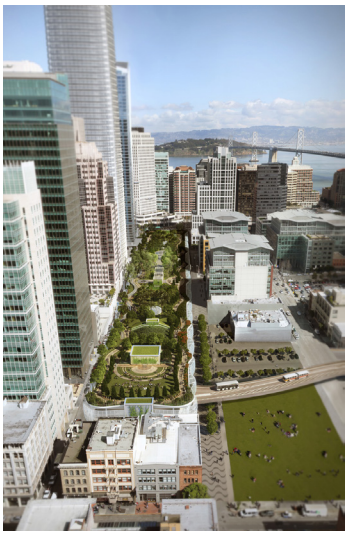

City of San Francisco

Meeting the Smart City Challenge

Volume 2

SmartCitySF.com

Notice of Funding Opportunity
#DTFH6116RA00002

SFMTA
Municipal
Transportation
Agency

TABLE OF CONTENTS

OMB Number: 4040-0004
Expiration Date: 8/31/2016

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [ ] New
- [x] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 05/24/2016

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City and County of San Francisco

* b. Employer/Taxpayer Identification Number (EIN/TIN): 941160893

* c. Organizational DUNS: 9566174350000

d. Address:

* Street1: 1 South Van Ness Avenue, 7th floor
Street2:
* City: San Francisco
County/Parish:
* State: CA: California
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 94103-1267

e. Organizational Unit:

Department Name: Municipal Transportation Agenc

Division Name: Finance and Info Technology

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mr.
* First Name: Joel
Middle Name:
* Last Name: Goldberg
Suffix:

Title: Manager, Capital Procurement & Management

Organizational Affiliation:

* Telephone Number: 415-701-4499
Fax Number:

* Email: joel.goldberg@sfmta.com

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

B: County Government

Type of Applicant 2: Select Applicant Type:

C: City or Township Government

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Dept of Transportation

11. Catalog of Federal Domestic Assistance Number:

20.200

CFDA Title:

Highway Research and Development Program

*** 12. Funding Opportunity Number:**

DTFH6116RA00002

* Title:

Beyond Traffic: The Smart City Challenge

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Beyond Traffic: The Smart City Challenge – Phase 2 Application

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 12,14 * b. Program/Project: 12,14

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 07/01/2016 * b. End Date: 02/28/2019

18. Estimated Funding ($):

* a. Federal	40,000,000.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	153,476,400.00
* f. Program Income	0.00
* g. TOTAL	193,476,400.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Mr. * First Name: Joel

Middle Name: C.

* Last Name: Goldberg

Suffix:

* Title: Manager, Capital Procurement and Management

* Telephone Number: 415-701-4499 Fax Number:

* Email: joel.goldberg@sfmta.com

* Signature of Authorized Representative:  * Date Signed: 05/23/16

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 01/31/2019

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Beyond Traffic: The Smart City Challenge	20.200	$ 40,000,000.00	$	$	$	$ 40,000,000.00
2. In-Kind Contributions			153,476,400.00			153,476,400.00
3.						
4.						
5. Totals		$ 40,000,000.00	$ 153,476,400.00	$	$	$ 193,476,400.00

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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1) Beyond Traffic: The Smart City Challenge	(2) In-Kind Contributions	(3)	(4)	(5)
a. Personnel	$ 11,799,108.60	$ 4,492,170.50	$	$	$ 16,291,279.10
b. Fringe Benefits	4,660,503.59	1,774,352.41			6,434,856.00
c. Travel	324,418.74	123,513.08			447,931.82
d. Equipment	2,037,664.93	775,782.18			2,813,447.11
e. Supplies	1,642,651.57	625,392.23			2,268,043.80
f. Contractual	1,645,154.75	626,345.25			2,271,500.00
g. Construction	398,774.36	151,821.84			550,596.20
h. Other	7,945,108.76	3,024,871.14			10,969,979.90
i. Total Direct Charges (sum of 6a-6h)	30,453,385.30	11,594,248.63			$ 42,047,633.93
j. Indirect Charges	9,546,614.70	3,634,598.37			$ 13,181,213.07
k. TOTALS (sum of 6i and 6j)	$ 40,000,000.00	$ 15,228,847.00	$	$	$ 55,228,847.00
7. Program Income	$ 40,000,000.00	$ 153,476,400.00	$	$	$ 193,476,400.00

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Prescribed by OMB (Circular A -102) Page 1A

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Beyond Traffic: The Smart City Challenge	$	$	$	$
9. In-Kind Contributions			153,476,400.00	153,476,400.00
10.				
11.				
12. TOTAL (sum of lines 8-11)	$	$	$ 153,476,400.00	$ 153,476,400.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 15,000,000.00	$ 3,750,000.00	$ 3,750,000.00	$ 3,750,000.00	$ 3,750,000.00
14. Non-Federal	$ 6,033,460.24	1,508,365.06	1,508,365.06	1,508,365.06	1,508,365.06
15. TOTAL (sum of lines 13 and 14)	$ 21,033,460.24	$ 5,258,365.06	$ 5,258,365.06	$ 5,258,365.06	$ 5,258,365.06

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. Beyond Traffic: The Smart City Challenge	$ 15,000,000.00	$ 15,000,000.00	$ 10,000,000.00	$
17. In-Kind Contributions	6,033,460.24	2,232,941.33	6,962,445.44	
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 21,033,460.24	$ 17,232,941.33	$ 16,962,445.44	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: 42,047,633.95

22. Indirect Charges: 13,181,213.07

23. Remarks:

OMB Number: 4040-0007
Expiration Date: 01/31/2019

ASSURANCES - NON-CONSTRUCTION PROGRAMS

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U. S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

19. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
[redacted]	Manager, Capital Procurement and Management
APPLICANT ORGANIZATION	**DATE SUBMITTED**
San Francisco Municipal Transportation Agency (SFMTA)	05/23/2016

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DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

Approved by OMB
4040-0013

1. * Type of Federal Action:
- [ ] a. contract
- [x] b. grant
- [ ] c. cooperative agreement
- [ ] d. loan
- [ ] e. loan guarantee
- [ ] f. loan insurance

2. * Status of Federal Action:
- [x] a. bid/offer/application
- [ ] b. initial award
- [ ] c. post-award

3. * Report Type:
- [x] a. initial filing
- [ ] b. material change

4. Name and Address of Reporting Entity:

[x] Prime [ ] SubAwardee

*Name: San Francisco Municipal Transportation Agency

*Street 1: 1 South Van Ness Avenue, 7th floor Street 2:

*City: San Francisco State: CA: California Zip: 94103

Congressional District, if known: 12, 14

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

6. * Federal Department/Agency:
U.S. Department of Transportation

7. * Federal Program Name/Description:

CFDA Number, *if applicable:*

8. Federal Action Number, *if known:*
DTFH6116RA00002

9. Award Amount, *if known:*
$ 40,000,000.00

10. a. Name and Address of Lobbying Registrant:

Prefix: *First Name: Holland & Knight Middle Name:

*Last Name: Suffix:

*Street 1: 800 17th Street, NW Suite 1100 Street 2:

*City: Washington State: DC: District of Columbia Zip: 20006

b. Individual Performing Services (including address if different from No. 10a)

Prefix: Ms. *First Name: Eve Middle Name:

*Last Name: O'Toole Suffix:

*Street 1: Street 2:

*City: State: Zip:

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

*** Signature:** Kate Breen

***Name:** Prefix: Ms. *First Name: Kate Middle Name:

*Last Name: Breen Suffix:

Title: Government Affairs Director **Telephone No.:** 415-701-4338 **Date:** 5/19/16

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Standard Form - LLL (Rev. 7-97)

Budget Summary

Budget	
Task	**Costs**
I. Program Management and Implementation	$4,785,116
II. Deployment	
• General	$13,007,948
• Tech Portal, Data Warehouse & Dashboards	$17,606,852
• Demonstration Proposals	
o Neighborhood	$9,707,330
o City	$8,355,700
o Regional	$1,765,900
SFMTA Total	**$19,987,895**
UC Berkeley Total	**$35,240,952**
Total	$55,228,846

Funding Plan		
Source	**Funding Source**	**Costs**
Federal	Smart City Challenge Grant	$40,000,000
Leveraged Sources	In-Kind Contributions to Smart City Institute	$153,476,400
	Total	$193,476,400

Methodology
The SFMTA has been aggressive in pursuing in-kind contributions, leveraging commitments and cash from its private sector partners. The overall budget of $55.2 million will be funded on a pro-rata, shared basis based with $40.0 million from the US DOT Smart City Challenge grant and $15.2 million from private sector cash or equivalent value. Additional commitments above the $15.2 million are additional revenues. They should be considered as current and future investments to scale San Francisco Smart City up based on the successes of the pilots presented in Volume 1. More detailed budget and schedules will be submitted upon grant award. The post-award program budget is subject to refinement based on the receipt of funds and level of in-kind contributions. Contributions equivalent to a total of $153M through May 20, 2016 are documented in the Letters of Commitment section and are based on a successful Smart City Challenge award. San Francisco Department of the Environment is also submitting an application to Paul Allen's Vulcan, Inc. with a total budget amount of $9,966,911.29.

Budget Summary - Year 1

Summary	
Task	**Total Cost**
Program Management and Implementation	
• Vision Director	$ 289,082
• Principal Investigators	$ 189,747
• Smart City Program Manager	$ 552,255
• Advisory Team	$ 390,471
• Advisory Team - Berkeley Law	$ 174,498
• Grants Manager	$ 37,005
• Travel	$ 70,499
Deployment	
• General	
o TSRC (UCB)	$ 2,047,583
o Communications	$ 1,268,891
o Safety Surveillance	$ 175,088
• Tech Portal, Data Warehouse, Dashboards	
o CTO/Data Management	$ 28,908
o Data Warehouse and Visualization (UCB)	$ 824,122
o Technology	$ 1,045,000
o Data Management	$ 1,856,146
o Middleware - Oracle SOA	$ 907,717
o Transform - ODI +	$ 907,717
o DBA	$ 453,858
o GIS	$ 453,858
• Regional	
o Project Manager - Regional Pilots	$ 375,855
o Transport As a Service Platform (Cost spread in multiple Deployment area	N/A
o Regional Commute Connected Carpool Lanes	$ 215,198
• City	
o Project Manager - City Pilots	$ 473,794
o Vision Zero Safe Driving Platform Speed Restriction App	$ 231,480
o Connected Streets - Connected Signalization	$ 344,725
o Digital Equity - Connected Mesh Network with Wifi	$ 110,850
o Digital Equity - Connected Mesh Network Collision Avoidance	$ 216,661
o Digital Equity - Connected Mesh Network Automated Taxis	$ 217,605
o Late Night Commute Shuttle	$ 1,100,000
• Neighborhood	
o Project Manager - Neighborhood Pilots	$ 332,354
o Neighborhood Challenge	$ 1,607,154
o Automated Vehicle (AV) Pilot (Through In-Kind contributions)	N/A
o Shared Mobility Hubs, Curbs & Lanes	$ 3,765,616
o Accessible Autonomous Shuttle & Delivery Service	$ 369,724
Total	$ 21,033,460

I. Program Management and Implementation Team

Labor and Fringe Benefits						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Vision Director						
9182 Manager VIII, Municipal Transporation Ag	$ 191,321	$ 97,616	$ 288,937	1040	0.50	$144,469
Principal Investigators						
Principal Investigator	$ 132,876	$ 53,150	$ 186,026	1560	0.75	$139,520
Co-Principal Investigator	$ -	$ -	$ -	0	0.00	$0
Smart City Program Manager						
5506 Project Manager III	$ 184,978	$ 91,011	$ 275,989	2080	1.00	$275,989
Advisory Team						
9183 Deputy Director I, Municipal Transportat	$ 203,567	$ 102,679	$ 306,246	62	0.03	$9,187
9179 Manager V, Municipal Transportation Agen	$ 154,418	$ 82,360	$ 236,778	146	0.07	$16,574
1823 Senior Administrative Analyst	$ 107,055	$ 59,039	$ 166,094	520	0.25	$41,524
1823 Senior Administrative Analyst	$ 107,055	$ 59,039	$ 166,094	520	0.25	$41,524
Program Liaison - Inter-agency Coordination	$ 270,400			208	0.10	$27,040
City Attorney ($250/hour)	$250/Hour			520		$130,000
Advisory Team - Berkeley Law						
Senior Personnel - Catherine Crump (no 3% escal	$ 232,093	$ 51,060.53	$ 283,154	124	0.06	$16,890
Research Fellow	$ 70,000	$ 26,600.00	$ 96,600	1560	0.75	$72,450
Research Fellow	$ 70,000	$ 28,000.00	$ 98,000	520	0.25	$24,500
Collaborator (JD)	$ 188,181	$ 71,508.78	$ 259,690	62	0.03	$7,791
Collaborator (JD)	$ 188,181	$ 75,272.40	$ 263,453	21	0.01	$2,635
Administrator (AU)	$ 91,980	$ 42,310.80	$ 134,291	47	0.02	$3,022
Administrator (AU)	$ 91,980	$ 44,150.40	$ 136,130	16	0.01	$1,021
Grants Manager						
9174 Manager IV, Municipal Transportation Age	$ 143,903	$ 78,014	$ 221,917	173	0.08	$18,493
Subtotal						$972,627
Contingency (10%)						$97,263
Labor and Fringe Total						**$1,069,890**

II. Deployment - Year One

Labor and Fringe Benefits						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
General						
TSRC (UCB)						
Co-Investigator	$ 158,016	$ 37,923.84	$ 195,940	87	0.04	$8,164
Assistant Senior Engineer	$ 105,468	$ 42,187.20	$ 147,655	1560	0.75	$110,741
Senior Project Manager	$ 103,392	$ 49,628.16	$ 153,020	1560	0.75	$114,765
Project Manager	$ 72,000	$ 34,560.00	$ 106,560	1560	0.75	$79,920
Survey Researcher 2	$ 51,324	$ 24,635.52	$ 75,960	1352	0.65	$49,374
Survey Researcher 2	$ 51,324	$ 24,635.52	$ 75,960	1352	0.65	$49,374
Survey Researcher 2	$ 51,324	$ 24,635.52	$ 75,960	1352	0.65	$49,374
Post-Doctoral Assistant	$ 53,682	$ 12,883.68	$ 66,566	2080	1.00	$66,566
Post-Doctoral Assistant	$ 53,682	$ 12,883.68	$ 66,566	2080	1.00	$66,566
GSR Step VIII	$ 42,519	$ -	$ 42,519	1473	0.71	$30,118
GSR Step VIII	$ 42,519	$ -	$ 42,519	1473	0.71	$30,118
GSR Step VIII	$ 42,519	$ -	$ 42,519	1473	0.71	$30,118
GSR Step VIII	$ 42,519	$ -	$ 42,519	1473	0.71	$30,118
Undergraduate Student Researcher	$ 20,880	$ -	$ 20,880	2080	1.00	$20,880
Undergraduate Student Researcher	$ 20,880	$ -	$ 20,880	2080	1.00	$20,880
Undergraduate Student Researcher	$ 20,880	$ -	$ 20,880	2080	1.00	$20,880
Undergraduate Student Researcher	$ 20,880	$ -	$ 20,880	2080	1.00	$20,880
Undergraduate Student Researcher	$ 20,880	$ -	$ 20,880	2080	1.00	$20,880
Academic Program Manager	$ 157,596	$ 75,646.08	$ 233,242	416	0.20	$46,648
Communication/Events Specialist	$ 90,000	$ 43,200.00	$ 133,200	624	0.30	$39,960
Survey Researcher 2	$ 51,324	$ 24,635.52	$ 75,960	1352	0.65	$49,374
Survey Researcher 2	$ 51,324	$ 24,635.52	$ 75,960	1352	0.65	$49,374
Communications						
1312 Public Information Officer	$ 84,760	$ 49,637	$ 134,397	1221	0.59	$78,906
Safety Surveillance						
David Ragland (UCB)	$ 162,720	$ -	$ 162,720	104	0.05	$8,136
Offer Grembek (UCB)	$ 104,340	$ 41,736.00	$ 146,076	208	0.10	$14,608
Post-Doctoral Researcher (UCB)	$ 66,204	$ 15,888.96	$ 82,093	624	0.30	$24,628
Graduate Student Researcher	$ 63,156	$ -	$ 63,156	386	0.19	$11,723
Graduate Student Researcher	$ 63,156	$ -	$ 63,156	520	0.25	$15,789
Research Associate	$ 71,256	$ 34,202.88	$ 105,459	624	0.30	$31,638

Labor and Fringe Benefits (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Tech Portal, Data Warehouse, Dashboards						
CTO/Data Management						
9182 Manager VIII, Municipal Transporation Ag	$ 191,321	$ 97,616	$ 288,937	104	0.05	$14,447
Data Warehouse and Visualization (UCB)						
Research and Data Librarian	$ 71,448	$ 34,295.04	$ 105,743	416	0.20	$21,149
Programmer	$ 125,436	$ 60,209.28	$ 185,645	1405	0.68	$125,433
Data Librarian	$ 83,544	$ 40,101.12	$ 123,645	1040	0.50	$61,823
Data Scientist	$ 120,816	$ 48,326.40	$ 169,142	1405	0.68	$114,278
Post-Doctoral Researchers	$ 53,682	$ 12,883.68	$ 66,566	1040	0.50	$33,283
Post-Doctoral Researchers	$ 53,682	$ 12,883.68	$ 66,566	1040	0.50	$33,283
GSR Step VIII	$ 42,519	$ -	$ 42,519	1346	0.65	$27,512
GSR Step VIII	$ 42,519	$ -	$ 42,519	1346	0.65	$27,512
GSR Step VIII	$ 42,519	$ -	$ 42,519	1346	0.65	$27,512
GSR Step VIII	$ 42,519	$ -	$ 42,519	1346	0.65	$27,512
Data Management						
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
5212 Engineer/Architect Principal	$ 190,964	$ 93,507	$ 284,471	2080	1.00	$284,471
1824 Principal Administrative Analyst	$ 123,941	$ 65,565	$ 189,506	2080	1.00	$189,506
Middleware - Oracle SOA						
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
Transform - ODI +						
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
DBA						
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
GIS						
1044 IS Engineer-Principal	$ 150,273	$ 76,543	$ 226,816	2080	1.00	$226,816
Regional						
Project Manager - Regional Pilots						
5207 Associate Engineer	$ 122,761	$ 65,073	$ 187,833	2080	1.00	$187,833
Regional Commute Connected Carpool Lanes						
Post-Doctoral Researcher (UCB)	$ 74,400	$ 16,368.00	$ 90,768	1560	0.75	$68,076
Alex Skabardonis (UCB)	$ 166,296	$ 63,192.48	$ 229,488	234	0.11	$25,817
Post-Doctoral Researcher (UCB) (4% escalation)	$ 77,376	$ 18,570.24	$ 95,946	520	0.25	$23,987
Alex Skabardonis (UCB) (4% escalation)	$ 172,948	$ 69,179.14	$ 242,127	78	0.04	$9,080

Labor and Fringe Benefits (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
City						
Project Manager - City Pilots						
9179 Manager V, Municipal Transportation Agen	$ 154,418	$ 82,360	$ 236,778	2080	1.00	$236,778
Vision Zero Safe Driving Platform Speed Restriction App						
David Ragland (UCB)	$ 162,720	$ -	$ 162,720	104	0.05	$8,136
Offer Grembek (UCB)	$ 104,340	$ 41,736.00	$ 146,076	208	0.10	$14,608
Post-Doctoral Researcher (UCB)	$ 66,204	$ 15,888.96	$ 82,093	832	0.40	$32,837
Graduate Student Researcher	$ 63,156	$ -	$ 63,156	386	0.19	$11,723
Graduate Student Researcher	$ 63,156	$ -	$ 63,156	520	0.25	$15,789
Research Associate	$ 71,256	$ 34,202.88	$ 105,459	1248	0.60	$63,275
Connected Streets - Connected Signalization						
Post-Doctoral Researcher (UCB)	$ 66,000	$ 14,520.00	$ 80,520	780	0.38	$30,195
Weibin Zhang (UCB)	$ 177,912	$ 67,606.56	$ 245,519	234	0.11	$27,621
Alex Skabardonis (UCB)	$ 166,296	$ 63,192.48	$ 229,488	234	0.11	$25,817
Kun Zhou (UCB)	$ 113,880	$ 43,274.40	$ 157,154	234	0.11	$17,680
Huadong Meng (UCB)	$ 112,320	$ 42,681.60	$ 155,002	234	0.11	$17,438
Post-Doctoral Researcher (UCB) (4% escalation)	$ 68,640	$ 16,473.60	$ 85,114	520	0.25	$21,278
Weibin Zhang (UCB) (4% escalation)	$ 185,028	$ 74,011.39	$ 259,040	78	0.04	$9,714
Alex Skabardonis (UCB) (4% escalation)	$ 172,948	$ 69,179.14	$ 242,127	78	0.04	$9,080
Kun Zhou (UCB) (4% escalation)	$ 118,435	$ 47,374.08	$ 165,809	78	0.04	$6,218
Huadong Meng (UCB) (4% escalation)	$ 116,813	$ 46,725.12	$ 163,538	78	0.04	$6,133
Digital Equity - Connected Mesh Network with Wifi						
Post-Doctoral Researcher (UCB)	$ 74,400	$ 16,368.00	$ 90,768	780	0.38	$34,038
Ching Yao Chan (UCB)	$ 160,405	$ 60,954.07	$ 221,360	125	0.06	$13,282
Post-Doctoral Researcher (UCB) (4% escalation)	$ 77,376	$ 18,570.24	$ 95,946	260	0.13	$11,993
Ching Yao Chan (UCB) (4% escalation)	$ 166,822	$ 66,728.66	$ 233,550	52	0.03	$5,839
Digital Equity - Connected Mesh Network Collision Avoidance						
Post-Doctoral Researcher (UCB)	$ 74,400	$ 16,368.00	$ 90,768	624	0.30	$27,230
Ching Yao Chan (UCB)	$ 160,405	$ 60,954.07	$ 221,360	312	0.15	$33,204
Dave Nelson (UCB)	$ 106,604	$ 49,037.91	$ 155,642	156	0.08	$11,673
Post-Doctoral Researcher (UCB) (4% escalation)	$ 77,376	$ 18,570.24	$ 95,946	260	0.13	$11,993
Trevor Darrell	$ 220,058	$ 52,813.92	$ 272,872	172	0.08	$22,512
Ching Yao Chan (UCB) (4% escalation)	$ 166,822	$ 66,728.66	$ 233,550	104	0.05	$11,678
Dave Nelson (UCB)	$ 110,868	$ 53,216.80	$ 164,085	104	0.05	$8,204
Digital Equity - Connected Mesh Network Automated Taxis						
Post-Doctoral Researcher (UCB)	$ 66,000	$ 14,520.00	$ 80,520	780	0.38	$30,195
Post-Doctoral Researcher (UCB)	$ 66,000	$ 14,520.00	$ 80,520	780	0.38	$30,195
Steve Shladover (UCB)	$ 198,432	$ 75,404.16	$ 273,836	312	0.15	$41,075
Post-Doctoral Researcher (UCB) (4% escalation)	$ 68,640	$ 16,473.60	$ 85,114	260	0.13	$10,639
Post-Doctoral Researcher (UCB) (4% escalation)	$ 68,640	$ 16,473.60	$ 85,114	260	0.13	$10,639
Steve Shladover (UCB) (4% escalation)	$ 206,369	$ 82,547.71	$ 288,917	104	0.05	$14,446

Labor and Fringe Benefits (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Neighborhood						
Project Manager - Neighborhood Pilots						
1823 Senior Administrative Analyst	$ 107,055	$ 59,039	$ 166,094	2080	1.00	$166,094
Neighborhood Challenge						
5288 Transit Planner II - Program Coordinator	$ 93,848	$ 53,470	$ 147,318	535	0.26	$37,875
5288 Transit Planner II - Community Outreach Coordinator	$ 93,848	$ 53,470	$ 147,318	891	0.43	$63,125
5288 Transit Planner II - Administration	$ 93,848	$ 53,470	$ 147,318	996	0.48	$70,542
Shared Mobility Hubs, Curbs & Lanes						
5288 Transit Planner II	$ 93,848	$ 53,470	$ 147,318	840	0.40	$59,494
5207 Associate Engineer	$ 122,761	$ 65,073	$ 187,833	240	0.12	$21,673
9145 Traffic Signal Electrician	$ 112,245	$ 62,785	$ 175,029	144	0.07	$12,117
9149 Traffic Signal Electrician Supervisor II	$ 140,883	$ 74,735	$ 215,618	84	0.04	$8,708
5212 Engineer/Architect Principal	$ 190,964	$ 93,507	$ 284,471	12	0.01	$1,641
5290 Transit Planner IV	$ 132,068	$ 68,953	$ 201,021	60	0.03	$5,799
Accessible Autonomous Shuttle & Delivery Service						
Post-Doctoral Researcher (UCB)	$ 66,000	$ 14,520.00	$ 80,520	780	0.38	$30,195
Post-Doctoral Researcher (UCB)	$ 66,000	$ 14,520.00	$ 80,520	780	0.38	$30,195
Steve Shladover (UCB)	$ 198,432	$ 75,404.16	$ 273,836	312	0.15	$41,075
Post-Doctoral Researcher (UCB) (4% escalation)	$ 68,640	$ 16,473.60	$ 85,114	260	0.13	$10,639
Post-Doctoral Researcher (UCB) (4% escalation)	$ 68,640	$ 16,473.60	$ 85,114	260	0.13	$10,639
Steve Shladover (UCB) (4% escalation)	$ 206,369	$ 82,547.71	$ 288,917	104	0.05	$14,446
Subtotal						$5,774,951
Contingency (10%)						$577,495
Labor and Fringe Total						**$6,352,447**

Subcontractor/Consultant Costs				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
(Tech Transfer) Subject Matter Experts	Estimate			$145,000
Communications				
Program Development Support - TBD	Estimate			$210,000
Neighborhood				
Neighborhood Challenge				
General Consultant - TBD	Estimate			$210,000
Consultant staff administration - TBD	Estimate			$24,000
Shared Mobility Hubs, Curbs & Lanes				
Motivate - Bike Share	$ 4,000	EA	$ 40	$160,000
EV Charging - TBD	$ 30,000	EA	$ 5	$150,000
Subtotal				$899,000
Contingency (10%)				$89,900
Subcontractor/Consultant Total				**$988,900**

Travel				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Program Management and Implementation				
Workshops				
Domestic Travel (2 Senior staff members)	5	Trip	$ 4,010	$20,050
International Travel (2 Senior staff members)	1	Trip	$ 7,000	$7,000
International Collaboration Meeting				
International Travel (2 Senior staff members)	1	Trip	$ 7,000	$7,000
Architecture Standard Meetings				
Domestic Travel (2 Senior staff members)	4	Trip	$ 4,010	$16,040
International Travel (2 Senior staff members)	2	Trip	$ 7,000	$14,000
General				
TSRC (UCB)				
TSRC Travel	Estimate			$20,000
(Tech Transfer) Travel	Estimate			$20,000
Safety Surveillance				
Domestic Travel	Estimate			$2,000
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
Domestic Travel (8 Senior staff members)	Estimate			$1,200
Regional Commute Connected Carpool Lanes				
San Francisco Site Visits	40	Trip	$ 68	$2,700
San Francisco Partner Meeting	2	Trip	$ 648	$1,295
City				
Vision Zero Safe Driving Platform Speed Restriction App				
Domestic Travel	Estimate			$2,000
Connected Streets - Connected Signalization				
San Francisco Site Visits	55	Trip	$ 68	$3,713
Digital Equity - Connected Mesh Network with Wifi				
San Francisco Site Visits	55	Trip	$ 68	$3,713
Digital Equity - Connected Mesh Network Collision Avoidance				
San Francisco Site Visits	20	Trip	$ 68	$1,350
US DOT Meeting in Washington DC	1	Trip	$ 2,005	$2,005
Digital Equity - Connected Mesh Network Automated Taxis				
San Francisco Site Visits	100	Trip	$ 68	$6,750
San Francisco Partner Meeting	1	Trip	$ 648	$648
Neighborhood				
Accessible Autonomous Shuttle & Delivery Service				
San Francisco Site Visits	100	Trip	$ 68	$6,750
Subtotal				$138,213
Contingency (10%)				$13,821
Travel Total				**$152,034**

Equipment				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
2 high performance multi-core servers with SATA SSD storage (Dell PowerEdge platform)	2	EA	$ 15,000	$30,000
Connected Streets - Connected Signalization				
Data Capture	1	EA	$ 20,000	$20,000
Data Storage	1	EA	$ 20,000	$20,000
Neighborhood				
Shared Mobility Hubs, Curbs & Lanes				
Bike Share (Configuration: 15 docks, 8 bikes)	40	EA	$ 47,167	$1,886,679
On-street Car Share	120	Spaces	$ 225	$27,000
Parklet	10	EA	$ 20,000	$200,000
EV Charging	5	EA	$ 60,000	$300,000
Kiosks (Sidewalk Labs)	Up to 100	In-Kind	$ -	$0
Subtotal				$2,483,679
Contingency (10%)				$248,368
Equipment Total				**$2,732,047**

Supplies				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
Computers	5	EA	$ 4,000	$20,000
Smart Phones for Research Participants	4	EA	$ 100	$400
Data Plans (for 4 phones)	12	Months	$ 100	$4,800
Printing Supplies	Fixed			$5,000
Tech Transfer: Supplies (Purchase of photos for publications, or software, hardware, streaming web services, etc., for webinars)	Fixed			$5,000
Communications				
Billboards/Bus Shelters	Estimate			$100,000
Printed Ads	Estimate			$50,000
Safety Surveillance				
Computer/Software	Estimate			$3,000
Printer Lease	Estimate			$1,019
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
Laptop Computers	6	EA	$ 2,500	$15,000
Desktop Computers	4	EA	$ 2,500	$10,000
Printing materials, external storage, misc office expenses	Fixed			$1,000
Technology				
Platform - Cloudera	1	License	$ 300,000	$300,000
Database - Oracle	1	License	$ 200,000	$200,000
Miscellaneous Tools	Estimate			$100,000
Cloud Storage - Amazon Web Services	1	In-Kind	$ 1,000,000	$0
Access Control	Estimate			$350,000

Supplies (continued)				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Regional				
Regional Commute Connected Carpool Lanes				
Miscellaneous	1	EA	$ 20,000	$20,000
City				
Vision Zero Safe Driving Platform Speed Restriction App				
Computer/Software	Estimate			$3,000
Printer Lease	Estimate			$1,019
Connected Streets - Connected Signalization				
Data Communication	0.5	EA	$ 20,000	$10,000
Miscellaneous	1	EA	$ 20,000	$20,000
Publication Expense	0	EA	$ 2,000	$0
Data Analysis Software	1	EA	$ 7,500	$7,500
Digital Equity - Connected Mesh Network with Wifi				
Electrical and Mechanical Supplies	Estimate			$5,000
Digital Equity - Connected Mesh Network Collision Avoidance				
Deep Learning Data Recording	20	EA	$ 1,000	$20,000
Deep Learning Camera	20	EA	$ 200	$4,000
Misc, electrical and mechanical	0	EA	$ 250	$0
Data Analysis tools and accessories	0	EA	$ 2,000	$0
Deep learning integration	0	EA	$ 1,000	$0
Digital Equity - Connected Mesh Network Automated Taxis				
Publication Expense	0	EA	$ 2,000	$0
Data Analysis Software	1	EA	$ 7,500	$7,500
Neighborhood				
Neighborhood Challenge				
Billboards/Bus Shelters	Estimate			$100,000
Literature/Doorhangers	Estimate			$20,000
Miscellaneous Supplies	Estimate			$5,000
Accessible Autonomous Shuttle & Delivery Service				
Data Acquisition Systems	$ 100,000	EA	$ 1	$100,000
Data Communication	$ 20,000	EA	$ 1	$10,000
Cloud Storage	$ 2,500	EA	$ 1	$2,500
Publication expense	$ 2,000	EA	$ -	$0
Data Analysis Software	$ 7,500	EA	$ 1	$7,500
Subtotal				$1,508,238
Contingency (10%)				$150,824
Supplies Total				**$1,659,062**

Construction				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Neighborhood				
Shared Mobility Hubs, Curbs & Lanes				
Labor (DT) - Kiosk Installation	$ 40	EA	$ 11,380	$455,184
PGE Power Survey	$ 40	EA	$ 720	$28,800
Labor (DPW) - Brickwork repair Market	$ 2	EA	$ 8,279	$16,558
Subtotal				$500,542
Contingency (10%)				$50,054
Construction Total				**$550,596**

Other				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
GSR Tuition Fees	Fixed			$36,544
Rent - Brower Center	Fixed			$1,200
Survey, Focus Groups and Incentives	Estimate			$0
(Tech Transfer) Writing/Editing Services	Estimate			$25,000
(Tech Transfer) Designing	Estimate			$25,000
(Tech Tranfer) Printing	Estimate			$25,000
Convening	Estimate			$65,000
Consortium Costs	Fixed			$129,816
Communications				
Mobility Platform App	Estimate			$250,000
Digital Ads	Estimate			$50,000
Drive Time Radio Ads	Estimate			$100,000
Research and Evaluation	Estimate			$170,000
Focus Groups	Estimate			$80,000
Safety Surveillance				
GSR Tuition Remission	Fixed			$9,546
Communications	Estimate			$1,341
Rent	12	Months	$ 736	$8,826
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
GSR Tuition Fees	Fixed			$68,260
Regional				
Regional Commute Connected Carpool Lanes				
Rent	12	Months	$ 750	$9,000

Other (continued)				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
City				
Vision Zero Safe Driving Platform Speed Restriction App				
GSR Tuition Remission	Fixed			$9,546
Communications	Estimate			$1,341
Rent	12	Months	$ 902	$10,826
Connected Streets - Connected Signalization				
Rent	12	Months	$ 900	$10,800
Digital Equity - Connected Mesh Network with Wifi				
Rent	12	Months	$ 788	$9,450
Digital Equity - Connected Mesh Network Collision Avoidance				
Rent	12	Months	$ 563	$6,750
Digital Equity - Connected Mesh Network Automated Taxis				
Rent	12	Months	$ 816	$9,788
Late Night Commute Shuttle				
Regional nighttime carpooling market demand analysis	Estimate			$100,000
Regional mobility hub feasibility study	Estimate			$100,000
Integrated mobility software development	Estimate			$100,000
Data monitoring solution	Estimate			$100,000
Marketing campaign for the vanpooling program	Estimate			$200,000
Subsidy program for low-income workers and disadvantaged	Estimate			$400,000
Neighborhood				
Neighborhood Challenge				
Website	Estimate			$15,000
Focus Groups	Estimate			$80,000
Quantitative Poll Surveys	Estimate			$75,000
Integration of Surveys with website and data sets	Estimate			$40,000
Direct Mail	Estimate			$360,000
Radio (English, Spanish, Chinese)	Estimate			$50,000
Chinese TV	Estimate			$25,000
Digital Ads	Estimate			$50,000
Robo Call	Estimate			$10,000
Voterfile Access	Estimate			$10,000
Paid Doorhanger Distribution Program	Estimate			$25,000
Events	Estimate			$10,000
Costs for Tabling at Community Events	Estimate			$20,000
Community Challenge Meetup costs	Estimate			$20,000
Accessible Autonomous Shuttle & Delivery Service				
Rent	12	Months	$ 816	$9,788
Subtotal				$2,912,821
Contingency (10%)				$291,282
Other Total				**$3,204,103**

Indirect Costs			
Expenditure	**Total**	**Indirect Cost Rate**	**Cost**
Program Management and Implementation			
Vision Director			
Labor	$ 144,469	90%	$130,166
Principal Investigators			
Labor	$ 139,520	26%	$36,275
Smart City Program Manager			
Labor	$ 275,989	90%	$248,666
Advisory Team			
Labor	$ 108,809	90%	$98,037
Advisory Team - Berkeley Law			
Direct Costs	$ 128,308	26%	$33,360
Grants Manager			
Labor	$ 18,493	90%	$16,662
General			
TSRC (UCB)			
Direct Costs (excludes Tuition, Rent, Equipment, Consortium less $25K)	$1,390,270	26%	$361,470
Communications			
Labor	$ 78,906	90%	$71,094
Safety Surveillance			
Direct Costs (excludes Rent, GSR Tuition Remission)	$ 113,881	26%	$29,609
Tech Portal, Data Warehouse, Dashboards			
CTO/Data Management			
Labor	$ 14,447	90%	$13,017
Data Warehouse and Visualization (UCB)			
Direct Costs (excludes Tuition, Equipment)	$ 526,497	26%	$136,889
Data Management			
Labor	$ 927,609	90%	$835,776
Middleware - Oracle SOA			
Labor	$ 453,632	90%	$408,722
Transform - ODI +			
Labor	$ 453,632	90%	$408,722
DBA			
Labor	$ 226,816	90%	$204,361
GIS			
Labor	$ 226,816	90%	$204,361
Regional			
Project Manager - Regional Pilots			
Labor	$ 187,833	90%	$169,238
Regional Commute Connected Carpool Lanes			
Direct Costs (excludes Rent)	$ 150,955	26%	$39,248

Indirect Costs (continued)			
Expenditure	**Total**	**Indirect Cost Rate**	**Cost**
City			
Project Manager - City Pilots			
Labor	$ 236,778	90%	$213,337
Vision Zero Safe Driving Platform Speed Restriction App			
Direct Costs (excludes Rent, GSR Tuition Remission)	$ 153,728	26%	$39,969
Connected Streets - Connected Signalization			
Direct Costs (excludes Equipment, Rent)	$ 212,386	26%	$55,220
Digital Equity - Connected Mesh Network with Wifi			
Direct Costs (excludes Rent)	$ 73,864	26%	$19,205
Digital Equity - Connected Mesh Network Collision Avoidance			
Direct Costs (excludes Rent)	$ 153,850	26%	$40,001
Digital Equity - Connected Mesh Network Automated Taxis			
Direct Costs (excludes Rent)	$ 152,087	26%	$39,543
Neighborhood			
Project Manager - Neighborhood Pilots			
Labor	$ 166,094	90%	$149,651
Neighborhood Challenge			
Labor	$ 171,541	90%	$154,559
Shared Mobility Hubs, Curbs & Lanes			
Labor	$ 109,432	90%	$98,598
Accessible Autonomous Shuttle & Delivery Service			
Direct Costs (excludes Rent)	$ 263,940	26%	$68,624
Subtotal			$4,324,381
Contingency (0%)			$0
Indirect Costs Total			**$4,324,381**

Budget Summary - Year 2

Summary	
Task	**Total Cost**
Program Management and Implementation	
• Vision Director	$ 147,999
• Principal Investigators	$ 195,439
• Smart City Program Manager	$ 565,350
• Advisory Team	$ 348,148
• Advisory Team - Berkeley Law	$ 182,634
• Grants Manager	$ 37,908
• Travel	$ 70,499
Deployment	
• General	
o TSRC (UCB)	$ 2,870,208
o Communications	$ 1,901,391
o Safety Surveillance	$ 204,031
• Tech Portal, Data Warehouse, Dashboards	
o CTO/Data Management	$ 29,600
o Data Warehouse and Visualization (UCB)	$ 768,096
o Technology	$ -
o Data Management	$ 1,900,659
o Middleware - Oracle SOA	$ 929,520
o Transform - ODI +	$ 929,520
o DBA	$ 464,760
o GIS	$ 464,760
• Regional	
o Project Manager - Regional Pilots	$ 385,017
o Transport As a Service Platform (Cost spread in multiple Deployment area	N/A
o Regional Commute Connected Carpool Lanes	$ 204,287
• City	
o Project Manager - City Pilots	$ 485,301
o Vision Zero Safe Driving Platform Speed Restriction App	$ 262,046
o Connected Streets - Connected Signalization	$ 356,865
o Digital Equity - Connected Mesh Network with Wifi	$ 99,640
o Digital Equity - Connected Mesh Network Collision Avoidance	$ 344,673
o Digital Equity - Connected Mesh Network Automated Taxis	$ 224,958
o Late Night Commute Shuttle	$ 1,100,000
• Neighborhood	
o Project Manager - Neighborhood Pilots	$ 340,555
o Neighborhood Challenge	$ 1,112,997
o Automated Vehicle (AV) Pilot (Through In-Kind contributions)	N/A
o Shared Mobility Hubs, Curbs & Lanes	$ 29,700
o Accessible Autonomous Shuttle & Delivery Service	$ 276,381
Total	$ 17,232,941

I. Program Management and Implementation Team

Labor and Fringe Benefits - Assumes 3% Escalation over Year 1						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Vision Director						
9182 Manager VIII, Municipal Transporation Ag	$ 197,061	$ 98,789	$ 295,850	520	0.25	$73,962
Principal Investigators						
Principal Investigator	$ 136,862	$ 54,744.91	$ 191,607	1560	0.75	$143,705
Co-Principal Investigator	$ -	$ -	$ -	0	0.00	$0
Smart City Program Manager						
5506 Project Manager III	$ 190,527	$ 92,006	$ 282,534	2080	1.00	$282,534
Advisory Team						
9183 Deputy Director I, Municipal Transportat	$ 209,674	$ 103,870	$ 313,544	62	0.03	$9,406
9179 Manager V, Municipal Transportation Agen	$ 159,051	$ 83,479	$ 242,529	146	0.07	$16,977
1823 Senior Administrative Analyst	$ 110,267	$ 59,926	$ 170,192	520	0.25	$42,548
1823 Senior Administrative Analyst	$ 110,267	$ 59,926	$ 170,192	520	0.25	$42,548
Program Liaison - Inter-agency cooridnation	$ 270,400			208	0.10	$27,040
City Attorney ($250/hour)	$250/Hour			347		$86,667
Advisory Team - Berkeley Law						
Senior Personnel - Catherine Crump	$ 232,093	$ 55,702.40	$ 287,796	128	0.06	$17,672
Research Fellow	$ 70,000	$ 28,000.00	$ 98,000	2080	1.00	$98,000
Collaborator (JD)	$ 188,181	$ 75,272.40	$ 263,453	104	0.05	$13,173
Administrator (AU)	$ 91,980	$ 44,150.40	$ 136,130	83	0.04	$5,445
Grants Manager						
9174 Manager IV, Municipal Transportation Age	$ 148,220	$ 79,116	$ 227,336	173	0.08	$18,945
Subtotal						$878,622
Contingency (10%)						$87,862
Labor and Fringe Total						**$966,484**

II. Deployment - Year Two

Labor and Fringe Benefits - Assumes 3% Escalation over Year 1						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
General						
TSRC (UCB)						
Co-Investigator	$ 162,756	$ 39,061.56	$ 201,818	87	0.04	$8,409
Assistant Senior Engineer	$ 108,632	$ 43,452.82	$ 152,085	1560	0.75	$114,064
Senior Project Manager	$ 106,494	$ 51,117.00	$ 157,611	1560	0.75	$118,208
Project Manager	$ 74,160	$ 35,596.80	$ 109,757	1560	0.75	$82,318
Survey Researcher 2	$ 52,864	$ 25,374.59	$ 78,238	1352	0.65	$50,856
Survey Researcher 2	$ 52,864	$ 25,374.59	$ 78,238	1352	0.65	$50,856
Survey Researcher 2	$ 52,864	$ 25,374.59	$ 78,238	1352	0.65	$50,856
Post-Doctoral Assistant	$ 55,292	$ 13,270.19	$ 68,563	2080	1.00	$68,563
Post-Doctoral Assistant	$ 55,292	$ 13,270.19	$ 68,563	2080	1.00	$68,563
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
Undergraduate Student Researcher	$ 21,506	$ -	$ 21,506	2080	1.00	$21,506
Undergraduate Student Researcher	$ 21,506	$ -	$ 21,506	2080	1.00	$21,506
Undergraduate Student Researcher	$ 21,506	$ -	$ 21,506	2080	1.00	$21,506
Undergraduate Student Researcher	$ 21,506	$ -	$ 21,506	2080	1.00	$21,506
Undergraduate Student Researcher	$ 21,506	$ -	$ 21,506	2080	1.00	$21,506
Academic Program Manager	$ 162,324	$ 77,915.46	$ 240,239	416	0.20	$48,048
Communication/Events Specialist	$ 92,700	$ 44,496.00	$ 137,196	624	0.30	$41,159
Survey Researcher 2	$ 52,864	$ 25,374.59	$ 78,238	1352	0.65	$50,855
Survey Researcher 2	$ 52,864	$ 25,374.59	$ 78,238	1352	0.65	$50,855
Communications						
1312 Public Information Officer	$ 87,303	$ 50,485	$ 137,788	1191	0.57	$78,906
Safety Surveillance						
David Ragland (UCB)	$ 167,592	$ -	$ 167,592	104	0.05	$8,380
Offer Grembek (UCB)	$ 107,460	$ 42,984.00	$ 150,444	208	0.10	$15,044
Post-Doctoral Researcher (UCB)	$ 68,184	$ 16,364.16	$ 84,548	624	0.30	$25,364
Graduate Student Researcher	$ 65,052	$ -	$ 65,052	772	0.37	$24,151
Graduate Student Researcher	$ 65,052	$ -	$ 65,052	520	0.25	$16,263
Research Associate	$ 73,392	$ 35,228.16	$ 108,620	624	0.30	$32,586

Labor and Fringe Benefits - Assumes 3% Escalation over Year 1 (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Tech Portal, Data Warehouse, Dashboards						
CTO/Data Management						
9182 Manager VIII, Municipal Transporation Ag	$ 197,061	$ 98,789	$ 295,850	104	0.05	$14,792
Data Warehouse and Visualization (UCB)						
Research and Data Librarian	$ 73,591	$ 35,323.89	$ 108,915	416	0.20	$21,784
Programmer	$ 129,199	$ 62,015.56	$ 191,215	1405	0.68	$129,196
Data Librarian	$ 86,050	$ 41,304.15	$ 127,354	1040	0.50	$63,677
Data Scientist	$ 124,440	$ 49,776.19	$ 174,217	1405	0.68	$117,706
Post-Doctoral Researchers	$ 55,292	$ 13,270.19	$ 68,563	1040	0.50	$34,281
Post-Doctoral Researchers	$ 55,292	$ 13,270.19	$ 68,563	1040	0.50	$34,281
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
GSR Step VIII	$ 43,794	$ -	$ 43,794	1919	0.92	$40,413
Data Management						
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
5212 Engineer/Architect Principal	$ 196,693	$ 94,511	$ 291,204	2080	1.00	$291,204
1824 Principal Administrative Analyst	$ 127,660	$ 66,463	$ 194,123	2080	1.00	$194,123
Middleware - Oracle SOA						
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
Transform - ODI +						
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
DBA						
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
GIS						
1044 IS Engineer-Principal	$ 154,781	$ 77,483	$ 232,264	2080	1.00	$232,264
Regional						
Project Manager - Regional Pilots						
5207 Associate Engineer	$ 126,443	$ 65,969	$ 192,412	2080	1.00	$192,412
Regional Commute Connected Carpool Lanes						
Post-Doctoral Researcher (UCB)	$ 77,376	$ 18,570.24	$ 95,946	1560	0.75	$71,960
Alex Skabardonis (UCB)	$ 172,948	$ 69,179.14	$ 242,127	234	0.11	$27,239
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	520	0.25	$22,320
Alex Skabardonis (UCB) (4% escalation)	$ 179,866	$ 71,946.30	$ 251,812	78	0.04	$9,443

Labor and Fringe Benefits - Assumes 3% Escalation over Year 1 (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
City						
Project Manager - City Pilots						
9179 Manager V, Municipal Transportation Agen	$ 159,051	$ 83,479	$ 242,529	2080	1.00	$242,529
Vision Zero Safe Driving Platform Speed Restriction App						
David Ragland (UCB)	$ 167,592	$ -	$ 167,592	104	0.05	$8,380
Offer Grembek (UCB)	$ 107,460	$ 42,984.00	$ 150,444	208	0.10	$15,044
Post-Doctoral Researcher (UCB)	$ 68,184	$ 16,364.16	$ 84,548	832	0.40	$33,819
Graduate Student Researcher	$ 65,052	$ -	$ 65,052	772	0.37	$24,151
Graduate Student Researcher	$ 65,052	$ -	$ 65,052	520	0.25	$16,263
Research Associate	$ 73,392	$ 35,228.16	$ 108,620	1248	0.60	$65,172
Connected Streets - Connected Signalization						
Post-Doctoral Researcher (UCB)	$ 68,640	$ 16,473.60	$ 85,114	1560	0.75	$63,835
Weibin Zhang (UCB)	$ 185,028	$ 74,011.39	$ 259,040	234	0.11	$29,142
Alex Skabardonis (UCB)	$ 172,948	$ 69,179.14	$ 242,127	234	0.11	$27,239
Kun Zhou (UCB)	$ 118,435	$ 47,374.08	$ 165,809	234	0.11	$18,654
Huadong Meng (UCB)	$ 116,813	$ 46,725.12	$ 163,538	234	0.11	$18,398
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	520	0.25	$22,320
Weibin Zhang (UCB) (4% escalation)	$ 192,430	$ 76,971.85	$ 269,401	78	0.04	$10,103
Alex Skabardonis (UCB) (4% escalation)	$ 179,866	$ 71,946.30	$ 251,812	78	0.04	$9,443
Kun Zhou (UCB) (4% escalation)	$ 123,173	$ 49,269.04	$ 172,442	78	0.04	$6,467
Huadong Meng (UCB) (4% escalation)	$ 121,485	$ 48,594.12	$ 170,079	78	0.04	$6,378
Digital Equity - Connected Mesh Network with Wifi						
Post-Doctoral Researcher (UCB)	$ 77,376	$ 18,570.24	$ 95,946	780	0.38	$35,980
Ching Yao Chan (UCB)	$ 166,822	$ 66,728.66	$ 233,550	78	0.04	$8,758
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	260	0.13	$11,160
Ching Yao Chan (UCB) (4% escalation)	$ 173,495	$ 69,397.81	$ 242,892	26	0.01	$3,036
Digital Equity - Connected Mesh Network Collision Avoidance						
Post-Doctoral Researcher (UCB)	$ 77,376	$ 18,570.24	$ 95,946	1170	0.56	$53,970
Ching Yao Chan (UCB)	$ 166,822	$ 66,728.66	$ 233,550	312	0.15	$35,033
Dave Nelson (UCB)	$ 110,868	$ 53,216.80	$ 164,085	312	0.15	$24,613
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	390	0.19	$16,740
Trevor Darrell (4% escalation)	$ 228,860	$ 54,926.48	$ 283,787	172	0.08	$23,412
Ching Yao Chan (UCB) (4% escalation)	$ 173,495	$ 69,397.81	$ 242,892	104	0.05	$12,145
Dave Nelson (UCB) (4% escalation)	$ 115,303	$ 55,345.47	$ 170,649	104	0.05	$8,532
Digital Equity - Connected Mesh Network Automated Taxis						
Post-Doctoral Researcher (UCB)	$ 68,640	$ 16,473.60	$ 85,114	780	0.38	$31,918
Post-Doctoral Researcher (UCB)	$ 68,640	$ 16,473.60	$ 85,114	780	0.38	$31,918
Steve Shladover (UCB)	$ 206,369	$ 82,547.71	$ 288,917	312	0.15	$43,338
Post-Doctoral Researcher (UCB) (4% escalation)	$ 72,000	$ 17,280.00	$ 89,280	390	0.19	$16,740
Post-Doctoral Researcher (UCB) (4% escalation)	$ 72,000	$ 17,280.00	$ 89,280	260	0.13	$11,160
Steve Shladover (UCB) (4% escalation)	$ 214,624	$ 85,849.62	$ 300,474	104	0.05	$15,024

Labor and Fringe Benefits - Assumes 3% Escalation over Year 1 (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Neighborhood						
Project Manager - Neighborhood Pilots						
1823 Senior Administrative Analyst	$ 110,267	$ 59,926	$ 170,192	2080	1.00	$170,192
Neighborhood Challenge						
5288 Transit Planner II - Program Coordinator	$ 96,663	$ 54,333	$ 150,997	522	0.25	$37,875
5288 Transit Planner II - Community Outreach Co	$ 96,663	$ 54,333	$ 150,997	870	0.42	$63,125
5288 Transit Planner II - Administration	$ 96,663	$ 54,333	$ 150,997	675	0.32	$48,974
Accessible Autonomous Shuttle & Delivery Service						
Post-Doctoral Researcher (UCB)	$ 68,640	$ 16,473.60	$ 85,114	1170	0.56	$47,876
Post-Doctoral Researcher (UCB)	$ 68,640	$ 16,473.60	$ 85,114	780	0.38	$31,918
Steve Shladover (UCB)	$ 206,369	$ 82,547.71	$ 288,917	312	0.15	$43,338
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	390	0.19	$16,740
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	260	0.13	$11,160
Steve Shladover (UCB) (4% escalation)	$ 214,624	$ 85,849.62	$ 300,474	104	0.05	$15,024
Subtotal						$6,004,696
Contingency (10%)						$600,470
Labor and Fringe Total						**$6,605,166**

Subcontractor/Consultant Costs				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
(Tech Transfer) Subject Matter Experts	Estimate			$145,000
Communications				
Program Development Support	Estimate			$210,000
Neighborhood				
Neighborhood Challenge				
General Consultant - TBD	Estimate			$210,000
Consultant staff administration - TBD	Estimate			$24,000
Subtotal				$589,000
Contingency (10%)				$58,900
Subcontractor/Consultant Total				**$647,900**

Travel				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Program Management and Implementation				
Workshops				
Domestic Travel (2 Senior staff members)	5	Trip	$ 4,010	$20,050
International Travel (2 Senior staff members)	1	Trip	$ 7,000	$7,000
International Collaboration Meeting				
International Travel	1	Trip	$ 7,000	$7,000
Architecture Standard Meetings				
Domestic Travel (2 Senior staff members)	4	Trip	$ 4,010	$16,040
International Travel (2 Senior staff members)	2	Trip	$ 7,000	$14,000
General				
TSRC (UCB)				
TSRC Travel	Estimate			$20,000
(Tech Transfer) Travel	Estimate			$20,000
Safety Surveillance				
Domestic Travel	Estimate			$1,500
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
Domestic Travel (8 Senior staff members)	Estimate			$1,200
Regional				
Regional Commute Connected Carpool Lanes				
San Francisco Site Visits	10	Trip	$ 68	$675
San Francisco Partner Meeting	2	Trip	$ 648	$1,295
City				
Vision Zero Safe Driving Platform Speed Restriction App				
Domestic Travel	Estimate			$1,500
Connected Streets - Connected Signalization				
San Francisco Site Visits	25	Trip	$ 68	$1,688
Digital Equity - Connected Mesh Network with Wifi				
San Francisco Site Visits	25	Trip	$ 68	$1,688
Digital Equity - Connected Mesh Network Collision Avoidance				
San Francisco Site Visits	20	Trip	$ 68	$1,350
US DOT Meeting in Washington DC	1	Trip	$ 2,005	$2,005
Digital Equity - Connected Mesh Network Automated Taxis				
San Francisco Site Visits	100	Trip	$ 68	$6,750
San Francisco Partner Meeting	1	Trip	$ 648	$648
Neighborhood				
Accessible Autonomous Shuttle & Delivery Service				
San Francisco Site Visits	100	Trip	$ 68	$6,750
Subtotal				$131,138
Contingency (10%)				$13,114
Travel Total				**$144,252**

Equipment				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
City				
Digital Equity - Connected Mesh Network Collision Avoidance				
Deep Learning Data Server	1	EA	$ 20,000	$20,000
Neighborhood Challenge				
Shared Mobility Hubs, Curbs & Lanes				
On-street Car Share	120	Spaces	$ 225	$27,000
Subtotal				$47,000
Contingency (10%)				$4,700
Equipment Total				**$51,700**

Supplies				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
Computers	0	EA	$ 4,000	$0
Smart Phones for Research Participants	0	EA	$ 100	$0
Data Plans (for 4 phones)	12	Months	$ 100	$4,800
Printing Supplies	Fixed			$5,000
(Tech Transfer) Supplies (Purchase of photographs for publications, or software, hardware, streaming web services, etc., for webinars)	Fixed	EA		$5,000
Communications				
Billboards/Bus Shelters	Estimate			$50,000
Printed Ads	Estimate			$50,000
Safety Surveillance				
Computer/Software	Estimate			$0
Printer Lease	Estimate			$1,005
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
Laptop Computers	0	EA	$ 2,500	$0
Desktop Computers	0	EA	$ 2,500	$0
Printing materials, external storage, misc office expenses	Fixed			$1,000
Regional				
Regional Commute Connected Carpool Lanes				
Miscellaneous	1	EA	$ 20,000	$10,000

Supplies (continued)				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
City				
Vision Zero Safe Driving Platform Speed Restriction App				
Computer/Software	Estimate			$0
Printer Lease	Estimate			$1,005
Connected Streets - Connected Signalization				
Data Communication	1	EA	$ 20,000	$20,000
Miscellaneous	1	EA	$ 20,000	$20,000
Publication Expense	0	EA	$ 2,000	$0
Data Analysis Software	0	EA	$ 7,500	$0
Digital Equity - Connected Mesh Network with Wifi				
Electrical and Mechanical Supplies	Estimate			$5,000
Digital Equity - Connected Mesh Network Collision Avoidance				
Deep Learning Data Recording	0	EA	$ 1,000	$0
Deep Learning Camera	0	EA	$ 200	$0
Misc, electrical and mechanical	200	EA	$ 250	$50,000
Data Analysis tools and accessories	2	EA	$ 2,000	$4,000
Deep learning integration	0	EA	$ 1,000	$0
Digital Equity - Connected Mesh Network Automated Taxis				
Publication Expense	0	EA	$ 2,000	$0
Data Analysis Software	0	EA	$ 7,500	$0
Neighborhood				
Neighborhood Challenge				
Billboards/Bus Shelters	Estimate			$50,000
Literature/Doorhangers	Estimate			$20,000
Miscellaneous Supplies	Estimate			$5,000
Accessible Autonomous Shuttle & Delivery Service				
Data Acquisition Systems	$ 100,000	EA	$ -	$0
Data Communication	$ 20,000	EA	$ 1	$20,000
Cloud Storage	$ 2,500	EA	$ 1	$2,500
Publication expense	$ 2,000	EA	$ -	$0
Data Analysis Software	$ 7,500	EA	$ -	$0
Subtotal				$324,310
Contingency (10%)				$32,431
Supplies Total				**$356,741**

Construction				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Subtotal				$0
Contingency (10%)				$0
Construction Total				**$0**

Other				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
GSR Tuition Fees	Fixed			$76,744
Rent - Brower Center	Fixed			$1,200
Survey, Focus Groups and Incentives	Estimate			$527,000
(Tech Transfer) Writing/Editing Services	Estimate			$25,000
(Tech Transfer) Designing	Estimate			$25,000
(Tech Tranfer) Printing	Estimate			$25,000
Convening	Estimate			$65,000
Consortium Costs	Fixed			$133,299
Communications				
Mobility Platform App				$750,000
Digital Ads				$75,000
Drive Time Radio Ads				$200,000
Research and Evaluation				$170,000
Focus Groups				$80,000
Safety Surveillance				
GSR Tuition Remission	Fixed			$21,002
Communications	Estimate			$1,341
Rent	12	Months	$ 763	$9,151
Regional				
Regional Commute Connected Carpool Lanes				
Rent	12	Months	$ 750	$9,000
City				
Vision Zero Safe Driving Platform Speed Restriction App				
GSR Tuition Remission	Fixed			$21,002
Communications	Estimate			$1,341
Rent	12	Months	$ 929	$11,151
Connected Streets - Connected Signalization				
Rent	12	Months	$ 900	$10,800
Digital Equity - Connected Mesh Network with Wifi				
Rent	12	Months	$ 788	$9,450
Digital Equity - Connected Mesh Network Collision Avoidance				
Rent	12	Months	$ 563	$6,750
Digital Equity - Connected Mesh Network Automated Taxis				
Rent	12	Months	$ 816	$9,788
Late Night Commute Shuttle				
Marketing campaign for the vanpooling program	Estimate			$300,000
Mobility Hub pilots	Estimate			$200,000
Subsidy program for low-income workers and disadvantaged	Estimate			$500,000

Other (continued)				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Neighborhood				
Neighborhood Challenge				
Website	Estimate			$15,000
Focus Groups	Estimate			$40,000
Quantitative Poll Surveys	Estimate			$75,000
Integration of Surveys with website and data sets	Estimate			$40,000
Direct Mail	Estimate			$110,000
Radio (English, Spanish, Chinese)	Estimate			$25,000
Chinese TV	Estimate			$15,000
Digital Ads	Estimate			$25,000
Robo Call	Estimate			$0
Voterfile Access	Estimate			$10,000
Paid Doorhanger Distribution Program	Estimate			$25,000
Events	Estimate			$10,000
Costs for Tabling at Community Events	Estimate			$20,000
Community Challenge Meetup costs	Estimate			$20,000
Accessible Autonomous Shuttle & Delivery Service				
Rent	12	Months	$ 816	$9,788
Subtotal				$3,703,806
Contingency (10%)				$370,381
Other Total				**$4,074,187**

Indirect Costs			
Expenditure	**Total**	**Indirect Cost Rate**	**Cost**
Program Management and Implementation			
Vision Director			
Labor	$ 73,962	90%	$66,640
Principal Investigators			
Labor	$ 143,705	26%	$37,363
Smart City Program Manager			
Labor	$ 282,534	90%	$254,563
Advisory Team			
Labor	$ 111,479	90%	$100,443
Advisory Team - Berkeley Law			
Direct Costs	$ 134,290	26%	$34,915
Grants Manager			
Labor	$ 18,945	90%	$17,069
General			
TSRC (UCB)			
Direct Costs (excludes Tuition, Rent, Equipment, Consortium less $25K)	$1,939,589	26%	$504,293
Communications			
Labor	$ 78,906	90%	$71,094
Safety Surveillance			
Direct Costs (excludes Rent, GSR Tuition Remission)	$ 125,634	26%	$32,665

Indirect Costs (continued)			
Expenditure	**Total**	**Indirect Cost Rate**	**Cost**
Tech Portal, Data Warehouse, Dashboards			
CTO/Data Management			
Labor	$ 14,792	90%	$13,328
Data Warehouse and Visualization (UCB)			
Direct Costs (excludes Tuition, Equipment)	$ 564,777	26%	$146,842
Data Management			
Labor	$ 949,854	90%	$855,819
Middleware - Oracle SOA			
Labor	$ 464,528	90%	$418,539
Transform - ODI +			
Labor	$ 464,528	90%	$418,539
DBA			
Labor	$ 232,264	90%	$209,270
GIS			
Labor	$ 232,264	90%	$209,270
Regional			
Project Manager - Regional Pilots			
Labor	$ 192,412	90%	$173,363
Regional Commute Connected Carpool Lanes			
Direct Costs (excludes Rent)	$ 142,932	26%	$37,162
City			
Project Manager - City Pilots			
Labor	$ 242,529	90%	$218,519
Vision Zero Safe Driving Platform Speed Restriction App			
Direct Costs (excludes Rent, GSR Tuition Remission)	$ 166,675	26%	$43,335
Connected Streets - Connected Signalization			
Direct Costs (excludes Equipment, Rent)	$ 253,666	26%	$65,953
Digital Equity - Connected Mesh Network Wifi			
Direct Costs (excludes Rent)	$ 65,622	26%	$17,062
Digital Equity - Connected Mesh Network Collision Avoidance			
Direct Costs (excludes Rent)	$ 231,800	26%	$60,268
Digital Equity - Connected Mesh Network Automated Taxis			
Direct Costs (excludes Rent)	$ 157,494	26%	$40,948
Neighborhood			
Project Manager - Neighborhood Pilots			
Labor	$ 170,192	90%	$153,343
Neighborhood Challenge			
Labor	$ 149,974	90%	$135,126
Accessible Autonomous Shuttle & Delivery Service			
Direct Costs (excludes Rent)	$ 195,305	26%	$50,779
Subtotal			$4,386,513
Contingency (0%)			$0
Indirect Cost Total			**$4,386,513**

Budget Summary - Year 3

Summary	
Task	**Total Cost**
Program Management and Implementation	
• Vision Director	$ 152,147
• Principal Investigators	$ 201,303
• Smart City Program Manager	$ 581,434
• Advisory Team	$ 306,619
• Advisory Team - Berkeley Law	$ 182,634
• Grants Manager	$ 38,948
• Travel	$ 70,499
Deployment	
• General	
o TSRC (UCB)	$ 2,922,147
o Communications	$ 1,406,391
o Safety Surveillance	$ 212,219
• Tech Portal, Data Warehouse, Dashboards	
o CTO/Data Management	$ 30,429
o Data Warehouse and Visualization (UCB)	$ 791,049
o Technology	$ -
o Data Management	$ 1,954,174
o Middleware - Oracle SOA	$ 955,653
o Transform - ODI +	$ 955,653
o DBA	$ 477,826
o GIS	$ 477,826
• Regional	
o Project Manager - Regional Pilots	$ 395,691
o Transport As a Service Platform (Cost spread in multiple Deployment area	N/A
o Regional Commute Connected Carpool Lanes	$ 189,852
• City	
o Project Manager - City Pilots	$ 498,694
o Vision Zero Safe Driving Platform Speed Restriction App	$ 271,907
o Connected Streets - Connected Signalization	$ 255,685
o Digital Equity - Connected Mesh Network with Wifi	$ 114,188
o Digital Equity - Connected Mesh Network Collision Avoidance	$ 249,388
o Digital Equity - Connected Mesh Network Automated Taxis	$ 297,240
o Late Night Commute Shuttle	$ 1,100,000
• Neighborhood	
o Project Manager - Neighborhood Pilots	$ 349,895
o Neighborhood Challenge	$ 1,184,903
o Automated Vehicle (AV) Pilot (Through In-Kind contributions)	N/A
o Shared Mobility Hubs, Curbs & Lanes	$ 29,700
o Accessible Autonomous Shuttle & Delivery Service	$ 308,350
Total	$ 16,962,445

I. Program Management and Implementation Team

Labor and Fringe Benefits - Assumes 3% Escalation over Year 2						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Vision Director						
9182 Manager VIII, Municipal Transporation Ag	$ 202,972	$ 101,170	$ 304,143	520	0.25	$76,036
Principal Investigators						
Principal Investigator	$ 140,968	$ 56,387	$ 197,355	1560	0.75	$148,017
Co-Principal Investigator	$ -	$ -	$ -	0	0.00	$0
Smart City Program Manager						
5506 Project Manager III	$ 196,243	$ 94,329	$ 290,572	2080	1.00	$290,572
Advisory Team						
9183 Deputy Director I, Municipal Transportat	$ 215,964	$ 106,403	$ 322,368	62	0.03	$9,671
9179 Manager V, Municipal Transportation Agen	$ 163,822	$ 85,401	$ 249,223	146	0.07	$17,446
1823 Senior Administrative Analyst	$ 113,575	$ 61,286	$ 174,860	520	0.25	$43,715
1823 Senior Administrative Analyst	$ 113,575	$ 61,286	$ 174,860	520	0.25	$43,715
Program Liaison - Inter-agency cooridnation	$ 270,400			208	0.10	$27,040
City Attorney ($250/hour)	$250/Hour			173		$43,333
Advisory Team - Berkeley Law						
Senior Personnel - Catherine Crump	$ 232,093	$ 55,702.40	$ 287,796	128	0.06	$17,672
Research Fellow	$ 70,000	$ 28,000.00	$ 98,000	2080	1.00	$98,000
Collaborator (JD)	$ 188,181	$ 75,272.40	$ 263,453	104	0.05	$13,173
Administrator (AU)	$ 91,980	$ 44,150.40	$ 136,130	83	0.04	$5,445
Grants Manager						
9174 Manager IV, Municipal Transportation Age	$ 152,667	$ 80,907	$ 233,574	173	0.08	$19,464
Subtotal						$853,298
Contingency (10%)						$85,330
Labor and Fringe Benefits Total						**$938,628**

