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Dynamic use of big data in the Abu Dhabi modelling framework

STEAM+ Consortium

مركز النقل المتكامل
INTEGRATED TRANSPORT CENTRE

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Jacobs

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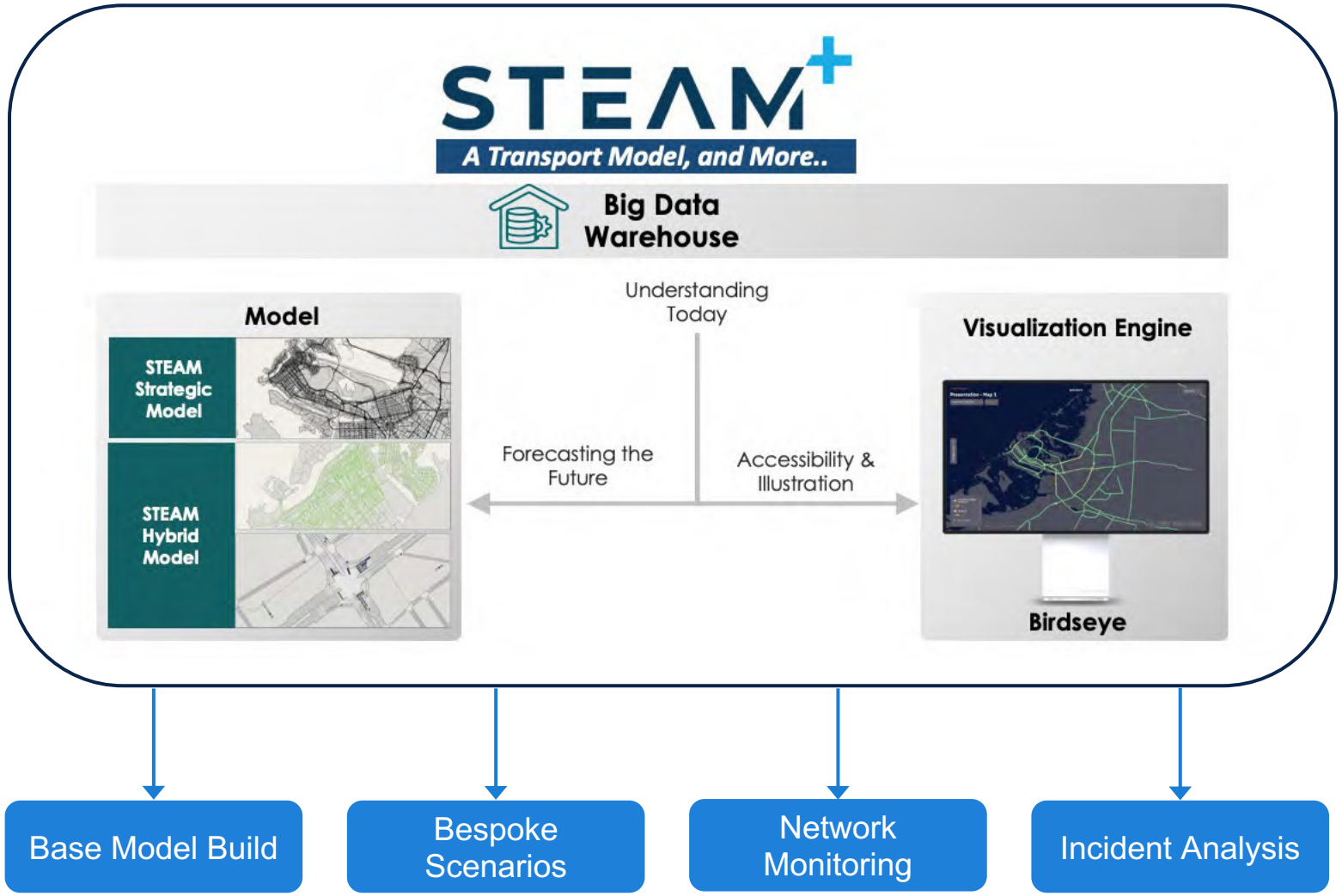
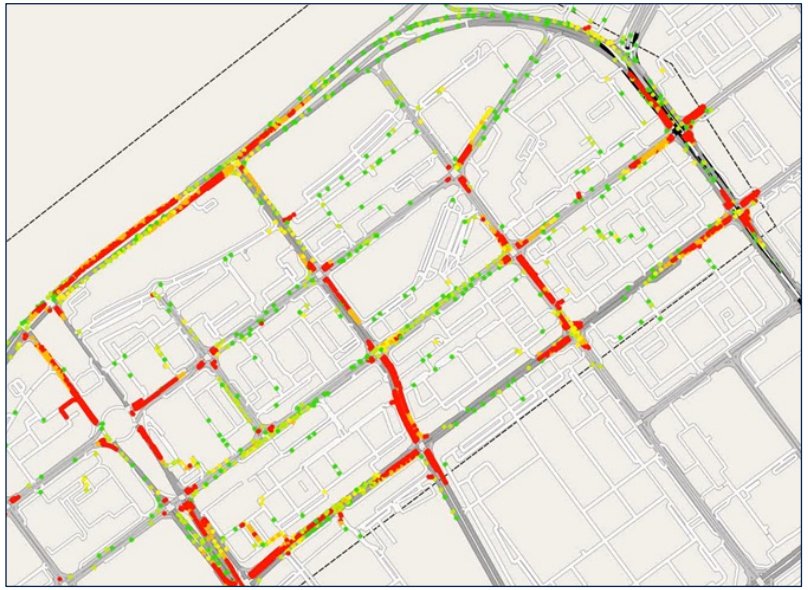
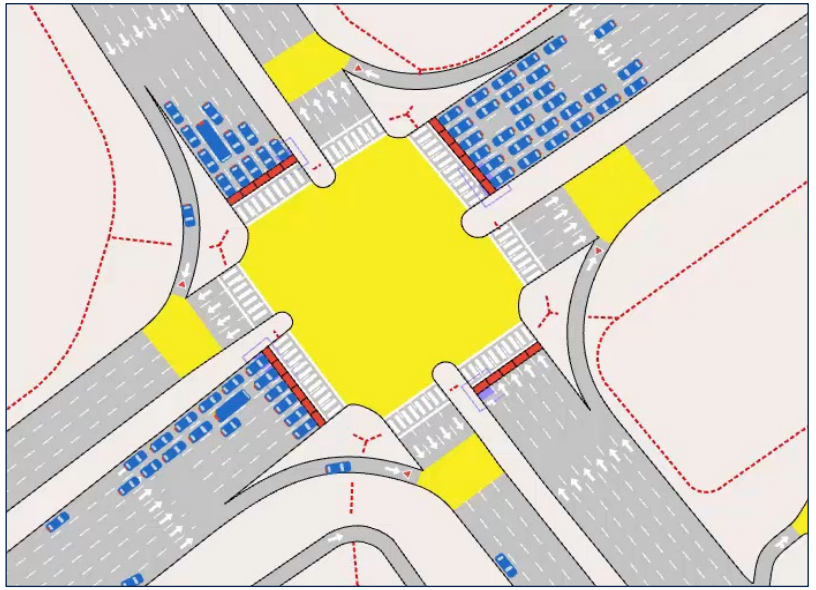
STEAM+ Framework



