Agency Preparedness for the Connected World

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Infrastructure Working Group
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Intelight

The Connected Vehicle (CV)

V2I
Vehicle-to-Infrastructure

V2V
Vehicle-to-Vehicle

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Automated Vehicles are Connected Too

This Audi talks to the internet…….but needs a driver

This one talks to the internet without a driver….. Olli uses IBM Watson cloud-based technology

Not all CVs are AVs - but all AVs will be CVs

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The Two Approaches

- Infrastructure focused
- Vehicle (automotive) focused
- Auto OEMs don't like that they <u>will</u> be dependent upon the infrastructure:
  - Accommodating the limitations of AV's as they develop
  - Vehicle to **INFRASTRUCTURE**
    - enabling CV applications
    - enabling revenue generation

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AV as a V2I Proponent and Driver?

- AVs need real-time data
  - Can be delivered using cellular communications
  - Provides in-vehicle systems with current road and traffic conditions
  - Provides in-vehicle systems with system-wide context (e.g. special events)
  - Mitigate/avoid impacts: "WAZE vs residents"/City mandated routing options?

Los Angeles Times

California Commute New traffic apps may be pushing cars into residential areas

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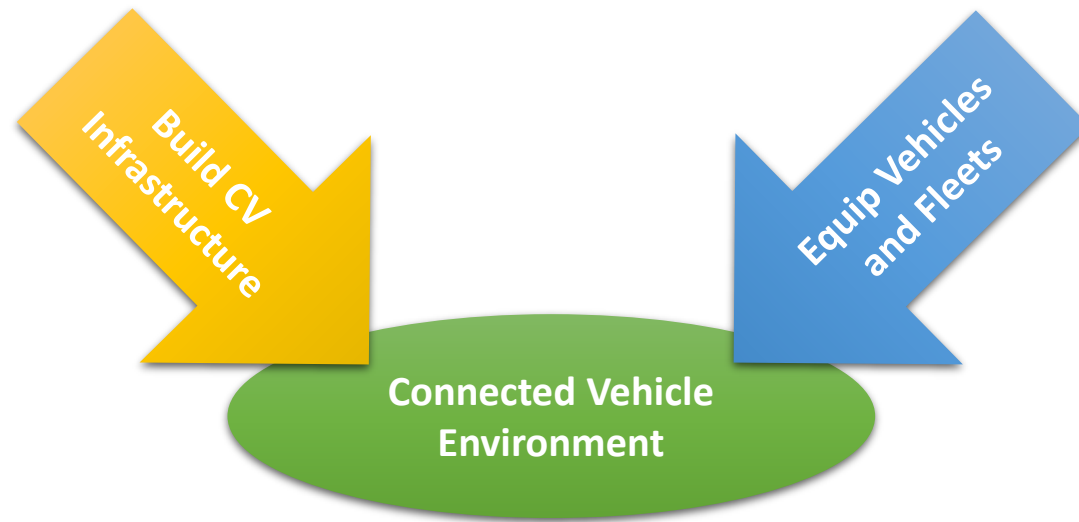# Next Step: Vehicular *ad hoc* Communications

- Vehicle to Bike
- Vehicle-to-Pedestrian
- V2X (Everything) – think Internet of things (IoT)

Standardized Driver warnings through visual and/or audio alerts

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Why is this important to a transportation agency?

- Connected Vehicle Technologies promise major benefits in safety and mobility, while improving the Environment and the Economy

- Infrastructure and vehicles have to cooperate:

Build CV Infrastructure

Equip Vehicles and Fleets

Connected Vehicle Environment

NHTSA:
Connected vehicle technology could potentially address 80% of all unimpaired crash scenarios

Irresistable? Affordable? Must Have or Good to Have?

What can the agency's role be?

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This Means BIG DATA!

- Lots of it
- Worth money? Revenue steams for agencies?
- Who owns it? Nobody gives it away!
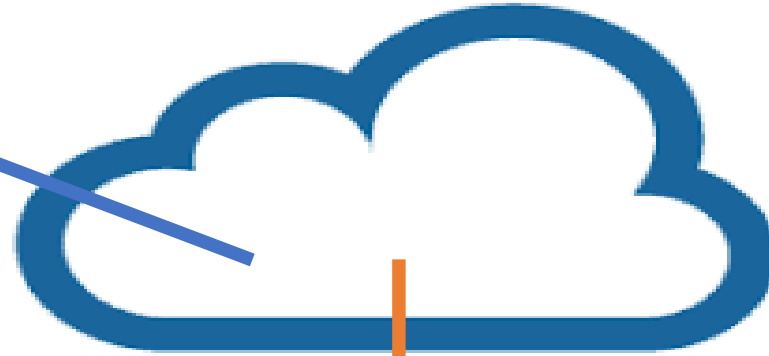- Public and Private sectors need to share data in complex global networks

As a transportation professional:

How do I make sure that my infrastructure is CV-ready?

How do I take advantage of these capabilities?

