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Data for Automated Vehicle Integration

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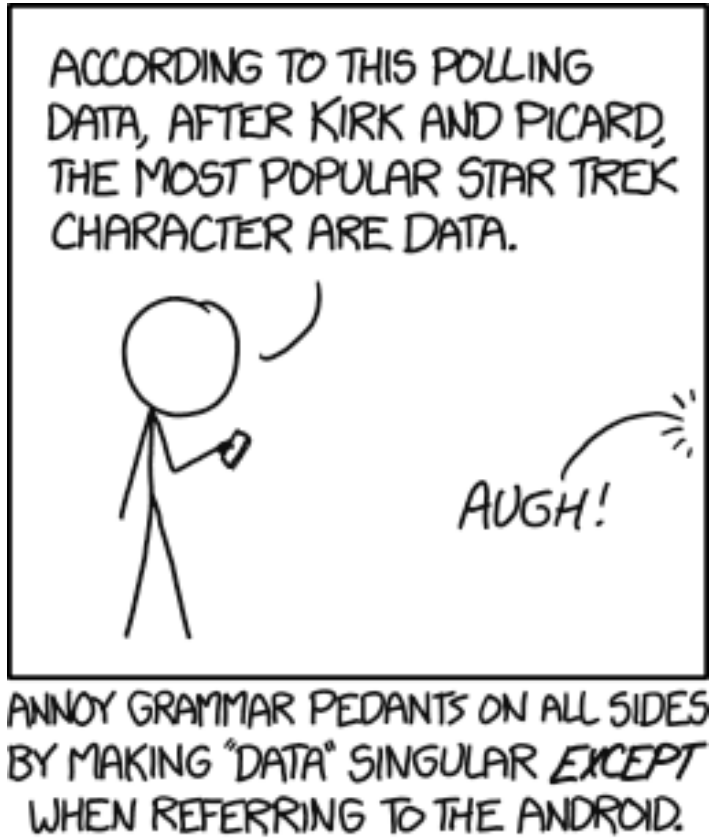
How to Take on a Cross-cutting Issue Like Data?



Graphic credit: https://xkcd.com/1429/

Access to data is a limiting factor for AV deployment. (It's also a sensitive topic.) One solution: *data exchanges.*

USDOT is using our *convening power* to understand critical use cases for data exchange and the appropriate federal role to enable them.

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Bringing Stakeholders Together for Meaningful Conversations on Data

(IT'S REALLY HARD TO DO)

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AV Data Guiding Principles (Beta)

1. Promote proactive, data-driven safety, cybersecurity, and privacy-protection practices.

2. Act as a facilitator to inspire and enable voluntary data exchanges.

3. Start small to demonstrate value, and scale what works toward a bigger vision.

4. Coordinate across modes to reduce costs, reduce industry burden, and accelerate action.

https://www.transportation.gov/AV/Data

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AV Data Framework (Beta)

Category*	Goals	Specific Data to Exchange	Real-World Examples
Business-to-Business (B2B)	• Mitigate known and emerging cyberthreats • Improve industry-wide safety through shared learning in safety-critical and edge case scenarios • Inform future insurance policies • Accelerate the resolution of legal liability claims	• Cybersecurity incidents • Edge cases • Near-miss events • Performance in safety-critical scenarios • Post-accident data	• Automotive Information Sharing and Analysis Center • ClinicalStudyDataRequest.com (CSDR) • PEGASUS • TNO Streetwise
Business-to-Government (B2G)	• Understand performance of rapidly evolving technology during testing phases • Inform policies and investments to improve system safety and efficiency	• Cybersecurity incidents • Near-miss events • Performance in safety-critical scenarios • Crash reconstruction	• Aviation Safety Information Analysis and Sharing • Voluntary Safety Self-Assessments (Part of ADS 2.0)
Business-to-Infrastructure (B2I)	• Help vehicles navigate safely around obstacles and in adverse weather conditions • Reduce system congestion • Help optimize infrastructure maintenance	• **Work zone activities and geometrics** • Road weather information • Missing signage or broken infrastructure • Curb use rules and availability	• National Transit Map • Waze Connected Citizens Program • Meteorological Assimilation Data Ingest System
Open Training Data (X2X)	• Improve ADS performance in common safety-critical scenarios • Support basic research and education	• Road, signage, and other infrastructure imagery • Edge cases • Bike/ped near misses • Truck platooning pilot data	• ImageNet • Multimedia Commons • Nexar NEXET • BikeMaps.org • FHWA Platooning POC

