• One breakout group will identify promising applications to achieve goals related to enhancing traveler and worker safety and security

• For the purposes of this breakout, transformative safety and security impacts have occurred when the transportation system has:
  – a transformative ability to reduce safety risks for travelers and pedestrians and enhance system security while maintaining current levels of traveler mobility, system productivity, and without increased environmental impact

• Active safety applications (low-latency V2V applications) are out of scope
Today’s Exercise
(Part 1) Measuring Impact

• Feedback materials
  – Application scorecard
  – 3 poker chips (for voting)
• Facilitators preview overall exercise
• Facilitators lead group discussion on measuring transformative impact
  – Three example measures given
  – Participants may suggest others
  – Simple hand-count voting to determine up to three to be further explored
• Flip-chart exercise (group discussion)
  – Measure definition and current baseline (if known)
  – What change represents transformative impact?
Today’s Exercise
(Part 2) High Impact Apps

• As we did yesterday, consider up to 10 applications in each impact area
  – One slide per concept, brief clarifying discussion
  – Record High-Medium-Low rating on your scorecard for each of the measures
• 3-2-1 Poker chip voting for the applications most likely to have transformative impact (per your measures)
• Facilitated discussion about the application with the highest vote total
  – Identify key data, communications and research needs for this application
  – How close to transformative will this application get us?
• Repeat facilitated discussion for second highest ranked application (time permitting)
• 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 11 AM
Exercise Ground Rules

• For today’s exercise, these items can’t be changed
  – Breakout group impact area definitions
  – No adding new application concepts
• Data environment assumptions from yesterday can be relaxed, however
  – Assumptions about what data is available can be tailored in this exercise

• Policy-related issues are NOT in play for discussion
  – If these topics come up, we will park the discussion until this afternoon, when we have special session to deal with these in turn
Impact Measure
Definition Activity
Safety and Security Impact Measures

- Total travel-related fatalities and injuries
- Average response time
- Fatalities per VMT

- Are these the right measures?
- Can we better refine them?
- How many measures are needed (up to 3)?
- For each selected measure:
  - Record definition
  - Establish current baseline (if known)
  - Set transformative target

Facilitators: Please record on flip charts. Use simple hand-count votes when needed.
Application Scorecard Activity
• Next, we’re going to go through application concepts that address the safety/security impact area

• 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

• Record an notes/comments on each application with an assessment on your scorecard for each criteria (High-Medium-Low)
  – Let’s fill in our selected measures now on your scorecard

• Consider how you will vote for the applications with the most potential to achieve our transformative targets
  – What applications have the most potential to help us reach our transformative target by 2025?
Application #1: CACC

- **Cooperative adaptive cruise control**
- **Problem Addressed:**
  - Significantly improve throughput by increasing capacity and efficiency, and increase safety by minimizing the number of interactions between vehicles
- **Description**
  - A traffic manager sets a gap policy to form or break-up platoons of vehicles
  - Speeds are automatically adjusted by the vehicle based on communications from the traffic management center
  - *Ad hoc* or managed platoons of vehicles moving on the facility
  - Management of gaps, flows and arrival rates
  - Systematically accounts for differing vehicle weight and performance
Application #2: Q-WARN

• Queue Warning

• Problem Addressed:
  – Warn motorists of existing or imminent downstream queues or shockwaves to increase safety by reducing rear-end collisions (and resulting congestion)

• Description
  – Monitor traffic data to check for presence of a stopped or slow moving queue
  – Predict queue formation and shockwave propagation
  – Alert motorists to reduce speeds thereby avoiding abrupt stops
  – Possibly implemented in conjunction with speed harmonization to provide target speeds by lane in approach to congested area
• **Mobile Accessible Pedestrian Signal System**

• **Problem Addressed:**
  – Many legacy pedestrian signals at traffic signals are not accessible to pedestrians with visual impairments, auditory systems have drawbacks

• **Description**
  – Mobile devices carried by visually impaired pedestrians receive SPaT data broadcast in signalized intersections
  – Orient intersection and crosswalk geometry, as well as intersection status
  – Mobile devices also broadcast messages to make enabled vehicles aware that a pedestrian is present in the case of blocked line-of-sight
Application #4: 
**INC-ZONE**

- **Incident Scene Work Zone Alerts for Drivers and Workers**
- **Problem Addressed:**
  - Public safety work zones (e.g., incidents, traffic stops) are dynamic and confusing for drivers -- and are high risk areas for vehicle-worker collisions
- **Description**
  - Warns drivers of lane closings and unsafe speeds for the temporary work zones that surround any traffic incident or law enforcement traffic stop
  - In-vehicle messaging would also provide merging and speed guidance
  - Warn on-scene workers of vehicles with trajectories or speeds that pose high risk to their safety
Application #5: RESP-STG

• Incident Scene Pre-Arrival Staging Guidance for Emergency Responders
• Problem Addressed:
  – *Ad hoc* staging/positioning of the first public safety vehicles arriving at an incident can result in potentially unsafe or unnecessarily congested conditions
• Description
  – Pre-arrival situational awareness is critical to public safety responder vehicle routing, staging and secondary dispatch decision-making
  – Still or video images of an incident scene, surrounding terrain, and traffic conditions provided to moving vehicles and dispatchers
  – Improve staging decisions based on available data, transmit staging plan (possibly graphic/map based) transmitted to emergency vehicles en route
Application #6: PREEMPT

- Emergency Vehicle Preemption with Proximity Warning
- Problem Addressed:
  - Reduce congestion and risk of accidents for motorists and pedestrians resulting from emergency vehicles traversing multiple arterial intersections
- Description
  - Adjust preemption and signal recovery cycles to account for non-linear effects of multiple emergency responses
  - Broadcast proximity warnings as the vehicle traverses the facility
  - Support location-specific signage, alerts, and warnings to motorists and pedestrians of immediate emergency vehicle operations
Application #7: 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
Application #8: 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
Application #9:
WX-MDSS

- **Enhanced MDSS Communications**
- **Problem Addressed:**
  - Reduce reliance on (potentially expensive) commercial wireless networks to communicate with snowplows or other maintenance vehicles
- **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
Voting
Breakout Exercise (Part 2) Voting

• Now that we’ve worked through all the applications, vote for the three most promising applications
  – 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
Exercise Complete