

TITAN

Integrate. Visualize. Analyze. Predict

Yaw Adu – Gyamfi, PhD

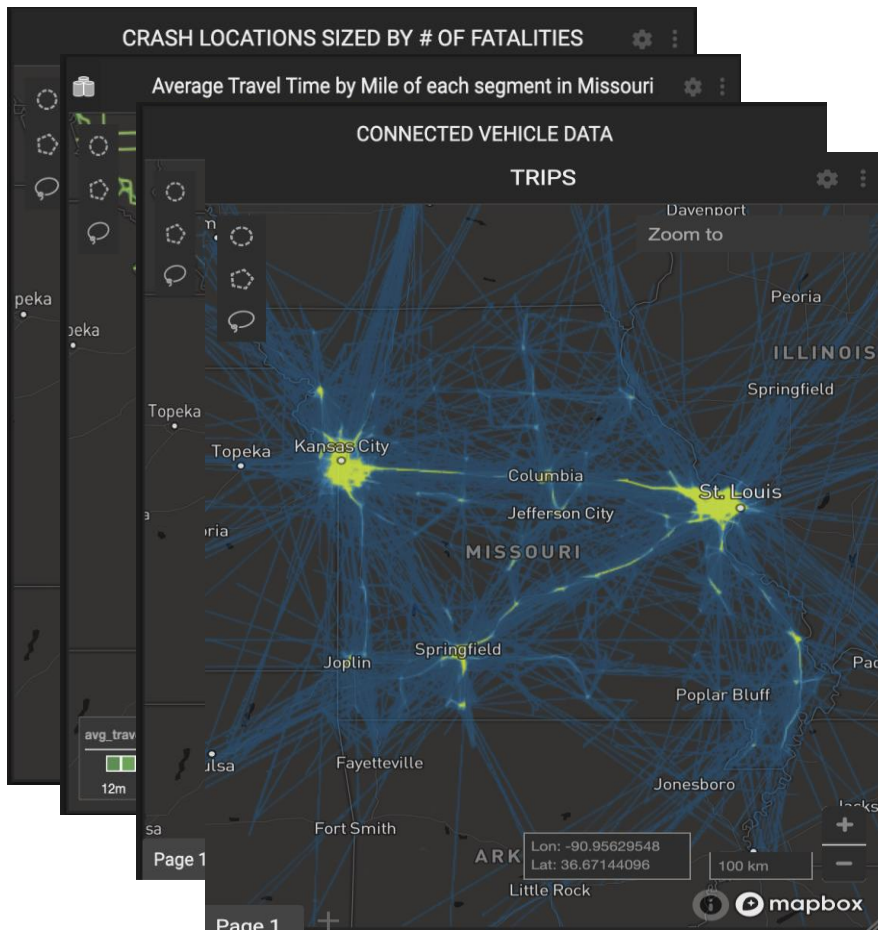
Assistant Professor

University of Missouri - Columbia

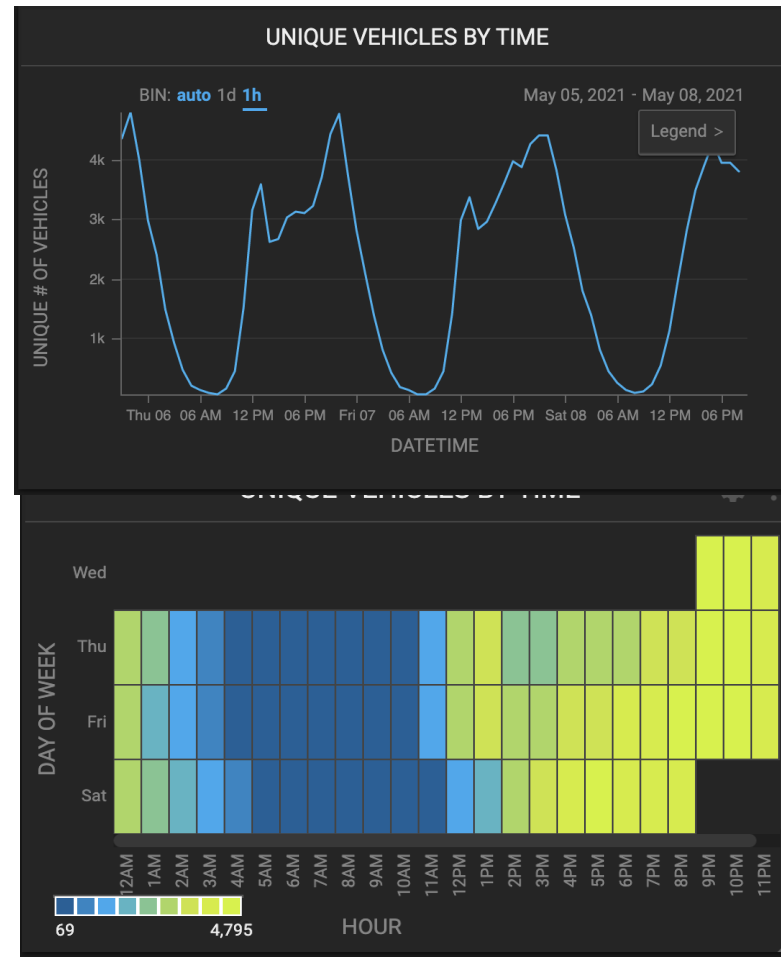
ITS HEARTLAND

Presentation Highlights

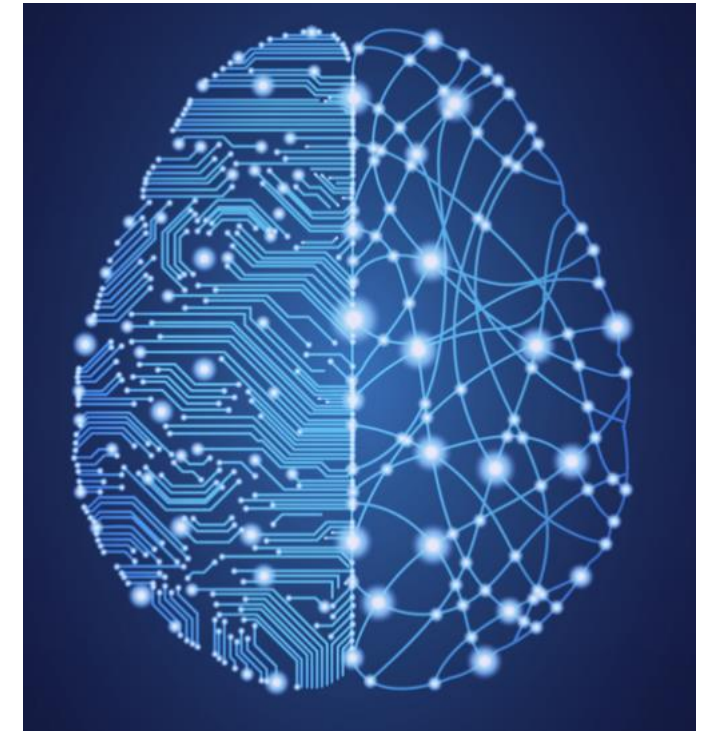
Big Data



Visual Analytics

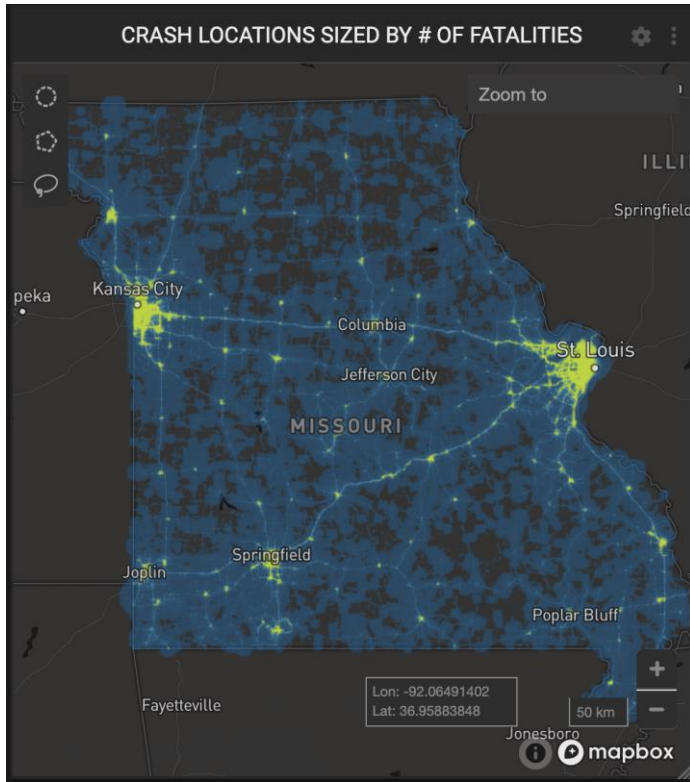


Predictive Analytics

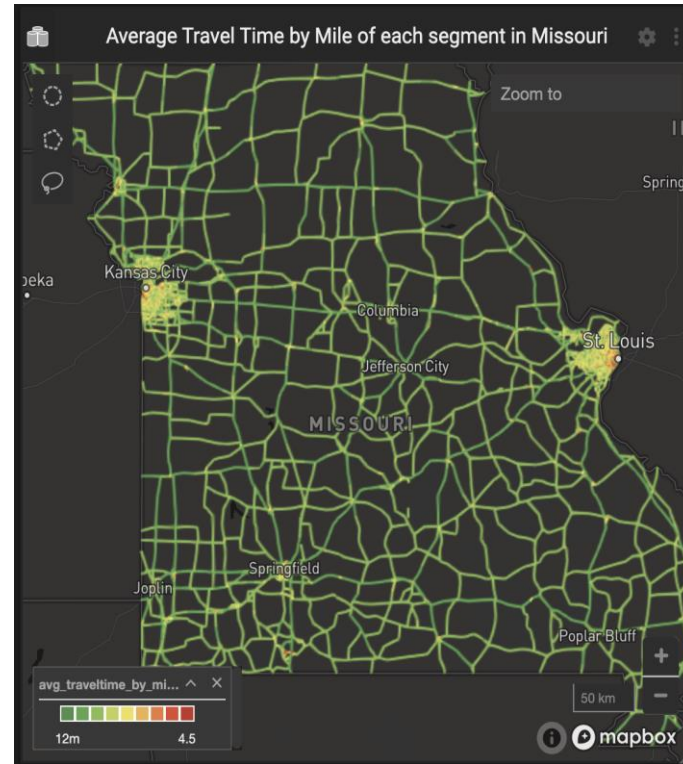


Big Data

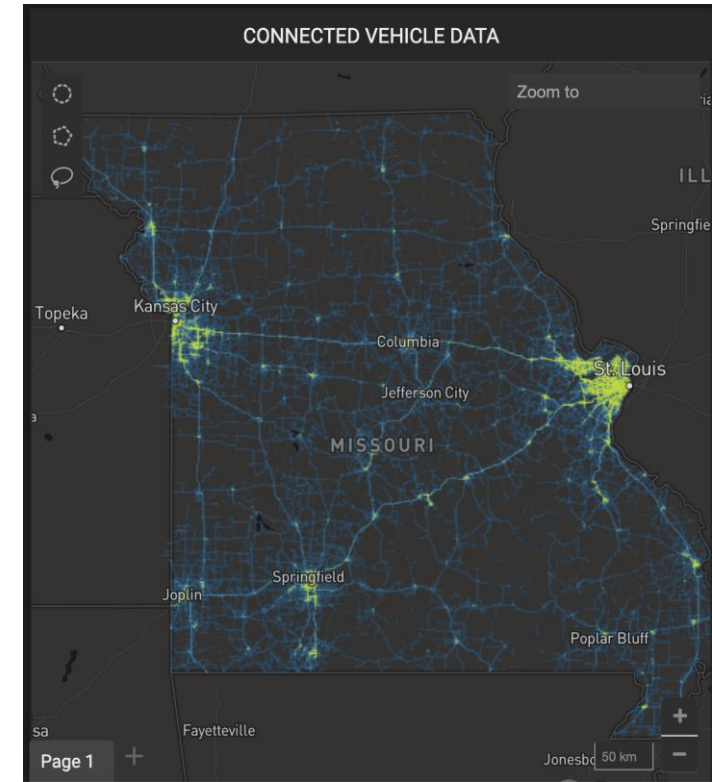
1.4 million rows: 10 years



57 Billion rows: 10 years



12 Billion rows: 1 year



It is not Fair

Can you get me crash data for St Charles, on I-70 for the last 2 years

I just want the pedestrian crashes for St Charles that involved a minors



Do we have traffic counts data for 270 for March?

I really need to see how long it takes us to clear an incident on 64 during peak hours.

Data Democratization



DATA

HARDWARE

SOFTWARE

QUESTIONS

Compare and Contrast

DEMOGRAPHIC: Age, Income, Gender

TEMPORAL: Day of week, Month, Year

SPATIAL: Road, Corridor, Intersection

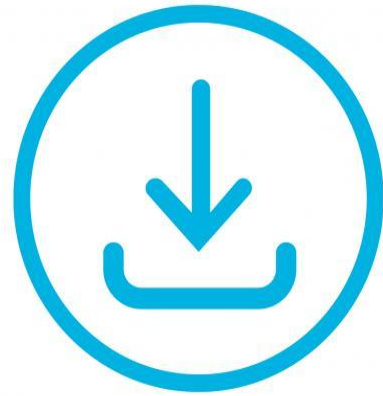
REGION: County, City, District, State.