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***represents two-way data exchange**

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Roundtable on Data for AV Safety

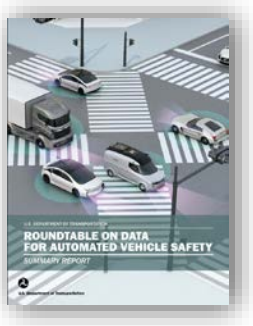
Outcomes

- Clarity on value of federal government as convener and facilitator
- Priority use cases for data exchange: work zones, scenarios, cybersecurity, others

Next Steps

- Enable voluntary data exchanges as “One DOT” via pilot projects
- Incorporate into AV policies
- Continue conversations

Photo credit: Dan Morgan



Summary Report available via:
https://www.transportation.gov/AV/Data

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Work Zone Data Exchange Project

THE LOCAL DATA CHALLENGE

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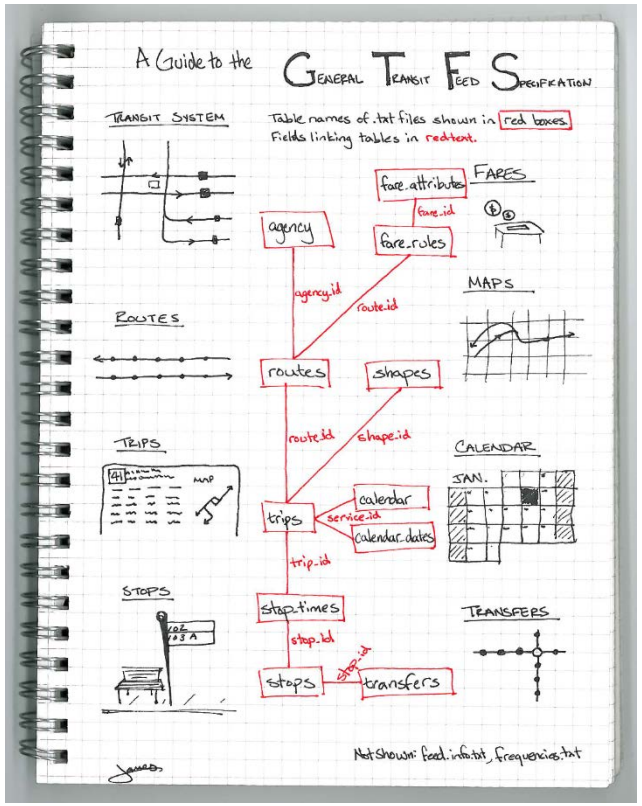
The Local Data Challenge

Up-to-date information about dynamic conditions occurring on the roads – such as construction events – can help AVs navigate safely and efficiently.

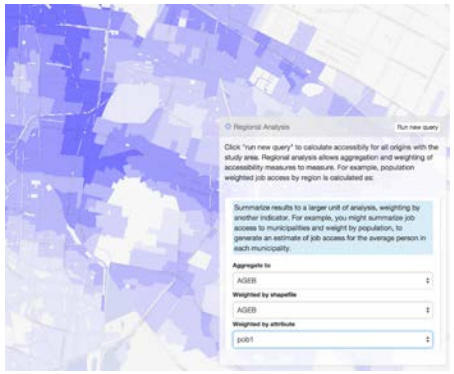
Many infrastructure owners and operators (IOOs) maintain data on work zone activity, but lack of common data standards and convening mechanisms makes it difficult and costly for third parties – including original equipment manufacturers (OEMs) and navigation applications – to access and use these data across various jurisdictions.

