Advanced Mobility Group

Creating more livable communities by assisting our clients to navigate, plan, program and build a sustainable future through innovative transportation solutions that redefine mobility.

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Advanced Mobility Group









TECHNOLOGY FACILITATION

PROGRAM MANAGEMENT

MOBILITY OPTIONS

INNOVATIVE TRANSPORTATION SOLUTIONS



www.amobility.com

Redefining Mobility

Portfolio of Projects



MOBILITY ON DEMAND, SHARED MOBILITY + MICRO MOBILITY



SHARED AUTONOMOUS VEHICLE PROGRAM

TRAFFIC ENGINEERING + DESIGN



CONNECTED AUTONOMOUS VEHICLE SIGNAL LAB

GOMENTUM

STATION

PROGRAM



I-880 + SR-4 INTEGRATED CORRIDOR MOBILITY



BICYCLE, PEDESTRIAN, COMPLETE STREETS DESIGN + SAFE ROUTES TO SCHOOLS



TRANSPORTATION DEMAND MANAGEMENT



EXPRESS LANES + CONGESTION PRICING

Dodofining Mobility

GoMentum Features

SECURE

With guards stationed at all entrances, no unauthorized personnel are allowed

EXPANSIVE

With 2,100 acres available multiple vehicles can be run without any interference

CONVENIENT

Just 50 miles from Silicon Valley, GoMentum enables agile work plans

REALISTIC

With features like tunnels, vehicles are subjected to real world obstacles & scenarios

VALIDATED

Leading auto OEM and tech providers have tested at GoMentum since 2015

FLEXIBLE

GoMentum works with partners to determine what to build next to suit their needs

Today's Announcement

Contra Costa Transportation Authority (CCTA) and AAA awarded a \$7.5 million grant from the U. S. Department of Transportation (USDOT) to support a four-year Automated Driving System (ADS) pilot program for three "real-world" demonstration projects.

- Rossmoor First Mile/Last Mile Shared Autonomous Vehicles, Walnut Creek, Calif.
- County Hospital, Accessible Transportation, Martinez, Calif.
- Personal Mobility on I-680 Corridor, Contra Costa County, Calif.







V2X Lab

AAA Northern California, Nevada & Utah



Why AAA?



AAA, a not-for-profit organization:

- Involved in original road signage
- Established emergency roadside assistance
- Tested and published guides on EVs and ADAS systems
- Child car seat legislation



Northern California Nevada & Utah

CONFIDENTIAL



V2X Lab



- State-of-the-art lab to test V2I and V2V technologies to enhance safety and reduce congestion
- Equipped with advanced traffic signal controllers, video detection, DSRC/C-V2X/5G communication etc.
- Open to OEMs, Transit Agencies, Cities & Counties, DOTs, Universities, Vendors

Connected Autonomous Vehicle (CAV):

Navigates intersection based on traffic data feeds from RSU and OBU **Communication**: 5.9 GHz / 5G

DSRC/C-V2X RSUs:

Provides traffic data to and receives vehicle data from OBU Communication: 5.9 GHz / 5G

DSRC/C-V2X OBUs:

Receives traffic data from and sends car data to RSU **Communication**: 5.9 GHz / 5G

Roadside Information Hub:

Collects traffic data and uploads to cloud; Provides edge data processing capabilities **Communication**: DSRC, C-V2X, 5G, Fiber

Northern California Nevada & Utah



Genesis of V2X Lab

- SAV testing experience in multiple cities (Las Vegas, San Ramon)
- Need temporary signal controller installation in parking lots in each city
- Expensive, time consuming, unnecessary

Potential Benefits

- **Cities and OEMs** do not have to build their own lab for this testing
- Equipment evaluation from multiple vendors before deployment
- Feature and interoperability testing before deployment
- Demonstration to key stakeholders (Council members, Maintenance crews, etc.) for buy-in







