Agenda

- DVRPC
- Choices & Voices Program Operation
- Creating Choices & Voices
- Advertising Choices & Voices
- Choices & Voices Results
- What's Next
MPO for Greater Philadelphia
- 2 States, 9 Counties, 352 Municipalities
- 2040 Growth Forecast
  - Population: +11% to 6.26 million
  - Employment: +11% to 3.27 million
Choices & Voices

www.dvrpc.org/choicesandvoices
How Should We Grow?

To meet the needs of 600,000 new residents and 300,000 new jobs over the next 27 years, should we build communities with transportation options where you can safely walk to a nearby store to get a quart of milk, or auto-oriented communities where you would drive there?

To further compare living in these different types of neighborhoods, click here.

- **Auto-oriented communities** separate houses from other uses, generally requiring a vehicle to get to work, run errands, or make any other trip.

- **Communities with transportation options** mix shops and residences, bringing them closer together so that getting to work, running errands, and other trips can be done by walking, biking, or taking transit.
Transportation Funding Options

Transportation Funding

The passage of Act 89 has provided a significant increase in funding for transportation investments in Pennsylvania. However, the region still faces a considerable shortfall between the cost to maintain and improve our roads, bridges, and transit system and the anticipated revenue the region will receive over the life of the Connections 2040 Plan. The Plan is required to maintain a balanced budget, and cannot spend any more than can be reasonably anticipated.

Given our funding gap, and the fact that the Greater Philadelphia region pays a lower local share for transportation infrastructure than many of our competing regions, the Connections 2040 Plan considers ways to increase funding to help improve our transportation system, in order to enhance quality of life and maintain economic competitiveness.

Do you think additional local funding is necessary to help pay for state-of-good repair needs and some new major transportation projects in the Greater Philadelphia region?

☐ Yes
☐ No

What type of local funding source(s) would you be willing to support? (Check all that apply)

☐ Increase the gas tax (1)
☐ Increase transit fares (1)
☐ Increase vehicle registration fees (1)
☐ Increase the general sales tax (1)
☐ Mileage tax (1)
☐ Place tolls on the region's limited access highways (1)
☐ Congestion Pricing (1)
☐ Carbon Tax (1)
☐ Other (1)

How much should these new funding sources cost the average household per year in total? (1)

[Input field showing $200]

NEXT
Transportation Investments

System Preservation

How well do you want to maintain roads and bridges?

Failure to properly maintain roads and bridges reduces safety, increases vehicle operating costs, increases travel delay, and vehicle emissions.

$35

$35 billion - Maintain current conditions

Click here to maintain current funding levels, current conditions worsen

Click here to maintain current conditions

Click here to achieve and maintain a state of good repair

Budget Remaining: $24.7 billion

4% 1.125,700 Acres Developed

3% 7,550 Vehicle Miles Driven

5% 109 Biking & Walking Trips

-2% 82 Transit Trips

6% $14,500 Transportation & Energy Costs

67% 36.4 Hours of Congestion

-4% 7.3 Greenhouse Gas Emissions

6% 7.5 Road Fatalities

DVRPC Program Operation Creation Advertising Results What's Next
At what level would you like to maintain transit infrastructure, including rail infrastructure, transit vehicles, and transit stations?

Failure to properly maintain transit infrastructure reduces the safety and reliability of the system as well as the comfort level of the user, all of which lead to lower ridership levels.

$25 billion - Maintain current conditions

Click here to maintain current funding levels, current conditions worsen

Click here to maintain current conditions

Click here to achieve and maintain a state-of-good repair
# Crowdsourcing

## Vehicle Miles Driven
Vehicle miles traveled have decreased in your scenario, helping to reduce congestion, improve road safety, and lower greenhouse gas emissions and the cost of transportation. Reducing VMT means the region will be less energy-dependent and may be more economically competitive than other more spread-out regions.