Hybrid Simulation Model

Strategic Level	Meso Level	Micro Level
		
Strategic master planning	Feasibility studies	Detail design and assignment
Policy testing	Traffic impact studies	Special event planning
Land use testing	Congestion and signal coordination	Detours and contraction phasing
Long-term planning	Public transport mid-term planning	Public transport mid-term planning

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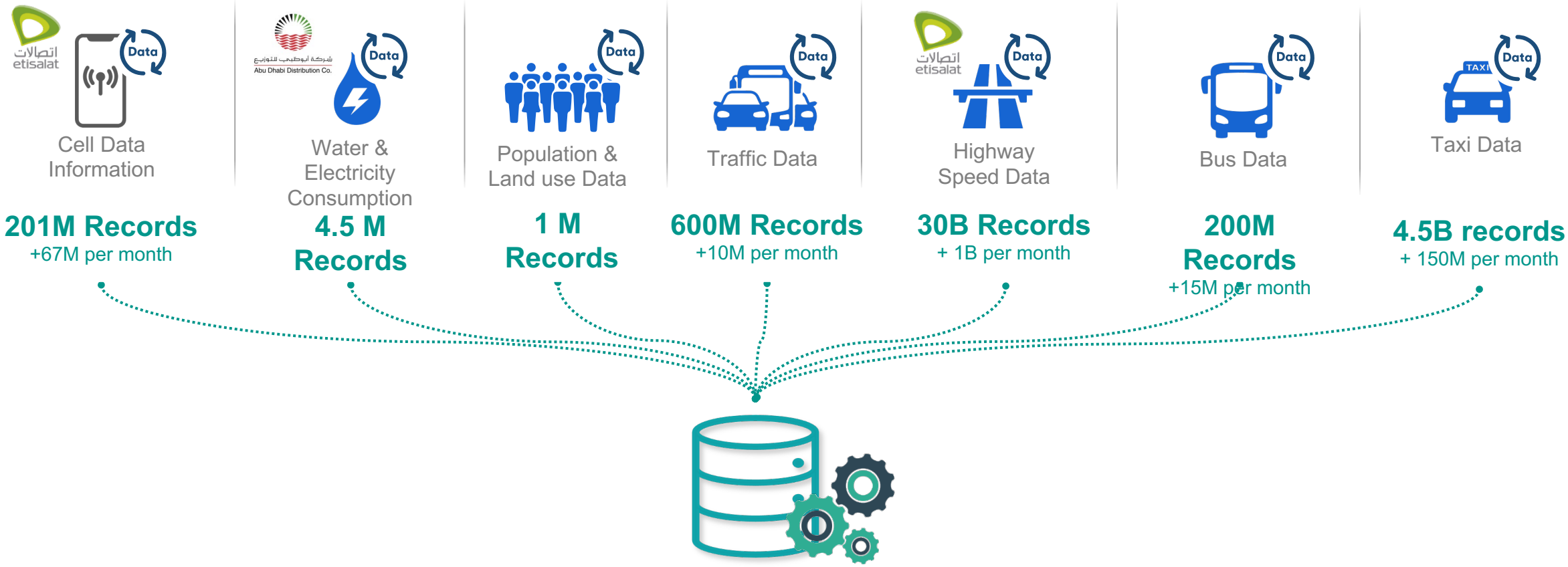
Data Warehouse



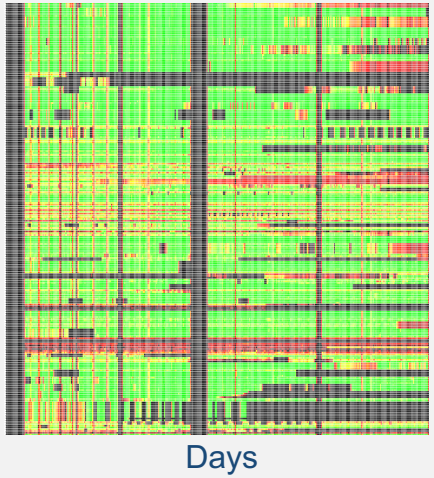
Billions of rows of data dynamically fed into the data warehouse

