APPENDIX F: TECHNICAL ANALYSIS

Table 1: Project Prioritization Matrix

Project Name	From	To	Project Cost ($2014 unless in Freight plan $2016, I-16 Widen, I-16 little Neck, Truman)	*Yes = 5; No = 0* — NEED SCREEN: System Performace — Facility LOS E or F	System Performace — High Truck Volumes	Safety and Security — Facility Crash Rate Above State Average	Safety and Security — Designated Evacuation Route	Accessbility, Mobility, Connectivity — Connects Population Centers to Activity Centers	Accessbility, Mobility, Connectivity — Does the proejct connect major freight generators with infrastructure	Accessbility, Mobility, Connectivity — Is the project identified in the Freight Plan?	Accessbility, Mobility, Connectivity — Is the project identified in the CAT TDP?	Accessbility, Mobility, Connectivity — Non-Motorized Priority	State of Good Repair — Bridge Suffiency of less than 50 or poor conditions	*Yes = 0; No = 5* — SUSTAINABILITY SCREEN: Environment/Quality of Life — Adverse Environmental Impacts	Environment/Quality of Life — Adverse Cultural, Historic, Community Resources	Environment/Quality of Life — Adverse Environmental Justice Impacts	TOTAL PROJECT SCORE	*Yes/No* — Additional Considerations: In Total Mobility 2040 Constrained Plan	Additional Considerations — Alternate Funding Source in 2040 Plan
I-516 / I-16 Interchange	--	--	$116,477,947	5	5	0	5	5	5	5	0	0	0	5	5	5	45.00	✓	
I-95 at SR 21 / Augusta Interchange Reconstruction	--	--	$114,242,793	5	5	0	5	5	5	5	0	0	0	5	5	5	45.00	✓	
President Street / Truman Parkway Interchange Bridge and	President Street / Truman Parkway		$108,883,056	5	0	0	5	5	5	5	0	0	0	5	5	5	40.00	✓	
I-516/Lynes Parkway Widening (6 lanes)	Veteran Parkway	Mildred Street	$139,815,951	0	5	0	5	5	5	5	0	0	0	5	5	5	40.00	✓	
I-516/Lynes Parkway Widening (6 lanes)	I-16	Veterans Parkway	$95,746,503	0	5	0	5	5	5	5	0	0	0	5	5	5	40.00	✓	
US 80/Victory Drive Improvements	Home Depot	Kerry Street	$39,015,752	5	0	0	5	5	5	5	0	5	0	5	5	0	40.00	✓	
I-95 Widening	I-16	Effingham Co./S.C.	$294,907,670	5	5	0	0	5	5	0	0	0	0	5	5	5	35.00		
I-95 Widening	I-16	Bryan County	$168,548,503	5	5	0	0	5	5	0	0	0	0	5	5	5	35.00		
I-95 Widening	Bryan County	US 17	$103,708,474	5	5	0	0	5	5	0	0	0	0	5	5	5	35.00		
I-95 Interchange	At SR 21/Augusta Rd		$298,707,473	5	5	0	0	5	5	0	0	0	0	5	5	5	35.00		
I-16 Widening	Pooler Parkway	I-95	$26,600,000	0	5	0	5	5	5	0	0	0	0	5	5	5	35.00	✓	
I-95 Interchange Improvements and Bridge Replacement	at SR 144		$65,003,914	5	5	0	0	5	5	0	0	0	0	5	5	5	35.00		
Airways Avenue Wideing	I-95	SR21	$5,846,375	5	0	0	0	5	5	5	0	5	0	5	5	0	35.00		✓
I-95 at Airways Avenue			$80,000,000	5	5	0	0	5	5	5	0	0	0	5	5	0	35.00		✓
I-16/Little Neck/ JDL Interchange			$20,400,000	5	5	0	5	5	5	0	0	0	0	0	5	0	30.00		
Airway Avenue flyover to Gulfstream	EB Airways Avenue	Flyover to EB Gulfstream	$15,280,653	5	0	0	0	5	5	5	0	0	0	5	5	0	30.00		✓
SR 204 / Abercorn Interchange Reconstruction	At I-95	--	$57,794,105	5	0	0	5	5	0	0	0	0	0	0	5	5	25.00		
Harris Trail Road Widening	Timber Trail	Port Royal Road	$16,707,369	5	0	0	0	5	0	0	0	0	0	5	5	5	25.00	✓	
Port Royal Widening	SR 144	Harris Trail	$9,928,080	5	0	0	0	5	0	0	0	0	0	5	5	5	25.00	✓	
Gulfstream Imrprovements	SR 21 Corridor	Airport	$70,339,882	5	5	0	0	5	0	0	0	0	0	5	5	0	25.00		
SR 204 Widening	US 17	Rio Road	$125,500,000	0	0	0	5	5	0	0	0	5	0	0	5	0	20.00		
Pooler Parkway/Quacco Road Widening 4 to 6 lanes	I-95	South Godley Station	$33,611,518	0	0	0	0	5	5	0	0	5	0	0	5	0	20.00		
Fort Argyle/SR 204 Widening 2 to 4 lanes	I-95	John Carter Road	$61,831,964	0	0	0	5	5	0	0	0	5	0	5	0	0	20.00		
Truman Parkway Widening	Victory Drive	Montgomery Crossroads	$87,500,000	5	0	0	0	5	0	0	0	0	0	5	5	0	20.00		
Quacco Rd Widening	Pooler Pkwy	I-95	$29,934,566	0	0	0	0	5	0	0	0	5	0	0	5	0	15.00		
SR 204/ Reconstructiosn Limited Access	At I-95	US 17	$101,100,000	0	0	0	5	5	0	0	0	0	0	0	5	0	15.00		
Little Neck Road Widening	John Carter Road	I-16	$53,643,585	0	0	0	0	5	0	0	0	5	0	0	5	0	15.00		
US 17 Widening to 6 lanes	SR 144	Chatham Parkway	$0	0	0	0	0	5	0	0	0	5	0	0	0	0	10.00		
Belfast Keller Widening	South of US 17	Belfast River Road	$0	0	0	0	0	5	0	0	0	0	0	0	5	0	10.00		

CORE
COASTAL REGION MPO

METROPOLITAN PLANNING ORGANIZATION

Resolution of the Coastal Region Metropolitan Planning Organization to Accept the Base Year and 2045 "Do Nothing" Traffic Demand Models

WHEREAS, the Coastal Region Metropolitan Planning Organization (CORE MPO) has been designated by the Governor of Georgia as the Metropolitan Planning Organization for the Savannah urbanized area; and

WHEREAS, it is necessary to project the long term population growth patterns and resulting traffic volumes using existing traffic counts for 2015 for the purpose of calibrating with the findings for the traffic model for the year 2045; and

NOW, THEREFORE, BE IT RESOLVED that The CORE MPO Board accepts the 2015 base year and 2045 do nothing travel demand models based upon the information presented by GDOT staff at the meeting held on December 12, 2018, with the understanding that the model files and supporting documentation will be provided at a later date. The travel demand model will serve as the primary analytical tool to evaluate the performance of potential highway capacity projects for inclusion in the Metropolitan Transportation Plan.

CERTIFICATION
I hereby certify that the above is a true and correct copy of a Resolution adopted by the Coastal Region Metropolitan Planning Organization Board at a meeting held on December 12, 2018.

Albert J. Scott, Chairman
Coastal Region Metropolitan Planning Organization

Long Range Transportation Plan (LRTP) – Travel Demand Model (TDM) Networks

Below is a list of TDM Networks adopted by the GDOT Office of Planning. The networks will be used during the TDM process of LRTP Updates for all of the 14 MPOs[1] in the state of Georgia. A short description of what each network entails follows.

I. *Base Year Network – 1st Network*
This network is the first one to be developed and serves as a foundation for developing the additional networks used in the LRTP Update TDM process. The Base Year Network consists of the existing MPO modeling area network updated to incorporate the following:
   a. The base year socio-economic data developed and submitted by each MPO,
   b. Any recent changes to the functional classification and number of lanes within that MPO modeling boundary, and
   c. Any projects completed or authorized from FY or CY2010 until 2015.

II. *Do-Nothing System Projects – 2nd Network*
This network includes the Base Year Network for any given MPO in addition to any projects recently completed and opened to traffic, or under construction since the Base Year within the MPO TDM modeling area.

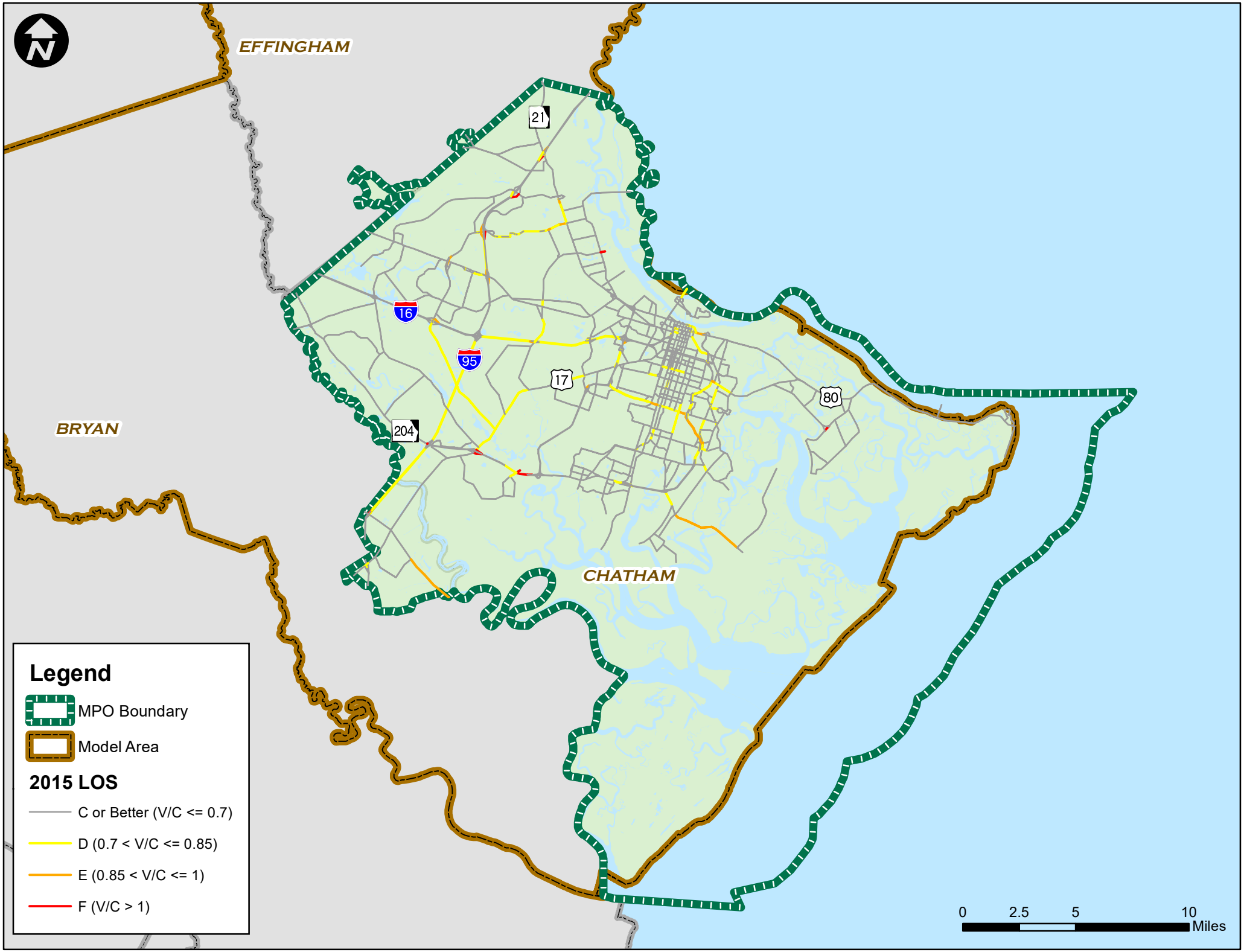
III. *Existing + Committed System Projects – 3rd Network*
This network encompasses the Base Year Network, the Do-Nothing System Projects Network, and all projects within a given MPO TDM modeling area with a construction phase listed in the current Statewide Transportation Improvement Plan (STIP). The STIP is revised and adopted every one to four years.

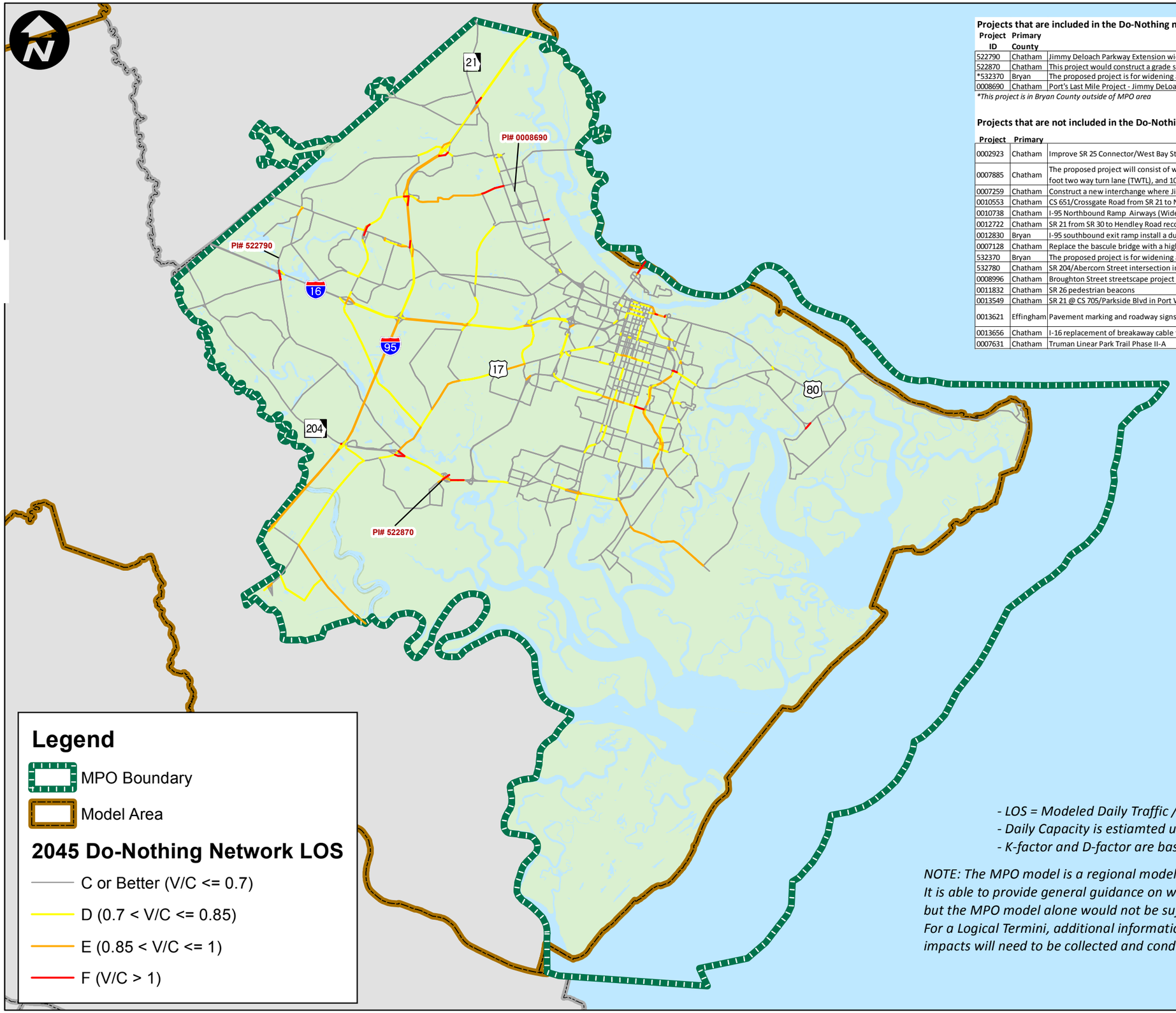
IV. *Completion of STIP System Projects – 4th Network*
This network includes the Base Year Network, the Do-Nothing System Projects Network, the E+C System Projects Network, and any projects with preliminary engineering and right of way funding reflected in the current STIP.

V. *Long Range Transportation Plan System Projects – 5th Network*
This network contains the Base Year Network, the Do-Nothing System Projects Network, the E+C System Projects Network, the Completion of STIP System Projects Network, and all projects that were identified by the particular MPO and listed on their draft LRTP that will address future transportation deficiencies through the planning horizon year.

VI. *Financially Constrained Network – 6th Network*
This network contains the Base Year Network, the Do-Nothing System Projects Network, the E+C System Projects Network, the Completion of STIP System Projects, and projects that are likely to receive funding from different sources and are of higher priority to any MPO.

[1] List of MPOs for which the TDM process is managed by GDOT
Albany / Athens / Augusta / Brunswick / Cartersville / Columbus / Dalton / Gainesville / Hinesville / Macon / Rome / Savannah / Valdosta / Warner Robins.


