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What is the WZDI Framework?

• Describes User Needs and Use Cases for:
  • WZAD dictionary
    • Standardizes WZAD content and format
    • Enables communication of WZAD
      • Between agency, private sector, and public users
      • Across multiple jurisdictions and regions
  • Conceptual Work Zone Data System (WZDS)
    • Illustrates concepts for capture, sharing, storing, maintaining, and archiving of WZAD
What is the Purpose of this Framework?

• Assist transportation agencies in:
  • Organizing their WZAD
  • Sharing WZAD with contractors, other agencies, third party data consumers

• Support the development of WZAD data dictionary:
  • For agencies
  • For standards development organizations (SDOs)

• Illustrate how collecting, editing, storing, disseminating, and archiving WZAD may occur over the work zone life cycle
WZAD User Groups

Internal Agency Stakeholders
- WZ Planning and Coordination
- Roadway Design and Engineering
- WZ Data Systems
- Construction and Maintenance Managers
- External Coordination
- TMC and Traveler Information
- WZ Performance and Impact Analysis

External Stakeholders
- Regional Partner Agencies
- Construction and Maintenance Contractors
- 3rd Party Traveler Information
- Utilities and Law Enforcement
- Travelers and Freight Haulers
- Connected and Autonomous Vehicles
- State and Federal Agencies
WZAD and WZDS fit in a TSMO-centric organizational structure

**Operational Benefits**
- Enhance coordination to minimize motorist impacts
- Improve mobility and safety impact estimates
- Improve tracking of contractor compliance
- Improve timeliness of WZ traveler information
- Improve performance measurement
- Improve Law Enforcement support
- Improve data for Connected and Autonomous Vehicles

**Organizational Benefits**
- Removes WZ Information silos
- Enhances funding and staffing for WZDS
- Streamlines WZAD gathering processes
- Promotes integration across all work zone life cycle stages
- Increases intra- and inter-agency coordination
Example of Current ad hoc WZAD Communication
Conceptual WZDS Architecture

- Conceptual WZDS Architecture
- Agency WZ Operations Tools/Staff
- Work Zone Data System (WZDS)
- Traffic Impact/Performance Analysis Tools/Staff
- Active Operational WZAD
- Planned & Actual WZAD Archive
- Agency WZ Planning & Design Tools/Staff
- Agency Traveler Information Systems

Diagram:
- Agency WZ Operations Tools/Staff
- Work Zone Data System (WZDS)
- Traffic Impact/Performance Analysis Tools/Staff
- Active Operational WZAD
- Planned & Actual WZAD Archive
- Agency WZ Planning & Design Tools/Staff
- Agency Traveler Information Systems
Integration of External Data Resources

Plan & Design Other Ext Resources → Agency WZ Planning & Design Tools/Staff → Work Zone Data System (WZDS) → Traffic Impact/Performance Analysis Tools/Staff → Traffic Delay Data and Other Ext Resources → Plan & Design Other Ext Resources

Agency WZ Operations Tools/Staff → Active Operational WZAD

Agency WZ Operations Tools/Staff → Plan/Design WZAD

WZAD Planning Updates → Traffic Impact/Performance Analysis Tools/Staff

Active Operational WZAD

Planned & Actual WZAD
Overall WZDS Conceptual Architecture
Detailed look at Potential WZAD Planning and Design Activities

Utilities Resources → Utilities WZ Schedule Planning Tools/Staff
Regional Resources → Regional WZ Schedule Planning Tools/Staff
Agency Planning & Design External Resources → Agency WZ Planning & Design Tools/Staff
Agency Traffic & Crash Impact External Resources → Plan/Design WZAD WZAD Planning Updates

Work Zone Data System (WZDS)
Detailed look at Potential WZAD Operations Activities

Work Zone Data System (WZDS)
Detailed look at Potential Traveler & Other Information Output Activities

Work Zone Data System (WZDS)

Active Operational WZAD

- WZ Operations Performance Monitoring
- TMC/ATMS/RCRS/ITS Information Integration & Output
- Agency Traveler Information Output Systems
- Smart Work Zone Automated I/O
- Agency Interface to Conn & Autonomous Vehicles

Travelers

3rd Party Traveler Information
Detailed look at Potential Post-Work Zone Performance and Impact Analyses

Work Zone Data System (WZDS)

Planned and Actual WZAD Archive

Traffic Impact/Performance Analysis Tools/Staff

Traffic Delay Data and Other Resources

Crash Impact/Performance Analysis Tools/Staff

Crash Data and Other Resources

Law Enforcement Impact/Performance Analysis

LE Other Resources

State and Federal Performance Analysis

National Other Resources
Application Examples

- WZDx
- TTI’s I-35 work
- VDOT in-field application
WZAD & WZDS
Example: WZDx

Work Zone Data System (WZDS)

- Planned and Actual WZAD Archive
- Active Operational WZAD
- WZAD Planning Updates
- Plan/Design WZAD

- Utilities Resources
- Regional Resources
- Agency Planning & Design External Resources
- Agency Traffic & Crash Impact External Resources

- Utilities WZ Schedule Planning Tools/Staff
- Regional WZ Schedule Planning Tools/Staff
- Agency WZ Planning & Design Tools/Staff

- Traffic Delay Data and Other Resources
- Crash Data and Other Resources
- Traffic Impact/Performance Analysis Tools/Staff
- Crash Impact/Performance Analysis Tools/Staff

- Law Enforcement Coord/Tools/Staff
- Agency WZ Operations Tools/Staff
- Contractor WZ Operations Tools/Staff
- Other Cons/Maint/Utilities WZ Coord Tools/Staff

- Agency Traveler Information Output Systems
- Agency Interface to Conn & Autonomous Vehicles
- Smart Work Zone Automated I/O
- TMC/ATMS/RCRS/ITS Information Integration & Output
- WZ Operations Performance Monitoring

- National Other Resources
- State and Federal Performance Analysis
- LE Other Resources

- Travelers
- 3rd Party Traveler Information
WZAD & WZDS Example: I-35 Expansion in Waco

- $2.1 billion
- Coordination of 17 projects
- 55,000 to 111,000 vehicles
- 30 million travelers
- 25% to 35% peak construction
- 200 directional miles
- 96-mile corridor construction project cost
  - with multiple contractors
  - per day
  - per year
  - traffic
  - estimated complete 2019
  - Central Texas, Texas
WZAD & WZDS
Example: I-35 Expansion in Waco
WZAD & WZDS Example: VDOT VCC

VCC Work Zone Components

- **VCC Monitor**
  - Situation Awareness

- **VCC Worker/SSP**
  - Dynamic Worker Location and Activity

- **VCC Vest**

- **VCC Cloud**
  - Data and Processing Hub

- **VCC Mobile**
  - Driver Interface

- **Work Zone Builder**
  - Detailed Work Zone Definition
WZAD & WZDS
Example: VDOT VCC