

The TSM&O Dashboard

The bridge between planning
and operations



The Need for Transportation Systems Management & Operations



The Need for Planning for Operations

The purpose of the Dashboard

Utilizing Big Data

Dashboard Demonstration

Why Does this Matter?

What is TSM&O???

The Federal Highway Administration (FHWA) defines **Transportation Systems Management and Operations (TSM&O)** as:

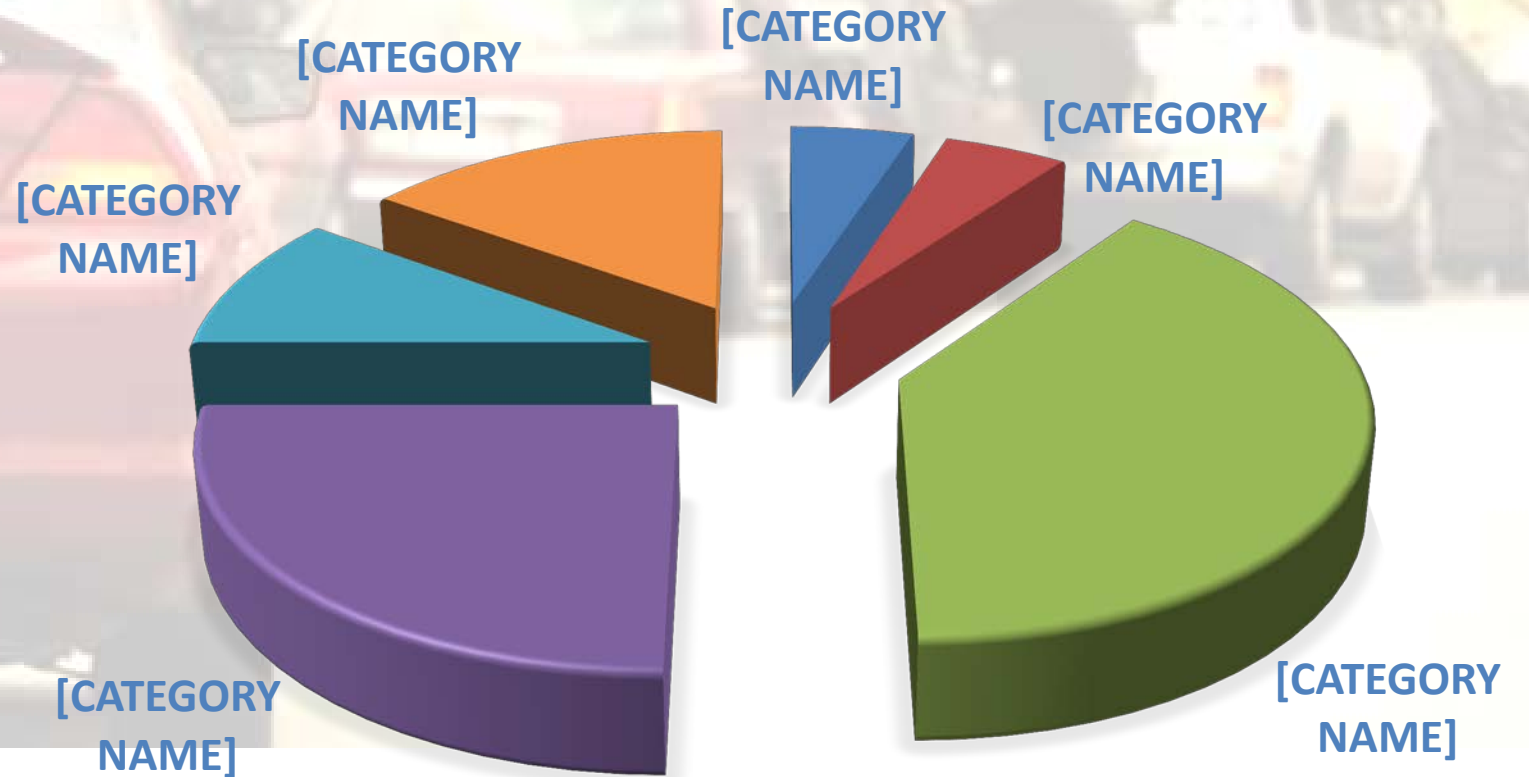
"an integrated program to optimize the performance of existing multimodal infrastructure through implementation of systems, services, and projects to preserve capacity and improve the security, safety, and reliability of our transportation system."