EFFINGHAM
BRYAN
CHATHAM
21
16
95
17
80
204
Legend
MPO Boundary
Model Area
2015 LOS
C or Better (V/C <= 0.7)
D (0.7 < V/C <= 0.85)
E (0.85 < V/C <= 1)
F (V/C > 1)
0
2.5
5
10
Miles



Projects that are included in the Do-Nothing network:

Project ID	Primary County	Short Description	Primary Work Type
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
*532370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening
0008690	Chatham	Port's Last Mile Project - Jimmy DeLoach Connector 4 lane Freeway	New Road

**This project is in Bryan County outside of MPO area*

Projects that are not included in the Do-Nothing network:

Project	Primary	Short Description	Reasons why they are not
0002923	Chatham	Improve SR 25 Connector/West Bay Street (add median)	No additional capacity
0007885	Chatham	The proposed project will consist of widening the existing typical section from two 9-foot lanes to four 12-foot lanes, one 16-foot two way turn lane (TWTL), and 10-foot rural shoulders.	No additional capacity
0007259	Chatham	Construct a new interchange where Jimmy DeLoach Parkway currently intersects US 80/SR 26/SR17 at grade.	No additional capacity
0010553	Chatham	CS 651/Crossgate Road from SR 21 to NS#734150L in Port Wentworth related to port's last mile project	No additional capacity
0010738	Chatham	I-95 Northbound Ramp Airways (Widen and extend storage)	No additional capacity
0012722	Chatham	SR 21 from SR 30 to Hendley Road reconfiguring the exiting I-95/SR 21 interchange to a diverging diamond interchange.	No additional capacity
0012830	Bryan	I-95 southbound exit ramp install a dual left turn lane adding additional storage, modify signal timing	No additional capacity
0007128	Chatham	Replace the bascule bridge with a high level fixed span	No additional capacity
532370	Bryan	The proposed project is for widening and reconstruction of SR 144	No additional capacity
532780	Chatham	SR 204/Abercorn Street intersection improvement at Largo Drive	No additional capacity
0008996	Chatham	Broughton Street streetscape project	No additional capacity
0011832	Chatham	SR 26 pedestrian beacons	Non Motorized
0013549	Chatham	SR 21 @ CS 705/Parkside Blvd in Port Wentworth pedestrian crossing	Non Motorized
0013621	Effingham	Pavement marking and roadway signs at 44 highway at rail crossings.	No additional capacity
0013656	Chatham	I-16 replacement of breakaway cable terminal anchors on guardrail	No additional capacity
0007631	Chatham	Truman Linear Park Trail Phase II-A	Non Motorized

Legend

MPO Boundary

Model Area

2045 Do-Nothing Network LOS

C or Better (V/C <= 0.7)

D (0.7 < V/C <= 0.85)

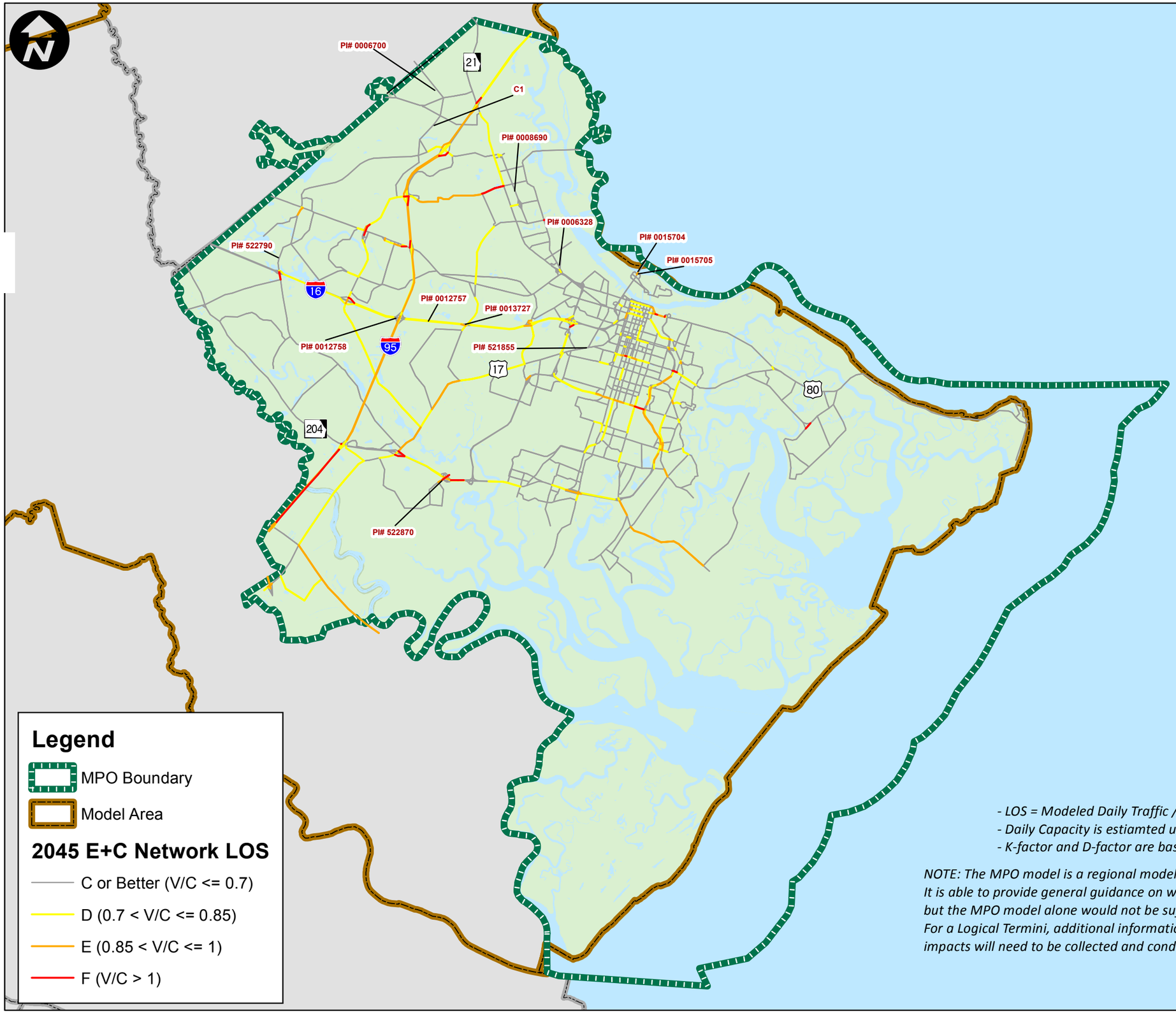
E (0.85 < V/C <= 1)

F (V/C > 1)

- LOS = Modeled Daily Traffic / Daily Capacity
- Daily Capacity is estiamted using peak hour factor (K-factor) and directional split factor (D-factor)
- K-factor and D-factor are based on Highway Capaciy Manual 2016.

NOTE: The MPO model is a regional model that is validated on the regional basis and not for specific corridors. It is able to provide general guidance on where the volume is exceeding the capacity, but the MPO model alone would not be sufficient for determining/confirming a Logical Termini. For a Logical Termini, additional information like traffic counts, sub-area validation and environmental impacts will need to be collected and conducted.

0 2.5 5 10 Miles



Projects that are included in the E+C network:

Project ID	Primary County	Short Description	Primary Work Type
0006328	Chatham	Brampton Road Connector to Ports (grade separated rail crossing)	New Road
*0006700	Effingham	This project is a part of the Effingham Parkway that will extend from Effingham County to northwest of Chatham County.	New Road
0012757	Chatham	Widen I-16 from I-95 to I-516.	Widening
0012758	Chatham	I-16/I-95 Interchange reconstruction (WB-SB and SB-EB directional ramps w/ NB CD Roadway)	Widening
0013727	Chatham	The proposed project will provide operational improvements to the I-16 at State Route 307/Dean Forest Road Interchange.	Diverging Diamond Interchange
0015704	Chatham	New bridge over the Back River SR 404 Spur/US 17 at Back River	Widening
0015705	Chatham	Widening and improvements of U.S. 17 from Hutchinson Island in Savannah, Chatham County, Georgia to South Carolina	Widening
521855	Chatham	Widening of SR 26/US 80/Ogeechee Road to 4 lane	Widening
C1	Chatham	Benton Blvd Extension	New road
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
0008690	Chatham	Port's Last Mile Project - Jimmy DeLoach Connector 4 lane Freeway	New Road
**532370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening

** This project is majorly in Effingham County outside of MPO area*
** *This project is in Bryan County outside of MPO area*

Projects that are not included in the E+C network:

Project ID	Primary County	Short Description	Reasons why they are not included
0007402	Chatham	Gwinnett Street improvements	No additional capacity
0010028	Chatham	Delesseups Avenue Road and Sidewalk Improvements project involves a minor road widening to 11' travel lanes and curb and gutter to improve drainage from Waters Avenue to Skidaway Road.	No additional capacity
0010739	Bryan	SR 144 intersection improvements at I-95 ramps	No additional capacity
0013282	Chatham	SR 25/Pipemake Canal bridge needs to be replaced with one which spans the connection between the wider channel on	No additional capacity
0013741	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0013742	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0015306	Chatham	Truman Linear Park Trail Phase II-B	Non Motorized
0015980	Chatham	McQueens Island trail restoration	Non Motorized
	Chatham	CAT Bike Share Expansion	Non Motorized
	Chatham	SR 307 Median Beautification and enhancement program	No additional capacity
	Chatham	This project will include roadway widening and operational improvements to intersections, drainage features, and	No additional capacity
	Chatham	Skidaway Road Improvements with an upgrade of the existing traffic signal at Ferguson/ Norwood Avenue and roadway drainage and sidewalks on both sides of Skidaway Road.	No additional capacity
	Chatham	Johnny Mercer Corridor Improvements	No additional capacity
	Chatham	This is a project to rebuild the existing two lanes on Little Neck Road between U.S. 17/Ogeechee Road and the Landfill Entrance just northwest of I-95. The reconstruction will allow for a future four lane section between U.S. 17 and I-95 to be built at a later date.	No additional capacity
0002923	Chatham	Improve SR 25 Connector/West Bay Street (add median)	No additional capacity
0007885	Chatham	The proposed project will consist of widening the existing typical section from two 9-foot lanes to four 12-foot lanes, one 16-foot two way turn lane (TWTL), and 10-foot rural shoulders.	No additional capacity
0007259	Chatham	Construct a new interchange where Jimmy DeLoach Parkway currently intersects US 80/SR 26/SR17 at grade.	No additional capacity
0010553	Chatham	CS 651/Crossgate Road from SR 21 to NS#734150L in Port Wentworth related to port's last mile project	No additional capacity
0010738	Chatham	I-95 Northbound Ramp Airways (Widen and extend storage)	No additional capacity
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0012830	Bryan	I-95 southbound exit ramp install a dual left turn lane adding additional storage, modify signal timing	No additional capacity
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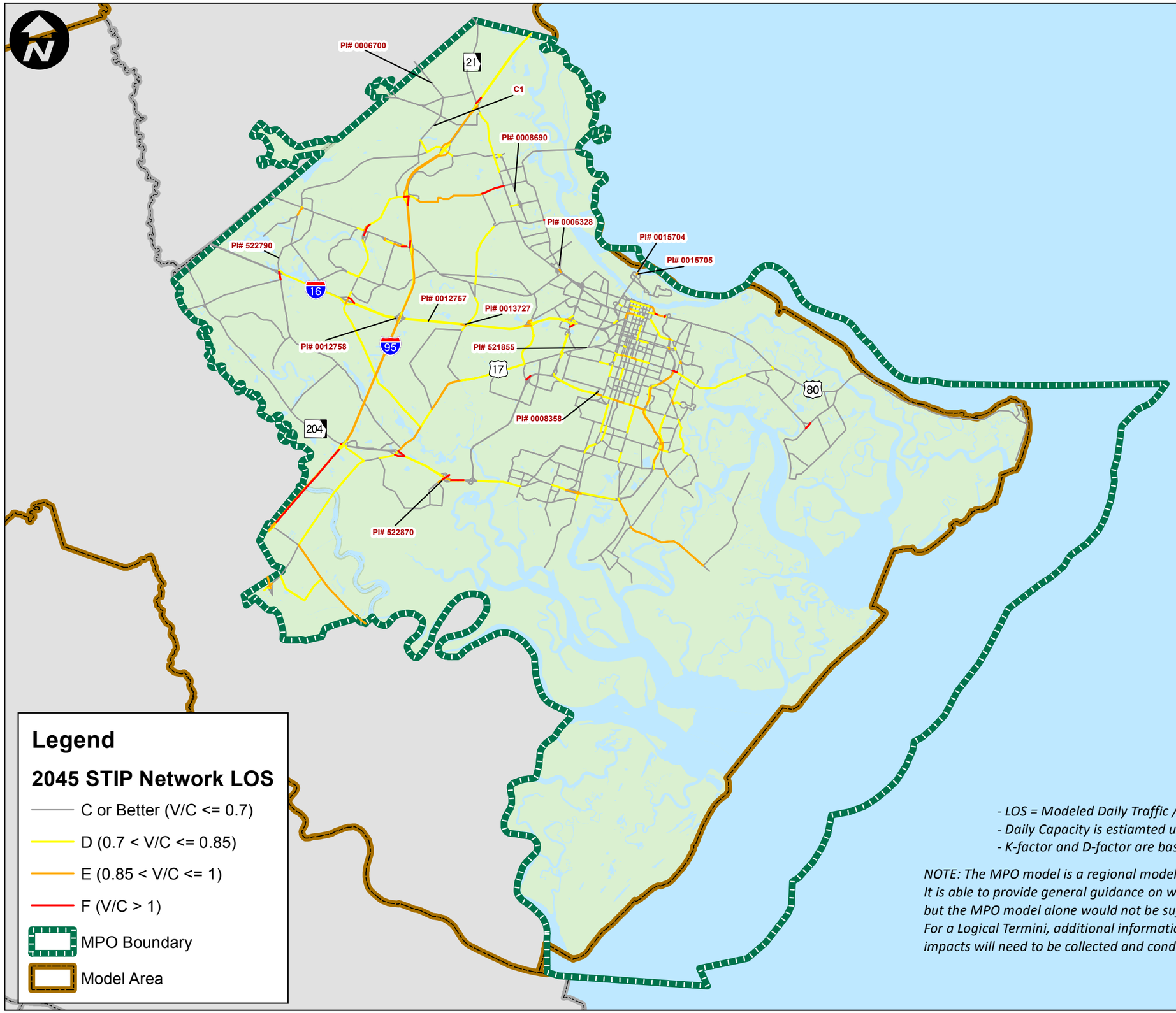

Projects that are included in the STIP network:

Project ID	Primary County	Short Description	Primary Work Type
0006328	Chatham	Brampton Road Connector to Ports (grade separated rail crossing)	New Road
*0006700	Effingha	This project is a part of the Effingham Parkway that will extend from Effingham County to northwest of Chatham County.	New Road
0012757	Chatham	Widen I-16 from I-95 to I-516.	Widening
0012758	Chatham	I-16/I-95 Interchange reconstruction (WB-SB and SB-EB directional ramps w/ NB CD Roadway)	Widening
0013727	Chatham	The proposed project will provide operational improvements to the I-16 at State Route 307/Dean Forest Road interchange.	Diverging Diamond Interchange
0015704	Chatham	New bridge over the Back River SR 404 Spur/US 17 at Back River	Widening
0015705	Chatham	Widening and improvements of U.S. 17 from Hutchinson Island in Savannah, Chatham County, Georgia to South Carolina	Widening
521855	Chatham	Widening of SR 26/US 80/Ogeechee Road to 4 lane	Widening
C1	Chatham	Benton Blvd Extension	New road
0008358	Chatham	Reduce traffic congestion on DeRenne Avenue by providing a new four-lane divided connector from I-516 to a realigned White Bluff Road with a new direct connection to Hunter Army Airfield and a multi-use path. (This will affect the White Bluff/Bull St. at DeRenne intersection as it relates to capacity, since the NBLT to WB I-516 traffic will no longer use the existing intersection)	New Road
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
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	Chatham	This is a project to rebuild the existing two lanes on Little Neck Road between U.S. 17/Ogeechee Road and the Landfill Entrance just northwest of I-95. The reconstruction will allow for a future four lane section between U.S. 17 and I-95 to be	No additional capacity
0008359	Chatham	Replace the existing two way left turn lane along DeRenne Avenue with a median to create a 4 lane divided roadway	No additional capacity
0010236	Chatham	Improve the raised median along DeRenne Avenue to better control access	No additional capacity
0010560	Chatham	Replace Bull River and Lazaretto Creek bridges and widen shoulders Johnny Mercer to Old US 80	No additional capacity
0002923	Chatham	Improve SR 25 Connector/West Bay Street (add median)	No additional capacity
0007885	Chatham	The proposed project will consist of widening the existing typical section from two 9-foot lanes to four 12-foot lanes, one 16-	No additional capacity
0007259	Chatham	Construct a new interchange where Jimmy DeLoach Parkway currently intersects US 80/SR 26/SR17 at grade.	No additional capacity
0010553	Chatham	CS 651/Crossgate Road from SR 21 to N34°31'50L in Port Wentworth related to port's last mile project	No additional capacity
0010738	Chatham	I-95 Northbound Ramp Airways (Widen and extend storage)	No additional capacity
0012722	Chatham	SR 21 from SR 30 to Hendley Road reconfiguring the exiting I-95/SR 21 interchange to a diverging diamond interchange.	No additional capacity
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- Daily Capacity is estiamted using peak hour factor (K-factor) and directional split factor (D-factor)
- K-factor and D-factor are based on Highway Capaciy Manual 2016.

