Metropolitan Washington Council of Governments

In Partnership With

MARYLAND DEPARTMENT OF TRANSPORTATION

District Department of Transportation

VDOT

GREATER WASHINGTON PARTNERSHIP

FROM BALTIMORE TO RICHMOND
FOSTERING UNITY
ADVANCING GROWTH

MARYLAND TRANSPORTATION INSTITUTE

Deployment of Personalized and Dynamic Travel Demand Management Technology in the Washington, D.C.-Baltimore, MD-Richmond, VA Megaregion

Advanced Transportation and Congestion Management Technologies Deployment Program (ATCMTD)

- Federal Highway Administration (FHWA) announced that $12 million in Fiscal Year (FY) 2020 funds were available nationally under ATCMTD Initiative Grant Award;
- COG/TPB staff submitted a $5.95 million grant application on August 5, 2019 titled “Deployment of Personalized and Dynamic Travel Demand Management Technology in the Washington, D.C.-Baltimore, MD-Richmond, VA Megaregion.”
- On June 16, 2020, COG/TPB staff was notified that it had been one of 10 projects nationally that had been awarded a ATCMTD program grant for the full grant dollar application amount

Team Organization

Project Agency Lead and Prime

Metropolitan Washington Council of Governments

Deployment and Partnership Lead

COMMUTER CONNECTIONS

Lead

Tech. Support

Subcontractor and Technical Lead: University of Maryland

incenTrip RITIS

Public-Private Partnership

Agency Partnership

Private-Sector Partners

GREATER WASHINGTON PARTNERSHIP
FROM BALTIMORE TO RICHMOND
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and 1000+ employer partners in the TDM regional network

Public Agency Partners

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

d. District Department of Transportation

VDOT Virginia Department of Transportation

and 26 additional partners in TDM regional network

ATCMTD Project Vision and Goals

- Leverage the best available technology to maximize the cost effectiveness of a megaregion TDM program
- Integrate and expand existing dynamic TDM programs with a shared technology platform for coordination among public and private-sector partners
- Provide personalized, timely and accurate traveler information and incentives to minimize congestion, energy use, and emissions
- Enhance multimodal transportation access and system performance for all user groups with rewards and gamification

Existing Programs and Core Components

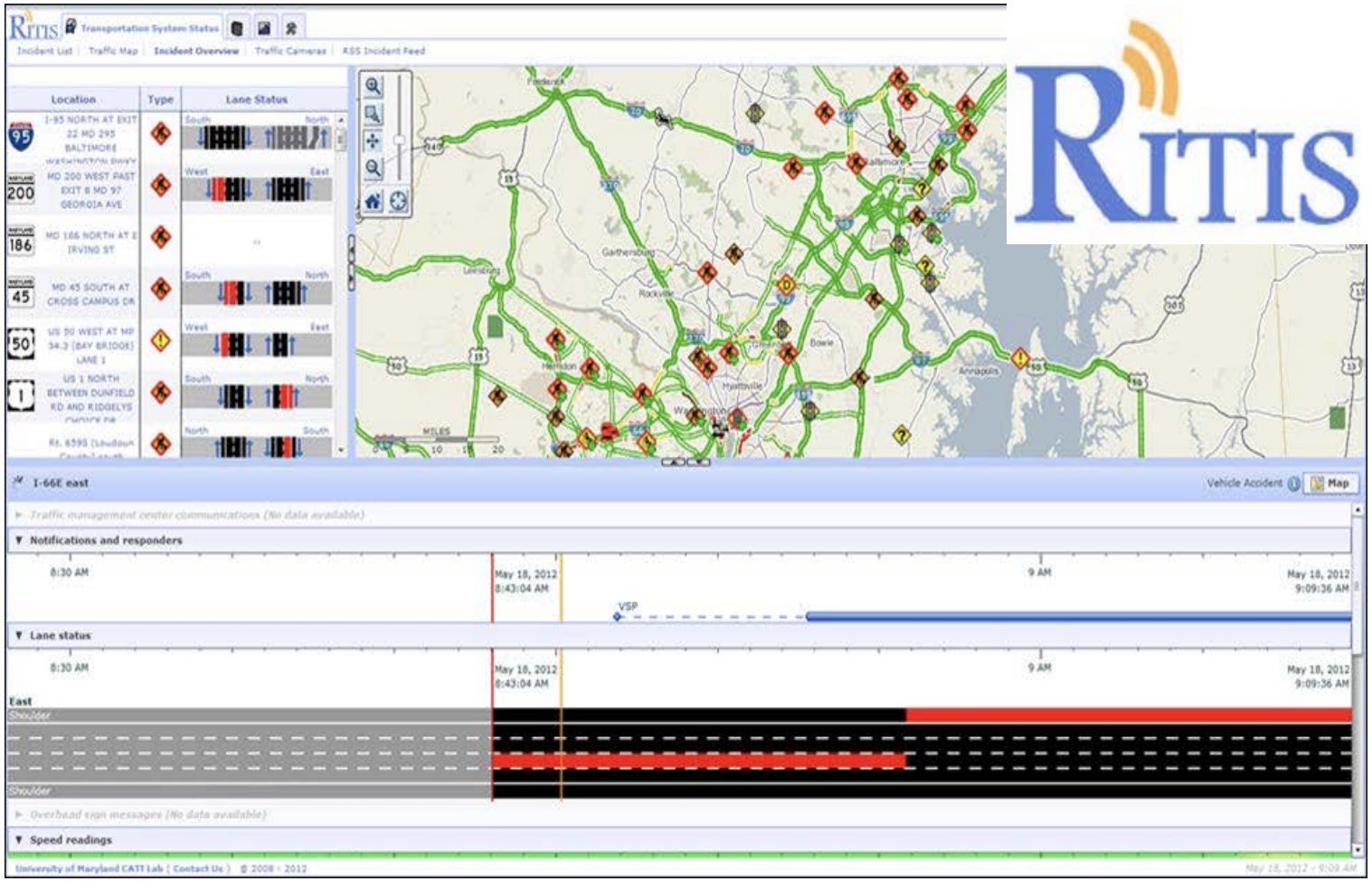
- **Commuter Connections**
  - COC Transportation Info, software, hardware, DB Maintenance
  - COC Transportation Information Services
  - Ridematching Coordination, Technical Assistance & Administrative Support
  - Marketing and Advertising
  - incenTrip

