



# Georgia Express Lane Modeling Using Activity-Based Model

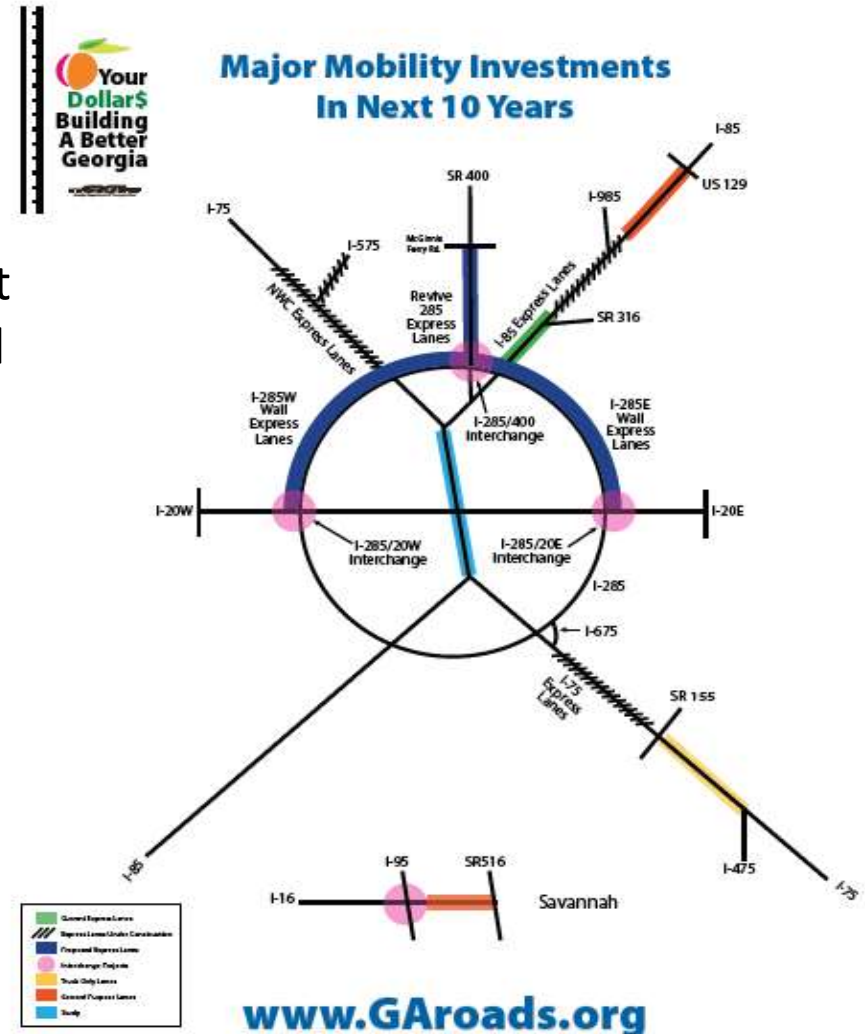
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# Georgia Express Lane Modeling

- Georgia Major Mobility Investment Program (MMIP)
  - Four Major Express Lane Projects
  - Require accurate and robust traffic and revenue analysis to support individual project programming decision, including laneage and access locations
- Atlanta Regional Commission (ARC) Regional Model
  - Transitioned from 4-step Model to activity-based model in 2017
  - Validate previous assumptions and provide defensible forecast using the new model platform





# Express Lane Validation Focus

## Volumes

- Distribution split between Express Lanes and GP Lanes
- Volume distribution during different time periods