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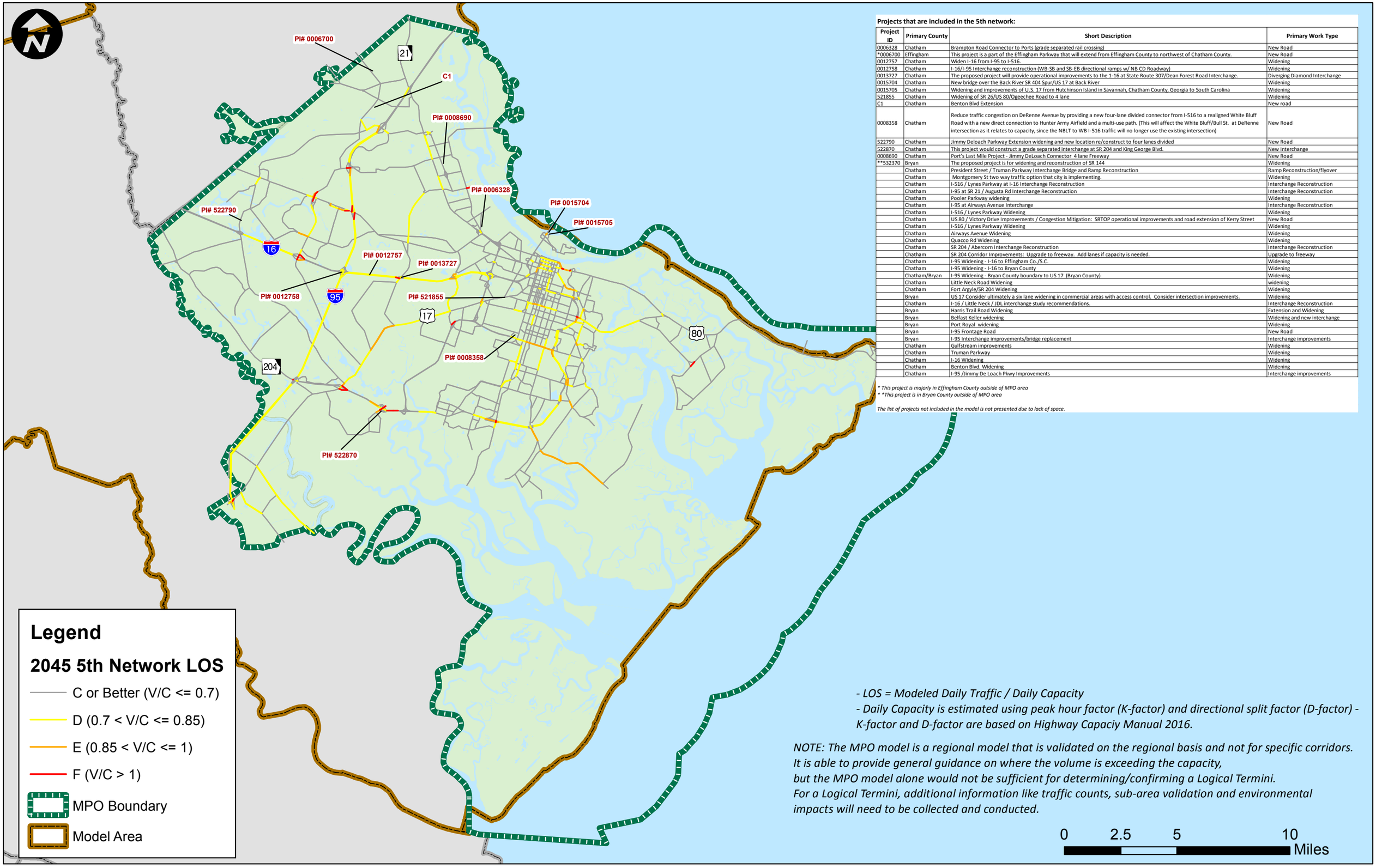


Projects that are included in the 5th network:

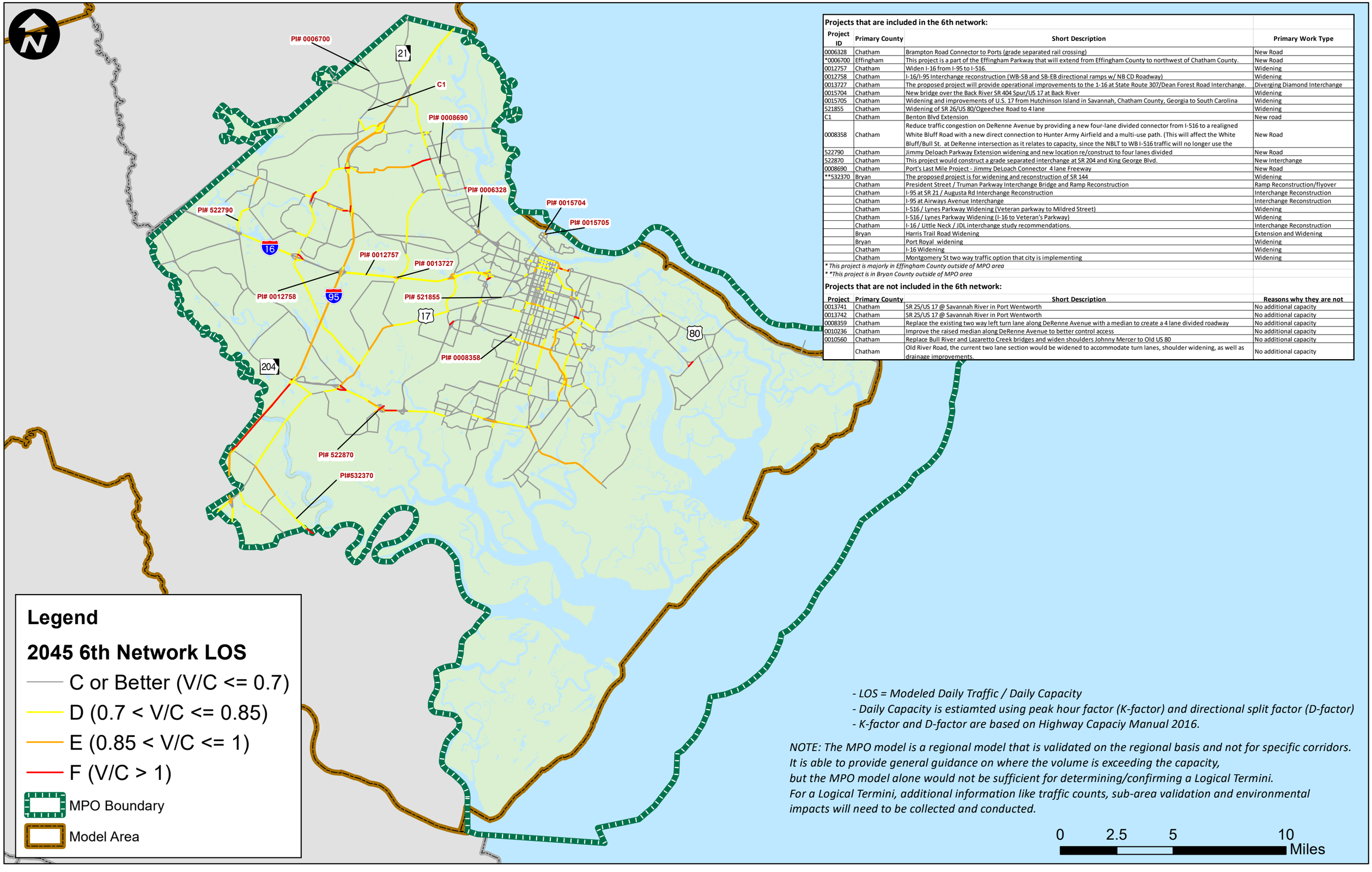
Project ID	Primary County	Short Description	Primary Work Type
0006328	Chatham	Brampton Road Connector to Ports (grade separated rail crossing)	New Road
*0006700	Effingham	This project is a part of the Effingham Parkway that will extend from Effingham County to northwest of Chatham County.	New Road
0012757	Chatham	Widen I-16 from I-95 to I-516.	Widening
0012758	Chatham	I-16/I-95 Interchange reconstruction (WB-SB and SB-EB directional ramps w/ NB CD Roadway)	Widening
0013727	Chatham	The proposed project will provide operational improvements to the 1-16 at State Route 307/Dean Forest Road Interchange.	Diverging Diamond Interchange
0015704	Chatham	New bridge over the Back River SR 404 Spur/US 17 at Back River	Widening
0015705	Chatham	Widening and improvements of U.S. 17 from Hutchinson Island in Savannah, Chatham County, Georgia to South Carolina	Widening
521855	Chatham	Widening of SR 26/US 80/Ogeechee Road to 4 lane	Widening
C1	Chatham	Benton Blvd Extension	New road
0008358	Chatham	Reduce traffic congestion on DeRenne Avenue by providing a new four-lane divided connector from I-516 to a realigned White Bluff Road with a new direct connection to Hunter Army Airfield and a multi-use path. (This will affect the White Bluff/Bull St. at DeRenne intersection as it relates to capacity, since the NBLT to WB I-516 traffic will no longer use the existing intersection)	New Road
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
0008690	Chatham	Port's Last Mile Project - Jimmy DeLoach Connector 4 lane Freeway	New Road
**532370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening
	Chatham	President Street / Truman Parkway Interchange Bridge and Ramp Reconstruction	Ramp Reconstruction/flyover
	Chatham	Montgomery St two way traffic option that city is implementing.	Widening
	Chatham	I-516 / Lynes Parkway at I-16 Interchange Reconstruction	Interchange Reconstruction
	Chatham	I-95 at SR 21 / Augusta Rd Interchange Reconstruction	Interchange Reconstruction
	Chatham	Pooler Parkway widening	Widening
	Chatham	I-95 at Airways Avenue Interchange	Interchange Reconstruction
	Chatham	I-516 / Lynes Parkway Widening	Widening
	Chatham	US 80 / Victory Drive Improvements / Congestion Mitigation: SRTOP operational improvements and road extension of Kerry Street	New Road
	Chatham	I-516 / Lynes Parkway Widening	Widening
	Chatham	Airways Avenue Widening	Widening
	Chatham	Quacco Rd Widening	Widening
	Chatham	SR 204 / Abercorn Interchange Reconstruction	Interchange Reconstruction
	Chatham	SR 204 Corridor Improvements: Upgrade to freeway. Add lanes if capacity is needed.	Upgrade to freeway
	Chatham	I-95 Widening - I-16 to Effingham Co./S.C.	Widening
	Chatham	I-95 Widening - I-16 to Bryan County	Widening
	Chatham/Bryan	I-95 Widening - Bryan County boundary to US 17 (Bryan County)	Widening
	Chatham	Little Neck Road Widening	widening
	Chatham	Fort Argyle/SR 204 Widening	Widening
	Bryan	US 17 Consider ultimately a six lane widening in commercial areas with access control. Consider intersection improvements.	Widening
	Chatham	I-16 / Little Neck / JDL interchange study recommendations.	Interchange Reconstruction
	Bryan	Harris Trail Road Widening	Extension and Widening
	Bryan	Belfast Keller widening	Widening and new interchange
	Bryan	Port Royal widening	Widening
	Bryan	I-95 Frontage Road	New Road
	Bryan	I-95 Interchange improvements/bridge replacement	Interchange improvements
	Chatham	Gulfstream improvements	Widening
	Chatham	Truman Parkway	Widening
	Chatham	I-16 Widening	Widening
	Chatham	Benton Blvd. Widening	Widening
	Chatham	I-95 /Jimmy De Loach Pkwy Improvements	Interchange improvements

** This project is majorly in Effingham County outside of MPO area*
** *This project is in Bryan County outside of MPO area*

The list of projects not included in the model is not presented due to lack of space.

- LOS = Modeled Daily Traffic / Daily Capacity
- Daily Capacity is estimated using peak hour factor (K-factor) and directional split factor (D-factor) - K-factor and D-factor are based on Highway Capaciy Manual 2016.

NOTE: The MPO model is a regional model that is validated on the regional basis and not for specific corridors. It is able to provide general guidance on where the volume is exceeding the capacity, but the MPO model alone would not be sufficient for determining/confirming a Logical Termini. For a Logical Termini, additional information like traffic counts, sub-area validation and environmental impacts will need to be collected and conducted.



Projects that are included in the 6th network:

Project ID	Primary County	Short Description	Primary Work Type
0006328	Chatham	Brampton Road Connector to Ports (grade separated rail crossing)	New Road
*0006700	Effingham	This project is a part of the Effingham Parkway that will extend from Effingham County to northwest of Chatham County.	New Road
0012757	Chatham	Widen I-16 from I-95 to I-516.	Widening
0012758	Chatham	I-16/I-95 Interchange reconstruction (WB-SB and SB-EB directional ramps w/ NB CD Roadway)	Widening
0013727	Chatham	The proposed project will provide operational improvements to the 1-16 at State Route 307/Dean Forest Road Interchange.	Diverging Diamond Interchange
0015704	Chatham	New bridge over the Back River SR 404 Spur/US 17 at Back River	Widening
0015705	Chatham	Widening and improvements of U.S. 17 from Hutchinson Island in Savannah, Chatham County, Georgia to South Carolina	Widening
521855	Chatham	Widening of SR 26/US 80/Ogeechee Road to 4 lane	Widening
C1	Chatham	Benton Blvd Extension	New road
0008358	Chatham	Reduce traffic congestion on DeRenne Avenue by providing a new four-lane divided connector from I-516 to a realigned White Bluff Road with a new direct connection to Hunter Army Airfield and a multi-use path. (This will affect the White Bluff/Bull St. at DeRenne intersection as it relates to capacity, since the NBLT to WB I-516 traffic will no longer use the	New Road
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
0008690	Chatham	Port's Last Mile Project - Jimmy DeLoach Connector 4 lane Freeway	New Road
**532370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening
	Chatham	President Street / Truman Parkway Interchange Bridge and Ramp Reconstruction	Ramp Reconstruction/flyover
	Chatham	I-95 at SR 21 / Augusta Rd Interchange Reconstruction	Interchange Reconstruction
	Chatham	I-95 at Airways Avenue Interchange	Interchange Reconstruction
	Chatham	I-516 / Lynes Parkway Widening (Veteran parkway to Mildred Street)	Widening
	Chatham	I-516 / Lynes Parkway Widening (I-16 to Veteran's Parkway)	Widening
	Chatham	I-16 / Little Neck / JDL interchange study recommendations.	Interchange Reconstruction
	Bryan	Harris Trail Road Widening	Extension and Widening
	Bryan	Port Royal widening	Widening
	Chatham	I-16 Widening	Widening
	Chatham	Montgomery St two way traffic option that city is implementing	Widening

** This project is majorly in Effingham County outside of MPO area*

** *This project is in Bryan County outside of MPO area*

Projects that are not included in the 6th network:

Project	Primary County	Short Description	Reasons why they are not
0013741	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0013742	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0008359	Chatham	Replace the existing two way left turn lane along DeRenne Avenue with a median to create a 4 lane divided roadway	No additional capacity
0010236	Chatham	Improve the raised median along DeRenne Avenue to better control access	No additional capacity
0010560	Chatham	Replace Bull River and Lazaretto Creek bridges and widen shoulders Johnny Mercer to Old US 80	No additional capacity
	Chatham	Old River Road, the current two lane section would be widened to accommodate turn lanes, shoulder widening, as well as drainage improvements.	No additional capacity

Travel Demand Model Documentation
for the
Coastal Regional MPO

CORE
COASTAL REGION MPO

September 2019

2015 Base Year Update &
2045 Travel Demand Models

Prepared for
Georgia Department of Transportation

GDOT
Georgia Department of Transportation

HNTB

Contents

TABLES

FIGURES

ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
CORE	Coastal Region Metropolitan Planning Organization
CTPP	Census Transportation Planning Package
E+C	Existing + Committed
FHWA	Federal Highway Administration
GDOT	Georgia Department of Transportation
HBO	Home-Based Other
HBS	Home-Based Shopping
HBW	Home-Based Work
HPMS	Highway Performance Monitoring System
I-E	Internal-External
IEPC	Internal-External Passenger Car
IETRK	Internal-External Truck
I-I	Internal-Internal
IITRK	Internal-Internal Truck
LOS	Level of Service
LR	Long Range
LRTP	Long-Range Transportation Plan
MPO	Metropolitan Planning Organization
FAST Act	Fixing America's Surface Transportation Act
NCHRP	National Cooperative Highway Research Program

NHB	Non-Home-Based
RMSE	Root Mean Squared Error
TAZ	Traffic Analysis Zone
TDM	Travel Demand Model
Univ	University
VMT	Vehicle-Miles Traveled
VHT	Vehicle-Hours Traveled
TIP	Transportation Improvement Program

1. INTRODUCTION

1.1 BACKGROUND

Federal legislation requires each metropolitan planning organization (MPO) to update its long-range transportation plan (LRTP) every five years or every four years in air quality nonattainment or maintenance areas. A LRTP covers a minimum twenty-year planning horizon and must be fiscally constrained. The current legislation, Fixing America's Surface Transportation (FAST) Act, was passed in 2015. The FAST Act requires that metropolitan transportation plans include current and projected transportation demand, existing and proposed transportation facilities that should function as an integrated metropolitan transportation system. It also requires MPOs to evaluating the condition and performance of the transportation system and for those MPOs who develop multiple scenarios, an analysis of how the preferred scenario has improved the conditions and performance of the transportation system should be included as well. Among all tools that helping MPOs to meet the requirements, a travel demand model (TDM) is a state-of-art tool to forecast the transportation demand and assess the performance measures on the transportation system.