- Optimize the existing multimodal transportation network to:
 - Preserve Capacity
 - Improve Safety
 - Improve Travel Time
 - Reliability
 - Minimize Investment / Maximize Results



What is the Problem?

- Congestion
- Safety
- Travel Time Reliability



The Need for TSM&O

- Available funding is decreasing
 - We need to do more with less!!
- We can not build our way out of congestion!
- New emphasis on maintaining and managing the efficiency of the existing system

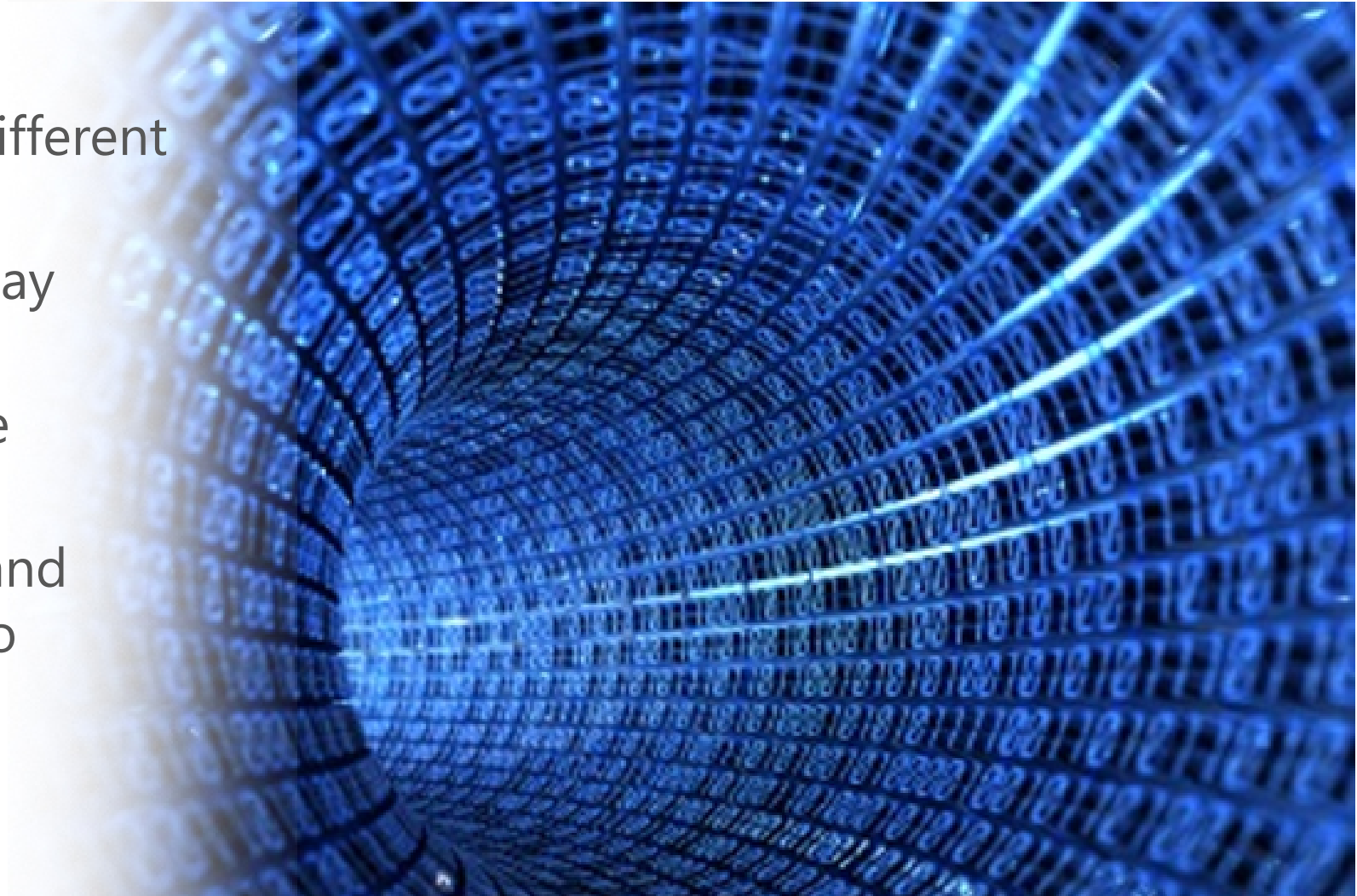


How do we “bridge” this gap?