II. Deployment - Year Three

Labor and Fringe Benefits - Assumes 3% Escalation over Year 2						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
General						
TSRC (UCB)						
Co-Investigator	$ 167,639	$ 40,233.40	$ 207,873	87	0.04	$8,661
Assistant Senior Engineer	$ 111,891	$ 44,756.40	$ 156,647	1560	0.75	$117,486
Senior Project Manager	$ 109,689	$ 52,650.51	$ 162,339	1560	0.75	$121,754
Project Manager	$ 76,385	$ 36,664.70	$ 113,050	1560	0.75	$84,787
Survey Researcher 2	$ 54,450	$ 26,135.82	$ 80,585	1352	0.65	$52,381
Survey Researcher 2	$ 54,450	$ 26,135.82	$ 80,585	1352	0.65	$52,381
Survey Researcher 2	$ 54,450	$ 26,135.82	$ 80,585	1352	0.65	$52,381
Post-Doctoral Assistant	$ 56,951	$ 13,668.30	$ 70,620	2080	1.00	$70,620
Post-Doctoral Assistant	$ 56,951	$ 13,668.30	$ 70,620	2080	1.00	$70,620
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
Undergraduate Student Researcher	$ 22,152	$ -	$ 22,152	2080	1.00	$22,152
Undergraduate Student Researcher	$ 22,152	$ -	$ 22,152	2080	1.00	$22,152
Undergraduate Student Researcher	$ 22,152	$ -	$ 22,152	2080	1.00	$22,152
Undergraduate Student Researcher	$ 22,152	$ -	$ 22,152	2080	1.00	$22,152
Undergraduate Student Researcher	$ 22,152	$ -	$ 22,152	2080	1.00	$22,152
Academic Program Manager	$ 167,194	$ 80,252.93	$ 247,447	416	0.20	$49,489
Communication/Events Specialist	$ 95,481	$ 45,830.88	$ 141,312	624	0.30	$42,394
Survey Researcher 2	$ 54,450	$ 26,135.82	$ 80,585	1352	0.65	$52,380
Survey Researcher 2	$ 54,450	$ 26,135.82	$ 80,585	1352	0.65	$52,380
Communications						
1312 Public Information Officer	$ 89,922	$ 51,562	$ 141,484	1160	0.56	$78,906
Safety Surveillance						
David Ragland (UCB)	$ 172,620	$ -	$ 172,620	104	0.05	$8,631
Offer Grembek (UCB)	$ 110,688	$ 44,275.20	$ 154,963	208	0.10	$15,496
Post-Doctoral Researcher (UCB)	$ 70,236	$ 16,856.64	$ 87,093	624	0.30	$26,128
Graduate Student Researcher (4% escalation)	$ 67,656	$ -	$ 67,656	772	0.37	$25,117
Graduate Student Researcher (4% escalation)	$ 67,656	$ -	$ 67,656	520	0.25	$16,914
Research Associate	$ 75,588	$ 36,282.24	$ 111,870	624	0.30	$33,561

Labor and Fringe Benefits - Assumes 3% Escalation over Year 2 (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Tech Portal, Data Warehouse, Dashboards						
CTO/Data Management						
9182 Manager VIII, Municipal Transporation Ag	$ 202,972	$ 101,170	$ 304,143	104	0.05	$15,207
Data Warehouse and Visualization (UCB)						
Research and Data Librarian	$ 75,799	$ 36,383.61	$ 112,183	416	0.20	$22,437
Programmer	$ 133,075	$ 63,876.03	$ 196,951	1405	0.68	$133,072
Data Librarian	$ 88,632	$ 42,543.28	$ 131,175	1040	0.50	$65,588
Data Scientist	$ 128,174	$ 51,269.48	$ 179,443	1405	0.68	$121,237
Post-Doctoral Researchers	$ 56,951	$ 13,668.30	$ 70,620	1040	0.50	$35,310
Post-Doctoral Researchers	$ 56,951	$ 13,668.30	$ 70,620	1040	0.50	$35,310
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
GSR Step VIII	$ 45,108	$ -	$ 45,108	1919	0.92	$41,625
Data Management						
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
5212 Engineer/Architect Principal	$ 202,594	$ 96,909	$ 299,503	2080	1.00	$299,503
1824 Principal Administrative Analyst	$ 131,489	$ 68,019	$ 199,508	2080	1.00	$199,508
Middleware - Oracle SOA						
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
Transform - ODI +						
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
DBA						
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
GIS						
1044 IS Engineer-Principal	$ 159,425	$ 79,369	$ 238,794	2080	1.00	$238,794
Regional						
Project Manager - Regional Pilots						
5207 Associate Engineer	$ 130,237	$ 67,510	$ 197,747	2080	1.00	$197,747
Regional Commute Connected Carpool Lanes						
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	1560	0.75	$66,960
Alex Skabardonis (UCB) (4% escalation)	$ 179,866	$ 71,946.30	$ 251,812	234	0.11	$28,329
Post-Doctoral Researcher (UCB) - partial FY	$ 74,880	$ 17,971.20	$ 92,851	520	0.25	$23,213
Alex Skabardonis (UCB) - partial FY (4% escalation over above)	$ 187,060	$ 74,824.15	$ 261,885	78	0.04	$9,821

Labor and Fringe Benefits - Assumes 3% Escalation over Year 2 (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
City						
Project Manager - City Pilots						
9179 Manager V, Municipal Transportation Agen	$ 163,822	$ 85,401	$ 249,223	2080	1.00	$249,223
Vision Zero Safe Driving Platform Speed Restriction App						
David Ragland (UCB)	$ 172,620	$ -	$ 172,620	104	0.05	$8,631
Offer Grembek (UCB)	$ 110,688	$ 44,275.20	$ 154,963	208	0.10	$15,496
Post-Doctoral Researcher (UCB)	$ 70,236	$ 16,856.64	$ 87,093	832	0.40	$34,837
Graduate Student Researcher (4% escalation)	$ 67,656	$ -	$ 67,656	772	0.37	$25,117
Graduate Student Researcher (4% escalation)	$ 67,656	$ -	$ 67,656	520	0.25	$16,914
Research Associate	$ 75,588	$ 36,282.24	$ 111,870	1248	0.60	$67,122
Connected Streets - Connected Signalization						
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	1170	0.56	$50,220
Weibin Zhang (UCB)	$ 192,430	$ 76,971.85	$ 269,401	234	0.11	$30,308
Alex Skabardonis (UCB)	$ 179,866	$ 71,946.30	$ 251,812	234	0.11	$28,329
Kun Zhou (UCB)	$ 123,173	$ 49,269.04	$ 172,442	234	0.11	$19,400
Huadong Meng (UCB)	$ 121,485	$ 48,594.12	$ 170,079	94	0.05	$7,654
Post-Doctoral Researcher (UCB)	$ 74,880	$ 17,971.20	$ 92,851	260	0.13	$11,606
Weibin Zhang (UCB) (4% escalation)	$ 200,127	$ 80,050.72	$ 280,178	78	0.04	$10,507
Alex Skabardonis (UCB) (4% escalation)	$ 187,060	$ 74,824.15	$ 261,885	78	0.04	$9,821
Kun Zhou (UCB) (4% escalation)	$ 128,100	$ 51,239.80	$ 179,339	78	0.04	$6,725
Digital Equity - Connected Mesh Network with Wifi						
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	780	0.38	$33,480
Ching Yao Chan (UCB)	$ 173,495	$ 69,397.81	$ 242,892	156	0.08	$18,217
Post-Doctoral Researcher (UCB)	$ 74,880	$ 17,971.20	$ 92,851	260	0.13	$11,606
Ching Yao Chan (UCB) (4% escalation)	$ 180,434	$ 72,173.72	$ 252,608	52	0.03	$6,315
Digital Equity - Connected Mesh Network Collision Avoidance						
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	780	0.38	$33,480
Ching Yao Chan (UCB)	$ 173,495	$ 69,397.81	$ 242,892	312	0.15	$36,434
Dave Nelson (UCB)	$ 115,303	$ 55,345.47	$ 170,649	312	0.15	$25,597
Post-Doctoral Researcher (UCB)	$ 74,880	$ 17,971.20	$ 92,851	260	0.13	$11,606
Trevor Darrell (4% escalation)	$ 238,015	$ 57,123.54	$ 295,138	172	0.08	$24,349
Ching Yao Chan (UCB) (4% escalation)	$ 180,434	$ 72,173.72	$ 252,608	104	0.05	$12,630
Dave Nelson (UCB) (4% escalation)	$ 119,915	$ 57,559.29	$ 177,474	52	0.03	$4,437
Digital Equity - Connected Mesh Network Automated Taxis						
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	1560	0.75	$66,960
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	780	0.38	$33,480
Steve Shladover (UCB)	$ 214,624	$ 85,849.62	$ 300,474	312	0.15	$45,071
Post-Doctoral Researcher (UCB) (4% escalation)	$ 74,880	$ 17,971.20	$ 92,851	520	0.25	$23,213
Post-Doctoral Researcher (UCB) (4% escalation)	$ 74,880	$ 17,971.20	$ 92,851	364	0.18	$16,249
Steve Shladover (UCB) (4% escalation)	$ 223,209	$ 89,283.61	$ 312,493	104	0.05	$15,625

Labor and Fringe Benefits - Assumes 3% Escalation over Year 2 (continued)						
Position (Title and Classification)	**Salary Per FTE**	**Mandatory Fringe Benefit (MFB) for FTE**	**Salary + MFB**	**Hours**	**FTE**	**Cost**
Neighborhood						
Project Manager - Neighborhood Pilots						
1823 Senior Administrative Analyst	$ 113,575	$ 61,286	$ 174,860	2080	1.00	$174,860
Neighborhood Challenge						
5288 Transit Planner II	$ 99,563	$ 55,525	$ 155,089	508	0.24	$37,875
5288 Transit Planner II	$ 99,563	$ 55,525	$ 155,089	847	0.41	$63,125
5288 Transit Planner II	$ 99,563	$ 55,525	$ 155,089	564	0.27	$42,031
Accessible Autonomous Shuttle & Delivery Service						
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	1560	0.75	$66,960
Post-Doctoral Researcher (UCB)	$ 72,000	$ 17,280.00	$ 89,280	780	0.38	$33,480
Steve Shladover (UCB)	$ 214,624	$ 85,849.62	$ 300,474	312	0.15	$45,071
Post-Doctoral Researcher (UCB) (4% escalation)	$ 74,880	$ 17,971.20	$ 92,851	520	0.25	$23,213
Post-Doctoral Researcher (UCB) (4% escalation)	$ 74,880	$ 17,971.20	$ 92,851	520	0.25	$23,213
Steve Shladover (UCB) (4% escalation)	$ 223,209	$ 89,283.61	$ 312,493	104	0.05	$15,625
Subtotal						$6,175,928
Contingency (10%)						$617,593
Labor and Fringe Total						**$6,793,521**

Subcontractor/Consultant Costs				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
(Tech Transfer) Subject Matter Experts	Estimate			$145,000
Communications				
Program Development Support	Estimate			$210,000
Neighborhood				
Neighborhood Challenge				
General Consultant - TBD	Estimate			$210,000
Consultant staff administration - TBD	Estimate			$12,000
Subtotal				$577,000
Contingency (10%)				$57,700
Subcontractor/Consultant Total				**$634,700**

Travel				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Program Management and Implementation				
Workshops				
Domestic Travel (2 Senior staff members)	5	Trip	$ 4,010	$20,050
International Travel (2 Senior staff members)	1	Trip	$ 7,000	$7,000
International Collaboration Meeting				
International Travel	1	Trip	$ 7,000	$7,000
Architecture Standard Meetings				
Domestic Travel (2 Senior staff members)	4	Trip	$ 4,010	$16,040
International Travel (2 Senior staff members)	2	Trip	$ 7,000	$14,000
General				
TSRC (UCB)				
TSRC Travel	Estimate			$20,000
(Tech Transfer) Travel	Estimate			$20,000
Safety Surveillance				
Domestic Travel	Estimate			$1,500
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
Domestic Travel (8 Senior staff members)	Estimate			$1,200
Regional				
Regional Commute Connected Carpool Lanes				
San Francisco Site Visits	40	Trip	$ 68	$2,700
San Francisco Partner Meeting	2	Trip	$ 648	$1,295
City				
Vision Zero Safe Driving Platform Speed Restriction App				
Domestic Travel	Estimate			$1,500
Connected Streets - Connected Signalization				
San Francisco Site Visits	40	Trip	$ 68	$2,700
Digital Equity - Connected Mesh Network with Wifi				
San Francisco Site Visits	40	Trip	$ 68	$2,700
Digital Equity - Connected Mesh Network Collision Avoidance				
San Francisco Site Visits	50	Trip	$ 68	$3,375
US DOT Meeting in Washington DC	1	Trip	$ 2,005	$2,005
Digital Equity - Connected Mesh Network Automated Taxis				
San Francisco Site Visits	100	Trip	$ 68	$6,750
San Francisco Partner Meeting	2	Trip	$ 648	$1,295
Neighborhood				
Accessible Autonomous Shuttle & Delivery Service				
San Francisco Site Visits	100	Trip	$ 68	$6,750
Subtotal				$137,860
Contingency (10%)				$13,786
Travel Total				**$151,646**

Equipment				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
Shared Mobility Hubs, Curbs & Lanes				
On-street Car Share	120	Spaces	$ 225	$27,000
Subtotal				$27,000
Contingency (10%)				$2,700
Equipment Total				**$29,700**

Supplies				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
Computers	0	EA	$ 4,000	$0
Smart Phones for Research Participants	0	EA	$ 100	$0
Data Plans (for 4 phones)	12	Months	$ 100	$4,800
Printing Supplies	Estimate			$5,000
(Tech Transfer) Supplies (Purchase of photographs for publications, or software, hardware, streaming web services, etc., for webinars)	Estimate	EA		$5,000
Communications				
Billboards/Bus Shelters	Estimate			$50,000
Printed Ads	Estimate			$50,000
Safety Surveillance				
Computer/Software	Estimate			$0
Printer Lease	Estimate			$1,005
Tech Portal, Data Warehouse, Dashboards				
Data Warehouse and Visualization (UCB)				
Laptop Computers	0	EA	$ 2,500	$0
Desktop Computers	0	EA	$ 2,500	$0
Printing materials, external storage, misc office expenses	Estimate			$1,000
Regional				
Regional Commute Connected Carpool Lanes				
Miscellaneous	0	EA	$ 20,000	$0

Supplies (continued)				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
City				
Vision Zero Safe Driving Platform Speed Restriction App				
Computer/Software	Estimate			$0
Printer Lease	Estimate			$1,005
Connected Streets - Connected Signalization				
Data Communication	0	EA	$ 20,000	$0
Miscellaneous	0	EA	$ 20,000	$0
Publication Expense	1	EA	$ 2,000	$2,000
Data Analysis Software	0	EA	$ 7,500	$0
		EA		$0
Digital Equity - Connected Mesh Network with Wifi				
Data Analysis Tools	Estimate			$4,000
Digital Equity - Connected Mesh Network Collision Avoidance				
Deep Learning Data Recording	0	EA	$ 1,000	$0
Deep Learning Camera	0	EA	$ 200	$0
Misc, electrical and mechanical	0	EA	$ 250	$0
Data Analysis tools and accessories	2	EA	$ 2,000	$4,000
Deep learning integration	20	EA	$ 1,000	$20,000
Digital Equity - Connected Mesh Network Automated Taxis				
Publication Expense	1	EA	$ 2,000	$2,000
Data Analysis Software	0	EA	$ 7,500	$0
Neighborhood				
Neighborhood Challenge				
Billboards/Bus Shelters	Estimate			$50,000
Literature/Doorhangers	Estimate			$20,000
Miscellaneous Supplies	Estimate			$5,000
Accessible Autonomous Shuttle & Delivery Service				
Data Acquisition Systems	$ 100,000	EA	$ -	$0
Data Communication	$ 20,000	EA	$ -	$0
Cloud Storage	$ 2,500	EA	$ 1	$2,500
Publication expense	$ 2,000	EA	$ 1	$2,000
Data Analysis Software	$ 7,500	EA	$ -	$0
Subtotal				$229,310
Contingency (10%)				$22,931
Supplies Total				**$252,241**

Construction				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
Subtotal				$0
Contingency (10%)				$0
Construction Total				**$0**

Other				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
General				
TSRC (UCB)				
GSR Tuition Fees	Fixed			$80,584
Rent - Brower Center	Fixed			$1,200
Survey, Focus Groups and Incentives	Estimate			$527,000
(Tech Transfer) Writing/Editing Services	Estimate			$25,000
(Tech Transfer) Designing	Estimate			$25,000
(Tech Tranfer) Printing	Estimate			$25,000
Convening	Estimate			$65,000
Consortium Costs	Fixed			$136,885
Communications				
Mobility Platform App	Estimate			$0
Digital Ads	Estimate			$75,000
Drive Time Radio Ads	Estimate			$500,000
Research and Evaluation	Estimate			$170,000
Focus Groups	Estimate			$80,000
Safety Surveillance				
GSR Tuition Remission	Fixed			$23,102
Communications	Estimate			$1,341
Rent	12	Months	$ 790	$9,476
Regional				
Regional Commute Connected Carpool Lanes				
Rent	12	Months	$ 750	$9,000

Other (continued)				
Expenditure	**Quantity**	**Unit**	**Unit Cost**	**Cost**
City				
Vision Zero Safe Driving Platform Speed Restriction App				
GSR Tuition Remission	Fixed			$23,102
Communications	Estimate			$1,341
Rent	12	Months	$ 956	$11,476
Connected Streets - Connected Signalization				
Rent	12	Months	$ 900	$10,800
Digital Equity - Connected Mesh Network with Wifi				
Rent	12	Months	$ 788	$9,450
Digital Equity - Connected Mesh Network Collision Avoidance				
Rent	12	Months	$ 563	$6,750
Digital Equity - Connected Mesh Network Automated Taxis				
Rent	12	Months	$ 816	$9,788
Late Night Commute Shuttle				
Marketing campaign for the vanpooling program	Estimate			$200,000
Subsidy program for low-income workers and disadvantaged	Estimate			$300,000
Regional mobility hubs	Estimate			$500,000
Neighborhood				
Neighborhood Challenge				
Website	Estimate			$15,000
Focus Groups	Estimate			$80,000
Quantitative Poll Surveys	Estimate			$75,000
Integration of Surveys with website and data sets	Estimate			$40,000
Direct Mail	Estimate			$110,000
Radio (English, Spanish, Chinese)	Estimate			$25,000
Chinese TV	Estimate			$15,000
Digital Ads	Estimate			$75,000
Robo Call	Estimate			$0
Voterfile Access	Estimate			$10,000
Paid Doorhanger Distribution Program	Estimate			$25,000
Events	Estimate			$10,000
Costs for Tabling at Community Events	Estimate			$20,000
Community Challenge Meetup costs	Estimate			$20,000
Accessible Autonomous Shuttle & Delivery Service				
Rent	12	Months	$ 816	$9,788
Subtotal				$3,356,082
Contingency (10%)				$335,608
Other Total				**$3,691,690**

Indirect Costs			
Expenditure	**Total**	**Indirect Cost Rate**	**Cost**
Program Management and Implementation			
Vision Director			
Labor	$ 76,036	90%	$68,508
Principal Investigators			
Labor	$ 148,017	26%	$38,484
Smart City Program Manager			
Labor	$ 290,572	90%	$261,805
Advisory Team			
Labor	$ 114,547	90%	$103,207
Advisory Team - Berkeley Law			
Direct Costs	$ 134,290	26%	$34,915
Grants Manager			
Labor	$ 19,464	90%	$17,538
General			
TSRC (UCB)			
Direct Costs (excludes Tuition, Rent, Equipment, Consortium)	$1,971,773	26%	$512,661
Communications			
Labor	$ 78,906	90%	$71,094
Safety Surveillance			
Direct Costs (excludes Rent, GSR Tuition Remission)	$ 129,693	26%	$33,720
Tech Portal, Data Warehouse, Dashboards			
CTO/Data Management			
Labor	$ 15,207	90%	$13,702
Data Warehouse and Visualization (UCB)			
Direct Costs (excludes Tuition, Equipment)	$ 581,654	26%	$151,230
Data Management			
Labor	$ 976,599	90%	$879,915
Middleware - Oracle SOA			
Labor	$ 477,588	90%	$430,307
Transform - ODI +			
Labor	$ 477,588	90%	$430,307
DBA			
Labor	$ 238,794	90%	$215,153
GIS			
Labor	$ 238,794	90%	$215,153
Regional			
Project Manager - Regional Pilots			
Labor	$ 197,747	90%	$178,170
Regional Commute Connected Carpool Lanes			
Direct Costs (excludes Rent)	$ 132,317	26%	$34,403

Indirect Costs (continued)			
Expenditure	**Total**	**Indirect Cost Rate**	**Cost**
City			
Project Manager - City Pilots			
Labor	$ 249,223	90%	$224,550
Vision Zero Safe Driving Platform Speed Restriction App			
Direct Costs (excludes Rent, GSR Tuition Remission)	$ 171,964	26%	$44,711
Connected Streets - Connected Signalization			
Direct Costs (excludes Equipment, Rent)	$ 179,269	26%	$46,610
Digital Equity - Connected Mesh Network with Wifi			
Direct Costs (excludes Rent)	$ 76,319	26%	$19,843
Digital Equity - Connected Mesh Network Collision Avoidance			
Direct Costs (excludes Rent)	$ 177,914	26%	$46,258
Digital Equity - Connected Mesh Network Automated Taxis			
Direct Costs (excludes Rent)	$ 210,642	26%	$54,767
Neighborhood			
Project Manager - Neighborhood Pilots			
Labor	$ 174,860	90%	$157,549
Neighborhood Challenge			
Labor	$ 143,030	90%	$128,870
Accessible Autonomous Shuttle & Delivery Service			
Direct Costs (excludes Rent)	$ 218,811	26%	$56,891
Subtotal			$4,470,319
Contingency (0%)			$0
Indirect Costs Total			**$4,470,319**

Budget Justification

Summary	
Category	**Justification**
Labor Rate Escalation	Labor escalation rates generally are 3% over the prior fiscal year (except where noted), and are adjusted at the start of each fiscal year. Escalation rates are based on historical cost-of-living adjustments and anticipated promotions for each respective job classification and position.
Fringe Benefits	SFMTA fringe benefits vary by position but are 58% on average. UC Berkeley fringe benefits are calculated at the projected rate of 40% for Academic titles, 24% Limited rate for Summer Academic salaries, 48% for Staff titles and 0% for Student titles. Current composite fringe benefit rates have all been reviewed and federally approved.
Subcontractor/Consultant	Consultants will aid in the neighbhorhood challenge and will generate content for technology transfer materials including mid-term publications and the culminating policy guide. The consultants will be determined after the grant award.
Travel	Travel for staff includes domestic and international travel to mandatory workshops, collaboration meetings, architecture standard meetings, travel to San Francisco from the UC Berkeley area, and travel for other project staff to represent the project at meetings in Washington D.C. and throughout the country.
Equipment	High performance multi-core servers for processing proprietary data and raw data sources. Data capture for selected Intersections outfitted with systems to capture operational data and environmental data. Data storage to centrally store data for analysis and archiving. Bike share, car share, parklets, EV charging and kiosks to create shared mobility hubs to reduce SOV trips, parking needs, and auto ownership.
Supplies	Computers will be used for project analysis and writing. Smart Phones will be used by the research staff in the field. Cellular Data Plans will support the smart phones in the field. Printing Supplies will be used to print recruitment material for the surveys, focus groups, digital design accessories for visual design and prototyping of dashboard components, dissemination and distribution of project deliverables in professional quality printed materials. Data analysis software is needed for specialized analysis software. Publication expenses provide fact sheets and final report publication expenses. Video cameras and data recording computers will be installed on up to 15 transit vehicles that are included in the project. Miscellaneous electrical and mechanical supplies include the electrical wiring, networking cables and connectors, mechanical fixtures, protective housing, and fixtures for the instrumentation and storage systems required the installation of cameras and data acquisition systems. Data analysis tools and accessories include two high-end laptops for data training and algorithm validation in field trips and laboratories. Software will be licensed throughout the project to facilitate the task of data analysis. Deep learning algorithms will be implemented and integrated with a real-time field demonstration on up to 2 vehicles. Data Communication data will be transferred from the on-board data capture systems via conventional wireless communications services. Data Acquisition systems provide low speed shuttles outfitted with systems to capture operational data and environmental data. Data logging systems include an individual bus outfitted with light-weight data logging equipment to capture specific operational data.

Summary (continued)	
Category	**Justification**
Construction	Construction for shared mobility hubs are included to install kiosks, connect the power supplies and to repair brickwork on the sidewalk areas.
Other	Tuition fees from UC Berkeley provide full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year. Rent is used for cubicle space in off campus office space. Survey, focus groups and incentives provide incentives for participants to maintain continued participation. Writing/editing services will draft and finalize outreach material that will be shared with residents and technology transfer materials to support knowledge transfer to other cities. Designing will provide graphic design for outreach and technology transfer publications. Printing will provide the publication of materials created to share information and progress with the community and technology transfer materials for knowledge transfer to other cities. Convening will provide meeting space, audio-visual support, recording, and other services required for technology transfer activities. Communications activities will market the project through a variety of avenues. The late night commute shuttle provides on-demand shuttle service that provides first and last mile connections from work centers to key transit stations and vice versa during late-night and early morning hours. The neighborhood challenge will engage our city's neighborhoods (low-income, disabled, older adults, children, working families, etc.) through a variety of efforts to be the first to try out innovative mobility options.
Indirect Costs	SFMTA's Sustainable Streets Division Indirect Cost Allocation Rate Plan is 90.1% and UC Berkeley's Off-Campus Facilities and Administrative Cost Rate is 26%, which are used to determine indirect costs. Indirect cost charges are calculated using direct labor costs for SFMTA, and modified total direct costs for UC Berkeley. This reflects the FTA indirect cost rate established by SFMTA and FTA on August 20, 2015 and the off-campus indirect cost rate established by the UC Berkeley and DHHS on August 27, 2015. Copies of each agreement are included.

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION IX
Arizona, California,
Hawaii, Nevada, Guam
American Samoa,
Northern Mariana Islands

201 Mission Street
Suite 1650
San Francisco, CA 94105-1839
415-744-3133
415-744-2726 (fax)

AUG 20 2015

Mr. Edward Reiskin
Director of Transportation
San Francisco Municipal Transportation Agency
City and County of San Francisco
One South Van Ness Ave, 7th Floor
San Francisco, CA 94103

Attn: Sonali Bose, Chief Financial Officer

RE: FY2013-2015 Indirect Cost Allocation Plan Rates

Dear Mr. Reiskin:

The Federal Transit Administration has received the fiscal year 2013-2015 Indirect Cost Allocation Plan Rates for the San Francisco Municipal Transportation Agency as follows:

	FY2013 Proposed Rate	FY2014 Proposed Rate	FY2015 Proposed Rate
Transit (5M) Capital Rate	89.8%	65.2%	114.3%
SSD (5N & 5Y) Capital Rate	58.2%	42.4%	90.1%

Based on the information provided, the fiscal year 2013-2015 indirect cost allocation plans do not require FTA review since the rates do not exceed 20% of the previously approved rates for Fiscal Year 2012 of 138.5% for Transit (5M) Capital Rate and 80.3% for the SSD (5N & 5Y) Capital Rate. Copies of the plans should be kept in your files to support the rates charged during fiscal years 2013-2015 to Federal Grants.

If you should have any questions regarding cost allocation plans, please contact Audrey Bredehoft, Financial Analyst at (415) 744-2597.

Sincerely,

Leslie T. Rogers
Regional Administrator

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN:

ORGANIZATION:
University of California (UCB)
Office of President
111 Franklin St., 10th Floor
Oakland, CA 94607-5200

DATE:08/27/2015

FILING REF.: The preceding agreement was dated 08/08/2014

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: INDIRECT COST RATES

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

EFFECTIVE PERIOD

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PRED.	07/01/2011	06/30/2012	53.50	On-Campus	Org Res (1)
PRED.	07/01/2012	06/30/2013	55.50	On-Campus	Org Res (1)
PRED.	07/01/2013	06/30/2015	56.50	On-Campus	Org Res (1)
PRED.	07/01/2015	06/30/2016	57.00	On-Campus	Org Res (1)
PRED.	07/01/2011	06/30/2016	26.00	Off-Campus	Org Res (1)
PRED.	07/01/2011	06/30/2012	56.50	On-Campus	Instruction
PRED.	07/01/2012	06/30/2016	50.50	On-Campus	Instruction
PRED.	07/01/2011	06/30/2016	26.00	Off-Campus	Instruction
PRED.	07/01/2011	06/30/2012	33.50	On-Campus	Other Spons Act
PROV.	07/01/2012	06/30/2014	38.00	On-Campus	Other Spons Act
PRED.	07/01/2014	06/30/2016	40.00	On-Campus	Other Spons Act
PRED.	07/01/2011	06/30/2012	19.00	Off-Campus	Other Spons Act
PRED.	07/01/2012	06/30/2016	16.50	Off-Campus	Other Spons Act
PRED.	07/01/2011	06/30/2012	29.00	On-Campus	SSL (2)
PRED.	07/01/2012	06/30/2016	40.00	On-Campus	SSL (2)
PRED.	07/01/2011	06/30/2012	16.60	Off-Campus	SSL (2)
PRED.	07/01/2012	06/30/2016	24.50	Off-Campus	SSL (2)
PRED.	07/01/2011	06/30/2016	8.00	Off-Campus	IPAA (3)

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PROV.	07/01/2016	Until Amended		(4)	

*BASE

Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials, supplies, services, travel and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, student tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000.

(1) Organized Research

(2) Space Sciences Laboratory (Research)

(3) Intergovernmental Personnel Act Agreement

(4) Use same rates and conditions as those cited for fiscal year ending June 30, 2016.

SECTION I: FRINGE BENEFIT RATES**

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
FIXED	7/1/2015	6/30/2016	36.00	All	Academic (1)
FIXED	7/1/2015	6/30/2016	44.00	All	Staff (2)
FIXED	7/1/2015	6/30/2016	20.00	All	Limited (3)
FIXED	7/1/2015	6/30/2016	0.00	All	Students (4)

** DESCRIPTION OF FRINGE BENEFITS RATE BASE:

1) Academic Rate: for use by all appointments that carry academic job codes including faculty with university approved research leaves (e.g. buyouts/leave of absence) and IPA assignments. Faculty summer salary is NOT included in this rate.

2) Staff rate: for use by all appointments that carry a staff job code.

3) Limited Rate: for use by all Post Docs, all appointments with limited access to benefit programs (identified through BELI* code, 2, 3, or 4), and all faculty summer salary.

4) Student rate: for use by all student job codes

Excluded from all rates: appointments categorically exempt from benefit programs (BELI code 5).

*Benefit Eligibility Level Indicator

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

This organization charges the actual cost of each fringe benefit direct to Federal projects. However, it uses a fringe benefit rate which is applied to salaries and wages in budgeting fringe benefit costs under project proposals. The following fringe benefits are treated as direct costs:
OASDI, WORKERS COMPENSATION, HELATH/DENTAL PLAN CONTRIBUTION, LIFE INSURANCE, MEDICARE, DISABILITY INSURANCE, UNEMPLOYMENT INSURANCE, INCENTIVE AWARD PROGRAM, AND RETIREMENT SYSTEM CONTRIBUTION.

Beginning 07/01/12, fringe benefits are charged using the rate(s) listed in the Fringe Benefits Section of this Agreement. The fringe benefits included in the rate(s) are:
FICA, DISABILITY, LIFE INSURANCE, HEALTH INSURANCE, RETIREMENT, UNEMPLOYMENT AND WORKERS COMPENSATION.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

DEFINITION OF EQUIPMENT
Equipment is defined as tangible nonexpendable personal property having a useful life of more than one year and an acquisition cost of $5,000 or more per unit.

DEFINITION OF ON-CAMPUS, OFF-CAMPUS AND SPECIAL RATES

DEFINITION OF OFF-CAMPUS RATE
The off-campus rate is applicable to those projects conducted at facilities not owned or leased by the University. However, if the project is conducted in leased space and lease costs are directly charged to the project, then the off-campus rate must be used.

PROJECTS CONDUCTED ENTIRELY ON-CAMPUS OR ENTIRELY OFF-CAMPUS:
Projects conducted entirely on-campus or entirely off-campus will be applied the on-campus or off-campus rate respectively.

PROJECTS CONDUCTED PARTIALLY OFF-CAMPUS AND PARTIALLY ON-CAMPUS:
If the project involves work at both on-campus and off-campus sites, either the on-campus or off-campus rate generally should be applied, consistent with where the majority of the work is to be performed. Salary cost is generally accepted as a measure of work performed in terms of the total project.

USE OF BOTH ON-CAMPUS AND OFF-CAMPUS RATES
The use of both on-campus and off-campus rates for a given project may be justified if both of the respective rates can clearly be identified with a significant portion of salaries and wages of the project. For purposes of this provision, significant is defined as approximately 25% or more of the total costs and a project's total salary and wage costs exceed $250,000.

OTHER SPECIAL RATES
These rates apply only to the facility or program to which they are identified. If any additional special rates become necessary the establishment of such rates should be coordinated through the cognizant negotiation agency.

GENOMIC ARRAYS
The NIH Policy on indirect costs pertaining to Genomic Arrays (NOT-OD-10-097) is effective as of 05/13/10.

This agreement only updates the fringe benefits.

NEXT PROPOSAL DUE DATE
Your next indirect cost proposal based on your fiscal year ending 6/30/15 is due in our office by 12/31/15 and your next fringe benefits proposal based on FY 6/30/15 is due by 12/31/15.

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of California (UCB)

(INSTITUTION)

(SIGNATURE)

Nathan Brostrom

(NAME)

EVP - Chief Financial Officer

(TITLE)

9/10/2015

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Arif M. Karim -A Digitally signed by Arif M. Karim -A DN: c=US, o=U.S. Government, ou=HHS, ou=PSC, ou=People, cn=Arif M. Karim -A, 0.9.2342.19200300.100.1.1=2000212895 Date: 2015.09.02 21:52:17 -05'00'

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

8/27/2015

(DATE) 0232

HHS REPRESENTATIVE: Patrick Smith

Telephone: (415) 437-7820

1. Identify any exceptions to the anticipated award terms and conditions as contained in Section F, Federal Award Administration Information.

   SFMTA Response: The SFMTA has not identified any exceptions to the anticipated award terms and conditions. The SFMTA anticipates that all of the data/information to be created during the project will be public information and open data accessible. The SFMTA does not know at this time whether it will use any proprietary software or other intellectual property for the project.

2. Identify any preexisting intellectual property that you anticipate using during award performance, and your position on its data rights during and after the award period of performance.

   SFMTA Response: The SFMTA does not know at this time whether it will use any proprietary software or other intellectual property for the project.

3. The use of a Dun and Bradstreet (D&B) Data Universal Numbering System (DUNS) number is required on all applications for Federal grants or cooperative agreements. Please provide your organization's DUNS number in your budget application.

   SFMTA Response: The SFMTA organizational DUNS number is 9566174350000

4. A statement to indicate whether your organization has previously completed an A-133 Single Audit and, if so, the date that the last A-133 Single Audit was completed.

   SFMTA Response: The SFMTA completes an A-133 Single Audit every year. The most recent A-133 Single Audit was completed by KPMG on January 29, 2016 for the year ended June 30, 2015.

5. A statement regarding Conflicts of Interest. The Applicant must disclose in writing any actual or potential personal or organizational conflict of interest in its application that describes in a concise manner all past, present or planned organizational, contractual or other interest(s), which may affect the Applicants' ability to perform the proposed contract in an impartial and objective manner. Actual or potential conflicts of interest may include but are not limited to any past, present or planned contractual, financial, or other relationships, obligations, commitments or responsibilities, which may bias the Applicant or affect the Applicant's ability to perform the agreement in an impartial and objective manner. The AO will review the statement(s) and may require additional relevant information from the Applicant. All such information, and any other relevant information known to DOT, will be used to determine whether an award to the Applicant may create an actual or potential conflict of interest. If any such conflict of interest is found to exist, the AO may (a) disqualify the Applicant, or (b) determine that it is otherwise in the best interest of the United States to contract with the Applicant and include appropriate provisions to mitigate or avoid such conflict in the agreement pursuant to 2 CFR 200.112.

   SFMTA Response: At the current time, the SFMTA knows of no personal or organizational conflict of interest regarding the proposed project. City officers and employees are subject to strict conflict of interest laws. The California Political Reform Act (Cal Govt. Code Sections 87100, et seq.) imposes broad conflict of interest rules, gift limits, and financial disclosure requirements.

The City and County of San Francisco, through its Campaign and Governmental Conduct Code, enforces additional conflict of interest rules and gift limits. Further, as a federal grantee, the SFMTA takes pains to identify and evaluate potential organizational conflicts of interest as early in the procurement process as possible, in order to avoid or mitigate any potential conflicts before contract award.

6. A statement to indicate whether a Federal or State organization has audited or reviewed the Applicant's accounting system, purchasing system, and/or property control system. If such systems have been reviewed, provide summary information of the audit/review results to include as applicable summary letter or agreement, date of audit/review, Federal or State point of contact for such review.

SFMTA response: The Federal Transit Administration conducted a Triennial Review of the SFMTA in 2013. The review was performed by Milligan & Company, LLC., for which they conducted a site visit from December 16-18, 2013, and issued a Final Report on January 13, 2014. During the site visit, administrative and statutory requirements were discussed and documents were reviewed, as well as SFMTA's transit facilities toured to provide an overview of activities related to FTA-funded projects.

In its Final Report, Milligan & Company determined that in the areas of:

- Financial Management and Financial Capacity: in which the SFMTA must demonstrate the ability to match and manage FTA grant funds, cover cost increases and operating deficits, financially maintain and operate FTA funded facilities and equipment, and conduct and respond to applicable audits, there were no deficiencies.

- Procurement: in which the SFMTA uses their own procurement procedures that reflect applicable state and local laws and regulations, provided that the process ensures competitive procurement and the procedures conform to applicable federal law, including 49 CFR Part 18 (specifically Section 18.36) and FTA Circular 4220.1F, "Third Party Contracting Guidance", the SFMTA needed to provide follow-up in regard to:
  - making and documenting adequate responsibility determinations prior to award of a contract,
  - completing the applicable pre-award and post-delivery audits certifications for future revenue rolling stock procurements,
  - searching the SAM before entering into applicable transactions and documenting the results of the search.

For the 2013 Triennial Review Audit, the SFMTA satisfactorily responded to the follow-up items allowing the items to be closed out by the FTA. Jeffrey Davis, FTA Office of Program Management & Oversight for Region IX, may be contacted in regard to the SFMTA's 2013 Triennial Review.

7. Terminated Contracts - List any contract/agreement that was terminated for convenience against the Applicant within the past 3 years, and any contract/agreement that was terminated for default within the past 5 years. Briefly explain the circumstances in each instance.

SFMTA Response: Not applicable.

8. Describe how your organization will obtain the necessary resources to fund and fulfill the proposed cost share, if applicable.

   SFMTA Response: As of May 20, 2016, SFMTA has received letters of commitment for in-kind contributions from private organizations totaling $153M, should this application be successful. These in-kind contributions will cover the potential cost share.

9. The Applicant is directed to review Title 2 CFR Part 170 (http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title02/2cfr170_main_02.tpl) dated September 14, 2010, and Appendix A thereto, and acknowledge in its application that it understands the requirement, has the necessary processes and systems in place, and is prepared to fully comply with the reporting described in the term if it receives funding resulting from this Notice. The text of Appendix A will be incorporated in the award document as a General Term and Condition as referenced under this Notice's Section F, Federal Award Administration Information.

   SFMTA Response: The SFMTA acknowledges that it has reviewed Title 2 CFR §170 and it has the necessary processes and systems in place and is prepared to fully comply with the reporting requirements if it receives funding from this Notice.

10. Disclose any violations by the Applicant of Federal criminal law involving fraud, bribery, or gratuity violations. Failure to make required disclosures can result in any of the remedies described in 2 CFR 200.338 entitled Remedies for Noncompliance, including suspension or debarment. (See also 2 CFR Part 180 and 31 U.S.C. 3321).

    SFMTA Response: None.

11. A statement to acknowledge receipt and acceptance of any Notice of Funding Opportunity Amendments issued by the USDOT.

    SFMTA Response: The SFMTA acknowledges the receipt of and accepts the terms in the Notice of Funding Opportunity Amendments issued by the USDOT.

Endorsement Letter from Co-Partner
UC Berkeley

Letters of Commitment

Company	Commitment
• Ford Motor Company	$50,000,000.00
• Zoox Inc.	$30,000,000.00
• TransitScreen / CIVIQ	$16,000,000.00
• Nohm	$15,000,000.00
• Yamaha Motor Ventures & Laboratory Silicon Valley, Inc.	$10,000,000.00
• Optimus Ride	$6,000,000.00
• Robert Bosch LLC	$5,000,000.00
• BMW of North America, LLC	$3,200,000.00
• Carma	$2,000,000.00
• Connecthings	$1,500,000.00
• Streetline	$1,400,000.00
• Volta	$1,200,000.00
• HERE	$1,000,000.00
• Infosys Ltd.	$1,000,000.00
• Next Future Transportation Inc.	$1,000,000.00
• Proxy Co.	$1,000,000.00
• Real-Time Innovations, Inc.	$1,000,000.00
• RideLeads	$1,000,000.00
• Smarking, Inc.	$820,000.00
• AT&T Smat Cities	$785,000.00
• Aclima, Inc.	$500,000.00
• EverCharge Inc	$500,000.00
• Siemens	$500,000.00
• Verizon	$500,000.00
• Local Motors	$400,000.00
• GRIDSMART Technologies	$280,000.00
• arcimoto	$250,000.00
• Mapbox	$250,000.00
• moovel	$250,000.00
• StreetLight Data	$250,000.00
• Global Quality Corp.	$200,000.00
• Silver Spring Networks	$200,000.00
• Getaround	$100,000.00
• Motionloft	$100,000.00
• Seevider, Inc.	$100,000.00
• APPCityLife, Inc.	$50,000.00
• Proterra Inc.	$50,000.00
• VIA Analytics, Inc.	$30,000.00

- Driversiti $25,000.00
- Nimble Consulting Inc. $23,400.00
- Black & Veatch $10,000.00
- VIMOC Technologies $3,000.00

Letters of Support - Public

- U.S. Senate - Dianne Feinstein
- U.S. House - Nancy Pelosi
- Office of the Governor
- Lieutenant Governor
- CalSTA
- CA DOT
- CA DMV
- CA OTS
- CARB
- CalEPA
- Governor's Office of Business and Economic Development
- CA DPH - Karen L. Smith
- CA DPH - Jahmal Miller
- Greenbelt Alliance
- Independent Living Resource Center San Francisco
- Lighthouse for the Blind and Visually Impared
- Senior Disaability Action
- SF Mayor's Office on Disability
- SFMTA Multimodal Accessiblity Advisory Committee
- The ARC of SF

Letters of Support - Private

- ABM Electrical Solutions
- Amazon Web Services, Inc.
- AT&T Smat Cities
- Automatic Labs
- Bay Area Motivate
- Booz Allen Hamilton
- Built.io
- Chariot
- Cloudera
- Cruise Automation, Inc.
- Envision Solar International Inc.
- GRIDSMART Technologies Inc.
- LiveEnsure Inc.
- LPWAN Network
- Lyft

- Mapbox
- Moovit
- Nokia
- Perkins+Will
- Plug & Play Tech Center
- Propeller Health
- PTV Group
- Shipbird, Inc.
- Streetline
- Swiftly, Inc.
- Veniam Inc
- Wave Mobile Solutions
- Xerox State & Local Solutions, Inc.
- Zipcar

Vulcan Supporting Partners (letters are included in the Vulcan application)

In addition to the above letters of commitment, San Francisco Department of the Environment has also received the below commitments for the Vulcan program.

Company	**Commitment**
• ReNewFinancial (Leveraged Financing)	$300,000,000.00
• California Clean Energy Fund (Leveraged Financing)	$25,000,000.00
• Powertree Services (In-Kind)	$16,000,000.00
• Pacific Gas & Electric (PG&E) (In-Kind)	$500,000.00
• CEC Neighborhood MUD Charging Solutions (Grant)	$300,000.00
• CEC Alternative Fuel Vehicle Readiness (Grant)	$300,000.00
• US Dept. of Energy Hydrogen Fuel Cell EV Outreach /Education (Grant)	$250,000.00
• California Energy Commission Fuel Cell EV--Hydrogen Siting Plan Grant (Grant)	$111,000.00

Berkeley
UNIVERSITY OF CALIFORNIA

Nicholas B. Dirks
CHANCELLOR
PROFESSOR OF HISTORY
PROFESSOR OF ANTHROPOLOGY

200 California Hall #1500
Berkeley, CA 94720-1500
510 642-7464
510 643-5499 FAX
chancellor@berkeley.edu

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx:

The University of California, Berkeley is honored to co-lead the US Department of Transportation's Smart Cities Challenge with the City of San Francisco, and I'm pleased to offer my support for this exciting new partnership. UC Berkeley has a long history of harnessing ingenuity and innovation, with a commitment to public service and active engagement in solving the world's most urgent challenges.

UC Berkeley's Institute of Transportation Studies (ITS) and Transportation Sustainability Research Center, along with our partnership with the Lawrence Berkeley National Laboratory, provide unparalleled technical expertise. Our faculty experts from the Haas Business School, Berkeley Law, College of Engineering, and the Graduate School of Public Policy, include a network of over 25,000 transportation professionals to help create the future of urban transportation in the United States.

Since 1947, when ITS was established by an act of California's legislature, the campus has pioneered much of the "smart" transportation research, such as digital freeway signs, metering lights at bridge tolls, driverless cars, and shared mobility transportation systems. UC Berkeley also drives public policy discussion at the state and federal level in these areas.

We are proud of our record in partnering with industry on research, and commercializing technology. UC Berkeley has the second highest percentage of industry-sponsored research compared to other research institutions in the U.S. Since 2004, the university has received $750 million in industry-sponsored research and over $250 million in licensing revenue from our commercialization efforts.

We look forward to working with the Department of Transportation on this exciting program to deliver the transportation system of the future while training the next generation of transportation technology and policy experts. Thank you for your consideration of our proposal.

All best,

Nicholas B. Dirks

Brad Simmons
Director
Government and Stakeholder Relations

One American Road
Suite 1001-E6
Dearborn, MI 48126

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Ford Motor Company Commitment to the San Francisco's Smart City Challenge Application

Dear Secretary Foxx,

On behalf of Ford Motor Company, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Ford Motor Company plans to invest well over $50 million over the next eight years to support the mobility efforts in the Bay Area, all of which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Ford intends to bring multiple elements of its Smart Mobility solution set to the Bay Area and San Francisco in particular. Through each of these efforts, we have the ability to support five of San Francisco's demonstration categories, including "Create Transportation as a Service Platform," "Reduce private car ownership need," "Increase Regional Transportation Options," "Increase Digital Equity" and "Increase vehicle electrification and vehicle-to-grid energy efficiency." Our solutions include:

1. The creation of a region-wide bike share platform to enable true multi-modality as part of an integrated mobility Eco-system. This would be a truly connected bike share platform unlike any other.
2. The creation of an integrated Dynamic Shuttle Service which would utilize a network of Ford Transit vans to offer efficient and flexible trips to multiple customers within a defined area. Dynamic Shuttle operates by using an algorithm to optimize pick-ups, drop-offs and routing based on demand. Customers utilize a smart phone app to request rides on the Dynamic Shuttle Service. The requests are managed and executed with a suite of service tools for the drivers, dispatchers and fleet managers. This current offering is a

springboard for Autonomous Shuttle Services as technology becomes available. This solution could work in concert with other shuttle providers in the Bay Area.

3. Through our FordPass® app, we will offer mobility solutions such as car sharing, smart parking and FordGuides who are always available to help commuters with their mobility services. The FordPass® app is free, even if you do not own a Ford vehicle, and provides equal access to transportation information for all.
4. A FordHub is also planned for San Francisco where consumers will be able to experience and explore the latest mobility innovations, learn about regional mobility services and current operating status.
5. Leveraging our Palo Alto Research and Innovation Center, our designers and engineers will be heavily involved in the design and creation of unique mobility solutions for the Bay Area.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Brad Simmons, Director, Government and Stakeholder Relations at 313-390-9880 or bsimmon1@ford.com.

Sincerely,
Brad Simmons
Director, Government and Stakeholder Relations

ZOOX'S COMMITMENT TO SAN FRANCISCO'S SMART CITY CHALLENGE APPLICATION
MAY 2016

ZOOX'S COMMITMENT TO SAN FRANCISCO

11 May 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

SUBJECT: ZOOX'S COMMITMENT TO THE SAN FRANCISCO'S SMART CITY CHALLENGE APPLICATION

Dear Secretary Foxx,

On behalf of Zoox, a venture backed stealth-mode Silicon Valley company pioneering autonomous city mobility, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

You, the city of San Francisco, and NHTSA are well aware that under the existing model of personal car ownership, cities are grinding to a halt. By developing a breakthrough transportation network of fully autonomous, electric, shared, and centrally-coordinated vehicles, Zoox is tackling one of society's greatest challenges: how populations move in cities. Such a transportation network is the only way to solve pollution, congestion, safety, and affordability in the world's largest cities.

For the Smart City Challenge, Zoox will reveal an autonomous, shared, and electric mobility service in San Francisco. Not reliant on any 3rd party solutions or large infrastructure investments, Zoox will provide the full stack of technology solutions to showcase to the world, a game-changing public deployment of a true, level-4, autonomous mobility service.

Zoox will provide its technology and run the pilot program free of charge for the city of San Francisco. The direct costs Zoox will incur in launching and operating two phases of the pilot service is at least $30M over the 2017 and 2018 timeframe. This comprises labor, hardware, and service operations. Furthermore, Zoox is indirectly putting to work hundreds of millions of dollars in Research and Development into launching these pilots in San Francisco. We view our long-term partnership with the city of San Francisco as an integral component of our strategy and our path to market.

Our fleet of fully autonomous, electric, shared, and coordinated vehicles simultaneously addresses many of the 12 vision elements of the Smart City Challenge and the four core principles of safety, sustainability, accessibility, and mobility. Our solution presents the ultimate realization towards urban automation, connected vehicles, user-focused mobility services and choices, electrification and EVs, and strategic business models and partnerships.

For us, the Smart City Challenge is an opportunity to reveal the world's first shared, electric, connected and automated transportation system. We are commited to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Ivan Mihov, Director of Strategy at ivan@zoox.com.

Sincerely,

Tim Kentley-Klay
CEO and Co-Founder

TRANSITSCREEN

May 20, 2016 Ā

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The Honorable Anthony FoxxĀ

SecretaryĀ

U.S. Department of TransportationĀ

1200 New Jersey Avenue, S.E.Ā

Washington, D.C. 20590Ā

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Subject: TransitScreen/CIVIQ commitment to the San Francisco's Smart City Challenge application Ā

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Dear Secretary Foxx,Ā

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On behalf of TransitScreen and CIVIQ ("TransitScreen Partnership"), I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Ā

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The TransitScreen Partnership will make available up to $16 million worth of cash in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.Ā

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The TransitScreen Partnership will be providing 200 or more information kiosk displays for to be determined on-street locations throughout San Francisco and the Bay Area called "BridgeSF". The city will be responsible for identifying the locations with TransitScreen-CIVIQ assistance and guidance. CIVIQ has demonstrated success with a similar solution as a hardware partner and co-owner in New York called LinkNYC. In San Francisco, these kiosks will also and uniquely provide local, real-time transportation information across multiple transportation modes provided by TransitScreen on one screen. TransitScreen is the global leader in transportation software signage has been a long-standing partner, friend, and resident of San Francisco with many strong local ties. Ā

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The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable. Ā

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If you have any questions regarding this matter, please contact Ryan Croft, (Cofounder/COO of TransitScreen) at ryan@transitscreen.com and/or 703-593-7937Ā

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Sincerely,Ā

Ryan CroftĀ

Cofounder/COO of TransitScreenĀ

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TRANSIT SCREEN

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TRANSIT SCREEN

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nohm
change the energy

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

Nohm strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's and Paul G. Allen Family Foundation Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

This opportunity will enable San Francisco to learn, test and share this knowledge with the rest of the world. San Francisco's neighborhoods and businesses will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. Proposed projects include integrating last mile options with public transit, strategically deploying electrification infrastructure that supports the grid and serves the community, developing and implementing incentives for electric vehicles, storage and demand response programs, and initiatives that promote broad access to electric vehicles while capturing economic develop opportunities.

Nohm is a privately held company formed in 2015 with investment from publicly traded FDG Group (0729.HK). FDG Group is a fully integrated vehicle OEM that has developed and commercialized a portfolio of ground-up designed, all-electric vehicles that meet the performance, safety, and cost requirements of global markets. FDG recently announced the formal opening of its 2.8 million square foot, state of the art manufacturing facility in Hangzhou, China, which has the capacity of manufacturing 100,000 vehicles per year. Nohm will initially import incomplete vehicles with final assembly to be completed in California, and plans to establish manufacturing in the United States to create new US jobs and support scaled demand. In addition, US-based Smith Electric Vehicles also invested its intellectual property in the Company, which includes Smith's extensive commercial EV deployment experience of more than 700 vehicles and 14,000,000 miles of on-the-job performance data with global fleets that include PepsiCo's Frito-Lay division and FedEx Express.

Cities cover 2% of the earth's surface, yet are the source of 70% of greenhouse gas emissions. Trucks are among the worst offenders. On a per mile basis, an average

medium-duty truck emits emissions equal to seven cars. Electrification of commercial transportation plays a critical role in the improvement of urban air quality and human health, as well as a significant opportunity for fleets to decrease operating expenses, increase revenues, and create new business models for last mile delivery that decrease urban congestion.

Nohm is committed to purchasing and deploying a minimum of 100 of its medium-duty all-electric vehicles for delivery and people transit in support of the Smart City program. We will collaborate with our partners, which include but are not limited to FedEx Ground, PepsiCo's Frito-Lay division, ABM, Chariot, and others, on these deployments by offering a 'no risk' monthly lease program at a rate that is equal to or less than a comparable fuel vehicle. We estimate these monthly lease payments at a range of $350 - $800 per month.

Nohm vehicles are designed for high-density, urban environments with diverse topography and unique highway-surface street acceleration conditions like San Francisco. Nohm's proprietary telemetry system enables collection of valuable utilization data that can further aid in city planning for public DC fast charge stations, traffic and congestion mitigation, and the development of zero-emission delivery zones to further benefit San Francisco. In addition, all of Nohm's vehicles are "V2G" ready, allowing for further benefit to the City and its businesses with grid stabilization, renewable storage and net-zero energy building footprints come online.

Nohm's in-kind commitment of 100 vehicles is valued at $15M.

Nohm and the City share the same vision of a new energy economy that creates opportunity and abundance for all. Historically the energy industry has been riddled with injustices from extraction through the waste produced and we know that we can do better with distributed, energy resources like electric vehicles, storage and renewable energy.

Developing advanced clean energy transportation solutions are critical to enabling a sustainable economy, addressing climate change for all sectors of our communities and ensuring a resilient electricity grid. I want to personally assure you that Nohm is committed to working with San Francisco on their Smart City Challenge grant to enable replicable solutions and market transformation for electrified medium duty vehicle solutions.

Thank you for your consideration.

Sincerely,

Bryan Hansel
CEO, Nohm

YAMAHA
Yamaha Motor Ventures & Laboratory Silicon Valley
800 Menlo Avenue, Suite 210 · Menlo Park, CA 94025

May 18, 2106

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Yamaha Motor Ventures & Laboratory Silicon Valley's Commitment to Support the City of San Francisco's Smart City Challenge Application**

Dear Secretary Foxx,

On behalf of Yamaha Motor Ventures & Laboratory Silicon Valley, Inc. ("**YMVSV**"), I am pleased to provide this letter of support for the City of San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. If San Francisco is selected as the winning city, then YMVSV intends to offer cash and/or in-kind contributions up to $10,000,000 over the three year grant period to support San Francisco's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

YMVSV is a wholly-owned subsidiary of Yamaha Motor Co. Ltd. ("**Yamaha Motor**"), which has, for over sixty years, worked at the forefront of personal transportation. YMVSV is the corporate venturing and strategic innovation arm of Yamaha Motor, and since YMVSV is located in the San Francisco Bay Area we are positioned to support San Francisco's research and demonstration projects.

All over the world people use our products for mobility, commerce, and recreation. Yamaha Motor proudly manufactures, sells and supports vehicles in the United States. With our global research, development, commercialization and venture capital efforts, we are creating new systems which enable the future of mobility.

Specifically, we aim to increase vehicle electrification, increase digital equity, increase regional transportation options, and increase awareness of the environment around us. As described elsewhere, low-speed, autonomous, urban electric vehicles and mobile micro-environmental sensors are part of our efforts to build this future.

Our potential contributions to San Francisco's impressive proposal may include:

- Production or prototype electric vehicles, including low speed urban vehicles such as electric golf cars, electric bicycles, electric scooters, and other vehicles
- Autonomous driving systems or sub-systems

- Advanced electric vehicle technologies
- Vehicle mounted micro-environmental sensor and data collection systems
- Investment and other support of relevant start-up companies
- Partnerships with state-of-the-art technology and solution providers

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to partnering with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding our support, please contact **Amish Parashar**, Director of Strategic Business Development by e-mail at amish@ymvsv.com or by phone at 408.212.1141.

Sincerely,

Hiroshi Saijou
Chief Executive Officer & Managing Director
Yamaha Motor Ventures & Laboratory Silicon Valley, Inc.

485 Massachusetts Ave, Suite 302
Cambridge, MA, USA, 02139
www.optimusride.com

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Optimus Ride commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Optimus Ride, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Optimus Ride will make available significant in-kind contributions (described below) to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Optimus Ride Inc., a provider of self-driving technologies, proposes to support the City of San Francisco's proposal by developing commercially viable, fully autonomous (level 4) shared-electric vehicle fleets that can be rapidly deployed within cities. The deployment of this self-driving, mobility-on-demand system will create transportation as a service platform with a special emphasis on first and last mile solutions. This deployment also addresses the need to reduce private car ownership and large deliveries in neighborhoods, while providing a pathway for increased vehicle electrification and V2G benefits. This deployment democratizes mobility by providing more equitable access to disadvantaged groups and is sympathetic to the goals of Vision Zero.

Optimus Ride is a newly created and funded start-up with the mission of being the premier provider of self-driving systems that enable safe, sustainable, and equitable mobility access to all citizens. Our five co-founders each have over 10 years of experience developed at MIT on enabling smart urban mobility. We have worked on the DARPA Urban Challenge, the CityCar (an electric, foldable, sharable vehicle), and the deployment of shared vehicle fleets (Zipcar). We also have extensive industrial experience in mobile robots at Rethink Robotics and at Google [x].

Optimus Ride is prepared to deploy connected and autonomous vehicles (CAVs) for pilot testing and eventual commercial scaling should the City of San Francisco be selected as the winner of this challenge. The timeline for our prototype-testing platform is in alignment with the DOT Smart City Challenge proposed phasing schedule. Optimus Ride will provide in-kind

485 Massachusetts Ave, Suite 302
Cambridge, MA, USA, 02139
www.optimusride.com

contributions during the testing, pilot, and deployment stages of this project including: 1) engineering support, 2) access to data emerging from the pilot and deployment, and 3) public education and engagement from the Optimus Ride leadership team and our academic-industrial-government network of contacts.

Personally, I have been able to interact extensively with the President's Council of Advisors on Science and Technology (PCAST) as a Smart Cities expert consultant for the "Technology and the Future Cities" study. This report has been delivered to President Obama for his consideration of Smart City Initiatives on February 23rd, 2016. In this report, PCAST discuss both strategies and policy recommendations for the accelerated adoption of CAVs, Electric Vehicles (EVs), shared fleets, and combinations thereof (e.g., shared-autonomous) particularly for cities. There are multiple paths to this solution, some with high risk, high cost, and long timelines. Our approach is to develop low risk, low-cost solutions that can quickly be deployed so that the technology can be tested and iterated with real users and urban environments leading to high reward. We believe Optimus Ride can spearhead this pathway in collaboration with the City of San Francisco.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please free to contact me at ryan@optimusride.com or 617-319-0778.

Sincerely,

Ryan Chin, Ph.D.
CEO and Co-founder
Optimus Ride Inc.

17 May 2016

Robert Bosch LLC
38000 Hills Tech Dr.
Farmington Hills, MI 48331
Telephone +1(248)876-2303
Michael.Caruso@
us.bosch.com
www.Bosch.us

The Honorable Anthony Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington DC 20590

Re: City of San Francisco Smart City Challenge Proposal

Dear Secretary Foxx,

I am writing to inform you that Bosch is pleased to partner with the City of San Francisco to deliver advanced mobility and technology solutions should the city be awarded the Department of Transportation (DOT) Smart Cities Challenge grant.

San Francisco's vision for smarter mobility includes thoughtful use of emerging transportation technologies, data, and applications. Bosch expertise in multiple DOT Vision Elements, together with San Francisco's proposed solutions will improve lives by making all modes of transportation safer, more accessible, and highly reliable.

Bosch and Lennar Urban are currently collaborating in San Francisco at the Hunter's Point Shipyard, Candlestick Point, and Treasure Island communities. Lennar Urban plans to deliver innovative solutions in the field of mobility, energy, security and quality of life. These ongoing developments hold great promise to compliment and amplify San Francisco's expected smart city achievements.

Bosch has invested $1 million in the Mobility Transformation Center (MTC) making us part of the leadership circle with 17 other industry partners. MTC is a partnership with the University of Michigan, DOT, academia, and over 60 industry partners to develop the foundations of a commercially viable ecosystem of connected and automated vehicles for moving people and goods. Bosch intends to leverage this collaboration as part of our commitment to the city of San Francisco and the DOT Smart City Challenge.

Bosch will voluntarily contribute in-kind services, discounted pricing, volume discounts, staff expertise, and software. It is estimated that this contribution could be as much as 15% of the cost of Bosch awarded content. In addition Bosch will waive the cost of 100,000 users of our "City App" for the first three years, valued at $1.65 million. As the statement of work is further defined, we will clarify the total dollar value of our contributions as required.

We look forward to providing the solutions outlined below.

Electric Vehicle Chargers

Bosch is an industry leading supplier of Level I, II, and III chargers. Volume discounts will apply to our products as well as in-kind consulting resources to support hardware, installation, integration, dealer training, dealer showcases, and community awareness.

Smart Parking Infrastructure

Bosch will provide discounted pricing on our Active Parking Lot Management (APLM) system that is applicable to both off-street and on-street parking. APLM integrates via our city-app or third party provider. Bosch's Automated Valet Parking (AVP) is also offered at discounted pricing.

Automation of Light Rail

Bosch will provide a portion of in-kind services for integration and application of collision avoidance for light-rail systems. The system combines a video sensor, radar sensor, and a high performance rail control unit.

Connected Freight

Bosch will provide discounted pricing for our asset monitoring system for rail and trucking applications. This system provides mobile connectivity for GPS tracking, security, safety, and transit time monitoring. Rapid integration into any existing IT infrastructure, and optimized real time operation with other services like intelligent traffic management systems is possible.

Vehicle Automation

Together with any OEM partner Bosch can provide technical expertise, sensors, sensor fusion, and component integration for a wide variety of autonomous assistance including:

- predictive emergency braking
- evasion
- lane keeping
- predictive pedestrian protection
- turn and crossing assistance
- driver monitoring

- light and sight
- parking

A portion of in-kind services are being offered by Bosch.

Connected Vehicles

Together with any OEM partner Bosch can provide technical expertise, hardware, software, and component integration for a wide variety of connected vehicle features. Technologies include:

- human machine interface (infotainment systems)
- heads up display units
- haptic feedback displays
- V2x functionality(i.e. cooperative adaptive cruise control, intersection collision avoidance, approaching emergency vehicle)
- IoT Cloud connectivity
- e-Horizon technology that provides predictive energy management
- Connected Horizon technology that uses sensor data to update dynamic maps layers (i.e. Traffic, potholes, and changing speed limits due to construction)

A portion of in-kind services are being offered by Bosch.

Powertrain Optimization with Autonomous Driving & Mobility Services

Together with any OEM partner Bosch can demonstrate real world driving CO2 and emission reduction assisted by haptic pedal feedback and navigation data. This technology uses on-board energy management optimization assisted with navigation map data, infrastructure information, and Human-Machine Interfaces (HMI). Bosch will also provide data analysis to support drive cycle analysis that accounts for the impacts of autonomous driving and mobility services.

Vehicle Electrification

Together with any OEM partner Bosch can provide technical expertise, system hardware, and component integration for a wide variety of electric vehicle features including E-Machines, inverter drives, power conversion, and battery management systems. A portion of in-kind services is being offered by Bosch.

DC Microgrid

The Bosch direct current (DC) microgrid offers significant advantages as compared to a conventional alternating current (AC) system. DC microgrid system architecture typically includes on-site distributed generation such as a solar photovoltaic system (PV) directly connected to highly energy efficient DC

lighting and other DC loads via a 380V nominal DC bus. Bosch has demonstrated improved system characteristics of energy efficiency, cost, reliability, and safety with this approach. Bosch will provide discounted pricing for design and implementation of a DC microgrid for a parking structure. The system would include engineering controls, energy management, solar panel installation, DC power lighting fixtures, smart lighting controls as well as integration with Bosch's smart parking infrastructure.

E-Bike

Bosch will provide discounted pricing for Bosch-equipped demo bikes for fleet bike share and urban cargo applications.

The Townie® Go, from Electra, is a battery-powered, pedal-assist bike that lets you ride like the wind without breaking a sweat. The Bosch frame-mount mid-motor lets you adjust your cadence based on speed. Multi-gear functionality lets you control output and battery life.

The EdgeRunner®, from Xtracycle, is purpose built with cargo storage amenities to make deliveries easier and more efficient. It features a Shimano drivetrain mated with a Bosch Performance line motor that aids your pedaling up to speeds of 20 miles per hour.

