



Geogira Statewide Travel Demand Model (GSTDM) 2020 Updates Version 1.1 (v1.1)

presented to

ARC Model Users Group

presented by

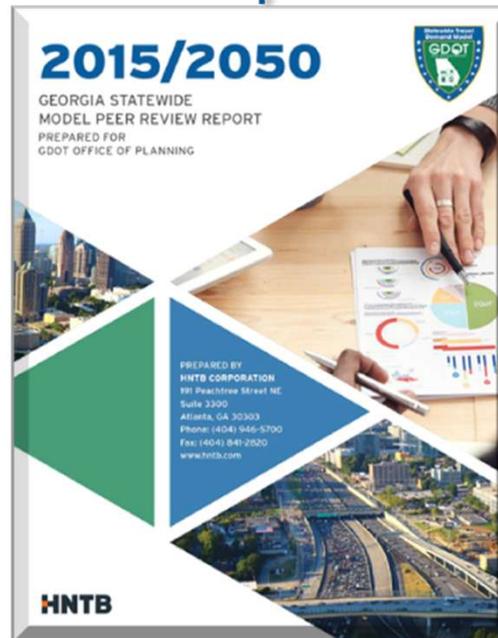
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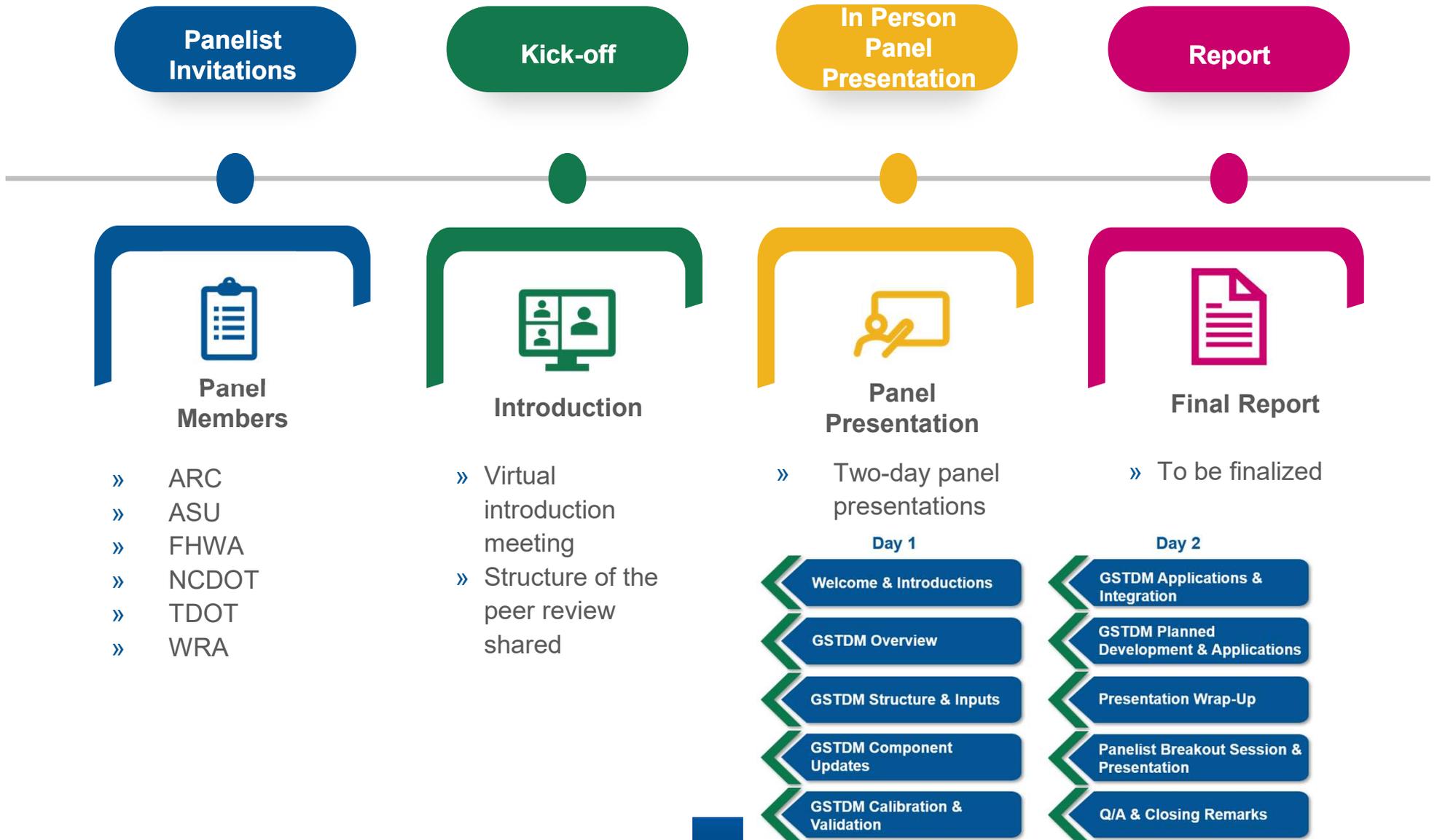