Existing Programs and Core Components

- **TSM&O and ICM Programs in the DMV Megaregion** State DOTs in the DMV megaregion have prioritized multimodal integrated corridor management (ICM) and transportation systems management & operations (TSM&O) programs, with major corridor-level ICM and TSM&O projects already in the deployment process (e.g., I-270, I-66, I-95, I-70, and the Capital Beltway).
- **The proposed ATCMTD project will** coordinate its corridor-level TDM deployment with selected ICM and TSM&O deployment projects funded by other sources.

VDOT Regional Multi-Modal Mobility Program (RM3P) Initiative

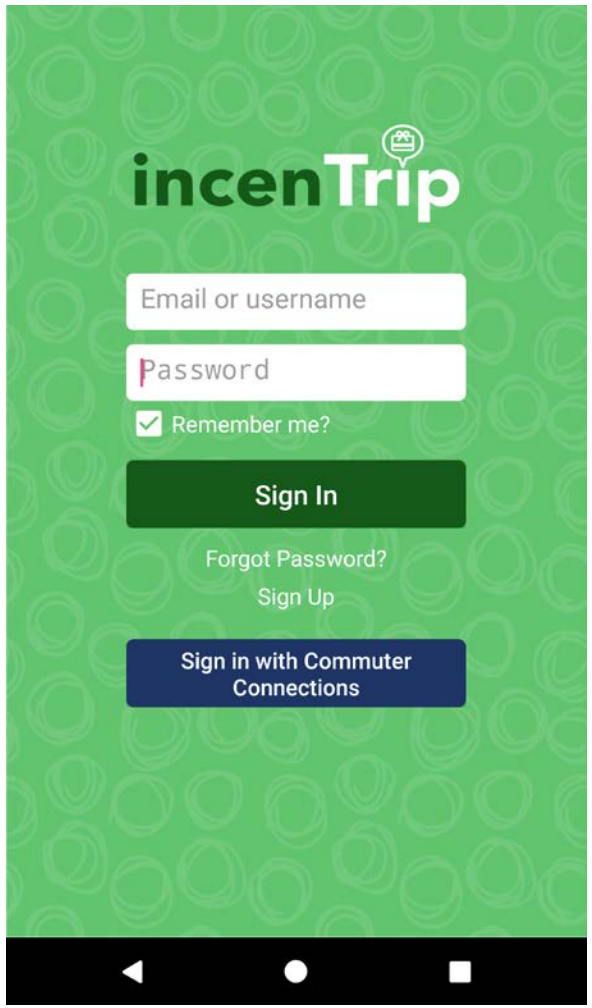
Existing Programs and Core Components

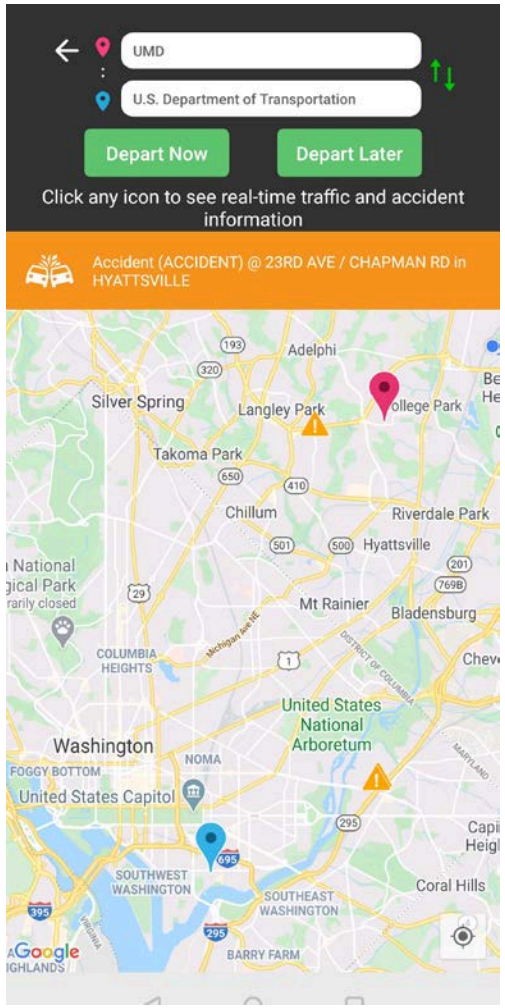


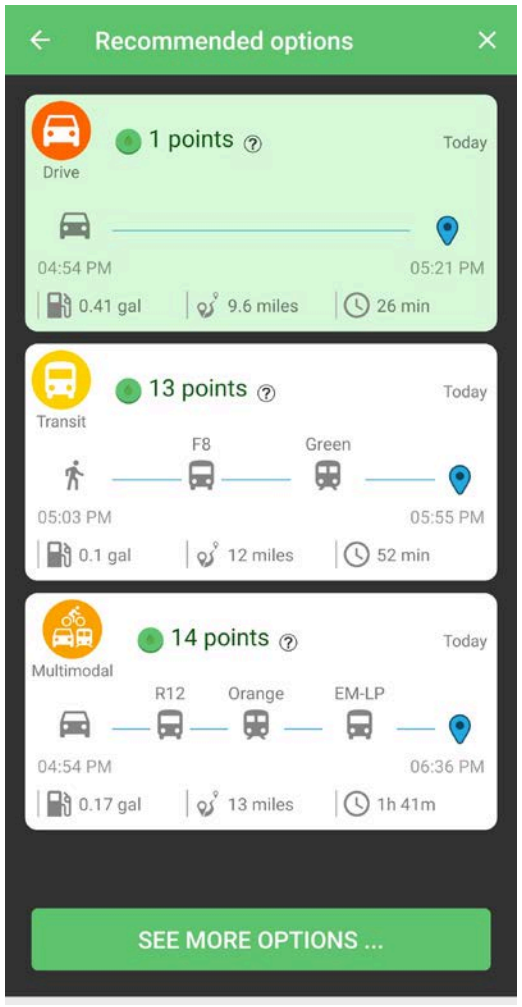
UMD Regional Integrated Transportation Information System (RITIS) is the largest data sharing, dissemination, analytics, and visualization platform in the U.S., including more than 40 performance measure, dashboard, and visual analytics tools. RITIS automatically fuses, translates, and standardizes data obtained from multiple agencies and the private sector to provide an enhanced overall view of the transportation network.

