Smart City/Smart Mobility Strategy
Hans Larsen, Fremont Public Works Director
May 2, 2018
About Fremont

230,000 Population; 4\textsuperscript{th} Largest City in Bay Area
About Fremont

“#1 Happiest Place to Live in America” (2017 & 2018 WalletHub Study)

- Family Friendly
- Ethnic Diversity
- Excellent Public Schools
- Parks and Open Space
- Low Crime Rate
- Regional Transit Access
- Silicon Valley Economy
- Unique History
Smart City Action Plan

- Prepared in 2017
- Five focus areas
- Builds on past efforts
- Identifies organizational vision, values, synergies and priorities
- Creates implementation teams and governance structure
- An “evolving process”, rather than a “static plan”
Context
Fremont’s Smart City / Smart Mobility Leadership

• Climate Action Plan (2012)
• Vision Zero (2015)
• USDOT Smart City Challenge (2016)
• Tesla Motors
• Unique Traffic Issues
Greenest Cities in America
2016 Wallet Hub Survey of 100 Largest Cities

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<th>Overall Rank</th>
<th>City</th>
<th>Total Score</th>
<th>‘Environment’ Rank</th>
<th>‘Transportation’ Rank</th>
<th>‘Energy Sources’ Rank</th>
<th>‘Lifestyle &amp; Policy’ Rank</th>
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Electric Vehicle Chargers

[Map showing locations of electric vehicle chargers in Fremont, California]
Solar Carports

14% of Fremont’s municipal energy is produced from solar panels at 5 locations
Low Energy Street Lighting

Fully converted all Fremont streetlights to brighter LED lights (16,000 lights)
Public Safety Cameras

Red-Light Running Enforcement (10), Gateway Cameras (9), Traffic Signal CCTV (51), Private Security Camera Registry
Electric Police Vehicle Demonstration

Partnership with Tesla

Note: Fremont police vehicle demonstration is proposed to use a Tesla Model S vehicle.
Fremont’s Smart Mobility Solutions
Defining Smart Mobility

Using information and communications technology to:

• Reduce traffic, congestion, and trip times
• Improve safety and emergency response
• Reduce pollution from transportation
• Empower people with choice and control
Silicon Valley’s Extreme Jobs/Housing Imbalance

Did you know?

In four years, Silicon Valley added

152,000 Jobs
28,000 Housing Units
Fremont’s Triple Tidal Wave of Traffic

Did you know? Through Fremont are amongst the most congested freeways in the Bay Area.
Navigation App Issues

Using Fremont Neighborhoods as a “Short Cut” for Regional Commuters
“Cut-Through” Countermeasures

- Signal Timing, Stop Signs
- Ramp Metering
- Turn Restrictions
- Waze Partnership
  - Connected Citizens Program
Turn Restriction Messages

- No left or through Mon-Fri 3PM-7PM
- Don't trust your apps
Monitoring Compliance
Drone Video Monitoring

Neighborhood cut-through traffic near 680/Mission
Subscribers to Nixle in Fremont area can get text alerts about major traffic incidents
Measuring Results Using “Big Data”

- Uses location records from mobile devices
- Analyzes origins and destinations
- Compares before and after conditions

Using StreetLightData, Fremont “turn restrictions” were found to have reduced neighborhood cut-through traffic by 70% to 90%.
Media Attention

Fremont: City takes steps to keep commuters on freeways and off its streets
Engineers partnering with mapping app Waze to affect change on roads

TRAFFIC:
CITY OF FREMONT SAYS TRAFFIC APPS CLUTTERING SIDE STREETS
Vision Zero in Fremont
Initiated by Fremont City Council in September 2015

- **Vision Zero Action Plan**
  (Adopted March 2016)
  - **Safer People** — “Enforcement, Education”
  - **Safer Streets** — “Engineering”
  - **Safer Vehicles**

- **7th U.S. City to Adopt Vision Zero Plan**
Fremont Major Traffic Crash Trends

Since start of Vision Zero program, major traffic crashes are down 27%
Vision Zero in Fremont

**VISION ZERO ACTION PLAN**

**SAFER STREETS**

1. Enhance Pedestrian Crossings
2. Tame High-Speed Arterial Streets
3. Provide New Traffic Signals at Priority Locations
4. Expand Safe Routes to Schools Programs
5. Build Better Bikeways
6. Make Freeway Interchanges Safer for Walking and Bicycling

