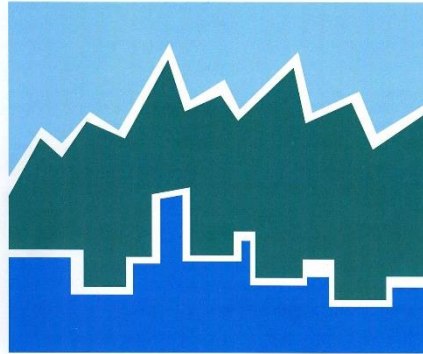# NHTS Data for Transportation Applications Workshop

Roundtable: Using the NHTS for Performance Measures

August 8-9, 2018
Transportation Research Board
Washington, DC

Subrat Mahapatra

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

Major Trends in Maryland

- Maryland VMT is at all time high (60 Billion in 2017)
- B-W region is one of the most congested regions
- Oversaturated conditions leads to higher unreliability
- State is home to 6.1 million people.1 million more people in coming 20 years
- 30% increase in overall VMT and truck VMT to double by 2040
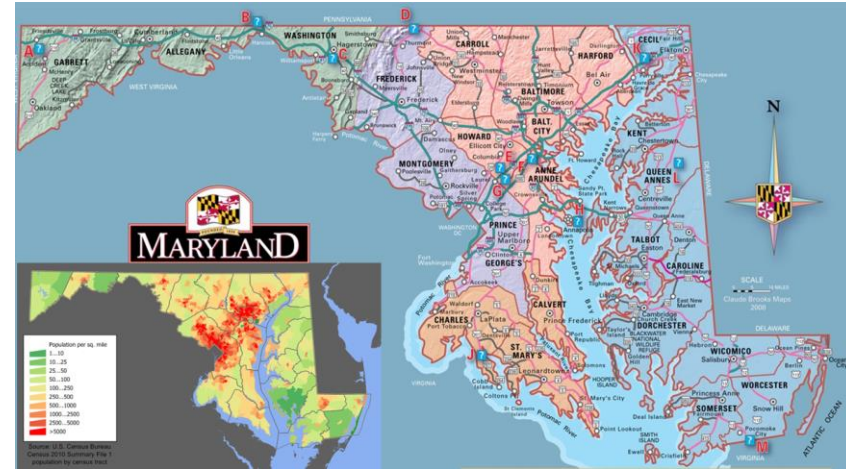
Maryland - America in Miniature

Challenges & Opportunities

- **Customer needs are more diverse and wide ranging** *(demographic shifts, aging population, mobility needs)*

- **Travel behavior and decisions are changing rapidly** *(where/ how we live, work, shop and travel)*

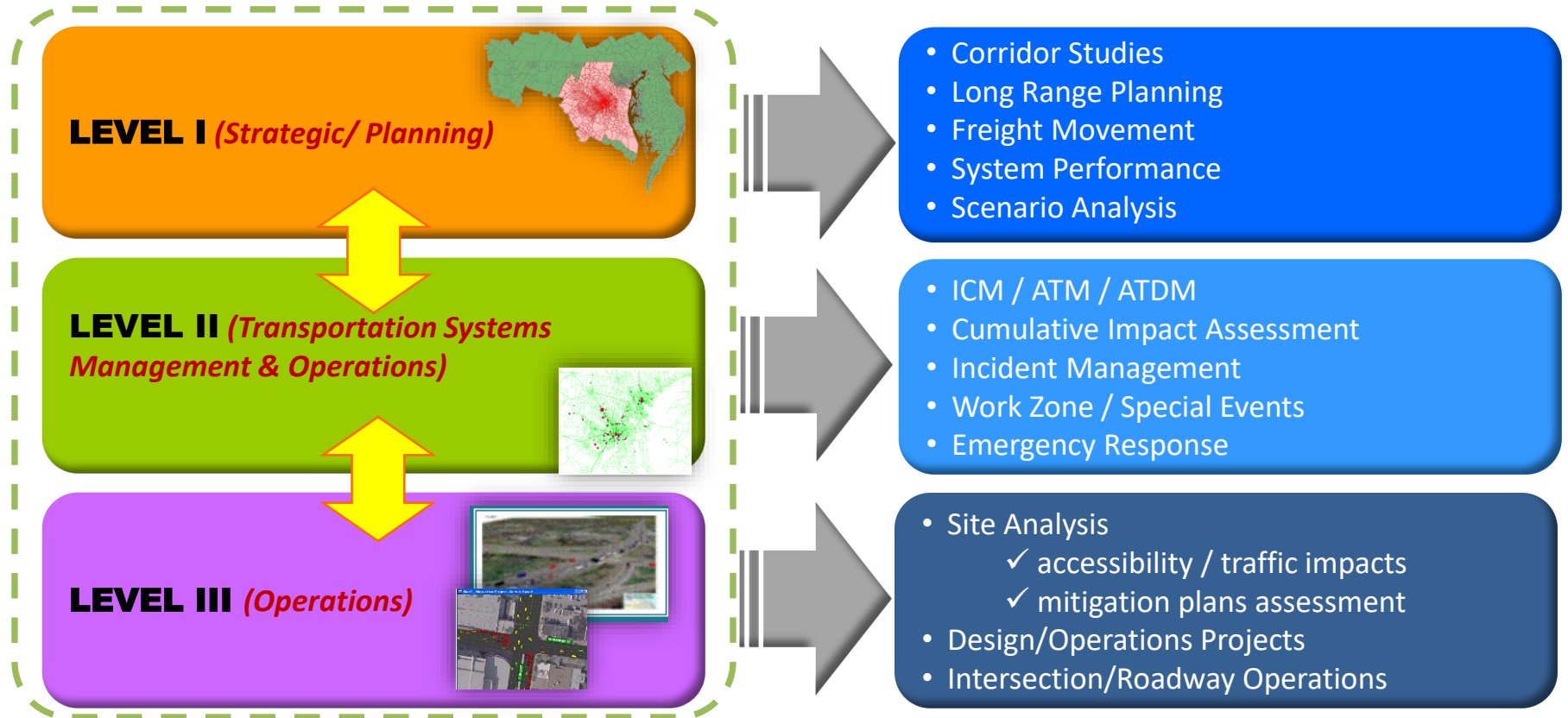- **Technology is playing a huge role** *(TNCs, CAVs, ATM /ATDM, Freight)*