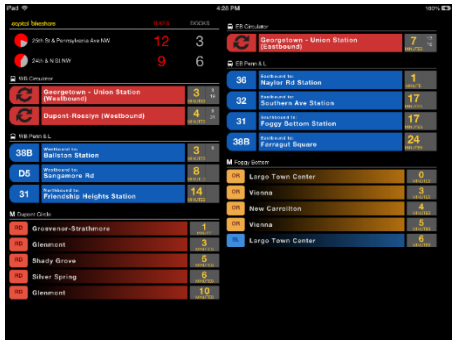
Learning from the Open Transit Data Story

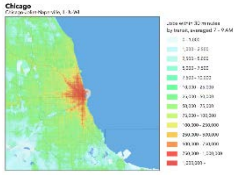
A **simple** specification…



…with a **wide range** of uses







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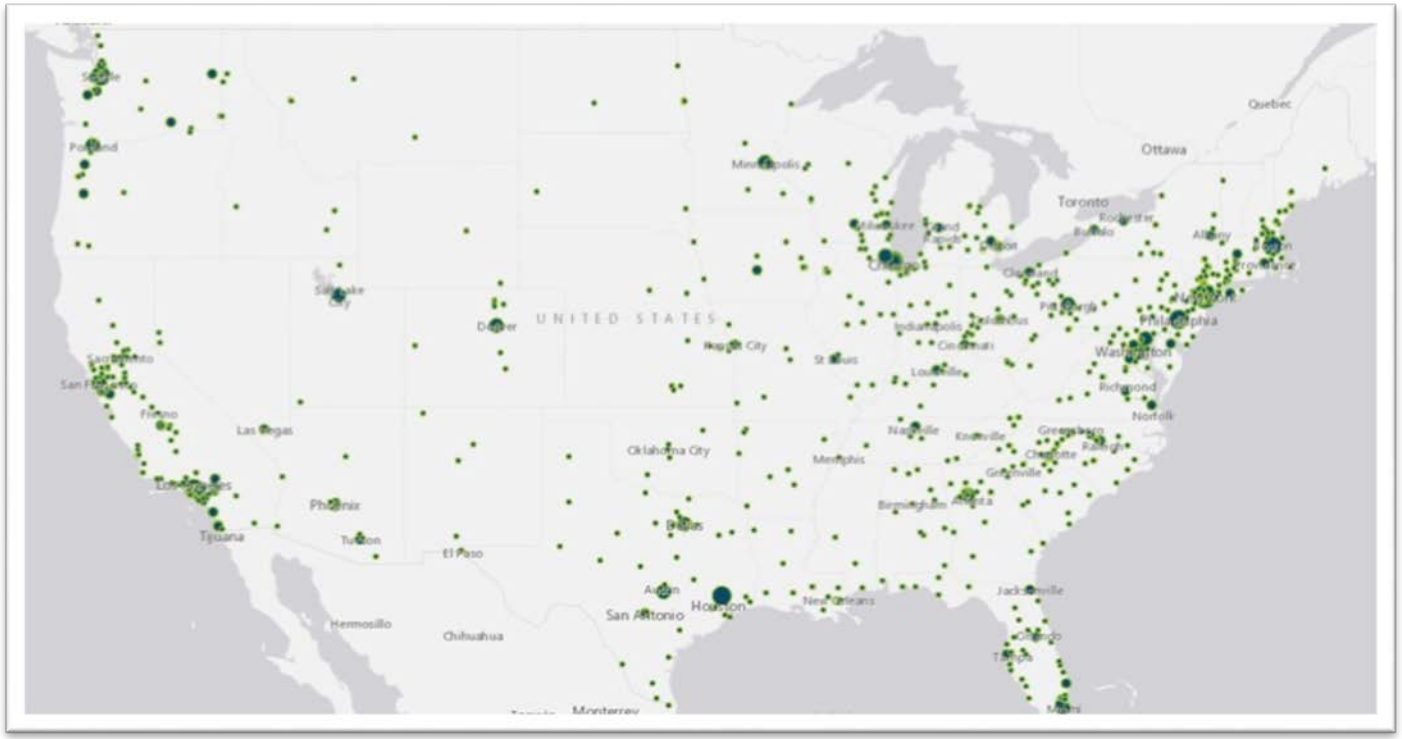
A Federated “Front Door” to Transit Data