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Current List of Vendors





V2X Applications

V2I Safety

Red Light Violation Warning Curve Speed Warning Stop Sign Gap Assist Spot Weather Impact Warning Reduced Speed/Work Zone Warning Pedestrian in Signalized Crosswalk Warning (Transit)

V2V Safety

Emergency Electronic Brake Lights (EEBL) Forward Collision Warning (FCW) Intersection Movement Assist (IMA) Left Turn Assist (LTA) Blind Spot/Lane Change Warning (BSW/LCW) Do Not Pass Warning (DNPW) Vehicle Turning Right in Front of Bus Warning (Transit)

Agency Data

Probe-based Pavement Maintenance Probe-enabled Traffic Monitoring Vehicle Classification-based Traffic Studies

CV-enabled Turning Movement & Intersection Analysis CV-enabled Origin-Destination Studies Work Zone Traveler Information

hern California

Nevada & Utah

Environment

Eco-Approach and Departure at Signalized Intersections Eco-Traffic Signal Timing Eco-Traffic Signal Priority Connected Eco-Driving Wireless Inductive/Resonance Charging **Eco-Lanes Management** Eco-Speed Harmonization Eco-Cooperative Adaptive Cruise Control Eco-Traveler Information Eco-Ramp Metering Low Emissions Zone Management **AFV Charging / Fueling** Information Eco-Smart Parking Dynamic Eco-Routing (light vehicle, transit, freight) Eco-ICM Decision Support System

Road Weather

Motorist Advisories and Warnings (MAW) Enhanced MDSS Vehicle Data Translator (VDT) Weather Response Traffic Information (WxTINFO)

Mobility



Smart Roadside

Wireless Inspection Smart Truck Parking

Source: US DOT



Conditional Priority for Buses



Priority for Emergency Vehicles



Connected Vehicle Deployment Locations – Planned vs. Operational



Northern California

Nevada & Utah











Why Should We Care?





Deaths / year

40+

Hours / yr spent in traffic

80%

Crashes can be addressed by V2X



Offerings

- Training/tutorial
 - 1 day training: V2X basics, ITS overview
 - 2 day training: Setup of V2Ienvironment
 - 3 day training: Interoperability testing
- Access to the site
 - 1/2 day access
 - 1 day access
 - 5 day access





Contact Info



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V2X: Vehicle to Everything



Northern Ca Nevada & Uta Source: Toyota

(MA)

V2X Technology Benefits





Reduce citizen complaints

improve efficiency on the road and reduce congestion

Increase safety

ability to detect invisible obstacles to lineof-sight only vehicle sensors





Enhance community well-being

ability to allow priority passage of public transit buses and emergency vehicles

DSRC vs C-V2X



DSRC:

- Point-to-point
- Since 2004
- Sizeable deployments
- Uses 5.9GHz spectrum
- Toyota, Europe

Cellular V2X (C-V2X):

- Point-to-point
- Since 2016
- Deployments in 2022
- Uses 5.9GHz spectrum
- Ford, China

Next Generation V2X (NGV) TS 10 NEMA Standards





"V" Model of Development





CAV V2I Signal Lab

- Trailer with Signals (4-way)
- Power Generator (120VAC)
- ATC Cabinet
- ATC Controller
- 4G Interface
- CV Interface
- Road Side Unit (RSU)





transportation authority



CAV V2I/V2V OBUs

- On-Board Unit (OBU)
- Antenna(s)
- Power Adapters
- On-board WiFi/Access Point
- Tablet (Monitoring & Testing)
- Vendor(s) Android-based test apps
- Laptops (Monitoring & Configuration)





https://www.youtube.com/watch?v=82AbX -rMP90&feature=youtu.be



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Cooperative Intersection Collision Avoidance System (CICAS)

Applications:

- Red-light violation warning (RLVW)
- Curve speed warning (CSW)
- Signalized left turn assist (SLTA)
- Spot weather information warning —reduced speed (SWIW-RS)
- Vulnerable Road User Protection (Warning from Bikes and Peds)