TITAN COMPONENTS

CLOUD-WEB-BASED



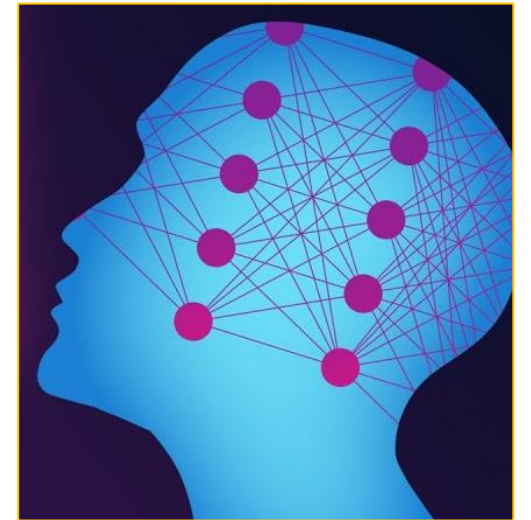
DATA
WAREHOUSE



DATA
DOWNLOAD



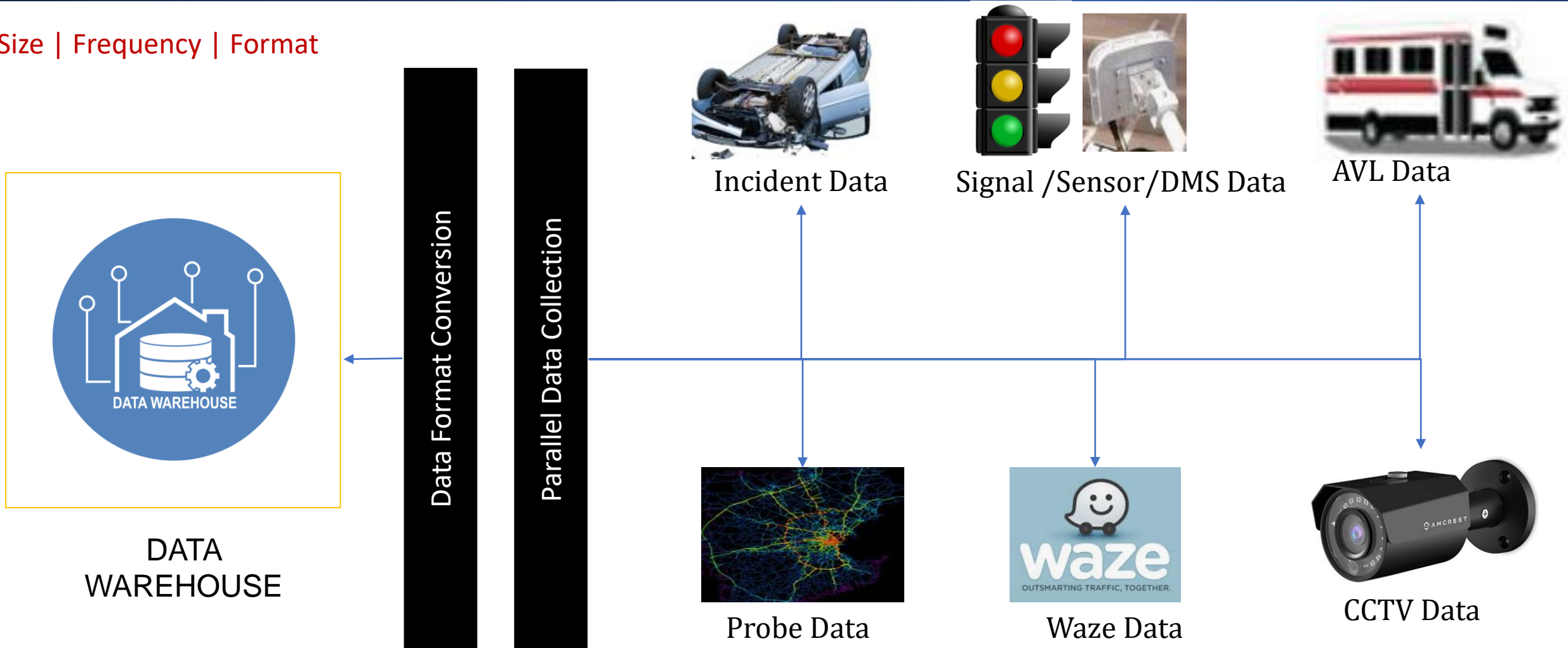
VISUAL
ANALYTICS



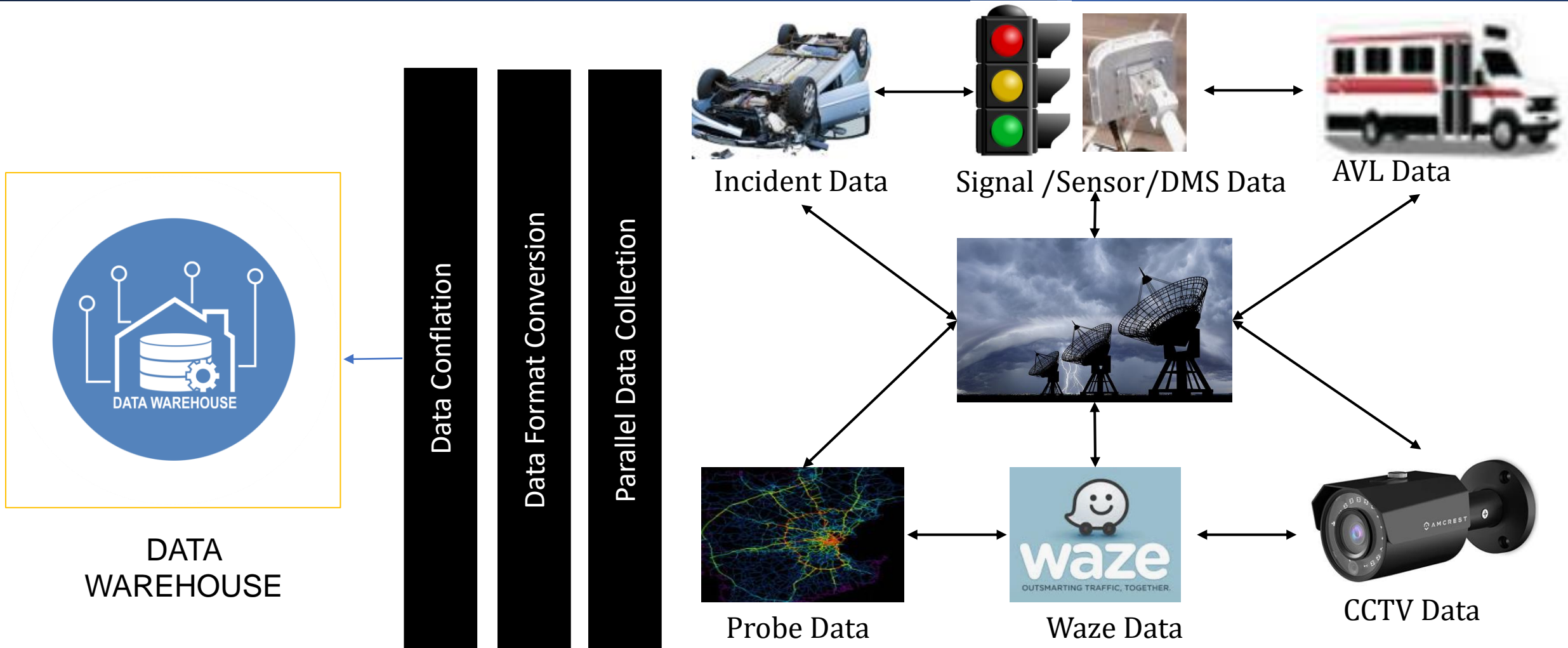
PREDICTIVE
ANALYTICS

TITAN COMPONENTS - DATA WAREHOUSE

Size | Frequency | Format



TITAN COMPONENTS - DATA WAREHOUSE

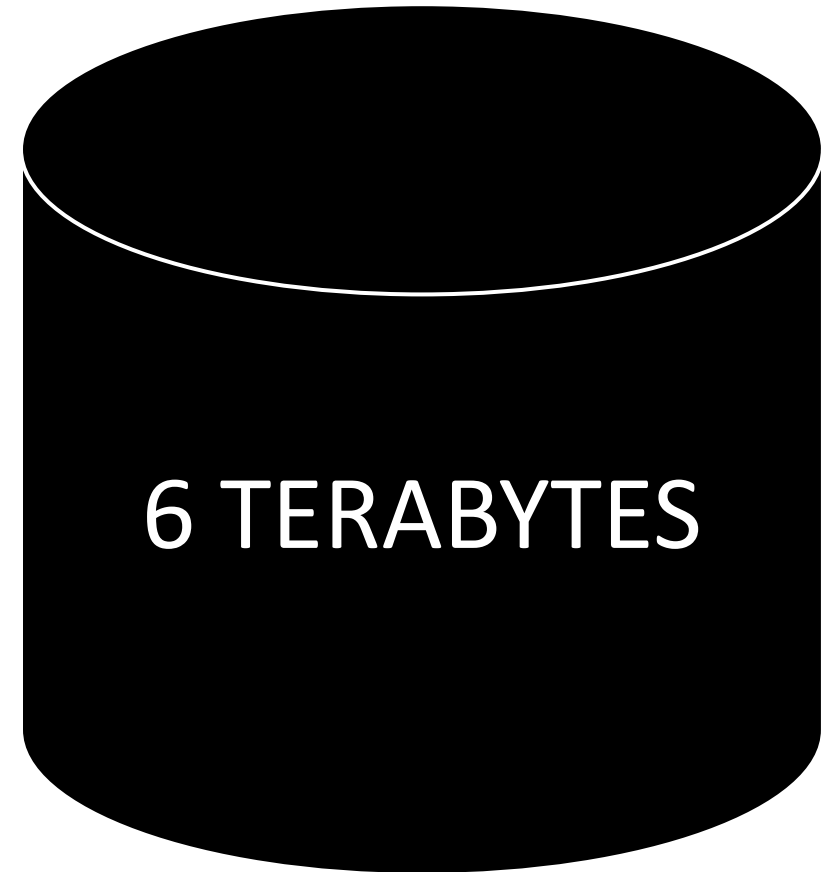


TITAN COMPONENTS - DATA WAREHOUSE



DATA
WAREHOUSE

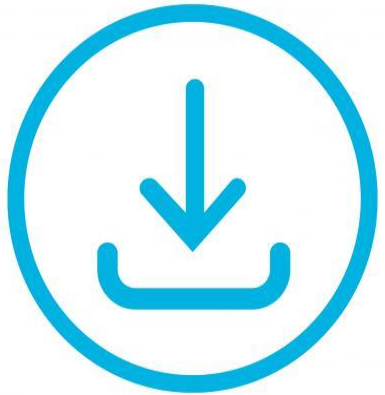
- Crashes
- Incidents
- Waze
- Detector
- Probe
- Trajectory
- Weather
- CCTV**