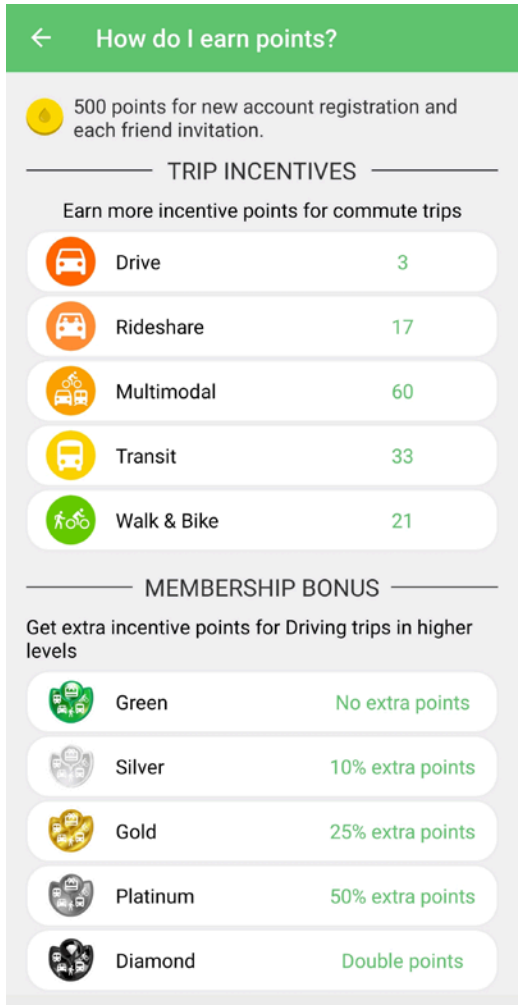
Existing Programs and Core Components

incenTrip App for Travel Demand Management







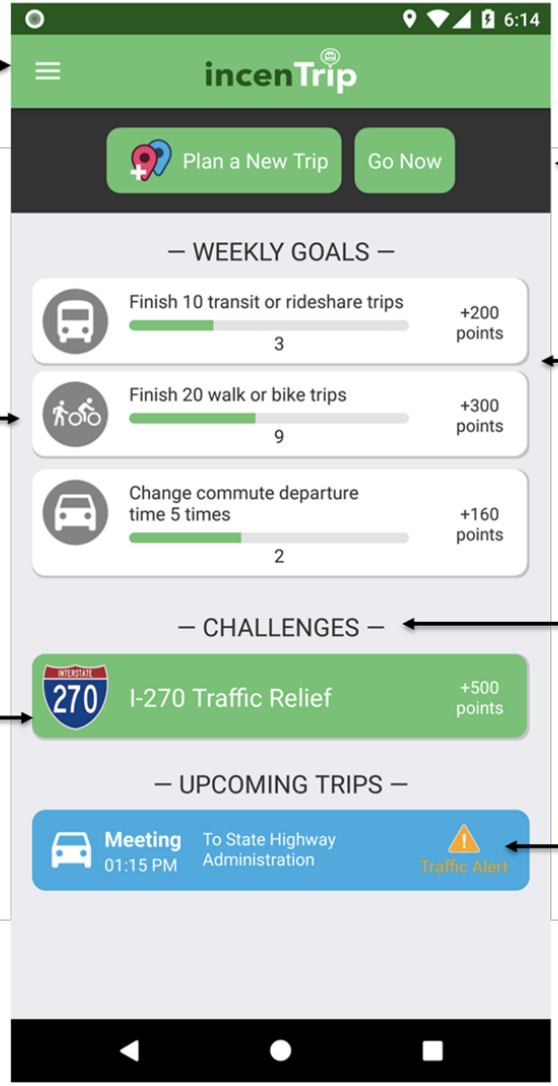


incenTrip App for Travel Demand Management

An embedded menu allows users to add personal settings, join incentive programs, and check and redeem rewards.

New background trip logging function allows users to earn incentives simply by carrying their phones with them.

Challenges enable customized incentive programs targeting congestion relief on specific corridors, for special events, and promotions (e.g., car free day, bike-to-work day).