GSTDM Timeline

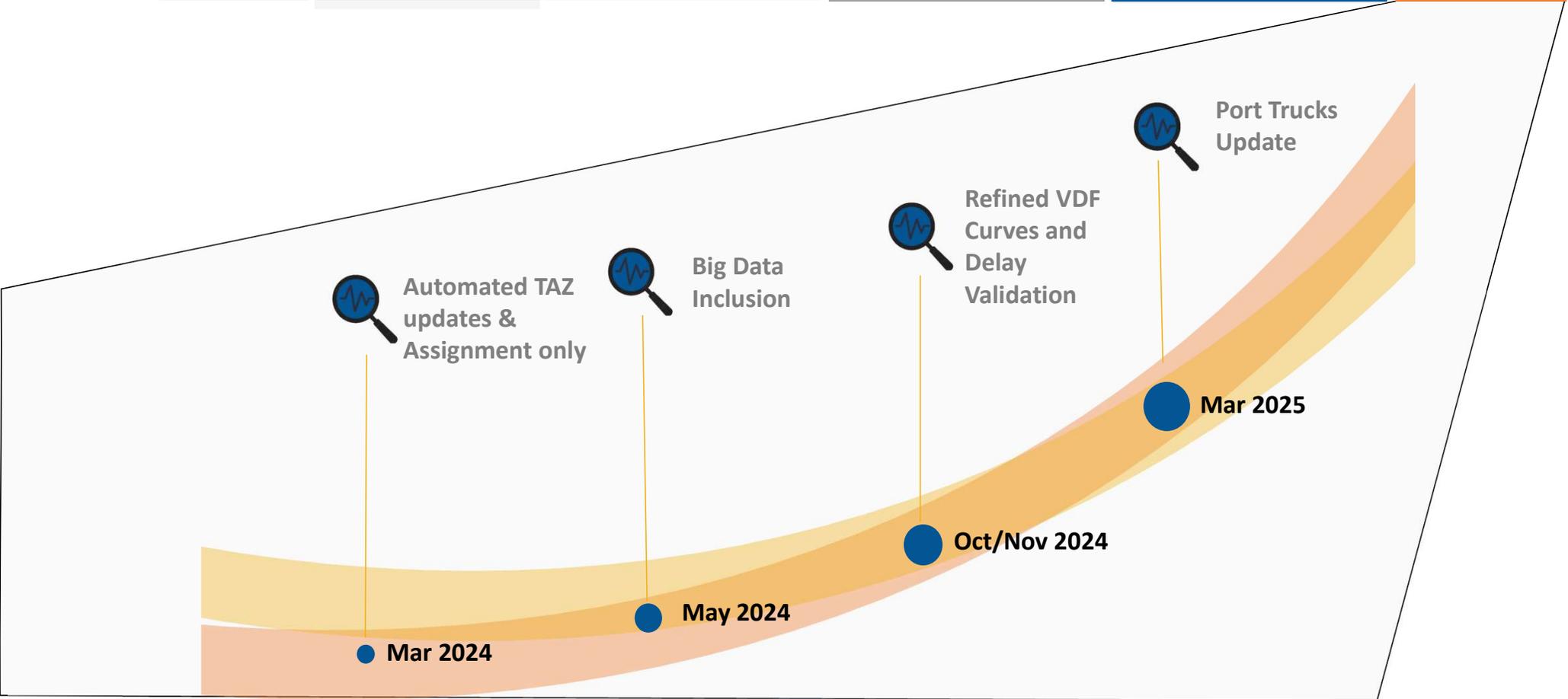


 FHWA Travel Model Improvement Program (TMIP) Peer Review

GSTDM Peer Review, 2025



Year	2009	2012	2016	2019	2023	2025
GSTDM Models	2006/2040	2010/2040	2010/2040 Enhanced	2015/2050	2020/2050 v1.0	2020/2050 v1.1



What's New in the Model?