TITAN COMPONENTS – DATA DOWNLOAD

WEB INTERFACE

API

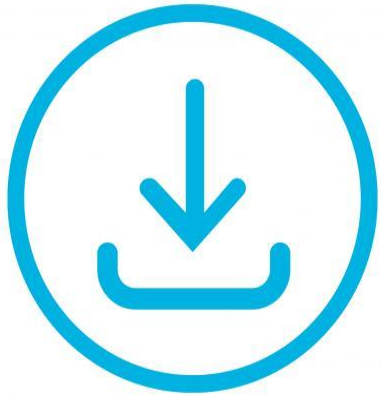


DATA
DOWNLOAD

HISTORICAL

REAL-TIME

TITAN COMPONENTS – DATA DOWNLOAD



DATA
DOWNLOAD

Query Detector Database

Start Date 2023/03/19 End Date 2023/03/26

Units for Travel Time
minutes

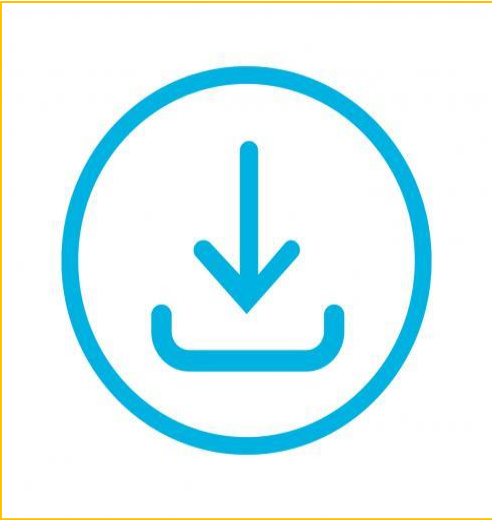
Aggregation Interval
60 min

File Name
Detector