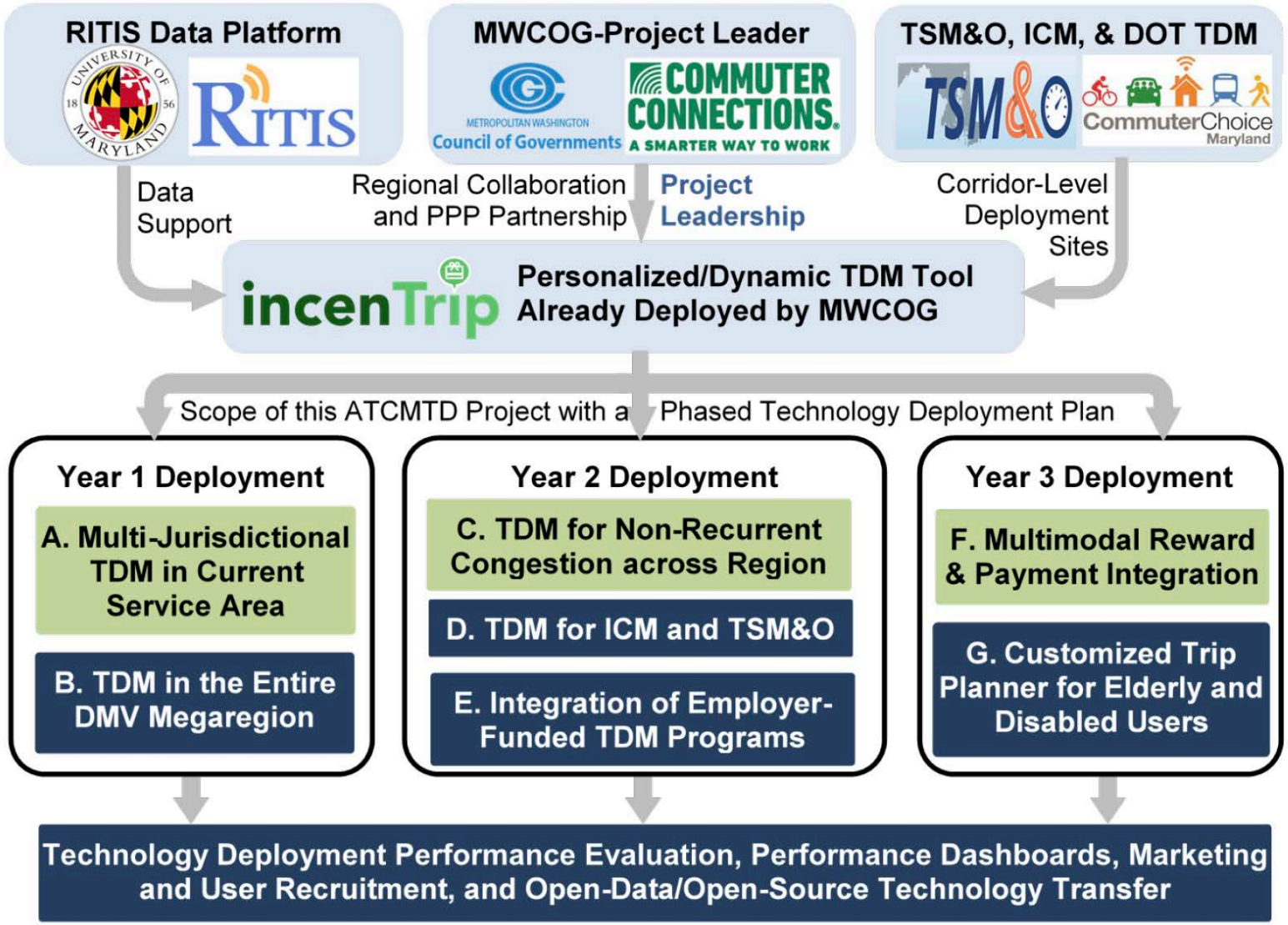
Trip planning function allows users to explore mode, departure time, and route options; and all incentives.

Users see trip statistics and personalized goals.

Users may suggest challenges and partners for crowd-sourced solutions.

Alerts of unusual travel conditions are sent to impacted road users before/during their trips.

Proposed ATCMTD Technology Deployment



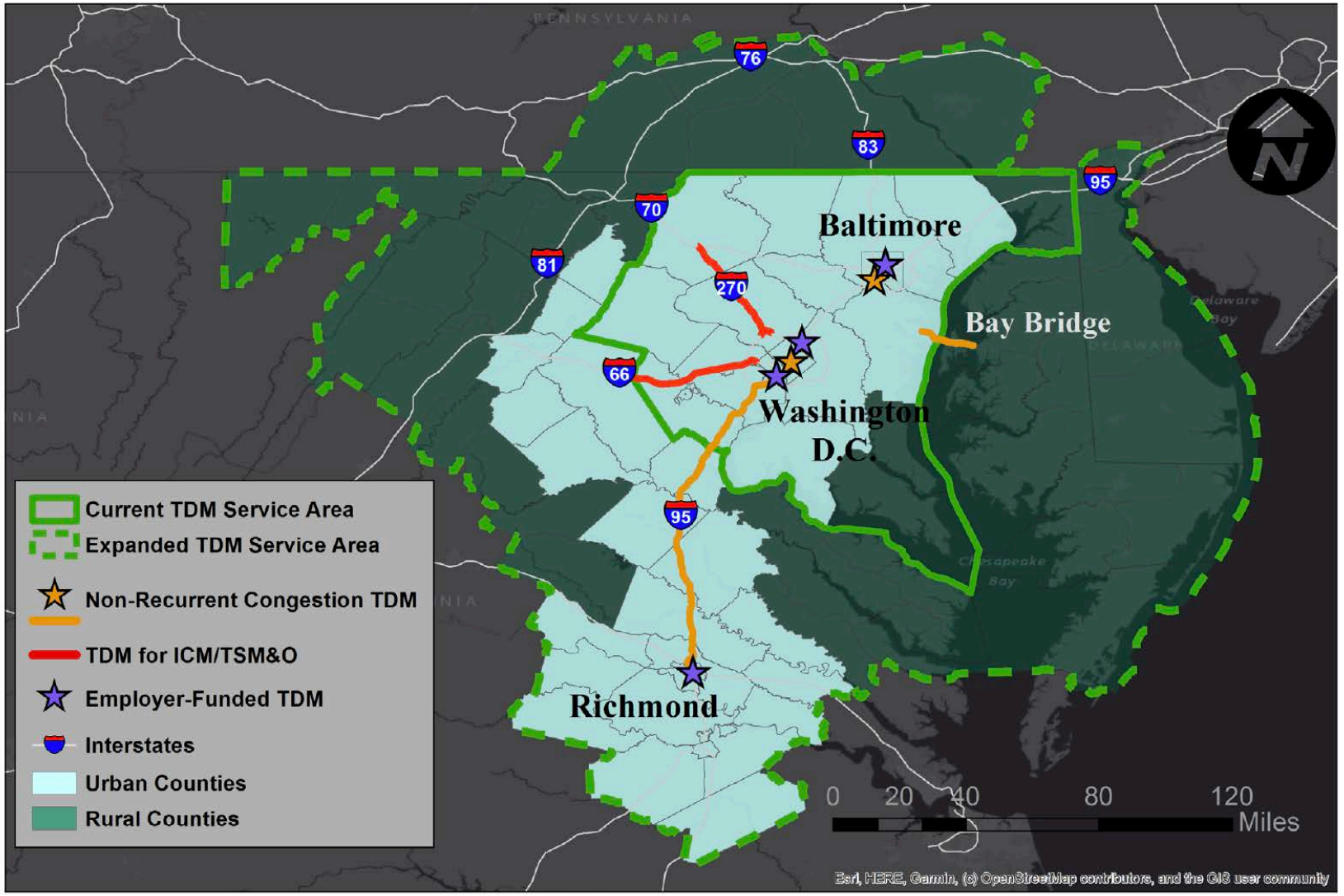
Existing Technology and Programs Already Funded & in Operation

