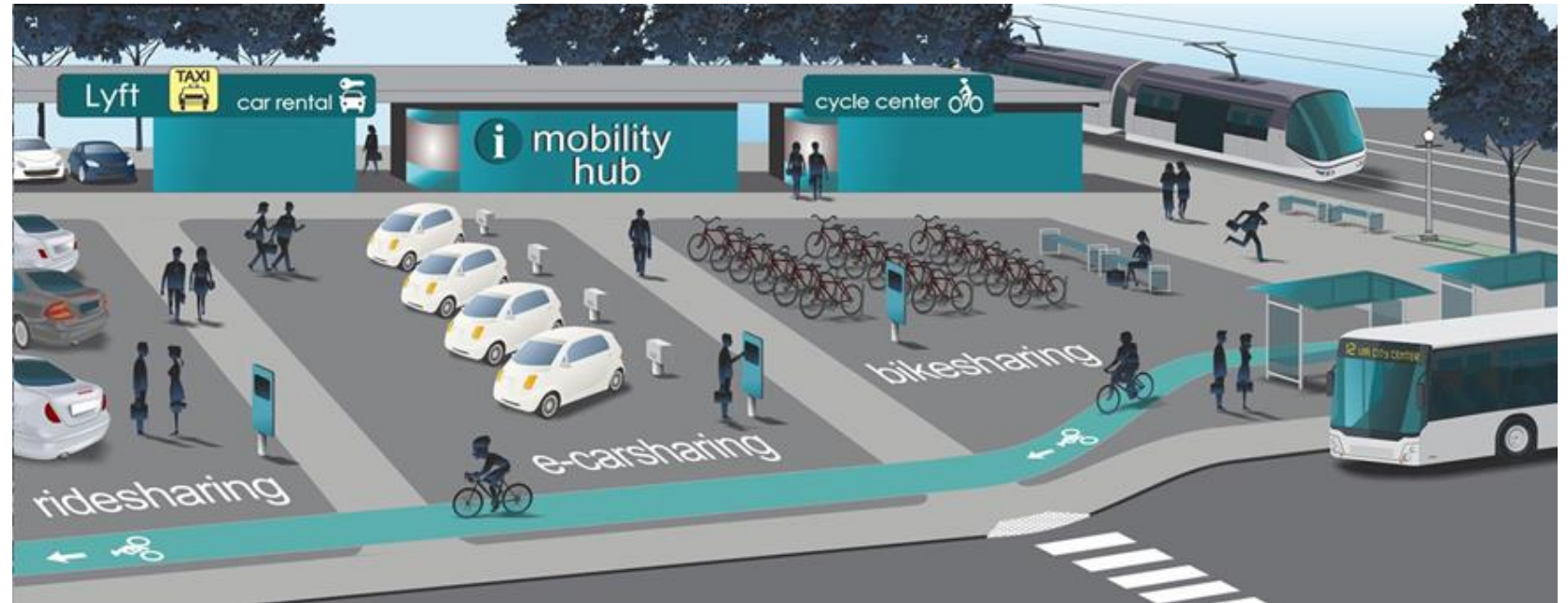




Innovation Update

Overview

- Goals
- Trends
- Successes
- Current and future efforts



Framework and Key Questions

Where does a specific innovative concept belong at this point in time?

Monitor

What specific transportation problem is being addressed?

How does the concept align with OCTA's responsibilities?

Shape

What are the costs/benefits?

How can risks be mitigated?

Can it be scaled-up following a pilot project?

What are the measures/metrics of success?

Test

How complex (technically, institutionally, etc.) is the concept to OCTA as an organization?

How complex is the concept to vendors, suppliers, or other partners (e.g., cities, etc.)?

How could the concept be integrated into OCTA functions?

Implement

Is the concept actionable now for implementation? If not, what are the barriers?

How might the concept evolve over time? Will it be obsolete quickly?

Who is the project sponsor (who will implement, operate or fund)?