Select County
Saint Charles

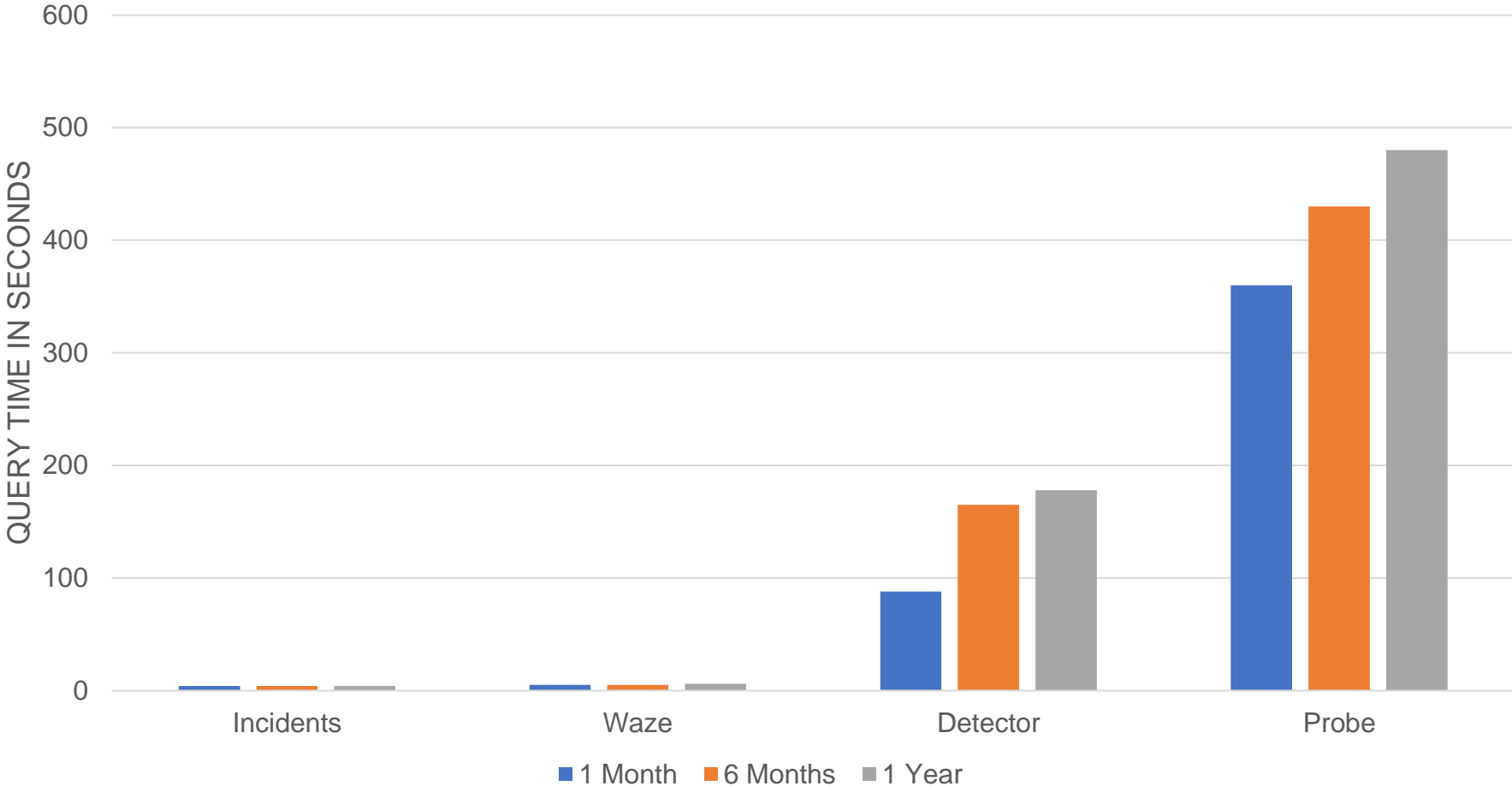
SUBMIT QUERY

TITAN COMPONENTS – DATA DOWNLOAD

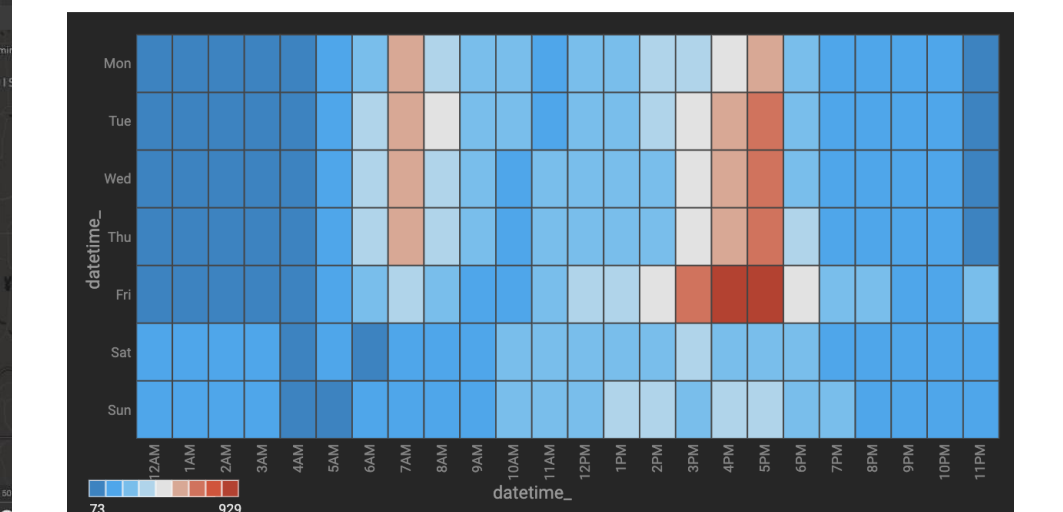
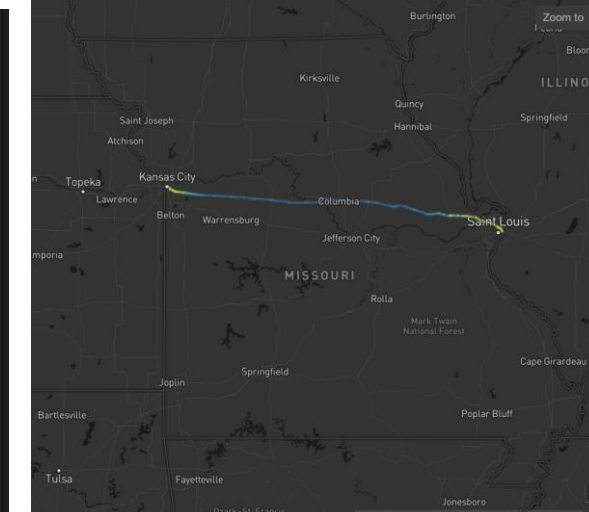
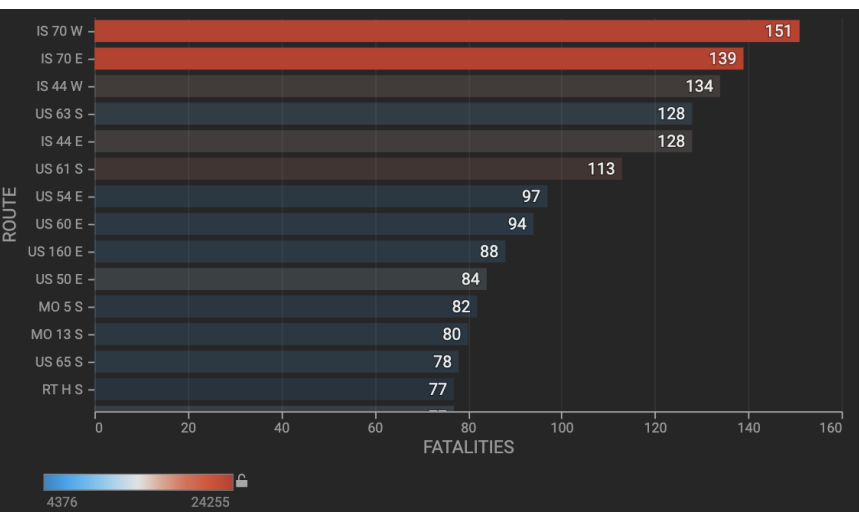
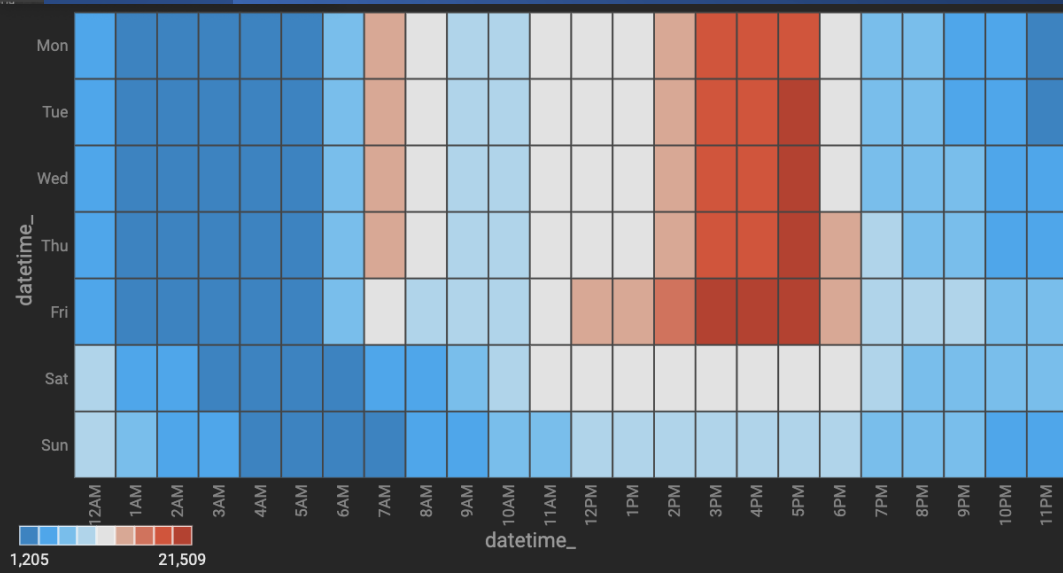
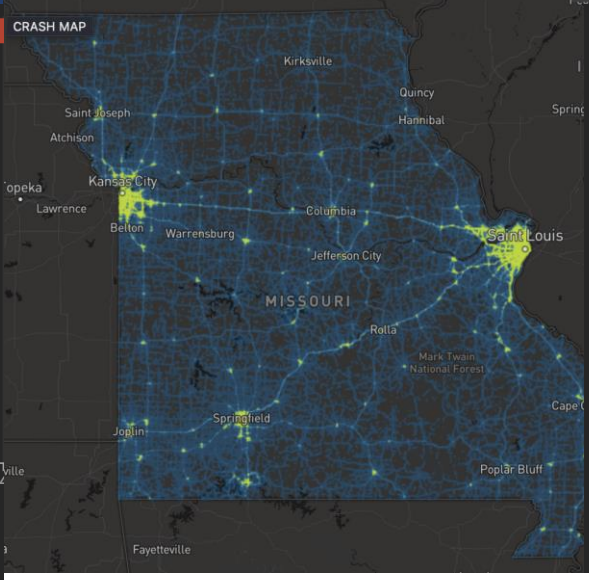
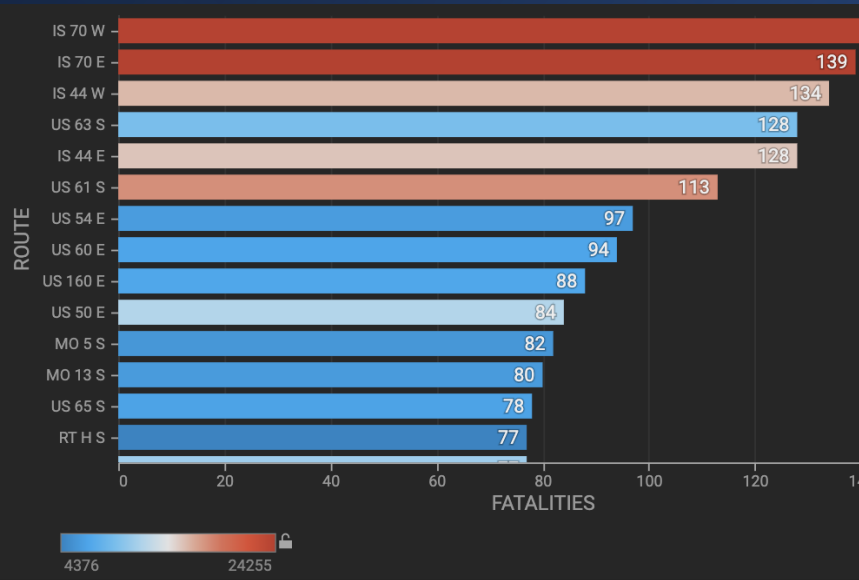