## Performance

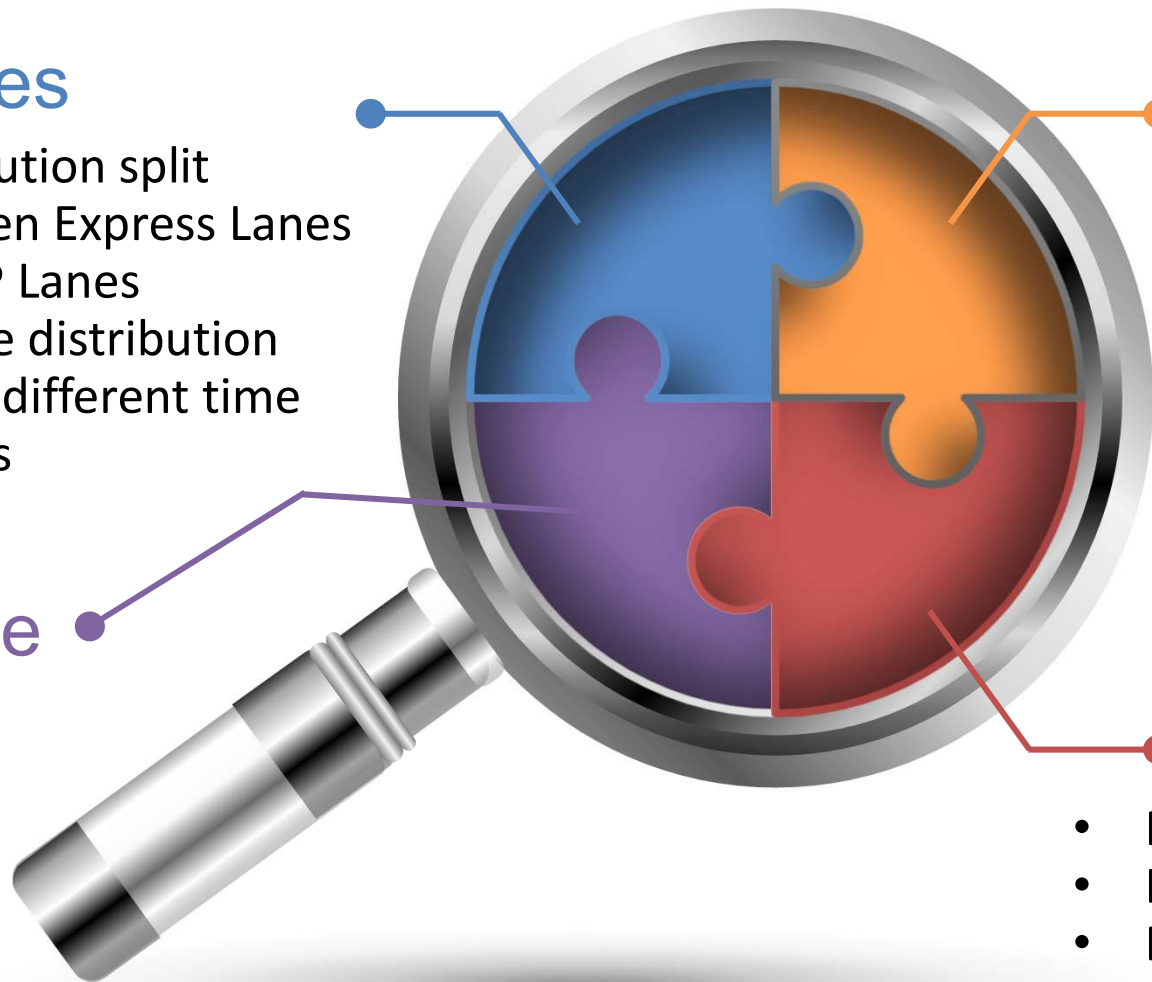
- Speed during different time periods
- Travel time savings for express lanes

## Toll Revenue

- Daily Revenue
- Peak Period Revenue

## Toll Rates

- Different time periods
- Different directions
- Different segments (O-D pairs)