Use Case 1: Pattern Analysis for the New Base Year Model

Data Warehouse

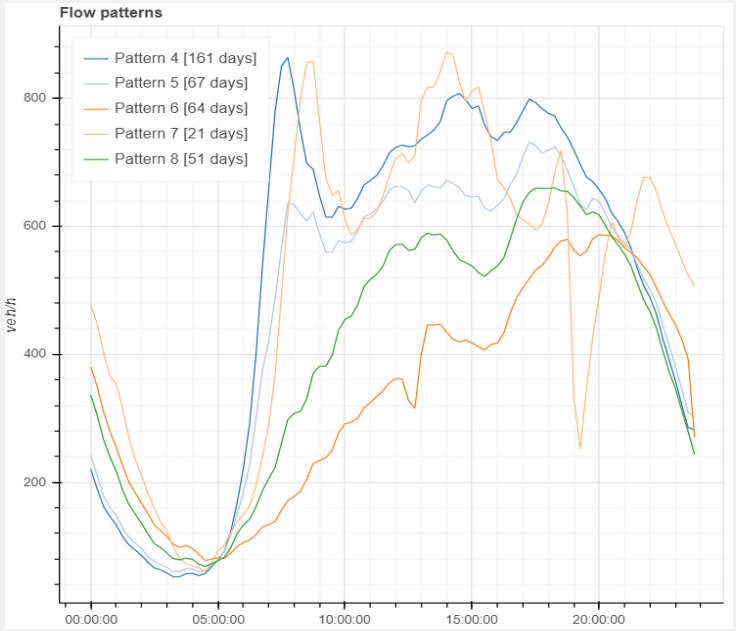
Historical Raw Data

Analysis and Cleaning



The Data cleaner is the process in which historical data are treated for the purpose of obtaining a “clean” dataset.

- Data-pre-processing and understanding.
- Filter outliers/incoherent measurements
- Infill missing data
- Estimates the reliability of the infilled data
- Aggregates/interpolate data into the desired sampling period, for example 1min to 15min;
- Aggregates data in “stations”, for multi loop locations;