DATA
DOWNLOAD

DATA QUERY SPEEDS



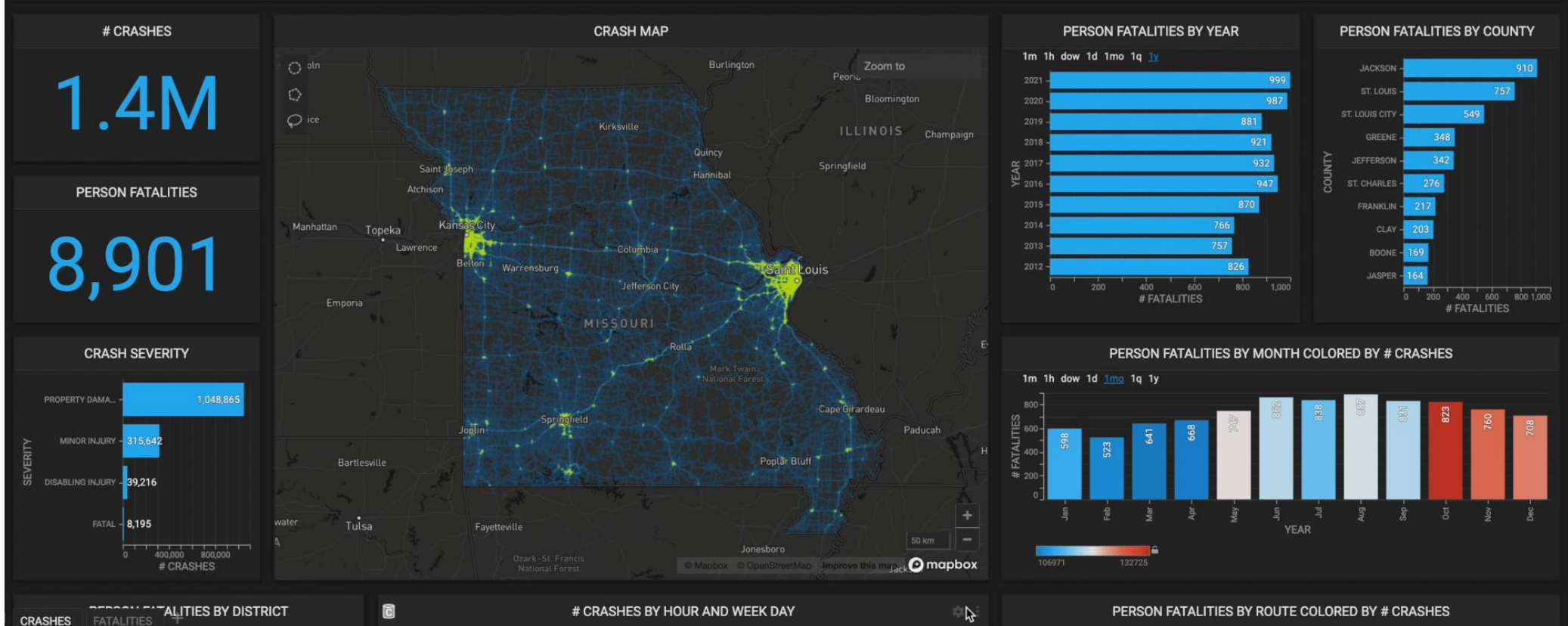
TITAN COMPONENTS - VISUAL ANALYTICS



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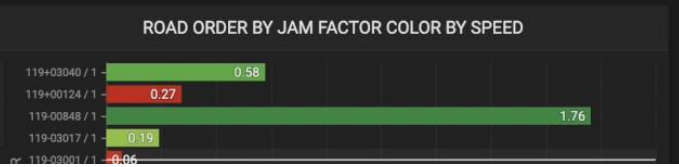
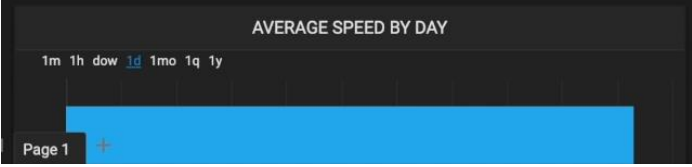
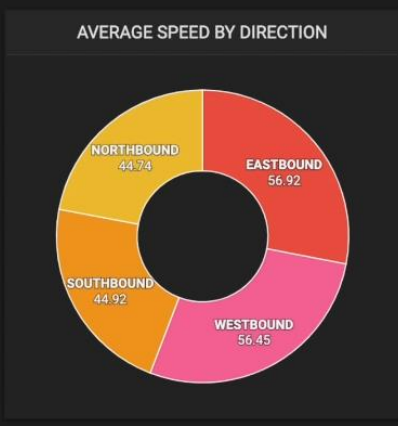
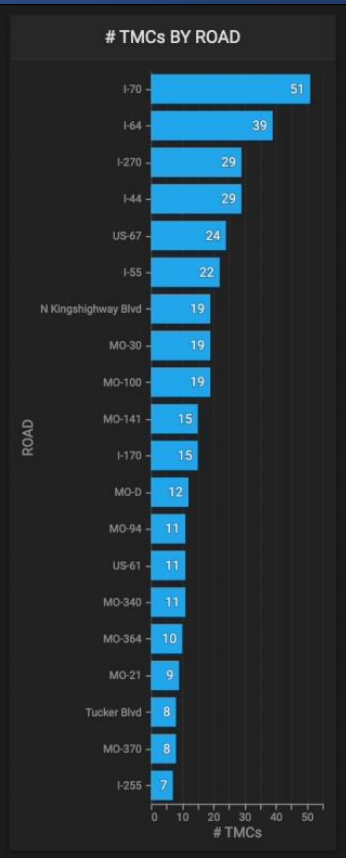
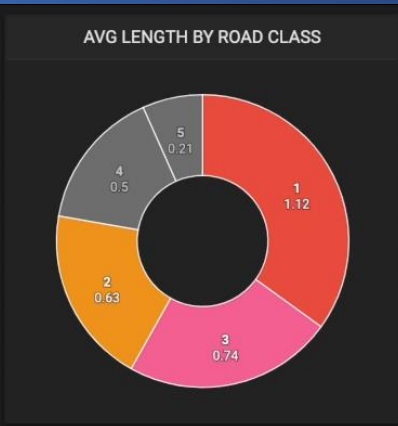
- App Center
- Safety
 - Probe
 - TrafficCounts
 - DailyCongestion
 - TrafficJams
 - WazeAnalytics
 - TranscoreAnalytics
 - WinterSeverity
 - CrashesSHP
 - Congestion
 - IncidentClearance
 - DetectorHealth
 - INTEGRATED
 - MotorCycles
 - CrashRisk

Dashboard only includes crashes that are landed on MoDOT's roadway inventory.