<table>
<thead>
<tr>
<th></th>
<th>Your Scenario:</th>
<th>Everyone’s Scenario:</th>
<th>Compare to Today:</th>
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<tr>
<td></td>
<td>-1%</td>
<td>-1%</td>
<td>7,340</td>
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<tr>
<td></td>
<td>7,260</td>
<td>7,950</td>
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## Biking & Walking Trips
Your scenario encourages more biking and walking trips by developing approximately 875 miles of new bike and pedestrian facilities, including new segments of the Circuit regional trail network, bike lanes, and sidewalks. Biking and walking have become easier because most new development has occurred in areas where walking is pleasant and homes, stores, restaurants, schools, parks, and jobs are located in close proximity to one another. Incorporating more physical activity into our transportation system will improve health.

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<th></th>
<th>Your Scenario:</th>
<th>Everyone’s Scenario:</th>
<th>Compare to Today:</th>
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<tr>
<td></td>
<td>5%</td>
<td>6%</td>
<td>100</td>
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<tr>
<td></td>
<td>105</td>
<td>106</td>
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</table>

## Transit Trips
Investments in our regional public transit infrastructure have improved system condition making for smoother, safer, and more comfortable rides, and attracting new riders to the system.

The annual number of transit trips has increased because new development in established areas has made transit a viable alternative to driving for many people.

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<th>Your Scenario:</th>
<th>Everyone’s Scenario:</th>
<th>Compare to Today:</th>
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<td></td>
<td>16%</td>
<td>18%</td>
<td>64</td>
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<tr>
<td></td>
<td>74</td>
<td>76</td>
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</table>

## Transportation & Energy Costs
Smaller, more energy-efficient homes have helped to lower energy bills. Compact development patterns and a strong transit system help the regional economy to deal with energy price fluctuations. Your scenario has focused considerable investment on road and bridge maintenance, and conditions generally have been maintained at today’s level. This helps to keep vehicle operating costs from significantly rising.

These costs do not account for the effect of inflation. An item that costs $1 today will likely cost between $2.00 and $2.50 in 2040. Growing world population and economic development may also mean the cost of energy will increase at an even greater rate.

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<th>Your Scenario:</th>
<th>Everyone’s Scenario:</th>
<th>Compare to Today:</th>
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<tr>
<td></td>
<td>4%</td>
<td>4%</td>
<td>$13,680</td>
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<tr>
<td></td>
<td>$14,200</td>
<td>$14,230</td>
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Creating Choices & Voices

Builds off DVRPC Scenario Planning Efforts

Making the Land Use Connection: Regional What-if Scenario Analysis
(2008, Publication #08059)

Implementing Connections: The Benefits For Greater Philadelphia
(2011, Publication #11045)
New Footprint Land Development

- **Recentralization**
  - Acres Developed: 5,800

- **Trend**
  - Acres Developed: 169,000

- **Sprawl**
  - Acres Developed: 478,000

Legend:
- Red: 2035 Future Development
- Gray: 2005 Existing Development

DVRPC Program Operation
Creation
Advertising
Results
What’s Next
Creating Choices & Voices

‘Regional’ Transit Score

0.41 * (Population / Res. Acre) +
0.09 * (Jobs / Comm. Acre) +
0.74 * (Zero-car households / Res. Acre)

Map 1: Transit Scores for DVRPC Region, State of New Jersey

Transit Scores, 2000 Census Tracts
- Low (< 0.60)
- Marginal (0.61 - 1.0)
- Medium (1.01 - 2.50)
- Med.-High (2.51 - 7.50)
- High (> 7.50)

Graph:
- Annual Transit Trips per Capita
- Regional Transit Score
- Trend
- Sprawl
- Recentralization

Equation:
y = 9.7801x + 0.4384
R² = 0.9701
Transportation Investment Scenarios

2012, Publication #13004

- **High** - $84 B
  - Obama proposal
- **Medium** - $62 B
  - MAP-21 level continues
- **Low** - $51 B
  - Actual gas tax revenue
## Transportation Elasticity