DOT focus on **performance management and customer service**…

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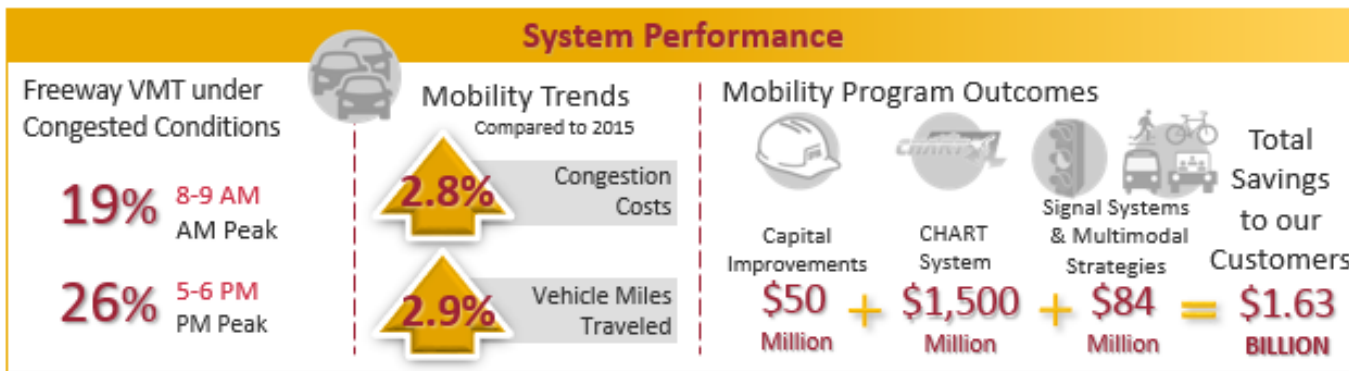
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Challenges & Opportunities

- **Aging Infrastructure, Competing Needs** for Funding

- DOT focus on **system efficiency and reliability** *(moving away from planning for average weekday to a typical day)*

- Provide a safe, reliable and efficient **door to door travel experience**

- **TSM&O Implementation** success depends on customers and their choices *(destination, departure time, route, mode)*

- **Communication** - *Telling our Story is very important*

Transportation Decision-making Context

LEVEL I *(Strategic/ Planning)*

- Corridor Studies
- Long Range Planning
- Freight Movement
- System Performance
- Scenario Analysis

LEVEL II *(Transportation Systems Management & Operations)*

- ICM / ATM / ATDM
- Cumulative Impact Assessment
- Incident Management
- Work Zone / Special Events
- Emergency Response

LEVEL III *(Operations)*

- Site Analysis
  - ✓ accessibility / traffic impacts
  - ✓ mitigation plans assessment
- Design/Operations Projects
- Intersection/Roadway Operations