The Coastal Region Metropolitan Planning Organization (CORE MPO) Savannah is in the greater Savannah area. The last LRTP, called Metropolitan Transportation Plan (MTP) for the CORE MPO area was approved in December 2013. Since Savannah is not in an air quality nonattainment area, the current MTP update must be approved by October 2019[1]. One component of the current MTP update is making informed decisions about multiple transportation system improvements. A TDM is among various planning tools that help MPOs understand the impact of their decisions and is commonly used to evaluate the performance of a transportation system in and around MPO areas. A TDM can predict the transportation deficiencies and the demand for transportation services. The TDM developed during the last MTP for CORE MPO in 2013 has the base year model in 2010 and future year models in 2040. During the current MTP process, the TDM has been updated to base year 2015 and future year to 2045. The purpose of this document is to provide an overview of the CORE MPO TDM update that would be used as a tool by the MPO for the development of the 2045 MTP.

[1] *The current CORE MTP was adopted August 7, 2019.*

1.2 TRAVEL DEMAND MODEL INTRODUCTION

1.2.1 What is Travel Demand Model?

Transportation modeling is an essential component of planning for regional infrastructure improvements. Regional TDMs provide the scale needed to analyze the benefits of transportation investments. It is a state-of-art analysis tool, which can replicate the existing travel demand, forecast future travel demand, and identify transportation network deficiencies and prioritize projects. The critical questions surrounding any transportation investment include not only "Where is a facility needed?" but also "When and why is a facility needed?" These questions can be answered through the regional perspective provided by large-scale TDMs. The process of travel demand forecasting uses what we know about the existing world to predict what conditions will be like in the future. It is a projection based on empirical data and foreseeable circumstances.

Most TDMs utilize a traditional four-step approach to estimate travel demand and patterns, how many trips will be generated, where they are going, what modes they are using, and which routes they will use. In the broadest sense, the MPO TDM consists of three elements: 1) model inputs, 2) a series of models conducting mathematical procedures, and 3) model outputs. Further detail on each is provided below.

A. Model Inputs

Model inputs are based upon the roadway system, land use and demographic or socioeconomic (SE) data. SE data, such as population, household and employment by type, represents land use. Future year projections of SE data were based on existing land uses including land development, as well as region wide forecasts of population, household and employment. Future year forecasts also considered planned major transportation improvements. It is in this area of TDM development that land use and community planning are connected to the transportation planning process. The SE data and the highway network serve as the basic inputs to the TDM.

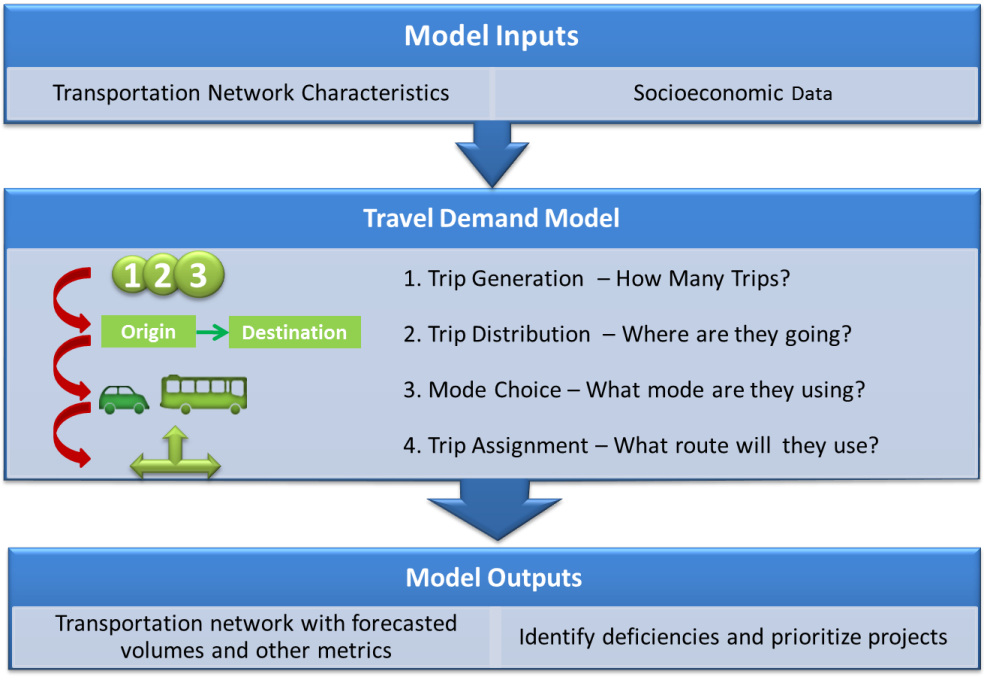
B. A Series of Mathematical Procedures

TDMs ultimately forecast travel demand using four steps: 1) trip generation, 2) trip distribution, 3) mode choice, and 4) trip assignment. The first step, trip generation, estimates how many trips are made by each household for each of the trip purposes (work, shopping, etc.) and how many trips are attracted to each location (work places, shopping centers, other activity areas, etc.). The second step, trip distribution, determines where the generated trips go (i.e. their origin and destination). The third step, mode choice, determines what modes will be utilized (i.e. passenger vehicles, transit, etc.). The fourth step, trip assignment, determines what routes will be taken to get from point A to point B.

C. Model Outputs

The outputs or results of the TDM forecast traffic volumes and other traffic metrics (i.e., travel speeds, travel time, congestion levels, etc.) on the transportation network. These metrics can be used to help identify transportation system deficiencies. TDMs are often used to assist in prioritizing transportation projects as well. **Figure 1-1** illustrates the structure of a TDM and its purpose.

Figure 1-1: TDM Structure



1.2.2 What the MPO's Regional TDM Can and Cannot Provide

TDMs across the country range in their abilities. Large metropolitan areas may include time-of-day, transit, and/or freight components. Very few even include non-motorized trip (bicycle/pedestrian) components. However, given the smaller nature of the MPO areas in Georgia outside Atlanta, the TDMs are simpler. A regional TDM in Georgia outside Atlanta generally can provide users with forecasted highway volumes for roadways with a functional class of collectors and above. The highway volumes are usually average daily volumes for long-range forecasts; 20 to 30 years out. The TDM can help MPOs to identify roadway deficiencies where daily volumes exceed the roadway capacities, evaluate impacts of major highway improvements, and evaluate transportation system performance for the purpose of LRTP development. For MPOs within the air quality nonattainment areas, the TDM is also used as the basis for air pollution emission estimates and for congestion management system statistics.

Because of its aggregate nature and regional scope, these TDMs are not designated to forecast the following metrics:

- Peak hour or peak period travel demand
- Freight demand
- Bicycle and walking trips
- Logical termini determination

1.2.3 Who is Responsible for What?

The MPO's TDM development is a process that requires collaboration between each MPO and the Georgia Department of Transportation (GDOT). While GDOT leads the development efforts of the MPO's TDM forecasts, the MPOs develop the inputs, which are the base year and forecasted socioeconomic data and future transportation project lists. **Table 1-1** summarizes the key activities and their lead agencies for a typical MPO's TDM development process. Note that MPOs' input of socioeconomic information, project lists and MTP scenarios drive the model forecast, and GDOT provides the technical services of the TDM development and forecast results.

Table 1-1: TDM Major Activities and Lead Agencies

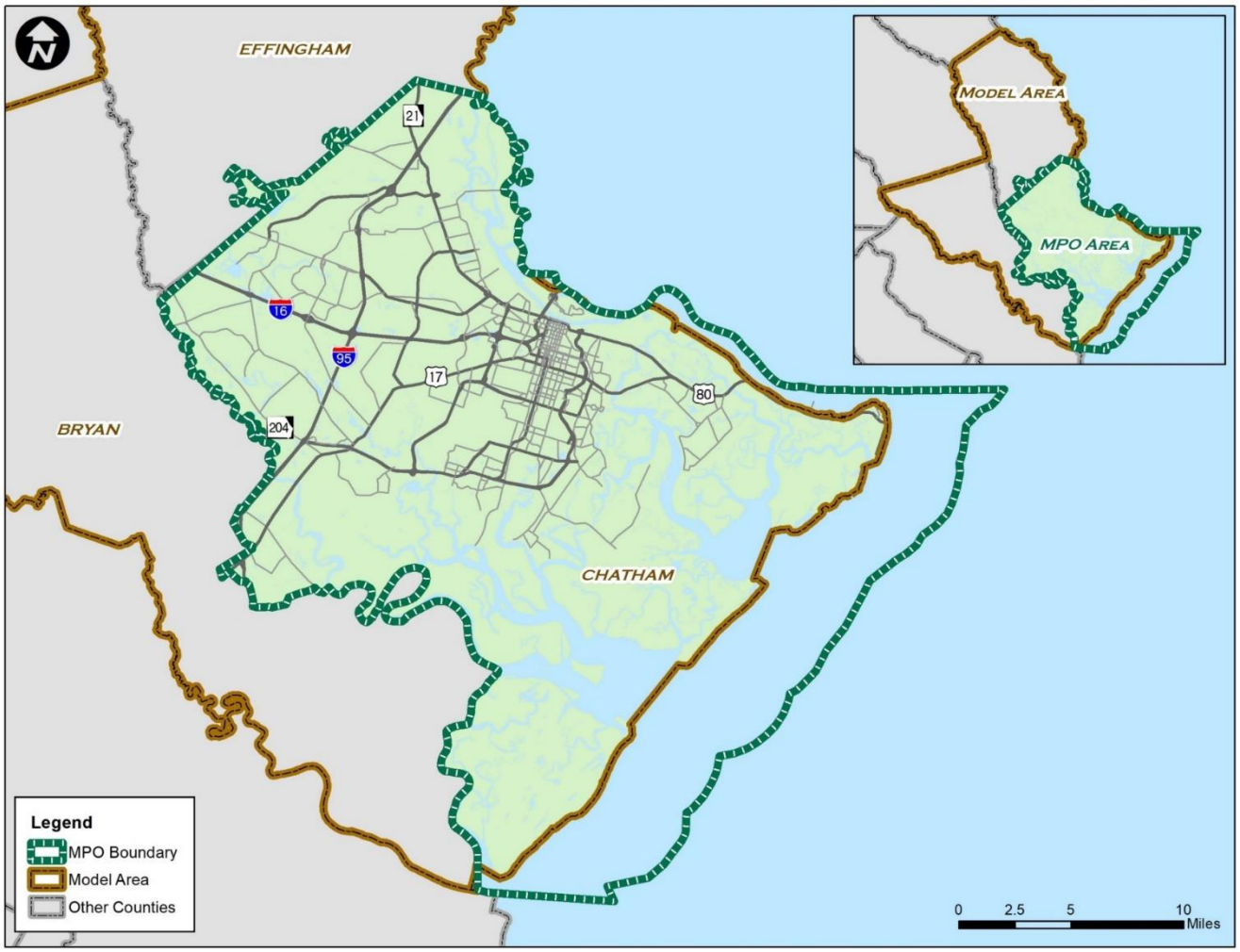
Activities	Lead Agencies
TDM Kick-Off Meeting	GDOT with MPO
Prepare and review base year socioeconomic data	MPO
Review base year socioeconomic data	GDOT
Base year model development and validation	GDOT
Prepare and review future year socioeconomic data	MPO
Review future year socioeconomic data	GDOT
Presentation of initial model results prior to proceeding with forecast of MTP scenarios	GDOT at MPO TCC/PC meetings
Develop and provide project lists for LMTP network scenarios	MPO
Develop each LRTP network scenarios and provide model outputs	GDOT

**TCC/PC: Technical Coordinating Committee / Policy Committee*

1.2.4 Metropolitan Planning Organization Area

The CORE MPO area includes all of Chatham County, small portion of Effingham and Bryan County. **Figure 1-2** illustrates the CORE MPO study area.

Figure 1-2: CORE MPO Area



2. 2015 BASE YEAR MODEL UPDATE

2.1 WHAT HAS BEEN UPDATED?

To update the base year model to 2015 in support of the CORE MPO 2045 MTP update, the following changes were made to the CORE MPO 2010 TDM:

- Modified TAZ boundaries and renumbered TAZs
  - Boundaries of certain TAZs are reviewed and changed. Based on these changes, TAZs are renumbered to remove gaps between zones.
- Updated socioeconomic data
  - GDOT reconciled socioeconomic data categories.
  - The CORE MPO has provided the updated study area traffic analysis zones (TAZs) and the associated socioeconomic data to reflect year 2015.
- Updated base year highway network
  - Updated roadway network functional classification;
  - Verified and updated number of lanes;
  - Updated traffic count locations and traffic counts from 2010 to 2015;
  - Reflected projects that have been completed during 2010 to 2015;
  - Included additional local roads to represent roadway connectivity; and
  - Added other road characteristics including road names, intersection geometries (such as interchange ramps), etc.
- Updated model's default Augusta trip production and attraction rates which were developed based on travel survey in Augusta in 1997. The models were updated based on add-on data GDOT purchased for entire state through 2017 National Household Travel Survey (NHTS).
- Updated base year validation components:
  - Updated screenlines;
  - Updated trip generation model;
  - Updated trip distribution model;
  - Updated trip assignment procedure; and
  - Updated external stations and trip data sets.
- Updated transit routes from 2010 to 2015
- Developed 2045 Scenarios based on projects provided by MPO

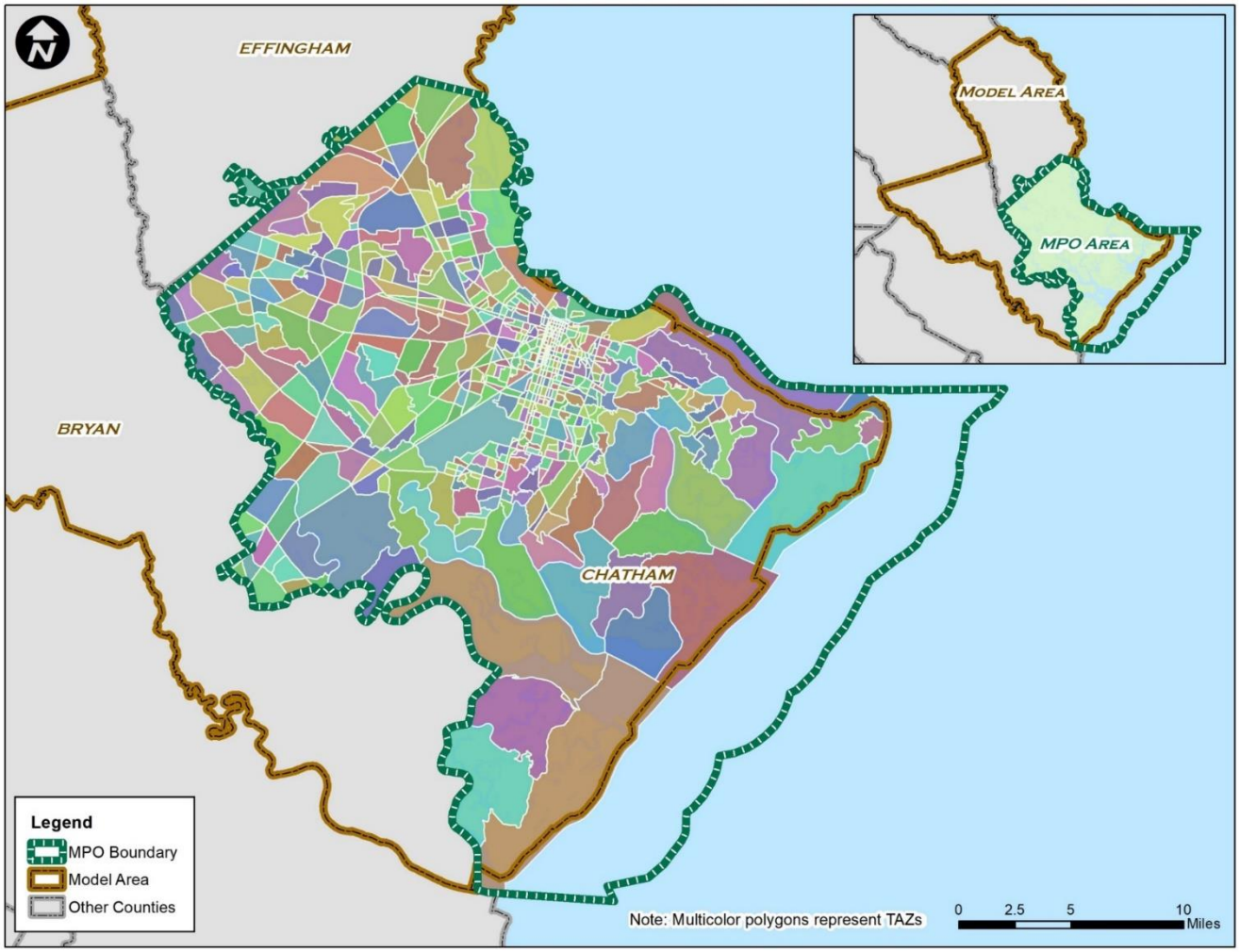
2.2 MODEL UPDATE

The following sections describe the details of the model updates, as well as each principal model element.