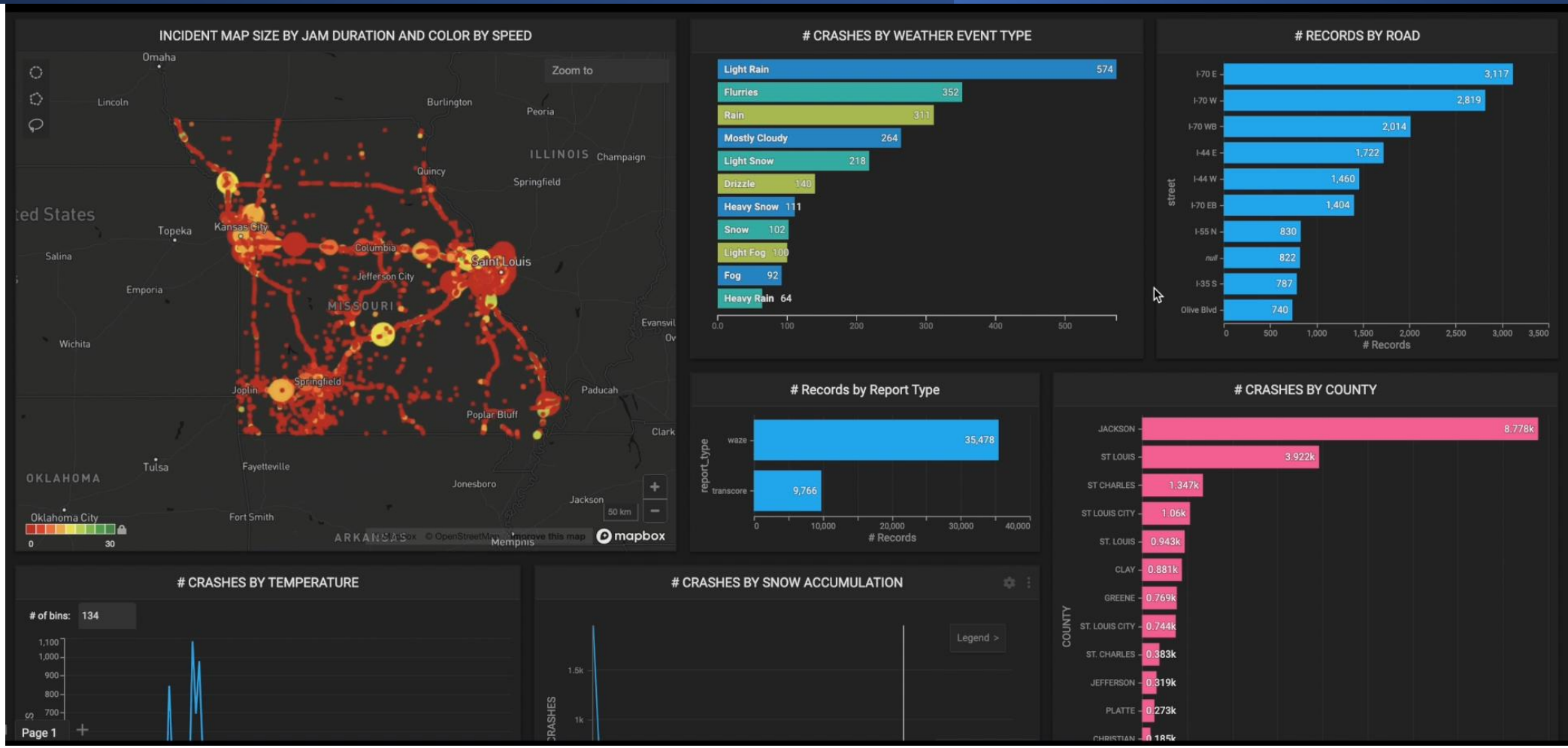
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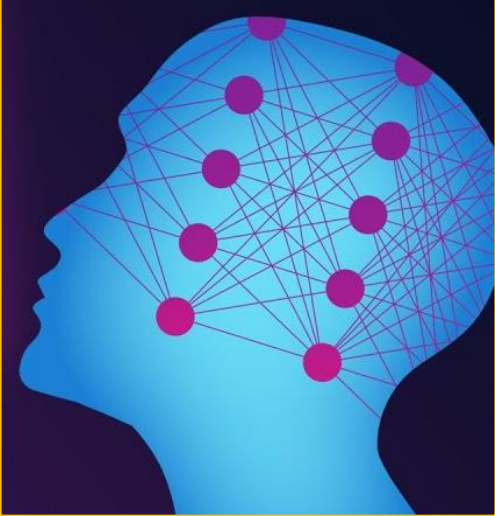


TITAN COMPONENTS - VISUAL ANALYTICS

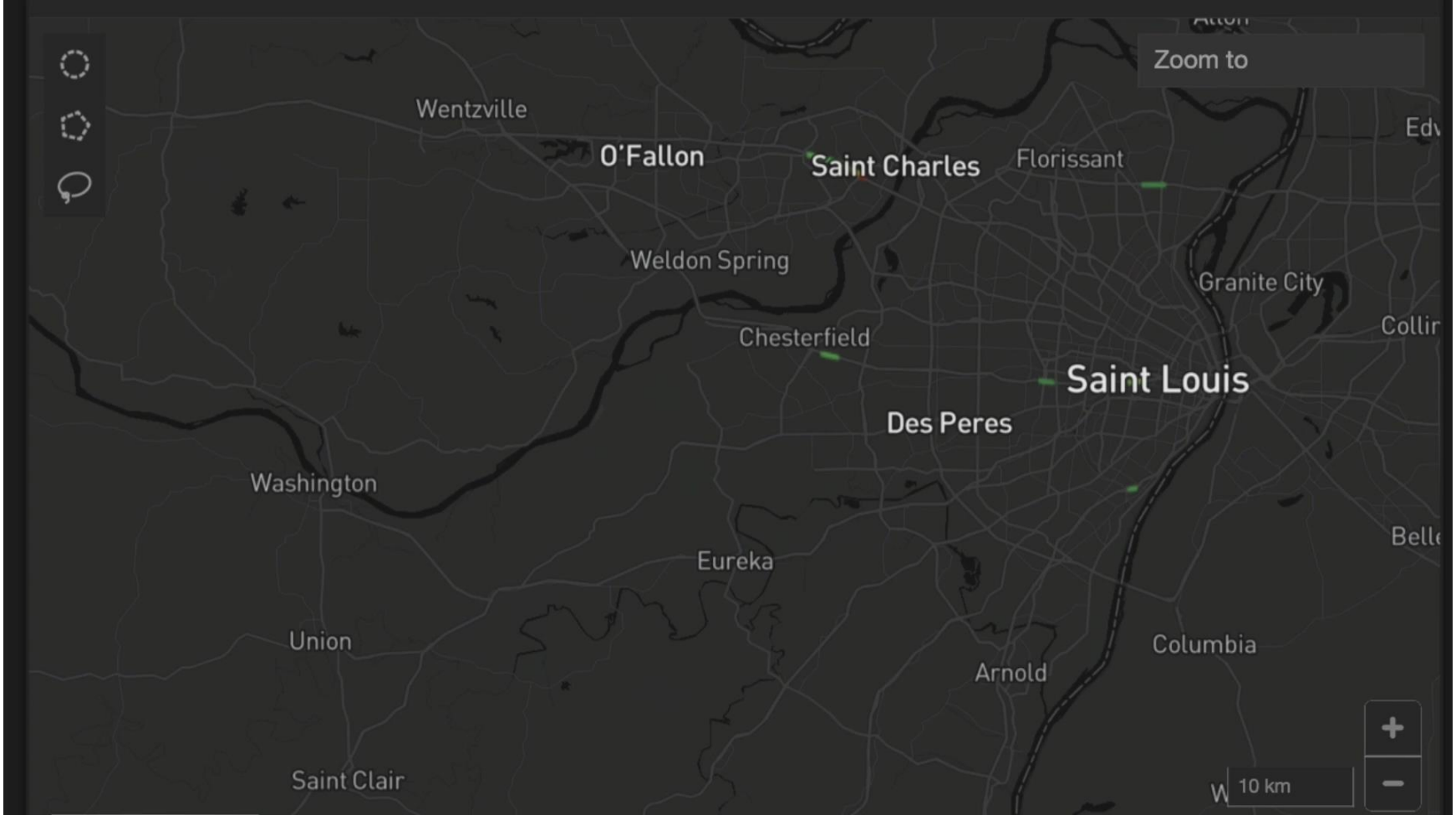
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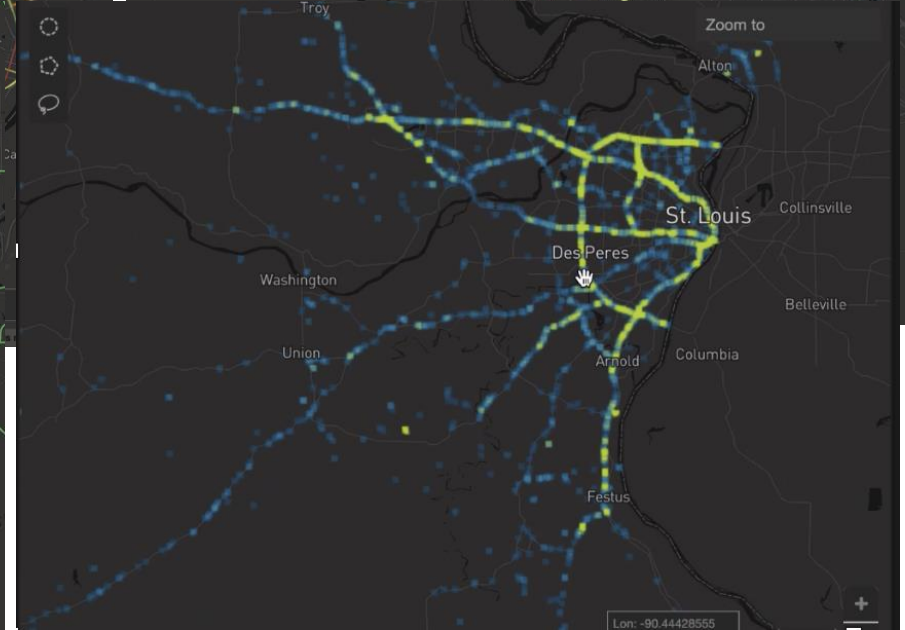
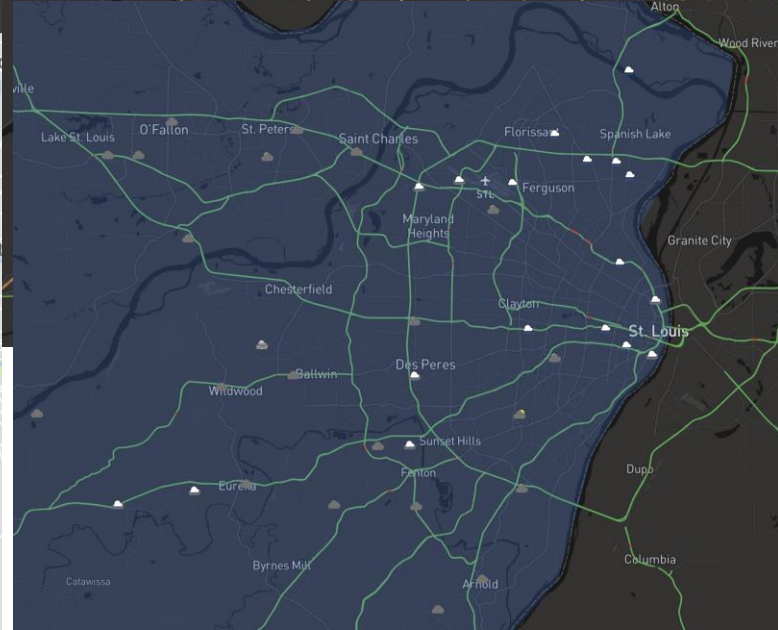
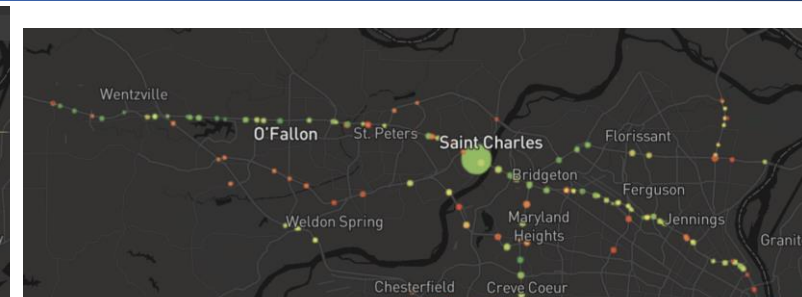
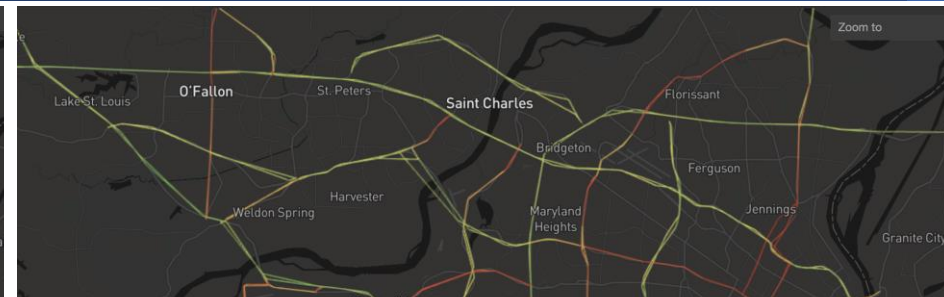
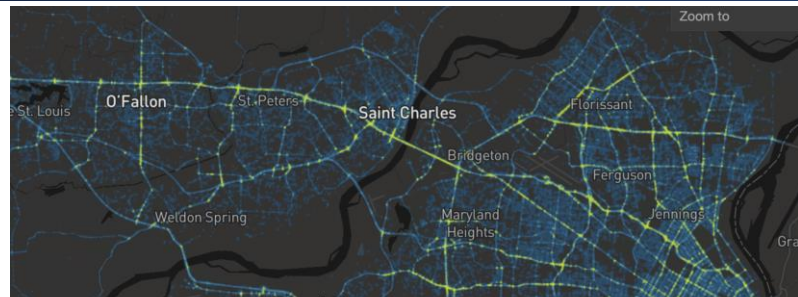
TITAN COMPONENTS - PREDICTIVE ANALYTICS



