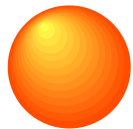




# Applications and Impacts Breakout Group IV: Safety and Security



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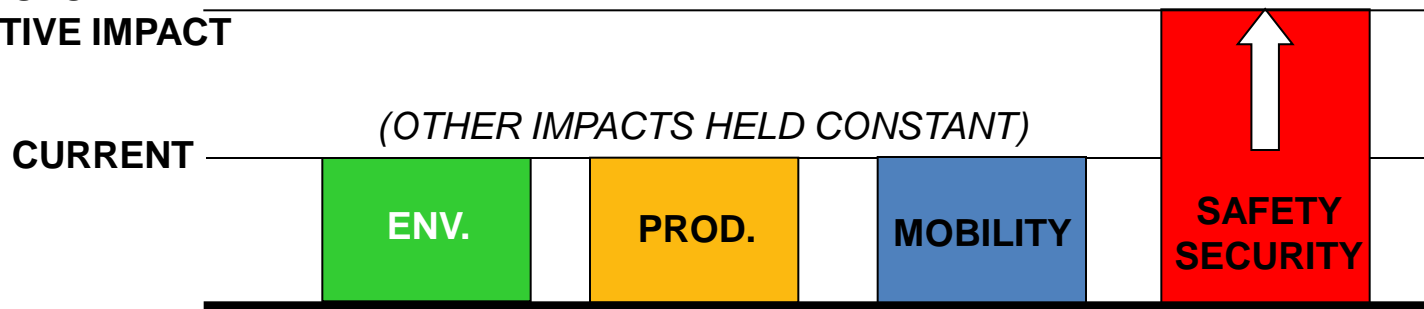
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Mobility and Environment Workshop – December 1, 2010



- 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

TRANSFORMATIVE  
POSITIVE IMPACT



# 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



- 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
  - Intellectual Property, Privacy, Access/Security, Meta-data, Quality, Aggregation, Standards, Financial/Business Models....
  - 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



# Application #3: PED-SIG

- **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
  - Orients 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

- **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*