Detector locations and stations

HSM Model

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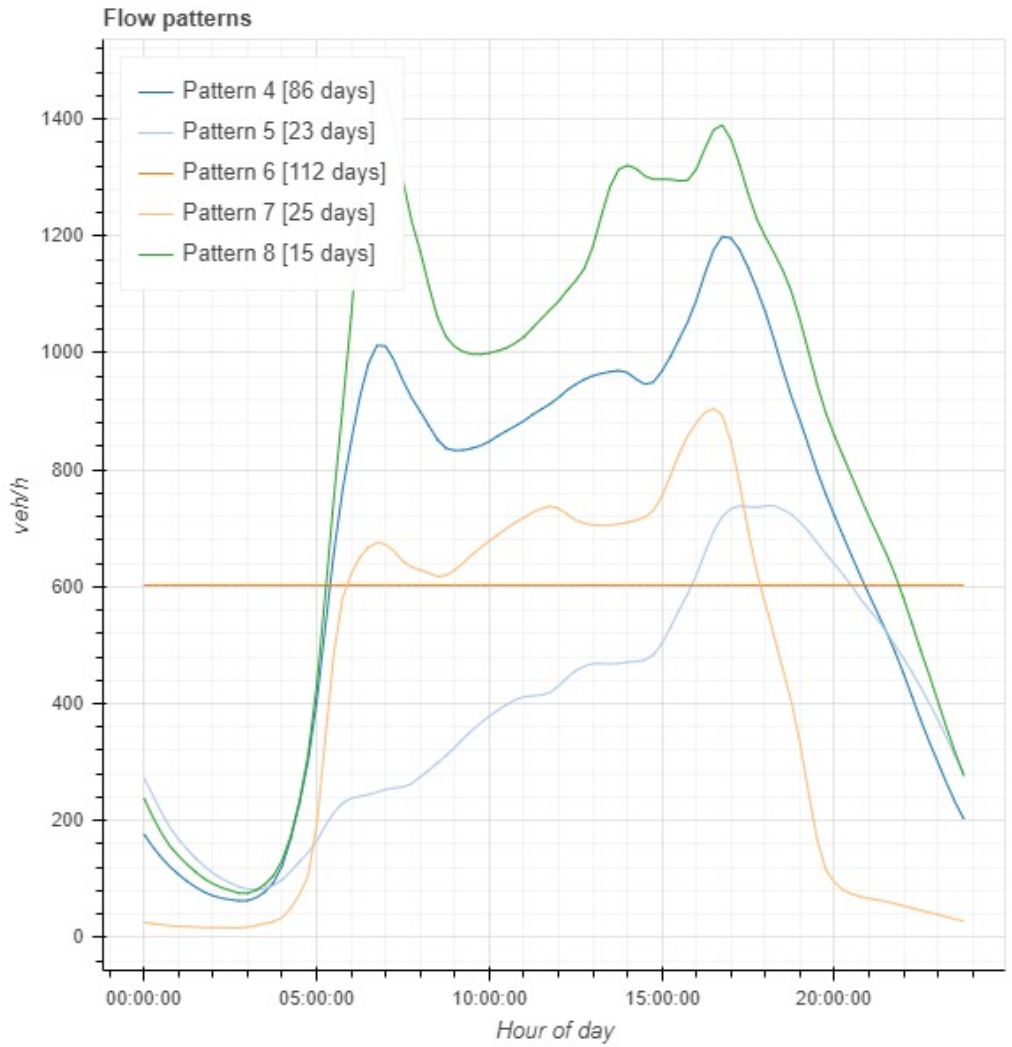