Cybersecurity

ESCRYPT, subsidiary of Bosch, provides solutions, products, and services to plan and implement the Holistic Security Approach. ESCRYPT provides a one-stop security solution for the entire device life cycle including end-to-end solutions from distributed Internet of Things (IoT) devices to back-end infrastructure. Bosch will provide a portion of in-kind consulting services for IoT Cloud and V2x Cybersecurity applications.

City App

Bosch's City App provides services for:

- event management
- citizen involvement
- push notifications
- real time updates
- trouble/incident reporting
- local business integration
- points of interest - things to do
- geo-localized services
- connecting the local economy with consumers
- city wide communications
- parking
- environmental data
- security
- alerts

- creating new revenue streams through advertising
- revenue share
- local business incentives delivered direct to the customer

Bosch will provide a portion of in kind resources to support integration and use case development as defined by the city.

Multi-Modal Transportation

Bosch's Multi Modal infrastructure provides services for:

- service options
- consumer payment
- ticket purchase
- brokering
- distribution to partners/businesses
- points of interest – transportation
- car/bike sharing information
- up to date parking data
- back end integration
- community carpooling
- quickest route
- rate and traffic information
- congestion avoidance
- crowd management
- predictive actions

Bosch will provide a portion of in kind resources to support integration and use case development as defined by the city.

IoT Cloud Services

Bosch's IoT suite services allow developers to quickly build, implement, and operate cloud-based and highly scalable IoT applications. Our services are tailor-made for use in IoT scenarios and address the most common requirements such as:

- devices, machine, and gateway management
- secure access management
- software roll-out
- connecting third-party systems and services,
- data analysis

Bosch IoT Cloud Services comprise virtual machine runtimes, databases, caching, messaging and multiple IoT-specific services. Bosch will provide a portion of in kind resources to support integration and use case development as defined by the city.

Big Data Analytics

Bosch has more than 5 years of experience in Big Data Analytics with over 50 full time data scientists. Bosch expertise includes high performance cluster setup and big data software platform, including competence in big data tools from various vendors. Services include:

- business opportunity and use case analysis
- business impact analysis
- data collection and organization
- data cleaning and integration
- model building
- onsite model deployment and calibration
- offsite hosting of data collection & analytics solution
- data model updates
- HPC services, and technology upgrades.

Bosch will provide a portion of in kind resources to support integration and use case development as defined by the city.

Security System Components and Video Analytics

Bosch's Security division offers a wide array of hardware, software, and services that enable a truly smart city. Our products enable advanced functionality and integration of back-end systems in order to maximize effectiveness and interoperability. Many use cases are possible that help to increase traffic flow and reduce accidents, especially those involving pedestrians and cyclists. Some of the use cases include:

- camera integration with intelligent traffic management systems (better traffic flow detection)
- vacant parking spot detection (integration with parking systems)
- customer access to cloud-based real-time dynamic data
- crowd management
- traffic updates
- road conditions
- temperature monitoring

Bosch video analytics offer integration with:

- IoT cloud services
- people counting
- pedestrian/cyclist detection and integration with smart traffic systems (V2x)
- enforcing regulation (parking in restricted area)
- perimeter protection
- gunshot and fire detection
- consumption and predictive analysis

- Integration with city services. i.e. waste management, road construction, snow removal, first responders

Bosch will provide both volume pricing discounts as well as a portion of in-kind services for system integration and use case development.

Mobility Services

Bosch provides many services centered on connectivity. At the core of the services is a family of products that can easily be retrofit into almost any vehicle. We offer either a diagnostic port dongle or an integrated solution containing an accelerometer and GPS sensors along with GSM and Bluetooth connectivity. Mobility services include the following:

- Remote diagnostics – trouble code severity, predictive analytics, maintenance reminders, odometer reporting, journey analysis, vehicle logbook/history
- eCall sensor and services – accident detection, orientation and severity detection, recorder, and notification
- Mobile security – GPS location services, driver behavior analytics, car theft warning
- Fleet Management – intra-fleet Benchmarking, fuel management, geo-fencing, vehicle tracking, fleet portal
- Breakdown assistance – Bosch Call Centers
- Secure truck parking – Bosch parking reservation & brokerage platform, reservation and payment via fleet management systems, content forwarding into on-board telematics systems, reservation and payment via nomadic or on-board devices, parking spot detection and integration, security cameras, security gates and barriers, license plate recognition
- Information services – App & Ux development, Big Data analytics, flexible rules engine, back-end Integration, IT Hosting

Bosch will provide a portion of in kind resources to support integration and use case development as defined by the city.

Sincerely,

Digitally signed by pki, BOSCH, US, M, I, Michael.Caruso
DN: dc=com, dc=bosch, cn=pki, cn=BOSCH, cn=US, cn=M, cn=I, cn=Michael.Caruso
Date: 2016.05.20 14:17:28 -04'00'

Michael Caruso
Director, Public-Private Partnerships
Robert Bosch North America

BMW Group

May 18, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **BMW commitment to the San Francisco's Smart City Challenge papplication**

Dear Secretary Foxx,

On behalf of BMW of North America, LLC, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. BMW of North America will make available up to $3.2 million worth of in-kind contributions to support the City's proposed research and demonstration projects related to smart charging, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility. BMW will also make additional matching funding available to support a battery refresh program, which demonstrate the ability to install used vehicle batteries at city emergency response locations.

BMW will engage 200 San Francisco-based i3 drivers in its new intelligent charging program called BMW i Charge Forward. This program will provide BMW i3 drivers in San Francisco tools and incentives to maximize renewable generation when they charge their i3. BMW will leverage its existing partnership with PG&E and other grid partners to provide this unique service. Using its vehicle telematics system, BMW can enroll any i3 driver without any modifications to the vehicles and without the need to rely on a charging station. In addition to SF based drivers, BMW would also include any i3 that travels to SF for work. These drivers will be allowed to manage their workplace charging to minimize carbon emissions and other grid impacts. The Charge Forward program is currently being tested in Mountain View, CA with 96 i3 households. BMW will expand the program to San Francisco and add the following new functionality:

- Ability to follow renewable loads and 'ramp' charging to follow renewable generation with signals from CleanPowerSF or PG&E.
- Ability to manage charging at any location in SF or the Bay Area, regardless where the driver charges.
- Can incorporate any vehicle that charges in SF, regardless of where the driver lives.
- Unique incentives to allow drivers to optimize charging across multiple charging events over multiple days.
- Incorporate new, innovative incentives that help SF and its partners evaluate the best way to design future intelligent charging programs.
- Leverage BMW's $4.0 million dollar CEC investment as well as an additional matching funds from BMW

Company
BMW of North America, LLC

BMW Group Company

Office address
200 Chestnut Ridge Road
Woodcliff Lake, NJ 07677

Telephone
(201) 675-2701

Fax
(201) 571-5483

E-mail
Adam.Langton@bmwna.com

Website
bmwusa.com

In addition to smart charging, BMW would develop a unique, first-in-the-nation, battery refresh program for any i3 owner or lessee living in the city of San Francisco. SF i3 drivers would get a new higher range battery in exchange for their current i3 battery. The current battery would be deployed in SF hospitals, police departments, fire departments, and low-income housing to support grid resiliency during natural disasters, using a storage system designed by BMW to minimize the refurbishment requirements of a used battery. This project would help the electricity and automotive industries demonstrate a new business model to improve the lifecycle carbon emissions of PEV batteries, as well as providing new ways to improve the value of used vehicles, another source of life-cycle carbon emission reductions.

BMW would offer 100 i3 drivers in SF an opportunity to trade in their battery for a higher-range version. BMW owners would be asked to make a payment for this service, while lessees would receive the service for free. BMW and its grid partners would deploy the used vehicle batteries as grid storage at 10-15 city and public-interest sites that are important to disaster response. BMW's modular storage design and low-cost installation would allow the city and BMW to work together to design the most efficient deployment of the battery storage. Participants would receive information about where their battery was deployed and how it contributes to disaster response.

BMW and the city would track the following metrics associated with the battery refresh program:

- Environmental benefits associated with new electric miles enabled by the enhanced battery range.
- Avoided carbon emissions, energy consumption other environmental impacts from deferred battery recycling.
- Avoided environmental impact of new battery production.

BMW requests $1.9 million to implement this project. The majority of this funding would be used to deploy the batteries as storage in government buildings, which avoids a municipal/non-profit government cost for disaster-preparedness.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Adam Langton, Energy Services Manager, at adam.langton@bmwna.com, or by phone at 201-675-2701.

Sincerely,

Adam Langton

BMW of North America, LLC
Energy Services Manager

27 Maiden Lane
Suite 590
San Francisco, CA 94108

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

cc: SFMTA

Subject: Carma commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Carma, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Carma will make available up to $2 million in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Carma provides mobility options and alternatives to private car ownership through commuting, carsharing and carpooling solutions. Carma's mission is to increase vehicle occupancy, reduce individual car ownership, optimize vehicle utilization, improve the environment, and provide affordable access to mobility across all demographic groups.

In 2015, Carma entered into a strategic partnership with City CarShare, the oldest carsharing organization in the San Francisco Bay Area, in order to support the growth and extend the reach of our mission. Carma and City CarShare have introduced numerous initiatives to support these goals, including our *Access*Mobile wheelchair-accessible vans, our *CommunityShare* carsharing plan for lower income residents, our Carma*ZOOM* high-occupancy commuter service, and collaborations with local agencies that enable our continued focus on providing a green fleet of vehicles to our members.

Carma and CityCarShare (collectively referred to as 'Carma') have worked extensively with local, state and federal government agencies through Public-Private Partnerships since 2001 in Seattle, San Francisco, Santa Barbara, Austin, and Washington DC. Our mobility solutions have resulted in millions of pounds of GHG emission reductions, tens of thousands of hours in travel time savings, hundreds of people adopting electric/hybrid vehicle alternatives, and many residents making the switch to a one or zero car household.

Company Background
Headquartered in San Francisco, Carma is the modern day solution to traffic and congestion servicing over 100,000 users through carsharing technology. Carma is not a Transportation Network Company (Uber, Lyft). We do not have paid drivers. Carma is a network of mobility solutions focused on efficient, affordable daily commuting and carsharing options, as defined by MAP 21 Section 1501.

Our mission is to pioneer the Ownerless Car Movement. Our goal is to get as many cars as possible off our congested roads by maximizing car occupancy at all hours of the day. Carma has the greenest carsharing fleet in the U.S. We have hundreds of cars, 56% of which are all-electric, plug-in hybrid or hybrid. City CarShare vehicles are available for reservations in 12 Bay Area cities.

Carma offers mobility solutions including, (1) Carsharing: hourly car reservations or City CarShare powered by Carma, (2) Commuting: daily Mon-Fri long-distance routes or CarmaZOOM, and (3) Carpooling: one-time commute rides or Carma Carpooling. CarmaZOOM and City CarShare are headquartered in and presently focused on the San Francisco Bay Area.

The following are examples of how Carma and City CarShare offer creative mobility solutions which, increase regional transportation options, reduce the need for private car ownership across many demographics, provide a transportation as a service platform and increase the use of electric vehicles in shared transportation.

***Access*Mobile**
In 2008, City CarShare introduced *Access*Mobile, the nation's first wheelchair-accessible carsharing program. For people with disabilities, transportation options are limited and mobility independence can be a struggle. Carma's *Access*Mobile wheelchair-accessible vans offer increased independence and the ability to reach locations that are otherwise inaccessible or cost-prohibitive using mass transit, paratransit, ridesourcing, or taxi services. *Access*Mobile allows disabled members access to an ADA-accessible vehicle without the cost of owning and retrofitting a private vehicle.

Since the program began more than eight years ago, we have heard countless stories from our members and their families highlighting the impact *Access*Mobile has on their lives, from having the ability to choose to go to the lake over the weekend, or visiting family during Thanksgiving. Our *Access*Mobile vans can seat up to six people and one wheelchair. Disabled members who don't have a Driver's License can have a family member or friend signup to drive on their behalf.

CommunityShare
Carma has been running programs to support low to moderate income Bay Area residents for more than ten years. Currently, over 60% of our vehicle locations are in designated low- to moderate-income neighborhoods.

Early on, we became aware that even with increased mobility options and the reduced cost of carsharing versus vehicle ownership, low-income residents in the Bay Area continued to face barriers in using carsharing. With this in mind, we introduced our CommunityShare Plan, which provides reduced fees and driving rates for lower income residents.

We have partnered with affordable housing complexes, community associations, and other agencies (e.g., San Francisco Working Families Credit Program), to increase awareness of carsharing as a viable mobility option to the community. Using membership or affiliation with an accredited association, allows us to ensure these benefits are provided to eligible participants.

CarmaZOOM

At Carma, we are acutely aware that a personal commuter vehicle is used only 4% of the time and carsharing vehicles average 18%. Through the introduction of our Carma*ZOOM* service we aim to increase vehicle occupancy rates during commute hours and make better use of each vehicle in our fleet by reducing their idle time.

Carma*ZOOM* is a network of strategically placed high-end vehicles, which provide a high-occupancy commuter solution for the farthest reaches of a metro area – locations that public transit cannot serve. Commuters can book a one-way seat, as either a rider or driver, in one of these high-occupancy vehicles to or from major work centers. The vehicle amenities, such as wifi and power outlets, make them a mobile work environment, while the comfortable leather seats allow others to relax on their commute. Once at the major work center, these same vehicles get repurposed for traditional carsharing or are used in corporate fleets. Each afternoon, new commuters travel together in these vehicles back to their origins in the suburbs. In the evening and at weekends, the vehicles are available to local residents to rent for errands or longer weekend trips.

This multi-purpose utilization of vehicles has a direct impact on the number of vehicles entering a targeted urban core or employment center. By repurposing vehicles throughout the day for different use cases, we minimize the number of vehicles necessary to service a collective group of people, therefore significantly reducing emissions.

CarmaZOOM Results

- CarmaZOOM launched in January 2016 with one route from San Francisco to Bishop Ranch, a business park located in the San Ramon Valley with 30,000 employees and 600 companies including AT&T, Chevron and General Electric.
- As of April 216, there are 15 Carma cars filled with 3-4 riders (average 3.72) bringing people to work every morning over the Bay Bridge. Trips are booked one-way and cost $5.50 (less than the Bay Bridge toll for a single occupancy vehicle). Each single fixed route is removing >11,000 cars annually from the road during commute hours. That small fleet will take > 150,000 cars off of two exits in/out of this one employment complex each year.
- For members using CarmaZOOM routes from San Francisco to Bishop Ranch during rush hour, their average commute has been cut in half. Members do not pay for gas, parking, bridge tolls, or insurance - these are all covered in the $5.50 one-way price.

Electric Fleet

We believe firmly that increased access to shared and high-occupancy vehicles can dramatically reduce the number of vehicles on the road, the number of miles driven and make streets safer. Currently, over 50% of the City CarShare fleet is battery-based (all-electric, plug-in hybrid, or hybrid).

Carma is constantly working to increase the visibility and adoption of electric vehicles in our fleet thorough programs such as our collaboration with the popular Bay Area artist Zio Ziegler to design "moving Art Gallery" cars. We have learned of so-called "range anxiety" being the deciding factor among carshare members in the past when choosing against an electric vehicle for their reservation. We are actively working to move the needle on electric-vehicle education and adoption through programs and collaborations.

Carma Carpool
Carma Carpool is the original real-time ridesharing App that allows commuters to share the cost of getting to and from work using their private vehicles. Unlike Uber, Lyft and other ridesourcing companies, Carma is 100% legal and not regulated by the City of San Francisco as the driver does not earn a profit (any funds transferred from rider to driver remain below the IRS standard mileage reimbursement rate for travel).

Carma recently completed two toll rebate programs for users of Carma Carpool in both Austin, TX and the San Francisco Bay Area. In the Bay Area pilot, drivers of qualifying HOV carpools using the Carma Carpooling app received a 100% rebate on their carpool toll. A summary of the results are shown in chart below, and more information may be found on our blog (https://medium.com/@iEmmett/tolling-and-the-sharing-economy-698780c31800#.prfa523b1) and from a Texas A&M Transportation Institute research paper presented at this year's Transportation Research Board (TRB) http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/TRB-160569.pdf

CARMA CONTRIBUTION

Carma, and our partners, would provide the City of San Francisco with the following mobility solutions and support for the Smart Cities Challenge:

- Up to 450 of Carma's multi-purpose, shared-use, hybrid vehicles. These vehicles would be stationed at key origin points along the worst commute routes in/out in the San Francisco Bay Area for commuters to carpool to/from San Francisco. At full capacity this could remove ~1.5% of the rush-hour vehicle traffic across the Bay Bridge. Once they have arrived downtown or at suburban employment centers, these same vehicles will become carsharing options for San Francisco residents and well beyond the borders of the city.
- Up to three *Access*Mobile vans to improve accessible carsharing options for wheelchair-bound residents.
- Partner with local non-profits to extend our CommunityShare half price plan to low income residents of the City of San Francisco, and provide free membership to all qualified residents.
- Carma will reactivate our carpool toll rebates (100% rebate for qualifying carpools on tolled bridges leading into the City of San Francisco) for participants using the Carma Carpooling App to provide a financial incentive for carpooling on the roads leading into the City of San Francisco.

- Carma is happy to share real-time non-PII data with all agencies involved with the SmartCities Challenge, and will integrate with any and all data systems and Apps selected and/or developed.
- Carma will provide full-time, on-site staff to manage the project, communicate with stake-holders, and facilitate integration with various agencies and third parties.

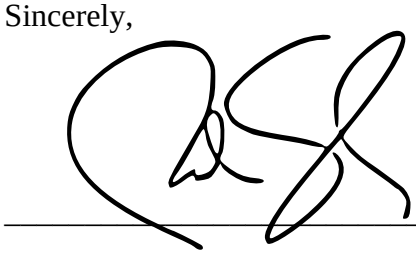
Carma will need several commitments from the City and various agencies to provide the resources necessary for this project to be a success. These include:

- Authorization and funding of toll rebates across toll roads leading into the City of San Francisco for GPS verified carpools using any authorized method or App including Carma Carpool and/or Carma*ZOOM*.
- BATA to support reconciliation of tolling rebates for any authorized method or App including Carma Carpool and/or Carma*ZOOM*.
- Subsidy of all GPS-verified carpools. Vendor and/or qualified participants of non-compensated driver carpools (as defined in MAP 21 Section 1501) would receive $2 per rider for each one-way GPS verified trip using any authorized method or App including Carma Carpool and/or Carma*ZOOM*.
- Provide complimentary parking, and charging stations, for all authorized vendors including Carma-owned vehicles.
- Reimburse Carma for any custom engineering development and/or integrations (those not part of our commercial off the shelf products) required to support systems as part of the San Francisco City project.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric hybrid, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean, affordable and accessible to everyone.

If you have any questions regarding this matter, please contact Paul Steinberg, Chief Business Officer by phone 408-540-9942 or email paul.steinberg@gocarma.com.

Sincerely,



Paul Steinberg
Chief Business Officer
paul.steinberg@gocarma.com

*Connecthings

CONNECTHINGS CORP

May 18th, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

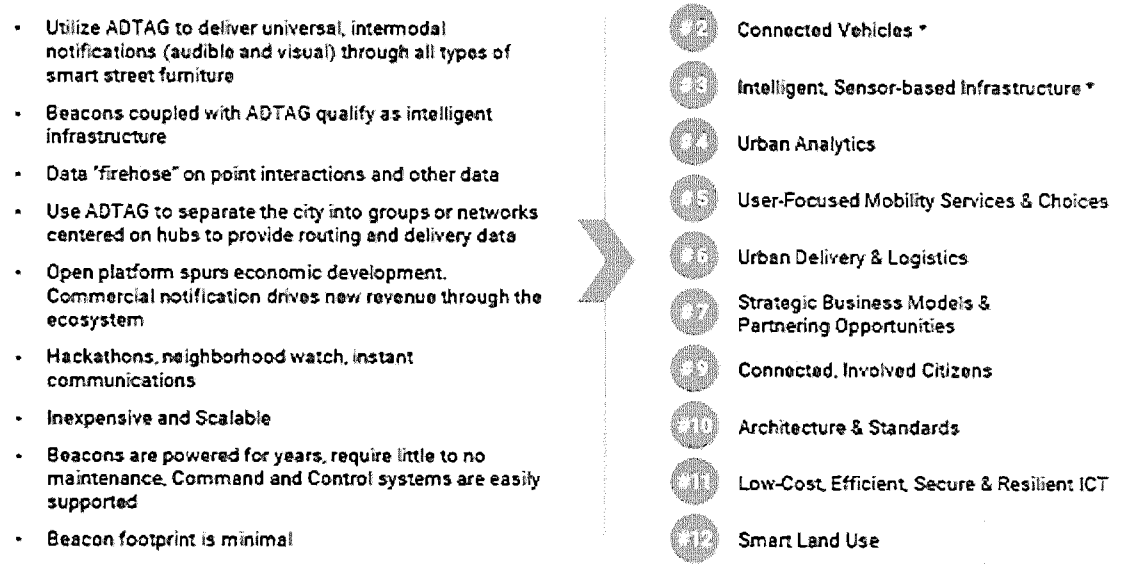
Subject: Connecthings commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Connecthings, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Connecthings will make available up to $1.5 million worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Our solution activates the inanimate objects within a city, tying together its street furniture, transit stops, and other assets with an operating system that delivers hyper-contextual content to the end users through their mobile devises throughout the City in real time. Our platform further provides the convergence between public, commercial, and private services. Specifically, we address 10 of the 12 Smart City Vision Statements as follows:

Connecthings' solution supports the USDOT Vision Statements



*Connecthings

CONNECTHINGS CORP

From the perspective of the four pillars of safety, sustainability, accessibility, and mobility, Connecthings provides a multipurpose, minimal footprint, contactless communications infrastructure which promotes interactivity of the public and private sector with the people within a city. This same infrastructure can be used for notifying when the next shared, autonomous vehicle is available, or to communicate Amber and Silver alerts. At the same time, that network provides the SFMTA with the ability to communicate the next available bus or to recommend an alternate mode of transportation. Additionally, the infrastructure detects the language set on a user's phone and delivers content in that user's native language.

Over the last 9 years, Connecthings has deployed their platform throughout 23 cities in Europe and Brazil, putting cities like Barcelona, Madrid, Rio, and Paris on the leading edge of the Smart City movement, connecting citizens and visitors with a wide array of City services. A particular focus of the company in all these cities has been Smart Transportation, and we want to bring that expertise to San Francisco in support of their effort. Our ADTAG platform enables Transportation Services to connect citizens and visitors to all modes of transportation through the integration of the various data feeds that deliver schedules, delay notices, and ticketing. For instance, a person waiting on a bus receives an alert with the estimated time of arrival, if the arrival time is more than 10 minutes (this is configurable), a recommendation for an alternate mode of transportation is made. This could be for a shared bicycle, a streetcar, or other vehicle.

Digital equity is an important benefit of our intelligent operating system. Over the years, we have served all populations within a city, and fully understand the imperative, including audible and visual alerts for the visually or hearing impaired.

Reliance on private cars in the City needs to be alleviated. Direct ownership of a vehicle is, by and large, an inconvenience in a city like San Francisco. When shared mobility services are widely deployed on our beacon networks, timely access to those services becomes ubiquitous, and user adoption will dramatically improve. Easy access and reliability is the key, and we provide both.

The Smart City Challenge is an opportunity to advance toward the world's first shared electric, connected, and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge making transportation is safe, clean, and affordable.

If you have any questions regarding this matter, please contact Ronald Espinosa, Vice President of Sales, North America at ron.espinosa@connecthings.com or 980.277.2515.

Sincerely,

Laetitia Gazel Anthoine
CEO

Streetline
5/16/16

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Streetline commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Streetline, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. ~~The~~ Streetline will make available up to $1.4 million worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Streetline is the world's leading Smart Parking Company. Streetline has the most robust and accurate parking occupancy detection portfolio. In a world where other smart parking companies claim 85% accuracy, but actually deliver real world data that is as little as 15% accurate, Streetline routinely achieves real world results at 90-97% accuracy levels.

Streetline has a full portfolio of applications that make this data usable by drivers, merchants, city planning, parking enforcement, and third party application developers. Given that parking accounts for nearly 1/3 of all city traffic and that Streetline has proven up to a 43% reduction in the time it takes drivers to park, Streetline can deliver significant impact:

- Getting cars off the road faster lowers traffic and increases pedestrian and bike safety
- By simply turning cars off up to 10 minutes earlier, pollution can be reduced
- Fewer cars on the road means public transportation can navigate city streets and their routes more quickly and predictably
- Knowledge of ADA parking accessibility and availability would be greatly enhanced through Streetline's distribution of such information to the public through its various distribution channels

This accurate parking availability data will also empower San Francisco Parking to optimize the usage and management of existing on/off street parking assets and help build San Francisco's Smart Transportation strategies and plans.

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Streetline was named one of Fast Company's 10 most innovative Companies in Transportation, as well as IBM Global Entrepreneur of the Year. Streetline was named Best Mobile Innovation for its Parker motorist guidance mobile application at the Mobile World Congress.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge in order to realize a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Kurt Buecheler, SVP Marketing and Bus Development, Streetline at kurt@streetline.com at 650-242-3416.

Sincerely,
Kurt

Kurt Buecheler
SVP Marketing and Business Development
Streetline, Inc.

VOLTA

VOLTACHARGING.COM

VOLTA HEADQUARTERS 155 De Haro St. San Francisco, CA 94103 PHONE 1-888-264-2208 EMAIL info@voltacharging.com

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Volta's commitment to San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Volta, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Volta will contribute up to $1.2 million worth of in-kind contributions and deployments to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

San Francisco-based Volta has developed a uniquely innovative approach to public Plug-in Electric Vehicles (PEV) charging, with its iconic, futureproof and engaging Smart City furniture. Partnering with brands committed to bettering the environment across US communities, Volta deploys Smart City networked EV charging kiosks at convenient urban locations venues such as civic shopping and entertainment districts, and provides free charging to drivers and free installation and maintenance for life to cities. The strategic sites of Volta community charging amenities drive both high utilization and high visibility, establishing Volta as an incredibly effective catalyst for PEV adoption. After launching in 2010, and validating its model in Hawaii and Arizona, Volta brought and grew its network tenfold in California within the last 18 months, and is now replicating its innovative infrastructure and services model in new markets nationwide.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Dr. Abdellah Cherkaoui, Vice President of Government, OEM & Utilities Relations, at 415 341 2566 (abdellah@voltacharging.com).

Sincerely,

Scott Mercer
Founder & CEO

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: HERE commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of HERE, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. HERE will make available up to $1,000,000 worth of in-kind contributions and discounts to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

HERE is pleased to present the City of San Francisco with a contribution of connected vehicle technology and data for supporting the US DOT Smart Cities Challenge. HERE, the location cloud company, enables rich, real-time location applications through its ability to ingest, process, and manage big data at scale from sources including vehicles, probes, and sensors. HERE has 30 years of experience in mapping and navigation, and works closely with every major automotive company. HERE is financially backed by a consortium of leading automotive companies (Audi/VW, BMW, and Daimler). HERE's maps and real-time data services power 9 out of 10 vehicle navigation systems in North America.

Over the past several years, we have been working across government, automotive, trucking, and consumer industries to develop and deploy advanced mobility applications and connected/automated vehicle (CAV) technologies. The HERE Platform and Data are deployed by all major automakers and support many government ITS Applications across the US and abroad.

HERE's proposal is to power San Francisco with a robust package of HERE Data and Platform Services for CAV. HERE can provide these solutions for the 3-year Smart Cities Challenge pilot term. HERE proposes to discount the data, platform, and services cost by $1,000,000 as a cost share donation toward the local match. The HERE package includes:

HERE Location Platform - automotive, truck, and transit routing, detailed roadway geometry and characteristics (e.g., posted speeds, driver warnings, lanes, signals), transportation/transit stations, business centers, addressing, and postal information. A collection of use case based data building blocks (APIs and SDKs) are used to rapidly integrate and deploy connected vehicles and other applications.

HERE Real-time and Archived Traffic Probe Data - real-time and archived traffic data for system evaluation and performance measurement based on hundreds of billions of probes.

HERE Staff Time for Technical and Implementation Support - HERE technical support will be available to the Smart Cities team for guidance on accessing, understanding, and deploying the provided technology.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

Sincerely,

Monali Shah
Global Director Intelligent Transportation
HERE

Infosys®
POWERED BY INTELLECT
DRIVEN BY VALUES

04/18/2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Infosys Ltd. commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Infosys Ltd., I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Infosys Ltd. will make available up to $1 MM worth of in-kind contributions by actively leveraging and sharing our learnings from past and ongoing industrial Internet of Things (IoT) testbeds related to smart cities and asset management, and from our collaborations with Industry 4.0 partners in the European Union, to support the City's proposed research and demonstration projects which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

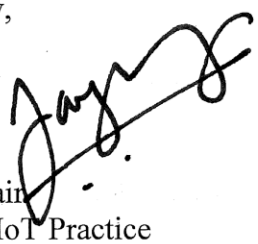
Infosys (NYSE: INFY) is a global leader in consulting, technology - including IoT - outsourcing and next-generation services. We enable clients in more than 50 countries to stay a step ahead of emerging business trends and outperform the competition. We help them transform and thrive in a changing world by co-creating breakthrough solutions that combine strategic insights and execution excellence. Infosys has been a leading system integrator for several compelling connected vehicle and smart transportation solutions, in addition to various Industrial IoT offerings. We are actively growing a healthy IoT partner ecosystem under the auspices of the Industrial Internet Consortium (www. iiconsortium.org), where we synergize with our partners to build marketable IoT solutions. We will leverage these specific experiences and expertise to contribute towards development of a robust, resilient, safe and interoperable Transportation as a Service Platform as a part of the SF Smart City Challenge. Our past experience includes developing an end-to-end connectivity platform solution for a heavy vehicle manufacturer that connected all service lines across multiple geographies and multiple business stakeholders, a platform for remote monitoring and diagnostics of automobiles for a leading automotive OEM, backend platform development for smart driver monitoring, usage-based insurance offering based on driver behavior, and multiple big data analytics and data science engagements using our own Infosys Information Platform (IIP),

among others. We are committed towards contributing to the challenge by extending these capabilities and exploring new frontiers in end-to-end transportation platform solutions to address the Smart Mobility needs of San Francisco.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Jayraj Nair, Head of IoT Practice at Infosys Ltd. at (510) 365-8593 or Jayraj_Nair@infosys.com

Sincerely,



Jayraj Nair
Head of IoT Practice
Infosys Ltd.
4009 Miranda Ave
Suite 100
Palo Alto, CA 94304

May 13th 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Next Future Transportation inc. commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

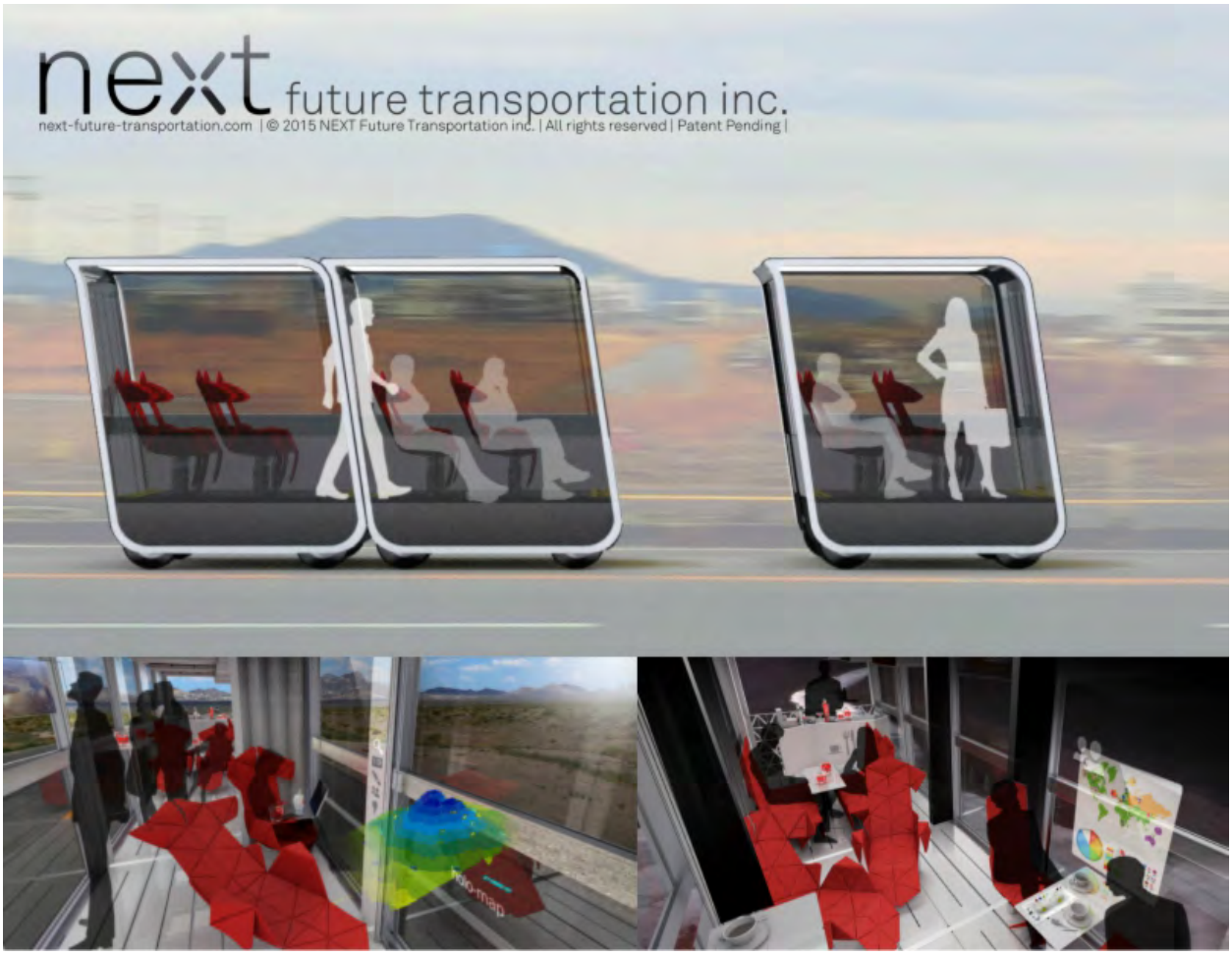
On behalf of **Next Future Transportation inc.**, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

Next Future Transportation inc. will contribute to support the City's proposed research and demonstration projects with an estimated total value of $1M for these purposes:

- Using our design for prototype creation: $350,000
- Providing engineering support for prototyping: $100,000
- Participating in pilot initiatives: $100,000
- Being part of a larger solution team: $50,000
- Partnering with UC Berkeley to refine our solution and participate in trials at the Field Station: $400,000

All of the above will be consistent with the Smart City Challenge's 12 Vision Elements and the four core principles of safety, sustainability, accessibility, and mobility.

At Next, we are creating the solution for an autonomous, electric, modular bus, that can be operated as individual modules and come together to form an integrated, scaleable bus.
Such a solution solves for efficient transport on freeways, and for the first and last mile problem of the commute, and local commuting needs in a safe and friendly manner that advantages all segments of our society and visitors from outside.
Our design solves both for inner city issues, as well as for regional integration.
NEXT offers a fleet of very compact (long as a Smart) but roomy (up to 10 people per module) electric vehicles. The modularity allows to adapt the capacity of the vehicle according to the effective passengers demand, and to dispatch and collect people on the vehicle without the need to stop the entire convoy, just detaching/connecting one module. Physical connection allows the use of additional on-demand services modules and solve the recharge issues.



The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Sri Jagannathan CTO of Next at sri@get-next.com or Emmanuele Spera CEO of Next at emspera@get-next.com or 408 646 7157

Sincerely,

Emmanuele Spera
CEO of Next
next-future-transportation.com

May 18th 2016

Proxy Co.
350 Townsend St
Suite 260
San Francisco
California 94107
650 823 7888

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Proxy Co. commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Proxy Co., I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Proxy Co. will make available up to $1,000,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Proxy creates presence and proximity technologies, enabling new and exciting experiences between passengers and public transportation systems. When our technology is deployed across public transportations systems it allows passengers to automatically pay for fares whenever passengers hop on and off a bus, train and the future of autonomous transit vehicles. This removes the need for ticketing and the onus on passengers to constantly tag on or off, and replenish their transit cards with funds, or search for machines to buy tickets. Proxy provides an infrastructure enabling Transit as a Service platform for other 3rd party providers to integrate to and access universal passenger presence and real time transit metadata while they travel. Our in-kid contribution includes a deployment of our technology, including sensors and back-end systems with the SFMTA's transit network and engineering expertise to bring the platform to operation.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Denis Mars, at denis@proxy.co.

Sincerely,
Denis Mars
Chief Executive Officer, Proxy Co.

Your systems. Working as one

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Real-Time Innovations, Inc. commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Real-Time Innovations, Inc. (RTI), I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. RTI will make available up to $1M of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

RTI provides the Connext® open-architecture, IIoT-standards-based communications software platform that forms the core nervous system for smart, distributed applications. Our customers span the breadth of the Internet of Things; the total value of the more than 1000 system designs that trust RTI for their fundamental architecture exceeds $1 trillion. RTI was named "The Most influential Industrial Internet of Things Company" in 2014 by Appinions and published in Forbes. RTI is on the Steering Committee of the Industrial Internet Consortium and helps lead its Smart City Testbed Program and leads IIC testbed projects in Smart Grid, Healthcare, Connected Vehicles, and Edge Intelligence.

RTI's Connext platform is the core architecture for autonomous drive applications at major car companies, for V2I communications, and for large transportation systems. The platform is the leading implementation of the open, IIoT-data-communications standard DDS. As the original author of the DDS standard and the chair of the DDS standards committee, RTI is committed to open, standards-based solutions.

RTI will make available up to $1M of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility. DDS can provide core data communications across the entire system enabling all of the demonstration categories in the program. The in-kind contribution will include software developer licenses for our Connext DDS Secure platform for up to 2 years. Support and consulting services will need to be negotiated separately.

232 E. Java Drive, Sunnyvale, CA 94089
Tel: +1 (408) 990-7400 Fax: +1 (408) 990-7402
rti.com

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Brett Murphy (Director Business Development, Industrial IoT) at brett@rti.com, 650-346-9307.

Sincerely,

Catherine Mekler
Vice President of Operations
Real-Time Innovations, Inc.

232 E. Java Drive, Sunnyvale, CA 94089
Tel: +1 (408) 990-7400 Fax: +1 (408) 990-7402
rti.com

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: RideLeads' Commitment to San Francisco's Smart City Challenge Application

Dear Secretary Foxx,

On behalf of RideLeads, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. RideLeads will make available up to $1 million worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

RideLeads provides cities with a packaged mobility and connected traveler platform, allowing them to invest in their own digital transportation infrastructure. Our open data platform is built in a modular, flexible format, allowing for third party plug and play integration. Users will be able to view all available transportation options and travel time estimates, book and pay directly via the app.

The RideLeads platform currently powers Washington, DC's new universal e-hail taxi app, which includes ADA accessibility, services for the unbanked population, detailed data reporting, and other benefits that are helping increase the efficiency and public service benefit of its taxi fleet. Our service can contribute to the following city demonstration categories:

- Create Transportation as a Service Platform: RideLeads will provide San Francisco with the software to serve as the transportation as a service platform that allows for third party plug and play integration, linking all modes of transportation in a single app with a payment gateway.

- Achieve Traffic Safety Vision Zero: RideLeads offers an open data platform, meaning the city can capture essential metrics such as traffic patterns and pedestrian habits and act on this information to make city transit safer and more efficient.
- Increase Digital Equity: The RideLeads platform features ADA accessibility, access for the hearing and vision impaired, voice call option for those without smartphones, and a cash payment option for the unbanked population.
- Reduce Private Car Ownership Need: Our platform will allow the city to offer citizens a wider variety of transit options with quicker response times and the ability to find cheaper options more easily, which increases the efficiency and appeal of public transit while reducing the need for car ownership, lowering congestion and pollution.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable. If you have any questions regarding this matter, please contact David Miller, CEO of RideLeads, at david@rideleads.com or 703-929-3597.

Sincerely,

Matt Cunningham
RideLeads
703-634-3838

5/13/2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Smarking Inc.'s commitment to the San Francisco's Smart City Challenge application

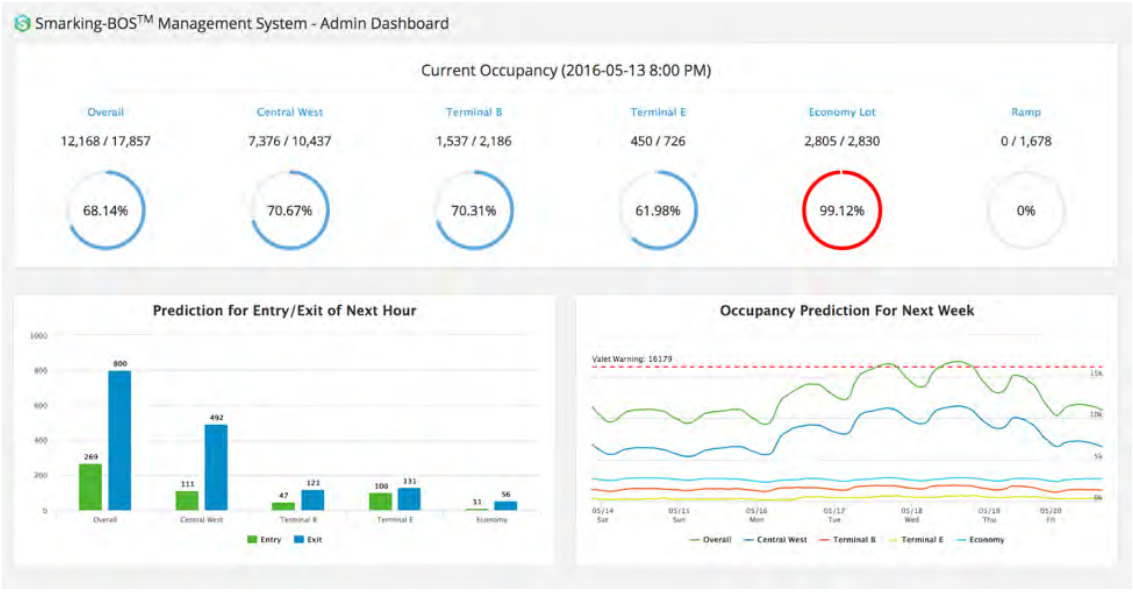
Dear Secretary Foxx,

On behalf of Smarking Inc., I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Smarking will make available up to $820,000 in in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Smarking is a data analytics company that specializes in parking data. Smarking collects and aggregates data from on and off-street parking assets: meters, gates, pay stations, LPR technology, parking guidance systems, mobile payments systems and others. Smarking builds clients a holistic business intelligence platform that displays real-time occupancy, predicted occupancy and host of reporting features surrounding historical occupancy, parking durations and revenues.

Together with the existing parking data generated by the SFTMA, Smarking would build a web-based analytics platform that allows users to actively understand and manage parking demand in real time. Without any hardware installations or downtime, the platform would enable better inventory management, payment tracking, and efficient data-based pricing. As parking inventory in San Francisco is curtailed to increase affordable housing, the Smarking platform would track and monitor demand for parking at the block and neighborhood level to help target areas of underutilized parking for conversion to housing. In the longer term, Smarking and the SFTMA would push the live and predicted occupancy data to connected or autonomous vehicles so that trips could be routed directly to parking spaces, reducing vehicle miles traveled (VMT) and traffic congestion within the city by up to 30%.

Smarking is uniquely positioned to deliver on this mission as the first pure play software and data analytics company in the parking industry. Founded at MIT in 2013, Smarking proved our business model by working with Logan International Airport (owned by Massport) to build a parking management system for the five garages and 17,850 parking spaces managed by the Logan parking team. At the core of the Logan Management System was a machine-learning algorithm that predicted occupancies at each facility up to one week in advance in addition to entry and exits for the upcoming hour. The algorithm incorporated historical data sets along with factors known to influence parking demand including flight schedules and weather. A screenshot of the main dashboard of the Logan System is below for your reference:

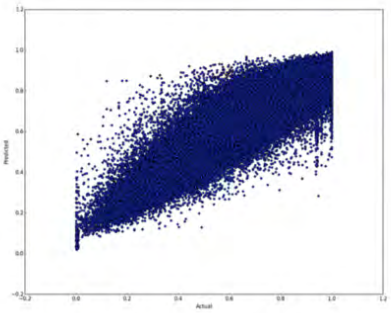


The dashboard of the Logan Management System

Smarking now has more than 60 clients consisting of commercial real estate firms, municipalities, parking operators, airports, and transit authorities. We have integrated data from more than 20 different parking related systems.

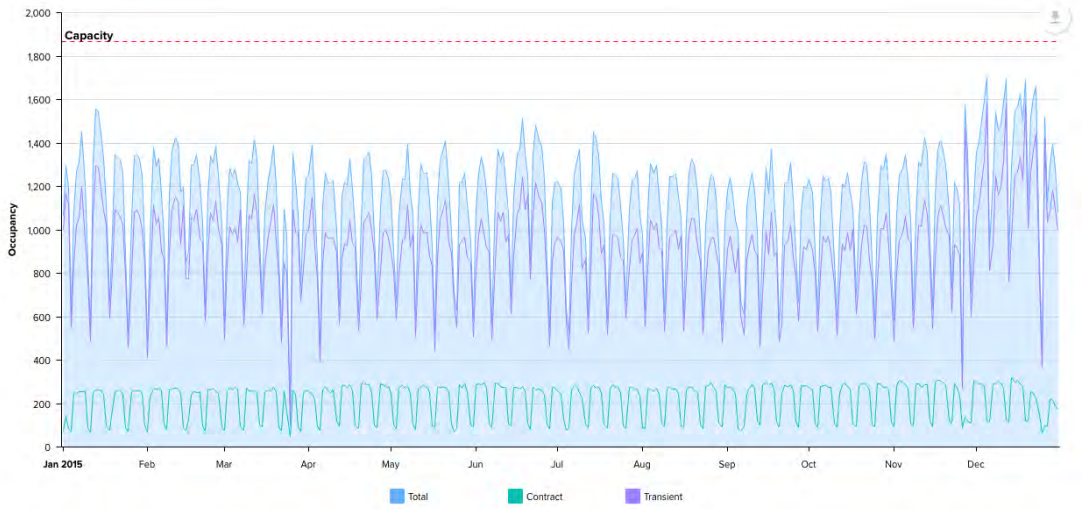
Smarking is currently working with five cities within the San Francisco Bay Area, and the Bay Area Rapid Transit District (BART). Smarking is familiar with the SFMTA's on and off-street data API's. In the summer of 2015, Smarking performed an on-street parking data analysis that predicted occupancy based on payment data. Using linear regression modeling, Smarking was able to calculate the relationship between payment occupancy and true occupancy at meters (R^2=0.83).

Smarking's model uses payment data to predict occupancy: R^2 = 83%

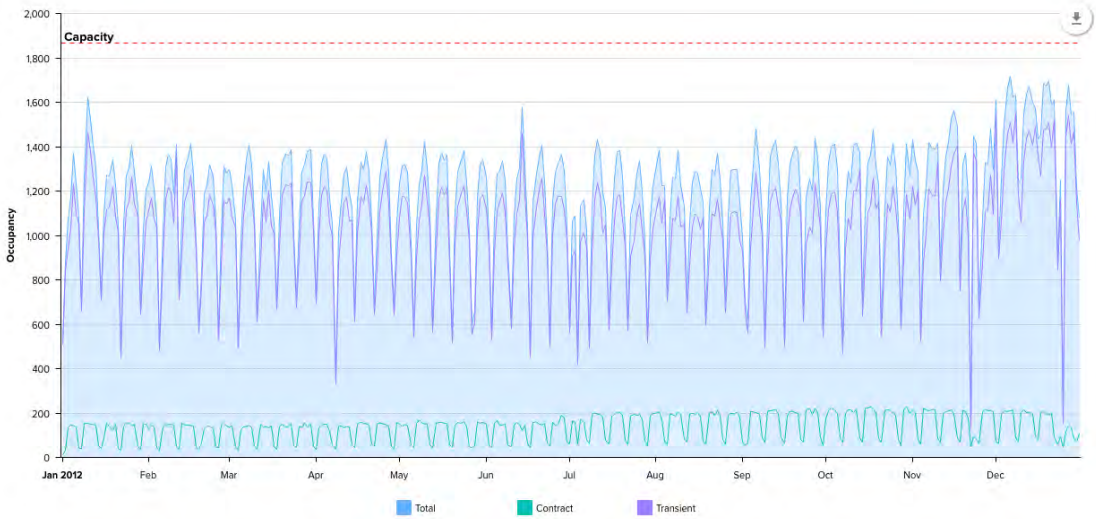


- Hourly data vs. monthly aggregated data
- Street-level data vs. District-level data (High variance at block level)
- Low-compliance data included

In early 2016 Smarking teamed up with Uber to track and measure the impact of ridesharing services on parking demand. We found that at the Sutter Stockton Garage, from 2012 to 2015, parking demand had decreased by approximately 10% based on average daily peaks. Below is the average daily peak for calendar year 2012 compared with calendar year 2015:



Daily peak occupancy in Sutter Stockton for 2015



Daily peak occupancy in Sutter Stockton for 2012

By helping and managers of parking assets derive actionable insights around their existing parking data, Smarking allows parking data to be applied in a much broader way than it has been traditionally. In our work with BART, Smarking is analyzing the rate of transactions in order to predict fill times at each of BART's 50 parking facilities. Because BART parking is priced below market rates, lots fill up almost every day. Smarking built an algorithm that examines the rate of payments at each facility and is able to calculate real time

occupancy and projected fill times based on how the rate of payment changes. Smarking plans to push this data via API to relevant outlets including Google Maps/Waze so that drivers can make more informed decisions regarding where and when they can expect parking availability at BART stations.

The City of San Francisco has articulated clear goals regarding the plan to leverage the Smart City challenge grant: reduce congestion, increase affordable housing, and lay the groundwork for connected and autonomous vehicles. Given our presence here in the Bay Area, our expertise working with parking data, preexisting relationships with other regional entities and Google/Waze, Smarking, the SFMTA, and the City of San Francisco are positioned to make meaningful progress towards these goals in the immediate future.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Cassius Jones, Growth Manager at cassius@smarking.net or 650-380-5114.

Sincerely,

Cassius Jones

San Francisco Smart City Challenge
AT&T-Led Partner Letter of Commitment

Dear City of San Francisco Stakeholders,

AT&T is pleased to submit this letter of support to San Francisco, CA for inclusion in its application to the U.S. Department of Transportation Smart City Challenge (the "DoT Smart City Challenge"). AT&T has a longstanding relationship with San Francisco and our connections across numerous departments uniquely position AT&T to execute complex projects for the city.

AT&T Smart Cities can provide a critical component to San Francisco's proposal, however, a comprehensive proposal will require collaboration by multiple solution providers. For the purposes of San Francisco's submission to the DoT Smart City Challenge, AT&T considers Ericsson, Qualcomm, MetroTech, Motionloft, and Savari as key strategic allies. Together with AT&T's additional vendors and relationships, we will be able to help San Francisco deliver and execute upon a comprehensive Smart City solution. A Smart City deployment led by AT&T, with assistance from these suppliers, inherently increases the repeatability of solution elements across the U.S., due to AT&T's longstanding city relationships, national network presence, and proven capabilities to execute complex projects.

Thank you for this opportunity, and we look forward to working with the City of San Francisco.

Sincerely,

Mike Zeto

Mike Zeto
General Manager
Smart Cities, AT&T

Matt Foreman

Matt Foreman
Market Development
Smart Cities, AT&T

Beverly Rider

Beverly Rider
Vice President
Enterprise IOT & Smart Cities, Ericsson

Matt Eichenberger

Matt Eichenberger
Sr Director of Business Development
Qualcomm QISI

Robert Bruckner

Robert Bruckner
SVP Sales and Service Deliver
MetroTech

Joyce Reitman

Joyce Reitman
CEO
Motionloft

Ravi Puvvala

Ravi Puvvala
CEO
Savari Inc

Part 1: CONTACT INFORMATION

Organization Name: AT&T Mobility II, LLC

Organization Primary point(s) of contact

Name	Title	e-mail	phone
Matt Foreman	Market Development	mf3510@att.com	770-241-2361
Jawad Tareen	Transportation Business Development Manager	jt788k@att.com	
Mike Zeto	General Manager, AT&T Smart Cities	mz499k@att.com	

Organization Type: For Profit Company

Are there any other organizations or companies that will be a part of your Partnership Proposal? Yes

If Yes, please list organization(s)/company name(s) below: (add rows as needed)

Company	Point of contact	e-mail	phone
Ericsson Inc.	Beverly Rider	Beverly.rider@ericsson.com	206-321-1373
Qualcomm Inc.	Matt Eichenberger	georgewo@qti.qualcomm.com	408-642-0077
MetroTech Net , Inc.	Robert Bruckner	robert.bruckner@metrotech-net.com	770-335-4635
MotionLoft	Joyce Reitman	Joyce.Reitman@motionloft.com	415-580-7672
Savari Inc.	Ravi Puvvala	ravi@savarinetworks.com	404-859-7284

Part 2: PARTNERSHIP PROPOSAL

All offers below are conditioned upon the City of San Francisco (a) being selected as the winning city of the DoT Smart City Challenge; (b) receiving $50 million dollars from the Department of Transportation in connection with the DoT Smart City Challenge; and (c) executing a mutually acceptable, definitive agreement(s) with the companies signing this letter of support, consistent with applicable procurement laws, regulations and requirements.

Wireless Products and Services:

AT&T is offering up to $300,000 of in-kind products, services, and support, in addition to resource support. This will be allocated as follows:

- 33% of cellular data connectivity needs to support sensors and technology to be deployed as a part of the execution of the Department of Transportation Smart City Challenge project. This will be a maximum of $50k per year, over the three year execution period, for a total of up to $150k.

- An additional $150k worth of products and services, selected from the below list, allocated at a maximum of $50k per year over the three year execution period.

    - **Internet of Things (IoT) Security Consulting Assessment:**

      This assessment will help inform San Francisco's deployment of secure smart city technologies and services, and will complement its vision of its smart city deployment. Through this service, AT&T can perform an IoT security assessment of the city's smart city components across four layers of potential vulnerabilities: Endpoints (e.g. meters, sensors, etc.), Network(s), Applications and Data, Over-arching threat analysis

    - **Big Data Solutions in Support of Smart Transportation:**

      AT&T is currently engaged in two California projects that can both inform, guide and apply to this project with San Francisco. Specifically, AT&T is working with the California Department of Transportation (Caltrans) and the University of California at Berkeley in two projects employing Big Data analysis of cellular network data to analyze traffic and transportation patterns: the Connected Corridors Project in Los Angeles, [1] and the SmartBay Project in the Bay area.[2] These projects are using aggregated and anonymized call data records (CDRs) from the geographically relevant portion of AT&T's 137 million mobile subscribers to model and forecast traffic patterns—complementing data derived from in-pavement sensors and other sources to build a far more robust understanding of movement patterns within the project areas. These projects are similar to work underway at some National University Transportation Centers,[3] but include the massive data set available from AT&T's subscriber base. The methods and insights being used to support each of these existing projects in California can be replicated for, and applied by AT&T to the City of San Francisco, although it would need to be in conjunction with a local academic institution or potentially an appropriate DOT UTC, to aid in its traffic and transportation planning for its Smart City deployment.

    - **Local Hackathon and/or DevLab Events:**

      Either or both of the events described below could be made available to support ladders of opportunity, economic development, and citizen engagement:
      Local Hackathon in support of Smart City objectives- A hackathon is a collaborative computer programming event. AT&T's Developer Program[4] conducts many hackathons around the country and the world, and would be able to support the city in engaging the local developer community with a transportation-focused hackathon.

      AT&T DevLab- An AT&T hosted DevLab will allow city IT employees and selected partners from across the city's departments and stakeholders to receive training on cutting edge app

[1] See http://about.att.com/innovationblog/09292015smartcities
[2] See http://fortune.com/2015/10/16/att-using-big-data-to-fix-traffic/
[3] See, for example, the research to be presented at an upcoming DOT Transportation Innovation Series, http://www.rita.dot.gov/transportation_innovation_series_2016_03_16
[4] See http://developer.att.com/community/events

development and coding practices that will improve their ability to develop and deliver solutions that are a part of their Smart City deployment.

- **Proof-of-Concept Pilot of LTE Cell Broadcast Technology for V2X Communications:**

  Extending the reach of DSRC-based V2X Communications to LTE-equipped vehicles
  AT&T currently has over 7 million vehicles on the road connected to its mobile network with embedded cellular communications, with millions more to be delivered to consumers over the next several years. None of these vehicles are currently equipped with dedicated short range communications capabilities ("DSRC"). As DSRC equipped vehicles and infrastructure elements begin to be deployed in support of the ITS, reaching portions of the existing fleet presents a significant challenge and opportunity.

  AT&T is working with several Tier 1 suppliers and OEMs to develop proof-of-concept pilot deployments of systems employing the cell broadcast capabilities of AT&T's mobile network and LTE devices to:

  1. Distribute DSRC-originated event notification messages to vehicles equipped with LTE. This system would extend the reach of V2X systems into the LTE vehicle ecosystem. For example, a Decentralized Environmental Notification Message (DENM) generated by DSRC equipped vehicles would be relayed to an AT&T servers via an LTE connection. The AT&T servers would define the area of relevance (AOR) for the DENM distribution, and distribute the message to all LTE equipped vehicles within the AOR for the event duration.
  2. Assess and validate the distribution of V2V SCMS credentials via cell broadcast technology. This would validate the ability of the LTE network to function as the Secure Credential Management Center, and distribute certificates and revocation lists via LTE.

  AT&T plans to conduct these proof-of-concept trials starting as early as January 2017. Either or both of these pilot deployments can be conducted in San Francisco, as a complement to the city's deployment of ITS capabilities.

Ericsson

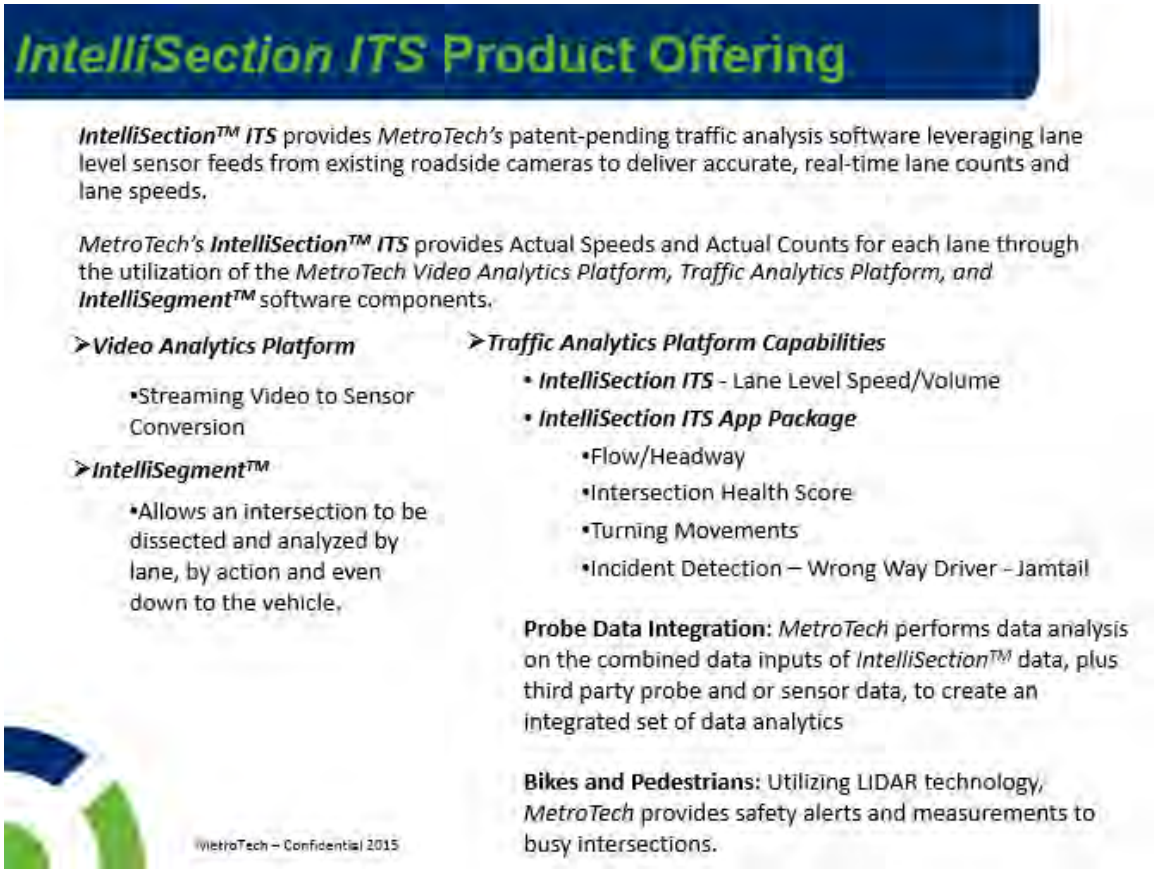
In support of the Department of Transportation Smart Cities Challenge winning city, Ericsson is building a multi-million dollar cross departmental data management and control center. In support of San Francisco's DOT proposal, Ericsson is excited to offer access to this core architecture as well as $100,000 of integration services allocated over 3 years.

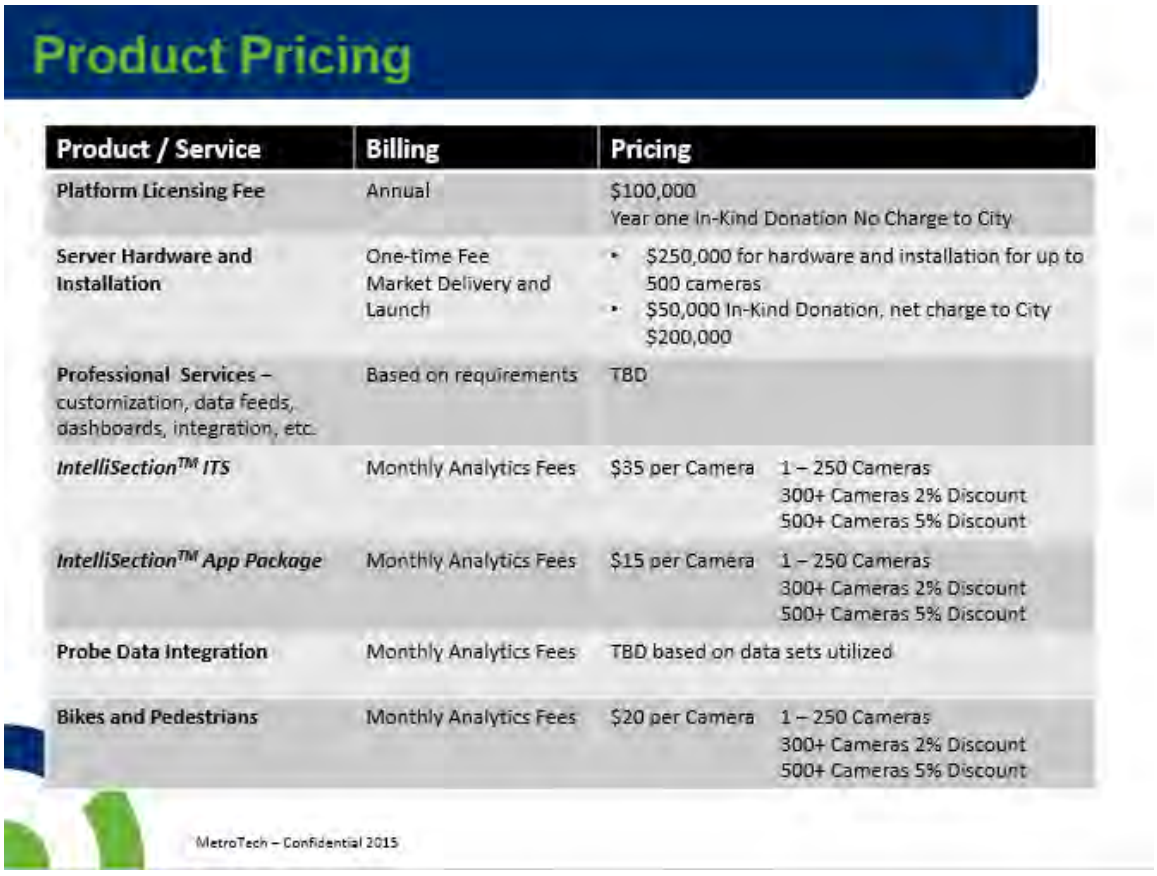
Qualcomm

Qualcomm will provide in-kind funding up to $100,000 for the winner of USDOT DoT Smart City Challenge in collaboration with AT&T. The $100,000 can be a combination of in-kind DSRC chipsets, engineering design, support and services, with the goal of implementing LTE encapsulation of DSRC packet in extending the range of V2V and V2X capabilities.

MetroTech

MetroTech is excited to offer up to $300,000 of in-kind value in support of deployment of the IntelliSection ITS solution. Kindly find solution and pricing details below.





Savari Inc.

We are proud to be part of a strong alliance led by AT&T to help the City of San Francisco enable V2X smart transportation solutions.

Contributions Savari will make to the City of San Francisco as part of the AT&T partner consortium, are twofold:

1. In-kind resources
2. Discounted pricing

Savari will contribute the following in-kind resources of the total value 35,000 USD to the City of San Francisco:

Product / Service	**Quantity**	**Datasheet**	**Corresponding team and category**
Road-Side-Units (RSU)	2	*Savari_RSU*	#2 Connected / Automated Vehicles • Integration, Installation and Operations
On-Board-Units (OBU)	5	*Savari_OBU*	#2 Connected / Automated Vehicles & • Integration, Installation and Operations
Vehicle-to-Phone applications • Smart cross • Driver alert of approaching pedestrian	unlimited	*Savari-V2P*	#2 Connected / Automated Vehicles & • Integration, Installation and Operations #4 Safety
Vehicle-to-Vehicle (V2V) applications • Electronic Emergency Brake Light (EEBL) • Forward Collision Warning (FCW) • Intersection Movement Assist (IMA) • Do-not-pass Warning (DNPW) • Left Turn Assist (LTA) • Blind Spot Warning (BSW)	unlimited	*Savrai_V2V*	#2 Connected / Automated Vehicles & Integration, Installation and Operations
Vehicle-to-Infrastructure (V2I) applications • In-Vehicle Traffic Light *Signal Phase and Timing (SPaT)* visualization • Curve Speed Warning (CSW) • Work Zone Warning	unlimited	*Savari_V2I*	#2 Connected / Automated Vehicles & Integration, Installation and Operations
Mobility Services • CV MMITS Apps (I-SIG, FSP, PED-SIG, PREEMPT) • CV Advanced Traveler Info Services	unlimited	/	#3 Connected / Automated Vehicles & • Mobility Services
Software Development Kit (under Non-Disclosure Agreement only)	unlimited	*Savari_SDK*	#2 Connected / Automated Vehicles & Integration, Installation and Operations
Hardware and Software installation Service and maintenance	40 hours	/	#2 Connected / Automated Vehicles & Integration, Installation and Operations #3 Mobility Srevices #4 Safety

Savari will guarantee its lowest pricing of large scale deployment possible in case more RSU's and OBU's are needed. Furthermore, Savari is happy to offer its learnings, experience and contacts (OEM, Tier-1, CAMP) from other consortium activities and projects to the City of San Francisco Smart City Challenge.