Performance Measures

Safety

Fatalities		Serious Injuries		Safety Programs
522	All Traffic Fatalities	**3,163**	Serious Injuries	**MARYLAND STRATEGIC HIGHWAY SAFETY PLAN**
127	Bike and Pedestrian Fatalities	**506**	Bike and Pedestrian Serious Injuries	Maryland's Strategic Highway Safety Plan
0.89	Traffic Fatality Rate per 100 Million Miles	**0.86**	Serious Injury Rate per 100 Million Miles	**HSIP** — Highway Safety Improvement Program

Infrastructure Condition

88% Percent of roadway miles with acceptable ride quality (based on IRI)

79% Percent of MDOT SHA network in overall preferred maintenance condition

67 Number of MDOT SHA deficient bridges

2.6% Percent of MDOT SHA deficient bridges

System Performance

Freeway VMT under Congested Conditions

19% 8-9 AM AM Peak

26% 5-6 PM PM Peak

Mobility Trends Compared to 2015

2.8% Congestion Costs

2.9% Vehicle Miles Traveled

Mobility Program Outcomes

Capital Improvements **$50 Million** + CHART System **$1,500 Million** + Signal Systems & Multimodal Strategies **$84 Million** = Total Savings to our Customers **$1.63 BILLION**

Performance Measures

TRADITIONAL MEASURES

- **ADT/ VMT**
- **Vehicle/ Person Delay/ Congested Miles**
- **Vehicle/ Person Throughput**
- **Average Incident Clearance Times**
- **Annual User Savings**

NEWER MEASURES

- **Accessibility/ Connectivity (auto, transit, non-motorized, freight)**
- **Reliability (auto, transit, truck)**
- **Market Segments (commuters, businesses, freight)**
- **Quality of Life/ Sustainability**
- **Economic Indicators**
- **GHG Emissions**
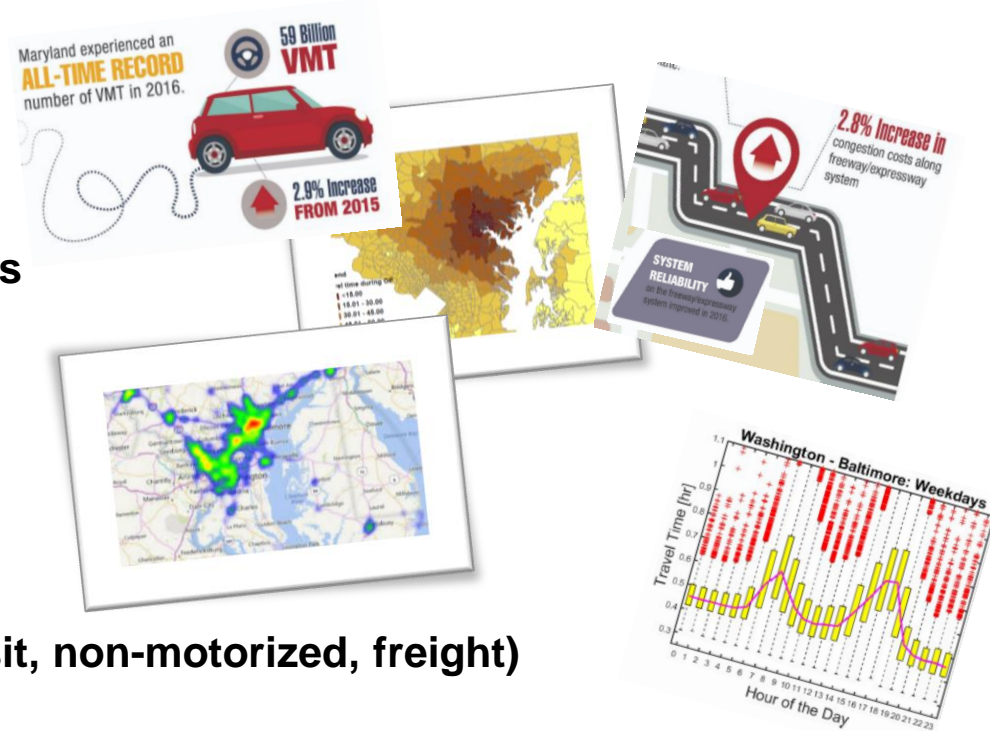
Fluctuations in Demand   Crashes   Inclement Weather   Work Zones   Poorly Timed Traffic Signals

Maryland DOT Use of NHTS Data

- Travel Behavior/ Characteristics by variables
- Trip making (O/D, commuting patterns), mode choices, vehicles ownership, trip lengths by purpose, travel costs, preferences etc.
- Estimating and validating traveling public's responses to policy changes (tolls/fares, capacity improvements, incentives, services, etc)
- Calibration/ Validation of Travel Demand Models