Deployment to be funded by Cost Share

Deployment to be funded by FHWA ATCMTD Initiative

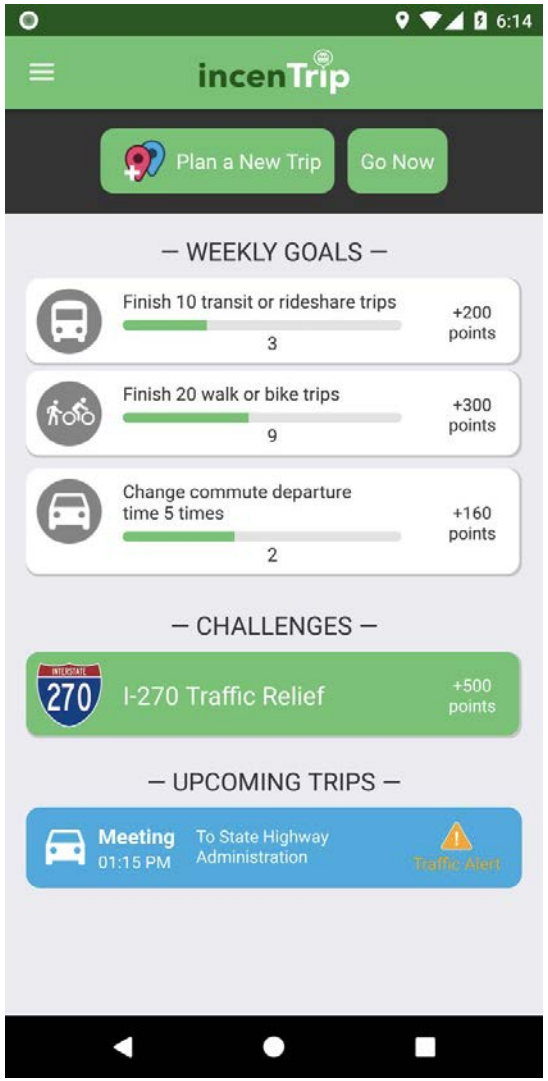
Year-1 Deployment: Megaregion program coverage

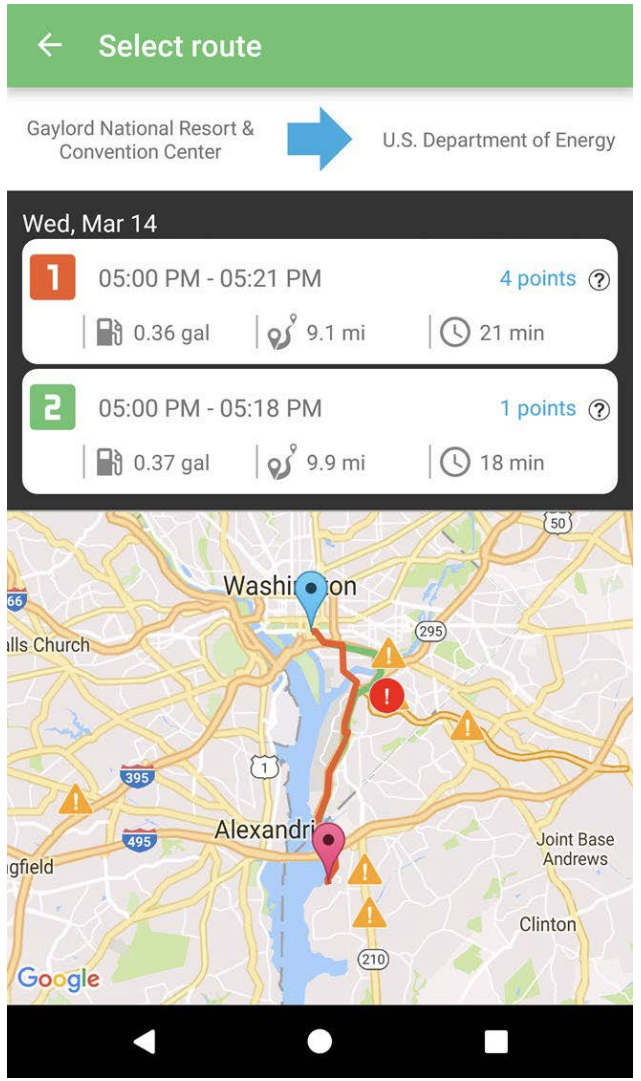
- **Task 1:** Project management and reporting
- **Task 2:** Deployment of personalized and dynamic TDM in existing service area
- **Task 3:** Technology deployment in the entire DMV megaregion and adjacent rural counties with multijurisdictional coordination