2.2.1 Traffic Analysis Zone Boundary Changes

Appendix A-1. 2015 and 2045 Socioeconomic Data contains the zonal level socioeconomic data used in the TDM for 2015 and 2045. A review memo for the socioeconomic data is included in the **Appendix A-2**: 2015 and 2045 Socioeconomic Data Review Memo**.** The study area has 797 internal TAZs, including 657 TAZs in the CORE MPO area and another 140 TAZs in the expanded portions of Bryan, Chatham and Effingham Counties. Zones 88 to 100; 196; 287; 299; 304; 330; 398-400;434; 456; 460; 486; 488; 490; 496-500; 503; 508-509; 575-600; 604; 647; 755-770; 876-879 are gap zones. The gaps are reserved for the addition of future new zones. There are an additional 20 external stations that facilitate traveling in and out of the region via individual facilities. **Figure 2-1** shows the TAZs (represented by random colors) within the CORE MPO area.

Figure 2-1: CORE MPO TDM TAZs



To make the TAZ system of the Savannah MPO model more robust, several TAZs were modified based on the census block boundaries and major roads. Maps showing the boundary changes are presented in **Appendix A-3.** Savannah TAZ Boundary Changes**.**

2.2.2 Model Inputs – 2015 Socioeconomic Data Summary

The MPO provided 2015 base year socioeconomic data for the model. For each of the 797 TAZs in the three-county study area, the following Socioeconomic (SE) variables were developed by the MPO for use in the trip generation model. Please note that the SE data categories have been updated in conjunction with MPO TDM enhancements. The updated categories include 1) Manufacturing & Transportation, Communication, Utilities, and Warehousing (MTCUW), 2) Retail and, 3) Service, 4) Agriculture, Mining and Construction (AMC). The Agriculture, Mining and Construction is added as a new category, and the Wholesale is combined with Manufacturing and other categories as the new "Manufacturing & Transportation, Communication, Utilities and Warehousing (MTCUW).

- **Population:** The total number of individuals that are residing in a given TAZ;
- **Households:** Total number of occupied households in a given TAZ;
- **Total Employment:** The total number of employed persons in a given TAZ;
- **Manufacturing, Transportation, Communication, Utilities, Warehousing (MTCUW) Employment**: Number of employees working for manufacturing-based, transportation-based, communication-based, utility-based, and warehousing-based businesses in a given TAZ where the business is located;
- **Service Employment:** Number of employees working for service-based businesses in a given TAZ where the business is located;
- **Retail Employment:** Number of employees working for retail-based businesses in a given TAZ where the business is located;
- **Agriculture, Mining, Construction (AMC) Employment:** Number of employees working for agriculture-based, mining-based, and construction-based businesses in a given traffic analysis zone where the business is located;
- **Median Income:** Median household income in a given TAZ in 2015 dollars (per 2015 Census);
- **School Enrollment:** The total number of enrolled K-12 students in a given TAZ at educational facilities except for the college level; and
- **College Students:** The total number of enrolled college students in a given TAZ with college or university level facilities.

Table 2-1 represents summary of 2015 socioeconomic data provided by MPO.

Table 2-1: Summary of 2015 Socioeconomic Data Provided by the MPO

Socioeconomic Variable	TDM Total	MPO Total
Population	361,071	285,078
Household	134,753	108,870
Total Employment	222,931	199,499
MTCUW Employment	29,297	26,461
Service Employment	159,028	142,596
Retail Employment	24,048	21,264
AMC Employment	10,561	9,178
Median Income	$46,654	$43,333
School Enrollment	64,383	46,356
College Students	28,688	28,688
Acreage	1,004,310	606,805

2.2.3 Model Inputs - 2015 Network Update

2.2.3.1 Functional Classification

According to Federal Highway Administration's guidance on functional classification updates, all functional classification categories will now exist in both urban and rural areas. Functional Classifications are updated and reviewed by MPO staff. Revised functional classification definitions should include the following categories:

- Principal Arterial
  - Interstate
  - Other Freeways and Expressways
  - Other Principal Arterials
- Minor Arterial
- Collector
  - Major Collector
  - Minor Collector
- Local

The revised functional classification categories are coded in the input network using the coding system show in **Table 2-2**. **Figure 2-2** represents the input network with updated functional classification categories.

Figure 2-2: Updated Functional Classification

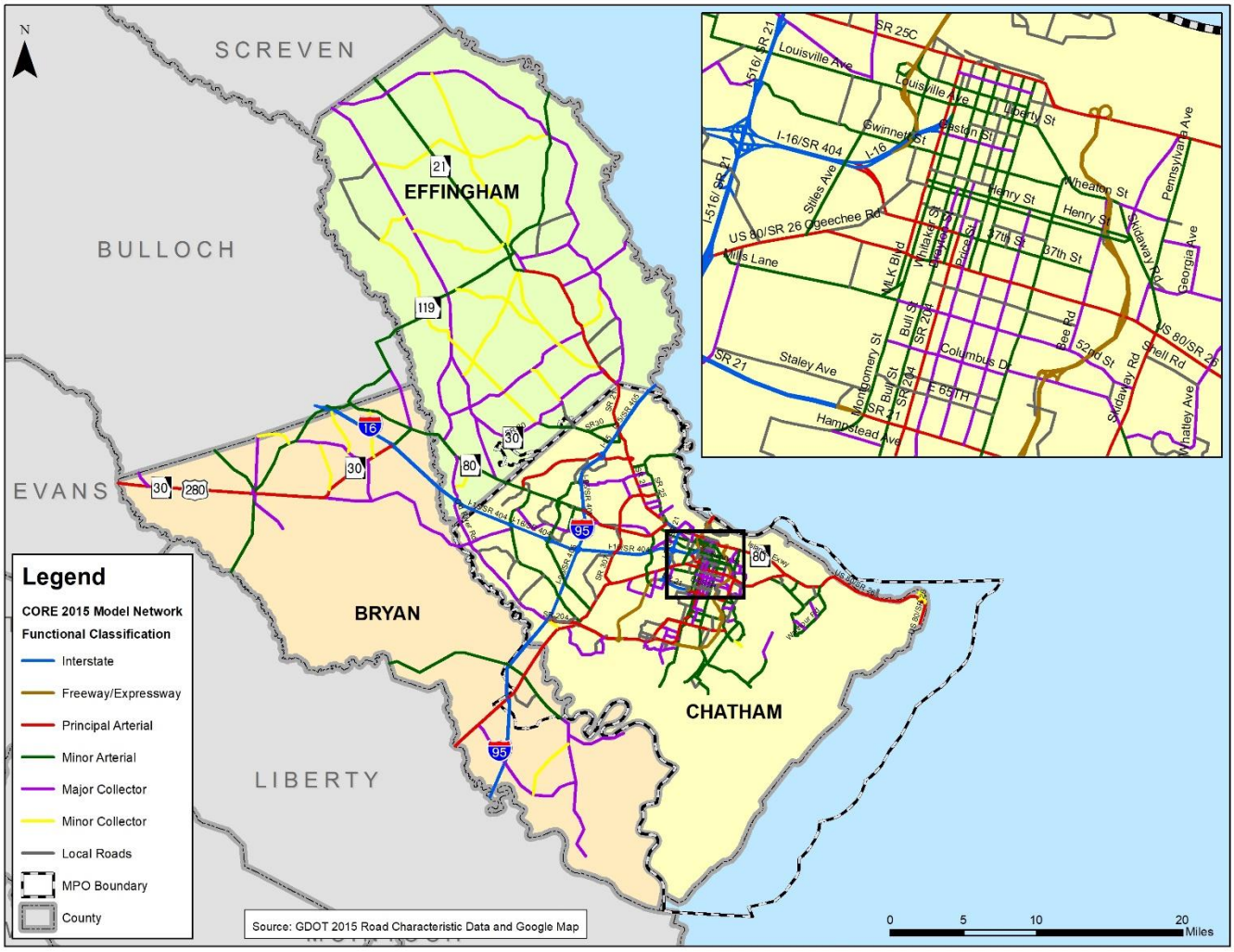


Table 2-2: Updated Functional Classification Category

Code	Functional Classification
1	Interstate
2	Other Freeways and Expressways
3	Other Principal Arterial
4	Minor Arterial
5	Major Collector
6	Minor Collector
7	Local

2.2.3.2 Facility Type and Area Type

Individually and in combination, facility type and area type provide the framework for organizing the network into sub-groups so that free-flow speeds and capacities can be assigned. In combination with the distance and number of lanes, these attributes constitute the base layer of highway network data needed to update and apply the travel demand model. The facility type and area type definitions used in the CORE MPO highway network and modeling process are shown in **Table 2-3** and **Table 2-4**. The facility types were coded based on each roadway's designated functional classification. The area types were assigned automatically during the model calculation based on geographic distribution of the socioeconomic data.

Table 2-3: Facility Types

Code	Facility Type
1	Interstate
2	Freeway
3	Expressway
4	Parkway
6	Freeway to Freeway Ramp
7	Freeway Entrance Ramp
8	Freeway Exit Ramp
11	Principal Arterial – Class I
12	Principal Arterial – Class II

Code	Facility Type
13	Minor Arterial – Class I
14	Minor Arterial – Class II
15	One Way Arterial
21	Major Collector
22	Minor Collector
23	One Way Collector
30	Local Road
32	Centroid Connector

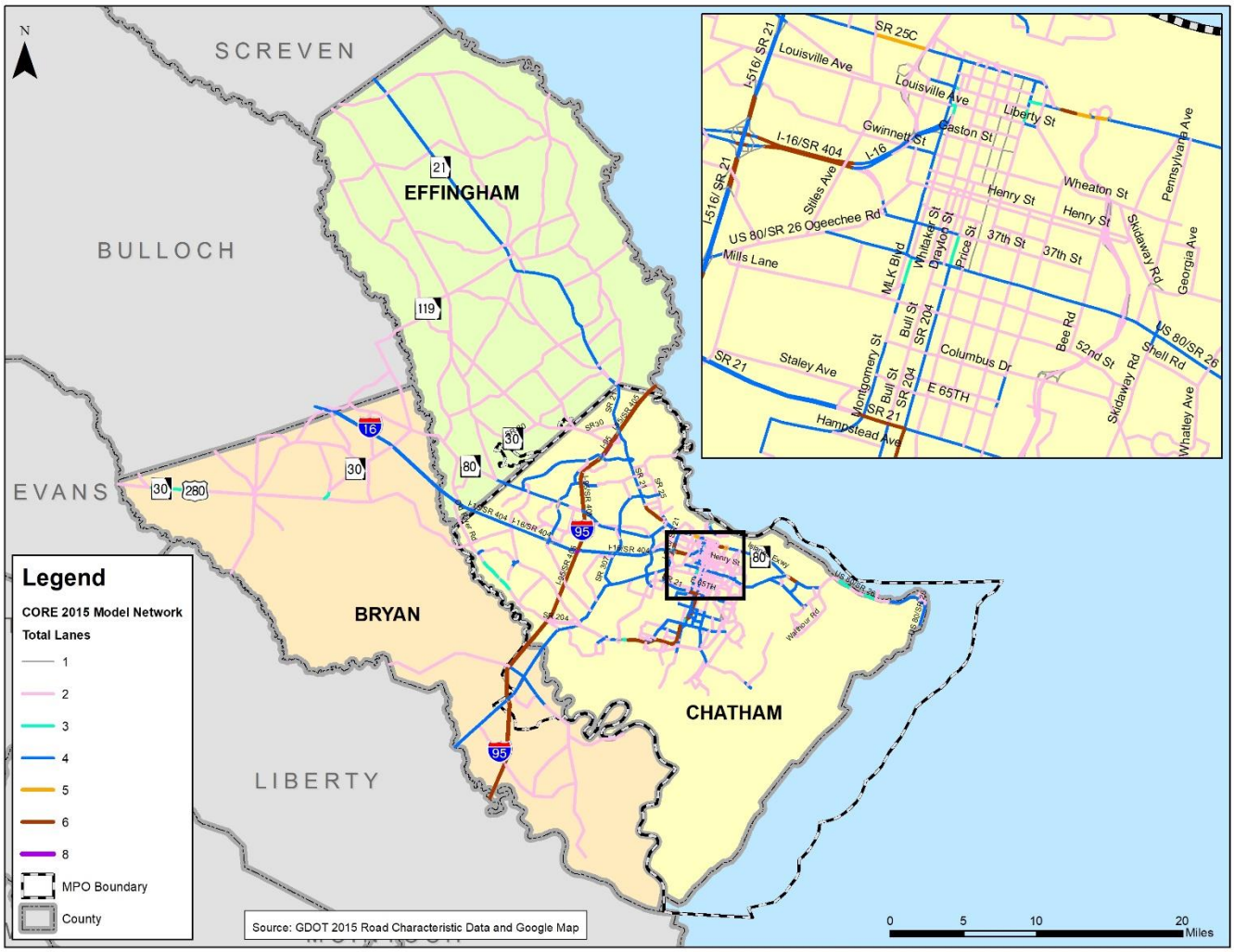
Table 2-4: Area Types

Code	Area Type
1	High Density Urban
2	High Density Urban Commercial
3	Urban Residential
4	Suburban Commercial
5	Suburban Residential
6	Exurban

2.2.3.3 Numebr of Lanes

The number of lanes on each highway link was updated and checked against Google Earth imagery to ensure accuracy and reflect 2015 conditions. **Figure 2-3** shows the number of lanes.

Figure 2-3: Number of Lanes



2.2.3.4 Capacity

Link capacities for the model network were obtained from the GDOT recommended lookup table of per-lane hourly capacities based on facility type and area type. The final link capacity was calculated by multiplying the hourly capacity per lane by the number of lanes, which was automatically added to the links during the model application. **Table 2-5** displays the hourly capacities per lane.

Table 2-5: Hourly Capacity per Lane by Facility Type and Area Type

Facility Type	Vehicles per Lane per Hour by Area Type						
	1	2	3	4	5	6	7
Interstate	1850	1900	1950	2000	2000	2100	2200
Freeway	1600	1660	1730	1790	1850	1820	1780
Expressway	1300	1380	1450	1530	1600	1570	1540
Parkway	1170	1240	1310	1370	1440	1410	1380
Freeway to Freeway Ramp	1400	1530	1650	1780	1900	1860	1820
Freeway Entrance Ramp	900	1030	1150	1280	1400	1370	1340
Freeway Exit Ramp	800	810	810	820	820	810	790
Principal Arterial – Class I	1000	1030	1050	1280	1400	1370	1340
Principal Arterial – Class II	900	900	900	900	900	880	860
Minor Arterial – Class I	800	810	810	820	820	810	790
Minor Arterial – Class II	760	760	770	770	770	760	730
One Way Arterial	760	760	770	770	770	760	740
Major Collector	620	640	650	660	670	660	650
Minor Collector	380	390	390	400	400	390	380
One Way Collector	370	380	380	380	380	380	370
Local Road	340	350	360	370	380	370	360
Centroid Connector	0	0	0	0	0	0	0

2.2.3.5 Speeds

Link speeds in the model network were derived from a speed lookup table based on facility type and area type. Assumed free-flow speed are approximately 5 mph faster than typical speed limits for the various roadway classes and area types, taking into consideration control for delay (i.e. traffic signals) if applicable. Peak and off-peak free-flow speeds were evaluated using observed speeds obtained from previous case studies that have been done earlier for other regions. Based on the initial study of the speeds, a revised speed table was developed as shown in **Table 2-6**.