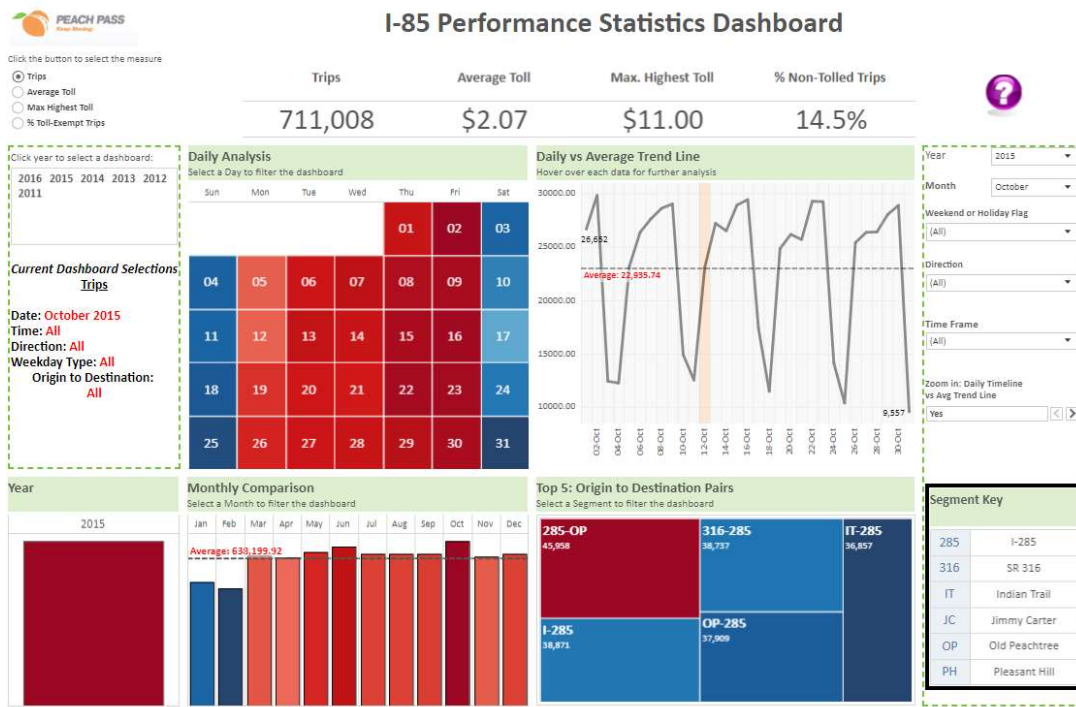
# I-85 HOT LANE OBSERVED DATA (2015)

- PROVIDED BY STATE ROAD TOLLWAY AUTHORITY

- Volumes
- Toll rates
- Daily and peak period toll revenue

- Performance

PM Peak Period Speed Comparison – NPMRDS  
2015 average of all weekdays Tuesday – Thursday



Corridor	Location	Time	2015 Hourly Speed Observed*	Average Speed 2015**	Model Speed 2015
I-285 West Wall	SB at SR 280	3-4PM	54	37	44
		4-5PM	36		
		5-6PM	25		
		6-7PM	34		
I-285 East Wall	SB at US 29	3-4PM	44	31	41
		4-5PM	28		
		5-6PM	22		
		6-7PM	31		
I-285 Top End	WB at GA 400	3-4PM	39	30	43
		4-5PM	24		
		5-6PM	22		
		6-7PM	34		
GA 400	NB at I-285	3-4PM	25	19	20
		4-5PM	18		
		5-6PM	14		
		6-7PM	18		

\*Based on National Performance Management Research Data Set (NPMRDS) – 2015 average of all weekdays Tuesday – Thursday



# GEORGIA EXPRESS LANE MODELING AND VALIDATION

## Results Comparison



- Modeled volumes on the I-85 HOT Lanes are **comparable** to the observed data
- Toll rates from the model are **Low**
- Modeled revenues are **Low**
- **Overestimation** of revenue percentage generated during the Off-peak period

## Area Identification



- Vehicle eligibility - Commercial Vehicle Trips\*
- Parameter sensitivity analysis - Utility expression calculator (UEC) in the tour mode choice
- Toll Diversion
- Volume Delay Functions

## Express Lane Modeling Validation Process



- Network validation
- Vehicle eligibility validation
- Removed tour/trip mode choice restriction after UEC testing
- Differentiated capacity and max flow rate of express lanes based on physical configurations
- Revised toll diversion curves by different time periods
- Refined the volume delay curves based on the I-85 HOT lane observed data
- Used toll segments instead of corridor as the toll optimization basis
- Revised toll optimization to estimate the range of different revenue reflecting tolling policies