Informing policy making and transportation investment decisions

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Big Data Applications

- Estimate O-D matrices (state, county, zip code, TAZ)

- Calibrate/ Validate statewide travel demand models, Integrated Models

- Compute trip-based performance measures (TTI/ PTI)

- Determine distribution of traffic along major routes, activity centers

- Estimate traffic volumes

- Accessibility Metrics (peak/ off-peak by mode)

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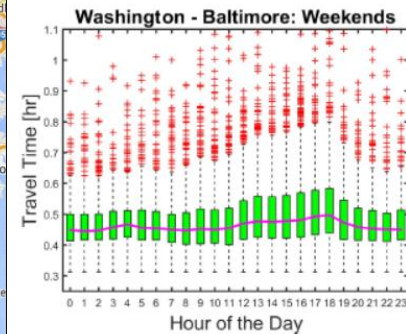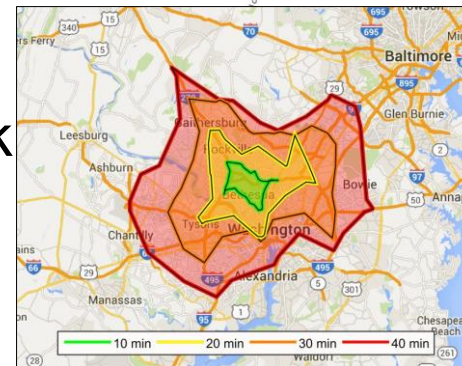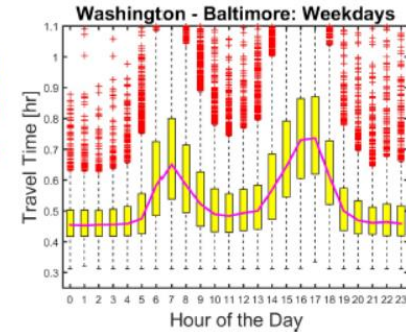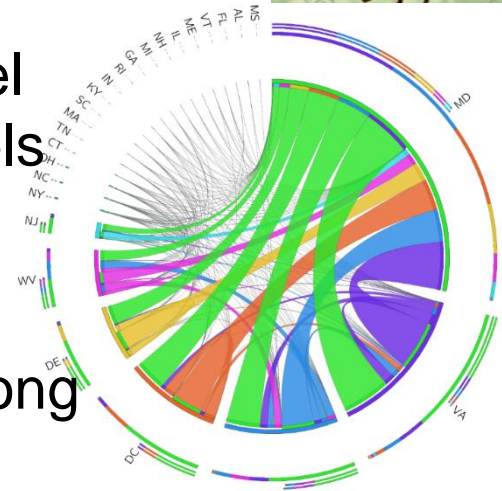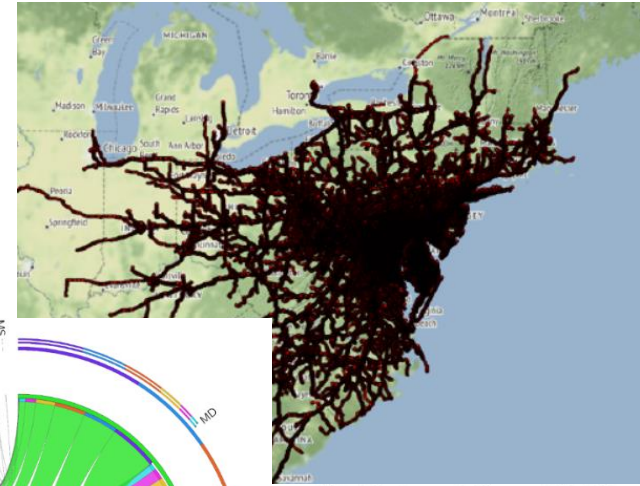
Going Forward…

- **Conventional data sources and traditional surveys are not enough…Big data provides a window into our customer needs**

- Big data applications for transportation decision-making is **still in infancy**. Needs champions, investment and **commitment for mainstreaming**

- **Collaboration** between agencies (DOTs, MPOs), Data Providers and Research Community (TRB, universities) needed

- Most likely early implementation will happen in **TSM&O and Performance Management areas**

- **Need for Advanced research** to combine traditional data sources with big data for travel behavior analysis

- Need to demonstrate the **value added and sustainability**

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Contact Information

Subrat Mahapatra

Deputy Director/ TSM&O Program Manager

Office of CHART & ITS Development

Maryland Department of Transportation

State Highway Administration

Email: smahapatra@sha.state.md.us