Table 2-6: Speed by Facility Type and Area Type

Facility Type	Miles per hour by Area Type						
	1	2	3	4	5	6	7
Interstate	55	60	60	60	60	70	70
Freeway	50	55	55	55	55	60	60
Expressway	50	50	50	50	55	55	55
Parkway	45	50	50	50	50	55	55
Freeway to Freeway Ramp	55	55	55	55	55	55	55
Freeway Entrance Ramp	45	50	50	50	50	55	55
Freeway Exit Ramp	22	23	30	31	34	40	48
Principal Arterial – Class I	22	28	33	34	37	47	52
Principal Arterial – Class II	23	26	31	32	35	45	49
Minor Arterial – Class I	22	23	30	31	34	40	47
Minor Arterial – Class II	21	22	27	30	32	38	45
One Way Arterial	23	26	30	32	35	42	48
Major Collector	17	18	21	27	29	34	42
Minor Collector	14	15	18	24	26	30	40
One Way Collector	17	18	21	27	29	34	42
Local Road	14	14	17	18	22	28	35
Centroid Connector	14	14	17	18	22	28	35

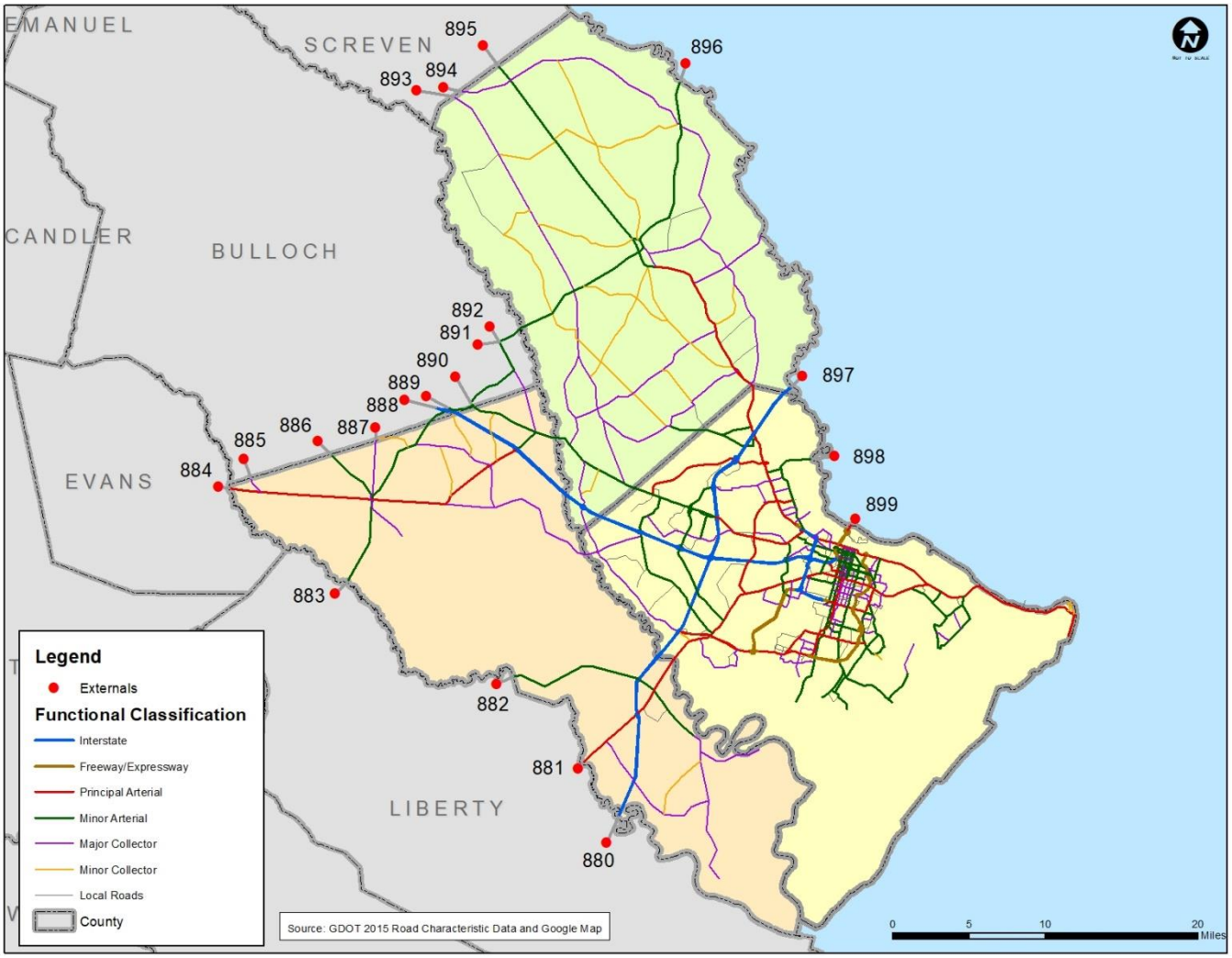
2.2.3.6 Traffic Count Locations

After updating the traffic count station information within the CORE MPO area and adding count stations in the three-county study area with reference to the online traffic data provided by GDOT, there are 354 count stations coded in the CORE MPO area and 118 count stations coded outside of the CORE MPO area within the three-county model area. All the count stations were updated with 2015 count information to assist with model validation.

2.2.3.7 External Stations and Traffic

There are 20 external stations established for the TDM, as illustrated below in **Figure 2-4**. Available 2015 traffic count data, including the average daily volumes and truck percent at or near the external stations, was obtained and coded for each external station. For external stations with no traffic counts available, appropriate daily volume estimations were decided based on best knowledge and professional judgment. External trip estimation for each external station can be found in **Table 2-14** in section 2.2.4.5.

Figure 2-4: External Station Locations



2.2.3.8 Network Atributes Summary

Table 2-7 lists the attributes that are coded in the 2015 input network with their description.

Table 2-7: Link Attributes

Attribute Name	Description/Coding System
ROAD_NAME	Roadway Name
DISTANCE	Roadway Link Length in miles
LANES	Number of Lanes for Each Direction
LANESAM	Number of Lanes in AM Peak Direction
LANESPM	Number of Lanes in PM Peak Direction
TOTAL_LANE	Number of Lanes for Both Directions
FC2015	Functional Classification Code (7 categories)
FTYPE	Facility Type
ONEWAY	1 – one-way link 0– two-way link
TOLLPC	Toll for passenger cars (dollars)
TOLLTK	Toll for heavy trucks (dollars)
USE	Truck usage restriction code
MPO	1 – in CORE MPO boundary; 0 – outside of CORE MPO boundary
COUNTY	County FIPS code
UAB2010	1 – in 2010 Urban Area Boundary based on 2010 Census; 0 – outside 2010 Urban Area Boundary
REMI2016	2016 Remi Districts
STATIONID	Traffic Count Station Number 2015
TCOUNT15	2015 AADT – Both Directions
COUNT15	2015 AADT – Each Direction

Attribute Name	Description/Coding System
TRKCOUNT15	Truck Count
SCREENLINE	Screenline ID
CUTLINE	Cutline ID
SCENARIO	Latest network the project should be included 2 – projects for the 2nd network – 2045 Do-Nothing 3 – projects for the 3rd network – 2045 E+C 4 – projects for the 4th network – 2045 STIP 5 – projects for the 5th network – 2045 LRTP 7 – projects for the 6th network – 2045 Financially Constrained
GDOT_PI	GDOT Project Identification Number
LOCAL_PI	Local Project Identification Number
RRFLAG	Railroad crossing type flag
DBFLAG	Draw bridge flag
PTSPEED	Transit route speed for transit only facilities
GSTDM_LINK	Corresponding GSTDM link nodes (format: A_B, for externals only)

2.2.4 Model Procedures

2.2.4.1 Trip Generation

Trip generation is the first step in the traditional four-step modeling process. It estimates the number of trips that will begin and end in each individual traffic analysis zone (TAZ). These are referred to as "trip ends." Trip ends generated by households are referred to as productions. Trip ends calculated from employment or school enrollment figures are referred to as attractions. This process is accomplished by establishing relationships between trips and socioeconomic variables. The process estimates the number of trip ends, or productions and attractions, for each TAZ by various trip purposes. Trip generation does not determine the origin and destination of each trip, only the total trips generated by each TAZ's socioeconomic characteristics.

In 1997, GDOT developed a new standardized trip generation process for the state's urbanized areas outside of Atlanta. The Trip Generation Update Project included a household travel survey and external travel survey in the Augusta metropolitan area. Household travel behavior by household size and income group is homogeneous from one urban area to another if transportation choices and land-use

patterns are similar. The Augusta survey information was used to formulate and recommend a trip generation process that is considered transferable to the State's other urbanized areas. In 2017, GDOT purchased add-on data from National Household Travel Survey (NHTS) which is used to update trip generation models developed in 1997.

The new trip generation process includes trip production and trip attraction sub-models. For all trips that have origins and destinations inside the CORE MPO region, excluding trucks, the trip production sub-model applies trip rates through a cross-classification of household size (1, 2, 3, 4+) and automobiles available (0, 1, 2, 3+). Aggregate household data for each traffic analysis zone is disaggregated into 16 cross-classified cells using a household stratification model. The household stratification model is also a product of the Trip Generation Update Project. This model breaks out the total number of CORE MPO households into cross-classification cells using zonal income, Savannah area specific data from the Census Transportation Planning Package (CTPP), and data from the Augusta household survey. The trip production sub-model applies regression equations for other trip purposes. The trip attraction sub-model applies regression equations for all trip purposes.

Typically, eight trip purposes were included in the trip generation process. These purposes are summarized below:

- **Home-Based Work (HBW)**: All travel made for the purpose of work that begins or ends at the traveler's home;
- **Home-Based Other (HBO)**: Any trip made with one end at the home except those for the purpose of work or shopping;
- **Home-Based Shopping (HBS)**: Trips made for the purpose of shopping and which begins or ends at the traveler's home;
- **Non Home-Based (NHB)**: Any trip that neither begins nor ends at home;
- **University (Univ)**: Travel made for university which begins and ends at the trip makers' residence;
- **Internal-Internal Truck (IITRK)**: Internal trips made by commercial vehicles;
- **Internal-External Passenger Car (IEPC)**: Internal trips beginning or ending outside the modeled area, excluding trucks; and
- **Internal-External Truck (IETRK)**: Internal truck trips beginning or ending outside the modeled area.
- **Port Direct (PORTDIR):** Internal-External heavy truck trips traveling to or from the Georgia Ports Authority that do not stop at a distribution center within the modeled area.
- **Port Indirect (PORTIND):** Internal-External heavy truck trips traveling to or from the Georgia Ports Authority that stop at a distribution center within the modeled area.

2.2.4.2 Household Stratification Model

The household stratification model subdivides the total number of households by TAZ into 16 household strata defined by household size and the number of automobiles available. Stratification is

done using zonal income, Savannah area specific data from the CTPP, and data from the Augusta household survey. The model distributes the total households in a TAZ to each cross-classification cell by calculating a relative[2] probability that a household will be a particular size with a particular number of automobiles. The relative probability is calculated with the following equation:

$$P(i,j) = S * I * CF, \text{ where}$$

$P(i,j)$ = *Relative probability that a household will be size i and own j autos*

S = *Household size factor from CTPP lookup table*

I = *Income factor from CTPP lookup table*

CF = *Composite household factor from Augusta household survey lookup table.*

An estimate of the number of households in a particular cross-classification cell is then calculated by multiplying the total number of households in the TAZ by the corresponding relative probability. The final number of households in each cross-classification cell is calculated by applying an adjustment factor to each calculated value. The adjustment factor is applied to ensure that the sum of the resulting disaggregated households equals the original aggregate number of households. This process is represented mathematically with the following equations:

$$HHij\ (est.) = HH * P(i,j), \text{ where}$$

$HHij\ (est.)$ = *Estimated number of households of size i that own j autos*

HH = *Total number of households in the TAZ*

$$HHij = HHij\ (est.) * F, \text{ where}$$

$HHij$ = *Final number of households[3] of size i that own j autos*

F = $HH / \Sigma HHij\ (est.)$, *control total adjustment factor.*

The three lookup tables used in the household stratification model are shown in **Table 2-8**, **Table 2-9** and **Table 2-8**.

[2] *The term "relative probability" is used because the value is not technically a statistical probability.*

[3] *Not rounded to an integer value to eliminate problems with round off errors.*

Table 2-8: CORE MPO 2015 TDM Household Size Distribution Percent

Computed Persons/HH Ranges			Household Sizes			
			1	2	3	4+
0.0	to	1.0	100.00%	0.00%	0.00%	0.00%
1.0	to	1.2	78.12%	20.56%	1.33%	0.00%
1.2	to	1.4	68.98%	25.68%	3.31%	2.03%
1.4	to	1.6	57.52%	31.28%	6.87%	4.33%
1.6	to	1.8	48.39%	35.11%	10.21%	6.30%
1.8	to	2.0	41.41%	35.37%	12.79%	10.43%
2.0	to	2.2	34.87%	35.63%	14.64%	14.86%
2.2	to	2.4	28.72%	34.71%	16.89%	19.68%
2.4	to	2.6	23.89%	32.74%	18.79%	24.58%
2.6	to	2.8	19.39%	31.40%	19.85%	29.35%
2.8	to	3.0	15.53%	29.47%	20.76%	34.24%
3.0	to	3.2	12.53%	27.49%	20.74%	39.24%
3.2	to	3.4	11.52%	24.89%	19.96%	43.63%
3.4	to	3.6	11.19%	21.16%	19.32%	48.32%
3.6	to	3.8	10.38%	20.42%	16.88%	52.32%
3.8	to	4	10.28%	20.32%	16.08%	53.32%

Table 2-9: CORE MPO 2015 TDM Household Income Distribution Percent

TAZ-Level Median HH Income		Income Group 1 <$20,000	Income Group 2 $20,000 - $39,999	Income Group 3 $40,000 - $59,999	Income Group 4 >$60,000
$0-	$2,499	88.35%	11.65%	0.00%	0.00%
$2,500-	$4,999	85.49%	11.68%	2.32%	0.50%
$5,000-	$7,499	83.00%	13.18%	3.00%	0.81%
$7,500-	$9,999	75.85%	14.68%	4.27%	5.21%
$10,000-	$12,499	69.33%	18.26%	7.18%	5.23%
$12,500-	$14,999	63.11%	21.31%	8.02%	7.56%
$15,000-	$17,499	57.71%	24.65%	8.94%	8.70%
$17,500-	$19,999	50.31%	29.38%	10.46%	9.85%
$20,000-	$22,499	43.26%	33.21%	12.57%	10.96%
$22,500-	$24,999	39.27%	33.87%	14.49%	12.36%
$25,000-	$27,499	33.16%	35.81%	17.02%	14.01%
$27,500-	$29,999	30.71%	34.88%	18.24%	16.17%
$30,000-	$32,499	27.34%	33.95%	19.45%	19.26%
$32,500-	$34,999	23.99%	33.56%	21.52%	20.93%
$35,000-	$37,499	21.08%	33.22%	22.54%	23.16%
$37,500-	$39,999	18.25%	31.43%	24.18%	26.15%
$40,000-	$42,499	16.55%	28.40%	26.12%	28.93%
$42,500-	$44,999	15.01%	26.88%	26.76%	31.34%
$45,000-	$47,499	13.91%	25.50%	26.63%	33.96%
$47,500-	$49,999	12.07%	23.87%	26.49%	37.58%
$50,000-	$52,499	11.88%	21.42%	25.69%	41.01%

TAZ-Level Median HH Income		Income Group 1 <$20,000	Income Group 2 $20,000 - $39,999	Income Group 3 $40,000 - $59,999	Income Group 4 >$60,000
$52,500-	$54,999	10.16%	20.12%	25.66%	44.07%
$55,000-	$57,499	9.45%	18.94%	24.80%	46.82%
$57,500-	$59,999	9.01%	18.53%	22.56%	49.90%
$60,000-	$62,499	8.44%	16.84%	21.02%	53.71%
$62,500-	$64,999	7.66%	15.98%	20.25%	56.12%
$65,000-	$67,499	6.88%	15.10%	19.48%	58.54%
$67,500-	$69,999	6.53%	14.16%	19.26%	60.04%
$70,000-	$72,499	6.01%	12.71%	18.33%	62.95%
$72,500-	$74,999	5.35%	12.18%	16.98%	65.49%
$75,000-	$77,499	5.12%	10.87%	16.36%	67.65%
$77,500-	$79,999	4.85%	10.42%	15.51%	69.22%
$80,000-	$82,499	4.46%	9.91%	14.65%	70.99%
$82,500-	$84,999	4.05%	9.39%	14.55%	72.02%
$85,000-	$87,499	3.64%	8.89%	13.59%	73.87%
$87,500-	$89,999	3.50%	8.39%	12.38%	75.73%

Table 2-10: CORE MPO 2015 TDM Household Size/Income/Auto Ownership Distribution Percent

Income Group	Persons Per Household	Autos Available			
		0	1	2	3+
1	1	30.63%	66.89%	2.48%	0.00%
	2	9.78%	65.78%	22.22%	2.22%
	3	7.33%	69.09%	16.28%	7.30%
	4	10.00%	56.94%	17.65%	15.41%
2	1	25.48%	47.76%	22.59%	4.17%
	2	4.00%	21.40%	63.20%	11.40%
	3	11.11%	12.56%	60.33%	16.00%
	4	9.00%	10.80%	59.42%	20.78%
3	1	18.33%	60.56%	15.78%	5.33%
	2	2.74%	16.77%	63.43%	17.06%
	3	9.00%	10.50%	50.33%	30.17%
	4	6.00%	4.38%	38.62%	51.00%
4	1	5.77%	66.54%	20.00%	7.69%
	2	6.94%	10.44%	53.22%	29.40%
	3	2.00%	5.81%	50.98%	41.21%
	4	1.90%	4.05%	54.05%	40.00%

2.2.4.3 Trip Productions

The routine for computing trip productions uses cross-classified data from the household stratification model and applies trip rates to calculate HBW, HBO, HBS and NHB trips. Trip rates for each purpose used the updated GDOT Daily Trip Production Rates that are based on *2017 NHTS* as the initial trip generation rate. **Table 2-11** shows the initial trip generation rates for the entire three-county study area. Further adjustments were applied to the initial results of trip production during the validation and calibration process, as shown in **Table 2-12**.