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<th>Tax or Fee</th>
<th>Trip Frequency</th>
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<td>Carbon Tax</td>
<td>-0.09</td>
<td>-0.26</td>
</tr>
<tr>
<td>Congestion Pricing*</td>
<td>-0.41</td>
<td>-0.15</td>
</tr>
<tr>
<td>Tolling</td>
<td>0.00</td>
<td>-0.28</td>
</tr>
<tr>
<td>VMT Fee</td>
<td>-0.16</td>
<td>-0.45</td>
</tr>
<tr>
<td>Gas Tax</td>
<td>-0.08</td>
<td>-0.23</td>
</tr>
<tr>
<td>Transit Fares**</td>
<td>-0.90</td>
<td>0.00</td>
</tr>
<tr>
<td>Vehicle Registration Fees</td>
<td>-0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Sales Tax / Other</td>
<td>-0.01</td>
<td>-0.03</td>
</tr>
</tbody>
</table>
Web Programming

Bootstrap

- Provides default layouts, styles, and components
- Uses 12-column responsive grid to fit to small screens
- Includes easy-to-use JQuery plugins
- Fast development, supported by all browsers back to IE7
- Dynamic controls the user interface
- Provides missing link between static HTML and dynamic data
- Uses Model-View-View Model (MVVM) pattern for event-driven programming

Knockout

- Comprehensive traffic analysis and reporting
- Monitor traffic sources to evaluate campaign effectiveness
- Compare visits to app submissions: completion ratio
- Track sharing via social media
- Find out what users do next on the website

Google Analytics
Getting the Word Out

- Social Media
- Link on DVRPC website
- Users can Like on Facebook and Retweet
- News articles (Inquirer, Newsworks.org, PlanPhilly)
- Posted on regional blogs
- DVRPC Newsletter (~10,000 subscribers)
- Tailored e-mails to ~200 regional organizations
- Business cards
- Presentations and meetings
- Partner organizations (county planning departments, TMAs)
Choices & Voices Responses

*No further evaluation
Version 2.1 results through May 21, 2015
Development Patterns

Average: 39,000 acres developed

- Core Cities & Older Suburbs: 41%
- Central Business Districts: 23%
- Towns & Centers: 19%
- Suburban Centers: 14%
- Conventional Subdivisions: 2%
- Conservation Design Subdivisions: 1%
Local Revenue Options

- Congestion Pricing: 22%
- Gas Tax: 22%
- Vehicle Registration...: 12%
- Tolling Highways: 11%
- VMT Fee: 10%
- Carbon Tax: 6%
- Other: 5%
- None: 5%
- Sales Tax: 3%
- Transit Fares: 2%

* Carbon Tax not available in Version 1.0

Version 1.0 and 2.0: Average ~$150 Per Household Per Year
Version 2.1: Average ~$210 Per Household Per Year
Expenditures

Choices & Voices Participants

- System Expansion: 6%
- Bike/Ped: 0.4%
- Operational Improvements: 13%
- System Preservation: 81%

Available Revenue: $74.3 Billion (Y-O-E)

Connections 2040 Plan

- System Expansion: 11%
- Bike/Ped: 1%
- Operational Improvements: 9%
- System Preservation: 79%

$63.5 Billion (Y-O-E)
Transit System Expansion

- Extend Norristown High Speed Line to King of Prussia Mall*: 54%
- Extend Broad Street Line to Navy Yard: 54%
- Cultural Connector Line: 46%
- Roosevelt Boulevard BRT: 45%
- Extend Elwyn Line to Wawa*: 43%
- Delaware Avenue Line: 38%
- South Jersey BRT*: 36%
- Extend Thorndale Line to Atglen: 33%
- Extend Lansdale Line to Pennridge: 33%
- West Trenton Line: 32%
- US 1 BRT*: 31%
- Glassboro-Camden Line**: 29%
- Extend Norristown Line to Pottstown***: 14%

* Fully Funded in Connections 2040
** Partially Funded in Connections 2040
***Not an option in Version 1.0

DVRPC Program Operation Creation Advertising Results What’s Next
Pima Association of Governments