We at Savari are looking forward to the City of San Francisco getting selected as the winning city of the Smart City Challenge and to start working with your team.

Is there anything confidential about your partnership proposal that you wish to keep away from public discussion? (Yes / No).

AT&T kindly requests this document is not made publically available.

Contribution Review

AT&T: Up to $300,000 over 3 years (+ intangibles such V2V and V2X trials)
Ericsson: Access to architecture for a $2.5M platform build, and $100,000 in integration services
Qualcomm: $100,000 over 3 years
MetroTech: $150,000 over 3 years
MotionLoft: $100,000 over 3 years
Savari: $35,000

10 Lombard St. Suite 200 San Francisco, CA 94111

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Aclima's commitment to San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Aclima, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Aclima will make available up to $500,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Environmental Intelligence for Urban Infrastructure
Aclima designs and deploys sensor networks that advance environmental intelligence to improve human health and planetary health. Our networks can collect, process, and analyze real-time data flowing from thousands of sensors, both stationary and on vehicles, enabling a level of environmental awareness that has never been possible before. We've developed a number of powerful partnerships, including the U.S. Environmental Protection Agency, University of California Berkeley, and Lawrence Berkeley National Laboratory to advance the science and utility of measurement devices based on small scale sensors. Deployment partners like Google and the General Services Administration have provided incredible distribution opportunities to scale our networks both indoors and outdoors. Enabled by a fully-integrated hardware and software platform, our team of experts help translate environmental data into actionable insights, empowering people to change the way we design and manage our buildings, communities, and cities.

Mapping How the Bay Area Lives and Breathes
As part of Aclima and Google's Clinton Global Initiative commitment, we have been mapping air quality, specifically pollutants that affect human health and climate change, in the Bay Area and will be expanding to Los Angeles and Central Valley in the coming months. With our research partners at U.S. Environmental Protection Agency and EPA Region 9, and participation from Bay Area Air Quality Management District, we are exploring a range of questions such as the impacts of roadway pollution on surrounding areas, as well as the effectiveness of mitigation strategies such as vegetation and green spaces.

Driving a Sustainable Transportation System with Hyper-Local Environmental Data
In support of San Francisco's Smart City Challenge proposal, Aclima will work with city departments and stakeholders to share this hyper-local data collected and provide urban analytics from our current driving of the Bay Area. As San Francisco develops a next-generation transportation platform, street-level environmental data will be critical to measuring and managing reductions in harmful emissions, while also quantifying efforts to advance San Francisco's sustainability objectives.

Connected Citizens, Healthier Communities

10 Lombard St. Suite 200 San Francisco, CA 94111

This environmental intelligence will inform not only next-gen transportation routes but also connect citizens to adopt non-vehicular modes of transportation and support eco-navigation of bike and pedestrian routes. Data could optimize routes to minimize exposure to pollution and assist City Transportation Planners in developing congestion pricing and bicycle siting infrastructure programs. Hyper-local air quality data can also engage citizens on the impact of our decisions on a range of environmental quality metrics.

We believe that making this real-time data accessible will transform our understanding of human and planetary health, and enable policymakers and citizens alike to play a more active role in improving cities through making more informed day-to-day decisions and better long-term planning. In essence, urban air quality data can serve as a metric of success and enable a smarter, more connected San Francisco transportation system.

We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, sustainable, and affordable. If you have any questions regarding this matter, please contact Kim Hunter, our Director of Communications & Engagement, at kim.hunter@aclima.io or (415)216-5509.

Sincerely,

Davida Herzl
CEO, Aclima Inc.

EverCharge

05/11/2016

The Honorable Anthony Foxx

Secretary

U.S. Department of Transportation

1200 New Jersey Avenue, S.E.

Washington, D.C. 20590

Subject: EverCharge commitment to the San Francisco's Smart City

Challenge application

Dear Secretary Foxx,

On behalf of EverCharge, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

EverCharge will make available up to $500,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

EverCharge increases vehicle electrification by allowing for 10x the number of charging stations to be installed at any given location at a fraction of the cost. Recently we completed the largest EVSE install for a residential property at the brand new LUMINA towers in downtown San Francisco. By choosing EverCharge the LUMINA was able to install 25 charging stations today with the ability to expand the dedicated charging service to every parking space in the garage, over 650 units.

Among others, we've helped properties like 200 Brannan, also located in downtown San Francisco, install 6 charging stations with the ability to expand up to 15 more, where only 2-3 stations could have been installed otherwise.

For electric vehicles to truly exist in cities, convenient charging stations are mandatory. Currently most city buildings do not have the proper infrastructure to install more than 3 stations, forcing upgrades that are costly and prohibitive. EverCharge's SmartPower technology intelligently manages power resources to

EverCharge

maximize existing infrastructure and learns drivers charging habits over time to become even more efficient.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Joseph Nagle, (Director of Marketing) at joseph@evercharge.net or 415-854-9190.

Sincerely,

Jason Appelbaum

CEO, EverCharge

SIEMENS

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Subject: Siemens commitment to the San Francisco's Smart City Challenge Application

Dear Secretary Foxx,

On behalf of Siemens, I am pleased to provide this letter of commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Siemens will make available up to $500,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

As a technology partner invested in transportation solutions for our cities, Siemens has extensive experience in intelligent traffic systems and connected vehicles, technologies which can support San Francisco-specific use cases to improve mobility issues in the region. In fact, Siemens has worked with key innovative mobility centers in Europe which are set up as public-private partnership models much like San Francisco is pursuing. Our European city partners have achieved great results through interdisciplinary collaboration models and we are happy to transfer this knowledge to the USA and San Francisco in particular.

Our key demonstrations revolve around Achieving Traffic Safety Vision Zero and Increasing Regional Transportation Options. For the Smart City application we plan to support San Francisco with pilot deployment of safety applications for Connected Vehicles as well as SafeZone solutions which are helping cities to achieve traffic safety Vision Zero.

First, Siemens will provide 10 units of road side wireless equipment (i.e. roadside units, or RSUs) to build a Connected Vehicle infrastructure pilot area. These RSUs will be installed at locations selected by the City of San Francisco. Siemens will perform the installation and testing of the RSUs. The Siemens RSU is designed to receive the USDOT standard message set from multiple vehicles and various on-board units. Within the RSU, Siemens will include WiFi capability so that the RSU can double as a local hot spot and provide a cellular

Siemens Industry, Inc.
Mobility Division
Intelligent Traffic Systems

9225 Bee Cave Road
Building B, Suite 101
Austin, TX 78733

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www.usa.siemens.com

backhaul [cell plan not included]. Also included will be power over Ethernet, GPS location by time of day and a power over Ethernet injector.

Besides hardware, Siemens would like to provide San Francisco several software applications integrated into the RSU. These software use cases have been developed at Siemens for the Tampa-Hillsborough Expressway Authority and in conformance with the USDOT-sponsored Connected Vehicle pilot deployments project. The following nine software applications will be integrated into the RSU and ready for deployment over the period of the grant:

- Signal control application with Signal Phase and Timing broadcast;
- Variable speed warning;
- Pedestrian crosswalk warning;
- Mobile accessible pedestrian signal;
- Adaptive traffic signal control;
- Probe enabled traffic monitoring and travel time;
- Transit signal priority (TSP);
- Vehicle turning right in front of bus warning; and
- Red light violation warning.

Third, Siemens Intelligent Traffic Systems (ITS) would be able to provide up to 50 hours of on-site support and design and engineering work free of charge for supporting the Connected Vehicles technology.

Fourth, Siemens would like to share best practices from strong innovative mobility centers in Europe such as Berlin and Braunschweig, cities that have significantly increased multimodal travel, transit efficiency and reduction of greenhouse gas emissions through transportation management. To bring this knowledge to bear, Siemens is providing consulting expertise up to 450 hours, requiring the physical presence of a European mobility expert in San Francisco to facilitate knowledge exchange and be a bridge to these existing projects.

Fifth, Siemens will offer a two camera dual lane SafeZone system for a time limited 6 month period free of charge to San Francisco in order to pilot the enforcement of section speed in localized safety hotspots.

Finally, Siemens will be able to provide up to 500 hours of onsite consulting and investigation, to understand the pain points, community needs and to prepare innovation proposal report. Based on the report, existing Siemens Web of Systems innovations will be used to add semantic meanings to data from different systems, to enable full interoperability among them. We will be able to fully leverage the potential of existing infrastructure to maximize the benefits to San Francisco and the smart city infrastructure users.

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SIEMENS

The value of the in-kind contribution described in this letter to support San Francisco is approximately $500,000, which Siemens will provide free of charge. For products and software, Siemens will grant a limited use license with final terms and conditions prior to delivery. Siemens is keenly in pursuing a pathway to commercialization of Connected Vehicles applications, both the ones that currently exist but also development of new applications. In exchange for the hardware (RSUs), software (Connected Vehicle applications) and engineering design support (applications customization, implementation, consulting), and the SafeZone solutions, Siemens asks San Francisco to provide Siemens with preferred vendor status when deploying CV use cases and applying technologies to support the Smart City Challenge.

Siemens will provide warranty and maintenance services for the equipment for a period of one year after the installation. Siemens recognizes that San Francisco will not indemnify the company for actions arising during this pilot effort. We will provide the San Francisco with proof of insurance for our efforts undertaken for this pilot.

The content of this letter is confidential until mutually agreed by the City of San Francisco and Siemens to make any portion of it public.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

Thank you in advance for your consideration. If you have any questions, or require additional information, please do not hesitate to contact Wendy Tao at wendy.tao@siemens.com.

Sincerely,

Marcus Welz
Chief Executive Officer
Siemens ITS

Rajarshi Ghosh
Chief Financial Officer
Siemens ITS

Siemens Industry, Inc.
Mobility Division
Intelligent Traffic Systems

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May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Verizon's commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Verizon, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

Verizon's Completed & Intended Commitments to San Francisco

Verizon regards San Francisco as a national frontrunner, driving smart community innovation, environmental sustainability, and improved citizen services. Verizon ranks as a leader in the most recent RootMetrics survey for San Francisco and remains committed to assuring we provide the capabilities required to implement the City's digital strategy. Verizon has already invested over $70M to drive high speed internet access through the San Francisco Bay Area and intends to further double our network coverage via small cell densification by the end of 2017. The significance of this investment will manifest through the enablement of IoT and Smart Community solutions, which generate new revenues and efficiencies for San Francisco and its operators, enterprises, and entrepreneurs.

In addition, Verizon has created a state of the art innovation hub in San Francisco, with the purpose of driving innovation, promoting cross-industry collaboration and investing in start-ups and entrepreneurs across the US. Verizon is also deeply committed to digital equality and the power of technology to improve the lives of every facet of the community. As such, we have donated $800,000 to various charities throughout the City via partnership with the 50 Fund.

Going forward, Verizon is evaluating increasing our commitment to San Francisco by exploring participating as a founding member of the City of SF and UC Berkeley's Smart City Institute, which will initially support the efforts in this USDOT proposal. As part of this membership, Verizon could make available up to $500,000 worth of cash and/or in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

As part of the in-kind contribution, Verizon could provide the City of San Francisco with a trial of Verizon's Intelligent Traffic Management solution built on the Thing Space

platform. This would include a proposed short-term trial of traffic data monitoring via our Intelligent Traffic Management solution, following launch of the solution in the market. If agreed upon by the parties, the short-term trial would be provided at no cost to the City, in exchange for the City's evaluation of the Intelligent Traffic Management solution. The potential trial of Verizon's Intelligent Traffic Management solution would include mapping services, access to the traffic data portal and reporting tools as well as training on the platform.

Verizon's Smart Community Solutions

Verizon has long supported initiatives designed to strengthen cities by helping improve livability for constituents, sustainability with renewable resources and resiliency to major events. We have been providing condition-based monitoring solutions, the cornerstone of today's M2M and IoT products, to government and commercial partners for over 15 years with proven results. In addition, Verizon's solutions are built with the foundation of network security, data analytics, and citizen engagement.

Verizon has built a strong foundation of Smart City solutions to turn near real-time information into valuable decisions to help improve the efficiency and address the safety concerns of your city. Verizon's team of approximately 100 data scientists are located in the Bay Area and are dedicated to enabling Thing Space developers with advanced big data analytic capabilities.

All Verizon solutions will be integrated with ThingSpace, Verizon's IoT solution platform, that offers reporting, analytics and the ability to share actionable data across all data inputs through a robust set of customizable APIs. ThingSpace has nearly 8,000 developers on the platform since its launch in October 2015. Our solutions can support and facilitate diverse connectivity initiatives for buildings and venues, energy and utilities, government and transportation. Verizon Smart Cities experts can help develop tailored plans to use natural resources more efficiently, improve public safety, increase non-tax revenue, easily engage residents and advance urban renewal efforts. In addition, the Verizon ThingSpace platform can interconnect solutions from San Francisco's ecosystem of smart city partners to enable the highest degree of security and data management and privacy.

Verizon Intelligent Traffic Management solutions allow cities to better manage the flow of traffic, in addition to understanding how traffic is performing along roadways, collecting various types of data and analyzing against industry metrics. Our solution can provide basic information such as travel times and origin/destination details and more complex details such as red light violations and adaptive/priority signaling. Data can also assist urban planners to locate new facilities and transit hubs, or to reduce the number of stops and improve speeds along busy corridors. Data can be used to facilitate signal optimization, a proven method to reduce congestion, emissions and ultimately improve air quality.

Verizon Intelligent Lighting solutions can integrate, based on the City's needs: LED lighting, digital signage, audio, video and safety sensors to help reduce energy cost, outages and outage duration.

Digital signage and audio features give municipalities the opportunity to generate revenue through media content delivery/advertising. Verizon can provide cities with superior advertising capabilities through the inclusion of brand and media offerings from AOL and Verizon Digital Media Services.

Environmental sensors can trigger alerts based on light, sound and moisture level (e.g., icy road-condition announcements). All these benefits are applicable for lights on streets, parking lots, stadiums, universities, parks, healthcare systems, office campuses and transit stops.

Verizon Intelligent Video makes it possible to get eyes on-site, without investing significant time and resources on streaming video. Cameras record high-quality video, that may be suitable for evidentiary purposes, while data is stored locally instead of streaming, on storage devices sized for short-term needs. Edge analytics, co-located with the camera, spot unusual or abnormal behaviors and trigger alerts to provide actionable information and a more efficient use of backhaul and long-term storage resources. Cameras also provide insight into transportation infrastructure.

Verizon Intelligent Lighting also improves public safety through features such as way finding, emergency call buttons, audio alerts, digital signage, and a number of possible sensor add-ons (seismic, air quality, weather, radiation, noise level, etc.). Verizon's Digital Signage solutions enhance public safety through civic information, alerts and announcements in case of emergencies (e.g., evacuation).

Verizon brings together all of these assets to deliver results and be a trusted City partner. As the provider of the nation's largest and most reliable 4G LTE network, our accolades do not stop there. Our leadership in 4G LTE wireless technology has enabled us to keep ahead of the rapid increase in wireless data traffic, about 90 percent of which now rides on the 4G LTE network. Leveraging our expertise with Cybertrust, Verizon is a top-rated managed security services provider, per Gartner. Verizon offers FISMA compliant, and FedRamp certified, cloud solutions, meeting strict government requirements.

Verizon is committed to diversity and inclusion and has been ranked among the best companies for multicultural women for 9 straight years, is ranked #1 for veterans, and has purchased $4.25B of goods and services from diverse suppliers, winning numerous awards for supply chain diversity. In 2015, Verizon employees volunteered 387,719 hours to support non-profit organizations and donated $9.6m to schools and non-profits. Verizon also contributed an additional $11m through its matching gifts program.

Subject to Definitive Agreement

This Letter of Intent is non-binding, and neither party is obligated to enter into a definitive agreement regarding the Smart Cities initiatives described herein. Should the parties agree to move forward with any trial or other Smart Cities or IOT-related services, it will be necessary to enter into a mutually agreed upon, definitive agreement

providing specific details and appropriate terms and conditions regarding each parties rights and responsibilities.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable. If you have any questions regarding this matter, please contact Mrinalini Ingram (Lani), Verizon Vice President, Smart Communities, at 408-391-6382.

Sincerely,

Mrinalini Ingram (Lani)
VP, Verizon Smart Communities
http://www.verizonenterprise.com/smart-cities

verizon

Exhibit A

Verizon's $800,000 Donation
Completed in February 2016

BAYCAT ($50K):
A nonprofit social enterprise that provides access, education and employment for low income youth, youth of color and young women.
http://baycat.org/about-baycat/

Bill Wilson Center ($100K):
A nonprofit that supports and strengthens the community by serving youth and families through counseling, housing, education, and advocacy.
http://www.billwilsoncenter.org/about/

BELL ($100K):
A nonprofit that works to create high-quality learning opportunities for the children who need them most so that they, too, can develop the skills, interests, and determination to excel.
http://www.experiencebell.org/about-us

Collective Impact – Mo'Magic ($75K):
This nonprofit is a collaborative of organizations and community members who regularly convene to address issues facing children, youth and their families in the Western Addition.
http://collectiveimpact.org/about-2/

College Track ($100K):
This nonprofit empowers students from underserved communities to graduate from college.
https://collegetrack.org/who-we-are/our-approach/

EOYDC ($100K):
This nonprofit develops the social and leadership capacities of youth and young adults (ages 6 – 24) so that they are prepared for employment, higher education, and leadership opportunities.
http://eoydc.org/mission_vision

Hamilton Family Center ($100K):
The mission of this nonprofit is to end family homelessness in the San Francisco Bay Area.
https://hamiltonfamilycenter.org/what-we-do/

Larkin Street ($100K):
This nonprofit works to create a continuum of services that inspires youth to move beyond the street.
http://larkinstreetyouth.org/about-us/

Taking it to the Streets ($75K):
This nonprofit exists to empower homeless and at-risk youth to live lives of their own design by providing opportunities through housing, employment, and mentorship programs.
http://www.takingittothestreetssf.org/

LOCAL MOTORS

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Local Motors commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Local Motors, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Local Motors will make available up to $400,000 worth of discounts or in-kind contributions in association with the purchase of Local Motors vehicles and associated dynamic mobility system to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Local Motor fosters open collaboration (online and offline) across our team, community, suppliers, and customers, in order to power faster, more efficient, more thorough product development to drive safety and improve quality. We produce vehicles using leading best practice manufacturing processes such as direct digital manufacturing combined with 3D printing to deliver today's most advanced vehicle systems and technologies, including our self-driving dynamic mobility system.

Along with partners such as IBM and NXP, we are proposing to deploy Local Motors' pedestrian friendly, low-speed, electric, on-demand, self-driving mobility system to help alleviate first/last mile access challenges commonly experienced within transportation systems. The Local Motors system will initially operate as a pilot and may operate on-demand or in both fixed route and/or fixed schedule to increase regional transportation options, and could also contribute to reducing large deliveries in neighborhoods. To support ongoing collaboration with San Francisco Smart City Partners and to ensure success of the proposal, Local Motors is willing to commit service and equipment resources in the amount of $400,000.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Matthew Lesh, Director of Mobility Systems at mlesh@local-motors.com or 480-717-7675.

Sincerely,

Matt Lesh

Matthew Lesh
Director, Mobility Systems
Local Motors

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **GRIDSMART Technologies Inc. Support of the San Francisco's Smart City Challenge Application**

Dear Secretary Foxx:

On behalf of GRIDSMART Technologies, I am pleased to provide this letter of commitment for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

GRIDSMART will make available up to $280,000 worth of in-kind contributions to support the City's proposed research and demonstration projects that will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

GRIDSMART brings experience and capabilities for the following demonstration categories:

- Create Transportation as a Service Platform;
- Achieve Traffic Safety Vision Zero;
- Increase Digital Equity. (Note: Not sure about this one) this means providing data to an open data platform.
- Deploy Environmental Air Quality Sensor Platforms on Traffic Intersection Infrastructure

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

GRIDSMART would like to use this opportunity to explain how we think our company can assist San Francisco in becoming the model that all other Smart Cities will attempt to emulate in the future. We outline areas and ways how we can help.

Smart City Vision:

Smart Cities of the future will manage population growth, which includes vehicle growth with greater levels of intermodal traffic that include pedestrian and bikes traffic as they move to zero emissions. This is highlighted by a Vision Zero initiative intended to eliminate all pedestrian fatalities. To help Smart Cities like San Francisco move efficiently and strategically forward GRIDSMART offers integrated, easy to install, easy to maintain smart mobility solutions.

info@gridsmart.com | 865.482.2112 | 10545 Hardin Valley Road, Knoxville, Tennessee 37932 USA GRIDSMART.COM

GRIDSMART's iconic bell shaped camera with a horizon to horizon view utilizes novel tracking algorithms that can be deployed to track vehicles, bicycles and pedestrians approaching and through a traffic intersection. GRIDSMART is the only intersection actuation product on the market that actually "sees" the center of the intersection.

GRIDSMART can be used to control signal timing, to improve traffic flow through cities and also alert user to incidents such as pedestrians or bikes in the crosswalk, wrong way drivers and "blocking the box". The alerts can be sent over DSRC.

DSRC is a standard that allows vehicles to talk to each other to reduce traffic collisions and when combined with the GRIDSMART camera system they can mitigate pedestrian and bicycles collisions today in moving towards the cities Vision zero goals. Only the GRIDSMART – DSRC integration manages the center of the intersection, sending alerts to vehicles that pedestrians, bicyclist, anyone is still in the intersection despite a green light indicator. Using a radio solution, the center of the intersection view provided by GRIDSMART is wirelessly delivered back to your traffic management center. The same view is available on i-Phones and Androids phones today. Future development will include the ability to send the center of the image directly to police and fire trucks, who will already have the advantage of DRSC radio. Imagine a police officer in pursuit or a fire truck on route getting not only an alert that something is in an approaching intersection, but having a visual of what is in the next intersection.

Since intersections and streets are rich sources of data, GRIDSMART and Silver Spring Networks are collaborating to develop optimized methods to collect data for large scale urban flows. This would include intersection and street sensors for air quality, ITS, image processing and the like. Data from these applications would be carried on Silver Spring Networks "Smart City Infrastructures", allowing cities to leverage pre-existing investments. Monthly recurring cellular charges for data back haul can be avoided.

AirGoSense:

To reduce greenhouse gases, Smart Cities must first be able to accurately measure the air quality at reasonable cost. For this data to be actionable, air quality data needs to be gathered at many different locations throughout the city, under similar conditions, and with a degree of regularity. Further to meet the DOT's expectations, it is necessary to have data proving how a particular initiative taken by the city directly led to an improvement in air quality.

Traditional methods for measuring air quality are not cost effective for installation in multiple locations and specifically at intersections. GRIDSMART is attacking this issue by integrating a low cost air quality sensor option made specifically to be installed at busy intersections to be released in Q-1 2017.

The city of San Francisco could be the first transportation department to accurately collect and assess in real time how changes in traffic flow affect air quality at an intersection.

The AriGoSense can measure in real-time multi-pollutant characterization of both gas phase (CO, CO2, NO, NO2, Ox) and particulate concentrations (.4 < diameter < 17µm). Along with it can also measure and provide data on the following at each intersection:

info@gridsmart.com | 865.482.2112 | 10545 Hardin Valley Road, Knoxville, Tennessee 37932 USA GRIDSMART.COM

- Barometric pressure
- Relative humidity
- Temperature
- Noise
- UV flux
- Wind speed
- Wind direction

GRIDSMART provides:

a. Bell camera, GS_2, and Client – core system for monitoring, actuating, and collecting data at any given intersection.
b. ATLAS – platform designed to provide situational awareness to any government department without the expense and time of installing a video management system. Camera agnostic.
c. AirGoSense – air quality sensor designed specifically for collecting and measuring air quality and other environmental factors.

If you have any questions regarding this matter, please contact Will Overstreet, Director of Product Management, will.overstreet@gridsmart.com, +1 678 938 1556.

Sincerely,

Bill Malkes
CEO, Co-Founder

info@gridsmart.com | 865.482.2112 | 10545 Hardin Valley Road, Knoxville, Tennessee 37932 USA GRIDSMART.COM

ARCIMOTO

544 Blair Blvd, Eugene, OR 97402

May 20th, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Arcimoto's commitment to the San Francisco Smart City Challenge

Dear Secretary Foxx,

On behalf of Arcimoto, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Arcimoto will make available in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Arcimoto will demonstrate the least-cost autonomous electric vehicle platform. This vehicle is a service platform that moves the transportation model towards traffic safety vision zero. Mass adoption of these platforms incorporated into new and existing mass transit systems will increase regional transportation options and reduce private car ownership. Low cost electric vehicle mass transit that is easy to access will increase digital equity by giving all persons easy access to mobility, and local carbon emissions are reduced with the use of an electrified, ultra-efficient, lightweight vehicle fleet. When the vehicles are not in use, the onboard batteries will be used for grid efficiency improvement and load leveling.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Mark Frohnmayer, President at 541.915.4973 or Mark@arcimoto.com.

Sincerely,

Mark Frohnmayer
President, Arcimoto, Inc

149 9th St Suite 404, San Francisco, CA 94103

19 May 2106

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Mapbox Commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Mapbox Inc, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Mapbox will make available up to $250,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

The lifeblood of city flows on its streets. The minute-by-minute activity of each city block -- the proportion of pedestrian and bicycle traffic, the relative density of motorized vehicles, and the turning patterns at its intersections -- is critical to understanding a city, and essential to its eventual transformation and improvement. Mapbox generates this data using anonymous telemetry from GPS-enabled devices, and ultimately provides specific data services that describe traffic patterns and the spatial and temporal 'pulse' of human and vehicular movement across every city block.

This information is not widely known, nor shared -- largely due to a paucity of data, or highly siloed and proprietary data where it does exist. Mapbox believes that successful and effective civic improvement cannot be achieved without open and accessible geodata. The officers and employees of Mapbox are excited to make available our data and services to the City to support, inform, and coordinate its vision for civic improvement. Specifically:

Achieve Traffic Safety Vision Zero: Mapbox performs 'mode detection' on location telemetry to report quantified data on: (a) what roads experience higher proportion of bike traffic to

facilitate planning of new bike paths, (b) the temporal variations in pedestrian traffic to inform pedestrian signal lengths at different times of the day, and (c) what proportion of traffic is turning left at every intersection in the city to inform adjustments to light timing and reduce potential collisions.

Create Transportation as a Service Platform: Mapbox will contribute its dense informatic layer to form one component of the connective tissue binding the City's economic, social, and technological services, and will make available to all participants its historic, real-time, and minute-by-minute congestion information. This coordination, built around open and accessible data, will allow multiple transportation services to coordinate better with each other, and the residents they serve.

Increase Digital Equity: Mapbox performs trip analysis of its anonymous location telemetry data at the block- and neighborhood levels to produce accessible overviews -- in aggregate, where vehicles are moving from and where are they going to -- which allows the city to quantify how effectively neighborhoods are served by a specific service, and to identify accidental or intentional biases in transport opportunity.

Mapbox measures human and vehicular activity in every city in America. This image shows probe density across San Francisco, where brighter is better: over 200 miles of road in San Francisco have data densities that allow extremely detailed, minute-by-minute analysis.

Mapbox supports San Francisco's Smart City Challenge vision by contributing 36 hours of consultancy, three years of its premium maps, geocoding and navigation service, and unencumbered access to its Location Telemetry platform for all contributing participants in the Challenge. This collaboration will bring additional data to Mapbox, which we anticipate creating a virtuous circle that will further improve Mapbox services and our underlying open data sources. Our employees are especially aligned with the city's desires to eliminate the hegemony of the car; increase transport accessibility to the elderly, disabled, and under-represented; and redress the current imbalance between pedestrians and vehicular activity.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Tyler Bell, Chief Product Officer at tyler@mapbox.com.

Sincerely,

Tyler Bell, PhD
Chief Product Officer, Mapbox Inc.

moovel North America | 1000 SW Broadway, Suite 1800 | Portland, OR 97205

May 19, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: moovel's commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of moovel, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. moovel will make available up to $250,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Since 2010, RideScout and GlobeSherpa have developed mobile app-based technologies that provide citizens with real-time information about urban transportation options and mobile payment solutions for U.S. transit agencies. In April 2016, these transportation technology leaders were formally merged as moovel North America, with the aim of transforming the urban transportation experience. Owned by Daimler AG, the parent company of Mercedes-Benz, moovel focuses on connecting people to public and alternative transportation options through three interconnected, mobile products: moovel transit, RideTap, and the moovel app.

moovel is a global leader in the development of technology to support a transportation as a service platform, and we enthusiastically support the City of San Francisco's proposal for the U.S. DOT's Smart City Challenge. We believe that by creating a flexible, interconnected, seamless mobility experience that builds on the backbone of urban mobility, public transit systems, we can increase regional transportation options and reduce the need for private car ownership. moovel offers its enthusiastic support of the City of San Francisco's proposal, and as part of our commitment to the City, we hope to deliver three services to the City and region: moovel transit, RideTap, and the moovel app.

moovel transit: The industry leader in public transit mobile ticketing and payment solutions

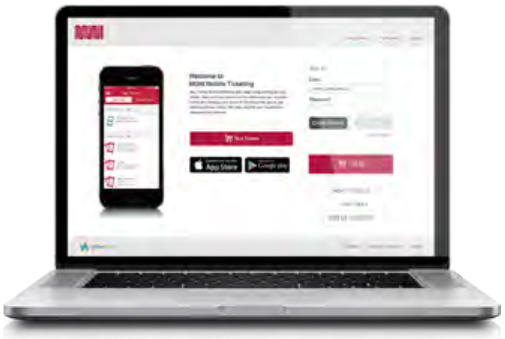
Through our support of the City of San Francisco's proposal, moovel looks forward to building on our existing collaboration with the San Francisco Municipal Transportation Agency (SFMTA) and the City. In November 2015, moovel transit (then GlobeSherpa) launched the MuniMobile mobile ticketing app in partnership with SFMTA, allowing transit users to purchase and use tickets and passes instantly on their phones.

Through the moovel transit platform, SFMTA, and potentially other regional transit agencies, will have the opportunity to access a whole world of ticketing, including mobile sales, smart card management, real-time analytics, and transaction data. moovel transit provides a secure technology platform for transit agencies, enabling open payment systems, open data, and mobile fare collection with minimal infrastructure investment.

The moovel transit platform includes:

- **Rider App** - With the Rider App, consumers can pay for their transit fare as they run to catch their ride. The app also allows access to mobile services including trip planning, arrival times, service alerts and deals at nearby retailers.
    - Account management capabilities for riders to manage and add value to their smartcards
    - Support for custom, visually authenticated mobile tickets and QR codes
    - Access to mobile services such as trip planning and arrival times
    - A robust set of features and functionality including support for multiple riders, offline functionality and ability to use more than one payment mechanism
    - Integrated support for transportation network companies through RideTap

- **Rider Web** - An eCommerce website that allows users to create and manage accounts, purchase fare media online, and then have those purchased fares appear in the Rider app
    - Fares can be purchased and managed through an agency-branded eCommerce website.
    - Integration with a variety of hardware platforms.
    - Purchases made through Rider Web are automatically sent to the Rider App for use
    - Provides account and card management features and the ability to review purchase history



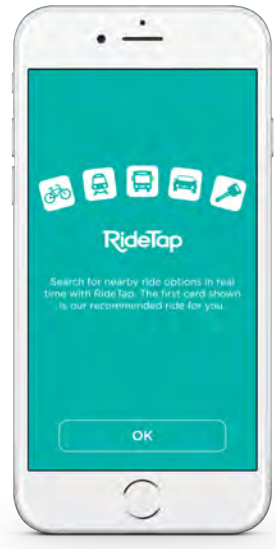
- Allows direct communication between customer and agency and provides access to support resources including help desk, FAQ's, and videos

- **Inspector App** - An enforcement application. The Inspector App includes instant inspection and validation of mobile tickets from any mobile device, giving fare enforcement personnel a reliable and easy-to-use handheld tool to verify payment.
  - Integration with a variety of hardware platforms
  - Rider information, fare information, and a map of ticket validation locations are all accessed through the Inspector App
  - Issue and print citations from mobile devices
  - Interoperability with agency databases
  - Support for contactless fare management as well as QR code ticketing

- **TOMS** - The back-office analytics and management software ("TOMS") makes transit management easy and efficient, helping agencies drive insights from mobile ticketing and provide improved customer service.
  - Manage a diverse range of services including accounts, orders, ticketing, fare catalogs, and real-time reporting
  - See system data on an easy to read analytics dashboard
  - Communicate with a diverse range of clients including both in-system devices and external vendor backend systems
  - Manage ticketing, transaction and inspection history by customer

RideTap: The SDK that allows any app to leverage a network of current and future transportation partners in one easy integration

In early May 2016, moovel launched the first pilot of RideTap, an SDK (software development kit) that offers any app instant access to a growing network of public and alternative transportation providers. Through the RideTap SDK, users in a transit agency mobile app can find a nearby Lyft or car2go within the app's navigation drawer to help them get to and from their public transit stop. Launch partners of the RideTap ecosystem currently include carsharing and ridesharing providers; additional confirmed partners include bikesharing and taxi-hailing services. A current list of partners is available on our website: http://www.ridetap.io



As part of our commitment to the Smart City Challenge, moovel will expand the RideTap ecosytem in San Francisco. The RideTap SDK integrates nearby ride options to help users find and get rides; enhancing their transit experiences. This technology leverages the most expansive aggregation, integration, and normalization of ride provider data available on the market today. People using apps with the RideTap SDK will be able to easily find nearby ride options based on where they are right now. For example, a regional Bay Area transit app could use RideTap to solve common first/last mile issues, or a city discovery app could integrate RideTap to help their users get the final destination of their choosing.

moovel: A state-of-the-art mobile app that allows users to find, book, and pay for the best way to get from point A to point B

moovel has developed a state-of-the-art global trip planning app for consumers seeking mobility options. Currently available in Germany, the moovel app aggregates and displays a variety of ground transportation options, including urban public transportation, regional rail, carsharing, taxi-hailing, and bikeshare, all within a single view. The moovel app enables users to make the most informed decision about what their best transportation option is at the time by allowing them to compare costs and travel times of various mobility options. moovel has established a unique advantage over other trip planners by creating the first mobile app that enables searching, booking, and payment for public and private mobility options directly through the app.

Building on our expertise in the United States and Germany, moovel pledges its support to partner with the City of San Francisco to develop a transportation as a service platform that will improve regional transportation options and reduce the need for private car ownership.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Regina Clewlow, Director of Business Development & Strategy at regina.clewlow@moovel.com or (650) 847-0623.

Sincerely,

Steve Carroll
Chief Business Development Officer

May 12, 2016

The Honorable Anthony Foxx
Secretary: U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **StreetLight Data's commitment to San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of StreetLight Data, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. StreetLight Data will make available up to $250,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

StreetLight Data creates accurate, rich **analytics** about transportation behavior derived from tens of millions of mobile devices, **in minutes** with the StreetLight InSight® online web portal. StreetLight's Metrics a) analyze current transportation patterns, b) measure changes over time and c) diagnose problems and suggest the best solutions. Our platform can contribute across the San Francisco portfolio of Smart City programs by providing data immediately to guide planning, and in an ongoing manner to measure success and provide benchmark comparisons to other communities. In particular, StreetLight's metrics support increasing regional transportation options, reducing private car ownership need, and reducing large deliveries in neighborhoods.

StreetLight will provide in-kind contributions of data for San Francisco in two ways:

1. **Analytics of key origin, destination, route, and VMT (and related greenhouse gases) for target regions to support data-driven planning for innovative programs.** For example, in support of a proposal component to increase late-night transportation options for low-income workers, StreetLight has created a heatmap of regions of the city where the most cars depart between the hours of 1AM and 5AM. This data will help the team target areas of focus. In addition, StreetLight mapped the destinations of these late-night car trips, which can guide the design of the most useful late-night vanpool/transit routes (see Figures below).
2. **Analytics of high-level targets (probably VMT and average travel time) for the city and key regions affected by projects within the Smart City initiative for the three years of the initiative.** This will help the City and its partners hold themselves accountable to their own goals, using performance-based measurement approaches. StreetLight can also provide comparison to any other city nationally, providing useful benchmarks and indications of best-practices.

These contributions build on StreetLight's record of supplying Metrics that reduce the cost and improve the effectiveness over 100 transportation projects across the US and Canada since 2015. **They will demonstrate how a pioneering Smart City can build data-driven planning and performance based project assessment into its core.**

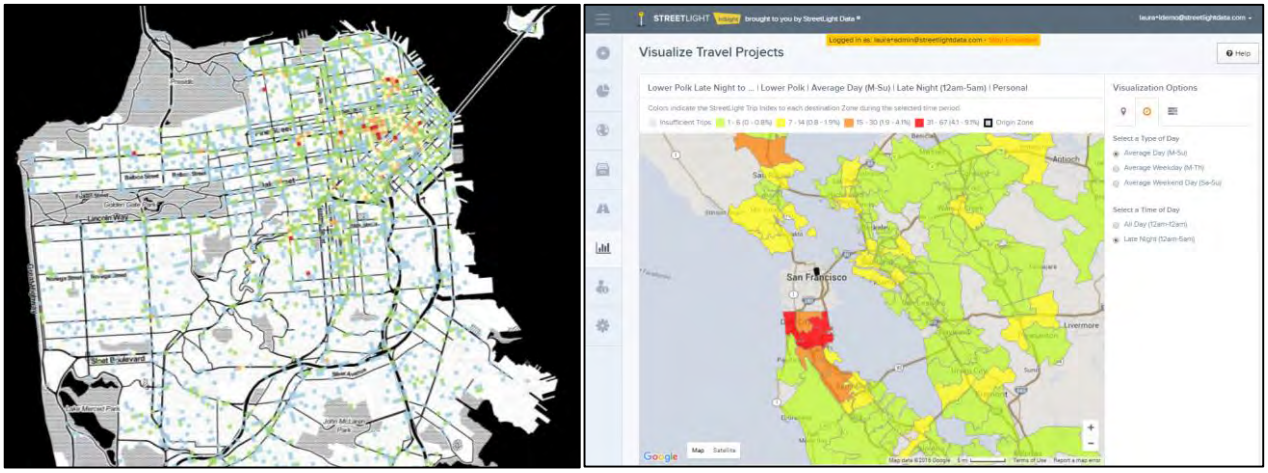
The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Laura Schewel, CEO of StreetLight Data (laura.schewel@streetlightdata.com, 415-578-5033).

Sincerely,

Laura Schewel

Laura Schewel, CEO



StreetLight InSight Metrics – The Image on the right shows a heat map of the most frequent late-night (12-5AM) departures for San Francisco in 2015 derived from millions of GPS traces. Red indicates higher departures for that 100m^2 grid. This Metric can help guide the city's efforts and expenditures in expanding late-night transit options, especially for low income workers. The image on the right, shows *StreetLight InSight's* analysis of the key destinations for late night vehicle departures from the Lower Polk district. These analyses took a few minutes to create.

May 15, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Global Quality Corp.'s commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Global Quality Corp. (GQC), I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. GQC will make available up to $200,000 worth of intellectual property to support the City's proposed R&D projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

GQC has been involved in developing innovative solutions that leverage the new long range low power wide area connectivity solutions along with powerful cloud-based analytics. For example, GQC participated in the recent SigFox hackathon hosted by San Francisco to create an end-to-end solution from an IoT sensor to the Azure cloud, and also competed in the LoraWAN competition in Santa Clara last month to demonstrate the combination of IoT with Azure machine learning. We have demonstrated how cars can be outfitted with some of these sensors to generate knowledge through Big Data Analysis to improve transportation efficiency without compromising air quality. We believe that our platform has the potential to meet the requirements of the NIST coordinated "IES-City Framework."

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable. If you have any questions regarding this matter, please contact me at (650)776-9466 or email me at sudhir@gqc.com

Sincerely,

S R Kshirsagar, President

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Silver Spring Networks commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Silver Spring Networks, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Silver Spring Networks will make available up to $200,000 worth of product and in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

In support of the challenge, Silver Spring Networks will build an outdoor RF meshing communication system for networking fixed roadway assets for the purpose increasing pedestrian, bike and vehicle safety; facilitating electric vehicle charging and reducing city road congestion by facilitating efficient parking spot detection. Silver Spring has already demonstrated experience in deploying this type of network in San Francisco as PG&E uses a parallel Silver Spring network for reading all of its smart electric meters.

In order to better serve their citizens, the business community and the environment; cities of the future will need to embrace a wide array of interconnected technologies. In the past, city systems such as the transportation system largely worked in silos. The key for success in the future is how to integrate many different systems in the city for better service and better efficiency. Further, the fiscal realities of the city budget mandate that the city use technologies that can be leveraged across a wide set of city needs.

Silver Spring's Internet of Things (IOT) RF communication platform is an example of a smart city foundational building block that has strong use-cases for serving future transportation system needs while also being a key tool for other city requirements such as efficient operation of other city systems (e.g. streetlights, electricity metering, environmental data collection).

Silver Spring is committing to deploy 3 RF Access Points (gateways) connected to Silver Spring's cloud-based management system, Streetlight.Vision and deploy 100 smart streetlight controllers on top of San Francisco's cobra-head roadway lights (LED or other). Silver Spring will also provide 5 IOT Routers which, in combination with other partners, will provide EV charger, signage and parking spot detector connectivity. Silver Spring will provide pedestrian/bike counters/detectors connected to streetlights for an intersection safety application. Silver Spring will provide a smartphone application to allow alerting of streetlight operations.

Further, Silver Spring's donation can also support connecting Smart Electric meters as an example of how other city-important applications can benefit from this communication system. Silver Spring will design this system, provide installation support, training and monitoring.

Silver Spring Networks is the leading networking platform and solutions provider for smart city and smart energy networks worldwide. Silver Spring's pioneering IPv6 networking platform, with more than 23 million Silver Spring enabled devices delivered across 5 continents, is connecting cities and utilities to homes and business throughout the world. In business since 2002, Silver Spring's goals are to achieve greater energy efficiency and provide innovative solutions that enable our customers to gain operational efficiencies, improve grid reliability, create revenue opportunities, and empower consumers to monitor and manage energy consumption.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Sean Tippett at stippett@ssni.com.

Sincerely,

Brandon Davito
Vice President, Smart City
Silver Spring Networks

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Getaround's support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Getaround, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. In addition to leveraging over $30 million worth of previous research and development in its hardware and software development, Getaround will make available staff time to execute the collaboration and share data throughout (estimated at $100,000) that will support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Getaround is a pioneering peer-to-peer carsharing platform that enables people to rent, locate and unlock high-quality vehicles from a mobile phone or web application. Each Getaround vehicle removes on average 9-13 other cars from road, offsets 100,000 pounds of C02 and recirculates $6K-10K of earnings from carsharing back to real people and the neighborhoods where vehicle providers and vehicle renters live in.

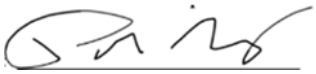
Extending the Getaround platform’ s positive dividends in addressing traffic congestion and carbon/air pollution, Getaround will partner with San Francisco to further electrify its shared mobility fleet, deliver electric mobility on-demand and integrate it into designated transit hubs throughout the city, thereby increasing cleaner, shared transportation options throughout the region and further reducing the need for private car ownership.

The Smart City Challenge is an opportunity to advance toward the world’ s first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Mohammed Al-Shawaf, Business Development & Public Policy at mo@getaround.com.

May 16, 2016

Sincerely,



Padden Murphy

Head of Business Development & Public Policy

Motionloft

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Motionloft commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Motionloft, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Motionloft will make available up to $100,000 worth of in-kind contributions and discounted services to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Motionloft is recommending a citywide deployment of its sensors in its hometown of San Francisco. This initiative supports the Smart City Initiative, providing insights into activity trends in San Francisco at a micro and macro level, with a communication platform for connecting to citizens' services and needs.

Motionloft sensors are weatherized, wirelessly connected and versatile, only requiring access to power to operate. Computer vision delivers highly accurate insights into real-world activity including pedestrian, bicycle and vehicle traffic. Meanwhile integrated beacon, z-wave, and WiFi provide a platform for responding to activity with alerts and communications to targeted mobile devices, connected cars, and smart devices.

With this platform San Francisco and affiliated organizations will have access to an intelligent platform to interpret and respond to pedestrian and vehicle activity at a street, neighborhood, and citywide level. Example initiatives that could benefit from this data could include:

Safety: Track improvements in traffic trends for high injury corridors during Vision Zero capital improvement projects. Automatically alert connected cars and pedestrians to specific incidents or high risk-areas.

Motionloft

Smart Transportation: Use real-time information to identify congestion and automatically reroute smart cars or public transportation while notifying passengers of changes to routes or wait times.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Joyce Reitman, CEO of Motionloft at joyce@motionloft.com and phone 415 580 7672.

Sincerely,

Joyce Reitman
CEO

550 15th St. Suite 29 San Francisco, CA, 94103

seevider
www.seevider.com
Seevider, Inc. 3150 De La Cruz Blvd. Suite 125, Santa Clara, CA 95054

May 15, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Seevider, Inc. commitment of the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Seevider,Inc., I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. The Seevider, Inc. will make available up to $ 100,000 worth of vision sensor, consulting and integration service contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Smart Vision Sensor platform for Smart City has developed the cost competitive intelligent city infrastructure sensor to provide smart parking guidance, EV charger guidance and reservation. It is also a V2I(Vehicle to Infrastructure) service platform that can deliver the principles for smart transportation. Seevider Inc., a startup company, can contribute vision sensor, service platform, consulting and integration service based on the project scope proposed by SF Smart City Challenge application.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Hobin Kim at hobin@seevider.com or (408)930-0852.

Sincerely,

Hobin Kim
CEO, Seevider, Inc.

8650 Alameda Blvd., NE, #102E
Albuquerque, New Mexico 87122
505.796.4015
hello@appcitylife.com
www.appcitylife.com

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: APPCityLife, Inc. commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of APPCityLife, Inc., I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. APPCityLife will make available up to 6 weeks of expertise and in-kind contributions worth $50,000 to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

APPCityLife is deeply involved in creative mobility solutions and is considered a leader in civic tech due to our end to end mobile platform for cities which makes it possible for cities to develop, manage, duplicate, and share mobile tools for their city without knowing how to code. Our team has developed unique transit applications for the cities of Albuquerque, New Mexico, Santa Fe, New Mexico and San Jose, California and is currently collaborating on a pilot project with the Valley Transit Authority as well as other private sector partners to deploy kiosk mobile apps at bus stops which support V2I technology and enable riders to communicate with an approaching bus driver. Because our platform helps cities to aggregate stand-alone applications into a single, official mobile app, it allows cities to help citizens and visitors to easily find the correct mobile applications and tools for their current needs and to send targeted, filtered native push notifications to riders about delays, changes or emergencies with the transit agency. Our platform will provide support to San Francisco in the following categories: Create Transportation as a Service Platform; Achieve Traffic Safety Vision Zero; Increase Digital Equity; Reduce private car ownership need. APPCityLife will commit in-kind contributions and expertise towards a mobile app to provide San Francisco with single-app access to transit information and services using a variety of data feeds including open data as well as support for integrated beacons and wearables as well as consultation and expertise in designing a comprehensive dashboard with rich analytics, visual mapping and real time reporting to demonstrate ROI and support data-driven planning.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable. If you have any questions regarding this matter, please contact Lisa Abeyta, Founder and CEO, at lisa@appcitylife.com and / or 505-796-4015.

Sincerely,

Lisa Abeyta
President/CEO, APPCityLife, Inc.
lisa@appcitylife.com
http://www.appcitylife.com
505-706-4015

PROTERRA
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www.proterra.com

May 15, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Proterra Inc. commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Proterra, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Proterra will make available up to $50,000 of in-kind contributions for each Proterra zero-emission bus to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Proterra is the market and technology leader for zero-emission, battery-electric, heavy duty buses for the North American market, with 63 vehicles in service at 15 different customer locations. Our flexible product platform allows a high degree of customization for energy storage and charging technologies to fit the needs of every city, including the demanding environment of San Francisco. Proterra is involved with creative mobility solutions by proving to cities that zero-emission bus technology has gone from being a research and development project, to an affordable and simple solution to increase vehicle electrification in the heavy-duty transit category. Proterra has proven this strategy by achieving over 2 million miles of revenue service at our 15 customer sites in the U.S.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Mac Burns, Sales Director at 908-723-4726 or at mburns@proterra.com

Sincerely,
Ryan Popple
CEO – Proterra Inc.

05/12/2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **VIA Analytics commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of VIA Analytics, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. VIA Analytics will make available up to $30,000 worth of in-kind contributions within the scope of a pilot project to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

VIA Analytics is a California Benefit Corporation dedicated to improving transit through the research and deployment of innovative solutions. Our driver assistance and analytics products have helped agencies throughout the world save money and operate more reliably and efficiently, improving the everyday commuting experiences of millions of passengers. Within the scope of the Smart City Challenge, VIA's on-board and backend solutions can help San Francisco create a holistic Transportation as a Service Platform that streamlines multi-modal connections, facilitating the use of sustainable transportation modes.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Dr. Juan Argote-Cabanero (Chief Executive Office of VIA Analytics) via email at juan@v-a.io.

Sincerely,

Juan Argote-Cabanero
Chief Executive Officer
VIA Analytics, Inc

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Driversiti's commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Driversiti, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Driversiti will make available up to $25,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Driversiti will help San Francisco achieve Traffic Safety Vision Zero. Our software operates on mobile phones to autonomously detect distracted driving, unsafe driving, and crashes. We detect these events in real-time, and use big data analysis to determine which areas of a city are the most dangerous. That facilitates implementation of better signage, reminders, and other programs to encourage safe behavior. It's a data-driven approach to a critical problem. Driversiti's in-kind contribution consists of technical and developer support to implement its solution into an existing mobile platform designated by the City. In addition to supporting integration, Driversiti will make this software available at a significant discount.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Dan Winston, Vice President of Business at Dan.Winston@driversiti.com or (443) 435 4153.

Sincerely,

Sascha Simon
CEO
Driversiti

Nimble Consulting Inc.
3450 Sacramento Street #406
San Francisco, CA 94118

May 12, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Nimble Consulting Inc. commitment to the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Nimble Consulting Inc. ("Nimble"), I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Nimble will make available up to 120 hours of in-kind contributions for consulting services to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

To make the best use of Nimble's 120 hours of in-kind consulting, we recommend using them within the same month of the start date. This allows ramp-up time for Nimble, as well as time to meet and work with key sponsors to contribute to specific deliverables. As examples, Nimble could use the time to develop the high-level approach for program management or governance and engagement across the challenge categories, or Nimble can focus on the engagement approach for a specific category. As a local boutique consulting firm, this is the maximum amount of in-kind services we can offer, but it provides enough time for the City of San Francisco team to assess our contributions and decide whether to continue working with us on a formal paid contracted basis.

Nimble is a boutique program management and change management consultancy that helps companies deploy transformational change. Having worked with local organizations (PG&E, SF Metropolitan Transportation Authority, SamTrans, Kaiser Permanente), Nimble has the relationships and experience to effectively design the governance and stakeholder management for San Francisco's Smart City eco-system. From our Smart Meter, GIS and mobile deployment success, we know how to deploy transformational change involving complex technology, mindset shift and behavioral changes across diverse end user groups. Our success is defined by creativity and flexibility in engaging and supporting end users with a wide-ranging level of comfort with (or access to) technology.

Our expertise in deploying new process and technology to employees or external customers for successful adoption can support the transportation mobility challenges on many levels for the city of San Francisco. As an example, we deployed GIS mobile solutions to union workers, corporate employees and executives at a major utility in California, a community of 500 geographically dispersed end users using different smart devices. Our unique approach involves a targeted stakeholder analysis, a deep understanding of the data, functionality and smart devices used by each end user group, a creative approach to outreach, tailored training and support, and strong partnerships with each of their major users. Since our team consists of consultants who hail from larger consulting firms (Booz Allen, Deloitte), we are known to work collaboratively and professionally within large project teams consisting of vendors, consultants and internal employees. The ability to work well in large, dynamic projects enables our team to deliver a coordinated and seamless approach to change for the end users. Nimble regularly conducted live demonstrations with various audiences and answered questions about the data, functionality and workflows as it applied to their every day jobs, building credibility for the larger program. Our success demonstrates our capability to deliver similarly complex solutions for the diverse needs of a large city in any of the categories below:

- Create Transportation as a Service Platform; Achieve Traffic Safety Vision Zero; Increase Regional Transportation Options; Increase Digital Equity; Reduce private car ownership need; Reduce large deliveries in neighborhoods; Increase vehicle electrification and vehicle-to-grid energy efficiency.

Nimble Consulting is a 100% woman-owned local boutique consultancy and a diversity supplier of the CPUC. We understand the local mindset of the Bay Area, are familiar with the neighborhoods and have relationships with local organizations within our communities as well. Our solution includes a best practice of aligning SF Vision goals to the overarching program and conducting a stakeholder analysis to ensure that all relevant people, communities and sponsors are engaged and prepared to adopt such a transformational change to become a truly Smart City..

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Betty Magome, CEO at betty@nimbleconsulting.net or 415 722 0129.

Sincerely,
Betty Magome
CEO, Nimble Consulting Inc.
www.nimbleconsulting.net

BLACK & VEATCH
6800 WEST 115TH STREET, SUITE 2292
OVERLAND PARK, KS 66211 USA
+1 913-458-3885 | EllermeierFJ@bv.com

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Black & Veatch commitment to San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Black & Veatch Corporation, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Black & Veatch will make available up to $10,000 worth of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Black & Veatch is a leading U.S.-based engineering, consulting and construction company that specializes in the deployment of energy, water, telecommunications and smart city infrastructure, including connected transportation solutions. We offer a range of services including: Engineering Procurement and Construction (EPC) services for electric vehicle and other distributed infrastructure; program management and systems integration for complex infrastructure projects; plan and roadmap development for comprehensive smart city programs or components such as telecommunications, electrification or energy; and a wide range of operational and planning analytics that help cities integrate and leverage data to make more informed decisions. Black & Veatch proposes to apply in-kind consulting or workshop services to support the City's efforts to design a scalable vehicle electrification system that will enable its connected transportation vision to be realized.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact me at 913-458-3885 or EllermeierFJ@bv.com.

Sincerely,

Fred J. Ellermeier
Vice President, Smart Integrated Infrastructure

VIMOC TECHNOLOGIES, INC
201 San Antonio Circle, Ste 104
Mountain View, CA 94040

11-May-2016

The Honorable Anthony Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: VIMOC Technologies' commitment to San Francisco's Smart City Challenge application

Dear Secretary Foxx:

On behalf of VIMOC Technologies, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. VIMOC will make available up to $3,000 of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility. While we would like to commit more, we are a very small company with limited ability to offer free resources.

We have significant experience in designing and implementing projects aligned with both Transportation as a Service Platform and with Traffic Safety Vision Zero. We recently installed 45 ped/bike count stations across the City of Palo Alto, funded largely through the Safe Routes to Schools program grants. We will make this data collected from this network of count stations available via our open platform API to automobile companies to include as part of their connected car services, with the intent to include them as inputs into their collision avoidance algorithms. In Palo Alto, Los Gatos, Redwood City and other locations, we have implemented parking monitoring solutions that will help to direct traffic to available parking spaces. Waze (a Google company) is currently running a trial using our API to help direct their users to available parking, thus reducing the amount of traffic searching for parking.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact me (my information is below).

Sincerely,

Alex Panelli
COO, VIMOC Technologies
(650) 678-3257
alex@vimoctechnologies.com

DIANNE FEINSTEIN
CALIFORNIA

SELECT COMMITTEE ON INTELLIGENCE - VICE CHAIRMAN
COMMITTEE ON APPROPRIATIONS
COMMITTEE ON THE JUDICIARY
COMMITTEE ON RULES AND ADMINISTRATION

United States Senate
WASHINGTON, DC 20510-0504
http://feinstein.senate.gov

May 19, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Foxx:

I write to express my strong support for the selection of the City of San Francisco to be the recipient of $40 million through the U.S. Department of Transportation's Smart City Challenge. San Francisco understands its communities and the challenges that they face, and it is ready to find and implement solutions. Moreover, San Francisco is the innovation capital of the world, which makes it the ideal place in which to launch the world's first shared, electric, connected, and automated transportation system.

If awarded this grant, San Francisco's neighborhoods will volunteer to host pilot programs to test new services and technologies. Pilot areas will see the incorporation of vehicle collision technology on large fleets, the implementation of public transit last mile options, and the installation of electrification infrastructure. Other proposed projects will include automated micro delivery hubs; banking and mobile data access for disadvantaged communities; and repurposing of public spaces to accommodate affordable housing, small parks, and pedestrian amenities. San Francisco will continually receive feedback on these pilot programs, thereby obtaining a greater understanding of the City's mobility needs and how to improve overall system performance.

San Francisco has an unparalleled partner in the University of California at Berkeley, a global research institution that currently analyzes and protects some of the world's most sensitive data. The City will work with Lawrence Berkeley National Laboratory, the Transportation Sustainability Research Center, and the Institute of Transportation Studies to find a solution for how to protect proprietary information and individual privacy rights while working with private companies and using data for public benefit. San Francisco is also joining forces with a number of state entities, including the Governor's Office of Business and Economic Development, the California Department of

Transportation, the California Energy Commission, the California Office of Health Equity, and the Strategic Growth Council. These offices have offered to provide support through numerous ways, such as engaging private industry; supplying information and guidance on advanced transportation technologies; and sharing research and resources developed through state programs.

San Francisco has a strong record of being at the forefront of traffic safety and environmental sustainability, values central to the Smart City Challenge. The City's innovative, data-driven approach to traffic safety has become a case study for the California Office of Traffic Safety and National Highway Traffic Safety Administration. These agencies examined the City's leadership in the Vision Zero movement to end traffic deaths by creating a partnership among transportation, public health, and police resources.

The State of California set new aggressive targets to fight pollution last year, aiming to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030. This legislation acknowledges the importance of including disadvantaged communities in new proposals to make our society more environmentally friendly. Both of these provisions align with San Francisco's Climate Action Strategy and its efforts to create one of the most accessible transportation systems in the nation, which currently provides free public transit to more than 80,000 people.

Thank you in advance for your attention to this request. San Francisco is committed to developing new transportation technologies to create a sustainable economy and address the threats of climate change. I hope that you will give the City's application every consideration. If you have any questions, please do not hesitate to contact me or have your staff contact Sean Elsbernd in my San Francisco office at (415) 393-0707.

Sincerely,

Dianne Feinstein
United States Senator

DF/th/mv

NANCY PELOSI
12TH DISTRICT, CALIFORNIA
DEMOCRATIC LEADER

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(202) 225-4965

Congress of the United States
House of Representatives
Washington, DC 20515-0508

DISTRICT OFFICE:
SAN FRANCISCO FEDERAL BUILDING
90-7TH STREET, SUITE 2-800
SAN FRANCISCO, CA 94103
(415) 556-4862
www.pelosi.house.gov

May 5, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx:

Thank you for your forward-looking leadership on integrating innovative technologies into our crucial transportation infrastructure. I am writing to request your continued full and fair consideration of the San Francisco Municipal Transportation Agency's *San Francisco Beyond Traffic* application, a finalist for the Smart City Challenge.

San Francisco's bold proposal connects ride-sharing, bike programs, pedestrian routes, rapid transit, and bus lines all on one integrated platform. This roadmap envisions the future of transportation defined by choice: empowering users with increased affordability and travel options, all while reducing congestion and emissions.

As the Innovation Capital of the world, San Francisco is uniquely qualified with the talent, vision and entrepreneurial spirit to incorporate our vast, world-class public transit network into the nation's first interactive transportation system.

With this $40 million grant, San Francisco can construct a national model integrating last mile options with public transit; empowering Californians from all walks of life with safe, affordable, and efficient transportation options at the touch of a button.

Thank you in advance for your consideration of my views and for your continued leadership in keeping our nation's transportation system at the cutting edge of technology.

best regards,

Nancy Pelosi

NANCY PELOSI
Member of Congress

OFFICE OF THE GOVERNOR

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

I support the selection of San Francisco as the recipient of the $40 million U.S. Department of Transportation Smart City Challenge.

San Francisco's Smart City Challenge proposal would launch the world's first shared, electric and automated transportation system. This includes automated vehicle collision technology on large fleets, integration of last mile options with public transit, deployment of electrification infrastructure, and installation of banking and mobile data access projects in disadvantaged communities, which are all aligned with the city's adopted Climate Action Strategy. San Francisco's proposal would provide a proving ground in improving transit and accessibility options, decreasing vehicle travel miles and reducing greenhouse gas emissions for California and the nation.

San Francisco is a national leader in implementing technological advances in transportation that reduce congestion, improve traffic safety, and confront climate change and is ideally positioned to test technologies that would promise a clean and efficient transportation sector for the future.

California stands ready to work hand-in-hand with San Francisco to usher in the nation's newest wave of innovation and sustainability. Thank you for your consideration.

Sincerely,

Edmund G. Brown Jr.

GAVIN NEWSOM
LIEUTENANT GOVERNOR

May 17, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

I strongly support the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

This opportunity will enable us to learn, test and share this knowledge with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. Proposed projects include vehicle collision technology on large fleets, integrating last mile options with public transit, deploying electrification infrastructure, automated micro delivery hubs, and projects like banking and mobile data access for disadvantaged communities.

San Francisco has a proven track record of being a pioneer not only in innovation, but in traffic safety, environmental sustainability and equity for all. Those values are at the core of its Smart City Challenge proposal.

The city has been a leader in the Vision Zero movement to end traffic deaths, creating a partnership that includes transportation, public health and police resources to bring a strategic, data-driven approach to traffic safety. The city's innovative approach became a case study not only for the California Office of Traffic Safety, but the National Highway Traffic Safety Administration.

In partnership, the State of California and San Francisco are actively using public policy to address our environmental and equity challenges. Both the State and the City have been at the forefront of confronting climate change. Last year California set new, aggressive targets for reducing pollution, including decreasing greenhouse gas emissions 40 percent below 1990 levels by 2030. This aligns with San Francisco's Climate Action Strategy, which saw the city reduce greenhouse gas emissions 20 percent below 1990 levels by 2012.

California's historic climate legislation recognizes the importance of ensuring that disadvantaged communities are included and lifted up as together we "green" our society. Investments from

California's Climate Investment Fund are targeted to benefit lower income Californians. San Francisco has also been at the forefront in ensuring that everyone benefits from public investments, from creating one of the most accessible transportation systems in the country for people with disabilities to providing free public transit to more than 80,000 low-income youth, seniors and people with disabilities.

These shared values are central to San Francisco's Smart City proposal, as is the City's innovative partnership with the University of California at Berkeley. That partnership will ensure that the ambitious research and implementation work associated with the grant benefit all Californians and beyond.

With 22 Nobel Laureates, UC Berkeley is a premier global research institution. Its partnership with the Lawrence Berkeley National Laboratory and UC Berkeley's Transportation Sustainability Research Center and the Institute of Transportation Studies provides technical expertise and an academic infrastructure that other applicants cannot match.

This partnership also provides a solution to a key challenge: how to work with innovative private companies and use their data for public benefit while still protecting proprietary information and individual privacy rights. UC Berkeley analyzes and safeguards some of the most sensitive data sets in the world through well-established data agreements. This same proven approach would be applied here.

Furthermore, the culture of openness, early adoption and innovation in the San Francisco Bay Area makes it the right city to build the transportation system of the future.

The San Francisco Bay Area has spurred the rapid adoption of innovative and green transportation technology. San Francisco's history of public transit and sharing services is unique. The birth of large-scale ride sharing companies occurred in San Francisco. There are more zero emission vehicles in California than anywhere else in the nation, with over 40 percent of the market. Currently, 12 companies are testing automated vehicle technology in California and the San Francisco Bay Area. For these technologies to succeed, a small, dense city with a culture of early adoption and dissemination of technology is critical. There is no better city than San Francisco to pioneer these technologies.

The State will work directly with San Francisco and provide the following resources:

- The Governor's Office of Business and Economic Development will assist with the engagement of private industry to discuss opportunities to develop partnerships;

- The Strategic Growth Council will connect cities with State resources, information and guidance – such as eligibility and timelines for competing in grant programs available through the California Climate Investments Fund;

- The California State Transportation Agency will make staff from the Department of Transportation and Department of Motor Vehicles available to supply information and

guidance on advanced transportation technologies and the deployment of autonomous vehicles;

- The California Energy Commission will share expertise and resources developed through the Alternative and Renewable Fuel and Vehicle Technology Program and the Electric Program Investment Charge program including research findings, and financial support for deploying electric vehicle charging infrastructure, hydrogen fueling infrastructure, and supporting zero-emission vehicles; and,

- The California Office of Health Equity will provide information and facilitate cross-sectoral partnerships with local health entities to identify and integrate health, equity, and sustainability into Smart City plans.

Developing advanced transportation technologies is critical to enabling a sustainable economy, and addressing climate change. I want to personally assure you that the State of California will work hand-in-hand with San Francisco to usher in the nation's newest wave of innovation and ensure that it benefits everyone, including our most marginalized communities. Thank you for your consideration.

Sincerely,

Gavin Newsom
Lieutenant Governor

CALIFORNIA STATE TRANSPORTATION AGENCY

Edmund G. Brown Jr.
Governor

Brian P. Kelly
Secretary

915 Capitol Mall, Suite 350B
Sacramento, CA 95814
916-323-5400
www.calsta.ca.gov

May 13, 2016

The Honorable Anthony R. Foxx
Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave, SE – 9th Floor
Washington, DC 20590

Dear Secretary Foxx:

I am pleased to support San Francisco's application for the Smart City Challenge grant program. As a hub of global innovation, San Francisco is perfectly positioned to become the world's first zero traffic deaths, zero emissions city.

I want to personally assure you that we will build upon our long-standing partnership with San Francisco to meet the Smart City Challenge's goals by providing staff expertise and other resources from our Department of Transportation, Department of Motor Vehicles, High-Speed Rail Authority, and Office of Traffic Safety. Our departments will work closely with the City and UC Berkeley to pilot new technology deployment, extend access to opportunities for low-income residents, and advance green infrastructure.

In particular, our Office of Traffic Safety will work hand-in-hand with the City of San Francisco to support their Vision Zero initiative. Our Department of Transportation (Caltrans) will fund projects to improve safety of local streets through our Active Transportation Program. Our California Climate Investment Fund (through cap-and-trade proceeds) will provide matching funds to expand transit and sustainable, affordable communities in San Francisco, and neighboring cities.

Thank you for establishing the Smart Cities Challenge, which has already begun to inspire new public-private partnerships and innovative solutions to California's transportation challenges. With USDOT's support, San Francisco can become an international model for shared, connected, affordable, and clean transportation.

