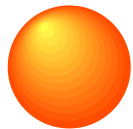# Applications and Impacts Breakout Group II: Productivity

Randy Butler
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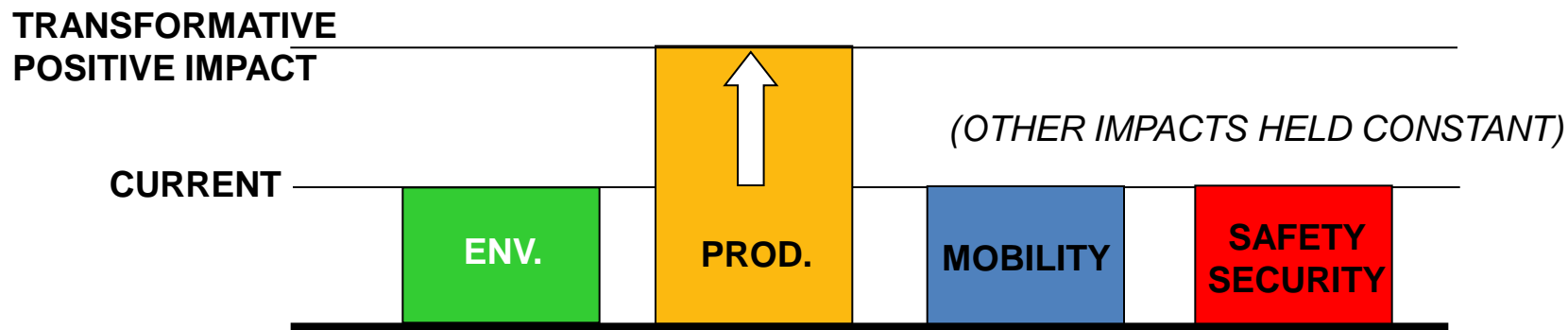Office of Operations Research and Development

Carolina Burnier
Noblis

Mobility and Environment Workshop – December 1, 2010

- One breakout group will identify promising applications to achieve goals related to overall system productivity

- For the purposes of this breakout, transformative productivity impacts have occurred when the transportation system has:

  - *a transformative capability to reliably deliver the largest aggregate net value of goods and passengers through the transportation system* within the current system footprint and without increased environmental impact, fuel use, or safety risk.

TRANSFORMATIVE POSITIVE IMPACT

(OTHER IMPACTS HELD CONSTANT)

CURRENT

| ENV. | PROD. | MOBILITY | SAFETY SECURITY |

- 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

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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 <u>NOT in play for discussion</u>
  - 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

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Impact Measure Definition Activity

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Productivity Impact Measures

- **Ratio of loaded moves to total moves**

- **Total vehicle-miles traveled (VMT)**

- **Total reliable trips delivered**

FACILITATORS: PLEASE RECORD ON FLIP CHARTS
USE SIMPLE HAND-COUNT VOTES WHEN NEEDED

- **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**

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Application Scorecard Activity

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- **Next, we're going to go through application concepts that address the productivity 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?

- **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)

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Application #2: 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

- **Electronic Toll Collection System**

- **Problem Addressed:**
  - Increase interoperability among ETC devices for vehicle-to-roadside communication using 5.9 GHz bandwidth

- **Description**
  - Current 915 MHz ETC systems rely on proprietary vehicle-to-roadside communications, limiting interoperability
  - Enable toll authority to accept electronic payments from vehicles equipped with electronic-payment services (EPS), regardless of EPS account ownership
  - Presents payment instructions to the driver, receives driver input, send payment authorization and display toll payment status to the driver
  - Could be implemented in conjunction with managed or HOT lane concepts

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- **Freight Signal Priority**

- **Problem Addressed:**
  - Reduce delays and improve travel time reliability for commercial vehicles traversing signalized corridors with significant truck traffic

- **Description**
  - Give priority to freight vehicles at intersections near key facilities (ports, rail terminals, warehouses, distribution centers)
  - Signal timings may be adapted to dynamically changing commercial vehicle demand at intersections, or along the entire facility
  - Enhances safety and reduces environmental impacts on these facilities by reducing congestion and excessive idling

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Application #5: 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

- **Freight Dynamic Route Guidance**

- **Problem Addressed:**
  - Lack of awareness of the best routes along congested corridors result in increased delays and costs to freight traffic

- **Description**
  - Address negative economic impact on the region by stifling the expansion and entry of logistics operations and logistics-dependent firms
  - Build on the C-TIP Real Time Traffic Monitoring (RTTM) and Dynamic Route Guidance (DRG) applications for best route between freight facilities
  - Routes calculated on current and predicted conditions

- **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

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Application #8: S-PARK

- **Smart Park and Ride System**

- **Problem Addressed:**
  - Uncertainty about parking availability at transit stations limits the attractiveness of using transit for suburban commuters

- **Description**
  - Capture information on park and ride lot availability, and communicate that to potential travelers at key decision points
  - Utilize hands-free voice recognition within the automobile
  - Identify alternative parking location when lots are full, provide updated train/BRT schedule information, support parking reservation concept

- **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

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Voting

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- 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

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Quick Break

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Exercise Results

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Exercise Complete

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