PREDICTIVE ANALYTICS



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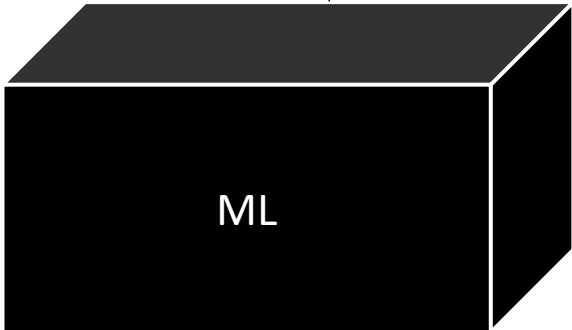


QUEUES

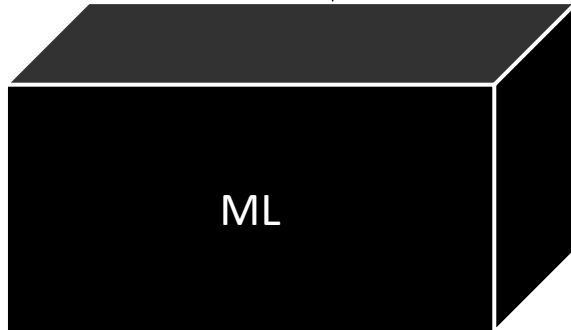
WEATHER

HARD BRAKING/ACCELERATION

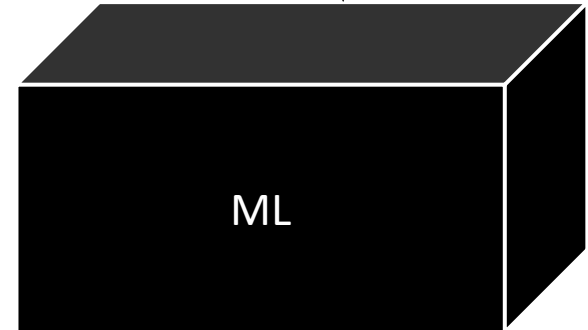
TITAN COMPONENTS - PREDICTIVE ANALYTICS



Dog

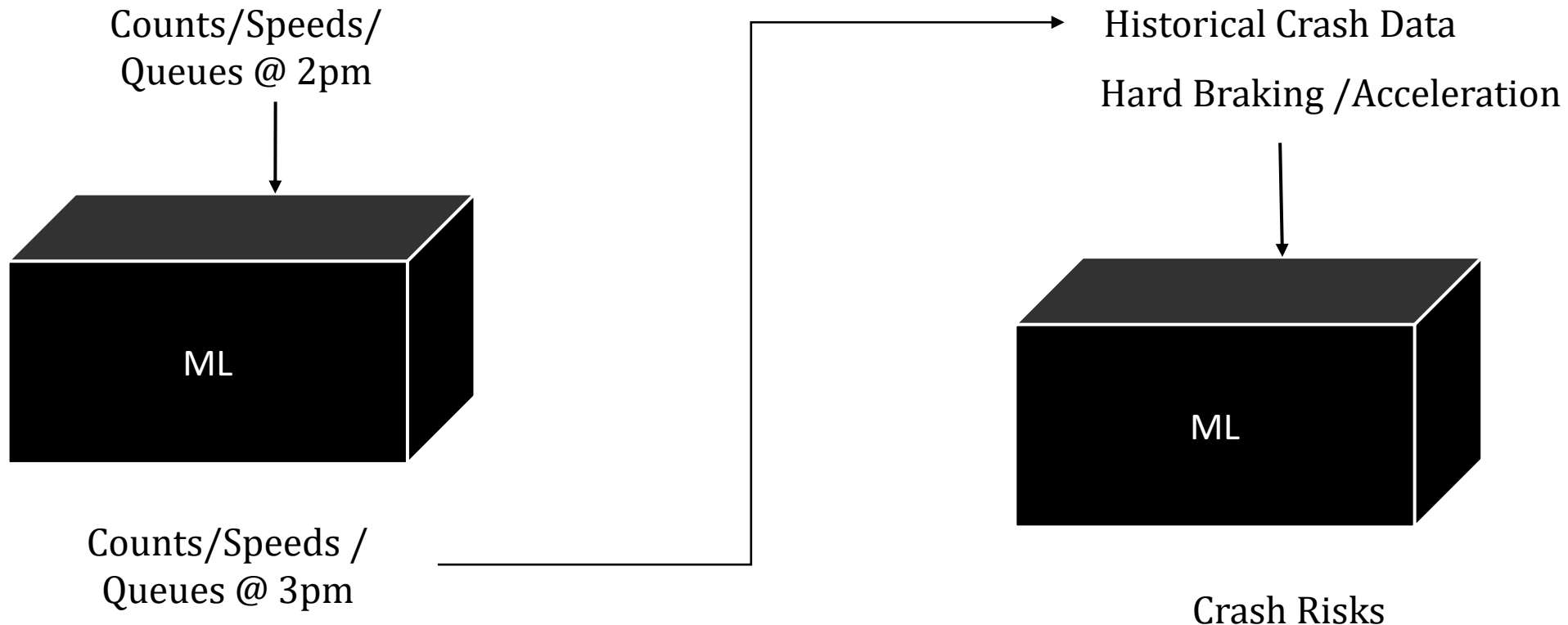


Cat



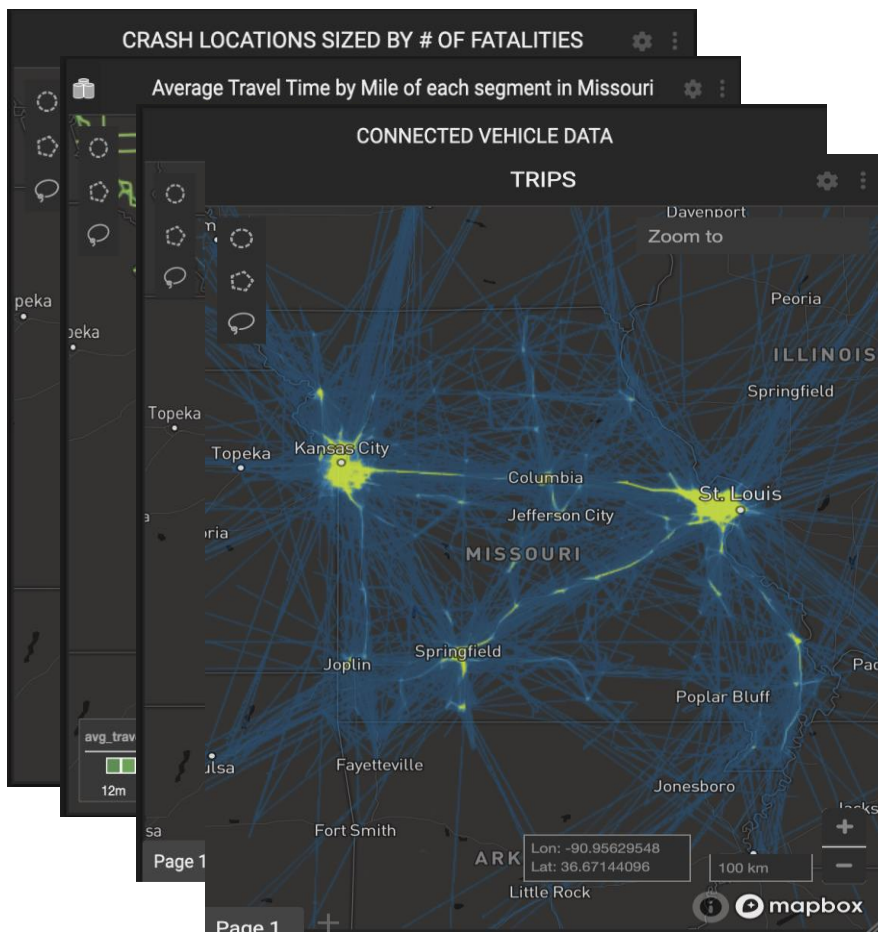
Car

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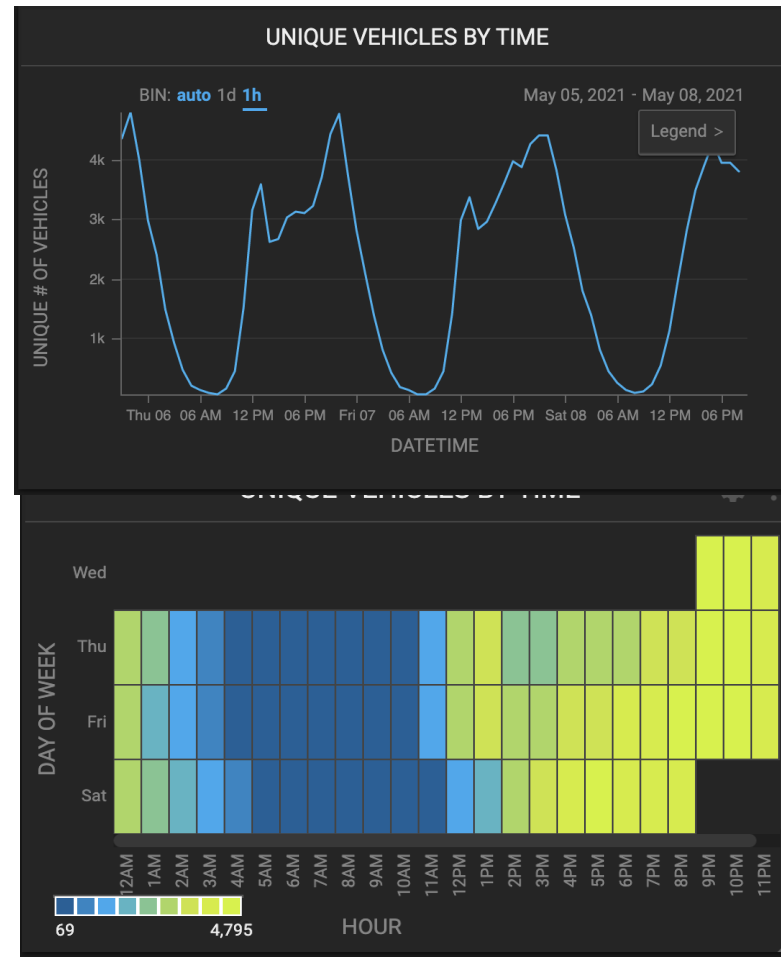