**SAFER PEOPLE**

7. Expand Traffic Safety Programs
8. Continue Targeted Enforcement of Speeding
9. Reduce Impaired Driving

**SAFER VEHICLES**

10. Promote Crash Avoidance Technology in Vehicles

www.fremont.gov/visionzero2020
US DOT Smart City Challenge

1,400 local officials, companies, academics and non-profits joined our webinars

800 people participated in our Smart City Forum

300 companies have expressed interest in partnering

78 applications received for the Smart City Challenge

7 Smart City Challenge Finalists announced in March at SXSW

1 Smart City Challenge Winner announced in June

www.transportation.gov/smartcity
Fremont Boulevard
Safe and Smart Innovation Corridor

5. Smart Parking and Access
   (Fremont Centerville Station)

6. On-Demand Mobility
   Information and Choices
   (Citywide at Transit Centers)

1. Automated, Electric Shuttle
   (Fremont City Center Area)

2. Safe and Smart Corridor
   (Along Fremont Boulevard)

3. Connected Vehicle/Automated
   Vehicle Test Bed
   (Auto Mall / Pacific Commons)

4. On-Demand Electric
   Vehicle Mobility
   (South Fremont Innovation District)

LEGEND
- Downtown Fremont
- South Fremont Innovation District
- Priority Development Areas
- Fremont Blvd Safe and Smart Corridor
Advanced Traffic Signals
Fremont Boulevard Corridor

- Adaptive and interconnected
- Central management center
- Emergency vehicle priority
- Transit priority
- Pedestrian and bike detection
- Multimodal counting
Safety Management
Fremont Boulevard Corridor

• Automated speed enforcement
  - provides data for targeted enforcement
  - issues warning letters
  - issues tickets (when authorized in CA)

• Automated red light running enforcement

• Smart lighting
Smart Parking and Choices
Fremont Centerville Train Station

- Real-time parking availability info
- Demand pricing
- Electric vehicle charging
- Car share
- Bike share
- Transit, shuttle and TNC info
Smart Vehicles and Infrastructure
Fremont Boulevard Corridor

- Dedicated Short Range Communications
- V2V, V2I, V2X Test Bed
What’s New, What’s Next?
Pony.ai
Testing Autonomous Vehicles in Fremont
Responder to Vehicle
Fremont Partnership with HAAS Alert

HAAS Alert Enables drivers, connected apps, and autonomous vehicles to “see” what's ahead, resulting in a safer driving experience for everyone on the road.

Now operating on three fire vehicles with more being added.
Bicycle to Signal Communications

Planned for deployment in Fall 2018
AC Transit Service Modernization

Existing Network
AC Transit Service Modernization
Proposed High-Frequency Network & Flex Shuttles in 2019
Shuttle Modernization Opportunity

Central Fremont has multiple independent shuttle systems

Paratransit, K-12 Schools, Public Transit, Non-Profit, Private, and Community College
On-Demand Shuttles

A “SEA” Change in Mobility - Shared, Electric, Automated

Local Motors, USA

Easy Mile, France
Fremont Drone Program Expansion

- Topographic Surveying
- Traffic Monitoring
- Pavement Condition Mapping
- Promotional Videos

Partnership with Fremont High School Students
Broadband Infrastructure
Growth in Data Demand

Terabits (TB) are 1 trillion bits of digital information or 1000 gigabits
Growth in Data Demand

Every 60 seconds:
- 98,000+ tweets
- 695,000 status updates
- 11 million instant messages
- 698,445 Google searches
- 168 million+ emails sent
- 1,820TB of data created
- 217 new mobile web users
Macro Cell Towers
Blended Macro Towers
Macro Cell Towers
Creative Applications
Small Cell Pole Attachments

“The Good, the Bad, and the Ugly”
Municipal Fiber
Fremont has 15 miles of fiber lines to support traffic signal communications

A comprehensive communications master plan for Fremont is planned
Smart City/Smart Mobility Action Plan

40 Projects Identified; 13 Already Funded

**Connected Streets** (14 projects; 8 funded)
*The use of data and technology to move people safely, seamlessly, efficiently, and affordably regardless of the mode of transportation.*

**Smart Parking** (8 projects; 1 funded)
*The use of data and technology to easily find parking or have a vehicle autonomously parked, thereby relieving unnecessary traffic and idling.*

**Trip Planning and Mode Choices** (18 projects; 4 funded)
*The use of data and technology to understand variables like traffic congestion and incidents, safety, emissions, and more to easily choose the most effective mode of transportation for each trip.*
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