



Applications and Impacts Breakout Group I: Environmental



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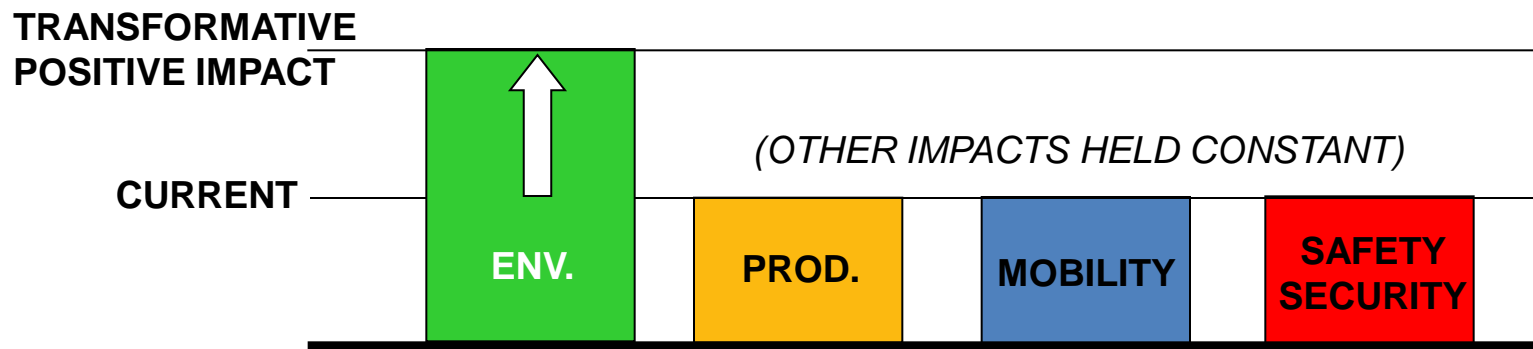
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- One breakout group will identify promising applications to achieve goals related to transportation-related environmental impacts.
- For the purposes of this breakout, transformative environmental impacts have occurred when the transportation system has:
 - the capability to reliably deliver goods and passengers safely through the transportation system at current levels with ***transformative reductions in environmental impacts resulting from transportation-related emissions and fuel consumption.***



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



Environmental Impact Measures

- Tons of GHG, total emissions
- Total gallons of fuel consumed
- Total vehicle-miles traveled (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 environmental 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: SPD-HARM

- **Dynamic Speed Harmonization**
- **Problem Addressed:**
 - Improve throughput and reduce risk of collision by optimizing for lane-specific speed limits on a freeway facility
- **Description**
 - Monitor traffic and weather data captured from multiple sources, and calculate a target speed for vehicles
 - Target speeds may be advisory or enforced, and may vary by location, e.g., distance upstream of a recurrent bottleneck, and by lane
 - Communicate target speeds through overhead dynamic signage, via DSRC to enabled vehicles with range (I2V) and from vehicle to vehicle (V2V)

- **Connected Eco Driving**
- **Problem Addressed:**
 - Improve fuel economy and reduce emissions by improving driver awareness of local road topography, signal status, and weather condition.
- **Description**
 - Modify vehicle operation to improve fuel economy and reduce emissions considering grade, predicted speed changes or braking, and real-time traffic
 - Adapts based on driver aggressiveness, energy/fuel consumption, brake regeneration, engine/drive torque-speed characteristics, other factors
 - Provide feedback to the driver (or electronic control signals to semi-autonomous systems) to keep the vehicle operating in target range

- **IntelliDrive-Driven Integrated Corridor Management**
- **Problem Addressed:**
 - Incompatible operational and data collection procedures limit coordination among freeway, signal system, and transit system operators in a corridor
- **Description**
 - Aggregate, consolidate and exchange data on alternate routes and modes to provide true corridor-wide traveler information services
 - Enable traffic management and transit agencies to coordinate their existing systems to improve corridor performance
 - Support integrated and coordinated response during major incidents and emergencies within corridor boundaries

Application #4: RAMP

- **IntelliDrive-Driven Ramp Metering System**
- **Problem Addressed:**
 - Improve current ramp metering systems capability to respond to changing traffic conditions in real time
- **Description**
 - Leverage new mobile source data to calculate optimal ramp metering rates resulting in improved throughput and reduced emissions
 - Broadcast timing information (analogous to SPaT data) allowing vehicles to decelerate or accelerate
 - Integrate with HOV bypass, arterial signal coordination and dynamic speed harmonization applications deployed in same interchange



Application #5: D-RIDE

- **Dynamic Ridesharing**
- **Problem Addressed:**
 - Logistical constraints of traditional carpooling (e.g., long-term commitments, fixed schedules, and communication difficulties) prevent ridesharing from realizing its full potential
- **Description**
 - Leverage in-vehicle and hand-held devices to allow ride-matching
 - Integrate carpooling functions into vehicle computer and displays, use voice activated ridesharing technology to reduce distraction effects
 - Vehicle-data integration utilized by HOV/HOT enforcement agencies to verify vehicle occupancy



- **IntelliDrive-Driven Traffic Signal System**
- **Problem Addressed:**
 - Improve the accuracy and timeliness of data used to control signal systems, reducing delays, costs and emissions while improving travel reliability
- **Description**
 - Utilize data from vehicles to accurately predict lane-specific platoon flow, platoon size, and other traffic characteristics
 - Reduce time and cost barriers to updating traffic signal timings, both periodic and real-time updates
 - Consider (freight/transit/light) vehicle mix in signal timing plans

Application #7: SIG-FLOW

- **Adaptive Speed Control for Efficient Traversal of Intersections**
- **Problem Addressed:**
 - Address under-utilization of the space-time resource within an intersection, reducing delays and improving emissions
- **Description**
 - Vehicles with adaptive cruise control coordinate with intersections
 - Each vehicle is assigned just the amount of space-time needed within the intersection to enable safe passage by an intersection manager agent
 - Target vehicle speeds through the intersection managed by an in-vehicle driver agent, although the driver may over-ride



Application #8: 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



- **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

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