What do we need???

- Methodology for storing different data sources
- Tools to organize and display different data format
- Analytics to easily generate business intelligence
- Easy viewable, accessible, and understandable platform to display data



The TSM&O Dashboard



M&O

The Purpose of the Dashboard



The Need for Planning for Operations

The purpose of the Dashboard

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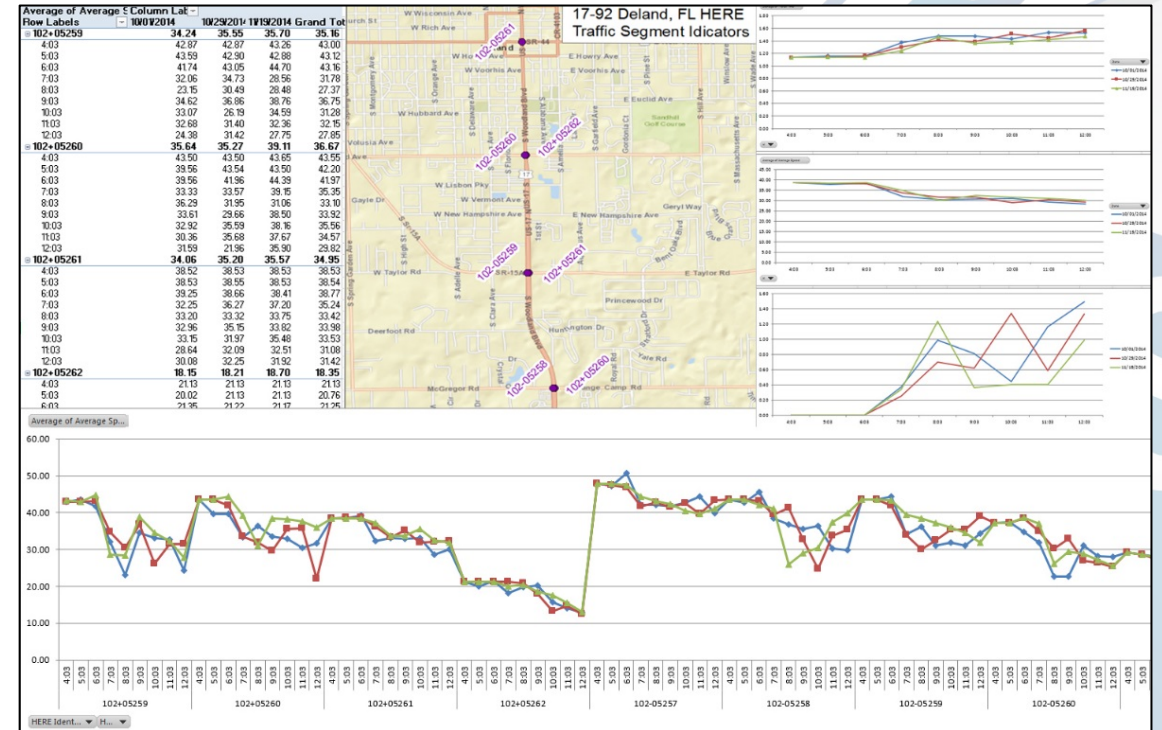
Dashboard Demonstration

Why Does this Matter?

Purpose of the Dashboard...

What does it do?

- To display **multiple datasets/data** sources
- Provide **flexibility** with reporting criteria
- Produces clearly interpretable results and most importantly delivers **performance measures**
- How we are actually doing this???



