WORK ZONE MANAGEMENT PROGRAM

Session 3: What’s Happening Now?

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Work Zone Data Exchange (WZDx)
VDOT’s In-Field Mobile Application
Connected Vehicle and Work Zone Activity in Northern Virginia

Overview

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Mission: Provide an open connected vehicle environment where concepts can be developed, tested, deployed, and evaluated in real world operating environments.
VCC Mobile
- Cellular or DSRC/OBE
- Dynamic Driver Messaging
- Work Zone Alerts
- Weather Advisories
- Traffic Incidents
- ATM/HOV Status and Alerts
- Pot Hole Detection and Road Surface Temp Monitoring
- Driver Reporting and Call for Help

VCC Monitor
- Realtime Situation Awareness Tool
- RSU Status and Performance Monitoring
- Message Flow Monitoring (BSM, BMM, PDM, TIM, etc.)
- SPaT Status Display
- Control Message Management
- Traveler Information Message Management
- Driver Report Location
VCC Work Zone Components

VCC Cloud
Data and Processing Hub

VCC Monitor
Situation Awareness

VCC Mobile
Driver Interface

VCC Worker/SSP
Dynamic Worker Location and Activity

VCC Vest

Work Zone Builder
Detailed Work Zone Definition

VCC Cloud
**Activity Area 1**
- **Approach**: Lat / Lon Geo Position
- **General Description**
- **Operational Restrictions**

**Activity Area 2**
- **Approach**: Lat / Lon Geo Position
- **General Description**
- **Operational Restrictions**

**Transition**
- **Lat / Lon Geo Position**
- **Beginning of Taper**
- **End of Taper**
- **Required Actions**
- **Merge Direction**
- **Lanes Offsets / Alternate Paths**
- **Speed Reduction**
- **Maneuver Restrictions**

**Desired CAV Data Elements**
- **Speed Limit**: 65
- **Speed Limit**: 45

**Termination**
- **Lat / Lon Geo Position**
- **Beginning of Taper**
- **End of Taper**
- **Resume Speed Limit**

**Potential Hazards**
- Workers Near Roadway
- Uneven Pavement

**Barrier Type**
- Active / Inactive
Initial Work Zone Builder POC

- Provide an app to produce work zone data suitable for use in CAVs
- Build initial tablet-based POC app to facilitate requirements generation
- Evaluate mapping and imagery data sources
- Align software with VDOT process flows
- Get feedback from SME’s
- Develop feature lists and priorities
- Explore data requirements and formats for internal and external use
Application Goals

• Create an app that end-users want to use
  – Help design work zones according to WAPM rules
  – Provide a means to submit the work zone for review/approval
  – Create inventory of work zone devices required to setup the zone

• Support features that help keep work zone data up to date
  – Daily task lists presented to user upon login
  – Support direct link to TOC for work zone status info

• Develop a field mode to help validate deployed work zone
  – Drive through placement verification

• End to end demonstrations Q1 2019
WZB Highlights

- Setup (or import) work zone administrative info
- Planned dates and scope
- Contact information
- Administrative rights

- Tap out activity areas
- Apply TTC-xx templates
- App applies WAPM rules and positions features
- Adjust/add/delete features by dragging and tapping the map
- Validate the work zone to support WAPM compliance

- Publish work zone data to VCC Cloud
- Keep activity dates up to date with daily reminders
- Adjust layout/activity as work progresses
- Export data to smarterroads.org
VCC Mobile Worker App

- Location and status updates from smart phone with app (for now)
- User selects an activity and duty status
- Worker app sends position and activity data directly to VCC Cloud via cellular comms
- VCC Cloud processes incoming messages and creates advisories and streaming alerts for drivers
  - Clustering of multiple worker reports
  - TIM messages sent via DSRC
  - Proprietary messages sent via cellular to VCC Mobile
- Messages are received on VCC Mobile and displayed to driver based on position, speed, direction, etc.
Safety Service Patrol App

- Cellular-based application
- Auto-detect on call and out of vehicle status
- Upload location and status to VCC Cloud
- Generate advisory TIM messages to notify connected and automated vehicles of location and activity
- Push the location and status information to smarterroads.org
- Integrate with TOC
Connected Worker Goals

• Migrate worker app from cell phone to more rugged and “automatic” platform
• Use of base station in work zone area eliminates need for multiple data plans
• Evaluate more accurate and effective localization than available via GPS
• Provides location and activity info, log workers into and out of active zones
• Warnings sent to drivers through mobile apps
• Warnings provided to workers via flashing LEDs and/or haptic cues
Questions?
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