2020/2050 GSTDM v1.0
(May 2023 - April 2025)

2020/2050 GSTDM v1.1
(April 2025 – TBD)



TAZ Information

Incorporated within SE Data

Automated Update

- Area of TAZ & Median Income of TAZ
- Minimize errors while updating the SE data
- Updating TAZ shapefile will be captured automatically



Linkage to Other Data

Expanded Data

Expanded to include Big Data

- Enrich network data to include more variables
- Improve efficiency in providing various performance measures
- Include new urban area boundary



Delay Calculation

Peak travel time for all users

Refined VDF and Updated Delay

- Congested Peak Travel time for Work trips
- An estimated off-peak travel time for non-work trips
- Improved delay closer to observed delay



Full Model Run

Full run within catalog

Full Run and Assignment Only

- Can support assignment only with selection of checkbox, along with ability to do full run
- Can support roadway improvement projects' evaluation



Port Trucks

Transearch Estimates

Updated Port Trucks

- Based on latest trends shared for Savannah Port; Truck trips are updated for Savannah port for the years 2030 and 2050

Validation Overview



GSTDM Model Validation Highlights – v1.1

Meets or Exceeds Federal Standards – same as v1.0

100%

Interstates, Principal Arterials and Minor Arterials Coverage

Within Standard Ranges

Modeled Trip Rates vs. Observed Data

Within Standard Ranges

Modeled County-to-County Work Trip Flow vs. Observed Data

Within Standard Ranges

Modeled Vehicle Miles Travelled (VMT) vs. Observed Data

Within Standard Ranges

Model Volume vs Observed Traffic Counts % Root Mean Square Errors

Validation Comparison

- » GSTDM v1.1 updated the **Volume Delay Function** in assignment to validate delays
- » These updates slightly affected trip length; other validation metrics almost **remained the same**
- » Model documentation of v1.0 can still be shared with v1.1 as there are no significant changes to model validation

Validation Metric	GSTDM v1.0	GSTDM v1.1
VMT Comparison for Interstates	0.30%	0.29%
VMT Comparison for Arterials	-1.0%	-0.9%
Correlation for Volumes against 2019 counts	0.96	0.96
RMSE for Volumes against 2019 counts	45%	45%
Trip Length for HBW Short trips (Minutes)*	28.2	27.6

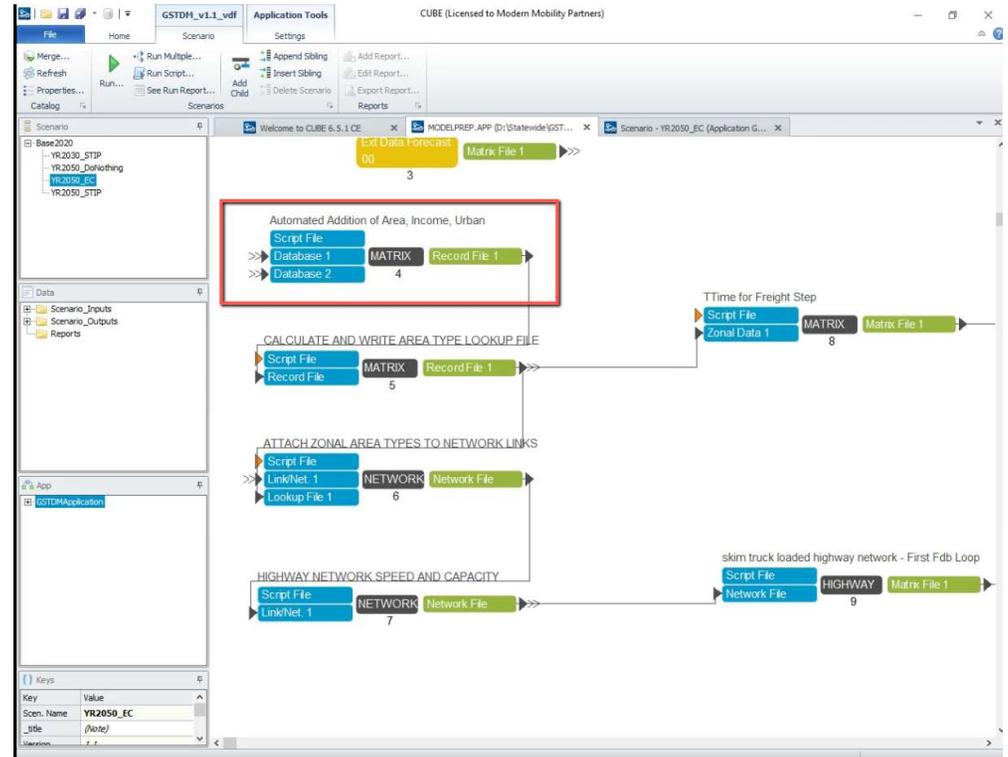
*2017 NHTS Addon for trip length – 29

TAZ Update – Automation

» Potential for errors when SE data is updated

» GSTDM v1.1 was updated to keep the information separate and tag them during the model run