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Utilizing Big Data

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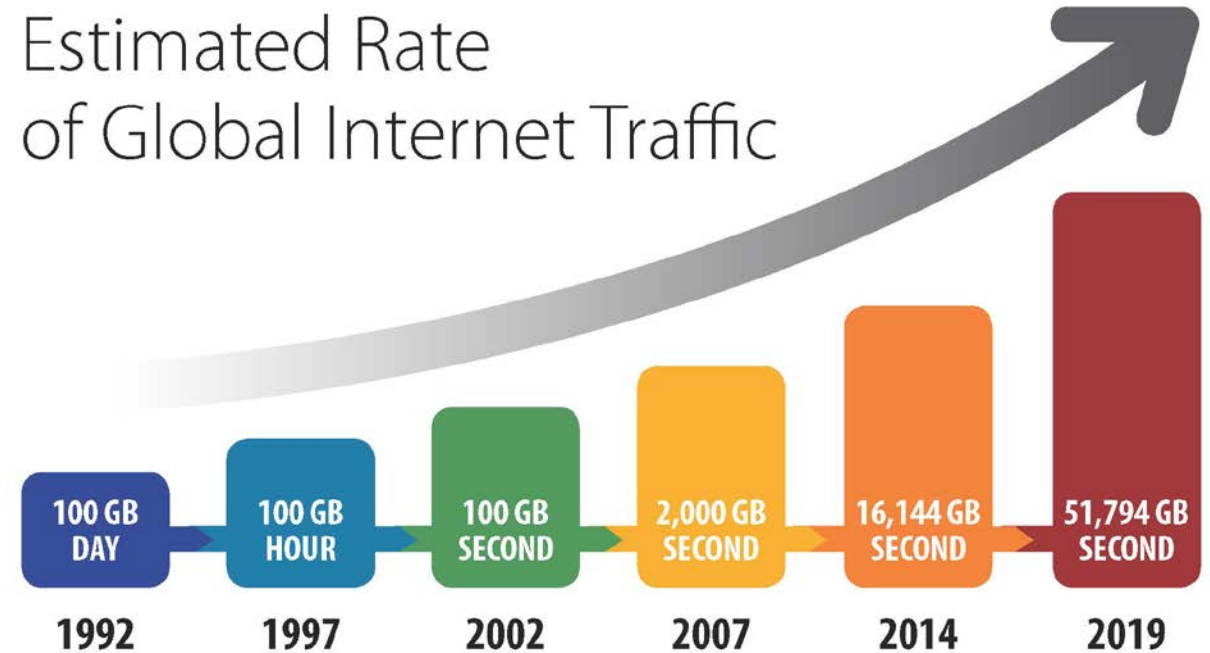
Why Does this Matter?

More data is available than ever

'The difficulty lies in determining how best to **transform the billions** of records generated every second into **usable and tangible information**. In the transportation industry, big data can be used to reveal new insights and provide a deeper level of analysis.'

– VHB article featured in *Engineering News Record* March 2016

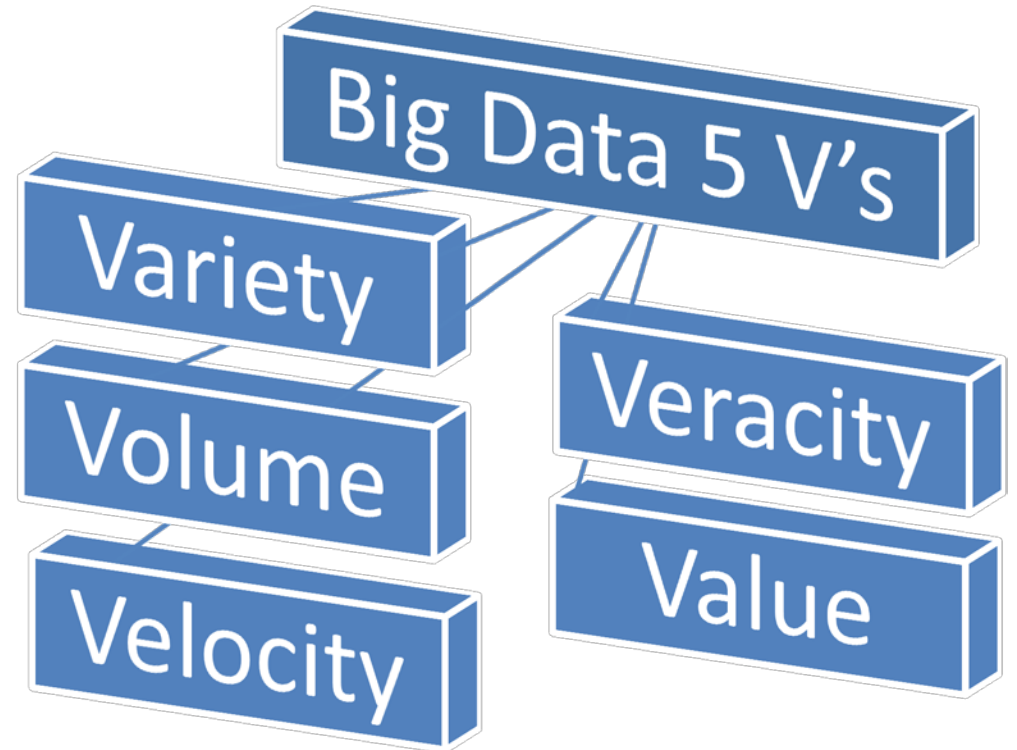
Estimated Rate
of Global Internet Traffic