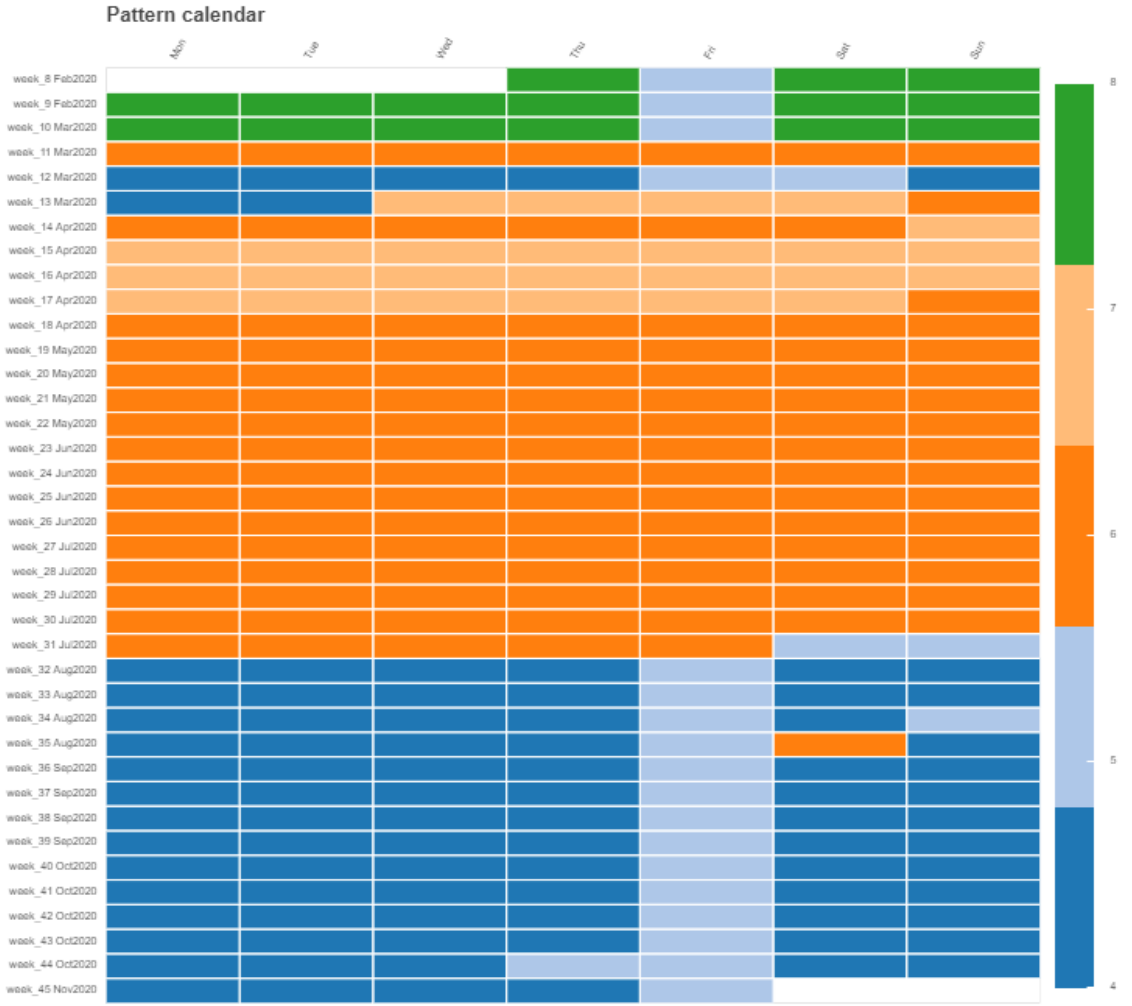
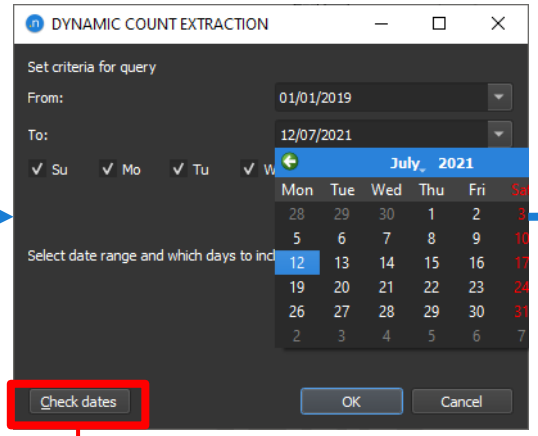
Use Case 1: Pattern Analysis for the New Base Year Model