Now, **basic transit data** is easy to **find and use nationwide;**
transit agencies and their users **continue to collaborate** on the spec



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Work Zone Data Exchange Project (Overview)

Purpose

- To jumpstart voluntary adoption of a basic work zone data specification
- To enable collaborative maintenance and expansion of the spec

Outcomes within 6 months

- **Data producers** make available an active work zone data feed using a common, non-proprietary specification
- **Non-government developers** use that data in a meaningful way – thus establishing a minimum viable product of voluntary data exchange for work zone data

Big Picture Outcome

- Repeatable approach to accelerate harmonization of local data sources

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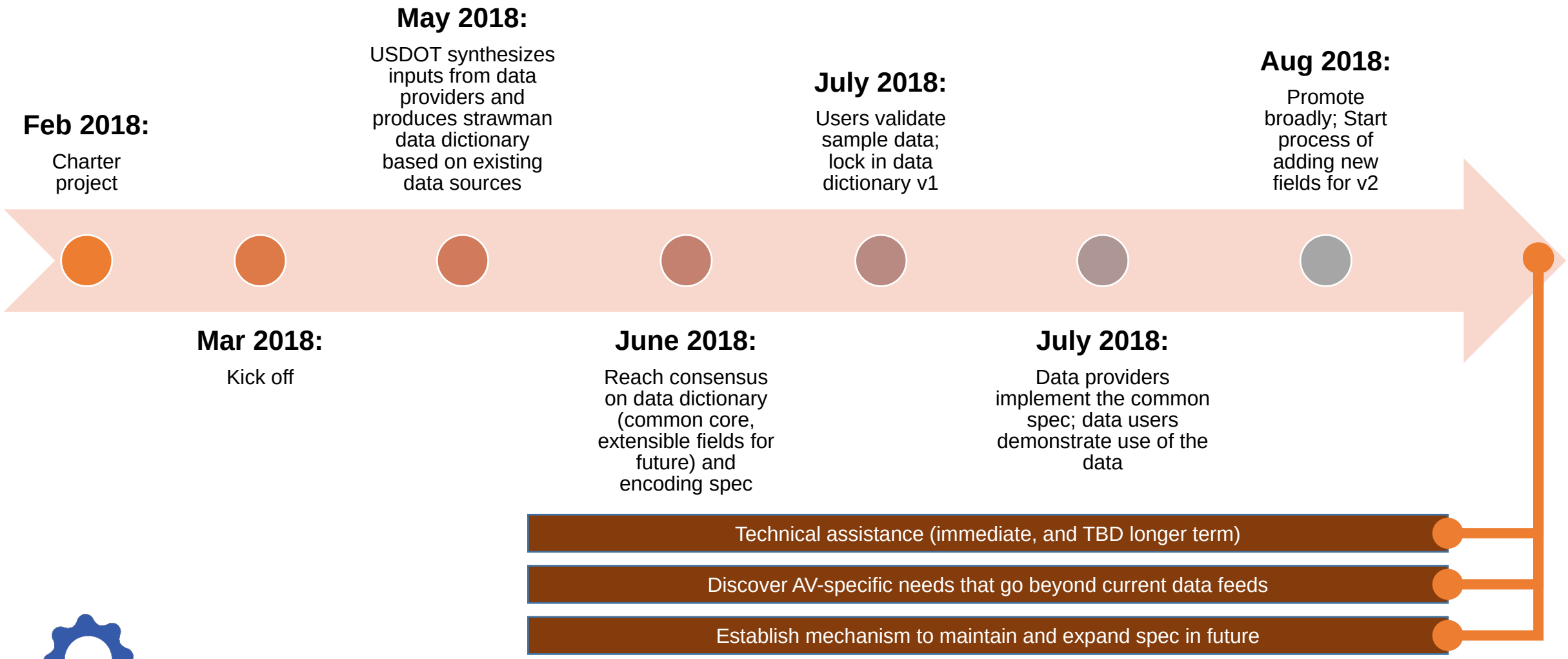
Work Zone Data Exchange Project (Notional timeline)