- Socioeconomic data – Population, Households, Employment in SE file (Inputs)
- Traffic Analysis Zone Information – Area, Median Income in TAZ file, Urban (Parameters)



Network Update – More Big Data Variables

» GSTDM v1.1 includes more variables

- State external
- State Freight Network
- MPO external variable for MPO model integration within GSTDM
- Urban Area Boundary from Census 2020 – *received March 2024*

» Including **new data dictionary file** to be shared with Model users

Variable	Variable Description	Value
GRIP	Governor's Road Improvement Program	0 – No 1 – Yes
EVAC	Hurricane evacuation routes	0 – No 1 – Yes
OCI_V3	Pavement Overall Condition Index score	0-100 0- impassable 100- great condition
OCI_GFP	Pavement rating based on OCI	good, fair, poor
MAP_21_GFP	Pavement rating based on MAP21	good, fair, poor
PAVETYPE_P	Pavement material / Pavement Type	Asphalt JCP - <i>Jointed Concrete Pavement</i> CRC - <i>Continuously reinforced concrete</i> Comp - <i>composite</i>
SRP	State Route Priority	C- <i>Critical</i> H – <i>High</i> M – <i>Medium</i> L- <i>Low</i>
SFN	State freight network	corridor names
RECSFN	Recommended state freight network	corridor names
UAB20	Urbanized Area boundary based on 2020 census	Identifier of the urbanized Area

Delay Update – Validation of Delay

» GSTDM v1.0 estimates the delay using the average daily travel time for all trips

» GSTDM v1.1 updates the delay estimation

- Estimated congested peak travel time for work trips
- Estimated off-peak travel time for non-work and truck trips

Source	Area	Daily Delay (vehicle hours)
2020 GSTDM v1.1	Statewide	1,054,240 (-8%)
RITIS (2019)*	Statewide	1,147,160

* [User Delay Cost Analysis, RITIS](#)

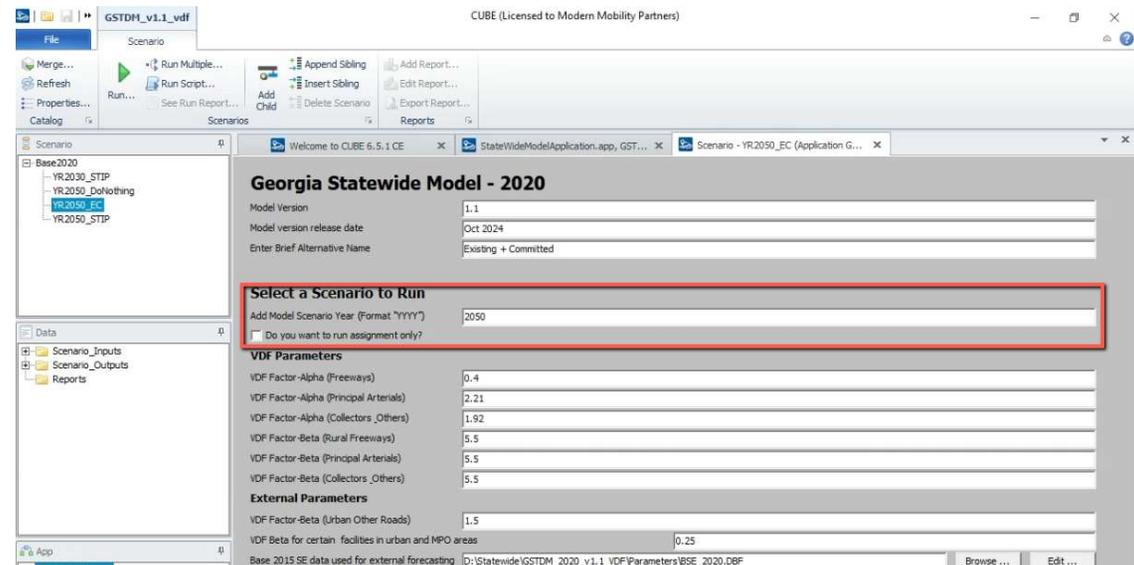
Highway Assignment – Standalone

» GSTDM v1.0 could run full run only in model catalog

» GSTDM v1.1 included ability to run highway assignment alone with help of checkbox selection

» This would support in evaluation of roadway improvement projects

Do you want to run Assignment Only?