Use Case 2: Junction Performance Monitoring

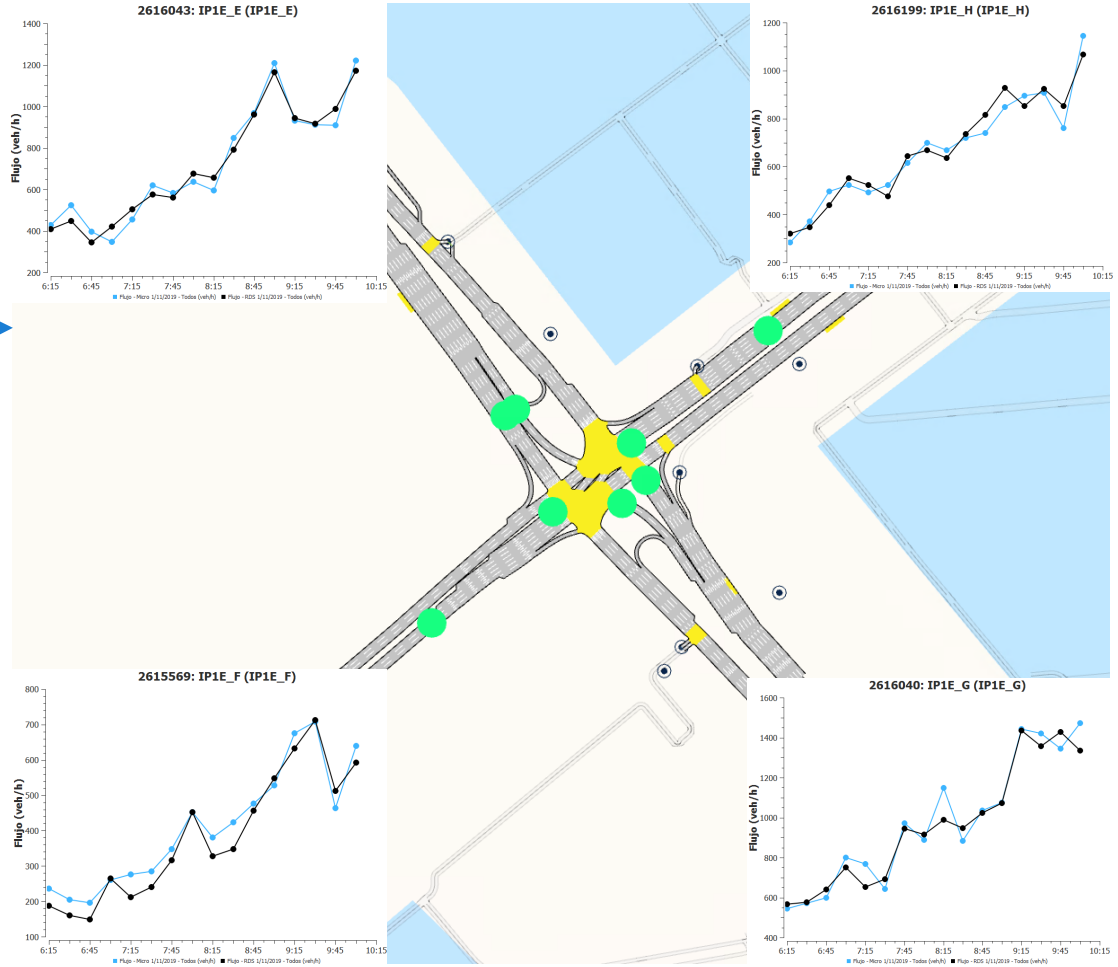


167 RTMS stations have data for the selected range

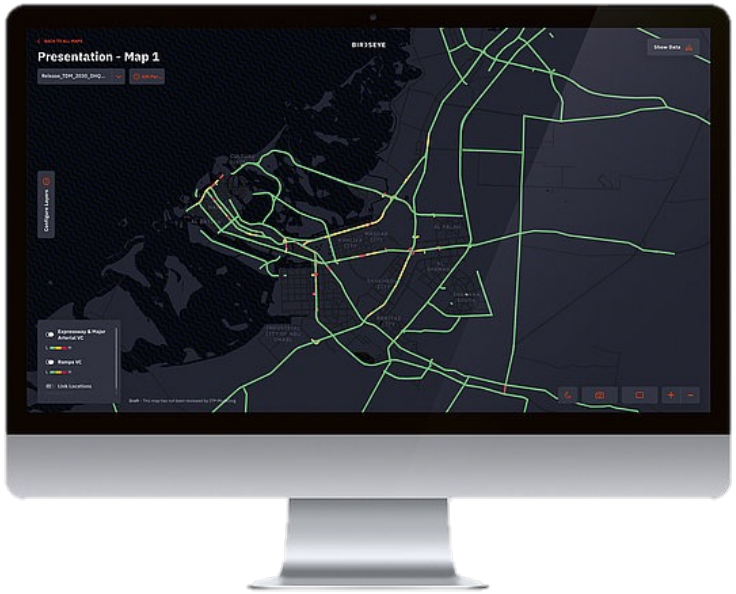
154 MCC locations have data for the selected range