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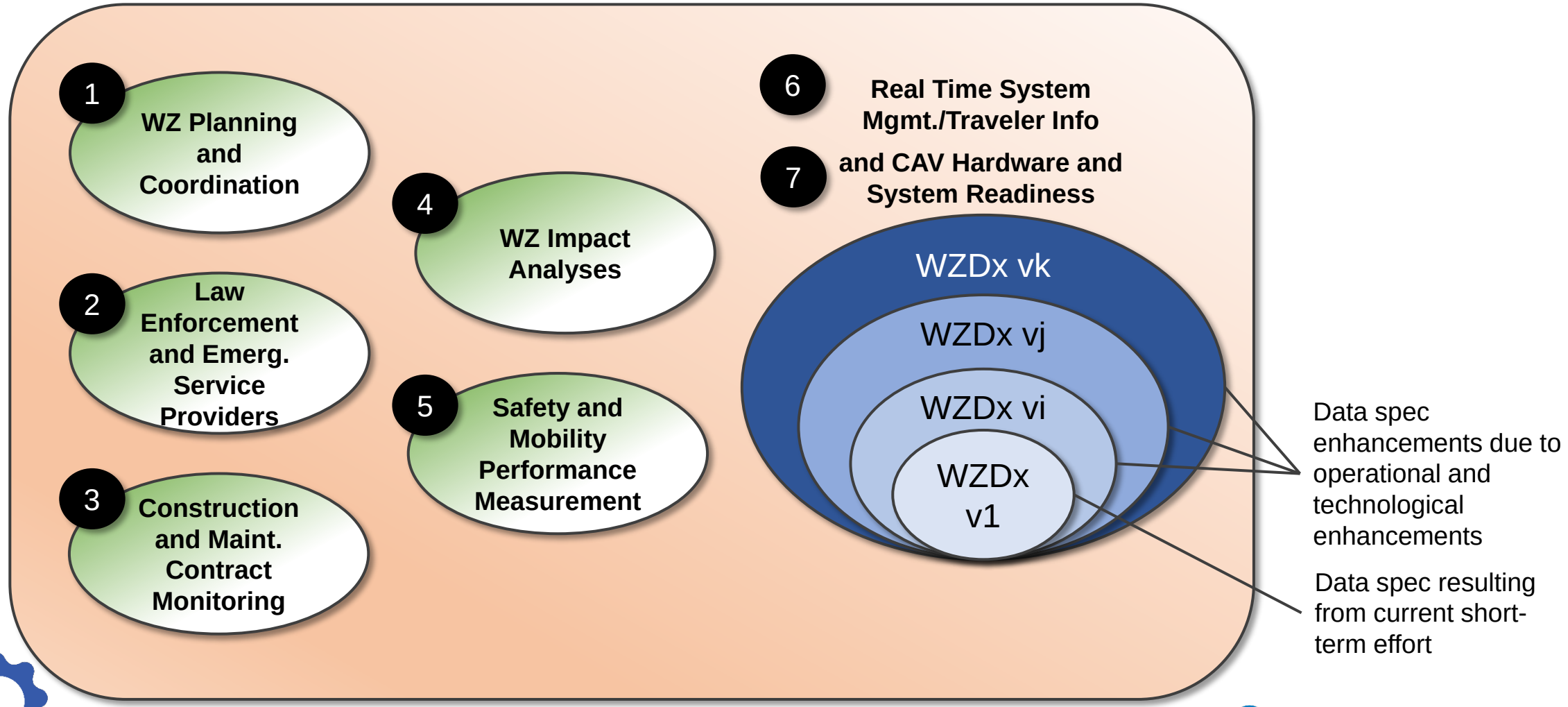
Longer-term Needs Discovery (FHWA Work Zone Data Initiative)



