TRB 2020 ANNUAL MEETING

99TH Annual Meeting
Washington, D.C.
January 12–16, 2020

DIVISION OF TRANSPORTATION MOBILITY

Jeff Rockower
Ridwan Ahmed

TRB

& the future of transportation

TRANSPORTATION MOBILITY

JEFF ROCKOWER

RIDWAN AHMED

TRB 2020 – Sessions Attended

Jeff Rockower

135

1. 1022 Evolution of Project Delivery Information Systems: Where We Were and Where We Are Headed
2. 1051 Data Governance Issues for Transportation Agencies
3. 1097 Blockchain: Opportunities and Challenges for the Transport Sector
4. 1163 Chief Information Officers Roundtable: The Pressing Issues and Concerns from Our Leaders
5. Task Force on Data Privacy, Security, and Protection Policy
6. 1314 Best Practices for Handling and Responding Before, During, and After a Cyber Attack or Data Breach
7. Cyber Security Subcommittee, ABR10(7)
8. 1455 Using Artificial Intelligence to Unlock the Hidden Value of Asset Management Data: Transforming Data into Advanced Decision Making
9. 1582 Evaluations and Applications of Emerging Crowdsourced Data Sets
10. 1663 Mainstreaming Resiliency: Physical Security Faces New Challenges
11. 1707 Keeping Our Nation's Transportation Assets Secure from Cyber Attacks
12. 1739 Digital Asset or Digital Liability
13. **1741 Data Governance Is a Journey, Not a Destination**
14. 1770 Research Data Management for State DOTs

Best (and worst) practices in data governance.

JEFF ROCKOWER

Best (and worst) practices in data governance.

- Data Governance is a discipline that provides clear-cut policies; procedures; standards; roles; responsibilities; and accountabilities to ensure that data is well-managed as an enterprise resource. —from the DGPO Data Governance Glossary
- "Data Governance is a system of decision rights and accountabilities for information-related processes, executed according to agreed-upon models which describe who can take what actions with what information, and when, under what circumstances, using what methods." — from the Data Governance Institute
- When you refer to governance, be careful! Depending on the context, "Data Governance" could refer to:
  - organizational bodies
  - rules (policies, standards, guidelines, business rules)
  - decision rights (how we "decide how to decide")
  - accountabilities
  - enforcement methods for people and information systems as they perform information related processes.

Best (and worst) practices in data governance.