762 Abu Dhabi SCOOT locations have data for the selected range

1406 other SCOOT locations have data for the selected range



Use Case 3: Birdseye

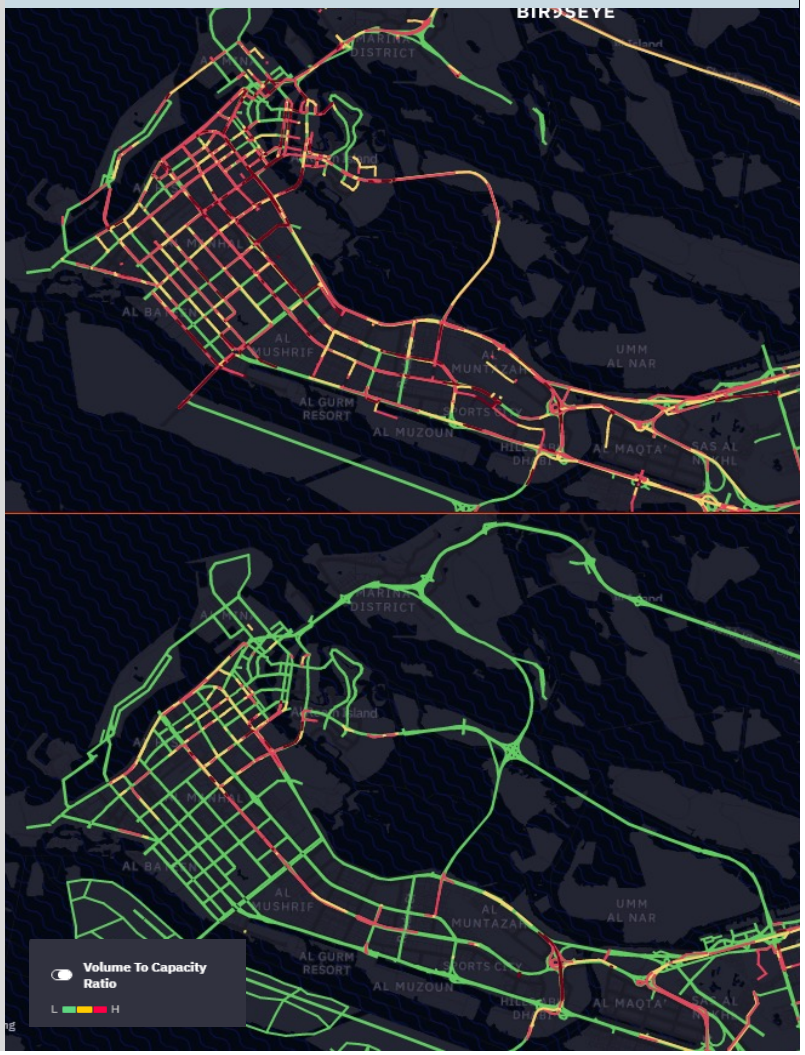


More than 1000 outputs from each model run

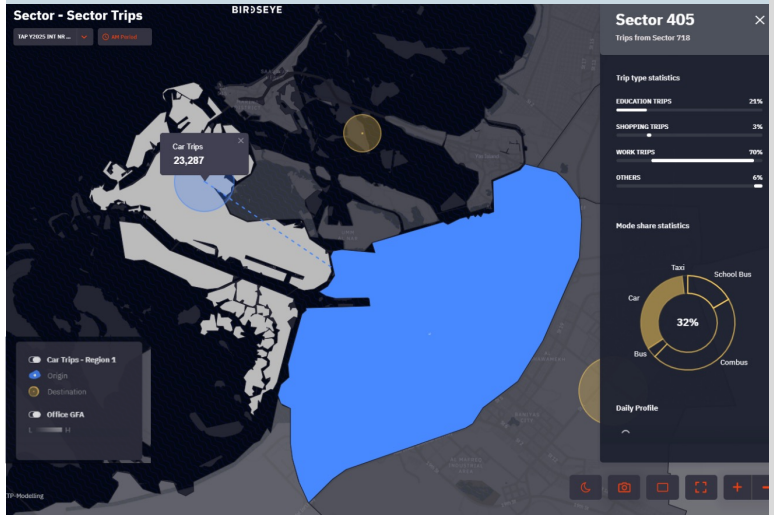
Modelling Outputs

Forecast Tram Boarding (By Station)

Scenario Comparison (With and without Strategy)



Trip Pattern Analysis



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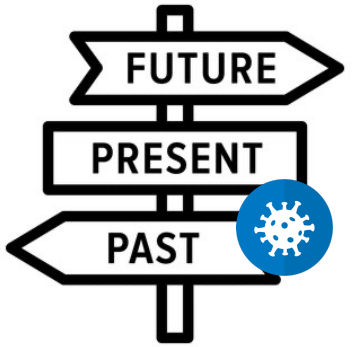
Conclusions

- STEAM+ framework integrates:
  - Data warehouse
  - Strategic transport model
  - Operational transport model

  + a high-quality visualization engine

- Brings together simulation results, historic data and almost-real-time data feeds
- Data warehouse helps understand the past, present and forecast trends with data and simulation outputs
- Supports model development with analysis of pre/post covid-19 patterns



- Continuous monitoring
- Data visualization platform provides easy access to data and modelling outputs for modellers and non-technical stakeholders

Thank you!

For more info please visit our stand or contact

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