Year-2 Deployment of Specialized TDM Programs

- **Task 4:** TDM Deployment for Non-Recurrent Congestion Mitigation
- **Task 5:** Corridor-level TDM Deployment for Multimodal ICM and TSM&O
- **Task 6:** Integration of Employer-Funded TDM for Shared-Platform Deployment



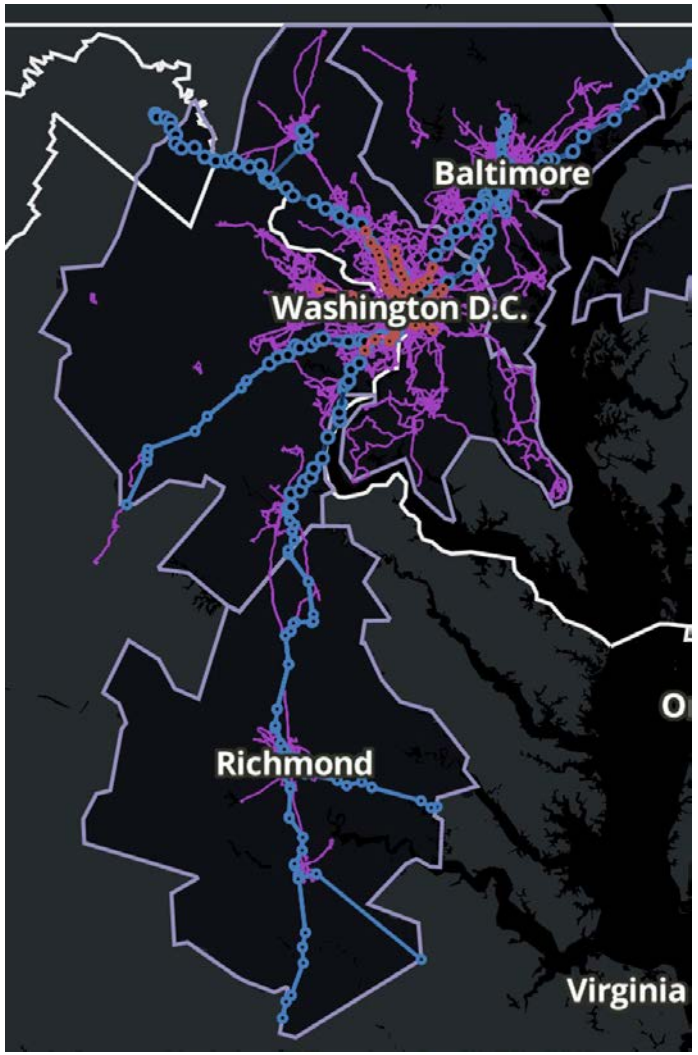


Year-3 Improved Services for All Users and Transactions

Discussion Items

- **Task 7:** Multimodal Reward and Payment Integration: Proof of Concept Only

- **Task 8:** Customized Multimodal Trip Planner for Elderly and Disabled Persons
  - Equity emphasis areas in DMV region, which are small geographic areas that have significant concentrations of low-income, minority populations, or both.



- Metro rail (red), commuter rail (blue), and bus (pink) systems in the DMV megaregion.

Timeline

Calendar Year	2019			2020									2021											2022
Project/Federal Fiscal Year	Year 1												Year 2											Year 3
Month	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	Oct ~ Sep
Phase One																									
Phase Two																									
Phase Three																									
Project Tasks and Schedule																									
1. Project Management																									
2. Multi-Jurisdiction Deployment																									
3. Full Megaregion Deployment																									
4. Non-Recurrent Congestion TDM																									
5. TDM for ICM/TSM&O																									
6. Employer Incentive Integration																									
7. Multimodal Payment Integration																									
8. Planner for Elderly & Disabled																									
9. Performance Evaluation																									
10. Marketing & User Recruitment																									
11. Technology Transfer																									

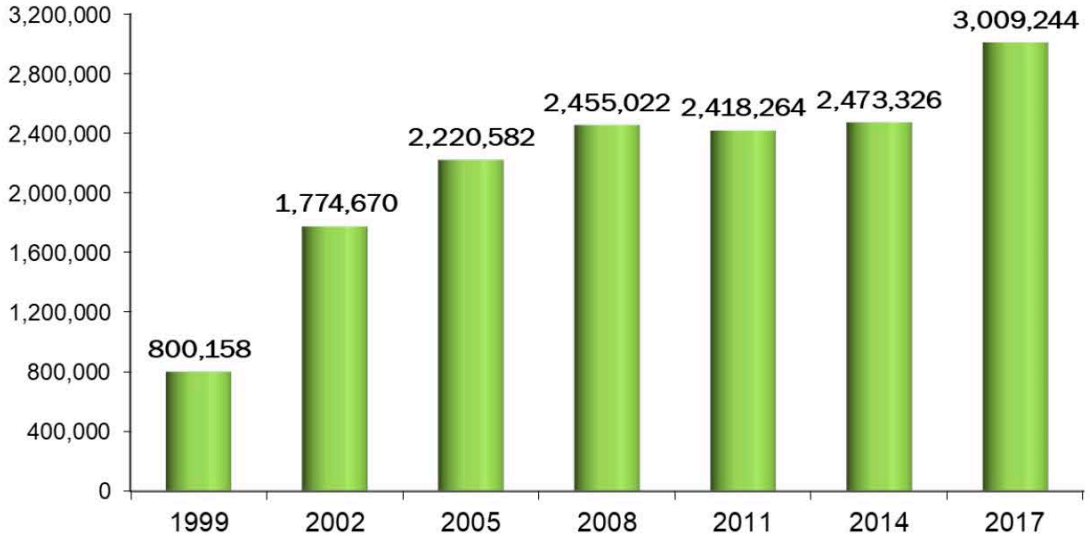
System Performance Improvement Goals

- Based on the same externally reviewed methods and the proposed ATCMTD project budget for the various megaregion TDM program components, we have produced the following system benefit projections at the megaregion level and for corridor-level deployment, respectively.