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The CV Infrastructure

Cloud-based computing

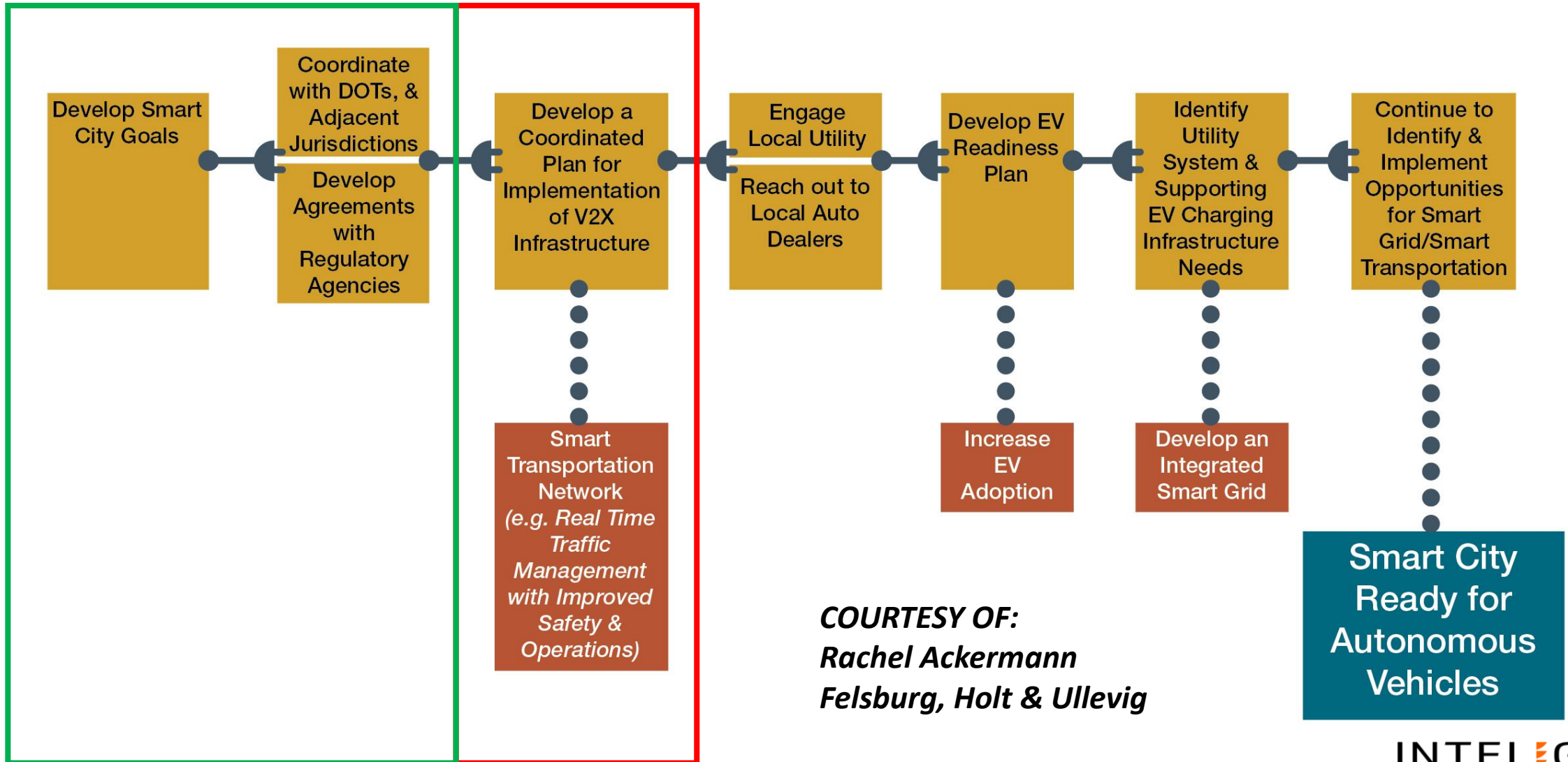Broadband Network

Edge Devices

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Public Agency Roles in CV

ROLE	AGENCY				
	Federal	State	County	MPO	Local
Standards	■	■			
Funding	■	■	■	■	■
Planning		■	■	■	■
Prioritization			■	■	■
Implementation		■	■		■

Identify and secure the public capital, operating and maintenance costs and benefits up front

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What does this mean for the transportation agency?

- Pressure on the agency : mission critical systems - no down-time
- Supply: New mobility options (e.g. shared rides, electric bikes and scooters)
  - Who provides them? Who regulates them?
  - What technologies and data are needed to be shared?
- Demand: Infrastructure-based shared netwroks and equipment
  - Who supports this (O&M issues: Service Level Agreements? and $$$$)
- New collaboration and partnership of public agency departments:
  - Public Works, IT, Planning, Community/Economic Development, City Manager

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What steps should an agency be taking?

COURTESY OF:
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What steps should an agency be taking?

- Establish formal Agency Team Structure and Allocation of Duties
- Obtain Council approval of annual work program
- Examine options and develop a strategy for the future based on positioning the agency for partnering:
  - Anticipated high demand for:
    - Data
    - Field communications
    - Infrastructure real estate
    - High SLA's (O&M response)

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What to look out for in <u>Regulating</u>

- Identify your public sector regulatory goals:
  - Protect public safety
  - Protect public assets
  - Recover regulatory costs

The agency goal should be to maintain control of the public infrastructure for the public benefit

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What to look out for in <u>Partnering</u>

- Data
  - Keep control of it
  - Make it available to third parties
  - Monetize/trade
- Field communications
  - Keep control of it
  - Shared broadband networks
  - Make it accessible to third parties
  - Monetize/trade
- Infrastructure real estate
  - Keep control of it
  - Make it accessible to third parties
  - Monetize/trade

> An agency goal should be to offset the cost of the involvement in the connected world through leveraging agency owned assets

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To Learn More ....

- FHWA/USDOT
  - https://www.its.dot.gov/cv_basics/cv_basics_resources.htm

- National Operations Center of Excellence
  - Resources:
    - https://transportationops.org/resources-connected-and-automated-vehicles
  - V2I Deployment Coalition (Phase 2)
    - https://transportationops.org/V2I/V2I-overview

- Local
  - ITS CA
    - http://www.itscalifornia.org

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