Innovation Goals

- Leverage internal and external expertise in team environment
- Be transparent with lessons learned
- Decide on appropriate roles and revisit periodically
- Invest public funds wisely



Industry Interviews Since November 2018

OEMs/Equipment

- Bosch
- Iteris*
- NAVYA
- Stantec*
- Toyota
- TrafficCast*

Big Data

- Inrix
- Populous
- Streetlight Data
- Swiftly
- Teralytics
- UrbanLogiq

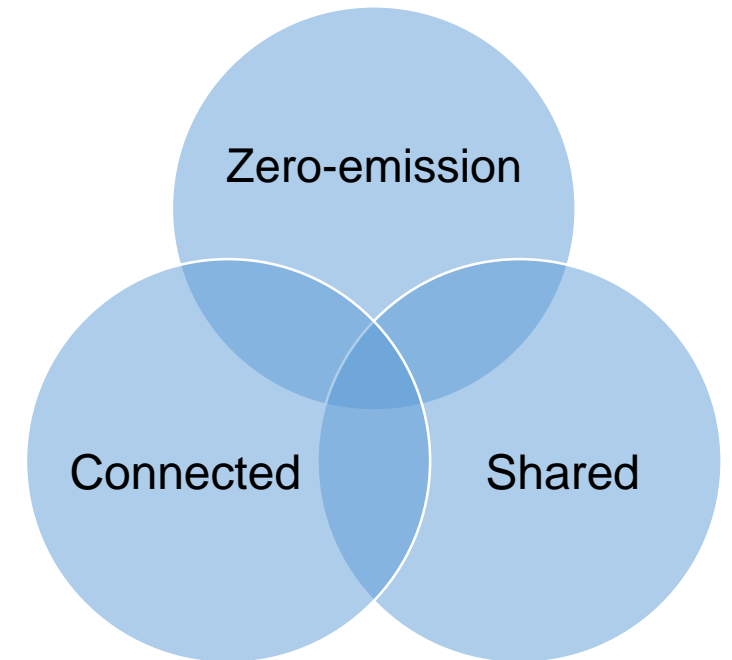
- **These firms also have big data analytics business units**

OEM – Original Equipment Manufacturers



Trends to Watch *(partial list)*

- Autonomous vehicles
 - Market penetration and impacts
 - Interoperability *(between vehicles and infrastructure)*
 - Data privacy and liability
 - Results of vehicle testing
- Demand and availability of electricity
 - Growth of electric cars
 - Battery electric bus deployment
 - Deployment of public charging infrastructure
 - Energy generation sources
- State/federal and laws/rulemaking



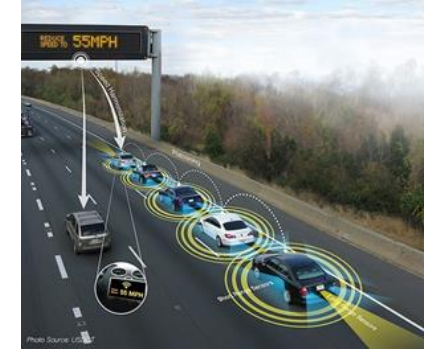
Ideally, autonomous vehicles (cars/buses) should achieve all three goals.

Monitor

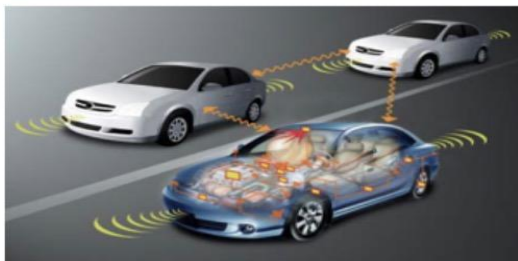
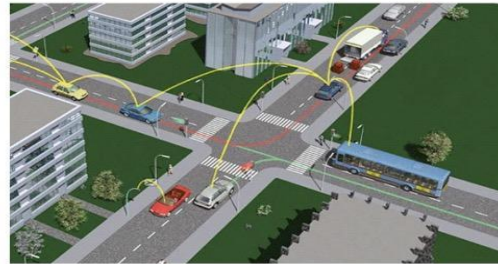
- Connected/autonomous vehicle benefits and impacts
- New vehicle-to-infrastructure communications (“5G”)
- Other “smart city” concepts