Thank you for your kind consideration.

Sincerely,

BRIAN P. KELLY
Secretary

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
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SACRAMENTO, CA 94273-0001
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www.dot.ca.gov

Serious drought.
Help save water!

May 17, 2016

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx:

The California Department of Transportation (Caltrans) is pleased to provide this letter of support for San Francisco's Smart City Challenge Proposal (Proposal). As the owner and operator of the California State Highway System, Caltrans operates and maintains many of the critical transportation systems within the San Francisco Region, contributing to the livability, and economic vitality of the region. The public benefits from Caltrans' well-established partnerships with San Francisco and other local, and regional agencies. This close working relationship helps each of us to accomplish our respective missions.

Caltrans has conducted research on connected and automated vehicles, for over 20 years, and has garnered national and international recognition. The cornerstone of this research focuses on wireless data communications technology, both vehicle-to-vehicle and vehicle-to-infrastructure. Our expertise is well aligned to support the Proposal, and particularly its top three vision elements: Urban Automation; Connected Vehicles; and Intelligent, Sensor-Based Infrastructure.

Caltrans is committed to assisting San Francisco and its partners in making the vision of their Proposal become a reality. We view this effort as a model that can be successfully followed by other regions in California to address similar issues. If you have any questions, please contact Jim Appleton, Chief, Division of Research, Innovation and System Information at (916) 654-8877, or by e-mail sent to jm.appleton@dot.ca.gov.

Sincerely,

MALCOLM DOUGHERTY
Director

c: Coco Briseño, Deputy Director, Planning and Modal Programs, Caltrans
Bijan Sartipi, District Director, District 4, Caltrans
Jim Appleton, Chief, Division or Research, Innovation and System Information, Caltrans

OFFICE OF THE DIRECTOR
DEPARTMENT OF MOTOR VEHICLES
P.O. BOX 932328
SACRAMENTO, CA 94232-3280

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx:

I strongly support the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are the global innovation leaders who are ideally positioned to launch the world's first shared, electric, automated and connected transportation system. These technologies promise a future where transportation is safe, clean, affordable, and where Californians from all walks of life are connected to jobs, recreation, health care, and civic institutions without the barriers that currently divide us.

San Francisco has a proven record of being a pioneer not only in innovation, but in traffic safety, environmental sustainability, and equity for all. Those goals are at the core of San Francisco's Smart City Challenge proposal.

A key component in achieving those goals is autonomous vehicles, and the San Francisco Bay Area is the hub for autonomous vehicle technology. Global automakers, technology stalwarts, and entrepreneurial start-ups are advancing autonomous vehicle technology in the San Francisco Bay Area.

The California Department of Motor Vehicles (DMV) is tasked with developing regulations to allow autonomous vehicles on California's public roadways. With assistance from the National Highway Traffic Safety Administration, regulations for manufacturer's testing of autonomous vehicles were completed and became effective in September 2014. To date, there are 13 companies approved to test their vehicles on public streets. All of them are conducting their tests in Northern California, including San Francisco.

The regulations for public deployment of autonomous vehicles are currently being developed in partnership with your Department. San Francisco's initiatives will be aligned with the regulations.

Developing advanced transportation technologies, such as autonomous vehicles, is critical to improving safety of the motoring public, enabling a sustainable economy, and addressing climate change. I want to personally assure you that the California DMV will work hand-in-hand with San Francisco to usher in the nation's newest wave of innovation and ensure that it benefits everyone, including the most marginalized communities. Thank you for your consideration.

Sincerely,

JEAN SHIOMOTO
Director

cc: Brian P. Kelly, Secretary, California State Transportation Agency

STATE OF CALIFORNIA

OFFICE OF TRAFFIC SAFETY
2208 KAUSEN DRIVE, SUITE 300
ELK GROVE, CA 95758
www.ots.ca.gov
(916) 509-3030
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(916) 509-3055 (FAX)

EDMUND G. BROWN JR., *GOVERNOR*

CALIFORNIA OFFICE OF TRAFFIC SAFETY

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

We strongly support the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. The Office of Traffic Safety (OTS) has supported San Francisco's innovative traffic safety efforts for many years. These efforts include high visibility enforcement and public education programs designed to reduce fatalities and serious injuries. The first in California to adopt a Vision Zero philosophy, San Francisco has developed partnerships with local transportation agencies, public health, local law enforcement and the private sector to identify strategic, data-driven approaches to end traffic related injuries and death.

San Francisco Bay Area has also spurred the rapid adoption of innovative and green transportation technology. Currently, 13 companies are testing automated vehicle technology in California and the San Francisco Bay Area. Developing advanced transportation technologies is critical to enabling a sustainable economy, and addressing climate change.

California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean, and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

The OTS stands ready to support San Francisco in its efforts to achieve Vision Zero and to create the transportation system of the future. The selection of San Francisco as a recipient will further these efforts in a city that has already demonstrated a commitment to traffic safety.

Thank you for your consideration.

Sincerely,

Rhonda L. Craft, Director
California Office of Traffic Safety

Air Resources Board

Mary D. Nichols, Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx:

From catalytic convertors to zero-emission vehicles, over the last several decades California polices spurred transformative transportation innovations that have been exported around the world. As governments move towards connected, smart mobility, we aim to lead again which is why I strongly support the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program.

The San Francisco Bay Area is the epicenter of California's global technology leadership; attracting more than half of the world's clean tech venture capital investment. As such, the City of San Francisco is ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

This opportunity will enable us to learn, test and share this knowledge with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. Proposed projects include vehicle collision reducing technology on large fleets, integrating last mile options with public transit, deploying electrification infrastructure, automated micro delivery hubs, and projects like banking and mobile data access for disadvantaged communities.

The San Francisco Bay Area has spurred the rapid adoption of innovative and green transportation technology. San Francisco's history of public transit and sharing services is unique. The birth of large-scale ride sharing companies occurred in San Francisco. There are more zero emission vehicles in California than anywhere else in the nation,

with over 40 percent of the market. Currently, 12 companies are testing automated vehicle technology in California and the San Francisco Bay Area. For these technologies to succeed, a small, dense city with a culture of early adoption and dissemination of technology is critical. There is no better city than San Francisco to pioneer these technologies.

San Francisco has a proven track record of being a pioneer not only in innovation, but in traffic safety, environmental sustainability and equity for all. These are values that are at the core of its Smart City Challenge proposal.

The State of California and City of San Francisco have adopted strong policies and forged myriad partnerships to address environmental and equity challenges. Both the State and the City have been at the forefront of confronting climate change for more than a decade. Last year Governor Jerry Brown set new, aggressive targets for reducing pollution, including decreasing greenhouse gas emissions 40 percent below 1990 levels by 2030. This aligns with San Francisco's Climate Action Strategy, which saw the city reduce greenhouse gas emissions 20 percent below 1990 levels by 2012. Transportation electrification is an essential piece of the solution as we seek to achieve deeper reductions.

California's historic climate legislation recognizes the importance of ensuring that disadvantaged communities are included and lifted up together as we make investments to reduce greenhouse gas emissions. California's Climate Investments are targeted to benefit Californians most impacted by the impacts of pollution and other environmental health concerns. San Francisco has also been at the forefront in ensuring that everyone benefits from public investments, from creating one of the most accessible transportation systems in the country for people with disabilities to providing free public transit to more than 80,000 low-income youth, seniors and people with disabilities.

These shared values are central to San Francisco's Smart City proposal, as is the City's innovative partnership with the University of California at Berkeley. That partnership will ensure that the ambitious research and implementation work associated with the grant benefit all Californians and beyond. With 22 Nobel Laureates, UC Berkeley is a premier global research institution. Its partnership with the Lawrence Berkeley National Laboratory and UC Berkeley's Transportation Sustainability Research Center and the Institute of Transportation Studies provide technical expertise and an academic infrastructure that other applicants cannot match.

This partnership also provides a solution to a key research challenge: how to work with innovative private companies and use their data for public benefit while still protecting proprietary information and individual privacy rights. UC Berkeley analyzes and

safeguards some of the most sensitive data in the world through well-established data agreements; a proven approach that would be applied here.

Developing advanced transportation technologies is critical to enabling a sustainable economy, and addressing climate change. The State of California is committed to work hand-in-hand with San Francisco to usher in the nation's newest wave of innovation and ensure that it benefits everyone, including our most disadvantaged communities. Thank you for your consideration. If you have questions, please contact my Senior Advisor, Steven S. Cliff, Ph.D. at 916.323.8511 or steve.cliff@arb.ca.gov.

Sincerely,

Mary D. Nichols
Chair, California Air Resources Board

CalEPA
California Environmental Protection Agency

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for Environmental Protection

May 17, 2016

The Honorable Anthony Foxx
Secretary of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Mr. Secretary:

I strongly support the selection of the City of San Francisco as the recipient of the U.S. Department of Transportation's Smart City Challenge grant program. San Francisco's approach is based on its ability to innovate and share the results with the country and the world; on values of community access to transportation; and on strong partnerships.

The Smart City Challenge will enable us to learn, test, and share new knowledge with the rest of the country and the world. Proposed projects include vehicle collision reducing technology on large fleets, integrating last mile options with public transit, deploying electrification infrastructure, automated micro delivery hubs, and projects like banking and mobile data access for disadvantaged communities. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system.

San Francisco is ideally positioned to launch the world's first shared, electric, connected and automated transportation system. The San Francisco Bay Area is the center of California's global technology leadership; California attracts more than half of the world's clean tech venture capital investment. These technologies promise a future where transportation is safe, clean and affordable, and where Californians from all walks of life are connected to their communities, jobs, recreation, health care and civic institutions.

From catalytic convertors to zero-emission vehicles, California policies have spurred transformative transportation innovations and exported them around the world. As governments move towards connected, smart mobility, we aim to lead again. The San Francisco Bay Area has spurred the rapid adoption of innovative and green transportation technology. San Francisco's history of public transit and sharing services is unique. The birth of large-scale ride sharing companies occurred in San Francisco. There are more zero emission vehicles in California than anywhere else in the nation, with over 40 percent of the market. Currently, 12 companies are testing automated vehicle technology in California and the San Francisco Bay Area. For connected, smart mobility to succeed, a small, dense city with a culture of early adoption and dissemination of technology, as well as a strong transit system, is critical. There is no better city than San Francisco to pioneer these technologies.

San Francisco has a record of being a pioneer not only in innovation, but in traffic safety, environmental sustainability and equity for all. These shared values are central to its Smart City proposal. The State of California and City of San Francisco have adopted strong policies and forged partnerships to address environmental and equity challenges. We have been at the forefront of confronting climate change for more than a decade. Last year Governor Jerry Brown set new, aggressive targets for reducing pollution, including decreasing greenhouse gas emissions 40 percent below 1990 levels by 2030. This aligns with San Francisco's Climate Action Strategy, which saw the city reduce greenhouse gas emissions 20 percent below 1990 levels by 2012.

California's historic climate legislation recognizes the importance of ensuring that disadvantaged communities are included and lifted up together as we make investments to reduce greenhouse gas emissions. California's Climate Investments are targeted to benefit Californians most impacted by pollution and other environmental health concerns. San Francisco has also been at the forefront in ensuring that everyone benefits from public investments, from creating one of the most accessible transportation systems in the country for people with disabilities to providing free public transit to more than 80,000 low-income youth, seniors and people with disabilities.

San Francisco will leverage partnerships with the neighborhoods that comprise it, and with external partners that can amplify its impact. The City has an innovative partnership with the University of California, Berkeley (UCB), a premier global research institution. In turn, the University's collaborations with the Lawrence Berkeley National Laboratory, UCB's Transportation Sustainability Research Center, and UCB's Institute of Transportation Studies provide technical expertise and an academic infrastructure that other applicants cannot match.

This partnership also provides a solution to a key research challenge: how to work with innovative private companies and use their data for public benefit while still protecting proprietary information and individual privacy rights. UCB analyzes and safeguards some of the most sensitive data in the world through established data agreements. The same, proven approach would be applied in the Smart Cities Challenge. These partnerships ensure that the ambitious Smart Cities research and implementation work can benefit all those in, and beyond, California.

Developing and distributing advanced transportation technologies is critical to equitably enabling a sustainable economy and addressing climate change. The State of California is committed to working hand-in-hand with San Francisco to usher in the nation's newest wave of innovation and ensure that it benefits everyone, including our most disadvantaged communities. Thank you for your consideration.

Sincerely,

Matthew Rodriquez
Secretary for Environmental Protection

GOVERNOR'S OFFICE OF BUSINESS AND ECONOMIC DEVELOPMENT
STATE OF CALIFORNIA • OFFICE OF GOVERNOR EDMUND G. BROWN JR.

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

I strongly support the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge. The Governor's Office of Business and Economic Development stands ready to assist San Francisco and identify opportunities to partner with private industry to maximize program investments.

California and San Francisco are uniquely positioned to launch the world's first shared, clean, connected and automated transportation system. Our commitment to transformation of the transportation sector, supported by a mix of aggressive environmental policies and goals, provides an open and supportive testing ground to implement visionary concepts. California is an epicenter of innovative business development, including the birthplace of ridesharing services and home to several companies testing autonomous vehicle strategies.

In addition, San Francisco has a proven track record navigating complex urban challenges and pioneering new solutions. San Francisco's Climate Action Strategy led to reductions in greenhouse gas emissions 20 percent below 1990 levels in 2012. As a leader in the Vision Zero movement, San Francisco partnered with transportation, public health and police officials to develop a strategic, data-driven approach to reduce traffic deaths. To ensure everyone benefits from public investments, San Francisco created one of the most accessible transportation systems in the country providing free public transit to more than 80,000 low-income youth, seniors and people with disabilities.

Bringing the Smart City Challenge to California will enable us to learn, test, and share a sustainable vision of the future with the rest of the world. We welcome and appreciate the opportunity. Thank you in advance for your consideration.

Sincerely,

Panorea Avdis
Director

(916) 322-0694 • Business.ca.gov • 1325 J Street, 18th Floor, Sacramento, California 95814

State of California—Health and Human Services Agency
California Department of Public Health

KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

EDMUND G. BROWN JR.
Governor

May 12, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

On behalf of the California Department of Public Health, I strongly support the selection of San Francisco for the U.S. Department of Transportation's $40 million Smart City Challenge grant program. San Francisco's proposal is a model for the rest of the state, and is closely aligned with California's broad public health goals including promoting active transportation, increasing transportation safety, reducing noise and air pollution, mitigating climate change, and promoting healthy, sustainable, and socially connected communities. Evidence has shown that mode shift from cars to active transportation could lead to improved health outcomes and, in fact, the Integrated Transport and Health Impacts Model, which was developed at CDPH, found that in the Bay Area an increase in daily walking and biking per capita from four to 22 minutes would reduce cardiovascular disease and diabetes by 14%. This project will not only benefit San Francisco's transportation sector, but will be a boon for healthy and sustainable communities across the entire state.

San Francisco has a proven track record of being a pioneer in traffic safety, environmental sustainability and strategies to promote health and wellness. The city has been a leader in the Vision Zero movement to end traffic deaths, creating a partnership that includes transportation, public health and police resources to bring a strategic, data-driven approach to traffic safety efforts to eliminate traffic fatalities by 2024. The city's innovative approach has received significant public attention, and became a case study for the California Office of Traffic Safety and the National Highway Traffic Safety Administration.

San Francisco's proposal builds on this reputation for high achievement. For example, I am very pleased by the proposed strategic partnership between the Mayor's Office of Civic Innovation's public data sharing platform and the Department of Public Health's TransBase system, which offers analysis of health and safety impacts of transportation in an open geospatial data portal. Other exciting components of the proposal include repurposing currently under-utilized parking space for affordable housing, small parks and pedestrian amenities, and increasing use of and access to zero-emissions vehicles to lower greenhouse gas emissions, which helps to mitigate threats to public health from climate change. I am also encouraged by the partnership with University of California, Berkeley,

which will ensure that the ambitious research and implementation work associated with the grant will benefit all Californians.

California has an opportunity to use this single-city initiative as a catalyst for change across the entire state. California is leading the way nationally in cross-sectoral work to promote health and equity. For example, ours is the first state in the nation to convene a Health in All Policies Task Force to work across sectors to embed health, equity, and environmental sustainability considerations into state-level government decision-making. In addition, public health departments statewide have been increasingly involved in transportation planning over the last five years, and transportation departments are increasingly integrating health goals into their work. I see this collaboration as essential for ensuring that our state's biggest projects meet their multiple aims of reducing greenhouse gas emissions, promoting health, reducing inequities, supporting local economies, and building a sustainable society that will improve quality of life for all. San Francisco's proposal embodies this approach, and their commitment to social equity and inclusion, affordability, accessibility, and sustainability represents a game-changer for California.

The Department of Public Health will support San Francisco's Smart City project in a variety of ways. One of the roles of the Health Department is to lift up best practices across the state and we are eager to share San Francisco's work with public health colleagues across the state including through the California Conference of Local Health Officers, through our Let's Get Healthy California initiative, and with members of the Health in All Policies Task Force. In addition to disseminating information, the California Office of Health Equity and its Health in All Policies team will conduct outreach to relevant stakeholders to support the city's transportation and health leaders as they integrate health, equity and sustainability during implementation of the Smart City project.

I want to reiterate that I strongly support San Francisco and this important project, and look forward to deepening our ongoing partnership with them, should they receive this funding. Thank you for your consideration.

Sincerely,

Karen L. Smith, MD, MPH
Director and State Public Health Officer

May 12, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

The California Department of Public Health's Office of Health Equity firmly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California's legislature established the Office of Health Equity in 2012 to develop and manage statewide strategies focused on eliminating health and mental health disparities including cross-sectoral efforts to address conditions such as educational opportunities, access to parks and green spaces, affordable housing, healthy foods, and transportation. Transportation is particularly important for health and equity because it connects people to jobs, schools, food, recreation, health care, and each other. Through our Health in All Policies team, the Office of Health Equity works closely with the State Department of Transportation and with local communities to promote transportation connecton with essential services, healthy land use planning, and bike/ped safety as essential components of transportation equity work. We also partner with our transportation colleagues to help them ensure that active transportation dollars reach the communities that need them most. San Francisco's proposal embodies our department's values of innovation, collaboration, and continual quality improvement.

San Francisco's proposal to develop integrated and connected transporation has the potential to reduce health inequities in several ways. Not only do low-income communities and communities of color have reduced access to transporation, which limits their access to essential functions, services, and opportunities such as jobs, healthcare, and housing, but we also know that traffic-related injuries and deaths disproportionately impact low-income communities and communities of color. San Francisco's transporation infrastructure investments will benefit low-income communities by providing greater economic opportunity, more affordable and accessible services, better connected neighborhoods, and reduced health inequities.

San Francisco has a proven track record as a pioneer not only in innovation, but in traffic safety, environmental sustainability and strategies to promote health equity. San Francisco has also been at the forefront in ensuring that everyone benefits from public investments, from creating one of the most accessible transportation systems in the country for people

with disabilities to providing free public transit to more than 80,000 low-income youth, seniors and people with disabilities. The city's focus on affordability is key for removing barriers for low-income communities. San Francisco has also been on the leading edge of addressing issues of pedestrian safety and economic opportunity for underserved communities through their Vision Zero movement to end traffic deaths. The initative created a partnership that includes transportation, public health and police resources to bring a strategic and data-driven approach to traffic safety efforts to eliminate traffic fatalities by 2024.

Several features of San Francisco's proposal promote equity, which is a key priority for my office. For example, keeping transportation services open around the clock so that late-night service workers will have safe and affordable means to get home, and converting public spaces currently under-utilized as parking into affordable housing, small parks and pedestrian amenities. San Francisco's proposal will also increase access to zero-emissions vehicles, and increase use of zero-emissions vehicles to lower green house gas emissions, which helps to mitigate one of the biggest threats to public health – climate change, which threatens to harm our most vulnerable populations first.

Not only will the Office of Health Equity support San Francisco in their work to implement their project, but we will also use our position within State government to lift up San Francisco's work as a model across the state. We will provide opportunities for San Francisco to share their successes and lessons learned with communities across California through our connections with local health officers and our health equity newsletter, as well as opportunities for San Francisco to share their work with agencies across California government through the 22-agency HiAP Task Force, which is facilitated by our office. San Francisco's commitment to social equity and inclusion, affordability, accessibility, and sustainability give me great confidence in the future success of this program. For those reasons, the Office of Health Equity strongly supports this proposal. Thank you for your consideration.

Sincerely,

Wm. Jahmal Miller, MHA
Deputy Director, Office of Health Equity
California Department of Public Health

GREENBELT ALLIANCE

San Francisco Office
312 Sutter Street, Suite 510
San Francisco, CA 94108
(415) 543-6771

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

RE: Support for San Francisco's submission to *Beyond Traffic: The Smart City Challenge*

Dear Secretary Foxx:

Greenbelt Alliance is the San Francisco Bay Area's leading organization working to protect natural and agricultural landscapes from sprawl development and help our cities and towns grow in smart ways to make the region great for everyone. We are the champions of the places that make the Bay Area special, with more than 10,000 supporters and a 58-year history of local and regional success.

As a non-profit partner invested in environmental and social equity solutions for our cities**, I am writing to express my strong support for the City of San Francisco's submission to *Beyond Traffic: The Smart City Challenge*.** The vision laid out is a thoughtful plan to encourage community support and data-driven process with relatable use cases that will encourage a shift toward the concept of transportation as a service that meets the needs of residents across the income spectrum.

San Francisco's proposal is smart and bold, preparing the groundwork for a combined shared, connected and automated vehicle program for the benefit of residents, commuters, businesses, and visitors. San Francisco has the talent and know-how to make this happen and demonstrate to other cities that we can create a win-win transportation system for all users. We believe this approach will create a better San Francisco, and create replicable and scalable strategies to move the country forward.

Thank you in advance for your consideration of this request. If you have any questions, or require additional information, please do not hesitate to contact me.

Sincerely,

Matt Vander Sluis
Program Director
mvandersluis@greenbelt.org

ILRCSF
support • information • advocacy

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

Independent Living Resource Center San Francisco (ILRCSF) strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared accessible, electric, connected , and automated transportation system. These technologies promise a future where transportation is accessible, safe, clean and affordable. This technology will enable Californians of all abilities to be connected to jobs, recreation, health care and civic institutions .

The mission of ILRCSF is to ensure that people with disabilities are full social and economic partners, both within their families and in a fully accessible community. For many of our consumers, lack of reliable transportation is one of the biggest barriers they face to fully accessing the community. Many people with disabilities either have to plan their activities based on how close their destination is to public transportation, or they must plan around when their rides are scheduled. Having a fully accessible, on demand fleet of autonomous cars would allow a wheelchair user to make a spontaneous trip to the movies with friends without scheduling a ride, or a blind parent to take their child to any Park they want, even if it isn't near public transportation . Successful implementation of San Francisco's proposed plan would level the playing field for the disability community by providing another accessible, affordable, and environmentally friendly transportation options that would not be dependent on a fixed route or a schedule, hence enabling people with disabilities to participate more freely and independently in the community.
The Smart City Challenge award would enable San Francisco to learn, test and share knowledge about advanced transportation technologies and tools with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. We are excited by this opportunity to join in shaping the transportation

future of our City and the nation from the start, helping to ensure that the technology that advances improves the mobility of people with disabilities and seniors.

San Francisco's vision for a Smart City with improved mobility would focus on safety, ease of use, opportunities for low income individuals, and better options for those who do not own their own car. Proposed projects that would serve people with disabilities and seniors include vehicle collision technology on large fleets to improve safety, and deployment of smart phones for low income residents, along with new phone apps, to make planning trips and moving between transportation modes easier and more seamless.

ILRCSF is excited by this opportunity to engage with the city to develop advanced transportation technologies that benefit people with disabilities and seniors. We look forward to working with the city to try out new ideas and ensure that the transportation future is accessible and convenient for all. Thank you for your consideration.

Sincerely,

Fiona Hinze

Systems Change Coordinator/Community Organizer

Independent Living Resource Center San Francisco

825 Howard Street, San Francisco, CA 94103
Email: fiona@ilrcsf.org

Phone: 415-543-6222, ext. 1106

LIGHTHOUSE
FOR THE BLIND AND VISUALLY IMPAIRED
1155 Market St., 10th Floor, San Francisco, CA 94103

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

The LightHouse for the Blind and Visually-Impaired strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

The LightHouse for the Blind has a core mission to ensure the accessibility and usability of public transportation, and we look forward to partner to ensure that mobility options for blind and visually-impaired Bay Area residents meet the needs of this population. For more than 50 years we have taught blind people how to use public transportation in San Francisco and beyond; today our six Orientation and Mobility instructors teach blind students how to ride BART, MUNI and a myriad of other transportation options.

More than teaching individual blindness skills; however, today the LightHouse has become a leader in providing design consultation, focus groups, UX testing and accessibility consultation to dozens of Bay Area hardware and software companies. Our ability to assemble large community groups, to disseminate information to a vast mailing list of blind people, and our new capabilities to host webcasts and produce video allows us to reach far more blind people than any other organization in the western US. As new forms of accessible mobility emerge, we'll want to ensure that blind people and those with limited vision can use the devices, apps, signage, maps and cues to best effect. Our capabilities to produce Braille, tactile maps, Bluetooth beacon indoor navigation and a host of other mobility-related services means our staff and community is a great fit for the Smart Cities project.

The Smart City Challenge award would enable San Francisco to learn, test and share knowledge about advanced transportation technologies and tools with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. The LightHouse is excited by this opportunity to join in shaping the transportation future of our City and the nation from the start, in order to ensure that the technologies that advances improves the mobility of people with disabilities and seniors.

lighthouse-sf.org | Voice: 415.431.1481 | Fax: 415.863.7568 | VP: 415.255.5906

San Francisco's vision for a Smart City with improved mobility, and the city's focus on safety, ease of use, opportunities for low income individuals, and better options for those who do not own their own car would serve our constituents. Proposed projects that would serve people with disabilities and seniors include vehicle collision technology on large fleets to improve safety, and deployment of smart phones for low income residents, along with new phone apps, to make planning trips and moving between transportation modes easier and more seamless.

We are excited by this opportunity to engage with the city to develop advanced transportation technologies that benefit people with disabilities and seniors. We look forward to working with the city to try out new ideas and ensure that the transportation future is accessible and convenient for all. Thank you for your consideration.

Sincerely,

Bryan Bashin

Bryan Bashin, CEO

SENIOR & DISABILITY ACTION

1360 Mission St., Suite 400
San Francisco, CA 94103
415-546-1333
www.sdaction.org

May 20, 2016

The Honorable Anthony Foxx
Secretary, U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

San Francisco Senior and Disability Action strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

Senior and Disability Action mobilizes and educates seniors and people with disabilities to fight for their rights and for social justice. We work to make San Francisco aging and disability-friendly, with the conviction that when seniors and people with disabilities are involved in all aspects of civic life, everyone benefits. We are committed to ensuring that our city has a variety of safe, accessible, and affordable transit options for all residents.

Our organization has a longstanding relationship with the San Francisco MTA, working together to make our city more accessible for seniors and people with disabilities, and making sure that we all can participate fully in the community.

The Smart City Challenge award would enable San Francisco to learn, test and share knowledge about advanced transportation technologies and tools with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. We are excited by this opportunity to join in shaping the transportation future of our City and the nation from the start, in order to ensure that the technologies that advances improves the mobility of people with disabilities and seniors.

San Francisco's vision for a Smart City with improved mobility, and the city's focus on safety, ease of use, opportunities for low income individuals, and better options for those who do not own their own car would serve our constituents. Proposed projects that would serve people with disabilities and seniors include vehicle collision technology on large fleets to improve safety, and deployment of smart phones for low income residents, along with new phone apps, to make planning trips and moving between transportation modes easier and more seamless.

We are excited by this opportunity to engage with the city to develop advanced transportation technologies that benefit people with disabilities and seniors. We look forward to working with the city to try out new ideas and ensure that the transportation future is accessible and convenient for all. Thank you for your consideration.

Sincerely,

Jessica Lehman

Jessica Lehman
Executive Director

Mayor's Office on Disability
City and County of San Francisco

Edwin M. Lee
Mayor
Naomi Kelly
City Administrator
Arfaraz Khambatta, CASp.
Interim Director

May 17, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

The San Francisco Mayor's Office on Disability (MOD) strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where affordable transportation is safe, clean and universally accessible, where Californians from all walks of life are connected, sans barriers, to jobs, recreation, healthcare and civic institutions. Furthermore, as the birthplace of the Disability Rights Movement, San Francisco has taken innovative steps to move beyond compliance and towards full integration of people with disabilities in all areas of public and private life.

Being uniquely situated amidst the land of innovation and with the guiding principle of full inclusion and equality for all, San Francisco will be able to advocate for, develop and fully implement self-directed universally accessible transportation options that are equally convenient and usable by everyone. We need solutions that leverage high-tech innovation and universal design to allow everyone to move around our city independently and efficiently regardless of economic status or ability to drive.

The Smart City Challenge award would enable San Francisco to learn, test and share knowledge about advanced transportation technologies and tools with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. We are excited by this opportunity to join in shaping the transportation future of our City and the nation from the start, in order to ensure that the technologies that advances improves the mobility of people with disabilities and seniors. Thank you for your consideration.

Sincerely,

Arfaraz Khambatta, Interim Director
Mayor's Office on Disability

1155 Market Street 1st Floor, San Francisco, CA 94103 415.554.6789 415.554.6159 Fax
415.554.6799 TTY MOD@sfgov.org

May 12, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

The Multimodal Accessibility Advisory Committee (MAAC) of the San Francisco Municipal Transportation Agency strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

MAAC is a group of 21 seniors and people with disabilities who regularly use SFMTA services and who provide input on accessibility for various transportation projects, and who are dedicated to maintaining, improving and expanding the accessibility of San Francisco's streets and public transportation system.

The Smart City Challenge award would enable San Francisco to learn, test and share knowledge about advanced transportation technologies and tools with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. We are excited by this opportunity to join in shaping the transportation future of our City and the nation from the start, in order to ensure that the technologies that advances improves the mobility of people with disabilities and seniors.

San Francisco's vision for a Smart City with improved mobility, and the city's focus on safety, ease of use, opportunities for low income individuals, and better options for those who do not own their own car would serve our constituents. Proposed projects that would serve people with disabilities and seniors include vehicle collision technology on large fleets to improve safety, and deployment of smart phones for low income residents, along with new phone apps, to make planning trips and moving between transportation modes easier and more seamless.

We are excited by this opportunity to engage with the city to develop advanced transportation technologies that benefit people with disabilities and seniors. We look forward to working with the city to try out new ideas and ensure that the transportation future is accessible and convenient for all. Thank you for your consideration.

Sincerely,

Marty Smith
Chair, SFMTA MAAC

The Arc San Francisco
1500 Howard Street San Francisco, CA 94103
phone (415) 255.7200 fax (415) 255.9488
www.thearcsf.org

The Arc
San Francisco

For people with intellectual and developmental disabilities

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

The Arc San Francisco strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's $40 million Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

The Arc San Francisco is a non-profit service and advocacy organization for adults (18+) with autism, Down Syndrome, cerebral palsy and intellectual and developmental disabilities. Founded in 1951, we currently serve over 700 individuals of diverse backgrounds, ages and disabilities providing a range of services relevant to all areas of adult life.
As a true community partner, we believe in educational outreach, the power of business partnerships and the importance of being a reliable resource for families, supporters, public policy makers and all those who share our vision of creating a more informed, diverse and inclusive society.
Increased access to safe, accessible and innovative transit for young and older adults with disabilities will positively impact current barriers of social isolation, disparity in access to healthcare, education, employment and other quality of life challenges that the individuals we serve face. The Smart City program will make a better and more accessible San Francisco for everyone that lives and visits here.

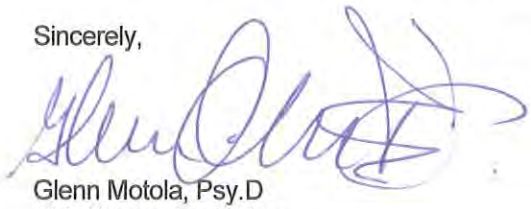
The Smart City Challenge award would enable San Francisco to learn, test and share knowledge about advanced transportation technologies and tools with the rest of the world. San Francisco's neighborhoods will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. We are excited by this opportunity to join in shaping the transportation future of our City and the nation from the start, in order to ensure that the technologies that advances improves the mobility of people with disabilities and seniors.

San Francisco's vision for a Smart City with improved mobility, and the city's focus on safety, ease of use, opportunities for low income individuals, and better options for those who do not own their own car would serve our constituents. Proposed projects that would serve people with disabilities and seniors include vehicle collision

technology on large fleets to improve safety, and deployment of smart phones for low income residents, along with new phone apps, to make planning trips and moving between transportation modes easier and more seamless.

We are excited by this opportunity to engage with the city to develop advanced transportation technologies that benefit people with disabilities and seniors. We look forward to working with the city to try out new ideas and ensure that the transportation future is accessible and convenient for all. Thank you for your consideration.

Sincerely,



Glenn Motola, Psy.D
Chief Executive Officer
The Arc San Francisco

May 18th, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

I am writing you on behalf of ABM Industries a company founded in 1909 in San Francisco with deep roots and commitment to our home community and its future.

In the last 106 years ABM has grown to become one of our States largest employer with approximately 22,000 employees in California and annual revenue of $5B (ABM Industries NYSE).

Our organization operates significant Parking and Shuttle services in San Francisco and provide host locations for several Ride Share organizations including City Car Share along with the installation and operation of many public Level 2 and DC Charging Stations.

ABM strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's and Paul G. Allen Family Foundation Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

This opportunity will enable San Francisco to learn, test and share this knowledge with the rest of the world. San Francisco's neighborhoods and businesses will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. Proposed projects include integrating last mile options with public transit, strategically deploying electrification infrastructure that supports the grid and serves the community, developing and implementing incentives for electric vehicles, storage and demand response programs, and initiatives that promote broad access to electric vehicles while capturing economic develop opportunities.

Our organization operates shuttle vehicles in the City of San Francisco and we are committed to transitioning fleet assets deployed in the City to clean energy, including all-electric, zero emission vehicles. We support and are interested in participating with Nohm in its City of San Francisco *Global E-Leader Deployment Program* -- and agree to evaluate the program with the intent of participation in the deployment period.

The number of vehicles will depend on the fit with our organization's economic and sustainability goals, the application, and duty cycle.

Based on our review of the vehicle specification, tour of Nohm's manufacturing facility and several Ride and Drive events with key ABM Shuttle and Parking Leaders, we anticipate a good fit with a number of our routes, subject to validation during the testing period proposed in this project.

Nohm vehicles are designed for high-density, urban environments with diverse topography and unique highway-surface street acceleration conditions like San Francisco. Nohm's proprietary telemetry system enables collection of valuable utilization data that can further aid in planning and deployment of convenient DC fast charge stations, traffic and congestion mitigation measures, and design of prospective zero-emission delivery zones to further benefit San Francisco.

In addition, all of Nohm's vehicles are "V2G" ready, providing benefits to fleet operators and the City in the form of potential new revenue streams, grid stabilization, storage for renewable electricity, and support for net-zero energy building footprints, along with portable power for Emergency Power source for Emergency Lighting at potential locations like BART Stations that rely on portable generators to provide evacuation and tunnel lighting in the event of a natural disaster.

ABM Industries and San Francisco share the same vision of a new energy economy that creates opportunity and abundance for all.

We are enthusiastic about being a partner in the transition to the era of electrified and connected transportation, integrated with distributed, energy resources including solar PV, energy storage, renewable energy, and the connected "smart grid".

The development of advanced clean energy transportation solutions is critical to enabling a sustainable economy, addressing climate change, and enhancing public health. Our organization is committed to working with San Francisco on their Smart City Challenge grant to scale up replicable solutions and market transformation for electric medium duty vehicles.

Thank you for your consideration.

Sincerely,

Cameron Funk
Director Business Development
ABM Industries


ABM
Building Value
Building Value in California...
We employ
21,000+
Californians
JANITORIAL
Each day, we clean
500+ Million
square feet
of buildings
ELECTRICAL
& LIGHTING
We service
& maintain
40,000+
parking lot
poles & lights
LANDSCAPE & TURF
We maintain
thousands of acres
of landscape & grounds for
300+ Properties
Founded in
1909 in
San Francisco
ENERGY
We've installed
& maintain
1,000+
EV Charging Stations
$1.1+ Billion
in Revenue
PARKING &
TRANSPORTATION
We manage parking at
500+ Locations
FACILITIES
ENGINEERING
Our 1,300+
Certified Engineers
keep buildings running
We Service & Maintain
8,900+ Buildings
SECURITY
PERSONNEL
Our 14,000+
licensed security
personnel help
keep buildings
safe & hospitable
HVAC &
MECHANICAL
We service & maintain
100,000+
heating and
cooling systems
40+ Branch Locations
abm.com/ca
ABM-08069-0606

U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

May 16, 2016

To Secretary Foxx:

Amazon Web Services, Inc. (AWS) offers commercially available, web scale computing services that help organizations avoid much of the heavy-lifting typically associated with launching and growing successful applications. These services are based on Amazon's own back-end technology infrastructure and incorporate over a decade and a half of experience building one of the world's most reliable, scalable, and cost-efficient web infrastructures. AWS offers a broad set of global compute, storage, database, analytics, application, and deployment services. AWS offerings are provided with a range of supporting components like management tools, networking services, and application augmentation services, with multiple interfaces to AWS Application Programming Interface (API)-based services. The use of AWS will provide customers with access to expertise in large-scale distributed computing and operations and will enable their applications to be robust and scalable.

AWS is excited to show our support for the City of San Francisco in the Smart Cities Challenge. AWS has offered insight as to how AWS provides scalable, cost-efficient solutions that help the City of San Francisco meet mandates, reduce costs, drive efficiencies, and increase innovation. AWS looks forward to providing additional information about AWS's services as the Challenge progresses and to identify more specific ways that we can support the City of San Francisco.

Respectfully,

Matthew Dittoe, Senior Sales Manger
Amazon Web Services, Inc.

San Francisco Smart City Challenge
AT&T-Led Partner Letter of Commitment

Dear City of San Francisco Stakeholders,

AT&T is pleased to submit this letter of support to San Francisco, CA for inclusion in its application to the U.S. Department of Transportation Smart City Challenge (the "DoT Smart City Challenge"). AT&T has a longstanding relationship with San Francisco and our connections across numerous departments uniquely position AT&T to execute complex projects for the city.

AT&T Smart Cities can provide a critical component to San Francisco's proposal, however, a comprehensive proposal will require collaboration by multiple solution providers. For the purposes of San Francisco's submission to the DoT Smart City Challenge, AT&T considers Ericsson, Qualcomm, MetroTech, Motionloft, and Savari as key strategic allies. Together with AT&T's additional vendors and relationships, we will be able to help San Francisco deliver and execute upon a comprehensive Smart City solution. A Smart City deployment led by AT&T, with assistance from these suppliers, inherently increases the repeatability of solution elements across the U.S., due to AT&T's longstanding city relationships, national network presence, and proven capabilities to execute complex projects.

Thank you for this opportunity, and we look forward to working with the City of San Francisco.

Sincerely,

Mike Zeto

Mike Zeto
General Manager
Smart Cities, AT&T

Matt Foreman

Matt Foreman
Market Development
Smart Cities, AT&T

Beverly Rider

Beverly Rider
Vice President
Enterprise IOT & Smart Cities, Ericsson

Matt Eichenberger

Matt Eichenberger
Sr Director of Business Development
Qualcomm QISI

Robert Bruckner

Robert Bruckner
SVP Sales and Service Deliver
MetroTech

Joyce Reitman

Joyce Reitman
CEO
Motionloft

Ravi Puvvala

Ravi Puvvala
CEO
Savari Inc

Part 1: CONTACT INFORMATION

Organization Name: AT&T Mobility II, LLC

Organization Primary point(s) of contact

Name	Title	e-mail	phone
Matt Foreman	Market Development	mf3510@att.com	770-241-2361
Jawad Tareen	Transportation Business Development Manager	jt788k@att.com	
Mike Zeto	General Manager, AT&T Smart Cities	mz499k@att.com	

Organization Type: For Profit Company

Are there any other organizations or companies that will be a part of your Partnership Proposal? Yes

If Yes, please list organization(s)/company name(s) below: (add rows as needed)

Company	Point of contact	e-mail	phone
Ericsson Inc.	Beverly Rider	Beverly.rider@ericsson.com	206-321-1373
Qualcomm Inc.	Matt Eichenberger	georgewo@qti.qualcomm.com	408-642-0077
MetroTech Net , Inc.	Robert Bruckner	robert.bruckner@metrotech-net.com	770-335-4635
MotionLoft	Joyce Reitman	Joyce.Reitman@motionloft.com	415-580-7672
Savari Inc.	Ravi Puvvala	ravi@savarinetworks.com	404-859-7284

Part 2: PARTNERSHIP PROPOSAL

All offers below are conditioned upon the City of San Francisco (a) being selected as the winning city of the DoT Smart City Challenge; (b) receiving $50 million dollars from the Department of Transportation in connection with the DoT Smart City Challenge; and (c) executing a mutually acceptable, definitive agreement(s) with the companies signing this letter of support, consistent with applicable procurement laws, regulations and requirements.

Wireless Products and Services:

AT&T is offering up to $300,000 of in-kind products, services, and support, in addition to resource support. This will be allocated as follows:

- 33% of cellular data connectivity needs to support sensors and technology to be deployed as a part of the execution of the Department of Transportation Smart City Challenge project. This will be a maximum of $50k per year, over the three year execution period, for a total of up to $150k.

- An additional $150k worth of products and services, selected from the below list, allocated at a maximum of $50k per year over the three year execution period.

    - **Internet of Things (IoT) Security Consulting Assessment:**

      This assessment will help inform San Francisco's deployment of secure smart city technologies and services, and will complement its vision of its smart city deployment. Through this service, AT&T can perform an IoT security assessment of the city's smart city components across four layers of potential vulnerabilities: Endpoints (e.g. meters, sensors, etc.), Network(s), Applications and Data, Over-arching threat analysis

    - **Big Data Solutions in Support of Smart Transportation:**

      AT&T is currently engaged in two California projects that can both inform, guide and apply to this project with San Francisco. Specifically, AT&T is working with the California Department of Transportation (Caltrans) and the University of California at Berkeley in two projects employing Big Data analysis of cellular network data to analyze traffic and transportation patterns: the Connected Corridors Project in Los Angeles, [1] and the SmartBay Project in the Bay area.[2] These projects are using aggregated and anonymized call data records (CDRs) from the geographically relevant portion of AT&T's 137 million mobile subscribers to model and forecast traffic patterns—complementing data derived from in-pavement sensors and other sources to build a far more robust understanding of movement patterns within the project areas. These projects are similar to work underway at some National University Transportation Centers,[3] but include the massive data set available from AT&T's subscriber base. The methods and insights being used to support each of these existing projects in California can be replicated for, and applied by AT&T to the City of San Francisco, although it would need to be in conjunction with a local academic institution or potentially an appropriate DOT UTC, to aid in its traffic and transportation planning for its Smart City deployment.

    - **Local Hackathon and/or DevLab Events:**

      Either or both of the events described below could be made available to support ladders of opportunity, economic development, and citizen engagement:
      Local Hackathon in support of Smart City objectives- A hackathon is a collaborative computer programming event. AT&T's Developer Program[4] conducts many hackathons around the country and the world, and would be able to support the city in engaging the local developer community with a transportation-focused hackathon.

      AT&T DevLab- An AT&T hosted DevLab will allow city IT employees and selected partners from across the city's departments and stakeholders to receive training on cutting edge app

[1] See http://about.att.com/innovationblog/09292015smartcities
[2] See http://fortune.com/2015/10/16/att-using-big-data-to-fix-traffic/
[3] See, for example, the research to be presented at an upcoming DOT Transportation Innovation Series, http://www.rita.dot.gov/transportation_innovation_series_2016_03_16
[4] See http://developer.att.com/community/events

development and coding practices that will improve their ability to develop and deliver solutions that are a part of their Smart City deployment.

- **Proof-of-Concept Pilot of LTE Cell Broadcast Technology for V2X Communications:**

  Extending the reach of DSRC-based V2X Communications to LTE-equipped vehicles
  AT&T currently has over 7 million vehicles on the road connected to its mobile network with embedded cellular communications, with millions more to be delivered to consumers over the next several years. None of these vehicles are currently equipped with dedicated short range communications capabilities ("DSRC"). As DSRC equipped vehicles and infrastructure elements begin to be deployed in support of the ITS, reaching portions of the existing fleet presents a significant challenge and opportunity.

  AT&T is working with several Tier 1 suppliers and OEMs to develop proof-of-concept pilot deployments of systems employing the cell broadcast capabilities of AT&T's mobile network and LTE devices to:

  1. Distribute DSRC-originated event notification messages to vehicles equipped with LTE. This system would extend the reach of V2X systems into the LTE vehicle ecosystem. For example, a Decentralized Environmental Notification Message (DENM) generated by DSRC equipped vehicles would be relayed to an AT&T servers via an LTE connection. The AT&T servers would define the area of relevance (AOR) for the DENM distribution, and distribute the message to all LTE equipped vehicles within the AOR for the event duration.
  2. Assess and validate the distribution of V2V SCMS credentials via cell broadcast technology. This would validate the ability of the LTE network to function as the Secure Credential Management Center, and distribute certificates and revocation lists via LTE.

  AT&T plans to conduct these proof-of-concept trials starting as early as January 2017. Either or both of these pilot deployments can be conducted in San Francisco, as a complement to the city's deployment of ITS capabilities.

Ericsson

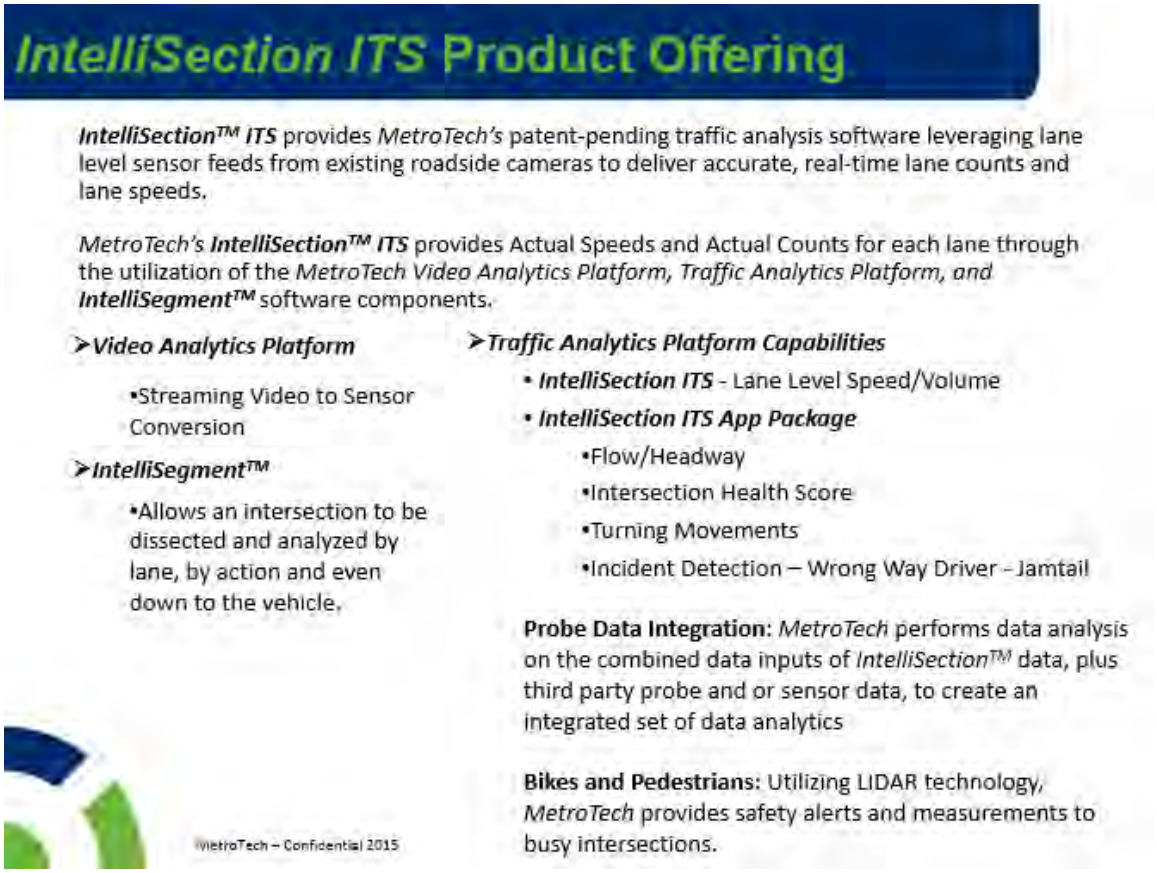
In support of the Department of Transportation Smart Cities Challenge winning city, Ericsson is building a multi-million dollar cross departmental data management and control center. In support of San Francisco's DOT proposal, Ericsson is excited to offer access to this core architecture as well as $100,000 of integration services allocated over 3 years.

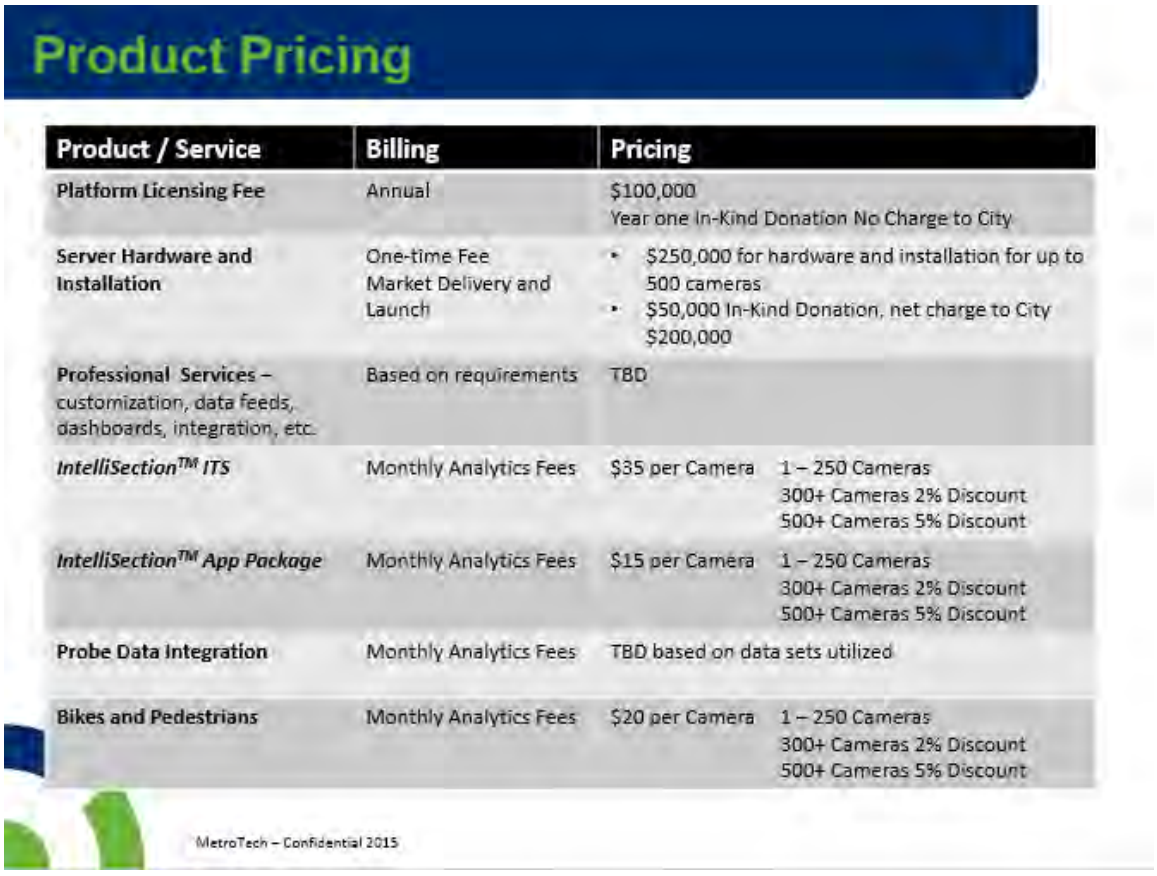
Qualcomm

Qualcomm will provide in-kind funding up to $100,000 for the winner of USDOT DoT Smart City Challenge in collaboration with AT&T. The $100,000 can be a combination of in-kind DSRC chipsets, engineering design, support and services, with the goal of implementing LTE encapsulation of DSRC packet in extending the range of V2V and V2X capabilities.

MetroTech

MetroTech is excited to offer up to $300,000 of in-kind value in support of deployment of the IntelliSection ITS solution. Kindly find solution and pricing details below.





Savari Inc.

We are proud to be part of a strong alliance led by AT&T to help the City of San Francisco enable V2X smart transportation solutions.

Contributions Savari will make to the City of San Francisco as part of the AT&T partner consortium, are twofold:

1. In-kind resources
2. Discounted pricing

Savari will contribute the following in-kind resources of the total value 35,000 USD to the City of San Francisco:

Product / Service	**Quantity**	**Datasheet**	**Corresponding team and category**
Road-Side-Units (RSU)	2	*Savari_RSU*	#2 Connected / Automated Vehicles • Integration, Installation and Operations
On-Board-Units (OBU)	5	*Savari_OBU*	#2 Connected / Automated Vehicles & • Integration, Installation and Operations
Vehicle-to-Phone applications • Smart cross • Driver alert of approaching pedestrian	unlimited	*Savari-V2P*	#2 Connected / Automated Vehicles & • Integration, Installation and Operations #4 Safety
Vehicle-to-Vehicle (V2V) applications • Electronic Emergency Brake Light (EEBL) • Forward Collision Warning (FCW) • Intersection Movement Assist (IMA) • Do-not-pass Warning (DNPW) • Left Turn Assist (LTA) • Blind Spot Warning (BSW)	unlimited	*Savrai_V2V*	#2 Connected / Automated Vehicles & Integration, Installation and Operations
Vehicle-to-Infrastructure (V2I) applications • In-Vehicle Traffic Light *Signal Phase and Timing (SPaT)* visualization • Curve Speed Warning (CSW) • Work Zone Warning	unlimited	*Savari_V2I*	#2 Connected / Automated Vehicles & Integration, Installation and Operations
Mobility Services • CV MMITS Apps (I-SIG, FSP, PED-SIG, PREEMPT) • CV Advanced Traveler Info Services	unlimited	/	#3 Connected / Automated Vehicles & • Mobility Services
Software Development Kit (under Non-Disclosure Agreement only)	unlimited	*Savari_SDK*	#2 Connected / Automated Vehicles & Integration, Installation and Operations
Hardware and Software installation Service and maintenance	40 hours	/	#2 Connected / Automated Vehicles & Integration, Installation and Operations #3 Mobility Srevices #4 Safety

Savari will guarantee its lowest pricing of large scale deployment possible in case more RSU's and OBU's are needed. Furthermore, Savari is happy to offer its learnings, experience and contacts (OEM, Tier-1, CAMP) from other consortium activities and projects to the City of San Francisco Smart City Challenge.

We at Savari are looking forward to the City of San Francisco getting selected as the winning city of the Smart City Challenge and to start working with your team.

Is there anything confidential about your partnership proposal that you wish to keep away from public discussion? (Yes / No).

AT&T kindly requests this document is not made publically available.

Contribution Review

AT&T: Up to $300,000 over 3 years (+ intangibles such V2V and V2X trials)
Ericsson: Access to architecture for a $2.5M platform build, and $100,000 in integration services
Qualcomm: $100,000 over 3 years
MetroTech: $150,000 over 3 years
MotionLoft: $100,000 over 3 years
Savari: $35,000

Automatic Labs
575 Florida St Suite 100
San Francisco, CA 94110

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Automatic Labs support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Automatic Labs, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Two of Automatic's key goals are to make drivers smarter and safer. In support of the Vision Zero program, Automatic aims to help track an overall "safety score" of San Francisco and ensure that the right policies and infrastructure changes are made to achieve Vision Zero's goals.
Automatic's technology identifies unsafe driver behavior and generates safety metrics that are tracked by location and over time to identify risky intersections and streets. As changes to the infrastructure/policies are made, changes in driving behavior on the at-risk streets are measured along those safety metrics.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Jerald Jariyasunant, Co-founder/Chief Data Scientist at jerry@automatic.com.

Sincerely,

Jerald Jariyasunant

May 19, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Bay Area Motivate's support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Bay Area Bike Share (operated by Bay Area Motivate), I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Bay Area Bike Share is preparing to undergo a massive expansion from 700 bicycles to 7,000 bicycles by 2018. With stations planned for San Francisco, the East Bay, San Jose, and the peninsula, Bay Area Bike Share is a truly regional transportation system that allows riders to swap vehicle trips (and vehicle ownership!) for transit trips, relying on bike share as the first or last mile or as a stand-alone mode. In its first two years of pilot operations, the Bike Share had no major incidents, and is expected to be an important factor in supporting the City's Traffic Safety Vision Zero policy.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact me.

Sincerely,

Emily J Stapleton

Emily Stapleton
General Manager, Bay Area Bike Share
emilystapleton@motviateco.com
1.415.758.3658

2200 Jerrold Avenue, Unit J
San Francisco, CA 94124

bayareabikeshare.com

Date: May 13th 2016
The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Booz Allen Hamilton support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Booz Allen Hamilton (Booz Allen), I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

Booz Allen brings a breadth and depth of expertise in the different Smart City Vision Elements. We have been working closely for several years with the USDOT, USDOE, other federal agencies, and multiple state and local, private, academic, and other partners on research, development, and testing of various topic areas that laid the foundation for the Challenge.

Booz Allen can provide technical and management expertise for the Smart City Challenge implementation in several areas including:

- Overall project management and technical support/oversight
- Connected/Automated Vehicles Evaluation and Assessment
- Analysis, Modeling and Simulation for CV/AV and Shared Mobility Services
- Strategic Planning and management for the San Francisco proposal deployment
- Cyber-security for CV/AV
- Data Analytics and System Engineering

We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable. In the event that the San Francisco is selected as the Smart City Challenge winner, we agree, subject to a negotiated agreement, to support San Francisco's Smart City concept development and planning activities.

If you have any questions regarding this matter, please contact Christopher Hill, Principal at Booz Allen Hamilton via email (hill_christopher@bah.com) or phone number 202-203-5411.

Sincerely,

C Hill

BOOZ ALLEN HAMILTON INC.

Christopher Hill
Principal, Booz Allen Hamilton

built.io®

+1.415.255.5955
info@built.io • www.built.io

May 20th 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Built.io support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Built.io, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

At Built.io we specialize in creating innovative mobile solutions for private organizations and municipalities. Just last week our company was recognized with Gartner's Cool Vendor designation – one of the highest accolades of our industry – for its mobility and integration platform. We provide the mobility and integration foundation for the Sacramento Kings' app and its soon-to-be-unveiled new arena, where navigation and transportation functionality span the arena as well as the surrounding neighborhood. Our team and technology also powered KurbKarma, a social network for parking designed to maximize inner city parking efficiencies, which ended up being awarded the TechCrunch Disrupt finalist distinction. We have proposed the creation of a cloud-based, API-enabled Digital Transportation Platform to integrate private and public resources and to streamline urban transportation – architected as a repeatable blueprint for cities across the United States.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Matthew Baier (COO of Built.io) at matthew@built.io or 415 255 5955.

Sincerely,
Matthew Baier
COO at Built.io

chariot

May 18, 2016

Chariot Transit Inc.
95 Minna Street, 2nd Floor
San Francisco, CA 94105

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Secretary Foxx,

Chariot strongly supports the selection of San Francisco as the recipient of the U.S. Department of Transportation's and Paul G. Allen Family Foundation Smart City Challenge grant program. California and San Francisco are global innovation leaders who are ideally positioned to launch the world's first shared, electric, connected and automated transportation system. These technologies promise a future where transportation is safe, clean and affordable, where Californians from all walks of life are connected to jobs, recreation, health care and civic institutions without the barriers that currently divide us.

This opportunity will enable San Francisco to learn, test and share this knowledge with the rest of the world. San Francisco's neighborhoods and businesses will volunteer to host pilot programs, testing the future of technologies meant to automate, connect, share, electrify, and improve the safety of our transportation system. Proposed projects include integrating last mile options with public transit, strategically deploying electrification infrastructure that supports the grid and serves the community, developing and implementing incentives for electric vehicles, storage and demand response programs, and initiatives that promote broad access to electric vehicles while capturing economic develop opportunities.

Our organization currently operates 90 passenger vans in the greater San Francisco Bay Area and we are committed to transitioning our fleet to clean energy, including all-electric, zero emission vehicles. We support and are interested in participating with Nohm in its City of San Francisco *Global E-Leader Deployment Program* -- and agree to evaluate the program with the intent of participation in the deployment period. The number of vehicles will depend on the fit with our organization's economic and sustainability goals, the application, and duty cycle. Based on our review of the vehicle specification, we anticipate a good fit with a number of our routes, subject to validation during the testing period proposed in this project.

Nohm vehicles are designed for high-density, urban environments with diverse topography and unique highway-surface street acceleration conditions like San

chariot

Francisco. Nohm's proprietary telemetry system enables collection of valuable utilization data that can further aid in planning and deployment of convenient DC fast charge stations, traffic and congestion mitigation measures, and design of prospective zero-emission delivery zones to further benefit San Francisco. In addition, all of Nohm's vehicles are "V2G" ready, providing benefits to fleet operators and the City in the form of potential new revenue streams, grid stabilization, storage for renewable electricity, and support for net-zero energy building footprints.

Chariot and the City share the same vision of a new energy economy that creates opportunity and abundance for all. We are enthusiastic about being a partner in the transition to the era of electrified and connected transportation, integrated with distributed, energy resources including solar PV, energy storage, and the "smart grid".

The development of advanced clean energy transportation solutions is critical to enabling a sustainable economy, addressing climate change, and enhancing public health. Our organization is committed to working with San Francisco on their Smart City Challenge grant to scale up replicable solutions and market transformation for electric medium duty vehicles.

Thank you for your consideration.

Sincerely,

Ali Vahabzadeh
CEO
Chariot Transit Inc.

cloudera®

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Cloudera's commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

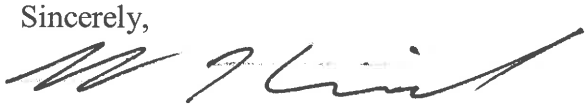
On behalf of Cloudera, Inc. ("Cloudera"), I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Cloudera is fully committed to San Francisco's Smart City Initiative and will make available its dedicated State and Local account team and associated resources, e.g., Professional Services Director, Business Value Consulting resources, including Subject Matter Experts, for initial pre-sales consulting advice and guidance to assist the City with architecting a big data platform and defining transportation use cases to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Cloudera provides a software platform for unlimited storage and processing of a city's data for analytics and application of such data to benefit its citizens. Cloudera is willing to partner with cities and transportation organizations to assist in the improvement of services to citizens, while decreasing costs and maximizing revenues for their organizations. In creating a "Smart City", Cloudera's solution is expected to assist in: (i) improving safety for citizens using public transit; (ii) increasing reliability and timeliness of transportation offerings; (iii) cost-effectively managing a fleet of vehicles; (iv) increasing revenues with flex meter parking and additional transportation offerings; and (v) improving pedestrian and non-vehicle traffic patterns and offerings.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Dawn Carrington (Cloudera Account Executive) at 916-316-1065 or via email at dcarrington@cloudera.com.

Sincerely,



Wayne Kimber
VP Finance & PAO

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear **Secretary Foxx,**

On behalf of Cruise, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Cruise, now owned by GM, is developing autonomous vehicles, and we anticipate that our technology will transform transportation as we know it today, specifically, by increasing mobility and access, improving vehicle and traffic safety, and accelerating vehicle electrification.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact me, the Head of Legal and Regulatory, at mgipple@getcruise.com

Sincerely,
Matt Gipple
Head of Legal and Regulatory

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Envision Solar Inc., support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Envision Solar International, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Envision Solar is an innovative and disruptive San Diego-based sustainable technology company, offering turnkey solar powered products for electric vehicle charging, energy security and outdoor advertising. These products provide critical solutions that uniquely enable governments, corporations and property owners to significantly reduce costs and complications for electric vehicle charging infrastructure, to create meaningful revenue via outdoor advertising, multi-space parking metering and reduce their vulnerability to expensive and dangerous blackouts.

We're thrilled to have been recently awarded a mandatory statewide contract with the State of California, Department of General Services for the EV ARC™ which means both state and local public agencies can now piggyback off the State contract, taking advantage of the favorable pricing, T&Cs and avoiding any RFP requirement. We feel this will make driving on sunshine an even easier proposition.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact David Greenfader, VP Business Development at Envision Solar. I can be contacted at david.greenfader@envisionsolar.com or 310.961.4669.

Sincerely,

David Greenfader
Envision Solar International, Inc.

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **GRIDSMART Technologies Inc. Support of the San Francisco's Smart City Challenge Application**

Dear Secretary Foxx:

On behalf of GRIDSMART Technologies, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

GRIDSMART brings experience and capabilities for the following demonstration categories:

- Create Transportation as a Service Platform;
- Achieve Traffic Safety Vision Zero;
- Increase Digital Equity.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

GRIDSMART would like to use this opportunity to explain how we think our company can assist San Francisco in becoming the model that all other Smart Cities will attempt to emulate in the future. We outline areas and ways how we can help.

Smart City Vision:

Smart Cities of the future will manage population growth, which includes vehicle growth with greater levels of intermodal traffic that include pedestrian and bikes traffic as they move to zero emissions. This is highlighted by a Vision Zero initiative intended to eliminate all pedestrian fatalities. To help Smart Cities like San Francisco move efficiently and strategically forward GRIDSMART offers integrated, easy to install, easy to maintain smart mobility solutions.

GRIDSMART's iconic bell shaped camera with a horizon to horizon view utilizes novel tracking algorithms that can be deployed to track vehicles, bicycles and pedestrians approaching and through

info@gridsmart.com | 865.482.2112 | 10545 Hardin Valley Road, Knoxville, Tennessee 37932 USA GRIDSMART.COM

a traffic intersection. GRIDSMART is the only intersection actuation product on the market that actually "sees" the center of the intersection.

GRIDSMART can be used to control signal timing, to improve traffic flow through cities and also alert user to incidents such as pedestrians or bikes in the crosswalk, wrong way drivers and "blocking the box". The alerts can be sent over DSRC.

DSRC is a standard that allows vehicles to talk to each other to reduce traffic collisions and when combined with the GRIDSMART camera system they can mitigate pedestrian and bicycles collisions today in moving towards the cities Vision zero goals. Only the GRIDSMART – DSRC integration manages the center of the intersection, sending alerts to vehicles that pedestrians, bicyclist, anyone is still in the intersection despite a green light indicator. Using a radio solution, the center of the intersection view provided by GRIDSMART is wirelessly delivered back to your traffic management center. The same view is available on i-Phones and Androids phones today. Future development will include the ability to send the center of the image directly to police and fire trucks, who will already have the advantage of DRSC radio. Imagine a police officer in pursuit or a fire truck on route getting not only an alert that something is in an approaching intersection, but having a visual of what is in the next intersection.