Table 2-11: CORE MPO 2015 TDM Trip Generation Trip Rates

Household Size	Autos Available	HBW	HBO	HBS	NHB
1	0	0.488	0.818	1.007	0.878
	1	0.999	1.905	1.53	1.799
	2	0.999	2.221	0.794	1.799
	3+	0.999	1.899	1.544	1.799
2	0	1.069	1.596	1.535	1.673
	1	1.683	2.4	2.683	2.635
	2	2.004	3.289	2.188	3.137
	3+	2.004	3.368	2.005	3.137
3	0	1.534	3.284	0.381	2.51
	1	2.249	4.438	1.44	3.681
	2	2.709	5.434	1.53	4.434
	3+	3.323	6.206	2.94	5.438
4+	0	1.568	4.47	0.743	2.876
	1	2.509	6.624	2.416	4.602
	2	2.928	8.166	1.799	5.368
	3+	3.346	8.827	3.232	6.135

Special adjustment rates to trip production by purpose as shown in **Table 2-12** were introduced for each county:

Table 2-12: CORE MPO 2015 TDM Trip Production Rate Adjustments

County	HBW	HBO	HBS	NHB	TRK	UNIV
Chatham	None	None	None	None	0.5	None
Effingham	0.48	0.48	0.48	0.48	0.5	None
Bryan	1.1	1.1	1.1	1.1	0.55	None
Islands	0.470	0.470	0.47	0.47	0.47	0.47

Trip end productions for other purposes are calculated using the following regression equations:

*I-I Truck Productions = 0.388*Household + 1.206*Retail Employment + 1.362*(Manufacturing Employment) + 0.514*Service Employment*

*I-E Passenger Car Productions = 0.331*Household + 0.724*Total Employment*

*I-E Truck Productions = 0.078*Retail Employment + 0.78*Manufacture Employment*

2.2.4.4 Trip Attractions

The trip attraction routine to compute the estimated number of trips attracted to each TAZ uses the following regression equations:

*Home-Based Work Attractions = 0.977*Total Employment*1.4*

*Home-Based Other Attractions = 0. 6432*Population + 0.7934*Total Employment + 0.7183*School Enrollment*

*Home-Based Shopping Attractions = 5.585*Retail Employment*

Non-Home-Based Attractions = 0.377(Population) + 1.178(Retail Employment) + 1.4047*Service Employment*

*University Attractions = 1.532 * College Students*(1.0-0.1)*

Internal Truck Attractions = Internal Truck Productions

I-E Attractions = Based on counts and EE% (internal zones=0)

I-E Truck Attractions = Based on counts, EE%, and Truck% (internal zones=0)

Port related trucks (direct) = Based on external station traffic count

*Port related trucks (indirect) = Manufacture Employment * (2.0 * Port Indirect Accessibility)*

Special adjustment rates to trip attraction by purpose were introduced for each county as shown in **Table 2-13**:

Table 2-13: CORE MPO 2015 TDM Trip Attraction Rate Adjustments

Area	HBW	HBO	HBS	NHB
TDM	0.9	0.89	0.88	0.89

2.2.4.5 Internal and External Trips

The total number of internal-external (I-E) trips for each external station is calculated by subtracting the estimated number of external-external (E-E) trips, based on an assumed percentage from the station's daily traffic volumes. Then the total I-E trips are separated into I-E truck trips and other I-E trips based on an assumed truck percentage at each external station. **Table 2-14** displays the percentages that are used to calculate I-E and E-E attractions at each external station for truck and passenger cars.

Table 2-14: CORE MPO 2015 TDM External Trips

2015 Station	Road Name	2015 Volume	E-E Passenger Percent	E-E Truck Percent	I-E Passenger Car Percent	I-E Truck Car Percent	Direct Port Trips	Indirect Port Trips
880	I-95 South	49700	50.40%	21.60%	19.60%	6.10%	1.10%	1.10%
881	US-17 South	19200	31.68%	4.32%	56.32%	6.98%	0.40%	0.40%
882	GA-144	7350	40.95%	4.05%	50.05%	4.95%	0.00%	0.00%
883	GA-119 South	2710	39.60%	5.40%	48.40%	6.60%	0.00%	0.00%
884	US-280	2710	29.16%	6.84%	51.84%	12.16%	0.00%	0.00%

2015 Station	Road Name	2015 Volume	E-E Passenger Percent	E-E Truck Percent	I-E Passenger Car Percent	I-E Truck Car Percent	Direct Port Trips	Indirect Port Trips
885	Nevils Groveland Road	520	0.90%	0.00%	93.10%	6.00%	0.00%	0.00%
886	GA-67	2460	61.38%	6.12%	29.52%	2.98%	0.00%	0.00%
887	Ash Branch Road	730	63.63%	3.87%	30.67%	1.83%	0.00%	0.00%
888	I-16	24800	10.53%	2.97%	67.47%	2.43%	8.30%	8.30%
889	GA-46	950	0.81%	0.09%	88.49%	10.51%	0.00%	0.00%
890	US-80	3820	8.10%	0.90%	81.80%	6.80%	1.20%	1.20%
891	Mud Road	1620	42.48%	2.52%	51.92%	3.08%	0.00%	0.00%
892	GA-119 Connector	2290	0.81%	0.09%	91.19%	7.91%	0.00%	0.00%
893	GA-17	1250	1.26%	0.54%	68.74%	24.96%	2.30%	2.30%
894	Oliver Kildare Road	710	0.81%	0.00%	93.99%	5.30%	0.00%	0.00%
895	GA-21	3150	35.01%	9.99%	42.79%	6.81%	2.70%	2.70%
896	GA-119 North	1510	36.54%	8.46%	44.66%	10.34%	0.00%	0.00%
897	I-95 North	55600	46.80%	25.20%	18.20%	6.70%	1.50%	1.50%
898	GA-25	3850	16.20%	1.80%	73.80%	5.80%	1.20%	1.20%
899	US-17 North	16100	40.50%	4.50%	49.50%	4.50%	0.50%	0.50%

2.2.4.6 Special Trip Purposes for University Productions

The university trip production rates are used from ARC's Travel Demand Model, as shown in **Table 2-15**.

Table 2-15: CORE MPO 2015 TDM University Trip Production Rates

Household Size	Income Group 1 <$20,000	Income Group 2 $20,000 - $39,999	Income Group 3 $40,000 - $59,999	Income Group 4 >$60,000
1	0.018	0.018	0.018	0.018
2	0.096	0.096	0.066	0.066
3	0.045	0.045	0.082	0.107
4+	0.060	0.060	0.138	0.192

The original University Attraction Coefficient was derived as 1.532 from NHTS data, and the rate was adjusted to 0.1 for Savannah.

*Univ attractions = 1.532 * College Students * 0.1*

2.2.5 Balancing Productions and Attractions

For most trip purposes in the CORE MPO model, production and attraction trip ends are computed separately using 2015 socioeconomic data. As such, the sum of productions across all zones does not necessarily equal the sum of attractions. In reality, each trip has two trip ends; one is a production/origin and one is an attraction/destination. Hence, it makes sense to equalize the sum of productions with the attractions across all zones which, in effect, "balances" the two types of trip ends. This balancing or reconciliation is performed in the trip generation phase following the steps listed below:

- Productions and attractions are calculated for all internal TAZs by purpose;
- Zonal attractions for each trip purpose are proportionally adjusted so the total attractions equal the total productions by purpose (i.e. attractions balanced to productions) for all internal zones;
- Special generator productions and attractions are added/subtracted;
- University productions are set equal to university attractions (University attractions are calculated from university enrollment, which provides a better indicator for student trip making behavior);

- NHB productions are set equal to NHB attractions (NHB trip productions were generated in the "home" zone, but by definition, NHB trips do not begin or end at the home. Therefore, the assumption is that the attraction variables are a better indicator of total trips than home-based characteristics);
- Attractions are balanced to productions for all internal zones (except NHB and University);
- I-E attractions (including trucks) are calculated for external stations;
- I-E productions (including trucks) are balanced to the calculated attractions (assumes that because I-E attractions are based on traffic counts or external station projections, they provide the best controls); and
- I-E productions and attractions are appended to the I-I trip end file to produce the final productions and attractions.

2.2.6 Trip Distribution

Trip distribution is the second major step in the TDM process. Trip distribution is a vital part of the modeling process because it calculates the trip interchanges between each zone pair that eventually have to be accommodated by the transportation system. A gravity model, the most widely used trip distribution model, is used to perform trip distribution in the MPO model. As its name suggests, the gravity model for transportation planning is based on the gravitational theory of Newtonian physics. It predicts that the relative number of trips made between two TAZs is directly proportional to the number of trip ends (productions or attractions) in each TAZ and inversely proportional to a function of the spatial separation between those two areas. Mathematically, the gravity model is expressed as follows:

$$T_{ij} = P_i \left[\frac{A_j F_{ij}}{\sum_j A_j F_{ij}} \right]$$

where,

Tij = Number of trips that are produced in TAZ *i* and attracted to TAZ *j*

Pi = Total number of trips produced in TAZ *i*

Aj = Number of trips attracted to TAZ *j*

Fij = Friction factor, a value which is an inverse function of travel time

Many different measures of impedance can be used, such as travel time, travel distance, or travel cost. The potential impedance functions that can be used to derive the relative attractiveness of each TAZ from the impedance include: (1) exponential, (2) inverse power, and (3) gamma functions. In the CORE MPO model, exponential functions were used to calculate travel impedance based on travel time. The impedance function, also known as the friction factor, is shown below:

$$f(d_{ij}) = e^{-c(d_{ij})}$$

Where, *dij* is the distance between TAZ *i* and TAZ *j* and where, *c* is a parameter that needs to be calibrated in the model. The parameter, *c*, needs to be calibrated such that the model estimated trip length frequency distributions (often average length) match the observed/target trip length frequency distributions (or average trip length) for each of the trip purposes. The calibration of the parameter *c* is described in the Chapter 3, 2015 Base Year Model Validation Section 3.2 Trip Distribution.

2.2.6.1 Derivation of Target Trip Lengths

The average motorized non-public-transportation journey-to-work trip lengths at the county level was obtained from ACS (American Community Survey). **Table 2-16** shows worker's mean travel time to work for each county in the three-county study area.

Table 2-16: Mean Travel Time to Work

County	Mean Travel Time (Minutes)
Bryan	29.3
Chatham	21.3
Effingham	30.7

Because this data provides only the average travel time for each county, it is necessary to estimate a weighted average travel time for the entire study area, which was calculated to be approximately 23.4 minutes, considering the population distribution among the three counties. Since I-E trips were grouped into a separate trip purpose in the MPO model, which included part of the HBW trips, it is necessary to estimate an adjusted Journey-to-Work trip length that applies to only I-I work trips. This is commonly done by estimating the share of work trips that are I-E trips based on census county-to-county work trip flow data. By assuming an average travel time for I-E work trips, the county model estimated an adjusted I-I work trip length as:

$$T' = \frac{T - (S * T_{IE})}{(1 - S)}$$

where,

T' = Adjusted I-I work trip length

T = Work trip length

S = Share of I-E work trips

TIE = Estimated trip length for I-E work trips

The I-E HBW trips in the study area were assumed to account for 4.8 percent of trips and have an average trip length of 19 minutes. Given this assumption, the estimated internal HBW trip length is 23.7 minutes. Trip lengths for all other trip purposes (HBW, HBO, HBS, NHB and IE) were estimated based on equations from *Calibration and Adjustment of System Planning Models, FHWA* and *NCHRP Report 365. Calibration and Adjustment of System Planning Models* which includes equations to estimate average trip lengths based on the study area population; *NCHRP Report 365* includes an equation to estimate average work trip length based on the geographic size of the modeled area and also suggests rules of thumb for non-work trip lengths relative to the work trip lengths. The estimated average trip lengths for HBO, HBS and NHB trips are 20.2 minutes, 18.1 minutes, and 17.5 minutes, respectively. The average trip lengths for the different trip purposes for the three-county study area are summarized in **Table 2-17**. These are the target trip lengths to validate the trip distribution during the modeling process.

Table 2-17: CORE MPO 2015 TDM Targeted Average Trip Travel Times

Trip Purpose	Average Trip Travel Time (Minutes)
Home-Based Work	23.7
Home-Based Other	20.2
Home-Based Shopping	18.1
Non-Home-Based	17.5

2.2.6.2 Development of Minimum Time Paths

Minimum time paths for the network were calculated during the modeling process. These times include all turn prohibitions and turn penalties. Turn prohibitions are where specific turning movements are prohibited in the model, whereas turn penalties are where a time penalty is added to the model to discourage and ultimately decrease the amount of turns made at a specific location. The minimum times were then adjusted to include the intra-zonal times and terminal times. Intra-zonal times, the average time it takes to make a trip inside a particular TAZ, were created using travel time to the nearest four TAZs. Terminal times were assigned based on the employment density of the origin and

destination TAZs. At the trip origin, terminal time generally refers to the walk from one's residence to their car. At the destination end, it generally represents the time it takes to go from one's car to their destination. **Table 2-18** summarizes the terminal time criteria:

Table 2-18: CORE MPO 2015 TDM Terminal Time Criteria

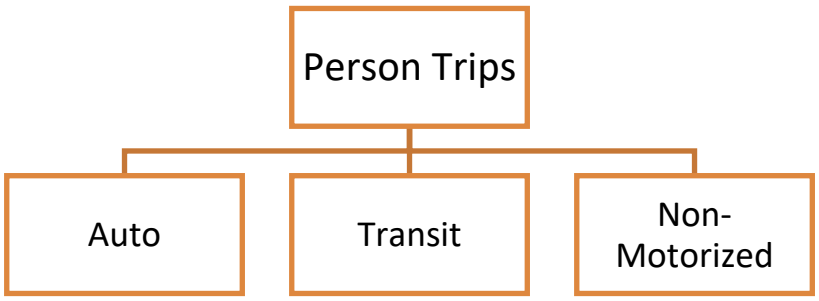
Zone	Area Types	
	1-3 (Urban)	4-7 (Suburban and Rural)
Origin	3 minutes	1 minute
Destination	3 minutes	1 minute

Gravity model input consists of a set of travel time impedance factors (friction factors), in addition to the production trip ends, attraction trip ends and minimum time skim. These parameters force the gravity model to produce sets of trips by purpose, whose distributions approximate an observed travel time distribution. Those parameters were adjusted due to the expansion of the model study area during the model validation process.

2.2.7 Mode Split

The mode split process determines what mode of travel will be used to make the trips between zones. In the CORE MPO model, the mode choice follows simple multinomial logit structure and splits the trips between auto, transit and non-motorized trips as shown in **Figure 2-5.**

Figure 2-5: CORE MPO Mode Choice Model Structure



Auto and transit trips are derived from utility equations which include variables for in-vehicle time (IVT), out of vehicle time (OVT) and cost. Utility equations for non-motorized trips include out of vehicle time, a variable to discourage long distance trips, a variable to encourage non-motorized trips in

highly accessibly areas, and variable to encourage non-motorized in the densest area types (i.e., a proxy for a pedestrian environment variable).

Table 2-19 displays assumptions that were used to derive the utility coefficients for in-vehicle time (IVT), out-of-vehicle time (OVT) and cost.

Table 2-19: CORE MPO Mode Choice Model Utility Coefficients

Purpose	IVT Coefficient	OVT Coefficient	Cost Coefficient ($)
HBW	-0.0250	-0.0500	-0.7111
HBS	-0.0125	-0.0375	-0.4267
HBO	-0.0125	-0.0375	-0.4267
Univ	-0.0125	-0.0375	-0.4267
NHB	-0.0225	-0.0675	-0.2880

The trip generation process estimates person trips for internal trip purposes (HBW, HBO, HBS and NHB). The person trips are converted to vehicle trips before trip assignment using average auto occupancy rates from National Cooperative Highway Research Program (NCHRP) Report 716. The other trip tables, including those for internal truck and I-E and E-E passenger car and truck trips, were calculated in terms of vehicle trips at their inception.

The CORE MPO mode share targets were primarily derived from the National Household Travel Survey (NHTS) and Chatham Area Transit (CAT) reports. The resulting mode share targets and modeled mode shares are shown in **Table 2-20**.

Table 2-20: Mode Share by Trip Purpose Comparison

Trip Purpose	Mode	Target	Model
HBW	Auto	96.6%	96.6%
	Transit	1.0%	1.0%
	Non-Motorized	2.4%	2.4%
HBS	Auto	93.7%	94.0%
	Transit	0.9%	0.9%
	Non-Motorized	5.4%	5.1%
HBO	Auto	83.1%	83.4%
	Transit	4.5%	4.4%
	Non-Motorized	12.4%	12.3%
NHB	Auto	89.4%	90.1%
	Transit	2.0%	2.0%
	Non-Motorized	8.6%	7.9%

2.2.8 Trip Assignment

The last step in the modeling sequence is the assignment of the trip tables to logical routes in the highway network. Trip assignment for the CORE MPO model was accomplished using the equilibrium assignment technique. The trip assignment algorithm is iterative, running through successive applications until equilibrium occurs. Equilibrium occurs when no trip can be made by an alternate path without increasing the total travel time of all trips in the network. The equilibrium assignment is an iterative process that reflects travel demand assigned to minimum time paths as well as the effects of congestion. In each iteration, traffic volumes are loaded onto network links and travel times are adjusted in response to the volume-to-capacity relationships. Final assigned volumes are derived by summing a percentage of the loadings from each iteration. The percentages reflect congested conditions that usually influence motorists' path selection for a portion of the day, not the entire day.