Megaregion-Level System Benefit Projections Including All Proposed TDM Deployment Tasks	Corridor and Bottleneck-Level Benefit Projections from Tasks 4 and 5
Project benefit projections: Years 1~3	Corridor travel time reduction: -8%
Congestion reduction: $56.2 million	Corridor travel delay: -20%
Fuel use savings: $38.3 million	Corridor speed improvement: +9%
Pollution emissions reduction: $0.3 million	Corridor travel reliability: +25%
Greenhouse gas emissions reduction: $4.1 million	Corridor SOV travel demand reduction: -3%
Noise reduction from VMT reduction: $6.1 million	Corridor person throughput: +6%
Safety benefits from VMT reduction: $4.4 million	Corridor energy savings: -14%
Total System Benefits: $109.4 million	Corridor GHG emissions reduction: -15%
Return on ATCMTD TDM Investment: 34 to 1	**Return on TDM investment: 23 to 1**

System Performance Improvements

Strong Commitment to and Capabilities for Performance Monitoring and Evaluation



a. Daily VMT Reduction due to TDM

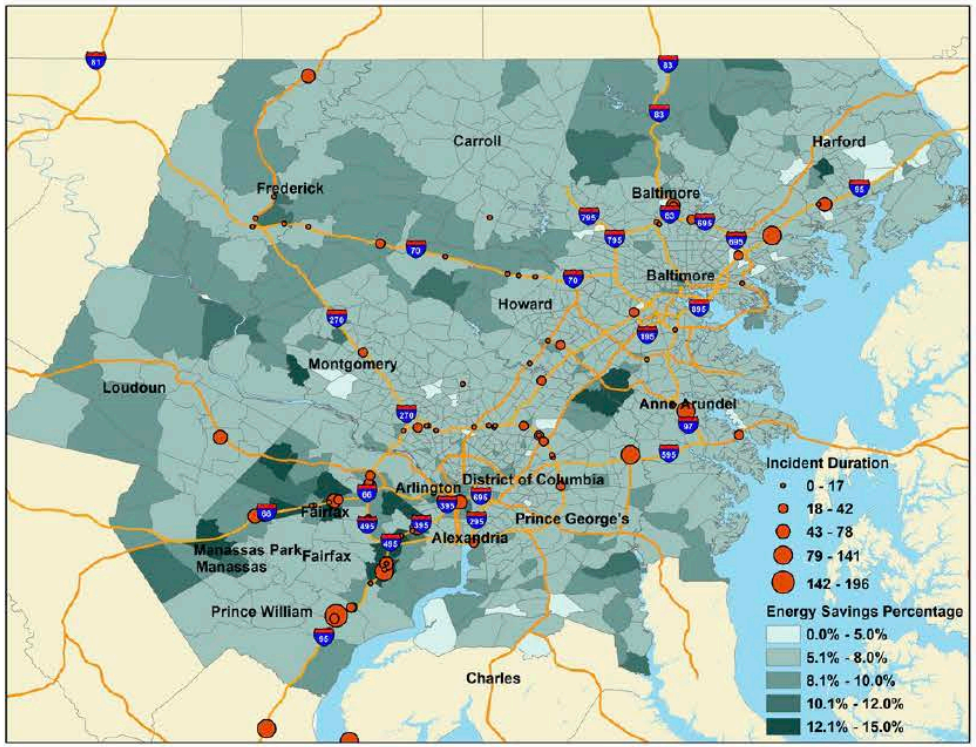
Societal Benefit	Benefit Unit	Benefit Base Units	Cost per Unit of Benefit	Total Daily Cost Saving
Air pollution				
- NOx	Tons NOx removed	0.770 T	$1,612	$1,241
- VOC	Tons VOC removed	0.548 T	$133	$73
- PM 2.5	Tons PM 2.5 removed	0.040 T	$15,107	$604
- PM 2.5 NOx	Tons PM 2.5 NOx removed	0.820 T	$1,612	$1,322
Greenhouse Gas Emissions	Tons CO2 removed	1,244 T	$36	$44,781
Noise pollution	Total VMT reduced	3,009244 VMT	$0.0223	$67,106
Congestion	Hours of delay reduced	24,464 hours	$25.13	$614,793
Excess fuel used	Gallons of fuel saved	167,180 gal	$2.51	$419,622
Health/safety [1)]	Accidents avoided/1 M VMT	3.043 acc.	$15,952	$48,543
All benefits				**$1,198,085**

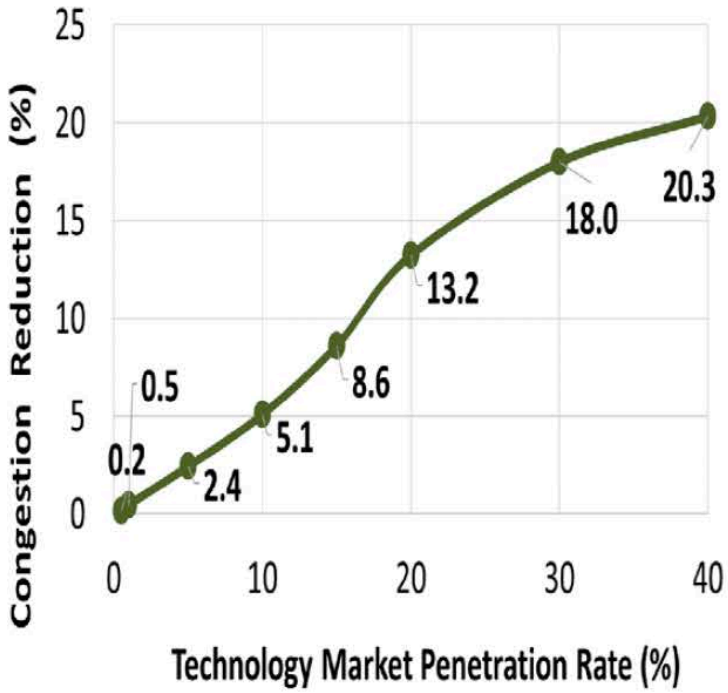
b. 2017 Evaluation of Daily TDM Program Benefits