PAG Engage 2045 Survey Tool
http://gismaps.pagnet.org/RTPengage/

Performance Measures

Using the Performance Measures
What's Next

Choices & Voices Source Code
https://github.com/dvrpc/ChoicesAndVoices

Future of Scenario Planning

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Accessible Wayfinding for the Disabled Traveler: DC Metro Wayfinding Project

W. Brandon Cox, MA, COMS

Senior Director of Rehabilitation & Education
Certified Orientation & Mobility Specialist
Columbia Lighthouse for the Blind

- Columbia Lighthouse for the Blind
- Metro
- ClickAndGo Wayfinding
Columbia Lighthouse for the Blind
ClickAndGO DC Metro Project

- Professional background & DC Metro Project background

- Phase 1 Demonstration (Completed December 2014)

- Phase 2 Demonstration (Estimated December 2015)
Phase 1 Demonstration: Completed December 2014

- Funded by New Freedom (FTA)
  - $100,000
- 10 Metro Stations completed with Virtual Tours and descriptions of each entrance.
- Gallery Place Chinatown completed with Virtual Tours and over 110 Point to Point Routes into and out of the station. Includes routes to bus stops and major landmarks.
- [www.clb.org/clickango](http://www.clb.org/clickango) or iPhone App
Phase 2 Demonstration: Estimated December 2015

- Funded by Enhanced Mobility Program (FTA)
  - $250,000
- 5-7 stations will add:
  - More advanced virtual tours
  - Routes into and out of station
    - High Resolution Low Vision Maps for Each Route
  - iBeacon Navigation Support
“How Do I Get There From Here?”

1. Self-orientation

2. Get directions or guide support

3. Orientation & Mobility

4. GPS, RIAS, Bluetooth & other new technologies*

5. Tactile maps
Tactile Maps
What is ClickAndGo?

- Searchable, customized data “manually pre-compiled”
- Serves *multiple user groups*
- Narratives include slope, sound, tactile and distance cues
- Free for users, no equipment to purchase, install, or maintain
What is ClickAndGo?

- Data delivered thru multiple formats (smartphone is one of “many” delivery options)
- Seamless outdoor to indoor transitioning
- Supported by iBeacon technology
- **Pre-journey learning and exploration:** Users can explore and “virtually” explore routes in advance of their travel to the site
What is ClickAndGo?

- Deliverable in multiple languages
- Also available via free IVR service for users with no access to higher tech devices
- Low vision “high contrast” maps of all routes and tours are provided
- Separate customized databases provided for wheelchair travelers
Multiple Databases for Different User Groups

Campus Wayfinding

Getting Around Campus

Welcome to the Universally Designed campus navigation project. Use the links to obtain directions to some common campus locations. The directions are optimized for various styles of travel.

Basic Directions:
Best for newcomers and general visitors

Detailed Directions:
Best for cane travelers and guide dog users

Stair Free Directions:
Best for wheelchair users and strollers
What is ClickAndGo?

• How is data compiled?

• What is the business model?

• Testimonials, Blind community responses
How is ClickAndGo Data Delivered to Users?

- Screenreader
- IVR via telephone or cellphone
- Text or MP3 file download
- Large print or Braille
- Refreshable Braille for DB
- iPhone App w/ iBeacon support
Website Access

View all routes for Baruch College

Select Landmarks

Starting Landmark: #23 Bus Eastbound
Destination Landmark: Library Building, Main Doors
Get Route Map

Select a point-of-interest for Baruch College

Detailed point-of-interest descriptions are available from the drop-down list. Select the point-of-interest from the list and click the "Get Point-of-Interest" button. If the desired point-of-interest is not listed, please contact info@clickandgomaps.com.

View all landmarks and points-of-interest for Baruch College

Find a point-of-interest

Point-of-Interest: 3rd Avenue Bus Northbound
Get Point-of-Interest

Select a virtual tour for Baruch College

Detailed virtual tours are available from the drop-down list. Select the virtual tour from the list and click the "Get Virtual Tour" button.