Source: Cisco VNI, 2015

What is this “Big Data”?

- **Big data** refers to datasets which are so large or complex that traditional data storage, processing, or procedures are inadequate.
- Big Data is **Relative**
- Big Data can is often based on the 5 V's
 - **Volume** – How much is there
 - **Variety** – How different are the datasets
 - **Velocity** – How often do the data update
 - **Value** – the worth of information (usefulness)
 - **Veracity** – the quality of the data

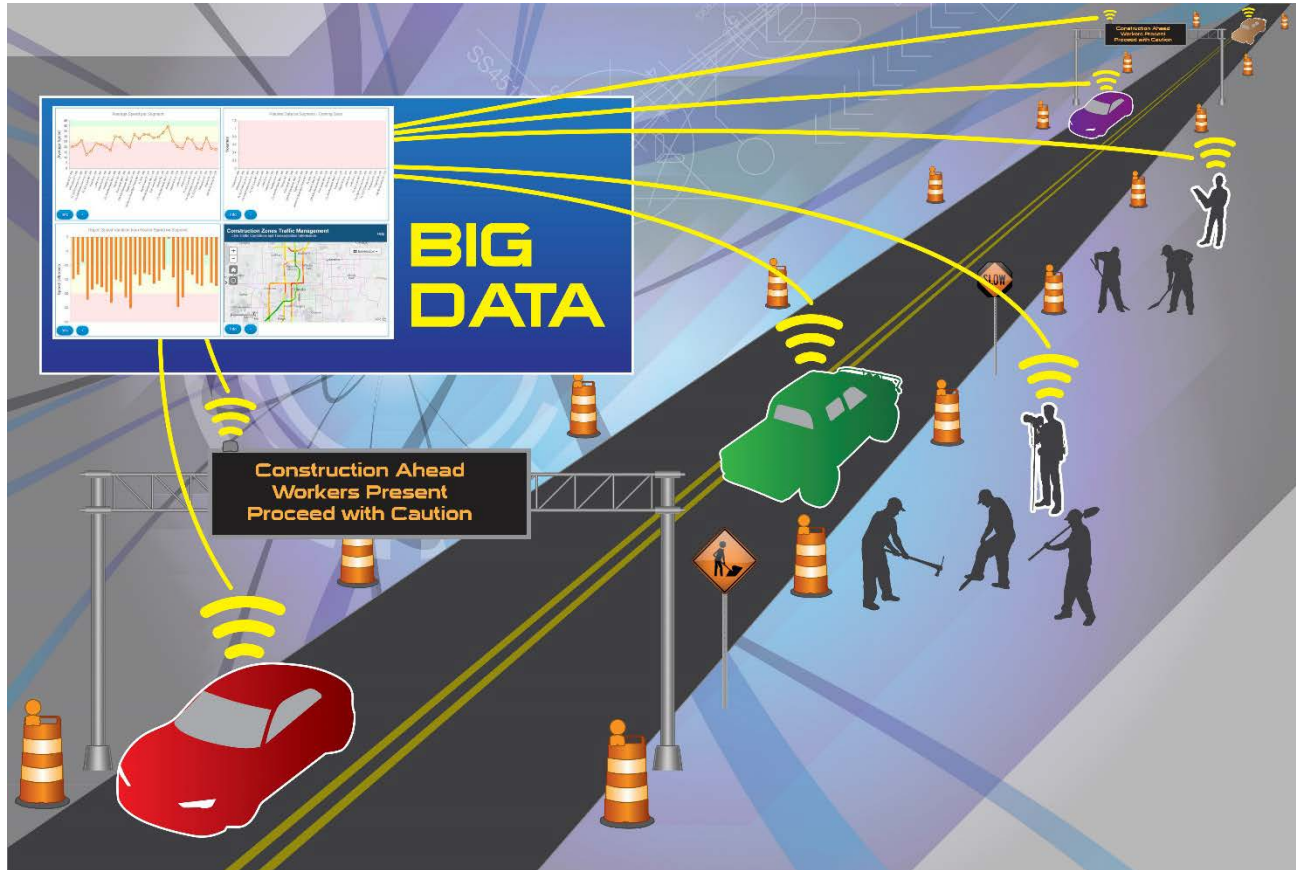


How do we store, manage, and ultimately analyze this information?

- Big Data Store – Non Relational Database Structure (Relational still has a place)
 - Any type of data
 - Any format
 - Any size
- Data Store Enables Everything
 - All Data is **readily available**
 - Data becomes **related**
 - Data is Useable



How do we get the Information?



- Real Time and historic feeding from the field to the environment
 - Probe Information (HERE)
 - Sensor Data
 - Bluetooth
- Planning Data
 - RCI
 - GIS
 - Reports

Resource Data is Available

- Planning Studies
- Planned Developments
- Work Program
- Construction Plans
- Right of Way Maps
- Comprehensive Plans