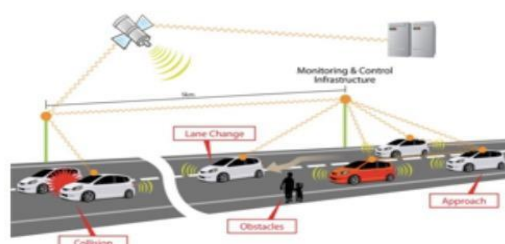
AUTOMATED



CONNECTED



V2V: Vehicle-to-Vehicle



V2I: Vehicle-to-Infrastructure



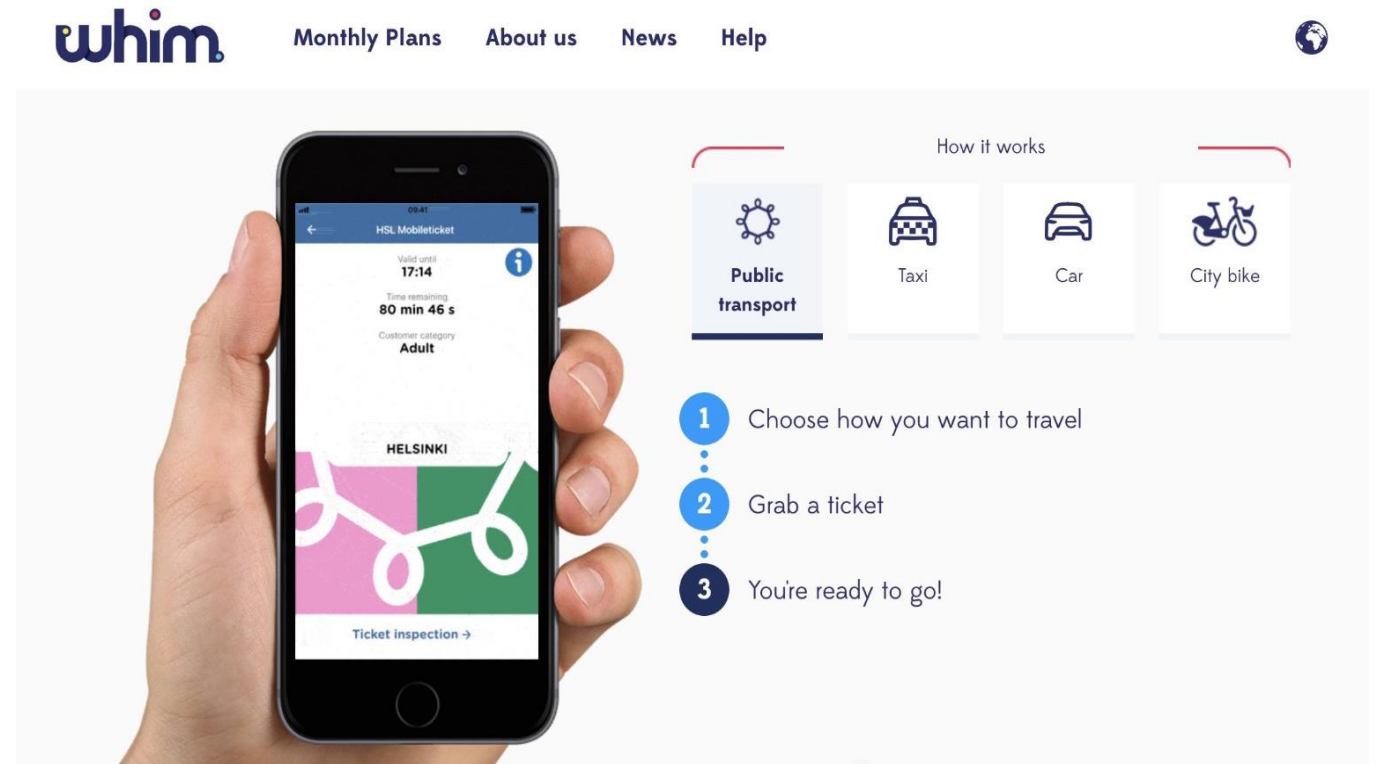
ELECTRIC



SHARED

Shape

- Integrated route planning and payment apps
- Transit signal priority using different bus-to-signal communication methods (*underway*)
- Best practices for shared active transportation issues including e-bikes and electric scooters (*completed*)



Test *(all underway)*

- Improved data to inform complex decisions
 - Signal performance measures
 - Accuracy of real-time bus information
 - Public input on innovation
- Vehicle-to-infrastructure communications on portions of Anaheim Boulevard *(partnership with Anaheim)*
- Hydrogen fuel cell buses
- OC Flex



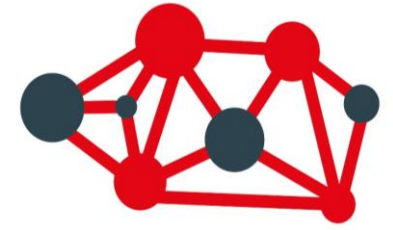
Approximately 16 percent of countywide traffic signals are equipped with advanced transportation controllers.

Next Steps

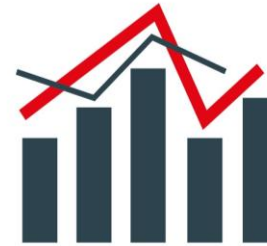
- Re-evaluate status based on monitoring efforts
- Recommend appropriate actions (shape, test, implement) for specific innovations
- Shared lessons learned with other agencies



UNCERTAINTY



COMPLEXITY



VOLATILITY



AMBIGUITY