Find a virtual tour

Virtual Tour: Library Building 1st Floor
Get Virtual Tour

Select a restaurant menu for Baruch College

Detailed restaurant menus are available from the drop-down list. Select the restaurant menu from the list and click the "Get Restaurant Menu" button.

Find a restaurant menu

Restaurant Menu: Bakery Island
Get Restaurant Menu
ClickAndGo Features

1. ACCESSIBLE WALKING DIRECTIONS

• Searchable “Point A to Point B” customized indoor and outdoor walking directions

• Select from list of starting and end points
ClickAndGo Features

- Exit bus. Walk to inside sidewalk guideline and turn left. Trail low curb and hedge on your right until they end. You may pass a bus shelter as you walk.
- When right side curb and hedge end, the sidewalk texture changes to smooth stone. Walk 10 ft ahead and turn right.
- You face the escalator entrance ahead in 30 ft. Walk ahead, locate descending escalator, and descend.
2. LOW VISION MAPS

- High contrast visual maps can be delivered for each walking route.
- User can zoom, download, print out, and carry for reference
- Delivered via website and iPhone App
Low Vision Maps

F & 7TH ST ENTRANCE TO GALLERY PLACE

VERIZON CENTER ENTRANCE

WMATA

G ST.

F ST.

7TH ST.

F ST.

6TH ST.

5TH ST.
3. VIRTUAL TOURS

• An “overview” or “walk-through” of a venue.

• Can serve as familiarization tool

• Facilitates the development of a cognitive map
ClickAndGo Features

4. POINT OF INTEREST INFORMATION (POI)

• Provides description/location of landmark.

• Identifies which routes have been compiled reach that POI.
5. INTERSECTION DESCRIPTIONS

- Detailed descriptions provided for intersections.

  Includes:
  
  - Geometry & type of traffic controls
  - Presence & location of pedestrian plazas and bicycle paths
  - Other relevant info
6. RESTAURANT / MENU ACCESS

- Can direct traveler to restaurants, and then provide audio/text menu option

7. EMERGENCY EVACUATION / EGRESS

- Supports emergency egress planning and procedures (*specific ibeacons dedicated to emergency messaging)
- Familiarization to emergency fire / exit routes
iBeacon support

Indoor Real-Time Location Support

- iBeacon support offered as complement to customized narratives.
- Provides real time location-specific support
- Used for landmark ID, orientation support
- Some iBeacons designated for emergency announcements, hazard alerts, etc
Narrative without iBeacon

→ Exit bus. Walk to inside sidewalk guideline and turn left. Trail low curb and hedge on your right until they end. You may pass a bus shelter as you walk.
→ When right side curb and hedge end, the side walk texture changes to smooth stone. Walk 10 ft ahead and turn right.
→ You face the escalator entrance ahead in 30 ft. Walk ahead, locate descending escalator, and descend.
Narrative with iBeacon support
iBeacon support

Fare card machines are on south wall just beside escalators.

After passing fare gates, be aware platform edge is ahead in 25 ft.
Community applications of ClickAndGo service

- Transit environments (bus, train, light rail)
- University campuses
- Hotel / Corporate / Conference centers
- Airports, hospitals, malls, parks, museums
- Downtown areas of cities
- Skyway and tunnel systems
ClickAndGo technology offers “pre-journey learning” and a low vision map component.

Free access to data in every possible format.

Data easily edited and updated.
Summary

- All blind-specific data compiled by O & M instructors
- Can provide seamless outdoor to indoor route guidance and familiarization support
- No installation, purchase, or maintenance of “equipment”
Questions and Resources

W. Brandon Cox

- Telephone: (202-630-2329)
- Email: bcox@clb.org

- www.clickandgomaps.com
- www.clb.org/clickandgo
Real-time ridesharing – Can toll discounts encourage carpooling?