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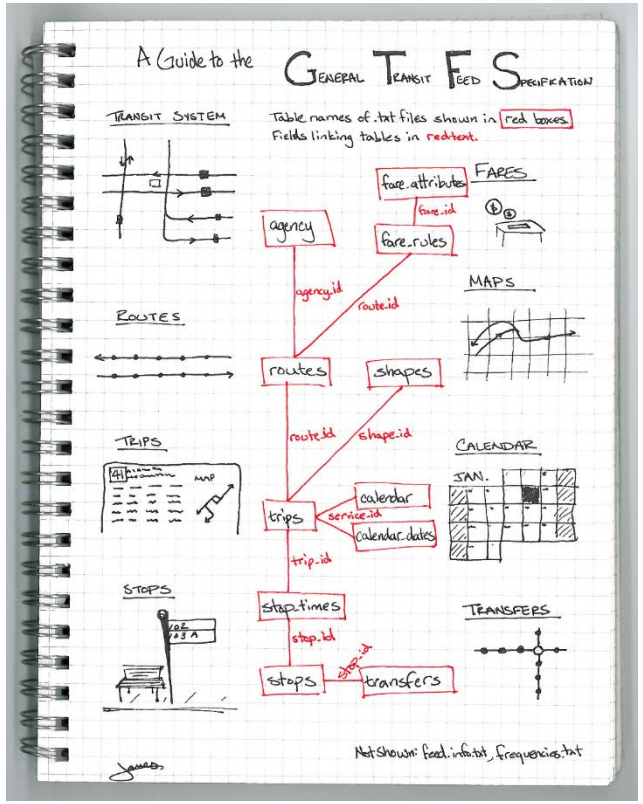
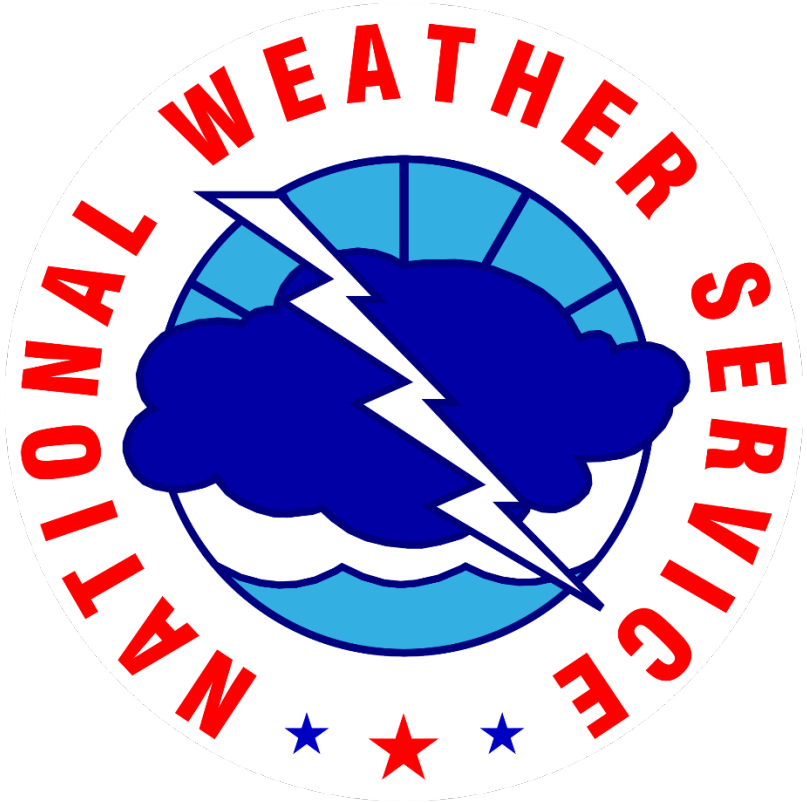
Relationship between Data & Digital Infrastructure for AV Integration

(HINT: DATA = DIGITAL)

A Range of Potential Federal & Non-Federal Roles





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Recap: Meaningful Conversations on Data

- Start with they **“why”** – what problem are you trying to solve through data?
- Then talk about **“who”** needs to be involved, and **“what”** data they’re exchanging
- Then dive into **“how”** to make this happen
- Consider using the AV Data Framework and Principles to jump-start your conversations (start small and scale)!

Thank You!

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