Applications and Data Environments Breakout
Group IV: Regional Data Environment

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Today’s Exercise (Part 1) Scorecards

- Feedback materials provided in the breakout rooms
  - Application scorecards
  - 3 poker chips (for voting)
- Facilitators will brief assumptions about the data environment that applications can draw upon
- Facilitators will clarify application evaluation criteria
- Consider a set of (up to 12) IntelliDrive application concepts
  - Facilitators provide one slide that describes the application
  - Field questions and clarifying discussion
  - Individually, you rate the application (HIGH, MEDIUM, LOW) against the criteria on your scorecard
Today’s Exercise
(Part 2) Voting

• Once you have scored each application, each participant votes for the three most promising applications
  – “Most promising”: strong potential for transformative impact, low deployment risk, and clear alignment with IntelliDrive program goals
  – BLUE = 3 points (top priority)
  – RED = 2 points (second-highest priority)
  – WHITE = 1 point (third-highest priority)
  – Deposit your chips in the voting bins identified for each application (also turn in your scorecards)
• Quick break (5 minutes) to tabulate the results
• Reconvene to consider results within each breakout
  – Discuss the implications of your group process
  – Identify a presenter from your group for the breakout report at 3 PM
Exercise Ground Rules

• For today’s exercise, these items can’t be changed
  – Evaluation criteria
  – Data Environment assumptions
  – Application concepts (no altering or adding new ones)
• Policy-related issues are NOT in play for discussion
  – If these topics come up, we will park the discussion until tomorrow, when we have special session to deal with these in turn
Data Environment Assessment

Scorecard Activity
Regional Data Environment Description

- Organizes multi-source data in a regional, state-wide, rural, multi-state or national data environment
  - Vehicles (light, transit, freight, non-motorized, public safety)
  - Mobile devices
  - Roadside/wayside infrastructure
- Federated with related data environments
  - Can pull in federated data to assist in regional control decisions
Regional Data
Environment Assumptions

- Spans a network of subsidiary sub-networks
  - Roadway sub-networks (e.g., arterial, freeway, or rural)
  - Parking facilities
  - Integrated transit sub-network (rail, bus and ferry sub-networks)
- Roadway facilities within the network may have access restrictions (e.g., HOV or Truck Only)
- Tolls may be collected on some or all lanes of these facilities
- Weather and incident-related closures are infrequent but significant events
- Regional network carries significant traveler demand and supports time-critical goods movement between intermodal facilities
- Directional passenger and freight demand patterns vary by time-of-day, day-of-week, and season
Vehicle and Traveler Data Source Assumptions

- Nearly all travelers carry GPS-enabled mobile devices
- Some travelers opt-in to configure their mobile devices to contribute data regarding position, time and trip characteristics
- Many light vehicles opt-in to contribute data, some broadcast HIA messages
- Many transit vehicles contribute position, passenger count, and other data, some broadcast HIA
- Many freight vehicles provide data on position, credentials and other data, some broadcast HIA
- Most emergency vehicles broadcast HIA and vehicle type data
• Road Weather sensors, loop detectors, other roadside sensors as currently deployed (2010 baseline)
• Many signalized intersections act as advanced intersections
  • DSRC-capable roadside equipment for 2-way communication with enabled devices and vehicles
  • Broadcast Signal Phase and Timing (SPaT) data via DSRC
• Some transit and curbside parking facilities provide utilization data (spaces used/remaining), every minute
Application Assessment Scorecard Activity
Next, we’re going to go through application concepts that utilize data from the regional data environment.

We will present each concept on a single slide:
- You can ask clarifying questions, or offer suggestions about how data might be leveraged.
- But the concept itself cannot be altered, modified or enhanced in discussion.
- Please record notes or comments on each concept on your scorecard.

You rate each application on three criteria (High, Medium, Low):
- **Potential Impact:** will this application have transformative impact?
- **Deployment Readiness:** if we assume the data is available, can this application be developed, tested and widely deployed by 2025?
- **Program Alignment:** does the application align with program objectives and is there a clear federal role in its development and deployment?
Application #1: ATIS

• **Multi-modal Real-Time Traveler Information**

• **Problem Addressed:**
  – Improve precision and accuracy traveler information with respect to travel times, cost, or availability on alternate routes or modes

• **Description**
  – Considers real-time and historical travel conditions for the traveler’s trip (pre-specified origin, destination, and time of departure)
  – Suggests potential routes and modes (e.g., HOV, transit, tolled lanes) with travel times, travel time reliability, and costs for each alternative
  – Predicts travel times based on existing and expected traffic patterns, weather conditions, incident locations, and work zone locations and timings

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Application #2: DR-OPT

- **Drayage Optimization**
- **Problem Addressed:**
  - Reduce freight delays at key facilities that overbook their capacity to ensure uninterrupted operations within the terminal/warehouse
- **Description**
  - Optimize drayage operations so that load movements are coordinated between freight facilities
  - Individual trucks are assigned time windows within which they will be expected to arrive at a pickup or drop-off location
  - Early or late arrivals to the facility are dynamically balanced
  - Web-based forum for load matching provided to reduce empty moves

**PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING**
Application #3: F-ATIS

- Freight Real-Time Traveler Information with Performance Monitoring
- Problem Addressed:
  - Uncertainties in traffic congestion and weather conditions pose a productivity and safety risks to freight traffic, result in negative environmental impacts
- Description
  - Enhance traveler information systems to address specific freight needs
  - Provide route guidance to freight facilities, incident alerts, road closures, work zones, routing restrictions (hazmat, oversize/overweight)
  - Tailored weather information, regulatory and enforcement information (speed limit reductions), “concierge” services and maintenance locations
  - Intermodal connection information, container disposition and schedule
  - Performance monitoring