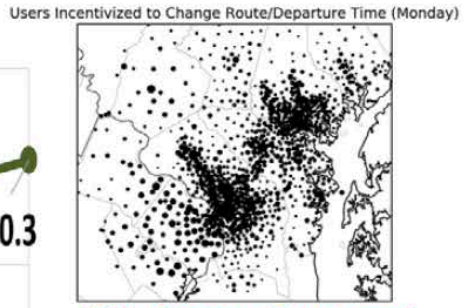
Selected MWCOG-led Regional TDM Program Evaluation Results: 1999~2017

System Performance Improvements

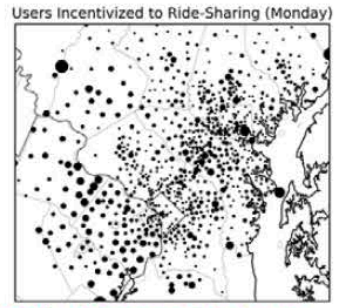
- Data-driven Benefit Projections Estimated for incenTrip, reviewed and approved by an external expert panel and ARPA-E technical staff and consultants.



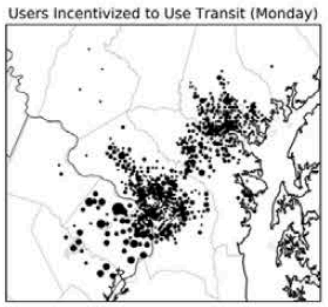




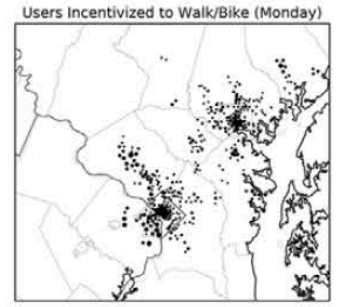
46%: Change Route and Departure Time



28%: Choose Various Rideshare Options



20% : Choose Transit



7%: Walking and Biking

a. Estimated energy savings by trip origin b. Regional congestion reduction c. Travel behavior changes

- Congestion Reduction, Energy Savings, and Other Project Benefit Projections

Performance Dashboard

CONGESTION

Total System Level Congestion Reduction

4,416 Hours	$ 112,522

Total User Level Congestion Reduction

53 Hours	$ 1,355

ENERGY

Total Fuel Use Reduction

2,044 Gallons	$ 7,156

Vehicle & Person Miles Traveled

Total VMT Reduction	-127,626 Miles
Total VMT	150,824 Miles
Total PMT	273,006 Miles

Vehicle & Person Hours Traveled

Total VHT Reduction	-10,811 Hours
Total VHT	13,215 Hours
Total PHT	37,014 Hours

EMISSION

Total GHG Emission Reduction

14,815,469 Tons	$ 587

Air Pollution Removed

PM 2.5	14,623 mg

SAFETY

Accident Avoided	0.079
Total Accident Cost Reduction	$ 13,754

HEALTH

Total Walking/Biking Miles Traveled	11,642 Miles

COST EFFECTIVENESS

Cost per Vehicle Trip Reduced	$ 6.10
Cost per Vehicle Mile of Travel Reduced	$ 0.00
Cost per mg of Reduced NOx	$ 232.37
Cost per mg of Reduced VOC	$ 8.16

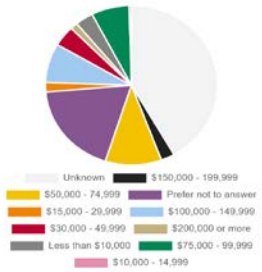
Performance Dashboard

USER

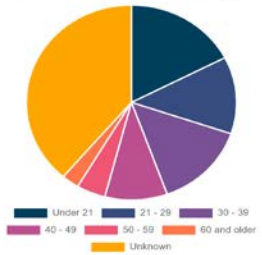
Total Registered Users	2,231
Total Active Users	1,101

View More

User Distribution by Income



User Distribution by Age



Geographical Distribution of Users

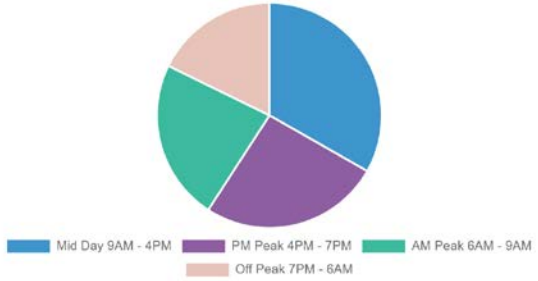
TRIP

Total Trips	44,684
Total Commute Trips	12,033
Total Vehicle Trip Reduction	-7,937

View More

Mode Share of All Trips

Departure time Distribution



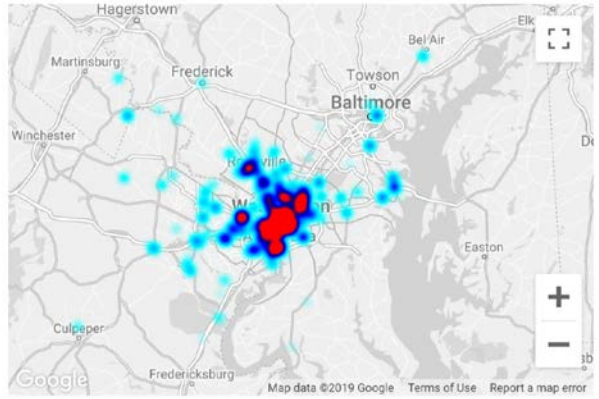
INCENTIVES

Total Points	1,056,426 points
Total Redeemed Rewards	$ 3,415

View More

Location Distribution of Trip Origin

Location Distribution of Trip Destination



Thank You!

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