AirGoSense:

To reduce greenhouse gases, Smart Cities must first be able to accurately measure the air quality. For this data to be actionable, air quality data needs to be gathered at many different locations throughout the city, under similar conditions, and with a degree of regularity. Further to meet the DOT's expectations, it is necessary to have data proving how a particular initiative taken by the city directly led to an improvement in air quality.

Traditional methods for measuring air quality are not cost effective for installation in multiple locations and specifically at intersections. GRIDSMART is attacking this issue by integrating a low cost air quality sensor option made specifically to be installed at busy intersections to be released in Q-1 2017.

The city of San Francisco could be the first transportation department to accurately collect and assess in real time how changes in traffic flow affect air quality at an intersection.

The AriGoSense can measure in real-time multi-pollutant characterization of both gas phase (CO, CO2, NO, NO2, Ox) and particulate concentrations (.4 < diameter < 17µm). Along with it can also measure and provide data on the following at each intersection:

- Barometric pressure
- Relative humidity
- Temperature
- Noise
- UV flux
- Wind speed
- Wind direction

info@gridsmart.com | 865.482.2112 | 10545 Hardin Valley Road, Knoxville, Tennessee 37932 USA GRIDSMART.COM

GRIDSMART provides:

a. Bell camera, GS_2, and Client – core system for monitoring, actuating, and collecting data at any given intersection.
b. ATLAS – platform designed to provide situational awareness to any government department without the expense and time of installing a video management system. Camera agnostic.
c. AirGoSense – air quality sensor designed specifically for collecting and measuring air quality and other environmental factors.

If you have any questions regarding this matter, please contact Will Overstreet, Director of Product Management, will.overstreet@gridsmart.com, +1 678 938 1556.

Sincerely,

Bill Malkes
CEO, Co-Founder

info@gridsmart.com | 865.482.2112 | 10545 Hardin Valley Road, Knoxville, Tennessee 37932 USA GRIDSMART.COM

LIVEENSURE®

2600 El Camino Real Suite 100 | Palo Alto, California 94306 | 650 351 7873

May 17, 2016

The Honorable Anthony Foxx, Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **LiveEnsure Inc. support of the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of **LiveEnsure Inc.** (www.liveensure.com), I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number **DTFH6116RA00002.**

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

LiveEnsure® is the culmination of over a decade of security, identity and authentication science, resulting in a patented suite of technologies design to increase trust while reducing privacy, technology and cost burdens on institutions, end users, systems and services alike. LiveEnsure® has pioneered "contextual authentication" allowing entities to trust their context as much as their credentials making their daily digital life simple and more secure. An example is smart car authentication based on user context. If both parents are in a vehicle, the home camera streams over the car interface. If only one, or they are in an unusual location, authentication will be required such as the presence of a smart phone or wearable. The applications to the smart, clean and safe city of the future are endless.

LiveEnsure® has garnered industry awards from TechCrunch, CES and CTIA Wireless and has been deployed globally in over 81 countries on iOS, Android and Windows mobile devices. Recently, we have begun work on automotive, smart car and smart home applications with some industry leaders from the auto industry and consumer electronics field.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Stephen Hughes, VP of Business Development at **stephen@liveensure.com.**

Sincerely,

Christian J. Hessler
CEO of LiveEnsure Inc.

May 19, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: SIGFOX commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of SIGFOX, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. As part of this LOC, SIGFOX is offering to provide LPWAN network services at a 50% reduced subscription cost for committed devices during the 2016 calendar year and their deployment for years to follow, with potential savings of millions of dollars to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

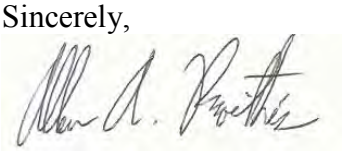
SIGFOX is the world's leading provider of global, simple, cost-effective and energy-efficient connectivity and services for the Internet of Things (IoT) that any company can use to create new business models, accelerate digital transformations, and create new value, right now.

The SIGFOX network, along with hundreds of ecosystem partners enabled smart city solutions across the globe such as assets tracking, transportation platforms, smart utilities, smart buildings, traffic safety, pedestrian's safety, and more increasing digital options, enriching citizens experience while reducing cost/resources.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Ramzi Alharayeri (Regional Director) at ramzi.alharayeri@sigfox.com or (408) 499-5776.

Sincerely,



Allen Proithis

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

May 23, 2016

Re: Lyft commitment to San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Lyft, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Lyft will make available several forms of in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Lyft is aligned with the city's vision and would be ready and eager to participate directly in several areas of the proposed pilots should the city's proposal be selected. Below are examples of ways in which Lyft would be willing to consider partnering with San Francisco's Smart City efforts.

1. Make available Lyft's robust APIs for integration into the City's multimodal transportation service platform, allowing trip planning, booking and payment functions to be performed.
2. Work with our partner General Motors to deploy advanced technology vehicles, including electric vehicles, as well as innovative ways to motivate drivers and users to use such vehicles and developing the necessary infrastructure network to enable their access to renewable-based fueling options.
3. Integrate Lyft Carpool at city-designated pickup and drop-off zones, leveraging new HOV lane access points to regional highways to increase commuter carpooling.
4. Test the impact of Lyft Line as a first and last mile connector to transit hubs in city neighborhoods with poor transit access, leveraging potential city-funded voucher incentives for passengers, while evaluating impact on drive-alone mode share.
5. Implement features in the Lyft app to improve the safety of passenger pickups in high-risk locations to advance the City's Vision Zero goals.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact me at emily@lyft.com or 202-374-6610.

Sincerely,

Emily Castor
Director of Transportation Policy
Lyft

149 9th St Suite 404, San Francisco, CA 94103

16 May 2106

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Mapbox commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Mapbox Inc, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Mapbox will make available up to $100,000 worth of cash or in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Mapbox collates anonymous telemetry from GPS-enabled devices to generate data products that describe traffic patterns and the 'pulse' of human and vehicular movement across every city block. This open, shared data describes transportation flow and accessibility, and is a critical part of the data layer driving a Transportation as a Service Platform, Increasing Regional Transportation Options, and Increasing Digital Equity by detailing and virtuously improving how citizens engage physically with the next version of the American city.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Tyler Bell, Chief Product Officer at tyler@mapbox.com.

Sincerely,

Tyler Bell, PhD
Chief Product Officer, Mapbox Inc.

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Moovit's **support of the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Moovit, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

As a public transportation app, Moovit is committed to reducing private car ownership need by providing smoother journeys on public transportation for all users. By combining official transit data with crowdsourced data provided by our Community of over 35,000 editors worldwide, Moovit offers travelers the fastest routes and most accurate real-time information on public transport. We understand that the "one person, one car" model is not sustainable long-term, and hope that by making public transportation even easier to use, people in both urban and rural areas will find they need private cars less and less.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Lindsay Cumming, (Moovit Head of PR) at lindsay.cumming@moovitapp.com.

Sincerely,
Lindsay Cumming

May 6, 2016

From

Ricky Corker
EVP & President, North America
Nokia
6000 Connection Drive, Bldg 4
Irving, TX 75039

To

Timothy Papandreou
Chief Innovation Officer
San Francisco Municipal Transportation Agency
1 South Van Ness Ave, 7th Floor
San Francisco, CA 94103

Dear Mr. Papandreou:

Nokia is pleased to provide the city of San Francisco with this letter of support towards the city's United States Department of Transportation (USDOT) smart city challenge grant application.

Driven by the human possibilities of technology, Nokia is creating a new type of connectivity through network and device technology that's seamless, intelligent, and secure. We're designing intuitive and dependable technology, to help people thrive. We are an innovation leader in the technologies that connect people and things, combining network infrastructure, software and services, with advanced technologies for smart devices and sensors to tap the power of connectivity. Nokia's Bell Labs, one of the world's foremost technology research institutes, is responsible for countless breakthroughs that have shaped the networking and communications industries.

Nokia's solutions are well aligned with the city of San Francisco's vision for a smart city. This includes:

- Nokia's Mobile Edge Computing (MEC) solutions could enable several use cases that enhance the overall user travel experience.
- Nokia's industry leading IMPACT Internet of Things (IoT) platform provides connectivity management, application enablement, device management and data collection, enabling the city of San Francisco to cost-effectively create services while managing millions of devices in a scalable and seamless manner.
- Nokia's ngConnect program has demonstrated and trialed several solutions, including the connected bus shelter and the connected service technician solutions.

Nokia is pleased to support the city of San Francisco, and upon the city winning the USDOT smart city challenge, Nokia would like to provide the city of San Francisco with the following free of charge:

- Consulting services towards the design, planning and deployment of cellular Mobile Edge Computing (MEC) based solutions.
- 5 Nokia Flexizone micro small cells for a cellular deployment by the city of San Francisco along its smart corridor. Access to videos and literature that could be used by crews for installation of the small cells.
- 2 CitiSite smart street light poles
- Multi-tenancy hosted platform that can support multiple use cases such as Video Analytics, Fleet Management, and Energy management, using the same platform. Video Analytics would be in scope for a period of three months. Support for installation, commissioning and maintenance of the solution, for a duration of three months.

Nokia's primary contact for this initiative will be:

- Senthil Sengodan, Head of North America Strategy
  Tel: 972 330 6029; email: senthil.sengodan@nokia.com

Partners that are working with Nokia include:

- James Lapham, CitiSite, Tel: 209-217-4162; james.lapham@citisite.us
- Monali Shah, HERE, Tel: 312-894-7244; monali.shah@here.com

With HERE, the location cloud company, Nokia is exploring partnership options for communicating specific travel information to vehicles over the cellular networks.

Additionally, through partners not named in this letter, Nokia will explore options to provide the city with licensed spectrum for the exclusive use by the city in a private LTE deployment. In return, Nokia expects the city to provide free-of-charge access to certain assets, such as streetlights for installation of small cells, fiber backhaul access etc. Details will be worked out in future discussions.

In addition to the support indicated above, Nokia would explore options for discounted pricing and volume discount for the solutions that Nokia would supply to the city. Nokia is looking forward to working with the city of San Francisco and helping the city realize its vision for a smart city.

Thank you.

Ricky Corker
EVP and President, North America
Nokia

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Re: Perkins+Will's support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Perkins+Will, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

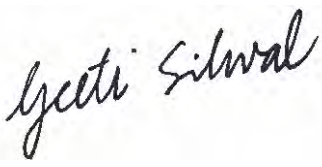
The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

A city prioritizing people over cars is fundamentally a city prioritizing public health, social equity and environmental goals. The Cities+Sites discipline in Perkins+Will, focuses on vibrant, walkable cities that strengthen a community's social fabric, promote a healthier environment by providing active modes of movement, reducing automobile use and hence carbon emissions, and foster a resilient, interconnected community by efficiently connecting people, ideas, and services. Reclaiming city right of ways to enable greater ease of movement for lower carbon footprint modes of transportation and for public life on streets will shift the paradigm of street metrics from LOS, VMT to one that measures peoples' comfort and peoples' experience.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Geeti Silwal, Associate Principal, Perkins+Will at Geeti.silwal@perkinswill.com or 415.546.2943.

Sincerely,



Geeti Silwal, AICP, LEED AP
Associate Principal, Perkins+Will, San Francisco

May 20th 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Plug & Play Tech Center support of the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Plug & Play Tech Center I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Plug & Play runs a Mobility Innovation platform, in partnership with corporations like Mercedes Benz, Bosch, Ford, Nissan, Valeo, Delphi, and many more. Included in our innovation platform is a 3-month accelerator where we support mobility related startups go to market faster by offering services, resources and the connections that they require in order to accomplish their goals.

Given the interest in innovation in mobility and smart city space, we'd like to help connect you with our portfolio start-up companies to possibly engage in pilots, licensing deals, strategic partnerships and investment opportunities through this challenge.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Sobhan Khani, (Business development Manager – IoT/ Mobility) at sobhan@pnptc.com or 602-703-3157).

Sincerely,
Sobhan Khani

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

May 20, 2016

Subject: Propeller Health commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Propeller Health, I am pleased to provide this Letter of Support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

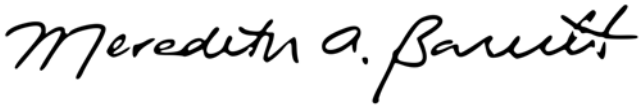
The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Propeller Health is a digital therapeutic focused on improving respiratory disease, and can help monitor and evaluate the health impacts of San Francisco's Smart City Challenge interventions. Our bluetooth-enabled sensors fit onto inhaled medications for asthma and passively collect information about where and when people experience asthma attacks and use their rescue medications, allowing us to identify hotspots of asthma across a city. We can then pull in environmental and neighborhood data to analyze what is driving asthma attacks region-wide. We see multiple possible contributions to San Francisco's efforts: evaluating the immediate impact of transportation interventions with a quantifiable, real-time health indicator, adding an innovative public-private partnership, and providing opportunity for citizen engagement.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Meredith Barrett, Vice President of Science and Research at Propeller Health, at 415-409-9258 or Meredith.barrett@propellerhealth.com.

Sincerely,



Meredith A. Barrett, PhD
Vice President of Science and Research
Propeller Health

PTV America, Inc.
1530 Wilson Blvd., Suite 440
Arlington, VA 22209, USA

(T) 571.645.5800
(C) 571.218.6042

www.ptvgroup.com

May 13, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: PTV Group commitment to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of PTV Group, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. The PTV Group will make available in-kind contributions to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

PTV Group believes in optimizing the movement of people and goods in cities, and regions, for a sustainable and smart future. This can be achieved by planning and managing our existing and future transportation systems which we already have in our cities, such as cars, taxis, trucks, buses, transits, cyclists, pedestrians etc., to the future transport systems, such as autonomous vehicles, delivery drones etc. PTV Group provides software solutions and professional services which enable planners, managers and operators to optimize movement of people (Transportation) and goods (Logistics) in real-time for traffic management, control and operation; and for short, medium and long term planning.

For a smart city, PTV offers it's faster than real time traffic predictions software solution PTV-Optima which is a great smart mobility tool to achieve a better connectivity of transport systems in a city. PTV-Optima offers connectivity of various modes of private and public transport and to the land-uses, connectivity of movement of people with goods, connectivity of traffic operations and transport planning and most important connectivity of transport systems and related data from various agencies within a city or a region.

For cities to become smarter in the way the manage transport operations they require state of the art mobility services to reduce congestion and improve the efficiency of the existing transport infrastructure. Smart mobility planning requires a robust transport platform, capable of using the existing transport systems and data such as the smart city traffic control center, as well as new

systems and data such as that from wireless sources. With live data fusion and a traffic prediction platform in which information can be shared quickly, PTV-Optima can augment the capability of smart control centers. As a result, both urban and inter-urban traffic can be managed to minimize delays for the drivers and maximize the utilization of the existing transport infrastructure. This lean smart mobility approach can improve the economic efficiency of towns and cities, as well as make the area a greener and more vibrant place to live and work.

PTV Group also has got extensive expertise and state of the art solutions to address future transformative transportation opportunities and its operation. One of such smart mobility opportunity for San Francisco is autonomous vehicles (AV) moving people and goods. PTV-VISSIM (automotive) provides is a highly detailed representation of vehicles moving in any environment. The application of PTV-VISSIM for autonomous vehicles in San Francisco will provide necessary insights in the following two fields:

- The requirements that a complex urban environment poses on the control of AV; and,
- The impact of AVs on the performance of traffic flow.

Any urban situation is far more complex than the "isolated" environment of a freeway where restrictions on free movement result from other vehicles only. In an urban context, there are more, differently moving actors interacting with each other: cars and trucks are mixed with pedestrians, bicycles and other road users. Additionally, traffic control, stop lines, traffic signals etc. determine the movement of any vehicles. San Francisco with its complex topography poses additional requirements which can be explicitly treated in PTV-VISSIM. Therefore, all such influences directly affect AVs can be directly introduced into PTV-VISSIM.

In addition, AVs with a movement model different from manually driven vehicles will have an influence on the performance of road traffic. Depending on the control algorithms the influences may be positive, e.g. higher capacities at signalized intersections, or negative, e.g. due to safety restrictions. Only when AVs are modelled in a detailed way, their influence on city traffic can be estimated. Modelling with PTV-VISSIM will allow testing different shares of AVs in the vehicle fleet as well as combining different "types" of AVs such as passenger cars, taxi-bots etc. in San Francisco. Since PTV-VISSIM treats all vehicles in their individual way, with different types of drivers, with/without driver assistance or controlled automatically and distinguishes between cars, trucks, busses, bicycles and pedestrians, with dedicated models for each of the interactions, it can also provide useful insights required for AV development as well as for the city traffic management in San Francisco, including conventional and autonomous vehicles.

PTV Group with its 30-year + leadership position in advanced logistics optimization software and over 2,000 active logistics customers, also provides a comprehensive software platform for the efficient planning, forecasting, operational management, driver interaction, and optimization

of urban freight and service fleets. Urban logistics is a major mobility challenge in San Francisco, as in cities throughout the world. Unique in the logistics software market, PTV's software can provide the basis for planning more efficient routes, paths through the network, real-time traffic-conditioned dynamic scheduling and other mechanisms for ensuring freight and service personnel arrive on time while minimizing congestion and emissions in San Francisco. Taking into account real-time and predicted traffic conditions delivered via PTV-Optima, delivery and service vehicles can be dynamically rerouted, stops can be re-ordered, and adjusted Estimated Time of Arrival (ETA) provided to all stakeholders, including fleets, shippers, drivers and end-customers.

PTV's urban logistics software platform is standards-based and can operate with available databases and integrate with other software and communications solutions, e.g. most popular vehicle telematics, supply chain management, enterprise resource management, CRM, dispatch, and fleet management systems. PTV Smartour is the professional route planning and vehicle scheduling application for individual fleet operators. At the same time it can be used as central route planning and control system to coordinate transports within a city by several transport operators. The application considers all relevant truck and fleet restrictions of a road network and all commercial and technical parameters that are relevant to calculate realistic delivery/collection routes. PTV Smartour considers customer time windows and driver regulations and can also ensure that the destination is prepared for the delivery and has available dock and personnel needed to unload the delivery. With the help of the PTV Drive&Arrive service all parties involved in a transport chain can be informed about the estimated arrival time at their location including historical as well as real-time traffic situation. In case of any deviation in time PTV Smartour can alter the route and/or schedule to take this into account, thus avoiding idle time, excess emissions, and congestion due to forced truck/van waiting times. To assist the driver of a commercial vehicle to follow the route in an optimum way (shortest, fastest) considering the type of vehicle and all road-site restrictions related PTV Navigator provides a turn-by-turn navigation solution. It might also be used to let the driver follow a pre-calculated route providing PTV Navigator with waypoints (guided navigation) to ensure a particular route, e.g. for the delivery of dangerous goods.

In addition to current urban delivery and services provision modes and methods, PTV's platform is prepared to utilize a mix of autonomous, shared vehicle fleets in addition to the existing modes of freight and services vehicles. Importantly, PTV software explicitly takes into account such vehicle-specific characteristics as height, weight, hazardous materials, etc. in order to ensure that safe and legal routes are adhered to in all cases. Local regulations dealing with noise abatement, turn restrictions including vehicle specific and time specific, parking and loading/unloading restrictions are also explicitly included.

The Smart City Challenge is an opportunity to advance toward the world’s first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with

San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

We are proud to be a part of this exciting vision for San Francisco. If you have any questions regarding this matter, please feel free to contact me, at shaleen.srivastava@ptvgroup.com.

Sincerely,

Shaleen Srivastava

Vice President (Traffic) North America
1530 Wilson Blvd. Suite 440
Arlington, Virginia 22209, USA
Tel.: +1 (571) 645-5800
Cell: +1 (571) 218-6042
shaleen.srivastava@ptvgroup.com

5.14.16

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Shipbird's support to the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Shipbird, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Shipbird uses a community conscious model that will help bolster local economies, while keeping additional vehicles off the road, offering green friendly shipping solutions (increasing vehicle electrification), and helping reduce large deliveries in neighborhoods. Our in-kind contributions will include sharing of our vast data sets. Included we can offer insight on what types of vehicles are being used, miles traveled, time to deliver, and location end points. Ultimately, we hope to increase use of hybrid/electric vehicles that will help lower the carbon footprint in our community.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Marc Diamond (of Shipbird, Inc.) at md@shipbird.com.

Sincerely,

Marc Diamond
CEO Shipbird

Streetline
5/16/2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Streetline's support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Streetline, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Streetline is the world's leading Smart Parking Company. Streetline has the most robust and accurate parking occupancy detection portfolio. In a world where other smart parking companies claim 85% accuracy, but actually deliver real world data that is as little as 15% accurate, Streetline routinely achieves real world results at 90-97% accuracy levels.

Streetline has a full portfolio of applications that make this data usable by drivers, merchants, city planning, parking enforcement, and third party application developers. Given that parking accounts for nearly 1/3 of all city traffic and that Streetline has proven up to a 43% reduction in the time it takes drivers to park, Streetline can deliver significant impact:

- Getting cars off the road faster lowers traffic and increases pedestrian and bike safety
- By simply turning cars off up to 10 minutes earlier, pollution can be reduced
- Fewer cars on the road means public transportation can navigate city streets and their routes more quickly and predictably
- Knowledge of ADA parking accessibility and availability would be greatly enhanced through Streetline's distribution of such information to the public through its various distribution channels.

This accurate parking availability data will also empower San Francisco Parking to optimize the usage and management of existing on/off street parking assets and help build San Francisco's Smart Transportation strategies and plans.

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Streetline was named one of Fast Company's 10 most innovative Companies in Transportation, as well as IBM Global Entrepreneur of the Year. Streetline was named Best Mobile Innovation for its Parker motorist guidance mobile application at the Mobile World Congress.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Kurt Buecheler, SVP Marketing, Bus Development, Streetline at kurt@streetline.com at 650-242-3416.

Sincerely,
Kurt Buecheler

Swiftly, Inc.
www.goswift.ly
530 Divisadero St. #263
San Francisco, CA 94117

Saturday, May 14, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Swiftly, Inc. Support of the San Francisco's Smart City Challenge Application

Dear Secretary Foxx,

On behalf of Swiftly, Inc. I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Swiftly, Inc. is a San Francisco based mobility tech startup that was developed out of Stanford's StartX accelerator program. We have created a next generation Mobility on Demand mobile application that we have already started to deploy in San Francisco. This application helps city residents find the fastest, most affordable, and most environmentally friendly ways to get from A to B by analyzing public and private transportation providers in real-time. Our ultimate goal is to reduce private car ownership, congestion, and greenhouse gas emissions while increasing the accessibility of transportation options for the entire community.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please feel free to contact me directly at jonny@goswift.ly or 858.414.5241.

Sincerely,

Jonathan Simkin
CEO of Swiftly, Inc.
jonny@goswift.ly
415.894.5223

VENIAM
THE INTERNET OF MOVING THINGS

May 16, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: **Veniam Inc. support of the San Francisco's Smart City Challenge application**

Dear Secretary Foxx,

On behalf of Veniam Inc. I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance Urban mobility technology and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Our cutting-edge technology for building mesh networks of connected vehicles has been commercially tested and operated in a mid-sized city for 18 months, and is used daily by tens of thousands of citizens. Veniam managed services enable your city to leverage an industry grade solution that fulfils the following promises:

1. Provide high-quality Internet connectivity to more citizens located both inside and outside buses, taxis, service vans and other vehicles;

2. Use the vehicles as roaming mobile sensor platforms to collect and analyze massive urban datasets with high resolution, which can be used for a myriad of smart city applications, from environmental monitoring and traffic control to smart waste management and public safety.

3. Build smart city services seamlessly on top of Veniam's platform to monitor, understand and manage the urban flows of people, vehicles and goods and citizen's mobility patterns, while empowering city services with new sources of revenue, information and connectivity;

For examples of Veniam's real-world smart city applications please refer to a case study for Porto, Portugal powered by Veniam products and services: https://veniam.com/wp-content/uploads/2016/05/PortoCaseStudy_Letter_2016-04-15.pdf.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Daniel Kennison, Director (dkennison@veniam.com) or Rohit Sharma, GM Veniam Inc. (rsharma@veniam.com).

Sincerely,

Rohit Sharma
650 575 3303

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Wave Mobile Solutions support of San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Wave Mobile Solutions, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

GRIDSMART technologies Inc. and Wave Mobile Solutions have partnered to address San Francisco's Vision Zero initiative. DSRC V2X + Wi-Fi + GridSmart will be added to the SFGo existing network utilizing the cat5e cables that have already been pulled and using the existing backhaul network which will save the city more than **10 million dollars**. DSRC equipment will be deployed at every intersection to 1) improve traffic flow to manage MMITS and 2) eliminate vehicle collisions. Wi-Fi will be deployed at every intersection to provide free Wi-Fi for connected citizens across the city and allow communications of MMITS systems including ride sharing and first and last mile transit information and updates. Lastly GridSmart cameras will be deployed at every intersection, using previously installed cat5e cables, to detect bikes and pedestrians in the street and alerts will be sent over DSRC to eliminate pedestrian fatalities as part of San Francisco's Vision Zero Initiative. DSRC equipped autonomous electric and ride share vehicles will be able to utilize this network to optimize their travel routes and reduce travel time while eliminating traffic accidents and reducing greenhouse emissions.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact Geoff Smith, Managing Director, at gsmith@wavemobilesolutions.com or 408-306-9205.

Sincerely,

Geoff L. Smith

May 13, 2016

David P. Cummins
Senior Vice President
Parking and Mobility Solutions

Xerox State & Local Solutions, Inc.
8260 Willow Oaks Corp Dr.
Suite 600
Fairfax, VA 22031
david.cummins@xerox.com
tel (301) 807-5775

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Subject: Xerox State & Locations support of the San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Xerox State & Local Solutions, I am pleased to provide this letter of support for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002.

The City's proposed research and demonstration projects will help advance the mobility technology of the future and are consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Xerox has a number of solutions that support these Vision Elements including:

- Trip planning and booking platform called the Mobility Marketplace,
- Smart Parking solutions including parking guidance, demand based pricing, and other congestion reduction initiatives,
- Video technology to enforce traffic laws and also capture data in support of Vision Zero initiatives, which can also be integrated,
- Connected car management leveraging our work the Mobility Transformation Center at the University of Michigan Transportation Research Institute, and
- Public transit passenger information and fare collection solutions for transit authorities globally.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We look forward to the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact me at 1.301.807.5775 or david.cummins@xerox.com.

Sincerely,

David P. Cummins
Senior Vice President
Mobility Solutions
Xerox State & Local Solutions, Inc.

zipcar

May 20, 2016

The Honorable Anthony Foxx
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Re: Zipcar commitment to San Francisco's Smart City Challenge application

Dear Secretary Foxx,

On behalf of Zipcar, the world's leading car sharing network, I am pleased to provide this Letter of Commitment (LOC) for San Francisco's Smart City Challenge proposal being submitted in response to the U.S. Department of Transportation's Notice of Funding Opportunity Number DTFH6116RA00002. Zipcar will make its services and data available to support the City's proposed research and demonstration projects, which will be consistent with the Smart City Challenge's 12 Vision Elements and four core principles of safety, sustainability, accessibility, and mobility.

Our commitments are as follows:

- Zipcar will directly support the city's goals of reducing private car ownership. We can proudly say that each Zipcar removes up to 13 personally owned cars from the road, and with 10 years of operation and more than 1,100 cars in San Francisco today, we've already had a significant impact. We will work with the city to expand our footprint and service offering to increase this impact.
- 30% of congestion in cities is due to people looking for parking. We're committed to improving congestion in SF as we expand and launch new services. Our new flexible services will allow members to take both pre-reserved trips and on-demand trips with a choice of their end destination to best match their needs.
- Zipcar's current API allows users of partner mobility apps to view nearby Zipcar locations. We're committed to enhancing our API to allow people to more easily use Zipcar starting from third-party apps. Also, Zipcar could potentially provide additional data on reservations and trips taken (while maintaining member privacy).
- Zipcar will directly increase regional transportation options through our plans to expand in Polk Gulch/Tenderloin, Cole Valley/Haight Ashbury, the Richmond District and throughout the Bay area (Oakland, Emeryville, North Bay).
- We will continue to develop smart parking solutions that will allow members more seamless access to public and private parking locations.

The Smart City Challenge is an opportunity to advance toward the world's first shared, electric, connected and automated transportation system. We appreciate the opportunity to partner with San Francisco on the Smart City Challenge to advance a future where transportation is safe, clean and affordable.

If you have any questions regarding this matter, please contact me at 415-361-8714 or jprospero@zipcar.com.

Sincerely,

Joe Prospero
Market Manager, San Francisco
Zipcar

35 Thomson Place, Boston, MA 02210
t 866.4ZIPCAR zipcar.com

APPENDIX: RESUMES

Proposed Key Staff

Timothy Papandreou

Joel Goldberg

Greg Riessen

Carli Paine

Andy Thornley

Lisa Walton

Dr. Susan Shaheen

Dr. Alexandre Bayen

Dr. Steve Shladover

Dr. Alexei Pozdnukhov

Laura Melendy

Dr. Joan Walker

Dr. David Ragland

Catherine Crump, JD

TIMOTHY NICHOLAS PAPANDREOU

97 Stillman Street | San Francisco, CA 94107 | timothy.papandreou@gmail.com| 415.297.8493

TEAM BUILDER | CHANGE AGENT | THOUGHT LEADER

Recognized Leader with nearly 20 years of public and private, local, regional, state and federal transportation and land use planning, design, project delivery and operations experience in the United States and Australia. Proven track record to think big, solve problems and deliver results through teamwork and collaboration.

- **Team Player** recognized as a "bridge builder" among public agencies, community and business groups to collaborate, partner and achieve results.
- **Team Builder** who leads by example to inspire professionalism and effective teamwork performance by empowering staff creativity, energy and innovation.
- **Strategic Thinker** with the ability to create, promote and land the vision with pioneering step-by-step work plans & processes for successful team delivery.
- **Change Agent** skilled in identifying gaps, stepping in early, taking charge and using data driven performance results to drive large-scale change.
- **Role Model** who leads by example in the workplace with integrity, quality, and a "can do" attitude and "walks the talk" focusing on a sustainability way of life.
- **Active Learner** advises and draws from over 50 cities, academia & NGOs to develop and apply global best practices and mentors mobility start-ups.
- **Thought Leader** on shared & automated mobility's role to meet city goals.

KEY SKILLS

Leadership:
Vision, Strategy & Implementation
Effective Communication
Strategic Decision Making
Data Driven Problem Solving
Emotional Intelligence
Peer Relationships
Organizational Development
Building Effective Teams
Building/Managing Partnerships

Subject Matter Expertise:
City Policy & Procedures
Transportation Policy & Funding
Integration & Optimization
Shared Mobility Service Models
Complete Streets Design & Policy
Transit Operations & Traffic Safety
Project Management & Delivery
Parking & Demand Management
Value Capture Agreements
User Experience

Professional Experience

San Francisco Municipal Transportation Agency, San Francisco CA **Jan 2009– Present**

Chief Innovation Officer Oct 2015-Present

- Thought Leadership: Represent agency at various industry and policy groups on the future of mobility.
- City Transportation Platform: Integrate shared, scheduled, on-demand and service deliveries in the city.
- Mobility As A Service: Collaborate with shared mobility providers to integrate routing & payment systems.
- Automated Vehicles: Integrate technology into shared & city fleets to reduce demand for parking & streets.
- Partnerships: Collaborate with business, community and government to improve mobility outcomes.

Director, Strategic Planning and Policy Jan 2009-Oct 2015

- Team Leadership: Manage up to 50-person team's workflow priorities, hiring, training and performance.
- Fiscal Management: Manage $5-7M budget, contracts & accounts; secure over $100M in capital grants.
- Operations & Safety: Create and lead inter-agency Vision Zero program to reach zero fatalities by 2024.
- Project Delivery: Manage cross-functional teams on dozens of transit and streets projects and programs.
- Engagement: Manage business and community partnerships and relationships at all levels of government.
- Strategic Planning: Develop 6-year, staff roots Strategic Plan to reach 50% non-driving mode share by 2018.
- Public Private Partnerships: Development Agreements, America's Cup, Car/Bikesharing, and Shuttle Fees.

Professional Experience (Continued)

Metro, Los Angeles CA **Jan 2005 – Jan 2009**

Transportation Policy Manager

- Develop programming and technical analysis for long-range plans and the Measure R sales tax.
- Provide policy analysis for Federal Reauthorization, SB 375 and related state transportation legislation.
- Represent Metro at the local, state and federal level, and with the 88 cities in the county.
- Develop and review public/private partnerships (P3) policy for transit, goods movement & highways.

Metro, Los Angeles, CA **Jul 2000– Jan 2005**

Transportation Project Manager

- Matrix with consultant teams to assist and manage 4 light rail and 2 bus rapid transit projects
- Assist in creating land use transportation plans for Metro stations and development agreements.
- Liaison to Southern California Association of Governments, LAX, Westside and South Bay Cities.
- Assist in re-branding agency to "Metro", which is one of the most awarded brands in the industry.

Earlier Career History

City of Malibu, Malibu CA **Jan 2000- Jul 2000**

Assistant City Planner: Land Use Development Permits, Traffic Operations, Environmental Analysis

State of Victoria Department of Infrastructure, Melbourne, Australia **Jan 1998- Dec 1999**

Transport Officer: Land Use Policy, Urban Economics, Transportation Funding (P3s) & Planning, Urban Form Codes

PPK Environment and Infrastructure, Melbourne, Australia **Mar 1996-Jan 1998**

Assistant Transport Planner: City General Plans, Traffic Analysis, Major Office/Mixed-Use Developments

One Link Transport (now Myki) Integrated Fare Card, Melbourne, Australia **Jan 1995-Mar 1996**

Transit Operations Assistant: Transit Operations, Ticket Vending Machines, Fleet fare boxes, Station Amenities

Tesltra Mobilenet Telecommunications, Melbourne, Australia **Jun 1993-Jan 1995**

Transit Operations Assistant: Transit Operations, Ticket Vending Machines, Fleet fare boxes, Station Amenities

Non-Government Organizational Experience

Cultivating Sustainable Communities Los Angeles (Founding Board Member) **Jan 2001-Jan 2009**

Developed city programs, bi-lingual electric car conversion kit, community land trusts, closing digital divide programs.

National Association Of City Transportation Officials (NACTO) **Jan 2014-Oct 2014**

Provide thought leadership and policy on shared and automated mobility integration for NACTO's 40 member cities

Education

Master of Arts in Urban Planning (Transportation)
June 2004 University of California, Los Angeles, CA

Bachelor of Applied Science (Urban Planning and Economics)
March 1998 Royal Melbourne Institute of Technology, Australia

Software: Office, Drive, Adobe Suite, Social Media, Project Management, Traffic Modeling

Achievements/Awards

2015 American Public Transportation Association Platinum Sustainability level Agency Certification
2015 SFMTA Strategic Plan 50% non-driving mode share goal by 2018 reached in late 2014
2015 National Highway Transportation Safety Administration recognition of Vision Zero Traffic Safety Action Strategy
2014 City lead programmer for NACTO Conference in San Francisco-record attendance and budget
2013 APTA Gold Sustainability level Agency Certification
2012 International Development and Transport Policy Sustainable Mobility Award for San Francisco Holistic Plan
2011 DoE National Climate Leader Award for SFMTA Climate Action Plan
2008 University of California and Metro Executive Leadership Program: Effective Agent of Change Award
2004 University of California Award of Excellence for Thesis: Car Sharing as the Bridge to Sustainability

JOEL C. GOLDBERG **(510) 339-2560**
7237 Wild Currant Way, Oakland, CA 94611 cogniznt@gmail.com

GOAL

To ensure the planned and timely delivery of funds to San Francisco for state of good repair as well as innovative projects and programs that advance active and sustainable mobility options.

- ► *Nearly 24 years of transportation planning, long-range programming, and grant procurement and administration, including nine years of management experience, to the position.*
- ► *Strong relations with Bay Area, State and Federal partners to achieve the City's transportation goals.*

EXPERIENCE

San Francisco Municipal Transportation Agency (SFMTA) (2007-present).

Manager, Capital Procurement & Management (2007-2009, 2010 – present). Acquire and manage all operating and capital grants for nation's eighth largest transit operator and San Francisco's surface transportation provider. Applied decades of of visioning, negotiating and consensus building skills to achieve well-understood and agreed upon results. *Six direct reports.*

- ► League of Cities representative (one of two) on Active Transportation Program TAC.
- ► Agency Single Point of Contact and lead for all matters related to Caltrans and FHWA funding.
- ► Chair, MTC Program Delivery Working Group
- ► For Fiscal Years 2013 and 2014, my team secured grants worth over $741 million supporting transit, bicycle, pedestrian, taxis, and multimodal projects.
- ► Full Funding Grant Agreement for Central Subway: Led all funding actions for the $1.578 billion project extending rail service to Chinatown, including execution of $942 million FFGA with the FTA.
- ► TIGER grant: $10 million for street and light rail improvements to City's Mission Bay neighborhood.
- ► Administration of all capital activities with a strong focus on project delivery and timely closeouts.
- ► Managed multi-party and 'partner' (pass-through) arrangements for innovative projects: Electric Vehicle Taxis, SF*park* variable parking pricing program, electric bicycle sharing.
- ► Implemented sophisticated, customized grant management database software.

Fund Programming Manager (2009-2010). Ensured that SFMTA's priority capital needs were matched to appropriate programs and oversaw all capital funding requests for all modes. *Three direct reports.*

- ► Extended transparent, accountable, multimodal programming paradigm to all corners of the Agency, bringing transit and other functional areas to the same table.
- ► Oversaw TIP Submittals by archiving, updating and /or adding nearly projects.

"Answer, Please!" Consulting (2006-07). Devoted time to being with my two young sons while working part-time as a transportation and planning consultant.

Sacramento Regional Transit District ("RT") (2005-06). Grants Manager. Interacted with key staff at local, state and federal levels to ensure timely fund receipts. *Three direct reports.*

- ► Produced and refined complex funding plans for three light rail extensions.
- ► Compiled Capital Budgets and launched 30-Year Capital Improvement Plan.
- ► Prepared Federal Appropriations materials and made numerous Board presentations.

San Francisco Bay Area Rapid Transit ("BART") (1998-2005). Principal Financial Analyst.

- ► Briefed General Manager, Deputy General Manager and Board members on key funding issues.
- ► Applied for and secured hundreds of millions of dollars of grants.
- ► Chaired MTC Transit Finance and Fund Programming Working Groups.
- ► Managed and presented BART long-range 30 Year Finance and System Reinvestment Plans.

SamTrans / Caltrain (1995-1998). Associate Planner.

- ► Developed 20-Year Capital Improvement Programs (CIPs) for SamTrans and Caltrain.
- ► Wrote Bus Service Evaluation Study scope for optimizing service in light of BART extension to San Francisco International Airport.

San Joaquin Council of Governments (1992-1995). Assistant Regional Planner.

- ► Compiled 1994 Federal Transportation Improvement Program project listings.
- ► Managed Regional Bicycle Facilities Master Plan and funding program.
- ► Authored Agency's first Park-and-Ride Plan and sales tax funded program.
- ► Administered Transportation Development Act (sales tax) program funds to eight jurisdictions.
- ► Launched Federal "ISTEA" Transportation Enhancement Activities Program.

EDUCATION & TRAINING

Eno Foundation, inaugural Transit Mid-Manager Seminar, Baltimore, 2010.

Master of City and Regional Planning, University of Pennsylvania, Philadelphia, 1996.

Urban Design and Planning Program, Harvard University, summer, 1988.

Bachelor of Arts, Brandeis University, Waltham, MA, 1988.

AFFILIATIONS

- ► WTS International (former Women's Transportation Seminar)
- ► Boy Scouts of America: Cub Scout Den Leader for 5 years, now Troop Committee Chair and Acting Scoutmaster.

FINALLY

I shoot hoops, practice Indonesian martial arts, take in Delta blues, and chase steam trains nationally with my family.

GREG RIESSEN, PE

(415) 906-0396
greg.riessen@gmail.com

Ten years of engineering and planning experience in the integration of cutting-edge transportation and sustainable land use projects in San Francisco and the greater Bay Area

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Transportation Engineer, Sustainable Streets Division
San Francisco Municipal Transportation Agency 2015-Present

- Leads the planning, design, implementation and integration of high priority **Muni Forward, Vision Zero and Bike Strategy** streetscape redesign projects that enhance transit and traffic operations, safety, and the customer experience. Typical project components include bus and rail transit-only lanes, widened sidewalks with corner bulbouts, placemaking elements, protected bikeways, and freight and passenger loading areas.

- In pursuit of minimizing delay and maximizing reliability for transit, while simultaneously enhancing safety for all modes, responsible for optimizing the performance of SFMTA's key **light rail traffic signal corridors** serving the emerging eastern side of San Francisco.

- Passion for discovering and applying new insights that enable higher levels of signal functionality while also paving the road for **connected and autonomous vehicles** and related emerging technologies. Coding of **traffic microsimulation models** using the VISSIM and SimTraffic software platforms to analyze multimodal operations and to visually convey network performance to decision makers.

<u>Current SFMTA projects being managed include:</u>

  - Third Street light rail corridor traffic signal and crosswalk upgrades to enhance transit signal performance, reduce left-turn collisions and improve pedestrian safety;
  - Folsom Showcase Street through Soma including widened sidewalks, transit boarding islands, protected bikeways, and pedestrian-oriented traffic signal phasing;
  - West Portal Avenue transit-only lanes, turn restrictions and placemaking improvements;
  - Montgomery and Kearny complete street redesigns through downtown, including new bicycle facilities, transit lanes and pedestrian scrambles;
  - Overhaul of the Planning Department's transportation environmental review procedures and the replacement of traffic Level of Service (LOS) with Vehicle Miles Traveled (VMT), including quantifying the traffic generation of on-site parking;
  - Transit Center District Plan detailed design, legislation, and coordination among multiple public agency and private developers that are undertaking the implementation.

Transportation Planner, Citywide and Environmental divisions
San Francisco Planning Department 2009-2015

- Managed the planning, design, and coordination of the Planning Department's most controversial and multifaceted streetscape projects, including both projects sponsored by the Department and by private developers.

- Conceived the **Railyard Boulevard Project** concept in order to enhance transit connectivity, create livable communities, and remove barriers between neighborhoods. Project includes the conversion of I-280 into a surface boulevard, the undergrounding of the Caltrain railroad tracks, and transit-oriented development along the former freeway and railyard parcels.

- Managed the exhaustive environmental transportation study of the **Transit Center District Plan**, which analyzed 80 intersections and 12 transit routes as well as pedestrian, bicycle, parking, loading, and emergency vehicle operations.

- Led the transportation planning of the Central Soma Plan which comprises a major residential and commercial upzoning and reconstruction of 48 street blocks, located around the under-construction Central Subway. **Led multi-agency team** in the creation and internal vetting of streetscape, and also led the consultant team conducting the environmental transportation analysis.

Other major San Francisco Planning Department projects

Transportation and placemaking projects

Mission Streetscape Plan
Better Streets Plan
Fisherman's Wharf Public Realm Plan
Cesar Chavez Street

Land use plan environmental review

Candlestick Point Hunters Point Shipyard
Parkmerced
Transit Center District
Treasure Island

Large development projects with streetscape enhancements

1540 Market Street and Oak Street Plaza
2001 Market Street and Whole Foods
California Pacific Medical Center
181 Fremont Street Tower
5th/Mission Technology Hub
SF Museum of Modern Art and SFFD Station #1

Transportation Engineer
Fehr & Peers Transportation Consultants, San Francisco 2006-2009

Prepared Transportation Impact Studies and Environmental Impact Reports for private and public land use and transportation projects; developed traffic simulations of transit vehicles, automobiles, bicyclists and pedestrians using the VISSIM and Simtraffic software platforms; developed truck turning templates using the AutoTURN software platform; managed project budgets and schedules; and articulated findings to decision makers, stakeholders and general public. Major projects include:

Temporary Transbay Center
Geary Bus Rapid Transit
Military West Street Road Diet, Benicia
Transit Center Bus Ramps and Yards
Highway 101 Greenbrae Corridor, Marin County
UCSF Transportation Operations Study

Education and Qualifications

Professional Engineer, State of California, Traffic Branch, License #2960.
Bachelor of Science in Transportation Engineering and Planning, Cornell University, Ithaca, NY, 2006.

CARLI PAINE

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PROFESSIONAL EXPERIENCE

San Francisco Municipal Transportation Agency — **San Francisco, CA**

Transportation Demand Management Project Manager — March 2011-January 2014
Manager, Transportation Demand Management Team — January 2014-March 2016
Manager, Land Use Development & Transportation Integration — March 2016-present

- Serve as agency liaison to Mayor's Office of Economic and Workforce Develoment on major land use development projects, identifying and negotiating optimal transportation programs
- Lead agency transportation demand management (TDM) efforts including development, implementation, and evaluation of innovative mode shift strategies, policies, and programs.
- Manage high profile projects with diverse stakeholders and interests including: pilot Commuter Shuttles Program, TDM Ordinance for new development, and TDM for 34th America's Cup.
- Represent SFMTA's interest with other agencies, developers, and other stakeholders with regard to TDM components in negotiation of developer agreements and in implementation of approved projects.
- Develop and deliver presentations to boards, commissions, community organizations, and conference attendees, communicating technical information and creating partnerships.
- Serve as liaison with other public agencies, corporations, elected officials, and community stakeholders on TDM policy development and programs.
- Project manage SFMTA's Super Bowl 50 San Francisco event responsibilities, overseeing schedules and ensuring dependencies between individuals and divisions.
- Supervise and manage team of seven staff, including hiring, establishing and delegating priorities, workplan oversight, performance planning and evaluation, mentoring.
- Lead inter-agency TDM working group to develop standardized TDM policy for San Francisco (TDM Ordinance to be introduced in March, 2016)
- Conduct and supervise correspondence with members of the public, other agencies, private sector parties, and decision-makers.
- Conceptualize and compose grants, manage awarded grants.
- Manage contractors and vendors, including RFP and purchase processes.

TransForm *(formerly TALC, the Transportation and Land Use Coalition)* — **Oakland, CA**

Transportation Program Director — August 2006-February 2011

- Promoted cost-effective public transportation investments through regional, state, and federal policy development and advocacy.
- Administered $20 million Bay Area-wide Safe Routes to Transit Grant program.
- Analyzed, crafted positions on, and advocated for or against state and regional transportation policies and legislation.
- Communicated with diverse audiences and served as spokesperson.
- Served as liaison between TransForm and other non-profit partner organizations, public agencies, and elected and appointed officials.
- Provided technical expertise to diverse partner organizations including public health, social justice, environmental, labor, and bicycle and pedestrian advocates.
- Hired and supervised consultants and four full- and part-time staff.
- Conceptualized and composed grant proposals and grant reports for foundation funders.

Planning and Land Use Department, City of Berkeley — **Berkeley, CA**

Associate Planner, Policy Division — November 2005-August 2006

- Served as Planning Commission Secretary.
- Analyzed and developed land use policies, including development of transportation services fee.
- Developed employment and household data for regional transportation and land use agencies.

- Wrote reports and made presentations to community groups, appointed and elected officials, and other stakeholders on policy analysis and recommendations, translating technical information for lay audiences.

Department of Community Development, City of El Cerrito **El Cerrito, CA**
Assistant Planner September 2001-August 2003

- Initiated and managed long-term projects including creek restoration; open space property acquisition; and, inter-jurisdictional pedestrian and bicycle trail alignment and development.
- Researched and coordinated environmental work including permitting and assessment.
- Wrote RFPs and oversaw public bid process for design, construction, and consultation.
- Conceptualized and composed grant applications, with over $1.5 million in grants successfully obtained; and, administered funded projects.
- Analyzed and presented projects to City Council, funding agency boards, and public workshops.
- Acted as liaison between the city and resident groups, state agencies and other agencies.

Goddard Institute for Space Studies, NASA/Columbia University **New York, NY**
Project Coordinator, "Climate Change and a Global City: An Assessment of the Metropolitan East Coast Region" May 2009- February 2002

- Managed daily operation of Congressionally-sponsored project assessing climate change impacts on New York City.
- Served as liaison and coordinator of research and outreach activities with participating scientists, public agency and non-profit stakeholders, and the media.

EDUCATION

Massachusetts Institute of Technology **Cambridge, MA**
Department of Urban Studies & Planning, Environmental Policy Group June 2005
Master in City Planning; Wallenberg Sustainability Fellow, Rappaport Public Policy Fellow

Columbia University **New York, NY**
BA, Environmental Science; Deans List May 1999

School for International Training **Ecuador**
Ecuador Comparative Ecology Program Fall 1998

Biosphere 2 Center **Oracle, AZ**
Earth Semester Spring 1997

LEADERSHIP

International Association for Public Participation SFMTA Training **March 2015**
MEA Leadership Development Program **September-December 2014**
Coaching for Execution **October 2014**
Facilitation Skills: A Leader's Toolkit **October-November 2014**
Communicating for Success **September 2014**
Crucial Conversations **March 2014**
24 PLUS for Supervisors and Managers **November 2011**
Walk Oakland Bike Oakland, Board of Directors **July 2008-December 2010**
Rockwood Art of Leadership Academy **March 2010**
Coaching Skills for Managers and Leaders, Compass Point **November 2009**

SKILLS

Computer: Excel, Word, Powerpoint, MS Project; Salesforce; Drupal
Communication: Excellent written and oral communication skills; Grant writing
Language: Conversational Spanish, basic reading and writing in Spanish

Andy Thornley

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415-244-4605

Experience

Senior Project Analyst, Sustainable Streets Division July 2014-present
San Francisco Municipal Transportation Agency, San Francisco, CA

Manage parking and right-of-way allocation in support of the city's Transit First policies and SFMTA's strategic plan, through planning, outreach, analysis, policy formulation, interagency coordination, internal and external communication, and implementation. Lead On-Street Car Share Pilot program, converting hundreds of on-street parking spaces for dedicated car share use in every district of the city.

Senior Project Analyst, SF*park*
Serco Inc, San Francisco, CA July 2012-June 2014

Manage and support projects related to the implementation of the San Francisco Municipal Transportation Agency's SF*park* pilot and other related projects. Lead planning, outreach, analysis, policy formulation, interagency coordination, internal and external communication, and implementation of neighborhood parking management planning and car share facilitation.

Policy Director
San Francisco Bicycle Coalition, San Francisco, CA April 2011-June 2012

Direct policy and planning initiatives for 12,000-member nonprofit advocacy organization promoting the bicycle for everyday transportation. Advocate for San Francisco Bicycle Plan development and implementation, as well as other plans and projects benefitting bicycle transportation and sustainable streets in San Francisco. Organize, engage, coach, and collaborate with SFBC members and community members, public agency staff, elected and appointed officials, and other stakeholders and decision makers, within San Francisco and across the region and nation. Direct efforts to enhance and secure public and private funding for bicycle projects and programs in San Francisco in local, regional, state, and national domains. Engage and shape larger land-use and transportation policy, planning and development processes in the city and region, including legislative and regulatory efforts at local, state, and national levels.

Program Director
San Francisco Bicycle Coalition, San Francisco, CA March 2005-April 2011

Direct advocacy and policy initiatives for 12,000-member nonprofit advocacy organization promoting the bicycle for everyday transportation. Advocate for San Francisco Bicycle Plan development and implementation, as well as other plans and projects benefitting bicycle transportation and sustainable streets in San Francisco. Organize, engage, coach, and collaborate with SFBC members and community members, public agency staff, elected and appointed officials, and other stakeholders and decision makers, within San Francisco and across the region and nation. Supervise two full-time staff as well as temporary project managers and interns. Direct programs in traffic safety education and enforcement, including League of American Bicyclists-certified adult bicycle education classes and outreach programs for bicycle riders and other street users. Direct efforts to enhance and secure public and private funding for bicycle projects and programs in San Francisco in local, regional, state, and national domains. Engage and shape larger land-use and transportation policy, planning and development processes in the city and region, including legislative and regulatory efforts at local, state, and national levels.

Member, Board of Directors January 2016-present
San Francisco Bicycle Coalition

Member, Board of Directors March 2013-present
Planning Association for the Richmond

President, Board of Directors May 2005-October 2012
TransForm, Oakland, CA

Member, Board of Directors April 2005-April 2010; October 2011-June 2012
Bay Area Bicycle Coalition

Founding Roustabout February 2004-present
San Francisco Ocean Film Festival

Chair September 2003-May 2005
San Francisco Bicycle Advisory Committee

Principal
Scoot Design, San Francisco, CA January 2002-April 2005
Communication design consultancy: Web and print design, production, and maintenance for publishing, marketing, sales, and general communication. Internet consulting (development, project management, training, hosting, system integration) for business and nonprofits.

Principal
TRS, San Francisco, CA January 1996 - January 2002
Computer system design and support services: Web design / development / maintenance; general internet consulting (analysis, implementation, training, and support); process consulting; database design / development / maintenance; system integration.

Senior Programmer/Analyst September 1992 - June 1997
Norcal Mutual Insurance Company, San Francisco, CA
Develop and enhance professional liability insurance systems (policy data, billing, claims processing, financial). Evaluate new technologies and tools, from office automation to workgroup and messaging environments and IP utilities and services. Designed, developed, and evangelized a pioneer intranet.

Information Analyst January 1990 - January 1992
Genstar Container Corporation, San Francisco, CA
Design and implement decision-support systems enhancing access to significant existing data resources. Integrate and consolidate existing production reports into a coherent library; expedite user access to data resources generally; extend analytical computing to the user community.

Programmer/Analyst November 1988 - January 1990
Genstar Container Corporation, San Francisco, CA
Develop and maintain application software for operational systems. Responsible for monthly customer rental billing process; provide overnight technical support to users in European and Asian offices (as well as business-day support for the headquarters office community).

Education

New York University, New York, NY - Bachelor of Arts: History, Political Science, Fine Arts, May 1982

Lisa M. Nedley-Walton
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Objective: To achieve a Senior Management position that will provide challenge and creativity while working with a company and team that is goal focused and willing to take appropriate risk. I am looking for a balance between business application and technological solutions.

Professional Experience

- Responsible for TechOps, Enterprise Application Development (Oracle ERP, DW…), IT Compliance and Security, Middleware, Data Base Management, Web Applications-SharePoint, and Enterprise Infrastructure and Data Centers and Cloud services. Responsible for the overall delivery of IT services to the company.
- Implemented Oracle HR, Process Manufacturing, Oracle Project Management Modules.
- Reviewed, analyzed and documented current business processes within supply chain.
- Responsible for IT Governance including Regulatory Compliance (SOX,PCI,HIPAA,ITAR,CoBiT, ITIL …) and IT Security; IT control environment – Application and infrastructure.
- Responsible for IT Security, Infrastructure, Policy, Procedure, Compliance
- Responsible for IT Internal and External Audit compliance and remediation
- Responsible for IT Operations and Infrastructure for a Global high tech company including Oracle DBA group and Oracle Development environment.
- Responsible for managing LAN/WAN, Telephony and Desktop Standards
- Develop Strategic Plans, Roadmaps and Architecture for Technical Operations, Security and Compliance, linked to business objectives and services
- Developed control execution calendars, test audit plans, and subsequent metrics and dashboards
- Work extensively with Internal and External Audit teams
- Developed roadmaps and framework that maps security standards to CoBit Key controls and ISO standards. Worked with the latest ITIL security framework for delivery and measurement of services.
- Managed budgets in excess of 10 million dollars per quarter.
- Managed the implementation of the Asian Headquarter Start Up
- Implemented Operational Best Practices; NOC (Network Operations Center), Global Change Management, Global Release Management, Defined SLAs and used ITIL as delivery model framework
- Development of Application development process; SDLC, Control processes, Production Lockdown, Release management
- Extensive Project Management Experience on Large Multiple Projects.
- Networking protocols, implementation and support
- Management and Administration of serial Network to distributed locations.
- Extensive presentation experience of projects and topics to large groups.
- Management of Mergers and Acquisition site assimilation.
- Negotiation of large telecom and network services contracts.
- Reduced costs of network and telecom 50% year over year while increasing service.
- Developed and conducted training on a three day corporate management seminar for middle managers on a global level.
- Unix: Sun Solaris, HPUX, AIX; Windows: NT, 98, Networking; Cisco, DB; Oracle ERP
- Managed the Program that migrated from Netscape Mail and Calendar to Microsoft Products – Globally, including application integration.

SFMTA (San Francisco Municipal Transit Agency) *October, 2015 - present*

San Francisco, California
CTO – Chief Technology Officer,.

San Francisco's Municipal Railway, known the world over as Muni, has served the citizens of San Francisco for over a century, literally rising from the ashes of the great San Francisco earthquake of 1906. Its colorful history is as unique as its fleet of buses, light rail vehicles, historic streetcars and iconic cable cars.

Established by voter proposition in 1999, the SFMTA, a department of the City and County of San Francisco, oversees the Municipal Railway (Muni), parking and Traffic, bicycling, walking and taxis. With four modes of transit, Muni has approximately 700,000 daily passengers. More than one million people traverse the city each day and rely on the SFMTA to ensure safe and reliable travel by transit, walking, bicycling, taxi and driving. Supporting the business of the SFMTA are 6,000 employees city wide.

As the IT leader, I am responsible for the overall leadership and management of the IT organization. I am also responsible for providing strategic planning and technical guidance on all information technology programs and initiatives for SFMTA. I am accountable for evaluation, implementation, and operation of SFMTA's technology infrastructure and business system development and design. I also develop SFMTA's future technology vision to enable growth and improve efficiencies throughout the organization. I actively partner with the various city agencies to ensure proper collaboration and synergies between systems and processes. I work with the Mayor's office of innovation to determine technology direction and provide leadership and to ensure the interests of the SFMTA are understood.

Bare Escentuals Beauty, Inc. *June, 2010 to October, 2015*
San Francisco, California
SR. DIRECTOR, IT GLOBAL OPERATIONS, REPORTING TO VICE PRESIDENT, IT.

Responsible for infrastructure including server environment (Virtual, Unix and Windows), data centers, network, telephony, storage (SAN/NAS), IT Security, middleware, DBA team, IT QA and Release Management, service desk, cloud services, and overall compute architecture and user support. Develop architectural principles and strategy. Responsible for the management of large enterprise operational projects design and deployment. Work with the business and development teams to define and develop appropriate processes, and associated system support. Develop strategic plans based on business goals. Develop and manage budgets for areas of responsibility. Work closely with Corporate Compliance Organizations to ensure compliance to PCI and SOX controls within compute environment. Develop Service Level Agreements for service delivery in all areas, using ITIL model as a framework. Manage the vendor relationship and SLAs of our partners.

- Role Accomplishments: Maximized the Microsoft platform - Moved to O365/Cloud, OneDrive, SharePoint in the Cloud, Lync telephony and collaboration. Moved to a commercial cloud - Azure and currently backup our EU and Asia sights to Azure. We are currently moving to take our DR to Azure as well as our DEV/Ops.
- Moved from 30% virtualized to 98% virtualized over 3.5 years, 3) Decreased Data Center power from 48KWH to 30KWH.
- Optimized and rationalized the storage footprint - had several different models and makes down to one platform for enterprise and one for Data Warehouse.
- Actively moved from Sonic and IBM WebSphere messaging to Oracle Fusion SoA suite.
- Consolidated the DBA functions to one team (SQL and Oracle).

XOMA *January, 2007 to June, 2010*
Berkeley, California
DIRECTOR, IT DELIVERY, REPORTING TO CIO

Responsible for application development, enterprise applications including Oracle ERP platform, Exchange Email,Web applications, SharePoint environment. Responsible for infrastructure including server environment (Unix and Windows), data centers, network, telephony, storage (SAN), and overall compute architecture. Develop architectural principles and strategy. Responsible for the management of large enterprise projects application development and deployment. Work with the business to define and develop appropriate business processes and associated system support. This included existing and new processes to support the business. Develop strategic plans based on business goals. Develop and manage budgets for areas of responsibility. Work closely with Quality and Corporate Compliance Organizations to ensure compliance to GxP and SOX controls within compute environment. Develop PMO – processes and management of IT and Business unit projects and programs. Developed Service Level Agreements for service delivery in all areas, using ITIL model as a framework. Manage the vendor relationship and SLAs of our outsourcing partners. Developed various business management dashboards to support management decisions and provide accountability reporting.

XILINX *December, 2004 to January, 2007*
San Jose, California
DIRECTOR, IT GOVERNANCE, REPORTING TO CIO

Responsible for IT Compliance and IT Security on a global basis. Work with Finance and Functional Compliance groups to ensure company compliance of all regulatory obligations. Manage assessment of key control environment. Work with internal audit and external audit teams to ensure compliance. Manage IT Security and Compliance to ISO 17799, COBIT and COSO standards. Develop policies, procedures and security technology roadmap, strategies and architecture. Manage Security and Compliance operating budget. Manage application control process; data base production lockdown, release management, SDLC, design review. Business analysis of segregation of duties for SoX controlled applications. Develop service metrics for project and service delivery using the ITIL model as a framework.

XILINX *July, 2004 to December, 2004*
San Jose, California
DIRECTOR, IT TRANSFORMATION, OFFICE OF THE CIO

Responsible for the analysis and development of an IT Transformation Program to enable agility in the operation of WWIT. Developed IT Operating model, Intern Program, Leaning and development program, skill and gap analysis for the organization. Developed Project Life Cycle process for application development. Migrated organization from Netscape email (front end and back end) to Microsoft platform including application integration processes.

XILINX *July, 2001 to July, 2004*
San Jose, California
DIRECTOR, TECHNICAL SERVICES. Reporting to CIO

Responsible for technical IT infrastructure division including; LAN/WAN, Internet connectivity, Security, Telephony, Security Management, Servers Administration, Data Centers, Data Base Administrators (Oracle), Computer Operations, Help Desk, for North America, Asia and Japan.

Defined and managed Technical Operations budget for North America and Asia. Vendor evaluation and management of key vendor relationships (QBR process). Developed NOC (network operations center) and associated processes to support the services provided to the business. Developed first Change Management process and tool implementation to manage changes to the environment. Responsible for all technical projects and technical support to applications development. Worked with Application Development and business partners to coordinate resources and identify appropriate infrastructure to support business requirements.

XILINX *May, 1999 to July. 2001*
San Jose, California
SR. MANAGER, GLOBAL NETWORK/TELECOM/SECURITY AND OPERATIONS. Manage LAN/WAN infrastructure and design. Manage all telecom systems as well as internet engineering and global infrastructure Security. Manage the San Jose Operations; Backup, computer room, data center design. Manage departmental budget

XILINX *October, 1998 to May, 1999*
San Jose, California
MANAGER, DESKTOP ENGINEERING. Manage first through third level support teams for desktop devices including, UNIX workstations and desktop PCs and laptops. Customers include San Jose Campus as well as remote users across US, Pacific Rim and Europe. Support team is 15 individuals that are responsible for internal helpdesk, field techs, and third level support as well as NT server administration for Xilinx. Ensured desktop environment supported evolving application environment. Evaluation and design of desktop environment.

XILINX *August 1998 to October, 1998*
San Jose, California
MANAGER, HELP DESK. Managed first level support team for internal helpdesk. Support of all UNIX and PC desktop devices. Managed training of supported applications and infrastructure.

XILINX *February, 1997 to August, 1998*
San Jose, California
PROGRAM MANAGER, TECHNICAL SERVICES. Managed large cross functional projects for Technical Services. Defined business requirements, RFP development, performed vendor evaluation, functional and technical design and implementation plans. Coordinated with Infrastructure and Application organizations. Projects included: Telephony/data vendor consolidation, Software distribution, Asset Management.

XILINX *October, 1996 to February, 1997*
San Jose, California
PROJECT MANAGER, NETWORK SERVICES implementations for the Network and Technical Services group. Act as liaison to field and other areas of company relative to Network Services. Analyze business requirements and provide recommendations to management. Develop and design network services for company. Implemented Global Frame Relay Network.

Mervyn's *April, 1995 to October, 1996*
Hayward, California
TECHNICAL ANALYST, MIS, DESKTOP TECHNOLOGIES. Provide technical expertise in the installation and support of operating systems and business applications on the PC platform. Design and support of serial network to distributed locations. Developed the Win95 Lap Top Configuration for implementation.

Mervyn's *February, 1991 to April, 1995*
Hayward, California
SENIOR STORE SYSTEMS SUPPORT ANALYST. Provide system support to the stores organization. Act as liaison between stores and corporate headquarters. Develop and provide system requirements to support business functions. Provide expertise during development, testing and implementation of systems and processes. Provide procedural and training support of new/current systems and processes. Manage communication network to stores including desktop process and applications. Application design, development and delivery responsibilities to stores' organization.

Supervise Communication Coordinator and Communication Analyst in their job functions to support of the store's organization.

Mervyn's *October, 1989 to February, 1991*
Hayward, California
STORE SYSTEM SUPPORT ANALYST. Support store's organization on systems and processes. Liaison to MIS area for requirements, development, testing, and implementation of systems to support stores' business functions. Provide stores with procedural and training support for systems and processes.

Mervyn's *September, 1988 to October, 1989*
Phoenix, Arizona
OPERATIONS MANAGER. Store Operations Manager in the Phoenix, Arizona market. Responsible for operations of facility, including expense control, maintenance, personnel, procedural controls and processes and inventory control.

Mervyn's *August, 1987 to September, 1988*
Phoenix, Arizona
ASSISTANT OPERATIONS MANAGER. Store Assistant Operations Manager in the Phoenix, Arizona market. Training for operations of facility, including expense control, maintenance, personnel, procedural controls and processes, including inventory control.

ACCOMPLISHMENTS

MERVYN'S

designed and implemented PC network communication platform distributed locations.

including: applications developed in visual basic, excel, word, access, and XcelleNet. procedural processes, on-line help. training process and maintenance, communication process and support from corporate to stores.

developed support structure for maintenance and growth of PC network communication platform.

Developed associated business process for store operations.

delivered presentation at national retail federation convention "managing messaging, electronically and painlessly."

presented at vendors user conference, XcelleNet. Mervyn's Store Workbench.

Featured team member for XcelleNet customer success story.

Part of the management team of six different Mervyn's stores.

Part of the Grand Opening Team of seven Mervyn's store as a loaned executive.

XILINX

Identified, define and analyzed various business processes for system support or adaptation.

Implemented Global Frame Relay Network.

Responsible for Corporate IT Security Roadmap/Strategy and division.

Managed overall program to migrate from Netscape email and calendar to Microsoft products on a global basis.

Designed RFP and implementation of Vendor consolidation for telephony and data services.

Implemented Global Change Management / Release Management Processes and Tool

Managed the opening of Asian Headquarters - Singapore

Implemented Software Distribution and Asset Management.

Re-structured Desktop Support Team to optimize support to customers.

Implemented Xilinx first Network Operations Center (NOC)

Responsible for all North American, Asia and Japan Sites all Technology services

Worked with Organizational Development Team to design, implement and present first Managers Symposium Training for Middle Managers – Globally.

