Example CV Pilot Deployment Concepts: Greypool County

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Greypool County Operations

Greypool County DOT:
- Rural county in Southwest U.S.
- Summers focused on enhancing road weather safety. The county experiences extreme heat, severe lightning storms, and dust storms
- Incident response often requires response vehicles (e.g., ambulance, fire, and police) to travel long distances

Limited road weather information collected by TMCs and disseminated to drivers

Severe incidents at rural intersections

Limited transit options into Greypool; Long wait times for fixed transit
Stakeholders Convene and Identify Key Transportation Challenges

- **Improve Safety at Rural Intersections**
  - Poor line of sight at intersections and high speeds on the mainline often result in drivers misjudging gaps when departing from stop signs
  - Red light running violations are prevalent at signalized intersections
  - Collision at intersections when a vehicle is turning left result in the most severe crashes – often resulting in injuries and fatalities

- **Improve Accessibility in Greypool County**
  - Existing fixed route transit options do not serve the majority of the destinations in the county
  - Transit stops are not always accessible to travelers and travelers often experience long wait times at transit stops

- **Improve Road Weather Information Dissemination**
  - Unpredictable weather (e.g., lightning storms, dust storms) during summer months often cause delays and impact safety
  - Limited deployed devices in the field to collect road weather information
  - Limited mechanisms to disseminated proactive road weather information to drivers
# Stakeholder Set Three Key Improvement Targets

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Targets</th>
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<tbody>
<tr>
<td>Reduces crashes, injuries, and fatalities</td>
<td>Reduce crashes by 10%; injuries by 20%; and fatalities by 30%</td>
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<tr>
<td>Improve accessibility</td>
<td>Provide transit options to areas not being served by fixed transit in Greypool County</td>
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<td></td>
<td>Reduce wait times for transit riders by 20%</td>
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<tr>
<td>Improve collection and dissemination of road weather information</td>
<td>Increase road weather data collection footprint of road weather by 50%</td>
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<td>Increase availability of weather-related traveler information</td>
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## Applications Considered for Improving Safety

### V2I Safety
- **Red Light Violation Warning**
- Curve Speed Warning
- **Stop Sign Gap Assist**
  - Spot Weather Impact Warning
  - Reduced Speed/Work Zone Warning
  - Pedestrian in Signalized Crosswalk Warning (Transit)

### V2V Safety
- Emergency Electronic Brake Lights (EEBL)
- Forward Collision Warning (FCW)
- Intersection Movement Assist (IMA)
- **Left Turn Assist (LTA)**
  - Blind Spot/Lane Change Warning (BSW/LCW)
  - Do Not Pass Warning (DNPW)
  - Vehicle Turning Right in Front of Bus Warning (Transit)

### Environment
- Eco-Approach and Departure at Signalized Intersections
- Eco-Traffic Signal Timing
- Eco-Traffic Signal Priority
- Connected Eco-Driving
- Wireless Inductive/Resonance Charging
- Eco-Lanes Management
- Eco-Tolling
- Eco-Cooperative Adaptive Cruise Control
- Eco-Traveler Information
- Eco-Ramp Metering
- Low Emissions Zone Management
- AFV Charging / Fueling Information
- Eco-Smart Parking
- Dynamic Eco-Routing (light vehicle, transit, freight)
- Eco-ICM Decision Support System

### Mobility
- Advanced Traveler Information System
- Intelligent Traffic Signal System (I-SIG)
- Signal Priority (transit, freight)
- Mobile Accessible Pedestrian Signal System (PED-SIG)
- Emergency Vehicle Preemption (PREEMPT)
- Dynamic Speed Harmonization (SPD-HARM)
- Queue Warning (Q-WARN)
- Cooperative Adaptive Cruise Control (CACC)
- Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG)
- Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE)
- Emergency Communications and Evacuation (EVAC)
- Connection Protection (T-CONNECT)
- Dynamic Transit Operations (T-DISP)
- Dynamic Ridesharing (D-RIDE)
- Freight-Specific Dynamic Travel Planning and Performance
- Drayage Optimization

### Agency Data
- Probe-based Pavement Maintenance
- Probe-enabled Traffic Monitoring
- Vehicle Classification-based Traffic Studies
- CV-enabled Turning Movement & Intersection Analysis
- CV-enabled Origin-Destination Studies
- Work Zone Traveler Information

### Smart Roadside
- Wireless Inspection
- Smart Truck Parking
## Applications Considered for Increasing Accessibility

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Applications Considered for Informing Drivers During Bad Weather

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**Smart Roadside**

- Wireless Inspection
- Smart Truck Parking

**Road Weather**

- Motorist Advisories and Warnings (MAW)
- Enhanced MDSS
- Vehicle Data Translator (VDT)
- Weather Response Traffic Information (WxTINFO)

**Manage Weather Events**

- Eco-Approach and Departure at Signalized Intersections
- Eco-Traffic Signal Timing
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- Wireless Inductive/Resonance Charging
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Connected Vehicle Applications Selected in Performance-Driven Approach

**Improve Safety**
- Red Light Violation Warning
- Stop Sign Gap Assist
- Left Turn Assist

**Increase Accessibility**
- Dynamic Transit Operations (T-DISP)

**Informing Drivers During Bad Weather**
- Weather Response Traffic Information (WxTINFO)
Projected Synergies and Impacts from Safety Applications in the Deployment Concept

Projected Impacts:
- Significant reduction in collisions, injuries, and fatalities at intersections.
- Non-recurring congestion resulting from incidents is reduced by 30%

Addition of Safety Apps
- Red Light Violation Warning
- Stop Sign Gap Assist
- Left Turn Assist
Projected Synergies and Impacts from Mobility Applications in the Deployment Concept

Projected Impacts:
- Travelers have increased accessibility to destinations Greypool County
- Wait times at transit stops reduced by 15%
- Transit ridership increases by 8%
- Switching from fixed transit to dynamic transit operations reduces operating costs by 20%

Addition of Mobility Apps
- Dynamic Transit Operations (T-DISP)
Projected Synergies and Impacts from Road Weather Applications in the Deployment Concept

Projected Impacts:
- County and personal vehicles act as traffic probes collecting road weather information increasing data collection footprint
- Better traveler information regarding road weather conditions results in reduced weather-related delay and incidents
- Travelers can adjust their travel patterns based on real-time road weather conditions

Addition of Weather Apps
- Weather Response Traffic Information (WxTINFO)
Integrated Concept for Greypool Operations

 Probe vehicles provide road weather information to TMCs and warnings are disseminated to travelers

 Avoid Storm

 Stop Sign Gap Assist applications alert drivers when it is safe to depart from a stop sign

 Dynamic transit service allows travelers to request a ride using a cell phone and travel to downtown Greypool