APA Transportation Planning Division webinar: Technology Applications for Transportation Planning
May 29, 2015

Greg Griffin, AICP
g-griffin@ttimail.tamu.edu
@gregpgriffin

image: TTI
Overview

1. Background
2. Project description
3. Results
4. Summary

Disclaimer
The contents of this presentation reflect the views of the author, who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the Federal Highway Administration (FHWA), the Texas Department of Transportation (TxDOT), or the Central Texas Regional Mobility Authority (CTRMA). This report does not constitute a standard, specification, or regulation.
1. Background
Real-time, aka ‘Dynamic’ Ridesharing

• RTR (or dynamic ridesharing) apps match carpool partners at the time the trip is needed or scheduled for a specific time and place.
• Traditional carpool coordination is non-dynamic, requiring pre-trip coordination between driver and passengers.
Enabling Technologies

Cell-based Internet
+ GPS
+ Personal verification
+ electronic $
+ cloud-based servers

Smartphone revolution?
Is smartphone ownership a barrier?

- Yes, for older & low-income demographics.
- Smartphone adoption continues to increase.
Prospect

• Increase managed lane person-throughput via tech.-based enforcement

• Decrease congestion on entire system by encouraging carpooling

• Potential infrastructure cost savings through deferred expansions and reduced maintenance

❖ Each prospect is contingent on widespread adoption
### Advantages

- Dynamic ridesharing merges attributes of mass transit and personal automobility:

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<tr>
<th></th>
<th>Mass Transit</th>
<th>Dynamic Ridesharing</th>
<th>Personal Autos</th>
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<tbody>
<tr>
<td>$ (personal)</td>
<td>Low *</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Time Accessibility</td>
<td>Scheduled</td>
<td>Flexible</td>
<td>Instant</td>
</tr>
<tr>
<td>Roadway efficiency</td>
<td>High *</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

*depending on utilization
Challenges

• Resistance to ridesharing remains:
  – **Coordination** with others still required
  – Concerns about **stranger danger** (may be mitigated with social media or employer networks)
  – **Marginal economy** of car and associated cost investments encourage continued use (households already own multiple cars)
Existing Research

- Pricing for road and parking impact prospects for dynamic ridesharing (Deakin et al. 2010)
- 3+ occupants could increase trust and utilization (Spielberg & Shapiro 2000)
- Preferences to schedule ride at least night before, rather than immediate (Deakin et al. 2010)
- Targeting large employers may reap fast benefits (Amey et al. 2011)
2. Project description
Single-occupant drivers + RtR software = Saving$

1. 80-90% of work trips are SOV
2. Encourage carpooling with toll road discounts (2: ½ off or 3+: free)
3. Provide mobility with software: not hardware:
Tolling Integration Concept

Rideshare & Toll Transactions

- Carma Rideshare Pickup
- CTRMA Toll Transaction
- Carma Rideshare Dropoff

Backoffice Coordination

- Carma Database
- CTRMA Database
- Toll Reimbursement
3. Results
Recruitment & Carpooling Trips

- Initial launch, press event
- Manor Expressway ribbon-cutting, postcards, billboard
- Carma 6.0 released, press blitz for fall
- Carma announces continuation, cash-out reminder

Weekly Passenger Trips

Texas A&M Transportation Institute
Carma Trip Origins and Destinations, 2014
Carma Pilot Weekday Users and CTRMA System Transactions
4. Summary
Key Findings for System Users

• Pilot Study Drivers Saved an Average of $1.08 per Trip in Tolls Alone
• Real-time Ridesharing Can Connect Drivers and Riders through Neighborhoods and Employers
• Users Appreciate Benefits of Toll Discounts by Occupancy
Key Findings for Agencies

- Real-time Ridesharing Can Be Used to Verify Vehicle Occupancy
- Vehicle Occupancy Can Be Increased Through Real-Time Ridesharing
- Real-Time Ridesharing Has Potential as a Social Equity Benefit, but This Has Not Been Realized in This Pilot to Date
Potential Research Directions

- Equity impacts for low-income communities
- Access to transit
- Employer/agency carpooling promotion & monitoring
- Effects of parking charges
- Barriers to non-participants
References


Questions?

Technology Applications for Transportation Planning

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