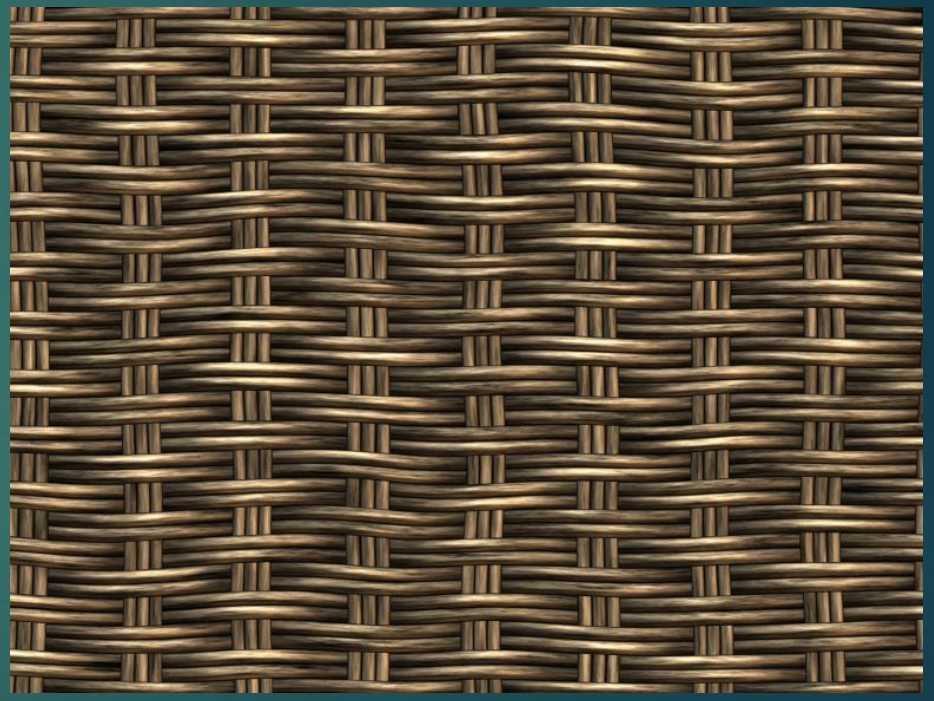
Necessities of Good Data Governance

- 1.) You need to develop your own definition of Data Governance.
  - It's Meaning
  - It's Purpose
  - It's Value to the Organization

Best (and worst) practices in data governance.

Necessities of Good Data Governance

- 2.) You need to develop a strategic and tactical plan that not only considers conventional components but:
  - Organizational Culture
  - Organizational Structure
  - Organizational Readiness
  - Organizational Decision Making
- Data Governance needs to be woven into the organization



Best (and worst) practices in data governance.

Necessities of Good Data Governance

- 3.) You need to realize that Data Governance is a Journey:
  - Technology rapidly changing(ML & AI)
  - Data in motion vs. Data at rest
  - Changing role of organization
    - "Construction Co." vs. "Mobility Maximizer"
    - Identity
  - Data Governance –Prescribed to Distributed to Emergent
  - 3rd Party Data

Best (and worst) practices in data governance.

Necessities of Good Data Governance

- 4.) You need to be adequately resourced/supported to succeed
  - Given the complexity and long term effort, dedicated staff must be assigned
  - Can't continue to load someone's plate
  - Executive sponsorship/involvement necessary as barriers are encountered or to reinforce guiding Principles.

Best (and worst) practices in data governance.

Necessities of Good Data Governance

- 5.) You need to be Collaborative and have Good Communication Skills
  - First and foremost, this is an enterprise activity
  - No one individual has the ability to see the complete "whole"
  - The vision for data governance needs to be Communicated in a clear, compelling way

- Data Governance is not an end in itself. It is not only about allowing us to integrate data, but integrating the organization. It also is a powerful force that can align your organization to its mission and vision. One in which you can truly engage your workforce to help create a successful future.

TRB 2020 - Sessions Attended :
Ridwan Ahmed

1. Autonomous Vehicles and Travel Behavior- 1101
2. Evaluation of Signs and Markings Based on User Needs – 1191
3. Traffic Control Devices Challenge: Connected and Autonomous Innovations for Improving Work Zone Safety—Hybrid Session – 1252
4. Technology Assisting to Make Better Work Zones -1309
5. Speed Feedback Signs, Curve Warning Treatments, and the History/Future of Traffic Control Devices -1388
6. Public Transit Innovation: Past, Present, and Future -1466
7. Autonomous Vehicle and Unmanned Aerial Systems Education and Training: The Future Is Now -1511
8. Information and Communications Technologies and the Evolution of Travel Choices – 1584
9. Driving and the Technology of Weather -1672
10. Highway Safety Performance Research- 1721

By: Ridwan Ahmed

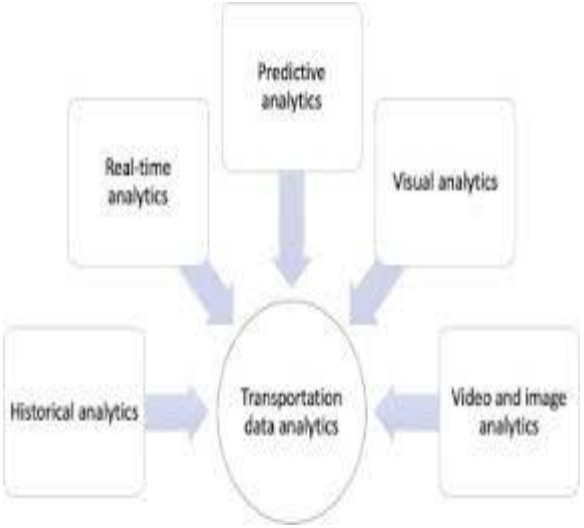
Public Transit Innovation: Past, Present, and Future -1466