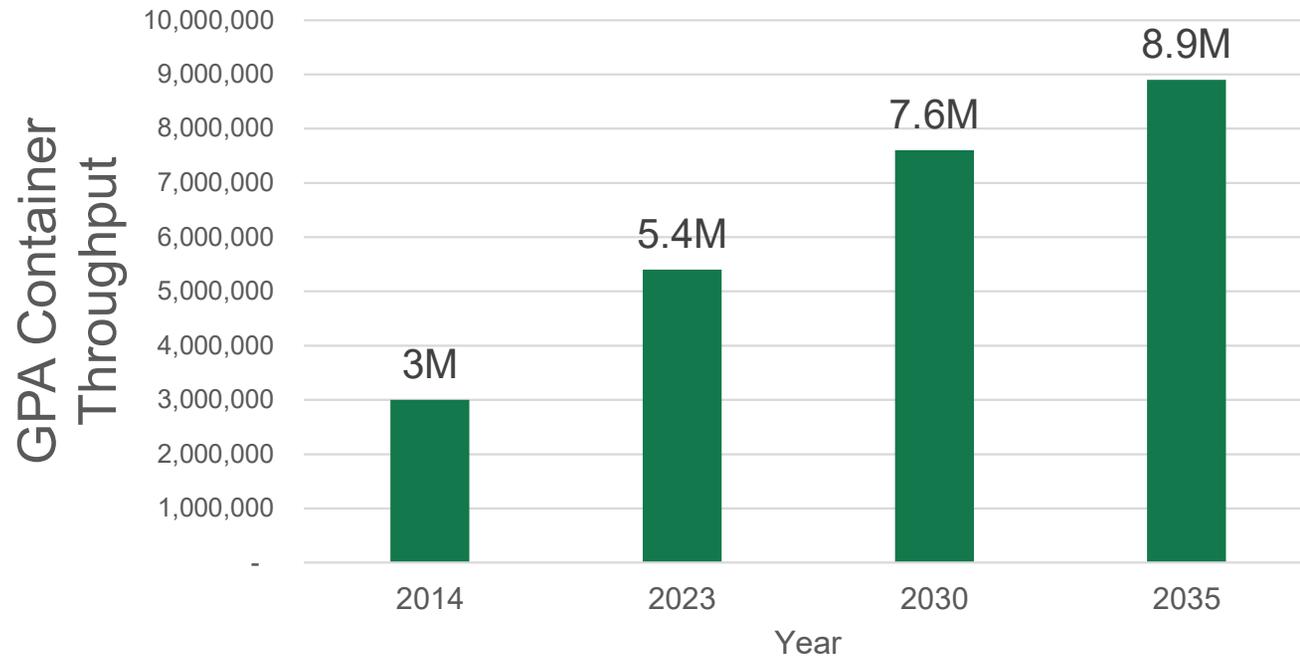


Port Trucks - Savannah

SG1

» GSTDM v1.1 included the latest trends in GPA container throughput

» These numbers show higher growth for the year 2030 when compared to Transearch Data



Slide 12

SG1

Sai to add Savannah port Trends presented in Athens GA Summit

Sai Vikas Gazula, 2025-06-13T14:28:42.755

What to expect in the Future GSTDM?

- » **Model Run-Time Optimization:** Implement a "warm start" approach to refine the model methodology and reduce run time. Test Open Path steps to reduce run times.
- » **Peer Review Recommendations:** Enhance the model methodology to include recommendations from the panel.
- » **Refine the model for Scenario Planning:** Enhance the model methodology to support **exploratory analysis** and facilitate more robust scenario planning.
- » **Freight Estimation Update:** Implement **Machine Learning** algorithms to improve freight estimation, replacing the current linear regression approach.
- » **Managed Lane updates:** Develop **toll and non-toll trips** to improve the current capacity-constraining model for Managed Lane (ML) modeling.

Future GSTDM Timeline

» **GSTDM 2020 v1.2**: Anticipated Q4 2025 or Q1 2026

» **GSTDM (2025)**: Overall timeline TBD

- Major update calibrating & validating to 2025 conditions
- Parallel efforts with GSTDM 2020 continuous updates
- Data collection will begin in 2026

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for comments, questions, and model files requests