Concluding Remarks

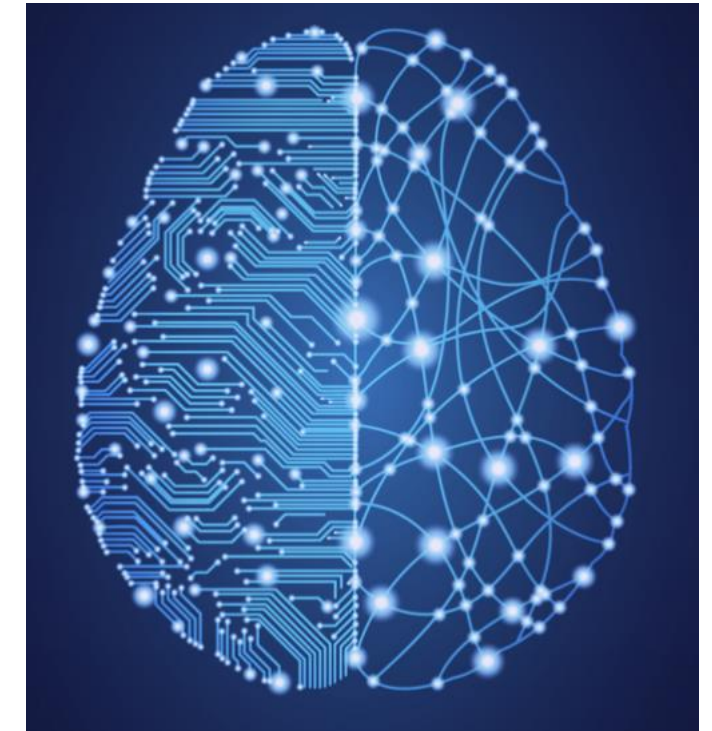
Big Data



Visual Analytics



Predictive Analytics

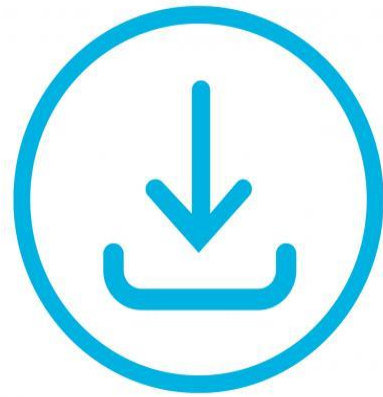


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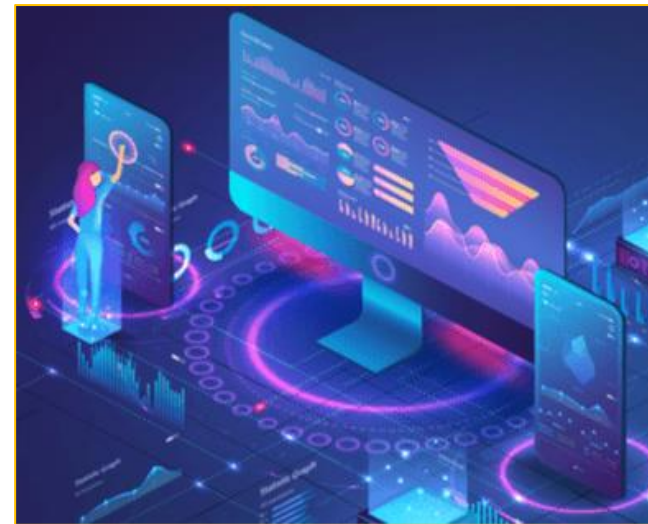
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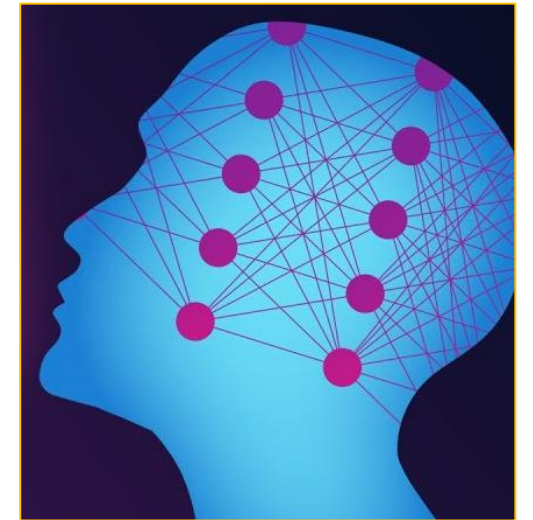
DATA
WAREHOUSE



DATA
DOWNLOAD



VISUAL
ANALYTICS



PREDICTIVE
ANALYTICS

Thank You