Defined new WWIT (World Wide IT) operating model and subsequent WWIT transformation program.

Implemented Compliance Self Assessment processes and Calendar for WWIT, including definition of key control environment and audit management.

XOMA

Implemented Oracle HRMS, Self Service, Benefits, defined new business processes and updated infrastructure.

Implemented Oracle Project Billing and Project Management, defined new business processes and updated as required. Defined project management standards for business through implementation as necessary.

Defined an optimization program for Oracle ERP applications and subsequent execution plan. Developed specific delivery SLAs to the business as well as the metrics and dashboard to report successes.

Implemented new NetApp SAN environment (FC and SATA)

Defined Architectural principals, infrastructure standards and provisioning process.

EDUCATION

University of Phoenix *1999*

BS – Business Management, Information Systems Management

Susan Shaheen, Ph.D. University of California, Berkeley

Relevant Expertise:
- Transportation Policy
- Travel Behavior
- Transportation Planning
- Data Collection/Analysis
- Shared Use Mobility
- Intelligent Transportation Systems
- Transportation Energy

Years of Experience: 25

Education:
Ph.D., Ecology, UC Davis (1999)
M.S., Public Policy, Rochester (1990)
B.A., Political Science and English, Nazareth College of Rochester (1990)

Susan Shaheen is an adjunct professor in the Civil and Environmental Engineering Department at the University of California, Berkeley and is a full research engineer with the Institute of Transportation Studies-Berkeley. She served as the Policy & Behavioral Research Program Leader at California Partners for Advanced Transit and Highways from 2003 to 2007, and as a special assistant to the Director's Office of the California Department of Transportation from 2001 to 2004. She was honored as the first Honda Distinguished Scholar in Transportation at the Institute of Transportation Studies at UC Davis in 2000 and served as the endowed chair until 2012.

She has been the Principal Investigator on approximately 60 projects at UC Berkeley on travel behavior, shared mobility, ITS, and alternative fuels. She has co-edited one book and authored 57 journal articles, over 100 reports and proceedings articles, and four book chapters. She is a desk editor of *Transport Policy*. She has also served as guest editor for *Transport Policy*, *Energies*, and the *International Journal of Sustainable Transportation* (IJST). She was the chair of the Emerging and Innovative Public Transport and Technologies Committee of the Transportation Research Board (TRB) from 2004 to 2011. She is on the editorial board of *IJST* (2011 to present) and the *International Journal of Transportation Science and Technology* (2015 to present), was a member of the National Academies' Transit Research Analysis Committee (2011 to 2013), and is on the ITS Program Advisory Committee of U.S. DOT advising the Secretary of Transportation (2014 to Present). She is chair of the Shared-Use Vehicle Public Transport Systems Subcommittee (AP020(1)) of TRB (2013 to Present) a member of the TRB Major Activity Circulation Systems and Their Performance (AP040) committee (2008 to 2011, reappointed in 2015), and a member of the Emerging and Innovative Public Transport Systems and Technologies Committee (AP020) (2013 to Present).

Professional Experience
- Adjunct Professor, Civil and Environmental Engineering, *2012 to Present*
- Member and Subcommittee Chair, Emerging and Innovative Public Transport Systems and Technologies (AP020), Transportation Research Board, *2013 to Present*
- Research Engineer and Co-Director, TSRC, University of California, Berkeley, *2001-Present*
- Postdoctoral Scholar, College of Engineering, California Partners for Advanced Transit and Highways (PATH), University of California, Berkeley, *2000-2001*
- Research Associate, Energy and Environmental Consulting, Energetics, *1991 to 1993*
- Research Associate, Environmental Consulting, ICF, Washington, DC, *1990 to 1991*

Key Skills
- Project management and research design
- Survey design and analysis, activity data analysis, statistical analysis
- Report writing and presentation

Relevant Awards, Recognition
In May 2016, Professor Shaheen was named one of the top 10 academic thought leaders in academia by Eno Transportation Foundation. She also has earned a variety of honors, including two national research awards for her contributions to a carsharing pilot program (2001) and a smart parking field test (2005). In May 2010 and 2007, she received an "Excellence in Management" award from UC Berkeley.

Alexandre M. Bayen, Ph.D. University of California, Berkeley

Alexandre Bayen is the Liao-Cho Professor of Engineering at UC Berkeley. He is a Professor of Electrical Engineering and Computer Science, and Civil and Environmental Engineering. He is currently the Director of the Institute of Transportation Studies (ITS). He is also a Faculty Scientist in Mechanical Engineering, at the Lawrence Berkeley National Laboratory (LBNL), where he is the Director of the Transportation Research Group. He received the Engineering Degree in applied mathematics from the Ecole Polytechnique, France, in 1998, the M.S. and Ph.D. in aeronautics and astronautics from Stanford University in 1998 and 1999 respectively. He was a Visiting Researcher at NASA Ames Research Center from 2000 to 2003. Between January 2004 and December 2004, he worked as the Research Director of the Autonomous Navigation Laboratory at the Laboratoire de Recherches Balistiques et Aerodynamiques, (Ministere de la Defense, Vernon, France), where he holds the rank of Major.

Professor Bayen is author of two books and over 200 articles in peer-reviewed journals and conferences. He has managed large projects totaling more than $30 million raised in funding since 2005 for his own research program. At UC Berkeley, Bayen manages ITS, an operation with an annual research budget of about $30 million per year.

Relevant Expertise:
- Optimization and control
- Machine learning
- Urban Computing
- Cyber Physical Systems
- Traffic operations
- Transportation planning
- Mobile Sensing

Years of Experience: 18

Education:
Ph.D., Aeronautics and Astronautics, Stanford University (2004)
M.S., Aeronautics and Astronautics, Stanford University (1999)
Eng. Deg., Applied Mathematics, Ecole Polytechnique, France (1998)

Professional Experience

- Director, Institute of Transportation Studies (ITS), UC Berkeley, *2014–Present*
- Director, Transportation Research Group, Faculty Scientist, Mechanical Engineering Lawrence Berkeley National Laboratory, *2015–Present*
- Professor Electrical Engineering and Computer Science, UC Berkeley, *2011–Present*
- Professor Civil and Environmental Engineering, UC Berkeley, *2005–Present*
- Major, Research Director, Autonomous Navigation Laboratory, France, *2004–2005*
- Visiting Scientist, NASA Ames Research Center, *2001–2003*
- Research Assistant, Aeronautics and Astronautics, Stanford University, *1998–2003*

Relevant Awards, Recognition

Professor Bayen received the Ballhaus Award from Stanford in 2004, the CAREER award from the National Science Foundation in 2009, and was named one of NASA's Top 10 Innovators on Water Sustainability (LAUNCH), 2010. Mobile Century and Mobile Millennium received the 2008 Best of ITS Award for 'Best Innovative Practice', at the ITS World Congress, and a TRANNY Award from the California Transportation Foundation, 2009. Mobile Millennium was featured more than 200 times in the media, both TV and radio (CBS, NBC, ABC, CNET, NPR, KGO, the BBC), as well as the popular press (Wall Street Journal, Washington Post, LA Times). In 2010, Bayen received the Presidential Early Career Award for Scientists and Engineers (PECASE) award from the White House. Subsequently, he has been awarded the Okawa Research Grant Award, the Ruberti Prize from the IEEE, and the Huber Prize from the ASCE.

Steven Shladover, Ph.D. University of California, Berkeley

Relevant Expertise:
- Intelligent transportation systems technology and standards
- Probe vehicle sampling and simulation
- Transportation performance measures

Years of Experience: 41

Education:
Sc.D., Mechanical Engineering, MIT (1978)
M.S., Mechanical Engineering, MIT (1974)
B.S., Mechanical Engineering, MIT (1972)

Dr. Shladover was one of the pioneers of Intelligent Transportation Systems in the U.S., beginning in the mid 1980's. He received his bachelors, masters and doctoral degrees in Mechanical Engineering from MIT, where he also satisfied all the course requirements for a doctorate in Transportation Systems. He began working on applications of information technology to improving surface transportation as a graduate student in 1973, and has worked since then on a wide variety of research projects. He combines hard-core engineering expertise in dynamic systems and control with knowledge of transportation system policy, planning and economics, which enables him to effectively apply rigorous analysis methods to complicated transportation problems. He was one of the first researchers to do in-depth investigations of probe vehicle data sampling in the days of the "vehicle infrastructure integrations" initiative, identifying limitations in the existing probe sampling protocols and recommending modifications.

Dr. Shladover research experience has included work on a variety of automated vehicle systems at a variety of levels. The target system applications have included both fully and partly automated passenger cars, trucks, buses and snowplows. His activities relative to these applications have included definition of concepts of operations, prediction of impacts on the transportation system, and design, development and testing of the prototype vehicle automation systems on full-scale test vehicles. He led the PATH Program's internationally renowned research on automated highway systems for twelve years, including a broad mix of projects involving analysis and simulation, synthesis of vehicle operating concepts (user services), evaluations of system effectiveness and the development of highly sophisticated test and demonstration vehicles.

Professional Experience
- Program Manager, Mobility, California PATH, U.C. Berkeley, *2011–present*
- Research Engineer, California PATH, U.C. Berkeley, *2003–present*
- Deputy Director and AVCSS Program Manager, California PATH, UC Berkeley, *1994–2003*
- Technical Director, Acting Director and Deputy Director, California PATH, UC Berkeley, *1989–1994*
- Manager, Transportation System Engineering, Systems Control Technology Inc., *1984–1989*
- Staff Engineer and Senior Engineer, Systems Control Technology, Inc., *1978–1984*
- Research Assistant and Lecturer (in 1978), Massachusetts Institute of Technology, *1975–1978*

Key Skills
- Automated Vehicle Systems, Prototype Vehicle Development and Evaluation
- System Engineering, Experimental Design, Transportation System Planning and Simulation

Relevant Awards, Recognition
- American Automatic Control Council's Control Engineering Practice Award, *2011*
- US Delegate to ISO TC204/WG14 Standards on Vehicle Roadway Warning and Control Systems, *2010–present*
- ASME DSCD's Charles Stark Draper Award for Innovative Practice, *2008*
- US DOT ITS Standards, *2000–2003*
- TRB National Research Council, *1990–1991*

Alexey Pozdnukhov, Ph.D. University of California, Berkeley

Professor Alexey Pozdnukhov is a leading expert in the area of complex data analysis in the domain of Smart Cities, including applications of streaming data analytics in urban mobility modelling, travel demand forecasting and location-based social networks. He leads research on hyper-realistic data-driven travel behavior microsimulation developing the testbed in the San Francisco Bay Area (the SmartBay project).

Prof. Pozdnukhov pioneered data-driven analysis of urban data with machine learning methods and contributed to the vision behind urban modelling principles that are currently becoming mainstream. His work is supported by NSF, NASA, California DOT, European Commission, as well as industry via gifts from Google, IBM and AT&T.

He has received a PhD following his research in machine learning methods and computer vision, and leaded a group engaged in several national and European research projects, including the strands of Irish Strategic Research Cluster in Advanced Geotechnologies. He has developed methodologies to apply machine learning methods in computational environmental modelling, integrate prior knowledge and efficiently process geo-referenced data streams from sensor networks.

Relevant Expertise:

- Machine learning
- Big data analytics
- Geospatial modeling
- Location-based services
- Demand forecasting

Years of Experience: 15

Education:

Ph.D., Computer Science, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland (2006)

B.Sc., M.Sc., Mathematical Physics Lomonosov Moscow State University, Russia (2003)

Prof. Pozdnukhov is a co-author of the book and an author of 30 peer-reviewed journal and full conference papers. He is a program committee member of multiple conferences, an Associate Editor of the Big Data section of Frontiers in ICT, an organizer of a series of ACM SIGSPATIAL workshops on Location-Based Social Networks, and the Bay Area Machine Learning Symposium.

He has developed an urban data science track in Berkeley's education program with an undergraduate Data Science for Smart Cities and graduate level Scalable Data Analytics courses. Besides taking on academic research positions, Prof Pozdnukhov's students have joined Amazon, Facebook, and IBM.

Professional Experience

- Assistant Professor, Civil and Environmental Engineering, U.C. Berkeley, *2013–Present*
- Faculty Scientist, Lawrence Berkeley National Laboratory, *2013–Present*
- Science Foundation Ireland Stokes Lecturer, National Centre for Geocomputation, Ireland, *2008–2013*
- Premier Assistant. Institute of Geomatics and Analysis of Risk, University of Lausanne, Switzerland, *2006–2008*
- Research Assistant. IDIAP Research Institute, Martigny, Switzerland, *2003–2006*
- Junior Researcher. Nuclear Safety Institute, Russian Academy of Sciences, *2000–2003*

Relevant Awards, Recognition

- Signatures Innovation Fellowship, *2015*
- Google Research Award, *2012*
- Science Foundation Ireland Stokes Lectureship, *2008–2013*

Laura Melendy — University of California, Berkeley

Laura Melendy is the Assistant Director of the Institute of Transportation Studies at the University of California, Berkeley and the Director of the Technology Transfer Program at the Institute. She is also the Executive Director of the Learn2Launch program in innovation and entrepreneurship at UC Berkeley. She received her Bachelors degree in Civil Engineering from the Georgia Institute of Technology in 1992 and her Masters in Transportation Engineering from the University of California, Berkeley in 1994.

She has spent the last 12 years dedicated to moving research results into practice. She has developed and delivered transportation–related professional development, technical assistance programs, and communications to encourage transportation professionals to apply innovation and best practices to improve transportation delivery in planning and policy, engineering, project development, infrastructure design and maintenance, safety, and environmental issues for motorized and non-motorized roadway traffic, aviation, and rail. Work products have included numerous publications, preliminary investigations, research syntheses and briefs, training programs, workshops, conferences, peer exchanges, and more.

Relevant Expertise:
- Technology Transfer
- Technical Communications
- Research Administration

Years of Experience: 14

Education:
Master of Science in Engineering, Transportation, University of California, Berkeley (1994)

Bachelors of Civil Engineering, Georgia Institute of Technology (1992)

In 2011, her role has expanded to include University research administration for the Institute of Transportation Studies, a $30 million per year program comprised of eight research centers and over 100 faculty, staff, and students. There, she has been engaged in all aspects of transportation research administration and continues to be a vocal proponent for strategic planning for a balanced research portfolio, designing research with outcomes in mind, and moving outcomes through to implementation.

Relevant Professional Experience

- University of California, Berkeley
  - Executive Director, Learn2Launch, *2013 to present*
  - Assistant Director, Institute of Transportation Studies, *2011 to present*
  - Director, Technology Transfer Program, *2007 to present*
  - Manager of Outreach and Information Services, Technology Transfer Program, *2003 to 2007*
- Transportation Research Board
  - Chair, Technology Transfer Committee, *2011 to 2016*
  - Member, Training and Education Committee, *2010 to present*
  - Member, Task Force on Mastering the Management of Transportation Research and Training Program, *2013 to 2015*
- Society of Research Administrators International, Annual Meeting, Keynote Speaker, *2015*
- NCHRP 20-05/Topic 41-06 Bringing Highway Research to Market Quickly, Panel Member, *2013*
- NHI "Leap Not Creep: Accelerating Innovation Implementation," Panel Member, *2008*

Relevant Awards, Recognition

- Chancellor's Outstanding Staff Award, University of California, Berkeley, *2013*
- National Program Achievement Award, National LTAP/TTAP Association, *2011*
- Institute of Transportation Engineers, Transportation Planning Council, Best Program Award, *2009*
- American Planning Association, California Best Practices Award, *2009*

Joan Walker, Ph.D. University of California, Berkeley

Joan Walker is an Associate Professor of Civil Environmental Engineering at UC Berkeley (and Full Professor beginning July 1) where she currently serves as Co-Director of the Center for Global Metropolitan Studies. She received her Bachelor's degree in Civil Engineering from UC Berkeley and her Master's and PhD degrees in Civil and Environmental Engineering from MIT. Prior to joining UC Berkeley, she was Director of Demand Modeling at Caliper Corporation and an Assistant Professor of Geography and Environment at Boston University. She is a recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE) – the highest honor bestowed by the U.S. government on scientists and engineers beginning their independent careers. She is an Associate Editor of Transportation Science and the current Chair of the Committee on Transportation Demand Forecasting (ADB40) for the Transportation Research Board of the National Academies. www.JoanWalker.com

Relevant Expertise:
- Discrete Choice Analysis
- Travel Demand
- Travel Behavior
- Behavior Change

Years of Experience: 20

Education:
Ph.D., Civil and Environmental Engineering, Massachusetts Institute of Technology (2001)
M.S., Civil and Environmental Engineering, Massachusetts Institute of Technology (1990)
B.S., Civil and Environmental Engineering, University of California, Berkeley (1991)

Professional Experience

- Co-Director, Center for Global Metropolitan Studies (GMS), University of California, Berkeley, *2015–present*
- Associate Professor, Civil & Environmental Engineering (CEE), Center for Global Metropolitan Studies (GMS), University of California, Berkeley, *2012–present*
- Acting Director, Institute of Transportation Studies University of California, Berkeley, *fall 2012*
- Assistant Professor, Civil & Environmental Engineering, Center for Global Metropolitan Studies, University of California, Berkeley, *2008–2012*
- Assistant Professor, Geography & Environment, Boston University, *2004–2008*
- Director of Demand Modeling, Caliper Corporation, Newton, Massachusetts, *2001–2004*
- Chair, Standing Committee on Transportation Demand Forecasting (ADB40), Transportation Research Board of the National Academies, *2013–present*
- Associate Editor, *Transportation Science*, *2009–present*. On 5 journal editorial advisory boards
- Co-organized workshops on Traveler Behavior Implications of Autonomous Vehicles at 3 conferences: Automated Vehicles Symposium, 2014 & 2016 in San Francisco, & International Association of Traveler Behavior Research, 2015 in England. Led ADB40 TRB Activities for Annual Conference 2014 to present (150+ papers submitted; podium sessions, workshops, meetings)

Selected Relevant Awards, Recognition

- Service Award, Institute of Transportation Studies, UC Berkeley (2014)
- Kitamura Paper Award, Transportation Research Board (2010)
- Certificate of Appreciation, TRB of the National Academies (2006, 2009)
- Presidential Early Career Award for Scientists and Engineers (PECASE), National Science Foundation (2008)
- CAREER Award, National Science Foundation (2007)
- IATBR Eric Pas Dissertation Prize in Travel Behavior Research, First Place (2002)
- INFORMS Transportation Science Dissertation Prize, First Place (2001)
- Eno Transportation Foundation, Leadership Development Program (1993)
- Graduate Fellowship, National Science Foundation (1992)
- Bechtel Achievement Award (UC Berkeley Engineering's top undergrad award) (1991)

David Ragland, Ph.D. University of California, Berkeley

David Ragland is an adjunct professor emeritus in the School of Public Health and Institute of Transportation Studies at UC Berkeley, where he serves as Director of the University of California Transportation Research and Education Center (SafeTREC) www.safetrec.berkeley.edu, a joint project of the Institute of Transportation Studies and School of Public Health. The Center's mission is to contribute to the effort to reduce traffic crashes through teaching, outreach, technical assistance, and research. He has served as the Principal Investigator on numerous projects at UC Berkeley related to all aspects of travel safety and has authored or co-authored over 100 publications on health and safety, focusing most recently on safety in multimodal transportation environments. He currently teaches courses on Injury Prevention and Control (School of Public Health), and Traffic Safety and Injury Control (Department of Civil and Environmental Engineering). SafeTREC research can be found on the SafeTREC site. Links to Dr. Ragland's publications can be found on ResearchGate and eScholarship.

Relevant Expertise:

- Traffic Safety
- Epidemiology
- Pedestrian Safety
- Transportation Planning
- Injury Risk in Multi-Modal Environments
- Data Collection/Analysis

Education:

B.A., Honors in Psychology, University of Oregon (1965)
Ph.D., Psychology, State University of New York at Buffalo (1976)
M.P.H., Epidemiology/ Biostatistics, University of California, Berkeley (1981)

Professional Experience

- Co-Director, University of California SafeTREC, Safe Transportation Research & Education Center, School of Public Health, Institute of Transportation Studies, *2016*
- Director, University of California SafeTREC, Safe Transportation Research & Education Center, School of Public Health, Institute of Transportation Studies, *2010–2016*
- Project Development Coordinator, University of California SafeTREC, Safe Transportation Research & Education Center, School of Public Health, Institute of Transportation Studies, *2009-2010*
- Director, University of California Traffic Safety Center (TSC), School of Public Health, Institute of Transportation Studies, *2000–2009*
- Adjunct Professor of Epidemiology, School of Public Health, University of California, Berkeley, *1999–present*

Catherine Crump, J.D. University of California, Berkeley

Catherine Crump is an Assistant Clinical Professor of Law and Associate Director of the Samuelson Law, Technology & Public Policy Clinic.

Professor Crump's research focuses on the impact of new technologies on civil liberties and civic engagement, particularly on matters related to privacy. Much of her research focuses on deployment of surveillance technologies by municipal government. She has extensive experience working on the privacy implications of location tracking technology, particularly the unique set of issues that arise when it is the government that deploys such technologies.

In addition to her work at Berkeley, Professor Crump is an academic fellow affiliated with the Center for Democracy and Technology, and a non-residential scholar at the Stanford Center for Internet and Society. She has testified to both Congress and the European Parliament about location tracking policy issues and written about these topics for both scholarly and lay audiences.

Relevant Expertise:

Privacy law and policy

Legal implications of location tracking technologies

Privacy by design

Years of Experience: 12

Education:
J.D. Stanford Law School, 2004
B.A. Stanford University, 2000

Professional Experience

University of California, Berkeley, School of Law
- Assistant Clinical Professor of Law (July 2014 – present)
- Associate Director, Samuelson Law, Technology & Public Policy Clinic (July 2014 – present)
- Co-Director, Berkeley Center for Law & Technology (June 2015 – present)

American Civil Liberties Union Foundation
- Staff Attorney (2007-2014)
- Fellow (2005-2007)

Judge M. Margaret McKeown, United States Court of Appeals for the Ninth Circuit
- Law Clerk (2004-2005)

Key Skills

- Project management and research design
- Legal and statutory analysis of privacy matters
- Research and report writing

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May 23, 2016

Timothy Papandreou
Chief Innovation Officer
San Francisco Municipal Transportation Agency
1 South Van Ness, 7th Floor
San Francisco, CA 94103
(415) 701-4333
Timothy.Papandreou@sfmta.com

SUBJECT: Subaward proposal entitled "*Smart City Challenge: San Francisco*"
UC Berkeley Principal Investigator: Professor Susan Shaheen
Total Amount: $19,987,895

Dear Mr. Papandreou:

On behalf of The Regents of the University of California, we are pleased to submit the enclosed subaward proposal to the San Francisco Municipal Transportation Agency (SFMTA) for inclusion in their full proposal in response to the US Department of Transportation Smart City Challenge solicitation - RFP #DTFH6116RA00002. The UC Berkeley subaward proposal is under the direction of UC Berkeley Principal Investigator, Professor Susan Shaheen and Co-Principal Investigator, Professor Alexandre Bayen of UC Berkeley's Institute of Transportation Studies.

Should this proposal be funded, we request terms and conditions for a contract that is appropriate for a public, non-profit educational institution and reserve the right to negotiate all terms and conditions. I am the University representative to whom questions may be directed and with whom award negotiations may be conducted. Subaward documents should be issued in the University's corporate name, i.e. The Regents of the University of California, Sponsored Projects Office, 2150 Shattuck Avenue, Suite 300, Berkeley, CA 94704-5940. Award documents that are sent electronically should be forwarded to spoawards@berkeley.edu.

Thank you for your consideration of this proposal.

Sincerely,

Paul S. Martinez
Contracts and Grants Officer
Sponsored Projects Office
UC Berkeley

UNIVERSITY OF CALIFORNIA Berkeley
Transportation Sustainability
RESEARCH CENTER

Smart City Challenge:
San Francisco

May 16, 2016

Proposal for San Francisco
Municipal Transportation Agency
(SFMTA)

Submitted by
Transportation Sustainability Research Center,
University of California, Berkeley
Susan Shaheen, Ph.D.

and

Institute of Transportation Studies,
University of California, Berkeley
Alexandre M. Bayen, Ph.D.

I) PROJECT SUMMARY

The Transportation Sustainability Research Center (TSRC) and Institute of Transportation Studies (ITS) of the University of California, Berkeley are proposing to partner with the San Francisco Municipal Transportation Agency (SFMTA) under the US DOT Smart Cities Challenge to transform San Francisco into test laboratory for the Nation. San Francisco is poised to be America's urban transportation laboratory to create the world's first shared electric connected and automated (SECA) transportation network. The City's vision is that anybody, regardless of means and ability can get a shared ride within two minutes to go anywhere in the city in 20 minutes for a average trip cost of $2.00.

The City's approach is a step-by-step phasing of multiple pilots that build upon each other, iterating with the community, academic, and technology partners along the way and sharing our lessons learned and best practices to the cities across the nation and the world. UCB will bring expertise in all aspects of the project, including pilot project design and testing and ultimately to understand the impacts on the transportation system from the perspectives of technology, safety, and travel behavior. The City's approach is human centered and UCB will align with this approach providing an understanding of mode choice, mode shift, interface with the technology, safety (real and perceived) and impact on air quality and greenhouse gas (GHG) emissions.

The following scope outlines the work plan and anticipated budget, pending grant award to SFMTA, selection of industry partners, and determination of costs and timelines. The UCB schedule and ability to meet goals is dependent on SFMTA implementation of the pilot projects in San Francisco in a timeframe that allows for data collection, as well as access to pilot project participants and data.

II) UC BERKELEY SCOPE OF WORK FOR SAN FRANCISCO SMART CITY CHALLENGE

The research component of our Smart City Challenge grant application is essential to understanding and documenting our demonstration pilot projects: 1) impact travel behavior, accessibility/equity, and safety; 2) reduce VMT, GHGs, and vehicle ownership and use; and 3) increase modal shift away from SOVs for San Franciscans and the greater Bay Area. The City of San Francisco has partnered with a multi-disciplinary team of researchers from the University of California, Berkeley and the Lawrence Berkeley National Laboratory (Vulcan proposal) to deploy, document, and analyze the demonstration concepts and pilots.

In this section, we discuss the overarching methodological approaches that underpin our vision and how they apply to the pilot projects. There are five key methodological areas included in this plan: 1) Behavioral Impacts, 2) Connected and Automated Vehicle Analysis, 3) Safety Impacts Analysis, 4) the Data Analytics and Mobility Data Commons (MDC) Architecture, and 5) Data Privacy Analysis. We conclude this overview with a table outlining our key study hypotheses with respect to the 16 pilot projects, associated

data metrics, and the data sources needed. These data will provide critical supply- and demand-side feedback to inform pilot operations and travelers, as well as to assess impacts. The massive understanding amassed through this research plan will be critical to providing iterative feedback throughout the pilots to optimize benefits and documenting lessons learned that can be shared with other cities throughout the US and across the globe.

1.0 Behavioral Impacts

Behavioral impacts will be captured through two key approaches: 1) a panel survey to assess the TaaS platform (regional scale) and 2) a before-and-after pilot project assessment to evaluate micro-level projects deployed at the city and neighborhood scale. Each is described below.

1.1 Panel Survey Approach to Understand Travel Behavior: TaaS Platform Evaluation

In social science survey research, using well-established panels is the gold standard for collecting high quality data. Companies (such as Knowledge Networks) maintain a pool of carefully selected (i.e., representative) and managed (i.e., retained) people who then are available for hire by people who want to conduct surveys. The panels are maintained over time so researchers can ask follow-up questions. We propose to develop a 500-person experimental panel to cover the regional-level TaaS Platform, as well as a 500-person control group (i.e., individuals that do not use the TaaS platform but have access to it through the two-year evaluation period). Key steps in this methodological approach include: 1) institutional review board (IRB) approval (i.e., a review board for the protection of human subjects); 2) Participant recruitment; 3) Deployment of the demonstration concept across the population; 4) Periodic surveys of panel participants and feedback (e.g., every 8 to 12 weeks, commensurate to the demonstration concept's start and end dates); and 5) Final analysis. The timeline for this project is six months of preparation time at the beginning and two years of data collection with user surveys, activity data, and focus groups during the 24-month assessment. This includes surveys every two months to gauge feedback to pricing and nudging experiments, which will be conducted between the before-and-after surveys at the start and end of the data collection period. The final six months of the project are dedicated to final analysis. We will provide feedback to the project implementation team throughout to inform incentives/nudging to optimize the social and environmental benefits of the TaaS platform applications. The Transportation Sustainability Research Center (TSRC) at UC Berkeley will lead this effort. Key staff include Professors Susan Shaheen and Joan Walker and Dr. Elliot Martin.

1.2 TSRC Behavioral Impact Analysis of Pilot Deployment Projects

TSRC will also lead the evaluation of numerous smart city pilot project efforts also using a frame of behavioral economics. We will assess the pilot projects on a number of dimensions including impacts on travel, the environment (e.g., emissions), and

equity/accessibility. We will also collect socio-demographic and attitudinal data, as appropriate. For each, researchers will survey a control group (n=200) and experimental group of participants (n=200) at the start (before any intervention), at the end of of two years, and approximately three times in between. There are five key steps to each pilot evaluation. At the start of the project, we will develop the survey instruments (first six months). After the surveys are conducted (months 7-30), the last six months of the study will entail final data analysis (i.e., surveys, activity data (as appropriate), and focus groups). We will provide feedback to the project implementation team at the city throughout the pilot assessment periods to guide/optimize the deployments. Surveys and behavioral tracking will provide the feedback into the pilot programs to enable adjustments throughout, as appropriate. There are five key steps including: 1) IRB approval; 2) Participant recruitment; 3) Deployment of the demonstration concept across the population; 4) Periodic surveys of participants and feedback (across the five survey total); and 5) Final analysis. TSRC is the lead on the following use case analyses: 1) regional connected carpool lanes, 2) Wi-Fi for transit/taxi/large municipal fleets, 3) shared van services (late night and school vans), 4) shared mobility hubs, 5) WiFi parklet, and 6) the automated vehicle pilot (delivery, municipal, and first-mile and last mile). Key staff include Professor Susan Shaheen, Dr. Elliot Martin, and Rachel Finson of TSRC.

2.0 Connected and Automated Vehicle Analysis

This research area is critical to the pilot effort and includes several projects: 1) low-speed vehicle applications and automated first- and last-mile mobility service; 2) evaluation of advanced collision avoidance systems and development of machine learning perception in urban environments for pedestrian and bicyclist safety; 3) provision of Wi-Fi services on the public transit fleet to encourage modal shifts and to close the gap in the digital and income divide; 4) coordinated signals and DSRC: implementation of the Multi-Modal Traffic Signal System (MMITSS); and 5) connected carpool lanes.

2.1 Low-Speed Shuttle and Automated First-Mile and Last-Mile Mobility Service

The automated vehicle (AV) applications are the most technologically challenging elements in the Smart City challenge grant, with the least mature technology and the most important need to ensure public safety throughout the development, testing, and evaluation process. The PATH UC Berkeley team's evaluation approach for these systems will begin by developing a solid understanding of the capabilities and maturity of the technology, its vulnerabilities to the complexities of the urban environment, and the enhancements that will be needed to enable it to advance from the current state of development, in which it requires continuous supervision by an onboard human operator/safety driver to the state in which it can operate in some urban neighborhood(s) without continuous human supervision. The later stages of the evaluation can then also address user perceptions of AV applications, their desires and concerns, and the perceptions of the other road users who are sharing the street space with the AVs. This approach applies to the low-speed urban application and to the automated on-demand transportation service in the pilot deployment.

The vehicles will be instrumented with an independent data acquisition system to record detailed real-time data about the external operating environment of the vehicles (movements of other vehicles, pedestrians, bicyclists and animals and objects in the path of the vehicles) and the movements of the vehicles within that environment, as well as all interventions that the supervisor had to take for reasons of safety, mobility, or both. The data acquisition system is expected to be more comprehensive for the low-speed application than for the automated on-demand service vehicles because the former vehicles have less sophisticated built-in sensory capabilities. The data acquisition is expected to include video cameras to record the complete driving scene, as well as laser scanners and radars to track all stationary and moving objects in the vehicle path. These detailed data will be recorded in a computer that will be installed in each vehicle, with sufficient storage capacity to capture a full day of operational data so that the complete data can be downloaded from the vehicles each night. Software will be developed to record and label all the data for subsequent off-line analysis and assessment of the hazards that were handled successfully and unsuccessfully by the vehicle system to identify the causes of all unplanned stops by the vehicles, all collisions and near-collisions with other objects, and all human supervisor interventions. These data will be analyzed to determine which situations are troublesome for the vehicle automation systems and to develop recommendations for how their developers can enhance their capabilities.

The operational records of the vehicles will be tracked from month-to-month of the testing period to identify trends in the frequency and severity of incidents involving the vehicles, particularly as their developers make changes to their systems. Evaluation criteria (based on frequency and severity of crashes, near misses, and operator interventions) will be defined to determine when the vehicles are performing at a level that would justify relaxation of the requirement for continuous supervision by the onboard operator, and after careful review with the relevant local stakeholders and regulatory authorities a recommendation will be made for when the on-board supervisor can be eliminated.

The timeline for this project includes 6-12 months of vehicle instrumentation development and installation as well as software development coincident with the infrastructure improvements necessary to accommodate shuttle/mobility service operation. Data collection will occur over a 24-month period, and operational records of the vehicles will be tracked from month to month during the testing period. User surveys will be used at the beginning and end of the effort, and in the case that the requirement for continuous supervision is relaxed, a new surveying instrument will be developed. The project team will provide feedback to the project implementation team throughout the duration of the project. California PATH at UC Berkeley will lead this effort. Key staff include Dr. Steven Shladover, Dr. Xiao-Yun Lu, and technical support staff.

2.2 Evaluation of Advanced Collision Avoidance Systems and Development of Machine Learning Perception in Urban Environments for Pedestrian and Bicyclist Safety

In this project, PATH researchers will collaborate with the City/County of San Francisco to address the traffic safety concerns of pedestrians and bicyclists. PATH will adopt the US DOT approved Mobileye Shield+^{TM} systems to install on the city's bus fleet, which empowers drivers to avoid and mitigate imminent collisions, protecting the most vulnerable and difficult to observe road users: bicyclists and pedestrians. Furthermore, researchers plan to leverage the research activities from the Berkeley Deep Drive (BDD) (bdd.berkeley.edu) Center at UC Berkeley. We will apply the advanced methodologies and research outcomes from BDD in autonomous perception, which will further improve the capability, reliability, and robustness of pedestrian and bicyclist recognition as well as their interactions with other road users. We expect the following outcomes: 1) Field deployment evaluation of Mobileye Shield+ units on up to 200 public transit vehicles to observe how the deployed systems perform; 2) Aggregate operational data from telematics services of all Mobileye Shield+ units to enable the safety assessment of SF city streets, including actual incidents and near-miss scenarios encountered by equipped buses; 3) Collection of field driving video data for algorithm training to advance developments and validation of advanced deep learning technologies; and 4) Field demonstration of deep learning research prototypes on 15 public transit vehicles in the most challenging urban environment. In Year 1, we will perform experimental design and plan for the deployment of Mobileye units onto the public transit fleet and also to begin data collection. In Year 2, data collection will continue with training and validation of deep learning algorithms. In Year 3, evaluation of Mobileye deployment data and the frequency of incidents along deployment routes will allow assessment of safety improvement, and also the implementation of deep learning technologies will be demonstrated in field testing. The project team will provide feedback to the project implementation team throughout the duration of the project. California PATH at UC Berkeley will lead this effort. Key staff includes Professor Trevor Darrel, Professor Pieter Abbeel, Dr. Ching-Yao Chan and technical support staff

2.3 Provision of Wi-Fi Services on the Public Transit Fleet to Encourage Modal Shifts and to Close the Gap in the Digital and Income Divide

In this project, PATH researchers will collaborate with the City/County of San Francisco to provide Wi-Fi services on the city fleet of 200+ SF public transit vehicles, with the goal to offer enhanced mobility to visitors and residents, as well as to provide equity in assessing the digital space. We will adopt the V2X solutions offered by one of a select number of connectivity solution providers from Silicon Valley, by using V2X networks and high-bandwidth backhaul communication links. The Wi-Fi services will be made available at no costs to passengers on public transit vehicles. We expect the following outcomes: 1) The availability of Wi-Fi services will promote the ridership on public transit systems in SF and offer an alternative modal choice for tourists and residents alike; 2) The services will allow disadvantaged groups to use the free Wi-Fi services when they take public transit as part of their daily routines, which can help to advance societal creativity and productivity; 3) Collection of deployment data through this service will enable the observation of transportation modal shift, through a before-and-after study to assess the effectiveness of a transit ridership increase; and 4) Reduction in private vehicle use and reliance due to a shift to public transit modes, particularly along the

transit bus routes and the associated neighborhoods. These changes will be evaluated by tracking the public transit vehicle trajectories and the travel patterns in adjacent districts. In Year 1, researchers will perform experimental design and plan for the deployment of the proposed solution to the transit fleet. In Year 2, data collection will be carried out to assess the ridership increase and the effects on modal shift. In Year 3, analysis of operational data and city traffic data will allow evaluation of the travel time and operational efficiency of the public transit fleet on selective routes and its impact on city-wide traffic. In addition, user surveys will be conducted to solicit feedback from riders about their experience in using the services for future enhancements. The project team will provide feedback to the project implementation team throughout the duration of the project. PATH at UC Berkeley will lead this effort. Key staff include Dr. Ching-Yao Chan and technical support staff.

2.4 Coordinated Signals and DSRC: Implementation of the Multi-Modal Traffic Signal System (MMITSS)

This proposed study, led by PATH, will evaluate and provide design guidance for the implementation of the Multi Modal Intelligent Traffic Signal System (MMITSS) at signalized intersections as part of the connected vision zero corridors pilot. The MMITSS system will be implemented along an arterial corridor with frequent public transit service, significant pedestrian crossing, and occasional construction trucks along with heavy traffic volume (e.g., Third Street/Bayshore, Embarcadero/King street) to provide priority to transit, heavy construction vehicles, and applications for pedestrian and bicycles including travelers with mobility limitations. As MMITSS has the ability to accommodate multiple priority levels for various traveler types while minimizing delays to traffic flow, the PATH research team will work closely with SFMTA to design specific MMITSS strategies through a systems engineering process employed in the design phase. As part of the design, data type and collection methods for before-and-after evaluation will be specified. The assessment of the system effectiveness will be conducted using field data, such as travel times and delays per vehicle class, and pedestrian delays and conflicts. Data on travel times will be collected from the public transit onboard devices and data providers. Signal status data obtained in real time from the controller conflict monitor will provide data on the frequency and the amount of additional green time for pedestrians and various vehicle types.

The timeline for this project includes six months of vehicle and infrastructure instrumentation in order to capture necessary data before and after the implementation of the DSRC/MMITSS applications. Data collection will occur over a 24 to 30-month period, and operational records of the vehicles will be tracked continuously during the testing period. System user surveys will be used at the beginning and end of the effort, and the project team will provide feedback to the project implementation team throughout the duration of the project. PATH at UC Berkeley will lead this effort. Key staff include Professor Alex Skabardonis, Wei-Bin Zhang, Dr. Kun Zhou, and technical support staff.

2.5 Connected Carpool Lanes

This proposed research will provide a technical evaluation of the implementation of a network of Connected Carpool Lanes along key arterials and freeways within the city of San Francisco to evaluate their effectiveness. Carpool lanes will be created through restriping of existing travel lanes, and their usage will be maximized based on innovative carpooling services (e.g., Lyft Carpool, Carma, Scoop) and enforcement approaches. The effectiveness of the proposed carpool lanes will be evaluated based on several metrics for the travelers (travel time, delay, travel time reliability), system (i.e., VMT, vehicle hours traveled, person miles traveled) and environment (i.e., impacts on fuel use and emissions). Travel time data on the selected corridors will be obtained from commercial data providers. HOV specific travel times will be obtained from the casual carpool travel providers, such as Lyft, Carma, etc. VMT estimates will require information on the quantity of travel that would be obtained by selective detection at key points in the corridor.

The timeline for this project includes six months to develop the data stream from various data aggregators, including casual carpooling application providers. Data collection will occur over a 24 to 30-month period, and operational aspects will be tracked continuously during the testing period. System user surveys will be used at the beginning and end of the effort, and system parameters will be measured before and during the study. The project team will provide feedback to the project implementation team throughout the duration of the project. PATH will lead this effort. Key staff include Professor Alex Skabardonis and technical support staff.

3.0 Safety Impacts Analysis

The safety impact analysis research plan consists of two key areas: 1) the safe driving platform app to detect and reduce unsafe driving patterns and subsequent collision/injuries/fatalities and 2) safety analyses for surveillance/monitoring.

3.1 Safe Driving Platform App to Detect and Reduce Unsafe Driving Patterns and Subsequent Collision/Injuries/Fatalities

A safe driving platform app will be used to detect unsafe driving patterns in a sample group of San Francisco drivers. The app will provide driver feedback, potentially reducing unsafe driving behavior, such as speeding and hard braking. The driver behaviors targeted account for a substantial portion of injury collisions in San Francisco. In addition to direct driver feedback, the project will compile input for safe-driving media campaigns and driver education programs in the city. Data from the app can be overlapped with collision history, infrastructure and other information, and can be analyzed along various dimensions, including spatial and temporal variables. Additional data collected via infrastructure sensors and other means through the Smart City Challenge can also be included in the analyses. SFMTA will conduct deployment of the app, with the following key steps: 1) Identify apps through discussions with companies currently providing such technology (year 1); 2) In consultation with SafeTREC of UC

Berkeley, develop an appropriate study design (e.g., baseline driving behavior, implement feedback phase, follow-up phase for driver behavior and, to the extent possible, long-term traffic incidents (year 1); and 3) Recruit drivers for the study and collect data following the study protocol (years 2 and 3). The role of SafeTREC will include the following key steps: 1) Advising on research design, app selection, data collection (year 1); Analyzing results and preparing reports (years 2 and 3); Identifying ways to incorporate study insights into the safe driving media campaigns (years 2 and 3); and 4) if the demonstration is successful, develop recommendations for extension/expansion of the program (year 3). Potential private sector partners include a company or companies that are developing apps for safe driving, such as Zendrive and Mobileye, which would later be contracted with the City of San Francisco. Key staff include Professor David Ragland and Research Associate Offer Grembek, both Co-Directors at SafeTREC.

3.2 Safety Analyses for Surveillance/Monitoring

To help guide and then evaluate the impact of the Smart City Challenge program, SafeTREC will conduct systematic analyses of data relying on existing or emerging data systems, such as the robust Transbase Data Base (www.TransBASEsf.org), which the City and County of San Francisco is developing. In these analyses, we will employ injury/fatality, exposure, and infrastructure data. Since use of collision data as the only barometer of traffic safety is a reactive approach, we also propose to identify data that can be used to evaluate surrogate safety measures—those based on non-crash events that are associated with increased crash frequency/severity—driver yielding, deceleration rates, stopping distances, etc. This will include sensors, video data, etc., which already are in place or that may be implemented as part of the Smart City Challenge grant. The four key steps are: 1) Identify data sources (e.g., Transbase, emergency medical data, mode-specific volume data, video, and sensor data (first six months of year 1); 2) Conduct analyses to guide development and implementation of Smart City Challenge projects (years 1-2); 3) Conduct analyses to evaluate changes in mode-specific injuries or volumes over the three-year grant period at specific locations and at the neighborhood and regional levels (years 2-3); and 4) Prepare reports and presentations describing results of the analyses (years 1-3). SafeTREC has conducted numerous analyses of the type proposed over the past 15 years. Key staff include: Professor David Ragland and Research Associate Offer Grembek.

4.0 Data Analytics and Mobility Data Commons (MDC) Architecture

As part of the proposed project, UC Berkeley researchers will develop a modular architecture to support a data commons that will allow management, discovery, sharing, use/re-use, and general consumption of mobility data from a range of sources (public, research, and private); frequencies (real-time streaming, historic); sources (sensors, operational databases, third party APIs); and structures (structured, semi-structured, and unstructured) to support research and deployment of key vision elements. The architecture will enable both real-time data flow and operations and a multi-tenant repository for post-hoc data access and use. MDC will support experimental and deployment protocols, document the findings, and ensure that the results are transparent

and reproducible. Data will adhere to standards ensuring interoperability within the MDC, city infrastructure, as well as with external systems and US DOT programs. There are three key components to this research: 1) data analytics and machine learning enabled decision making, 2) data warehouse and real-time processing; and 3) dashboards and visualization.

4.1 Data Analytics and Machine Learning Enabled Decision Making

The UC Berkeley research team will lead members of the Smart City Challenge partnership to collaboratively develop a dashboard displaying the vital parameters of the city related to this project at the regional, city, and neighborhood scales. Four key steps envisioned to support this effort. 1) Develop new data collection paradigms employing multiple industry sources (integrating near real-time locational data collected by the telecom industry (e.g., AT&T and Verizon) and IT services (Waze, Twitter, Sidewalk labs) (months 1-12). 2) Develop next generation of data-intensive (sample size of n=1 to 5M travelers) activity-based demand models. These models will include trip purpose, mode, destination, and departure times, which will inform a mobility micro-simulation for scenario evaluation, building off of the pilot deployment data of the city and Bay Area region and behavioral insights from the longitudinal panel research mentioned earlier (months 3-18). 3) Develop traffic flow models (micro-, meso- and macro-) with flow harmonization and congestion reduction capabilities that leverage the automated and connected vehicle pilots (months 12-24). Optimize schemes capable of performing a collection of simulations and behavioral intervention strategies (e.g., incentives/nudging) and robust model predictive control (months 18-36). Key staff include UC Berkeley Professors Alexandre Bayen and Alexei Pozdnukhov and several postdoctoral scholars and PhD students.

4.2 Data Warehouse and Real-Time Processing

A centerpiece of this research is the data commons. Commons data will be shared and preserved in data warehouse repositories and shared with different audiences throughout the project and well beyond the three-year effort. The repositories will link data, data models, and workflows from both the city and the private and research sectors (months 1-12). Data abstraction layers will be developed to handle the diversity of distributed data sources, satisfying the low latency and multi-tenancy requirements that ensure data harmonization and interoperability, both in batch and streaming processing on Berkeley's native Spark/Spark Streaming cluster computing technology (months 6-18). Data in the warehouse will be accessible to users through APIs and the open data commons using industry standards. We envision that the data warehouse will be housed and archived at the ITS Berkeley library at UC Berkeley. Privacy-preserving data access layer will implement data access protocols based on provable differential privacy guarantees (months 18-36). Key staff include Research Librarian Kendra Levine, a data architect, and two programmers.

4.3 Dashboards and Visualization

Data processing algorithms will support computation of TaaS performance metrics (described below) to evaluate the outcomes of demand management and a range of policy intervention strategies (e.g., pricing) toward the city and region's environmental and equity goals. This will result in various visualization components (Months 6-18) and modular dashboards (Months 12-24) supporting the pilot project use cases and personalized travel advisories. Visualization and data access components will be integrated (Months 24-36) with Berkeley's Data Science education program on-site, as well as with newly offered Massive Open Online Courses (MOOC), supporting community engagement, technology transfer, and digital equity through citizen science. Key staff include a data scientist and research engineer, and two software engineers.

5.0 Data Privacy Analysis

At the core of a smart city initiative is its data. Paramount to data are its management and privacy/security protections. Our team will focus on developing a rich understanding of data privacy and security as part of our research effort.

5.1 Best Practices for Transparency and Accountability Regarding Data Privacy and Security Choices for Smart Transportation Networks

San Francisco's implementation of the Smart City Challenge will function as a test case for what privacy and data security policies best facilitate the creation of smart transportation networks consistent with public preferences. These networks require the collection, retention, and sharing of data on individuals' movements. Public concern over data privacy and security has forestalled similar efforts in the past. As the Smart City Challenge's pilot projects are implemented, legal scholars will determine and document what approaches to public transparency, democratic accountability, and community involvement are most likely to ensure long-term project success and public acceptance. Underlying our approach is the hypothesis that a porous and iterative approach to community engagement is most likely to achieve public buy-in and, therefore, long-term project success. As part of this effort, UC Berkeley Law School faculty and researchers will collaborate with the UC Berkeley research teams (i.e., TSRC, PATH, ITS Berkeley Library, SafeTREC, Tech Transfer, LBNL) and city officials to: 1) apply core privacy by design concepts to project implementation (year 1); 2) monitor data collection, retention, use, and sharing (year 2); 3) monitor community outreach and engagement (years 1 to 3); 4) evaluate what approaches to data privacy and security most effectively achieve public support (year 3); and 5) develop a suite of model policies and protocols that other cities can rely on in addressing transparency and accountability issues that arise as a result of city data collection, retention, use, and sharing to facilitate smart transportation networks (year 3). We envision that one set of policies will provide substantive recommendations for data privacy and security. A second set will advise on the processes to ensure transparency and accountability adequate to achieve public buy-in. Berkeley Law School faculty and researchers will lead this effort. Key staff include Professor Catherine Crump and Jim Dempsey.

6.0 Communications Plan Support Activities

The Communications Plan in the Smart City Challenge grant application is essential to informing and engaging the public, monitoring public opinion, and ensuring that lessons learned are documented and absorbed by other cities around the nation and the world. UC Berkeley will perform the following elements of the Smart City Challenge grant communications plan: 1) Public Outreach and Opinion, 2) Climate and Equity Stakeholder Engagement, and 3) Knowledge Transfer.

6.1 *Public Outreach and Opinion*

The public relations and outreach needs for the Smart City Challenge grant are immense. UC Berkeley will provide portions of the outreach activities working in consultation with the City to engage the public and understand public opinion. The data for hypothesis testing related to the Community Mobility Challenge will initially come from focus groups and the Community Mobility Challenge website itself. Focus groups will inform the website, which will collect data from participating citizens. Public opinion surveys conducted three times per year will test the name recognition of the Community Mobility Challenge, and the approval rating of the Community Mobility Challenge citywide as well as in the particular neighborhood that put forward the winning application. In year one and two, public opinion surveys will test the recognition and approval ratings of the pilots/demonstration projects themselves as well.

Work under this task will be guided by the City, overseen by UC Berkeley faculty, and supported by a team of community outreach expert consultants who will jointly produce the following: website, focus groups, polls/surveys, integration of poll/survey data with website and datasets, an outreach campaign that includes direct mail, billboards/bus shelter postings, radio and TV ads in English, Spanish, and Chinese, robo-calls, door-to-door outreach including door-hangers, tabling at events to connect directly with citizens, and hosting community events and meet-ups. These activities will occur throughout the grant period, with emphasis on outreach activities on year one, and additional polling in years two and three. Key staff include Professor Susan Shaheen.

6.2 *Climate and Equity Stakeholder Engagement*

UC Berkeley's Technology Transfer Program, in partnership NRDC, will convene stakeholder engagement on climate and equity via an advisory group. The rise of the tech economy has undeniably altered the social equity landscape in San Francisco and the surrounding region. This effort will directly tackle the social equity and climate impacts of any Smart City Challenge outcomes. Doing so would break away from traditional planning approaches that silo transportation away from the full spectrum of its impacts—typically to the detriment of our environment and disadvantaged communities, including low income communities, communities of colors, and those with disabilities. We would establish an Advisory Group comprised of community-based organizations, groups focused on social equity, and environmental organizations that would convene on a quarterly basis. The Advisory Group would bring stakeholders reflective of San Francisco's rich cultural diversity and history of environmental activism into the

Challenge. NRDC has already taken this approach and found success in its ongoing study with Uber and Lyft examining the climate impacts of ride sharing, and with a state-funded pilot focused on electric vehicle car-sharing in low-income communities of central Los Angeles. The Advisory Board would be established in year one and meet quarterly for the duration of the grant. The culmination of the Climate and Equity Advisory Group's work would be the promulgation of a series of environmental and equity performance metrics and policy recommendations that could inform the development of San Francisco's transportation-as-a-service platform and framework with publication not later than year three of the grant. Key staff include Professor Susan Shaheen and Laura Melendy and partners at NRDC, Amanda Eaken and Kristen Torres Pawling.

6.3 *Knowledge Transfer*

Technology transfer communication efforts are intended to raise awareness and accelerate deployment and widespread adoption of the innovations and lessons learned from the Smart City Challenge through outreach, communications, and training. Activities to be delivered throughout the grant period will include: development and dissemination of print and electronic communications; delivery of webinars, workshops, conferences, and other training programs; hosted demonstrations for other city representatives visiting San Francisco; marketing and outreach activities; representation at and participation in national forums; and site visits to cities considering implementation.

Written communications, in both print and electronic formats, remains a mainstay of the technology transfer process. Publications will be produced jointly by subject matter experts who provide content and technical oversight, and communications and graphic design professionals who understand the audience and how to use the media effectively. Communications and marketing specialists will ensure that those publications reach their target audiences. Information specialists (research librarians) will ensure that all reports and publications are electronically archived and accessible internationally. Written deliverables will include quarterly updates and topical briefs to be produced on an ad hoc basis reporting on the various implementation and research outcomes as they are produced.

Training, workshops and conferences are an effective way to disseminate latest research results, incubate new ideas, and encourage collaboration among researchers and between government, industry and academia. We will host demonstration events in San Francisco so other cities may visit and learn from city staff, partners, and stakeholders, through presentations, walking tours, and other on-site activities. Outreach efforts at events hosted by other organizations provide opportunities for making presentations, exhibiting, and making one-to-one contact with potential adopters. Update webinars will be conducted on a quarterly basis, and video updates released as project milestones are reached. Tech Transfer will host one large-scale conference at the end of project period with cities invited from around the nation and world to demonstrate and disseminate lessons learned,

foster collaboration among and between government, industry, and researchers, and encourage implementation elsewhere.

High tech skills, such as data science, information management (collection, intellectual property, privacy, security), how to analyze and visualize big data for decision-making, will be important to the workforce of the future. Beyond skills, smart cities also require smart organizations. Silo-ed organizations are a barrier to truly smart cities, which need to integrate systems, people, and processes to make and implement data driven decisions. Training will both build skills, and help workers not only work collaboratively within their organizations, but also across organizations, including public- and private-sector agencies and groups. Tech Transfer will support the City in development and delivery of training modules based on lessons learned in year three.

One key component of UC Berkeley's knowledge transfer efforts will be conducted in partnership with the Natural Resources Defense Council through a Smart Cities Exchange.

Smart Cities Exchange. By initiating the Smart Cities Challenge, USDOT and Vulcan Philanthropy have uncovered tremendous, latent demand for more resources to create innovative public-private partnerships to solve urban mobility challenges. With 78 cities applying, and many more expressing interest, USDOT/Vulcan's key challenge is how to leverage the momentum generated after July 2016 when only one city is announced as winner and dozens still lack resources. Their significant $50M investment deserves maximum leverage. The urgency of the challenges facing cities all across America—congestion, air pollution, high cost of transportation—demands sharing best practices at lightning speed. By investing in the City of San Francisco, USDOT would initiate a concerted effort to build off of the momentum initiated by the Smart Cities Challenge. The Exchange would be a central component of San Francisco's project as a vehicle to glean best practices and transmit that shared learning to the other six Smart Cities Challenge finalists with a vision to scale up to other applicant cities already poised to use the Smart Cities Challenge frame. The Smart Cities Challenge Exchange will be established in year one and would convene twice annually in San Francisco. The exchange will include creation of issue specific working groups, real-time information exchange, and the publication of several white papers throughout the term of the grant. The Exchange's ultimate charge would be the development—at the culmination of the three-year challenge period—of a policy guide based on San Francisco's learning throughout the Challenge, to be developed in concert with the needs of other Challenge finalists.

Key staff on the knowledge transfer components include Laura Melendy and partners at NRDC, Amanda Eaken and Kristen Torres Pawling.

6.4 *Teams Supporting Communication Activities*

6.4.1. *The Technology Transfer Program*

The Technology Transfer Program at the University of California, Berkeley's Institute of Transportation Studies is uniquely positioned to conduct this outreach because they have already established their program as a premier source for technology transfer publications, professional training, expert assistance, and resources for public agencies. Topics of expertise include the transportation-related areas of planning and policy, engineering, project development, infrastructure design and maintenance, safety, and environmental issues for motorized and non-motorized roadway traffic, aviation, and rail.

The program serves over 25,000 public and private transportation agency personnel. The Program hosts over 80 transportation-related training events annually, including live classes, distance learning, hosted training, seminars, symposia, workshops, and conferences. Last year, over 3,000 transportation professionals attended Technology Transfer Program events, and Program staff visited more than two-dozen local agencies to provide on-site technical assistance.

The Program operates with eight career staff and a team of over 100 faculty and affiliates providing instruction and technical expertise in all modes of transportation. The Program offers extensive knowledge and experience in workforce development needs assessment, instructional development and delivery, professional web- and classroom-based training, expert-to-peer and peer-to-peer technical assistance, marketing and outreach, and event planning.

6.4.2 *The Natural Resources Defense Council*

Founded in 1970, NRDC has long been one of the nation's strongest and most-respected environmental advocates. A staff of over 500 brings to the table a key blend of scientific, legal, and policy expertise that the organization has leveraged to enact incredible change both globally and in California. NRDC led the campaigns to pass landmark legislation like SB 375, the first state law to connect land use, transportation infrastructure, and climate change, and AB 32, the Global Warming Solutions Act of 2006. NRDC also helped to pass the state's first clean car standards, which led to the federal 54.5 MPG fuel economy standards, and worked in 2015 to pass SB 350, which requires California to source 50% of its electricity from renewable power by 2030 and directs utilities to build the charging infrastructure to accelerate adoption of electric vehicles. The premise of NRDC's Urban Solutions program, in which this project is housed, is to establish best practices and then quickly scale them up across multiple cities, accelerating the pace of change to reach the scope and scale necessary to tackle the climate crisis.

VI) BUDGET

Total budget: $19,987,895.29 (see attached budget)

VII) PRINCIPAL INVESTIGATORS

Susan Shaheen, Ph.D. — University of California, Berkeley

Relevant Expertise:
- Transportation Policy
- Travel Behavior
- Transportation Planning
- Data Collection/Analysis
- Shared Use Mobility
- Intelligent Transportation Systems
- Transportation Energy

Years of Experience: 25

Education:
Ph.D., Ecology, UC Davis (1999)
M.S., Public Policy, Rochester (1990)
B.A., Political Science and English, Nazareth College of Rochester (1990)

Susan Shaheen is an adjunct professor in the Civil and Environmental Engineering Department at the University of California, Berkeley and is a full research engineer with the Institute of Transportation Studies-Berkeley. She served as the Policy & Behavioral Research Program Leader at California Partners for Advanced Transit and Highways from 2003 to 2007, and as a special assistant to the Director's Office of the California Department of Transportation from 2001 to 2004. She was honored as the first Honda Distinguished Scholar in Transportation at the Institute of Transportation Studies at UC Davis in 2000 and served as the endowed chair until 2012.

She has been the Principal Investigator on approximately 60 projects at UC Berkeley on travel behavior, shared mobility, ITS, and alternative fuels. She has co-edited one book and authored 57 journal articles, over 100 reports and proceedings articles, and four book chapters. She is a desk editor of *Transport Policy*. She has also served as guest editor for *Transport Policy, Energies*, and the *International Journal of Sustainable Transportation* (IJST). She was the chair of the Emerging and Innovative Public Transport and Technologies Committee of the Transportation Research Board (TRB) from 2004 to 2011. She is on the editorial board of *IJST* (2011 to present) and the *International Journal of Transportation Science and Technology* (2015 to present), was a member of the National Academies' Transit Research Analysis Committee (2011 to 2013), and is on the ITS Program Advisory Committee of U.S. DOT advising the Secretary of Transportation (2014 to Present). She is chair of the Shared-Use Vehicle Public Transport Systems Subcommittee (AP020(1)) of TRB (2013 to Present) a member of the TRB Major Activity Circulation Systems and Their Performance (AP040) committee (2008 to 2011, reappointed in 2015), and a member of the Emerging and Innovative Public Transport Systems and Technologies Committee (AP020) (2013 to Present).

Professional Experience

- Adjunct Professor, Civil and Environmental Engineering, *2012 to Present*
- Member and Subcommittee Chair, Emerging and Innovative Public Transport Systems and Technologies (AP020), Transportation Research Board, *2013 to Present*
- Research Engineer and Co-Director, TSRC, University of California, Berkeley, *2001-Present*
- Postdoctoral Scholar, College of Engineering, California Partners for Advanced Transit and Highways (PATH), University of California, Berkeley, *2000-2001*
- Research Associate, Energy and Environmental Consulting, Energetics, *1991 to 1993*
- Research Associate, Environmental Consulting, ICF, Washington, DC, *1990 to 1991*

Key Skills

- Project management and research design
- Survey design and analysis, activity data analysis, statistical analysis
- Report writing and presentation

Relevant Awards, Recognition

In May 2016, Professor Shaheen was named one of the top 10 academic thought leaders in academia by Eno Transportation Foundation. She also has earned a variety of honors, including two national research awards for her contributions to a carsharing pilot program (2001) and a smart parking field test (2005). In May 2010 and 2007, she received an "Excellence in Management" award from UC Berkeley.

Alexandre M. Bayen, Ph.D. — University of California, Berkeley

Alexandre Bayen is the Liao-Cho Professor of Engineering at UC Berkeley. He is a Professor of Electrical Engineering and Computer Science, and Civil and Environmental Engineering. He is currently the Director of the Institute of Transportation Studies (ITS). He is also a Faculty Scientist in Mechanical Engineering, at the Lawrence Berkeley National Laboratory (LBNL), where he is the Director of the Transportation Research Group. He received the Engineering Degree in applied mathematics from the Ecole Polytechnique, France, in 1998, the M.S. and Ph.D. in aeronautics and astronautics from Stanford University in 1998 and 1999 respectively. He was a Visiting Researcher at NASA Ames Research Center from 2000 to 2003. Between January 2004 and December 2004, he worked as the Research Director of the Autonomous Navigation Laboratory at the Laboratoire de Recherches Balistiques et Aerodynamiques, (Ministere de la Defense, Vernon, France), where he holds the rank of Major.

Relevant Expertise:

- Optimization and control
- Machine learning
- Urban Computing
- Cyber Physical Systems
- Traffic operations
- Transportation planning
- Mobile Sensing

Years of Experience: 18

Education:

Ph.D., Aeronautics and Astronautics, Stanford University (2004)
M.S., Aeronautics and Astronautics, Stanford University (1999)
Eng. Deg., Applied Mathematics, Ecole Polytechnique, France (1998)

Professor Bayen is author of two books and over 200 articles in peer-reviewed journals and conferences. He has managed large projects totaling more than $30 million raised in funding since 2005 for his own research program. At UC Berkeley, Bayen manages ITS, an operation with an annual research budget of about $30 million per year.

Professional Experience

- Director, Institute of Transportation Studies (ITS), UC Berkeley, *2014–Present*
- Director, Transportation Research Group, Faculty Scientist, Mechanical Engineering Lawrence Berkeley National Laboratory, *2015–Present*
- Professor Electrical Engineering and Computer Science, UC Berkeley, *2011–Present*
- Professor Civil and Environmental Engineering, UC Berkeley, *2005–Present*
- Major, Research Director, Autonomous Navigation Laboratory, France, *2004–2005*

- Visiting Scientist, NASA Ames Research Center, *2001–2003*
- Research Assistant, Aeronautics and Astronautics, Stanford University, *1998–2003*

Relevant Awards, Recognition

Professor Bayen received the Ballhaus Award from Stanford in 2004, the CAREER award from the National Science Foundation in 2009, and was named one of NASA's Top 10 Innovators on Water Sustainability (LAUNCH), 2010. Mobile Century and Mobile Millennium received the 2008 Best of ITS Award for 'Best Innovative Practice', at the ITS World Congress, and a TRANNY Award from the California Transportation Foundation, 2009. Mobile Millennium was featured more than 200 times in the media, both TV and radio (CBS, NBC, ABC, CNET, NPR, KGO, the BBC), as well as the popular press (Wall Street Journal, Washington Post, LA Times). In 2010, Bayen received the Presidential Early Career Award for Scientists and Engineers (PECASE) award from the White House. Subsequently, he has been awarded the Okawa Research Grant Award, the Ruberti Prize from the IEEE, and the Huber Prize from the ASCE.