The Evolution of Transit

Regional Transportation Commission (RTC), Southern Nevada

Objective:

A crash prevention pilot program along a key corridor of Interstate 15 in Las Vegas, Nevada



Involved Agencies:

The pilot was led by Waycare, an AI-driven mobility solutions provider, in partnership with the Regional Transportation Commission of Southern Nevada (RTC), Nevada Highway Patrol (NHP) and the Nevada Department of Transportation (NDOT).

Goals:

- **Connect People**
- **Congestion Capacity & Safety**
- **Data Driven Solutions**

By: Ridwan Ahmed

Data Sources:

Waycare system uses data from

- **Connected cars**
- **Road cameras**
- **Apps like Waze**
- **Social Media**
- **Historical Data**

Benefits:

- **Number of primary crashes reduced by 17 percent along the Interstate 15 Las Vegas.**
- **Predictive analytics, gave the city's safety and traffic management agencies the ability to take preventative measures in high risk areas.**
- **Preventative measures were deployed 91 percent of drivers reduced their speed to below 65 MPH**
- **Waycare has been providing traffic agencies with alerts detailing when and where it predicts an accident is likely to take place. RTC then uses a message board system to deliver alerts to drivers, advising them to reduce their speed and drive with extra caution.**
- **12 minutes average faster response time by law enforcement**

By: Ridwan Ahmed

Evaluation of Signs and Markings Based on User Needs – 1191

Freeway Traffic Sign Design for Interstate 80 Smart Corridor in California: A Driving Simulator Study

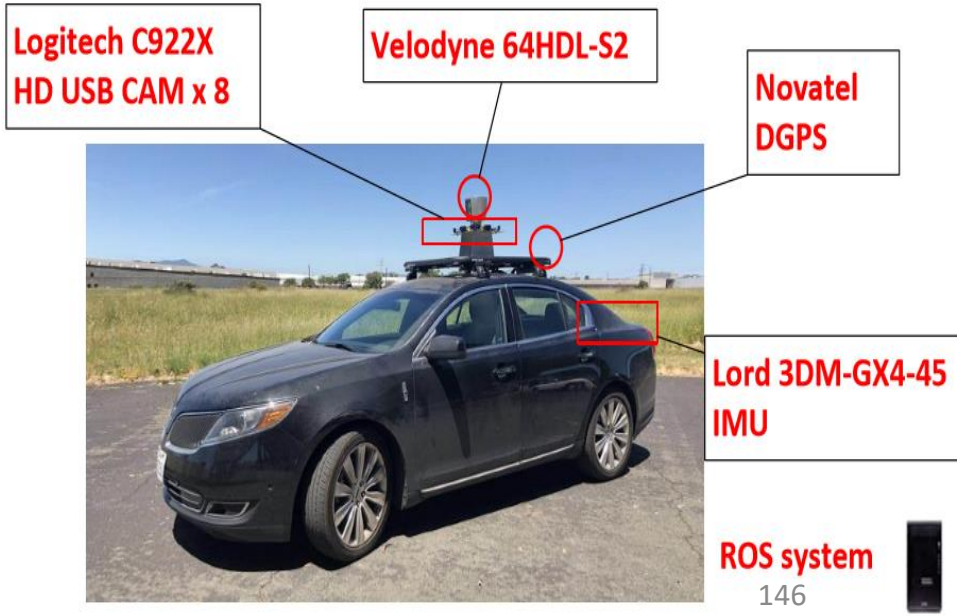
California PATH, UC Berkeley

Background:

- The Interstate 80 Smart Corridor under this study
- Caltrans installed Information Display Boards (IDBs) at six strategic decision points along the corridor
- Display innovative concepts of signs

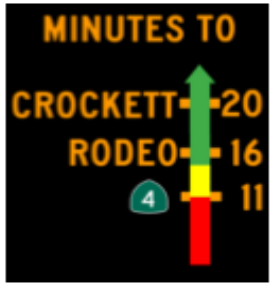
Method of the Simulator Testing:

- Collect video data on I-80 corridor using instrumented car
- Replace IDB signs in the video with the IDB designs to be evaluated.



By: Ridwan Ahmed

Traffic Sign Categories and Design Factors:

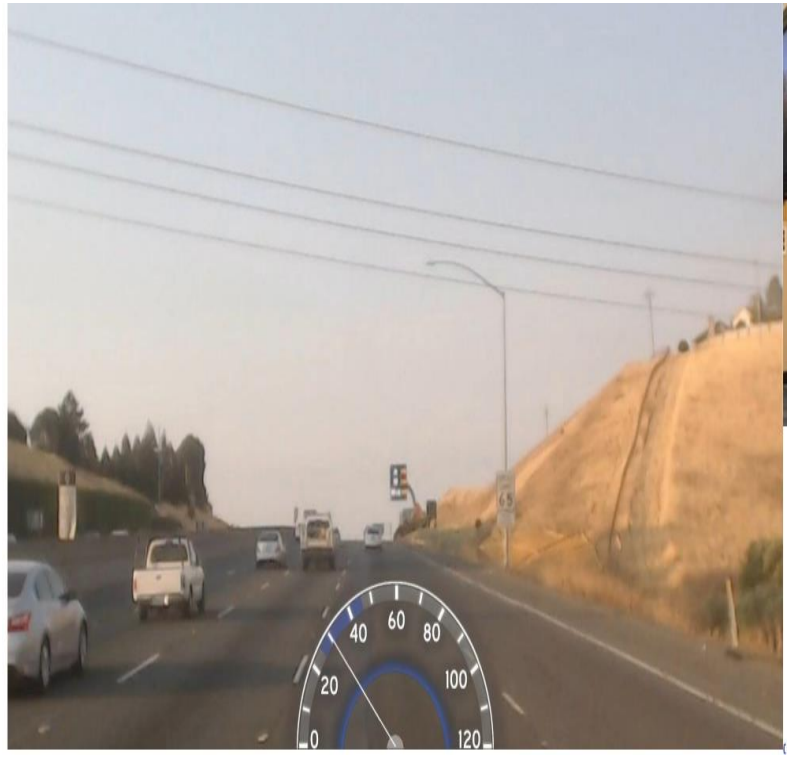


Message Categories	Design Factors
1. Travel time and up to six lines messages	• Number of lines of messages
2. Transit travel time messages	• Transit logo vs. Text only • Symbols for BART
3. Single-link GRIP	• Orientation: top-bottom vs. bottom-top • With or without roadwork legend • Number of destinations

By: Ridwan Ahmed

Testing procedure:

- Provide participants with one destination before each trip.
- Randomly displayed one sign in each trip.
- Participants control the speed of the simulator.



Subjective questions :

After completing each trip, the following questions were asked about each sign.

- What is the sign about?
- Detailed information about the destination.
- Is it easy or difficult for you to understand the sign? (rating scale: 1-5)

By: Ridwan Ahmed

Findings:

❖**Up to six lines messages**

- **Five or six lines of messages were significantly harder to understand comparing with the 3-line travel time message.**

❖**Transit travel time messages**

- **Transit logos were preferred.**
- **It was hard to understand the origin of the transit travel time.**
- **Likely to think the time is “driving to the station” because of seeing the sign while driving on freeway.**

❖**Single link GRIP**

- **Bottom-top orientation was mostly preferred.**
- **Legend helped to understand the traffic, but also made the sign busy and more likely to be perceived inaccurately.**
- **Single link GRIPs with four destinations were more likely to be perceived inaccurately comparing with single link GRIPs with three destinations.**

By: Ridwan Ahmed

Traffic Control Devices Challenge: Connected and Autonomous Innovations for Improving Work Zone Safety-Hybrid Session –1252

“Connected” Temporary Traffic Control Devices

Oregon State University

Introduction:

Work zones present a unique challenge in transportation safety because they disrupt standard traffic flow through an area.