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Application #4: MAYDAY

- **Mayday Relay**
- **Problem Addressed:**
  - Run-off-the-road single vehicle crashes in rural areas are frequent, response can be delayed due to limited communications and infrequent patrolling
- **Description**
  - Enabled vehicles send a mayday message, including vehicle location, airbag status, g-loading (magnitude and direction)
  - Passing IntelliDrive-enabled vehicle receives the mayday message, and relays the message at a roadside hot spot
  - Message passed to 911 center for EMS dispatch, minimizing the time required to deliver medical attention to crash victims

**PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING**
• **Multi-modal Integrated Payment System**

• **Problem Addressed:**
  – Unfamiliarity with fare payment methods and inconvenience are factors that deter some travelers from using transit more often

• **Description**
  – Utilize standards for an open architecture electronic payment system
  – Establish a transportation payment environment that reduces delays at toll plazas and parking payment kiosks, and reduces dwell times at bus stops
  – Promote ease of transfers across modes and increase customer convenience
  – Mine trip chaining patterns to improve service planning and operations
  – Support implementation of congestion-based transit fare pricing

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Application #6: T-DISP

• Dynamic Transit Operations

• Problem Addressed:
  – Traditional fixed route/fixed schedule transit is inherently inefficient for the traveler in low density, low ridership, and dispersed origin/destination areas

• Description
  – Enable demand-responsive transportation services utilizing GPS and mapping capabilities of mobile devices
  – Travelers input a desired destination and time of departure tagged with their current location
  – Central system dynamically schedules and dispatches or modifies the route of an in-service vehicle by matching compatible trips together
  – Like a stock exchange, providers can bid/trade within a transparent platform

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Application #7:
T-EVAC

- Emergency Communications and Evacuation
- Problem Addressed:
  - In an evacuation, many people willing to evacuate are unable to leave, and coordinating efforts is limited by data scattered across multiple institutions
- Description
  - Integrate data across multiple agencies to identify and locate people who are more likely to require guidance and evacuation assistance
  - Provide a mobile-accessible database that contains information about who needs help, what kind of help, and where help is needed
  - Individuals who require assistance transmit a “help” message to and receive directions from the authorities
  - Enable dynamic dispatching and routing of available resources (e.g., vehicles) during the evacuation

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Application #8: 
T-MAP

• Universal Map Application
• Problem Addressed:
  – Interoperability among proprietary map applications on current CAD/AVL systems increases cost and complexity of transit management
• Description
  – Pursue an open map concept to establish an universal map application supported by private transit CAD/AVL systems
  – Application processes RSS feeds from supporting agencies to incorporate incidents, detours, street closures, and other data on transit map applications
  – Transit agencies provide vehicle locations, passenger amenities, and service level to agencies scheduling street repairs or other road closures

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTs – CRITERIA RATING
Application #9: VMT

- IntelliDrive-Driven Mileage Based User Fees
- Problem Addressed:
  - Projected reduced gas tax revenue for same vehicle miles traveled (VMT), while cost of providing transportation system increases with inflation
- Description
  - Integrate IntelliDrive and Mileage Based User Fees (MBUF) to eliminate redundant GPS, maps, driver interfaces, and communications in the vehicle
  - Accumulate miles driven in categories determined by policy and charge for the miles driven, ensure interoperability among jurisdictions
  - Considerations may include vehicle type, time of day, roadway type, jurisdiction, direction of travel, and geographic area of travel

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Application #10: WX-INFO

- **Real-Time Route Specific Weather Information for Motorized and Non-Motorized Modes**

- **Problem Addressed:**
  - improve mobility and safety of users of motorized and non-motorized modes of transportation (e.g., automobiles, transit, freight, bicyclists, and pedestrians) by providing real-time, highly localized weather and road condition

- **Description**
  - Fuse weather-related probe data generated by probe vehicles with weather data from traditional weather information sources
  - Develop highly localized weather and pavement conditions for specific roadways, pathways, and bikeways

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Application #11: WX-MDSS

- Enhanced MDSS (Maintenance Decision Support System) Communications
- Problem Addressed:
  - Reduce reliance on (potentially expensive) commercial wireless networks to communicate with snowplows or other maintenance vehicles
  - Keep treatment recommendations current
- Description
  - MDSS equipped maintenance vehicles utilize DSRC hot spots to download treatment recommendations and upload recent maintenance activities
  - In many rural areas access to commercial networks is limited and/or expensive
  - Utilize DSRC hot spots to reduce costs and improve communications latency for state DOTs

PARTICIPANTS: ON YOUR SCORECARDS, PLEASE RECORD NOTES/COMMENTS – CRITERIA RATING
Voting
Breakout Exercise
(Part 2) Voting

• Now that we’ve worked through all the applications, vote for the three most promising applications
  – “Most promising”: strong potential for transformative impact, low deployment risk, and clear alignment with IntelliDrive program goals
  – BLUE = 3 points (top priority)
  – RED = 2 points (second-highest priority)
  – WHITE = 1 point (third-highest priority)
  – Deposit your chips in the voting bins identified for each application (also turn in your scorecards)
• We’ll take a quick break (5 minutes) to tabulate the results
• One Bin, One Participant, One Chip rule
  – Do NOT dump all of your chips in a single bin
  – We want your individual priority of the top THREE applications
Quick Break
Exercise Results
Results Discussion

• Were similar or dissimilar applications selected during voting?

• Did the highest ranking applications align in the same quadrants of the impact/deployment readiness chart?

• Regarding the top 6 applications:
  – Are they highly overlapping? Or independent?
  – Do they require coordinated research?
  – Will they require coordinated deployment?

• Who would like to volunteer to report out the breakout group findings?
Exercise Complete