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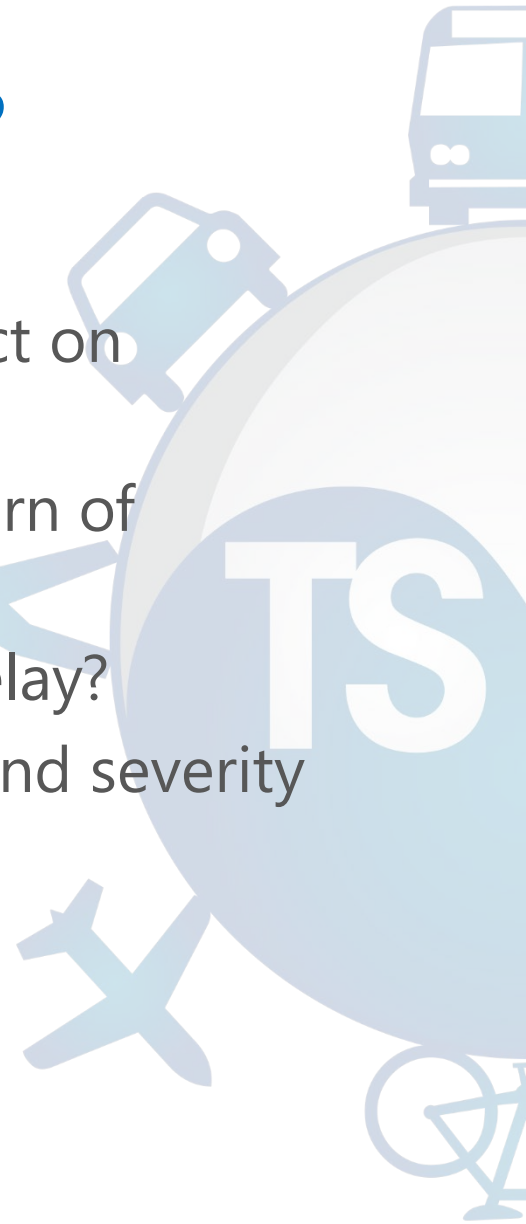
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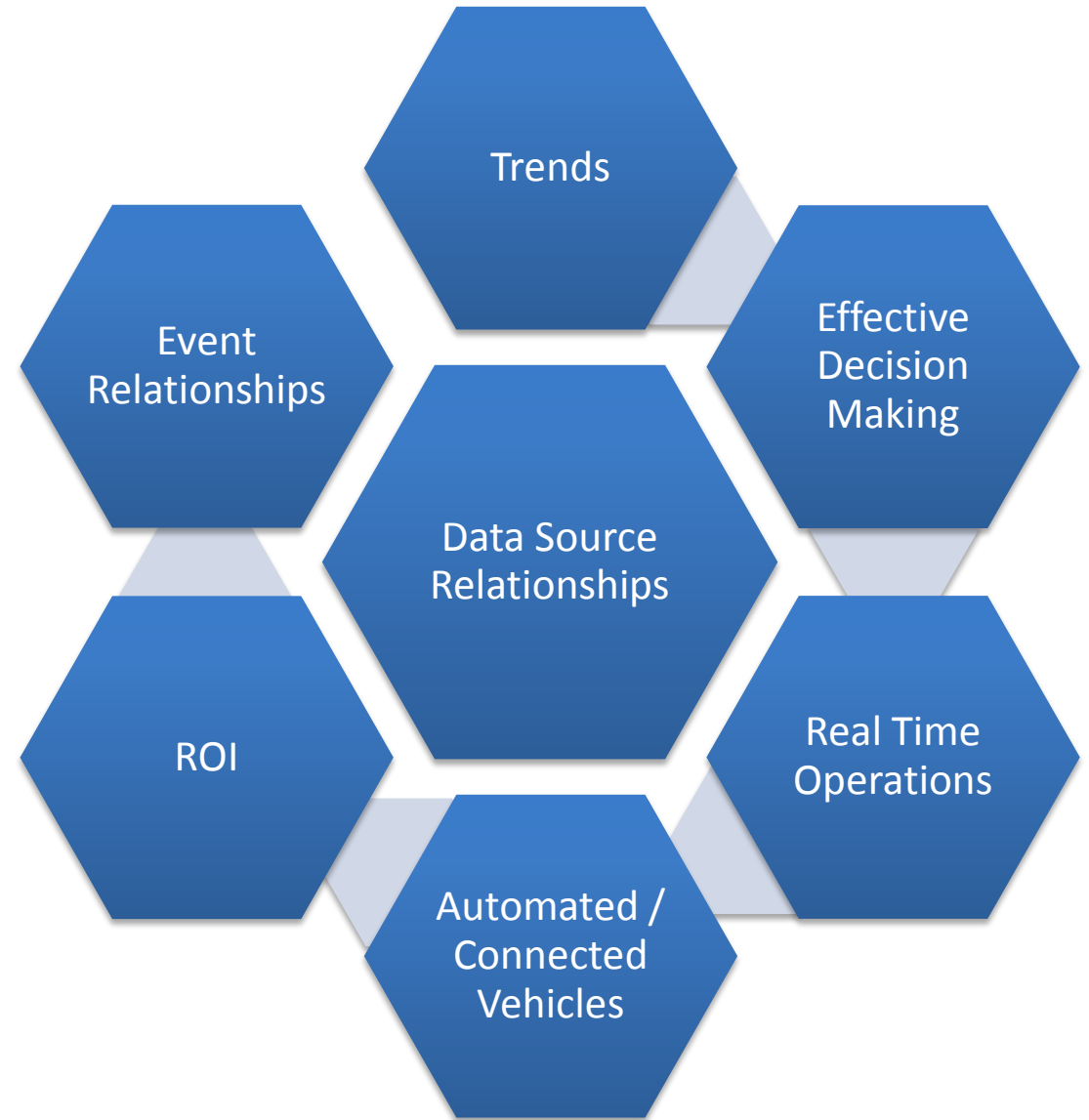
What questions do we want to answer?

- Speed
- Delay
- Volume
- Truck Percentage
- Freight Routes
- Travel Time
- Travel Time Reliability
- Incidents
- Clearance Time
- What was the incident impact on alternate routes?
- What was the benefit or return of investment in an ATMS?
- How much did we reduce delay?
- Did we reduce the number and severity of crashes?
- Is the network reliable?



Why Does this Matter?

- Executive Level – Decision & Policy Makers
- Planning Level – Project Identification / Prioritizing
- Operation Level – Improvement Strategies / Real Time Network Monitoring



Thank You!!!



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