Project Title:	Proposal for SFMTA
Agency:	Susan Shaheen/Alex Bayen
PI:	

Salaries:			Monthly Base Salary			Months Charged to Project				Project Salary			2017-2018 Year 1	2018-2019 Year 2	2019-2020 Year 3	TOTAL
Name	**Title**	**Budget Year**	**Cal/Ac Yr**	**Summer**	**Title**	**Cal/Ac Yr**	**% Effort**	**Summer**	**% Effort**	**Ac Yr**	**Summer**	**Rate Increase**	**10/1/16-9/30/17**	**10/1/17-9/30/18**	**10/1/18-9/30/19**	
Susan Shaheen	Principal Investigator	Year 1	11,073	11,073	Academic	12	75%		0%	99,657		3.00%	99,657.00	102,647.00	105,726.00	308,030.00
Joan Walker	Co-Investigator	Year 1	13,167	13,167	Limited			0.5	100%		6,584	3.00%	6,584.00	6,781.00	6,984.00	20,349.00
Elliot Martin	Assistant Senior Engineer	Year 1	8,789	8,789	Academic	12	75%		0%	79,101		3.00%	79,101.00	81,474.00	83,918.00	244,493.00
Rachel Finson	Senior Project Manager	Year 1	8,616	8,616	Staff	12	75%		0%	77,544		3.00%	77,544.00	79,870.00	82,266.00	239,680.00
TBD	Project Manager	Year 1	6,000	6,000	Staff	12	75%		0%	54,000		3.00%	54,000.00	55,620.00	57,289.00	166,909.00
Nelson Chan	Survey Researcher 2	Year 1	4,277	4,277	Staff	12	65%		0%	33,361		3.00%	33,361.00	34,361.00	35,392.00	103,114.00
Adam Cohen	Survey Researcher 2	Year 1	4,277	4,277	Staff	12	65%		0%	33,361		3.00%	33,361.00	34,361.00	35,392.00	103,114.00
Adam Stocker	Survey Researcher 2	Year 1	4,277	4,277	Staff	12	65%		0%	33,361		3.00%	33,361.00	34,361.00	35,392.00	103,114.00
TBD	(2) Post-Doctoral Assistan	Year 1	8,947	8,947	Limited	12	100.0%			107,364		3.00%	107,364.00	110,585.00	113,902.00	331,851.00
TBD	(4) GSR Step VIII	Year 1	21,052	21,052	Student	5.5	49.5%	3	100%	57,314	63,156	3.00%	120,470.00	161,651.00	166,500.00	448,621.00
TBD	(5) Undergraduate Studen	Year 1	13,920	13,920	Student	9	50%	3	100%	62,640	41,760	3.00%	104,400.00	107,532.00	110,758.00	322,690.00
Laura Melendy (TTR)	Academic Program Mana	Year 1	13,133	12,133	Staff	12	20%		0%	31,519		3.00%	31,519.00	32,465.00	33,439.00	97,423.00
TBD (TTR)	Communication/Events Sp	Year 1	7,500	7,500	Staff	12	30%		0%	27,000		3.00%	27,000.00	27,810.00	28,644.00	83,454.00
Alexandre Bayen	Co-PI	Year 1	17,166	17,166			0%		0%			3.00%				
TBD	Survey Researcher 2	Year 1	8,554	8,554	Staff	12	65%		0%	66,721		3.00%	66,721.00	68,723.00	70,785.00	206,229.00
Total Salaries:													**874,443.00**	**938,241.00**	**966,387.00**	**2,779,071.00**

Fringe Benefits:			Benefit Rate	Person Months Charged to	Project Benefits				
Name	**Title**	**Budget Year**	**Budget Year**	**Project**	**Ac Yr**	**Summer**			
Susan Shaheen	Principal Investigator	Year 1	40.00%	9	39,863		39,863.00	41,059.00	42,290.00	123,212.00
Joan Walker	Co-Investigator	Year 1	24.00%	0.5		1,580	1,580.00	1,627.00	1,676.00	4,883.00
Elliot Martin	Assistant Senior Engineer	Year 1	40.00%	9	31,640		31,640.00	32,590.00	33,567.00	97,797.00
Rachel Finson	Senior Project Manager	Year 1	48.00%	9	37,221		37,221.00	38,338.00	39,488.00	115,047.00
TBD	Project Manager	Year 1	48.00%	9	25,920		25,920.00	26,698.00	27,499.00	80,117.00
Nelson Chan	Survey Researcher 2	Year 1	48.00%	7.8	16,013		16,013.00	16,493.00	16,988.00	49,494.00
Adam Cohen	Survey Researcher 2	Year 1	48.00%	7.8	16,013		16,013.00	16,493.00	16,988.00	49,494.00
Adam Stocker	Survey Researcher 2	Year 1	48.00%	7.8	16,013		16,013.00	16,493.00	16,988.00	49,494.00
TBD	(2) Post-Doctoral Assistan	Year 1	24.00%	12.0	25,767		25,767.00	26,540.00	27,336.00	79,643.00
TBD	(4) GSR Step VIII	Year 1	0.00%	5.7						
TBD	(5) Undergraduate Studen	Year 1	0.00%	7.5						
	(5) Undergraduate Studen	Year 2	0.00%	7.5						
	(5) Undergraduate Studen	Year 3	0.00%	7.5						
	(5) Undergraduate Studen	Year 4	0.00%							
	(5) Undergraduate Studen	Year 5	0.00%							
Laura Melendy (TTR)	Academic Program Mana	Year 1	48.00%	2.4	15,129		15,129.00	15,583.00	16,051.00	46,763.00
TBD (TTR)	Communication/Events Sp	Year 1	48.00%	3.6	12,960		12,960.00	13,349.00	13,749.00	40,058.00
Alexandre Bayen	Co-PI	Year 1	0.00%							
TBD	Survey Researcher 2	Year 1	48.00%	7.8	32,026		32,026.00	32,987.00	33,977.00	98,990.00
Total Fringe Benefits:							**270,145.00**	**278,250.00**	**286,597.00**	**834,992.00**

GSR Tuition Fees	**# Yr 1**	**# Yr 2**	**# Yr 3**	**# Yr 4**	**# Yr 5**	**Total**				
GSR Fees	**$ 36,544.00**	**$ 76,744.00**	**$ 80,584.00**			**$ 193,872.00**	36,544.00	76,744.00	80,584.00	193,872.00
Total GSR Tuition Remission							**36,544.00**	**76,744.00**	**80,584.00**	**193,872.00**
Total Salaries and Benefits							**1,181,132.00**	**1,293,235.00**	**1,333,568.00**	**3,807,935.00**
Rent										
Brower Center							1,200.00	1,200.00	1,200.00	3,600.00
Total Rent:							**1,200.00**	**1,200.00**	**1,200.00**	**3,600.00**
Consultant Costs										
(Tech Transfer) Subject Matter Experts							145,000.00	145,000.00	145,000.00	435,000.00
Total Consultant Costs:							**145,000.00**	**145,000.00**	**145,000.00**	**435,000.00**
Supplies										
GAEL:										
5 Computers at $4k each							20,000.00			20,000.00
Smart Phones for Research Participants (5 phones/$100 each)							400.00			400.00
Data Plans ($100/month for 36 months for 5 phones)							4,800.00	4,800.00	4,800.00	14,400.00
Printing Supplies							5,000.00	5,000.00	5,000.00	15,000.00
(Tech Transfer) Supplies (Purchase of photographs for publications, or software, hardware, streaming web services, etc., for webinars)							5,000.00	5,000.00	5,000.00	15,000.00
Total Supplies Costs:							**35,200.00**	**14,800.00**	**14,800.00**	**64,800.00**
Domestic Travel										
TSRC Travel							20,000.00	20,000.00	20,000.00	60,000.00
(Tech Transfer) Travel							20,000.00	20,000.00	20,000.00	60,000.00
Total Domestic Travel Costs:							**40,000.00**	**40,000.00**	**40,000.00**	**120,000.00**
Other expenses										
Survey, Focus Groups and Incentives								527,000.00	527,000.00	1,054,000.00
(Tech Transfer) Writing/Editing Services							25,000.00	25,000.00	25,000.00	75,000.00
(Tech Transfer) Designing							25,000.00	25,000.00	25,000.00	75,000.00
(Tech Tranfer) Printing							25,000.00	25,000.00	25,000.00	75,000.00
Convening							65,000.00	65,000.00	65,000.00	195,000.00
(Tech Transfer) Community Mobility Challenge Public Outreach							1,341,000.00	931,000.00	799,000.00	3,071,000.00
Total Other Expenses:							**1,481,000.00**	**1,598,000.00**	**1,466,000.00**	**4,545,000.00**
Consortium Direct Cost										
Natural Resources Defense Council Sub 1							129,816.00	133,299.00	136,885.00	400,000.00
Consortium Total Direct							**129,816.00**	**133,299.00**	**136,885.00**	**400,000.00**
Consortium FA										
Natural Resources Defense Council Sub 1										0.00
Total Consortium FA							**0.00**	**0.00**	**0.00**	**0.00**
Consortium/Contractual Total costs										
Natural Resources Defense Council Sub 1 UCB IDC: Yes							129,816.00	133,299.00	136,885.00	400,000.00
Total Consortium Costs							**129,816.00**	**133,299.00**	**136,885.00**	**400,000.00**
Direct Costs							**3,013,348.00**	**3,225,534.00**	**3,137,453.00**	**9,376,335.00**
SUBTOTAL Direct Costs							**3,013,348.00**	**3,225,534.00**	**3,137,453.00**	**9,376,335.00**
UCB Indirect Costs Base							2,870,788.00	3,014,291.00	2,918,784.00	8,803,863.00
Total IDC							746,405.00	783,716.00	758,884.00	2,289,005.00
Total Direct & Indirect Costs:							**3,759,753.00**	**4,009,250.00**	**3,896,337.00**	**11,665,340.00**

	Category	**On / Off Campus**
IDC RATE: 26%	**Sponsored Research**	**Off-Campus**
		Sponsor Category
		Federal

TSRC Smart City Budget Justifications

Personnel:

- **Susan Shaheen**, Principal Investigator (12/year at 75% effort at year), will provide overall guidance and direction for the research and high level communication with project partners.

- **Alexandre Bayen**, Professor Bayen (project effort provided as needed) will provide intellectual direction and overall management for this project. The full academic year of a member of the faculty of UC Berkeley are paid by the University with the understanding that they will ordinarily teach and conduct research with flexibility, but will not make substantial, specific quantified commitments of time and effort to specific organized research projects. Therefore, Professor Bayen is not requesting salary support on this project.

- **Joan Walker**, Co-Investigator (.5 Summer month/year at 100% effort each year), will conduct research with Susan Shaheen pertaining to Transportation as a Service.

- **Laura Melendy**, Academic Program Manager (12 months/year at 20% effort each year), will oversee technology transfer, community outreach, and knowledge transfer communications.

- **Elliot Martin,** Assistant Research Engineer, (12 months/year at 75% effort each year), will lead researchers developing, implementing and analyzing behavioral research components.

- **Rachel Finson**, Senior Project Manager, (12 months/year at 75% effort each year), will provide overall project management and coordination.

- **TBD**, Project Manager, (12 months/year at 75% effort each year), will manage sub-projects within the TSRC portfolio and assist with financial monitoring and progress and financial reporting.

- **Nelson Chan, Adam Cohen, Adam Stocker, TBD,** Survey Researchers, (12 months/year at 65% effort each year), will work under Susan Shaheen and Elliot Martin to assist with implementing surveys and focus groups, analyzing data, and writing summary reports.

- **TBD**, Post-Doctoral Researchers, (12 months/year at 100% effort each year) will work under Elliot Martin to conduct analysis.

- **TBD**, Communication/Events Specialist, (12 moths per year at 30% effort each year) will work with Laura Melendy to provide communication support and events coordination.

- **TBD**, Graduate Student Researchers, (5.5 Academic months in the first year and 9 academic months each following year at 49.5% effort. 3 Summer months each year at 100% effort) will assist research implementation and data analysis under direction from Elliot Martin.

- **TBD**, Undergraduate Student Assistants, (9 Academic months at 50% effort and 3 Summer months at 100% effort/year each year) will assist with writing and data analysis under direction from Elliot Martin.

Fringe Benefits:

- Fringe benefits for **Susan Shaheen and Assistant Research Engineer** are calculated at the projected rate of 40% for Academic titles.
- Fringe benefit rates for **Joan Walker** are calculated at the projected rate of 24% Limited rate for Summer Academic salaries.
- Fringe benefits for **Academic Program Manager, Senior Project Manager, Project Manager, Survey Researchers and Communication/Events Specialists** are calculated at the projected rate of 48% for Staff titles.
- Fringe benefits for **Graduate Student Researchers and Undergraduate Student Assistants** are calculated at the projected rate of 0% for Student titles.
- The UC Berkeley composite fringe benefit rates have been reviewed and federally approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year.

Rent:

Brower Center Rent: Cubicle space at the Brower Center at $600/month reflecting the amount of project staff time that will be conducted at the Brower Center. Additional space for project provided gratis at 50 UN Plaza.

Consultants:

Subject Matter Experts TBD: Will generate content for technology transfer materials including mid-term publications and the culminating policy guide at an estimated $250/hour.

Supplies:

Materials and Supplies ($64,800): The University of California, Berkeley, assigns a unique accounting number to projects such as that proposed here. Only expenditures that are necessary for and directly related to a particular project may be charged against that project's accounting number. For this project, the budgeted supplies include project-related consumable materials and project specific research supplies including, but not limited to, computers, smart phones, data plans, printing supplies and materials for webinars. Materials and Supplies costs for the project will be for three year.

Travel:

Domestic Travel: $8,000/year for multiple trips to San Francisco each week to meet with SFMTA, technology providers, site visits for installation, and site visits for evaluation,

including the focus groups. Estimate of $30.00/trip including mileage, toll and parking. When staff can accomplish tasks via BART, they will take BART which will eliminate parking costs. Likely trips to surrounding Bay Area. $12,000 year for six trips to D.C., other smart cities to share information, and conferences to present the SF Smart Cities.

For Tech Transfer:
$4000 for multiple trips to SF each week to meet with partners and tech transfer events. $8000 year for 4 trips to D.C. and other cities for tech transfer events. $8000 to bring in other participants from other smart cities for tech transfer events

Other Expenses:

Survey, Focus Groups and Incentives: Will be to provide incentives for the survey participants to maintain continued participation over the durration of the project. Incentives will also be provided to the focus group participants.

Writing/Editing Services: Will draft and finalize outreach material about the project that will be shared with residents of San Francisco and the Bay Area and technology transfer materials to support knowledge transfer to other cities.

Designing: Will provide graphic design for outreach and technology transfer publications.

Printing: Publication of materials created to share information and progress about the project with the community and technology transfer materials for knowledge transfer to other cities.

Convening: Will provide meeting space, audio-visual support, recording, and other services required for technology transfer activities.

Public outreach: Will provide public outreach campaign including direct mail, billboards/bus shelter postings, radio and TV ads in English, Spanish, and Chinese, robo-calls, door-to-door outreach including door-hangers, tabling at events to connect directly with citizens, and hosting community events and meet-ups.

Subawards:

Natural Resources Defense Council: Will assist the project by leading the Smart Cities Exchange and building climate and equity stakeholder engagement. Founded in 1970, the Natural Resources Defense Council has long been one of the nation's strongest and most-respected environmental advocates. A staff of over 500 brings to the table a key blend of scientific, legal, and policy expertise that the organization has leveraged to enact incredible change both globally and in California. NRDC led the campaigns to pass landmark legislation like SB 375, the first state law to connect land use, transportation infrastructure, and climate change, and AB 32, the Global Warming Solutions Act of

2006. NRDC also helped to pass the state's first clean car standards, which led to the federal 54.5 MPG fuel economy standards, and worked in 2015 to pass SB 350, which requires California to source 50% of its electricity from renewable power by 2030 and directs utilities to build the charging infrastructure to accelerate adoption of electric vehicles. The premise of NRDC's Urban Solutions program, in which this project is housed, is to establish best practices and then quickly scale them up across multiple cities, accelerating the pace of change to reach the scope and scale necessary to tackle the climate crisis. NRDC will be supporting UC Berkeley's proposal by providing the Smart Cities Exchange and Climate and Equity Advisory Group components.

Indirect Charges:

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

Project Title:	Samrt Cities - Data Warehouse and Visualization
Agency:	SFMTA
PI:	Susan Shaheen/Alexandre Bayen

Salaries:

Name	Title	Budget Year	Monthly Base Salary Cal/Ac Yr	Monthly Base Salary Summer	Title	Months Charged to Project Cal/Ac Yr	Months Charged to Project % Effort	Summer	% Effort	Project Salary Ac Yr	Project Salary Summer	Project Salary Rate Increase	2017-2018 Year 1 10/1/16-9/30/17	2018-2019 Year 2 10/1/17-9/30/18	2019-2020 Year 3 10/1/18-9/30/19	TOTAL
TBD	Research and Data Librari	Year 1	5,954	5,954	Staff	12	20%		0%	14,290		3.00%	14,290.00	14,718.00	15,160.00	44,168.00
TBD	Programmer	Year 1	10,453	10,453	Staff	12	68%		0%	84,752		3.00%	84,752.00	87,294.00	89,913.00	261,959.00
TBD	Data Librarian	Year 1	6,962	6,962	Staff	12	50%		0%	41,772		3.00%	41,772.00	43,025.00	44,316.00	129,113.00
TBD		Year 1					0%		0%							
TBD	Data Scientist	Year 1	10,068	10,068	Academic	12	68%		0%	81,627		3.00%	81,627.00	84,076.00	86,598.00	252,301.00
TBD	(2) Post-Doctoral Researc	Year 1	8,947	8,947	Limited	12	50%		0%	53,682		3.00%	53,682.00	55,292.00	56,951.00	165,925.00
TBD	(4) GSR Step VIII	Year 1	21,052	21,052	Student	4.5	49.5%	3	100%	46,893	63,156	3.00%	110,049.00	161,651.00	166,500.00	438,200.00
							0%		0%							
Total Salaries:													**386,172.00**	**446,056.00**	**459,438.00**	**1,291,666.00**

Fringe Benefits:

Name	Title	Budget Year	Benefit Rate Budget Year	Person Months Charged to Project	Project Benefits Ac Yr	Project Benefits Summer			
TBD	Research and Data Librari	Year 1	48.00%	2.4	6,859		6,859.00	7,065.00	7,277.00	21,201.00
TBD	Programmer	Year 1	48.00%	8.1	40,681		40,681.00	41,901.00	43,158.00	125,740.00
TBD	Data Librarian	Year 1	48.00%	6	20,051		20,051.00	20,652.00	21,272.00	61,975.00
TBD	Data Scientist	Year 1	40.00%	8.1	32,651		32,651.00	33,630.00	34,639.00	100,920.00
TBD	(2) Post-Doctoral Researc	Year 1	24.00%	6	12,884		12,884.00	13,270.00	13,668.00	39,822.00
TBD	(4) GSR Step VIII	Year 1	0.00%	5.2						
Total Fringe Benefits:							**113,126.00**	**116,518.00**	**120,014.00**	**349,658.00**

GSR Tuition Fees	# Yr 1	# Yr 2	# Yr 3	# Yr 4	# Yr 5	Total				
GSR Fees	$ 68,260.00	$143,344.00	$ 150,512.00			$362,116.00	68,260.00	143,344.00	150,512.00	362,116.00
Total GSR Tuition Remission							**68,260.00**	**143,344.00**	**150,512.00**	**362,116.00**
Total Salaries and Benefits							**567,558.00**	**705,918.00**	**729,964.00**	**2,003,440.00**

Equipment:				
2 high performance multi-core servers with SATA SSD storage (Dell PowerEdge platform)	30,000.00			30,000.00
Total Equipment Costs:	**30,000.00**	**0.00**	**0.00**	**30,000.00**
Supplies				
GAEL:				
Laptop Computers ($2500/pc * 6)	15,000.00			15,000.00
Desktops ($2500/pc * 4	10,000.00			10,000.00
(Printing materials, external storage, misc research expenses	1,000.00	1,000.00	1,000.00	3,000.00
Total Supplies Costs:	**26,000.00**	**1,000.00**	**1,000.00**	**28,000.00**
Domestic Travel				
Domestic Travel (8 Senior staff members)	1,200.00	1,200.00	1,200.00	3,600.00
Total Domestic Travel Costs:	**1,200.00**	**1,200.00**	**1,200.00**	**3,600.00**
Direct Costs	**624,758.00**	**708,118.00**	**732,164.00**	**2,065,040.00**
SUBTOTAL Direct Costs	**624,758.00**	**708,118.00**	**732,164.00**	**2,065,040.00**
UCB Indirect Costs Base	526,498.00	564,774.00	581,652.00	1,672,924.00
Total IDC	136,889.00	146,841.00	151,230.00	434,960.00
Total Direct & Indirect Costs:	**761,647.00**	**854,959.00**	**883,394.00**	**2,500,000.00**

	Category	On / Off Campus
IDC RATE: 26%	**Sponsored Research**	**Off-Campus**
		Sponsor Category
		Federal

Data Warehouse and Visualization
Budget Justification

Personnel:

- **TBD**, Research and Data Librarian (12 months/year at 20% effort each year) will research the ontologies, design the catalog and categorize and support digital materials resulting from the project.

- **TBD**, Programmer, (12 months/year at 68% effort each year) will implement the information collection, processing and storage pipelines.

- **TBD,** Data Librarian, (12 months/year at 50% effort each year) will categorize and maintain the data warehouse, and provide day-to-day support and maintenance for license management and access to data.

- **TBD,** Data Scientist, (12 months/year at 68% each year) will perform research in data compression and visualization techniques develop concepts of dashboard visualization components and their interactions, investigate the accuracy, completeness and timeliness of data from a range of sources.

- **TBD,** Post-Doctoral Researchers, (12 months/year at 50% effort each year), will develop scalable methods of data processing, research computational methods to enhance performance of processing of structured and unstructured data, and work with the programmer on the implementation of scientific methods in software.

- **TBD,** Graduate Student Researchers, (4.5 Academic months in the first year and 9 academic month each following year at 49.5% each year, and 3 summer months at 100% effort each year) will conduct research in mobility data analysis and visualization, as well as data-driven transportation systems design and optimization. They will prepare publications and present the results of the work in academic, industrial and DOT practitioner oriented conferences.

Fringe Benefits:

- Fringe benefits for **Research and Data Librarian, Programmer, Data Librarian and Data Scientist** are calculated at the projected rate of 46% for Staff Titles.
- Fringe benefits for the post-doctoral Researcher are calculated at the projected rate of 24% for Limited titles.
- The UC Berkeley composite fringe benefit rates have been approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year.

Equipment

Servers: 2 high performance multi-core servers on Dell PowerEdge platform with SATA SSD storage for processing proprietary data and raw data sources licensed for exclusive use to UC Berkeley. Cloud services access provided by award sponsors will be leveraged for the rest of the data and computations required by the project.

Materials and Supplies

Materials and Supplies ($28,000): The University of California, Berkeley, assigns a unique accounting number to projects such as that proposed here. Only expenditures that are necessary for and directly related to a particular project may be charged against that project's accounting number. For this project, the budgeted supplies include project-related consumable materials and project specific research supplies including, but not limited to, laptop computers, desktop computers, printing materials and misc. research supplies to be used for the project. Materials and Supplies costs for the project will be for three year.

Travel

Domestic Travel:

Travel to project coordination meetings and data providers companies (San Francisco Bay Area, New Jersey, Sacramento CA, Chicago) are budgeted. We request funds for 2 co-PIs and 4 all senior personnel to attend these meetings. Additionally, funds are requested for the PIs and the graduate students to travel to an annual academic conference for publishing & presentation of their research findings. Travel expenses include round trip airfare calculated at $600, meals at a maximum of $71/day, hotel expenses at $175/night, and conference registration costs at $450 for the PIs and $250 for the students.

Indirect Charges:

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated September 9, 2015.

Budget - Safe Driving Platform App to Detect and Reduce Unsafe Driving Patterns (e.g., Speeding, Hard Braking) and Subsequent Collisions/Injuries/Fatalities

	Monthly Rate	# months	Unit	%	10/01/16 09/30/17	10/01/17 09/30/18	10/01/18 09/30/19	**TOTAL BUDGET**
Academic Personnel								
David Ragland	$13,560	12	cal. yr.	5.0%	$8,136			
Project Manager	$13,966	12	cal. yr.	5.0%		$8,380		
	$14,385	12	cal. yr.	5.0%			$8,631	$25,147
Offer Grembek	$8,695	12	cal. yr.	10.0%	$10,434			
Co-Investigator	$8,955	12	cal. yr.	10.0%		$10,746		
	$9,224	12	cal. yr.	10.0%			$11,069	$32,249
Post-Doctoral Researcher	$5,517	12	cal. yr.	40.0%	$26,482			
	$5,682	12	cal. yr.	40.0%		$27,274		
	$5,853	12	cal. yr.	40.0%			$28,094	$81,850
1 Graduate Student Researcher	$5,263	4.5	acad mo	49.5%	$11,723			
Graduate Student Researcher	$5,263	3	summer	100.0%	$15,789			
1 Graduate Student Researcher	$5,421	9	acad mo	49.5%		$24,151		
Graduate Student Researcher	$5,421	3	summer	100.0%		$16,263		
1 Graduate Student Researcher	$5,638	9	acad mo	49.5%			$25,117	
Graduate Student Researcher	$5,638	3	summer	100.0%			$16,914	$109,957
TOTAL ACADEMIC PERSONNEL					$72,564	$86,814	$89,825	$249,203
Staff Personnel								
Research Associate	$5,938	12	cal. yr.	60.0%	$42,754			
	$6,116	12	cal. yr.	60.0%		$44,035		
	$6,299	12	cal. yr.	60.0%			$45,353	$132,142
TOTAL STAFF PERSONNEL					$42,754	$44,035	$45,353	$132,142
TOTAL ACADEMIC AND STAFF PERSONNEL					$115,318	$130,849	$135,178	$381,345
	Estimated Employee Benefit Rate							
Employee Benefits	FY18	FY18	FY19	FY20				
David Ragland	0.0%	0.0%	0.0%	0.0%	$0	$0	$0	$0
Offer Grembek	40.0%	40.0%	40.0%	40.0%	$4,174	$4,298	$4,428	$12,900
Post-Doctoral Researcher	24.0%	24.0%	24.0%	24.0%	$6,356	$6,546	$6,743	$19,645
Research Associate	48.0%	48.0%	48.0%	48.0%	$20,522	$21,137	$21,769	$63,428
GSR Tuition Remission - $9546/$10501/$11551 per semester (estimated FY15/16 cost + 10% per year)					$9,546	$21,002	$23,102	$53,650
TOTAL EMPLOYEE BENEFITS					$40,598	$52,983	$56,042	$149,623
TOTAL PERSONNEL & BENEFITS					$155,916	$183,832	$191,220	$530,968
Equipment								
					$0	$0	$0	$0
TOTAL EQUIPMENT					$0	$0	$0	$0

Travel				
Domestic Travel	$2,000	$1,500	$1,500	$5,000
TOTAL TRAVEL	$2,000	$1,500	$1,500	$5,000
Subcontract				
	$0	$0		$0
TOTAL SUBCONTRACT	$0	$0	$0	$0
Other Direct Costs				
Computer/Software	$3,000	$0	$0	$3,000
Printer Lease	$1,019	$1,005	$1,005	$3,029
Communications	$1,341	$1,341	$1,341	$4,023
Office Space	$10,826	$11,151	$11,476	$33,453
TOTAL OTHER DIRECT COSTS	$16,186	$13,497	$13,822	$43,505
TOTAL DIRECT COSTS	**$174,102**	**$198,829**	**$206,542**	**$579,473**
	MTDC			
	$153,730	$166,676	$171,964	
Indirect Costs				
26% of Modified Total Direct Costs	$39,970	$43,336	$44,711	$128,017
TOTAL AMOUNT REQUESTED	**$214,072**	**$242,165**	**$251,253**	**$707,490**

Budget Justification

Personnel:

- **David Ragland**, Project Manager (12 months/year at 5% effort each year), will provide overall guidance and direction for the research and high level communication with project partners.

- **Offer Grembek**, Co-Investigator (12 months/year at 10% effort each year), will collaborate on the overall guidance and direction for the research and high level communication with project partners

- **Post-Doctoral Researcher,** (12 months/year at 40% effort each year) will assist with research projects under the guidance of the project's senior personnel. The researcher will conduct background research and conduct data analyses.

- **Research Associate,** (12 months/year at 60% effort each year) will coordinate and conduct data analysis tasks.

- **Graduate Student Researcher,** (4.5 academic months in the first year and 9 academic months each following year at 49.5% each year and 3 summer month/year at 100% effort each year) will **c**onduct background research and develop data collection protocols under the guidance of the research associated and the lead investigators; will assist in report writing and the development of presentations and research papers.

Fringe Benefits:

- Fringe benefits for **David Ragland** are calculated at 0% of Recall Appointments.
- Fringe benefits for **Offer Grembek** are calculated at the projected rate of 40% of Academic titles in FY 2018, FY 2019 and FY 2020.
- Fringe benefits for **Research Associate** are calculated at the projected rate of 48% of Staff titles FY 2018, FY 2019 and 2020.
- Fringe benefits for the **Post-Doctoral Researcher** are calculated at the projected rate of 24% of Limited titles in FY 2018, FY 2019 and FY 2020.
- Fringe benefits for **Graduate Student Researcher** are calculated at the rate of 0% for Student titles.
- The UC Berkeley composite fringe benefit rates have been reviewed and federally approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year.

Travel:

Domestic Travel: Local travel related to conducting the project.

Other Direct Costs:

Computer/Software: Computers and software will be purchased for performing statistical analysis and research, tracking program activities, and producing required reports.

Printer Lease: Includes the costs for leasing printer/copier for use in printing and the duplication of grant materials.

Office Space:
Office space rental costs are included as an Other Direct Cost because the University's indirect cost rate agreement excludes rental costs of off-campus facilities. The University has made arrangements for SafeTREC to rent spaces at the American Baptist Seminary of the West (2614 Dwight Way, Berkeley, CA) and the research will be conducted at that location. Indirect cost is not collected on the Office Space rental cost.

Indirect Costs:
The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015

Budget--Safety Surveillance

	Monthly Rate	# months	Unit	%	10/01/16 09/30/17	10/01/17 09/30/18	10/01/18 09/30/19	**TOTAL BUDGET**
Academic Personnel								
David Ragland	$13,560	12	cal. yr.	5.0%	$8,136			
Project Manager	$13,966	12	cal. yr.	5.0%		$8,380		
	$14,385	12	cal. yr.	5.0%			$8,631	$25,147
Offer Grembek	$8,695	12	cal. yr.	10.0%	$10,434			
Co-Investigator	$8,955	12	cal. yr.	10.0%		$10,746		
	$9,224	12	cal. yr.	10.0%			$11,069	$32,249
Post-Doctoral Researcher	$5,517	12	cal. yr.	30.0%	$19,861			
	$5,682	12	cal. yr.	30.0%		$20,455		
	$5,853	12	cal. yr.	30.0%			$21,071	$61,387
1 Graduate Student Researcher	$5,263	4.5	acad mo	49.5%	$11,723			
Graduate Student Researcher	$5,263	3	summer	100.0%	$15,789			
1 Graduate Student Researcher	$5,421	9	acad mo	49.5%		$24,151		
Graduate Student Researcher	$5,421	3	summer	100.0%		$16,263		
1 Graduate Student Researcher	$5,638	9	acad mo	49.5%			$25,117	
Graduate Student Researcher	$5,638	3	summer	100.0%			$16,914	$109,957
TOTAL ACADEMIC PERSONNEL					$65,943	$79,995	$82,802	$228,740
Staff Personnel								
Research Associate	$5,938	12	cal. yr.	30.0%	$21,377			
	$6,116	12	cal. yr.	30.0%		$22,018		
	$6,299	12	cal. yr.	30.0%			$22,676	$66,071
TOTAL STAFF PERSONNEL					$21,377	$22,018	$22,676	$66,071
TOTAL ACADEMIC AND STAFF PERSONNEL					$87,320	$102,013	$105,478	$294,811
	Estimated Employee Benefit Rate							
Employee Benefits	FY18	FY18	FY19	FY20				
David Ragland	0.0%	0.0%	0.0%	0.0%	$0	$0	$0	$0
Offer Grembek	40.0%	40.0%	40.0%	40.0%	$4,174	$4,298	$4,428	$12,900
Post-Doctoral Researcher	24.0%	24.0%	24.0%	24.0%	$4,767	$4,909	$5,057	$14,733
Research Associate	48.0%	48.0%	48.0%	48.0%	$10,261	$10,569	$10,884	$31,714
GSR Tuition Remission - $9546/$10501/$11551 per semester (estimated FY15/16 cost + 10% per year)					$9,546	$21,002	$23,102	$53,650
TOTAL EMPLOYEE BENEFITS					$28,748	$40,778	$43,471	$112,997
TOTAL PERSONNEL & BENEFITS					$116,068	$142,791	$148,949	$407,808
Equipment								
					$0	$0	$0	$0
TOTAL EQUIPMENT					$0	$0	$0	$0

Travel				
Domestic Travel	$2,000	$1,500	$1,500	$5,000
TOTAL TRAVEL	$2,000	$1,500	$1,500	$5,000
Subcontract				
	$0	$0		$0
TOTAL SUBCONTRACT	$0	$0	$0	$0
Other Direct Costs				
Computer/Software	$3,000	$0	$0	$3,000
Printer Lease	$1,019	$1,005	$1,005	$3,029
Communications	$1,341	$1,341	$1,341	$4,023
Office Space	$8,826	$9,151	$9,476	$27,453
TOTAL OTHER DIRECT COSTS	$14,186	$11,497	$11,822	$37,505
TOTAL DIRECT COSTS	**$132,254**	**$155,788**	**$162,271**	**$450,313**
	MTDC			
	$113,882	$125,635	$129,693	
Indirect Costs				
26% of Modified Total Direct Costs	$29,609	$32,665	$33,720	$95,994
TOTAL AMOUNT REQUESTED	**$161,863**	**$188,453**	**$195,991**	**$546,307**

Budget Justification

Personnel:

- **David Ragland**, Project Manager (12 months/year at 5% effort each year), will provide overall guidance and direction for the research and high level communication with project partners.

- **Offer Grembek**, Co-Investigator (12 months/year at 10% effort each year), will collaborate on the overall guidance and direction for the research and high level communication with project partners

- **Post-Doctoral Researcher,** (12 months/year at 30% effort each year) will assist with research projects under the guidance of the project's senior personnel. The researcher will conduct background research and conduct data analyses.

- **Research Associate,** (12 months/year at 30% effort each year) will coordinate and conduct data analysis tasks.

- **Graduate Student Researcher,** (4.5 academic months in the first year and 9 academic months in the following two year at 49.5% effort each year and 3 summer months at 100% effort each year) will **c**onduct background research and develop data collection protocols under the guidance of the research associated and the lead investigators; will assist in report writing and the development of presentations and research papers.

Fringe Benefits:

- Fringe benefits for **David Ragland** are calculated at 0% of Recall Appointments.
- Fringe benefits for **Offer Grembek** are calculated at the projected rate of 40% of Academic titles in FY 2018, FY 2019 and FY 2020.
- Fringe benefits for **Research Associate** are calculated at the projected rate of 48% of Staff titles FY 2018, FY 2019 and 2020.
- Fringe benefits for the **Post-Doctoral Researcher** are calculated at the projected rate of 24% of Limited titles in FY 2018, FY 2019 and FY 2020.
- Fringe benefits for **Graduate Student Researcher** are calculated at the rate of 0% for Student titles.
- The UC Berkeley composite fringe benefit rates have been reviewed and federally approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year.

Travel:

Domestic Travel: Local travel related to conducting the project.

Other Direct Costs:

Computer/Software: Computers and software will be purchased for performing statistical analysis and research, tracking program activities, and producing required reports.

Printer Lease: Includes the costs for leasing printer/copier for use in printing and the duplication of grant materials.

Office Space:
Office space rental costs are included as an Other Direct Cost because the University's indirect cost rate agreement excludes rental costs of off-campus facilities. The University has made arrangements for SafeTREC to rent spaces at the American Baptist Seminary of the West (2614 Dwight Way, Berkeley, CA) and the research will be conducted at that location. Indirect cost is not collected on the Office Space rental cost.

Indirect Costs:
The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015

Project Name: Automated Taxi Evaluation

				Year 1 Oct 1, 2016 to Sept 30 2017	Year 2: Oct 1, 2017 to Sep. 30, 2018	Year 3: Oct 1, 2018 to Sep. 30, 2019	Year 2: Oct 1, 2019 to Sep. 30, 2020
		Grand total Federal	Grand Total State	Total	Total	Total	Total
a	Personnel	$ 378,588	$ -	$ 106,743	$ 115,667	$ 156,178	$ -
b	Fringe Benefits (Total)						
	Fringe	$ 109,296	$ -	$ 30,446	$ 34,430	$ 44,419	$ -
	Tuition remission	$ -	$ -	$ -	$ -	$ -	$ -
c	Travel	$ 22,840	$ -	$ 7,398	$ 7,398	$ 8,045	$ -
d	Equipment	$ -	$ -	$ -	$ -	$ -	$ -
e	Supplies	$ 9,500	$ -	$ 7,500	$ -	$ 2,000	$ -
f	Subcontracts	$ -					
g	Construction	$ -					
h	rent	$ 29,363		$ 9,788	$ 9,788	$ 9,788	
i	Total Direct charges	$ 549,586	$ -	$ 161,875	$ 167,281	$ 220,430	$ -
	idc Rate	$ 0		26%	26%	26%	
j	indirect Costs	$ 135,258	$ -	$ 39,543	$ 40,948	$ 54,767	$ -
K	Total Costs	$ 684,844	$ -	$ 201,417	$ 208,230	$ 275,197	$ -
		$ 684,844					
				$ 684,844			

SECTION B - BUDGET

6. Object Class Categories

GRANT PF

(1) (2)

Automated Taxi Evaluation
Budget Justification

Personnel:

- **Stephen Shladover**, Project Manager (12 months/year at 20% effort each year) will provide overall guidance and direction for the research, and will lead research implementation and data Analysis as well as communicating with project partners, overall project management and coordination.

- **TBD**, Post Doctorial Researchers, (12 months/year at 50% each year) will assist research implementation and data analysis under direction from Steve Shladover.

Fringe Benefits:

- Fringe benefits for **Steve Shladover** are calculated at the projected rate of 38% for the first 6 months, for Academic Titles, and then at a rate of 40% for the remaining 30 months.
- Fringe benefits for the post-doctoral researchers are calculated at the projected rate of 22% for Limited titles, for the first 6 months of the project and then at a rate of 24% for the remaining 30 months.
- The UC Berkeley composite fringe benefit rates have been approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year. The rate for in-state fee remission for Winter, 2016 is $8,592.

Travel

Domestic Travel: Travel is included to local cities where the connected car pool lanes are implemented as well as project management meetings – which are anticipated to be held locally.

Materials and Supplies

Materials and Supplies ($9,500): The University of California, Berkeley, assigns a unique accounting number to projects such as that proposed here. Only expenditures that are necessary for and directly related to a particular project may be charged against that project's accounting number. For this project, the budgeted supplies include project-related consumable materials and project specific research supplies including, but not limited to, data analysis software and publication materials. Materials and Supplies costs for the project will be for three year.

Rent

Rent ($29,363): Cubicle space in off campus office space that PATH has in the Powerbar building in downtown Berkeley. This is a proportion of the rent ($647 / month) reflecting the amount of project staff time (45 months) that will be conducted at this off-campus location.

Indirect Charges:

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

Project Name: Collision Warning

				Year 1 Oct 1, 2016 to Sept 30 2017	Year 2: Oct 1, 2017 to Sep. 30, 2018	Year 3: Oct 1, 2018 to Sep. 30, 2019	Year 2: Oct 1, 2019 to Sep. 30, 2020
		Grand total Federal	Grand Total State	Total	Total	Total	Total
a	Personnel	$ 339,421	$ -	$ 96,087	$ 131,998	$ 111,335	$ -
b	Fringe Benefits (Total)						
	Fringe	$ 110,051	$ -	$ 30,407	$ 42,446	$ 37,198	$ -
	Tuition remission	$ -	$ -	$ -	$ -	$ -	$ -
c	Travel	$ 12,091	$ -	$ 3,355	$ 3,355	$ 5,380	$ -
d	Equipment	$ 20,000	$ -	$ -	$ 20,000	$ -	$ -
e	Supplies	$ 102,000	$ -	$ 24,000	$ 54,000	$ 24,000	$ -
f	Subcontracts	$ -					
g	Construction	$ -					
h	rent	$ 20,250		$ 6,750	$ 6,750	$ 6,750	
i	Total Direct charges	$ 603,813	$ -	$ 160,600	$ 258,550	$ 184,664	$ -
	idc Rate			26%	26%	26%	
j	indirect Costs	$ 146,526	$ -	$ 40,001	$ 60,268	$ 46,258	$ -
K	Total Costs	$ 750,340	$ -	$ 200,601	$ 318,818	$ 230,922	$ -
		$ 750,340					
				$ 750,340	$ 258,550	$ 184,664	
				$ 41,755.93	$ 67,222.94	$ 48,012.63	
					$ 6,750	$ 6,750	
					$ 20,000	$ -	

Collision Warning
Budget Justification

Personnel:

- **Trevor Darrell**, Project Manager (3 months/year at 33% effort each year) will provide overall guidance and direction for the research,
- **Ching Yao Chan,** Co-Investigator (12 months/year at 20% effort each year), will lead research implementation and data Analysis as well as communicating with project partners, overall project management and coordination.
- **Dave Nelson**, R&D Engineer (12 months/year at 9% effort each year) will implement the collision warning systems and data capture support systems, under the direction of Ching Yao Chan
- **TBD**, Post Doctorial Researcher, (12 months/year at 45% effort in the first year, 75% in the second year and 50% in the third year) will assist research implementation and data analysis under direction from Trevor Darrell.

Fringe Benefits:

- Fringe benefits for **Ching Yao Chan** are calculated at the projected rate of 38% for the first 6 months, for Academic Titles, and then at a rate of 40% for the remaining 30 months.
- Fringe benefits for **Trevor Darrell** and the post-doctoral Researcher are calculated at the projected rate of 22% for Limited titles, for the first 6 months of the project and then at a rate of 24% for the remaining 30 months.
- Fringe benefits for **Dave Nelson** are calculated at the projected rate of 46% for Limited titles, for the first 6 months of the project and then at a rate of 48% for the remaining 30 months.
- The UC Berkeley composite fringe benefit rates have been approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year. The rate for in-state fee remission for Winter, 2016 is $8,592.

Travel

Domestic Travel: Travel is included to local cities where the collision warning systems are implemented as well as project management meetings – which are anticipated to be held locally.

Materials and Supplies

Deep Learning Cameras and Data Recording ($24,000): video cameras and data recording computers will be installed on 15 transit vehicles that are included in the project. The estimated costs for cameras and data recording systems are at $1,000-2,000 with variations in devices and features needed for types of vehicles.

Miscellaneous Electrical and Mechanical Supplies ($50,000): including the electrical wiring, networking cables and connectors, mechanical fixtures, protective housing, and fixtures for the instrumentation and storage systems required the installation of cameras and data acquisition systems. The costs are estimated at $3,000 per vehicles for a total of $45k, with $5k allocated for replacement and spare parts.

Data Analysis Tools and Accessories ($8,000): Two high-end laptops at $2,000 each will be used for data training and algorithm validation in field trips and laboratories. Software priced at $4,000 will be licensed throughout the project to facilitate the task of data analysis.

Deep learning Integration ($20,000): In the final stage of implementation, the deep learning algorithms will be implemented and integrated with a real-time field demonstration on 2 vehicles**.** The integration computer and human-machine interface are estimated at 10k each.

Equipment:

Deep Learning Data Server ($20,000): The deep learning approach for developing collision warning systems requires the training of algorithms through a large amount of data, which in turns needs a dedicated high-end computing station, as well as data storage and processing.

Rent

Rent ($20,250): Cubicle space in off campus office space that PATH has in the Powerbar building in downtown Berkeley. This is a proportion of the rent ($647 / month) reflecting the amount of project staff time (31.5 months) that will be conducted at this off-campus location.

Indirect Charges:

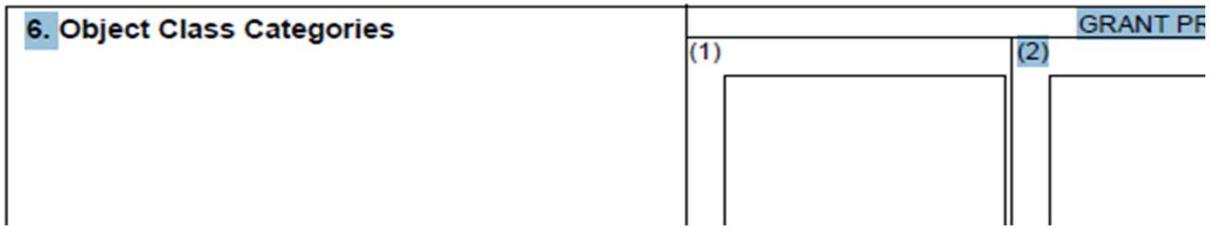
The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward

costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

Project Name: Connected Car pool Lanes

				Year 1 Oct 1, 2016 to Sept 30 2017	Year 2: Oct 1, 2017 to Sep. 30, 2018	Year 3: Oct 1, 2018 to Sep. 30, 2019	Year 2: Oct 1, 2019 to Sep. 30, 2020
		Grand total Federal	Grand Total State	Total	Total	Total	Total
a	Personnel	$ 302,541	$ -	$ 100,338	$ 102,234	$ 99,970	$ -
b	Fringe Benefits (Total)						
	Fringe	$ 83,703	$ -	$ 26,622	$ 28,728	$ 28,353	$ -
	Tuition remission	$ -	$ -	$ -	$ -	$ -	$ -
c	Travel	$ 9,960	$ -	$ 3,995	$ 1,970	$ 3,995	$ -
d	Equipment	$ -	$ -	$ -	$ -	$ -	$ -
e	Supplies	$ 30,000	$ -	$ 20,000	$ 10,000	$ -	$ -
f	Subcontracts	$ -					
g	Construction	$ -					
h	rent	$ 27,000		$ 9,000	$ 9,000	$ 9,000	
i	Total Direct charges	$ 453,204	$ -	$ 159,955	$ 151,932	$ 141,317	$ -
	idc Rate	26%		26%	26%	26%	
j	indirect Costs	$ 110,813	$ -	$ 39,248	$ 37,162	$ 34,403	$ -
K	Total Costs	$ 564,017	$ -	$ 199,203	$ 189,094	$ 175,720	$ -
		$ 564,017					
				$ 564,017			

SECTION B - BUDGET



Connected Car Pool Lanes
Budget Justification

Personnel:

- **Alex Skabardonis**, Project Manager (12 months/year at 15% effort each year) will provide overall guidance and direction for the research, Leading research implementation and data Analysis as well as communicating with project partners.

- **TBD**, Post Doctorial Researcher, (12 calendar/year at 100% effort each year) will assist research implementation and data analysis under direction from Alex Skabardonis.

Fringe Benefits:

- Fringe benefits for **Alex Skabardonis** are calculated at the projected rate of 38% for the first 6 months, for Academic Titles, and then at a rate of 24% for the remaining 30 months.
- Fringe benefits for the post-doctoral Researcher are calculated at the projected rate of 22% for Limited titles, for the first 6 months of the project and then at a rate of 24% for the remaining 30 months.
- The UC Berkeley composite fringe benefit rates have been approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year. The rate for in-state fee remission for Winter, 2016 is $8,592.

Travel

Domestic Travel: Travel is included to local cities where the connected car pool lanes are implemented as well as project management meetings – which are anticipated to be held locally.

Materials and Supplies

Materials and Supplies ($33,000): The University of California, Berkeley, assigns a unique accounting number to projects such as that proposed here. Only expenditures that are necessary for and directly related to a particular project may be charged against that project's accounting number. For this project, the budgeted supplies include project-related consumable materials and project specific research supplies including, but not limited to, computers, sensors and publication supplies. Materials and Supplies costs for the project will be for three year.

Rent

Rent ($23,288): Cubicle space in off campus space that PATH has in the Powerbar building in downtown Berkeley. This is a proportion of the rent ($647 / month) reflecting the amount of project staff time (36 months) that will be conducted at this off-campus location.

Indirect Charges:

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

Project Name: Connected Signalization

				Year 1 Oct 1, 2016 to Sept 30 2017	Year 2: Oct 1, 2017 to Sep. 30, 2018	Year 3: Oct 1, 2018 to Sep. 30, 2019	Year 2: Oct 1, 2019 to Sep. 30, 2020
		Grand total Federal	Grand Total State	Total	Total	Total	Total
a	Personnel	$ 418,071	$ -	$ 128,327	$ 159,353	$ 130,390	$ -
b	Fringe Benefits (Total)						
	Fringe	$ 139,650	$ -	$ 42,847	$ 52,625	$ 44,178	$ -
	Tuition remission	$ -	$ -	$ -	$ -	$ -	$ -
c	Travel	$ 8,100	$ -	$ 3,713	$ 1,688	$ 2,700	$ -
d	Equipment	$ 40,000	$ -	$ 40,000	$ -	$ -	$ -
e	Supplies	$ 79,500	$ -	$ 37,500	$ 40,000	$ 2,000	$ -
f	Subcontracts	$ -					
g	Construction	$ -					
h	rent	$ 32,400		$ 10,800	$ 10,800	$ 10,800	
i	Total Direct charges	$ 717,720	$ -	$ 263,186	$ 264,466	$ 190,069	$ -
	idc Rate			26%	26%	26%	
j	indirect Costs	$ 167,783	$ -	$ 55,220.36	$ 65,953.05	$ 46,609.87	$ -
K	Total costs	$ 885,504	$ -	$ 318,406	$ 330,419	$ 236,679	$ -
		$ 885,504					
				$ 885,504			

SECTION B - BUDGET

6. Object Class Categories	(1)	(2)	GRANT PF

Connected Signalization
Budget Justification

Personnel:

- **Alex Skabardonis** Project Manager (12 months/year at 15% effort for each year) will provide overall guidance and direction for the research,
- **Wei Bin Zhang,** Co-Investigator (12 months/year at 15% effort each year) will lead research implementation and data Analysis as well as communicating with project partners, overall project management and coordination.
- **Kun Zhou,** Assistant Research Engineer (12 months/year at 15% effort each year) will support intersection control software implementation.
- **Huadong Meng**, Research Engineer (12 months/year at 15% effort each year) will support intersection control software implementation.
- **TBD**, Post-Doctoral Researcher (9 Academic months/year at 50% each year and 3 summer months/year at 100% effort each year) will support data analysis under direction of Alex Scabardonis.

Fringe Benefits:

- Fringe benefits for **Wei Bin Zhang Alex Skabardonis, Huadong Meng and Kun Zhou** are calculated at the projected rate of 38% for the first 6 months, for Academic Titles, and then at a rate of 40% for the remaining 30 months.
- Fringe benefits for the post-doctoral researchers are calculated at the projected rate of 22% for Limited titles, for the first 6 months of the project and then at a rate of 24% for the remaining 30 months.
- The UC Berkeley composite fringe benefit rates have been approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year. The rate for in-state fee remission for Winter, 2016 is $8,592.

Travel

Domestic Travel: Travel is included to local cities where the connected car pool lanes are implemented as well as project management meetings – which are anticipated to be held locally.

Materials and Supplies

Materials and Supplies ($44,500): The University of California, Berkeley, assigns a unique accounting number to projects such as that proposed here. Only expenditures that are necessary

for and directly related to a particular project may be charged against that project's accounting number. For this project, the budgeted supplies include project-related consumable materials and project specific research supplies including, but not limited to, data communication, brackets, wiring, transformers, data analysis software and publication expenses including a high performance dedicated, workstation. Materials and Supplies costs for the project will be for three year

Equipment

Data Capture ($54,000): Selected Intersections will be outfitted with systems to capture operational data and environmental data. These are custom designed and assembled systems and this expense represents the cost of the components, wiring and sensors that comprise the data capture systems

Data Storage ($30,000): Data will be centrally stored for analysis and archiving.

Rent

Rent ($32,400): Cubicle space in off campus office space that PATH has in the Powerbar building in downtown Berkeley. This is a proportion of the rent ($647 / month) reflecting the amount of project staff time (50 months) that will be conducted at this off-campus location.

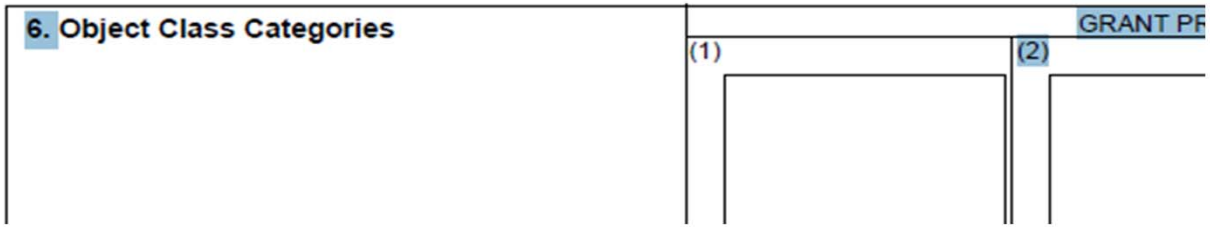
Indirect Charges:

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

Project Name: Low Speed Shuttle Evaluation

				Year 1 Oct 1, 2016 to Sept 30 2017	Year 2: Oct 1, 2017 to Sep. 30, 2018	Year 3: Oct 1, 2018 to Sep. 30, 2019	Year 2: Oct 1, 2019 to Sep. 30, 2020
		Grand total Federal	Grand Total State	Total	Total	Total	Total
a	Personnel	$ 397,074	$ -	$ 106,743	$ 128,537	$ 161,794	$ -
b	Fringe Benefits (Total)						
	Fringe	$ 113,732	$ -	$ 30,446	$ 37,519	$ 45,767	$ -
	Tuition remission	$ -	$ -	$ -	$ -	$ -	$ -
c	Travel	$ 20,250	$ -	$ 6,750	$ 6,750	$ 6,750	$ -
d	Equipment	$ -	$ -	$ -	$ -	$ -	$ -
e	Supplies	$ 147,000	$ -	$ 120,000	$ 22,500	$ 4,500	$ -
f	Subcontracts	$ -					
g	Construction	$ -					
h	Rent	$ -		$ 9,788	$ 9,788	$ 9,788	
i	Total Direct charges	$ 707,419	$ -	$ 273,727	$ 205,093	$ 228,599	$ -
	idc Rate			26%	26%	26%	
j	indirect Costs	$ 176,295	$ -	$ 68,624.32	$ 50,779.36	$ 56,890.93	$ -
K	total costs	$ 883,713	$ -	$ 342,351	$ 255,872	$ 285,490	$ -
		$ 883,713					
				$ 883,713			

SECTION B - BUDGET



Low Speed Shuttle Evaluation
Budget Justification

Personnel:

- **Stephen Shladover**, Project Manager (12 months/year at 20% effort for each year) will provide overall guidance and direction for the research, and will lead research implementation and data Analysis as well as communicating with project partners, overall project management and coordination.

- **TBD** Post Doctorial Researchers, (12 months/year at 50% effort in the first year, 75% effort in the second year and 100% effort in the third year) will assist research implementation and data analysis under direction of Dr. Steve Shladover.

Fringe Benefits:

- Fringe benefits for **Steve Shladover** are calculated at the projected rate of 38% for the first 6 months, for Academic Titles, and then at a rate of 40% for the remaining 30 months.
- Fringe benefits for the post-doctoral researchers are calculated at the projected rate of 22% for Limited titles, for the first 6 months of the project and then at a rate of 24% for the remaining 30 months.
- The UC Berkeley composite fringe benefit rates have been approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year. The rate for in-state fee remission for Winter, 2016 is $8,592.

Travel

Domestic Travel: Travel is included to local cities where the connected car pool lanes are implemented as well as project management meetings – which are anticipated to be held locally.

Materials and Supplies

Data Acquisition systems ($100,000) The low speed shuttles will be outfitted with systems to capture operational data and environmental data. These are custom designed and assembled systems and this expense represents the cost of the components, wiring and sensors that comprise the data capture systems

Data communication ($30,000) Data will be transferred from the on-board data capture systems via conventional wireless communications services, over the duration of the project

Data Storage ($7,500): Data will be centrally stored for analysis and archiving.

Data Analysis Software ($7,500): include licensing fees for specialized analysis software, for the 36 month duration of the project

Publication Expense ($2,000): Fact sheet and final report publication expenses

Rent

Rent ($29,363): Cubicle space in off campus office space that PATH has in the Powerbar building in downtown Berkeley. This is a proportion of the rent ($647 / month) reflecting the amount of project staff time (45 months) that will be conducted at this off-campus location.

Indirect Charges:

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

Project name: Veniam Bus

				Year 1 Oct 1, 2016 to Sept 30 2017	Year 2: Oct 1, 2017 to Sep. 30, 2018	Year 3: Oct 1, 2018 to Sep. 30, 2019	Year 2: Oct 1, 2019 to Sep. 30, 2020
		Grand total Federal	Grand Total State	Total	Total	Total	Total
a	Personnel	$ 151,690	$ -	$ 51,367	$ 46,440	$ 53,883	$ -
b	Fringe Benefits (Total)	$ -					
	Fringe	$ 42,014	$ -	$ 13,785	$ 12,494	$ 15,736	$ -
	Tuition remission	$ -	$ -	$ -	$ -	$ -	$ -
c	Travel	$ 8,100	$ -	$ 3,713	$ 1,688	$ 2,700	$ -
d	Equipment	$ -	$ -	$ -	$ -	$ -	$ -
e	Supplies	$ 14,000	$ -	$ 5,000	$ 5,000	$ 4,000	$ -
f	Subcontracts	$ -					
g	Construction	$ -					
h	rent	$ -		$ 9,450	$ 9,450	$ 9,450	
i	Total Direct charges	$ 244,154	$ -	$ 83,314	$ 75,072	$ 85,769	$ -
	idc Rate	$ 26		26%	26%	26%	
j	indirect Costs	$ 56,109	$ -	$ 19,204.67	$ 17,061.62	$ 19,842.82	$ -
K	Total Costs	$ 300,263	$ -	$ 102,519	$ 92,133	$ 105,611	$ -
		$ 300,263					
				$ 300,263			

WiFi Mesh Networks
Budget Justification

Personnel:

- **Ching Yao Chan**, Project Manager (12 months/year at 8% effort in the first year, 5% effort in the second year and 10% effort in the third year) will provide overall guidance and direction for the research, and will lead research implementation and data Analysis as well as communicating with project partners, overall project management and coordination.

- **TBD**, Post Doctorial Researchers, (12 months/year at 50% effort each year) will assist research implementation and data analysis under direction of Dr. Chan.

Fringe Benefits:

- Fringe benefits for **Ching Yao Chan** are calculated at the projected rate of 38% for the first 6 months, for Academic Titles, and then at a rate of 40% for the remaining 30 months.
- Fringe benefits for the post-doctoral researchers are calculated at the projected rate of 22% for Limited titles, for the first 6 months of the project and then at a rate of 24% for the remaining 30 months.
- The UC Berkeley composite fringe benefit rates have been approved by the Department of Health and Human Services for use by all fund sources for FY15–16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only.
- The University of California provides full remission of tuition, fees, and graduate student health insurance to all graduate students who are employed on-campus 45% time or greater during the academic year. The rate for in-state fee remission for Winter, 2016 is $8,592.

Travel

Domestic Travel: Travel is included to local cities where the connected car pool lanes are implemented as well as project management meetings – which are anticipated to be held locally.

Materials and Supplies

Data Logging Systems ($15,500): An individual bus will be outfitted with light-weight data logging equipment to capture specific operational data.

Electrical and Mechanical supplies ($5,000): A series of brackets, wiring and transformers will be required to complete the installation of the data logging equipment.

Data Analysis Software ($4,000): include licensing fees for specialized analysis software, for the 36 month duration of the project

Publication Expense ($2,000): Fact sheet and final report publication expenses

Rent

Rent ($14,175): Cubicle space in off campus office space that PATH has in the Powerbar building in downtown Berkeley. This is a proportion of the rent ($647 / month) reflecting the amount of project staff time (45 months) that will be conducted at this off-campus location.

Indirect Charges:

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

Smart City Proposal

SUMMARY - October 1, 2016 to September 30, 2019

Senior Personnel	Daily Rate	# Days	Person-MO	Salary	CBR	Total Costs	*Comments*
Catherine Crump (Project Manager)	$1,017.95	41.60		$42,346.85	$9,886.36	$52,233.22	

Other Personnel	Rate	% Effort	# Months				*Comments*
Research Fellow	$5,833.33	100.00%	36.00	$210,000.00	$82,950.00	$292,950.00	
James Dempsey (Co-Investigator)	$15,681.75		36.00	$26,345.34	$10,425.23	$36,770.57	*Different % effort in each year*
Administrator	$7,665.00		36.00	$10,117.80	$4,815.15	$14,932.95	*Different % effort in each year*
				$288,809.99	*$108,076.74*	***$396,886.74***	***Subtotal - Personnel***
						$396,886.74	*Total Direct Costs*
						$103,190.55	*Indirect Costs @ 26% of Total Direct Costs*
						$500,077.29	**TOTAL PROJECT COSTS -**

Budget Justifications

PERSONNEL

Catherine Crump, Project Manager (1 Summer month/year at 64% effort each year), will provide overall guidance and direction for the research on privacy. She will oversee all research and administrative aspects of the project. She will oversee personnel, review the research methods, and conduct periodic meetings to discuss progress and resolve problems, and manage the budget. Professor Crump is requesting summer salary support in each year of this project.

James Dempsey, Co-Investigator, (12 months/year at 4% effort in the first year, 5% effort in the remaining two years), will provide subject expertise on privacy issues and participate in the preparation of project outputs.

TBD, Research Fellow, (12 months/year at 100% effort each year), will assist the project by conducting research, collecting data, participating in community outreach and engagement, and participating in the preparation of project outputs. The research fellow will take day-to-day charge of project implementation, allowing consistent staffing and depth of expertise.

TBD, Administrator, (12 months/year at 3% effort in the first year and 4% effort in the remaining two years), will provides logistical support to the project team and facilitates communications among multiple project partners in order to coordinate project activities.

Fringe Benefits

Composite Benefits. The University of California, Berkeley Composite Benefit Rates (CBR) have been reviewed and federally approved by the Department of Health and Human Services (DHHS) for use by all fund sources for FY2015-16. Rates beyond June 30, 2016 are estimates and are provided for planning purposes only. Future CBR rates are subject to review and approval by DHHS on an annual or bi-annual basis. (The DHHS-approved fringe benefit rates are available online at: http://spo.berkeley.edu/Policy/benefits/benefits.html)

Indirect Costs

The Off-Campus Facilities and Administrative Cost Rate of 26% is used to determine IDC. Indirect cost charges are calculated using modified total direct costs (which excludes equipment, graduate students tuition remission, rent, participant support, and subaward costs in excess of $25,000 per subaward). This reflects the off-campus indirect cost rate established by the University and DHHS in an agreement dated August 27, 2015.

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN:

ORGANIZATION:
University of California (UCB)
Office of President
111 Franklin St., 10th Floor
Oakland, CA 94607-5200

DATE:08/27/2015

FILING REF.: The preceding agreement was dated 08/08/2014

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: INDIRECT COST RATES

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

EFFECTIVE PERIOD

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PRED.	07/01/2011	06/30/2012	53.50	On-Campus	Org Res (1)
PRED.	07/01/2012	06/30/2013	55.50	On-Campus	Org Res (1)
PRED.	07/01/2013	06/30/2015	56.50	On-Campus	Org Res (1)
PRED.	07/01/2015	06/30/2016	57.00	On-Campus	Org Res (1)
PRED.	07/01/2011	06/30/2016	26.00	Off-Campus	Org Res (1)
PRED.	07/01/2011	06/30/2012	56.50	On-Campus	Instruction
PRED.	07/01/2012	06/30/2016	50.50	On-Campus	Instruction
PRED.	07/01/2011	06/30/2016	26.00	Off-Campus	Instruction
PRED.	07/01/2011	06/30/2012	33.50	On-Campus	Other Spons Act
PROV.	07/01/2012	06/30/2014	38.00	On-Campus	Other Spons Act
PRED.	07/01/2014	06/30/2016	40.00	On-Campus	Other Spons Act
PRED.	07/01/2011	06/30/2012	19.00	Off-Campus	Other Spons Act
PRED.	07/01/2012	06/30/2016	16.50	Off-Campus	Other Spons Act
PRED.	07/01/2011	06/30/2012	29.00	On-Campus	SSL (2)
PRED.	07/01/2012	06/30/2016	40.00	On-Campus	SSL (2)
PRED.	07/01/2011	06/30/2012	16.60	Off-Campus	SSL (2)
PRED.	07/01/2012	06/30/2016	24.50	Off-Campus	SSL (2)
PRED.	07/01/2011	06/30/2016	8.00	Off-Campus	IPAA (3)

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PROV.	07/01/2016	Until Amended		(4)	

*BASE

Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials, supplies, services, travel and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, student tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000.

(1) Organized Research

(2) Space Sciences Laboratory (Research)

(3) Intergovernmental Personnel Act Agreement

(4) Use same rates and conditions as those cited for fiscal year ending June 30, 2016.

SECTION I: FRINGE BENEFIT RATES**

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
FIXED	7/1/2015	6/30/2016	36.00	All	Academic (1)
FIXED	7/1/2015	6/30/2016	44.00	All	Staff (2)
FIXED	7/1/2015	6/30/2016	20.00	All	Limited (3)
FIXED	7/1/2015	6/30/2016	0.00	All	Students (4)

** DESCRIPTION OF FRINGE BENEFITS RATE BASE:

1) Academic Rate: for use by all appointments that carry academic job codes including faculty with university approved research leaves (e.g. buyouts/leave of absence) and IPA assignments. Faculty summer salary is NOT included in this rate.

2) Staff rate: for use by all appointments that carry a staff job code.

3) Limited Rate: for use by all Post Docs, all appointments with limited access to benefit programs (identified through BELI* code, 2, 3, or 4), and all faculty summer salary.

4) Student rate: for use by all student job codes

Excluded from all rates: appointments categorically exempt from benefit programs (BELI code 5).

*Benefit Eligibility Level Indicator

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

This organization charges the actual cost of each fringe benefit direct to Federal projects. However, it uses a fringe benefit rate which is applied to salaries and wages in budgeting fringe benefit costs under project proposals. The following fringe benefits are treated as direct costs:
OASDI, WORKERS COMPENSATION, HELATH/DENTAL PLAN CONTRIBUTION, LIFE INSURANCE, MEDICARE, DISABILITY INSURANCE, UNEMPLOYMENT INSURANCE, INCENTIVE AWARD PROGRAM, AND RETIREMENT SYSTEM CONTRIBUTION.

Beginning 07/01/12, fringe benefits are charged using the rate(s) listed in the Fringe Benefits Section of this Agreement. The fringe benefits included in the rate(s) are:
FICA, DISABILITY, LIFE INSURANCE, HEALTH INSURANCE, RETIREMENT, UNEMPLOYMENT AND WORKERS COMPENSATION.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

DEFINITION OF EQUIPMENT
Equipment is defined as tangible nonexpendable personal property having a useful life of more than one year and an acquisition cost of $5,000 or more per unit.

DEFINITION OF ON-CAMPUS, OFF-CAMPUS AND SPECIAL RATES

DEFINITION OF OFF-CAMPUS RATE
The off-campus rate is applicable to those projects conducted at facilities not owned or leased by the University. However, if the project is conducted in leased space and lease costs are directly charged to the project, then the off-campus rate must be used.

PROJECTS CONDUCTED ENTIRELY ON-CAMPUS OR ENTIRELY OFF-CAMPUS:
Projects conducted entirely on-campus or entirely off-campus will be applied the on-campus or off-campus rate respectively.

PROJECTS CONDUCTED PARTIALLY OFF-CAMPUS AND PARTIALLY ON-CAMPUS:
If the project involves work at both on-campus and off-campus sites, either the on-campus or off-campus rate generally should be applied, consistent with where the majority of the work is to be performed. Salary cost is generally accepted as a measure of work performed in terms of the total project.

USE OF BOTH ON-CAMPUS AND OFF-CAMPUS RATES
The use of both on-campus and off-campus rates for a given project may be justified if both of the respective rates can clearly be identified with a significant portion of salaries and wages of the project. For purposes of this provision, significant is defined as approximately 25% or more of the total costs and a project's total salary and wage costs exceed $250,000.

OTHER SPECIAL RATES
These rates apply only to the facility or program to which they are identified. If any additional special rates become necessary the establishment of such rates should be coordinated through the cognizant negotiation agency.

GENOMIC ARRAYS
The NIH Policy on indirect costs pertaining to Genomic Arrays (NOT-OD-10-097) is effective as of 05/13/10.

This agreement only updates the fringe benefits.

NEXT PROPOSAL DUE DATE
Your next indirect cost proposal based on your fiscal year ending 6/30/15 is due in our office by 12/31/15 and your next fringe benefits proposal based on FY 6/30/15 is due by 12/31/15.

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of California (UCB)

(INSTITUTION)

(SIGNATURE)

Nathan Brostrom

(NAME)

EVP - Chief Financial Officer

(TITLE)

9/10/2015

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Arif M. Karim -A Digitally signed by Arif M. Karim -A DN: c=US, o=U.S. Government, ou=HHS, ou=PSC, ou=People, cn=Arif M. Karim -A, 0.9.2342.19200300.100.1.1=2000212895 Date: 2015.09.02 21:52:17 -05'00'

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