According to Bai and Li (2007):

- **Over half of fatal work zone crashes were due to driver inattention**

According to National Work Zone Safety Information Clearinghouse:

- **94,000 work zone crashes in the United States in 2017**
  - **25,000 - injury only**
  - **710 - fatality**

Causes of work zone crashes:

92% of work zone crashes are from human error (University of Kansas)

- **52% - inattentive driving**
- **25% - speeding**
- **15% - other human errors**

8% - non-human error

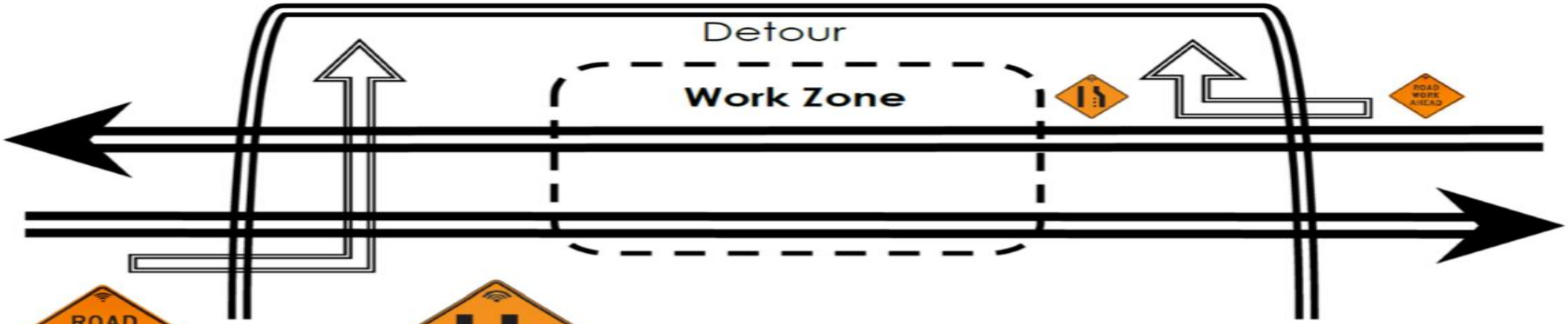
By: Ridwan Ahmed

Solution:

The connected capability of the "Connected" Temporary Traffic Control Device ("C"-TTCD) facilitated using Dedicated Short-Range Communications (DSRC) technology. A modified MUTCD sign that utilizes DSRC via a Roadside Unit to

- **Push upcoming road work conditions to CAVs**
- **Alert the driver, as well as the vehicle, to make a change in driving behavior or navigation**
- **Increases Attention**
- **Reduces Speed**

W20-1
(w/ WIFI symbol)



Information Sign	
• Visual Warning • Alternative Route • Audio Warning • Haptic Warning	• Warnings • Takeover Request • Speed Restriction • Land Guidance

Provide work zone information to CAVs through ***Connected Temporary Traffic Control Devices*** *(CTTCD) to improve driver awareness and CAV integration*

Feasibility/ Applicability:

Connected" Temporary Traffic Control Device ("C"-TTCD) are feasible and applicable for deployment in the near and long term because:

- **"C"-TTCDs are resilient to various weather conditions, roadway types, and environments.**
- **The "C"-TTCD concept is easily transferable to other roadway projects**
- **Alterations to legal MUTCD sign deifications should cause no difference in understanding for non-CAV vehicles.**

By: Ridwan Ahmed