2.2.8.1 Output Network Attributes

During the model run, additional network link attributes are attached to the input network to store assignment results as well as values used in the trip assignment. These additional attributes provide

volumes, travel time, speed, and so on for each link, and can be used to summarize network-wide link statistics. A list of these attributes is shown in **Table 2-21**.

Table 2-21: CORE MPO 2015 TDM Output Network Attributes

Attribute Name	Description
TAZ	Nearest TAZ ID
ATYPE	Area Type
HCAP	Hourly Capacity (Vehicles per Hour)
HCAPAM	AM Peak Hourly Capacity (Vehicles per Hour)
HCAPPM	PM Peak Hourly Capacity (Vehicles per Hour)
CAPACITY	Daily Capacity (Vehicles per Day)
SPEED	Free Flow Speed (Miles per Hour)
TIME_FF	Free Flow Travel Time (Minutes)
TIME_OP	Off-peak Travel Time (Minutes)
LINKCLASS	Link Classification Used in Assignment
WALKTIME	Walk Time
NONMOTTIME	Non-Motorized Time
TIME_CG	Congested Travel Time – Before assignment
V_1	Daily Volume (Each Direction)
TIME_1	Congested Link Travel Time – After assignment
VC_1	Daily Volume Capacity Ratio
CSPD_1	Congested Speed (Miles per Hour)
VHT_1	Vehicle Hours of Travel
VT_1	Daily Volume (Both Direction)
V_TRK	Daily Volume (Truck)
V_PC	Daily Volume (Total Passenger Cars)
VMT_1	Daily Vehicle Miles of Travel

Attribute Name	Description
VHD_1	Daily Vehicle Hours of Delay

3. 2015 BASE YEAR MODEL VALIDATION

GDOT requires refinements to various model parameters until the 2015 base year model sufficiently replicates observed 2015 travel patterns and conditions. The base year model was checked for accuracy under each of the major steps in the TDM process starting from trip generation to trip assignment. Both inputs and outputs were checked for accuracy and reasonableness and include review of the transportation network and attributes, trip generation and distribution parameters, average trip lengths by purpose, vehicle-miles traveled (VMT) statistics and root mean squared error (RMSE). Modeled volumes are validated against traffic counts at several levels – regional, corridor (including screenlines) and link-by-link. Results from each of these validation steps are presented in the following sections.

3.1 TRIP GENERATION

The GDOT trip generation process primarily uses parameters from NHTS and U.S. Census data. Minor adjustments are made to GDOT standard procedures to reflect unique characteristics in each area being modeled. Various validation checks are made to ensure that trip generation results are reasonable. National data sources are used as reasonableness checks for trip generation results.

In the CORE MPO trip generation, person trips per household is below the normal value. The comparison between target ranges of calibration measures and modeled results for trip generation are summarized in **Table 3-1.** All trip generation measures are within the target range.

Table 3-1: Trip Generation Model Reasonableness Checks

Calibration Measures	Target Range / Value[4]		Model Results
	Min	Max	
Socioeconomic Data			
Persons / Household	2	4	2.7
Workers / Household	1	3	1.7
School / Population	0.2	0.2	0.2
Trip Generation			
Person Trips Per Household	8.5	9.2	9.6
Person Trips Per Person	3	4	3.0
HBW Trips / Employee	0	2	1.1
Shopping Trips / Retail Employment			4.8
P/A Ratio Before Balancing (HBW)	0.9	1.1	0.97
P/A Ratio Before Balancing (HBO)	0.9	1.1	0.97
P/A Ratio Before Balancing (HBShop)	0.9	1.1	0.97
P/A Ratio Before Balancing (NHB)	0.9	1.1	0.97

3.2 TRIP DISTRIBUTION

Trip distribution parameters are calibrated to produce reasonable average trip lengths for auto trips by purposes and truck trips. Expected average trip lengths were estimated from 2013 ACS 5-yr estimates Travel Time to Work data and the population and geographic size of the modeled area. Travel times from trip assignment were used as input to trip distribution (i.e., feedback), which strengthens the

[4] *Source:* General Summary of Recommended Travel Demand Model Development Procedures for Consultants, MPOs and Modelers, *GDOT, May 2013.*

validity of the modeled trip lengths. The comparison between the target trip lengths and modeled trip lengths are summarized in **Table 3-2**. All are within an acceptable range.

Table 3-2: Trip Length Validation Measures

Trip Purpose	I-I HBW	I-I HBO	I-I HBS	I-I NHB	Truck	I-E Passenger Car	I-E Truck
Target[5] Average Trip Length	23.7	20.2	18.1	17.5	25	25	25
Model Average Trip Length	23.59	23.44	21.64	22.74	25.67	46.87	37.41
Model/Target Ratio	99.0%	96.3%	96.6%	97.9%	100.4%	104.4%	113.7%

3.3 TRIP ASSIGNMENT

The trip assignment validation process includes the comparison of the model outputs to expected targets. Targets for various model parameters have been compiled by GDOT from a number of sources. The following documents serves as the primary sources for checking the reasonableness of model parameters and results:

- *Model Validation and Reasonableness Checking Manual*, Travel Model Improvement Program (TMIP), FHWA, 2010;
- *NCHRP Report 716 Travel Demand Forecasting: Parameters and Techniques,* Transportation Research Board, 2012*; and*
- *Calibration and Adjustment of System Planning Models*, USDOT, FHWA, 1990.

The primary targets GDOT uses for validating the trip assignment process are outlined in **Table 3-3**. The results of the CORE MPO 2015 TDM validation results are described in the following sections.

[5] *Sources: CTPP 2015 Journey to Work data;* NCHRP Report 365 *and* Report 716*;* Calibration and Adjustment of System Planning Models*, USDOT, FHWA, December 1990;* General Summary of Recommended Travel Demand Model Development Procedures for Consultants, MPOs and Modelers*, GDOT, May 2013.*

Table 3-3: Trip Assignment Validation Measure Targets

Validation Measures	Target Range/Value
VMT (based on HPMS VMT reports)	
VMT - Interstates	Less than 6% - 7%
VMT – Principal Arterials	Less than 10% - 15%
VMT – Minor Arterials	Less than 10% - 15%
VMT – Collectors	Less than 15% - 25%
VMT – Total	Less than 5%
Volumes for Individual Links	
Volumes to Count Deviation	Less than Maximum Desirable Deviation (NCHRP Report 255)
Screenlines and Cutlines	
Volumes to Count Deviation for each line group	Less than Maximum Desirable Deviation (NCHRP Report 255)
Volume RMSE	
Volume Group: 0 – 5,000	Less than 100%
Volume Group: 5,001 – 10,000	Less than 75%
Volume Group: 10,001 – 15,000	Less than 50%
Volume Group: 15,001 – 20,000	Less than 30%
Volume Group: 20,001 – 30,000	Less than 30%
Volume Group: >30,001	Less than 30%
System Total	Less than 35%

3.3.1 Overall Vehicle-Miles Traveled Summary

Daily VMT is calculated by multiplying the amount of daily traffic on a roadway segment by the length of the segment, then summing all the segments' VMT to give a total for a geographical area of concern.

The total model VMT has two percent difference when compared to the observed VMT, as shown in **Table 3-4** below.

Table 3-4: CORE MPO 2015 TDM VMT

Functional Classification	Mileage (miles)		VMT (000,miles)		VMT Distribution			
	Observed[6]	Model	Observed	Model	Observed	Model	Difference	% Difference
Interstates	67	67	3,500	3,508	35%	36%	8	0%
Principal Arterial	166	164	3,631	3,535	37%	37%	-96	-3%
Minor Arterial	227	218	1,809	1,685	18%	17%	-124	-7%
Collectors	371	359	1,007	982	10%	10%	-25	-3%
Total	**831**	**808**	**9,947**	**9,710**	**100%**	**100%**	**-237**	**-2%**

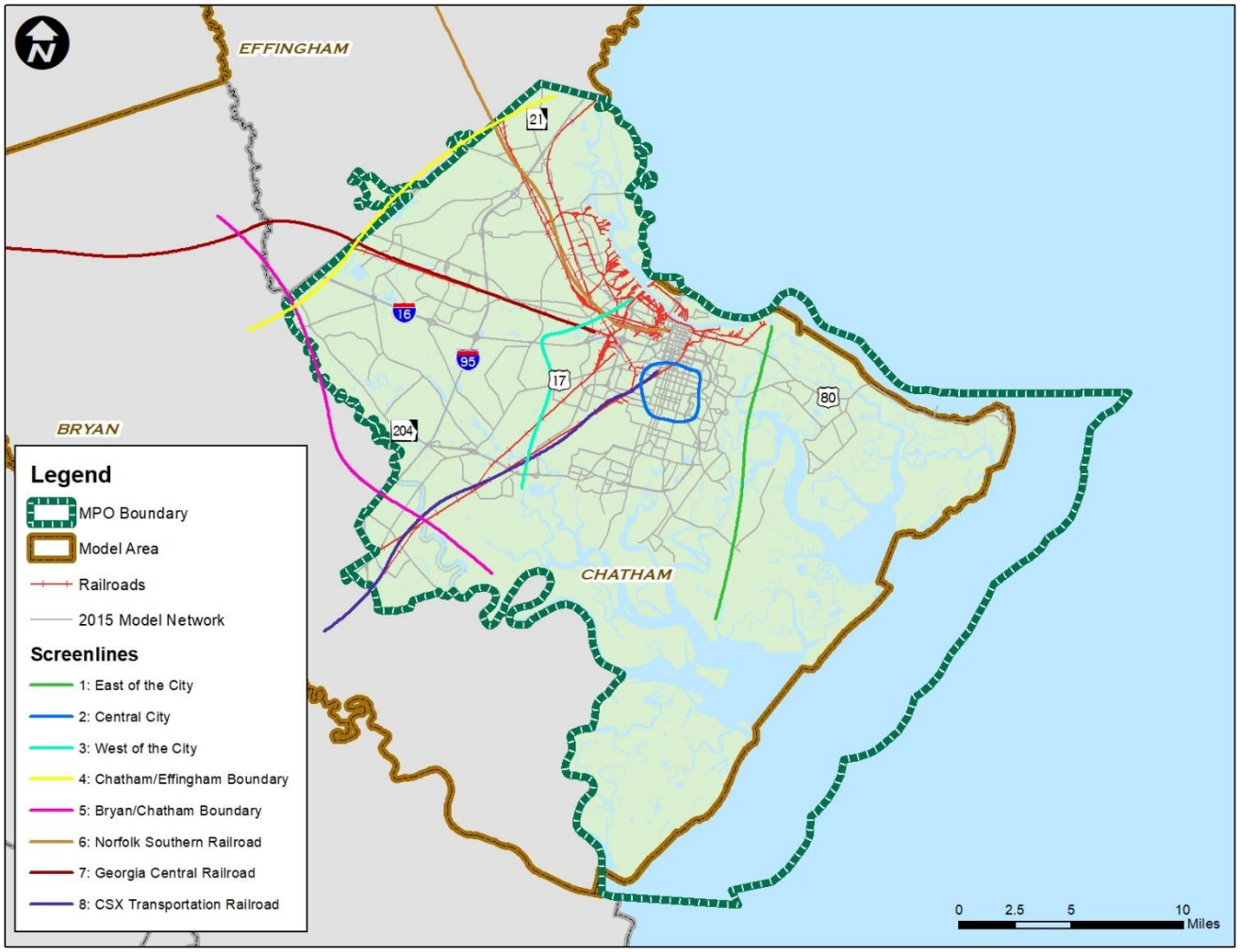
3.3.2 Screenlines Summary

One of many steps in the validation process involves screenlines. Screenlines are often defined by physical features such as railroads, creeks and rivers. Because all roadways are not reflected in the TDM, these types of features serve to funnel traffic into corridors so that all trips can be analyzed where crossing of these features is possible.

Figure 3-1 depicts the locations of screenlines used during the validation process.

[6] *Source:* 2015 GDOT VMT – Mileage by Route and Road System Report 445, *GDOT*. *http://www.dot.ga.gov/informationcenter/statistics/RoadData/Documents/445/DPP445_2015.pdf*

Figure 3-1: CORE MPO 2015 TDM Screenlines



3.3.2.1 Model Screenlines Analysis Results

The volume-to-count percent deviation on each of the eight established screenlines is well below the corresponding maximum desirable percent deviation. The total volume to total count percent deviation for all eight screenlines is at zero percent. **Table 3-5** provides a summary of total volume and total counts comparisons on the screenlines.

Table 3-5: CORE MPO 2015 TDM Screenline Results

Screenlines	Total Volumes	Total Counts	Maximum Desirable Percent Deviation[7]	Volume to Count Percent Deviation
1- East of the City	66,089	64,500	29%	2%
2- Central City	205,361	221,010	18%	-7%
3- West of the City	179,413	186,370	20%	-4%
4- Chatham/Effingham Boundary	69,569	71,280	28%	-2%
5- Bryan/Chatham Boundary	109,267	101,290	25%	8%
6- Norfolk Southern Railroad	157,818	159,120	21%	-1%
7- Georgia Central Railroad	53,250	52,760	32%	1%
8- CSX Transportation Railroad	144,193	149,200	21%	-3%
Total	**984,959**	**1,005,530**	**10%**	**-2%**

3.3.3 Modeled Volume Summary

3.3.3.1 Link Volume Percent Deviation

The percent deviation is described in *Calibration and Adjustment of System Planning Models, FHWA, 1990*. This method is used to calibrate a model for system-wide studies. It is based on the expectation that the TDM should accurately predict the number of through-lanes required to provide a specific level of service (LOS) for a given facility. Trip assignment deviation should not result in a design deviation of more than one highway travel lane. Therefore, the expected accuracy of the model increases as the annual average daily traffic (AADT) on a facility increases.

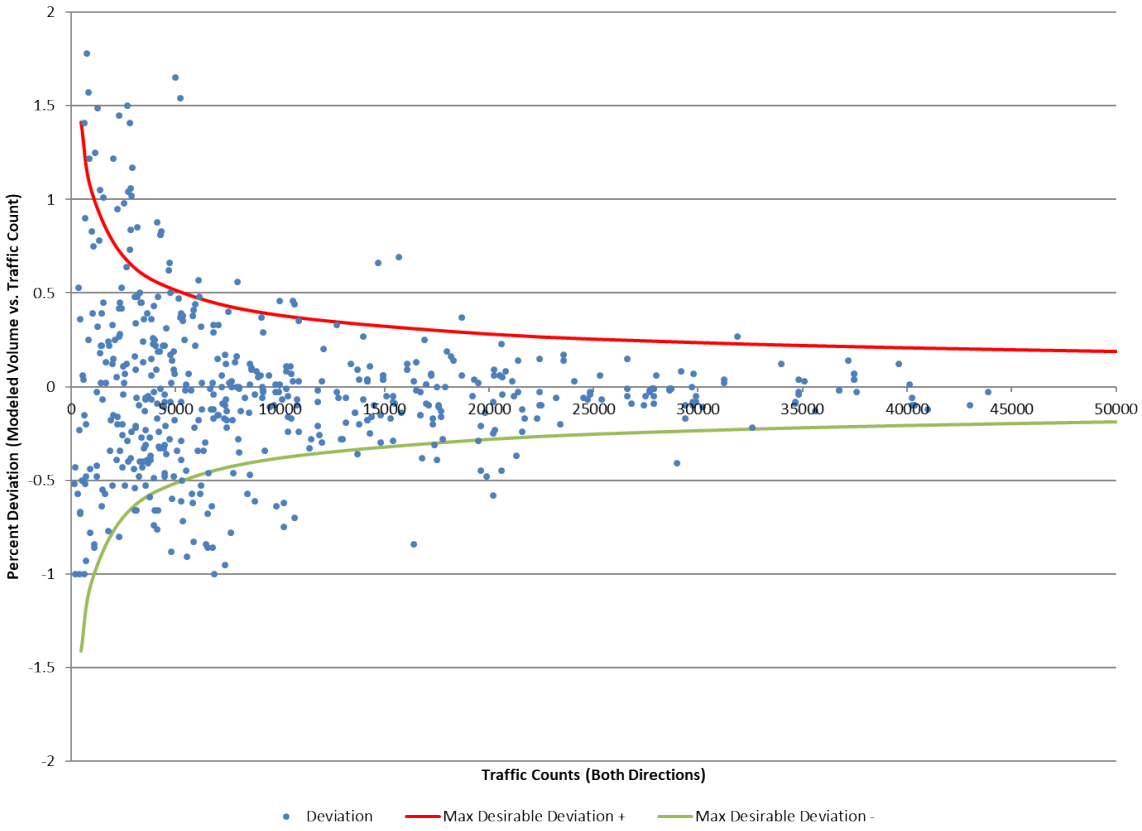
Figure 3-2 shows the deviation between the 2015 base year volumes assigned by the TDM and observed traffic counts. As the graph shows, most of the link-level model deviation points are

[7] *Sources:* NCHRP Report 255, Report 365 *and* Report 716; General Summary of Recommended Travel Demand Model Development Procedures for Consultants, MPOs and Modelers, *GDOT, May 2013*.

concentrated between the maximum desirable deviation positive line and maximum desirable deviation negative line. The following conclusions can be drawn from the graph:

- Almost all of the model highway links were assigned volumes that were in reasonable agreement with the traffic counts.
- Observed traffic counts for most of the highway links were under 45,000 per day.

Figure 3-2: CORE MPO 2015 TDM Link Volume Percent Deviation



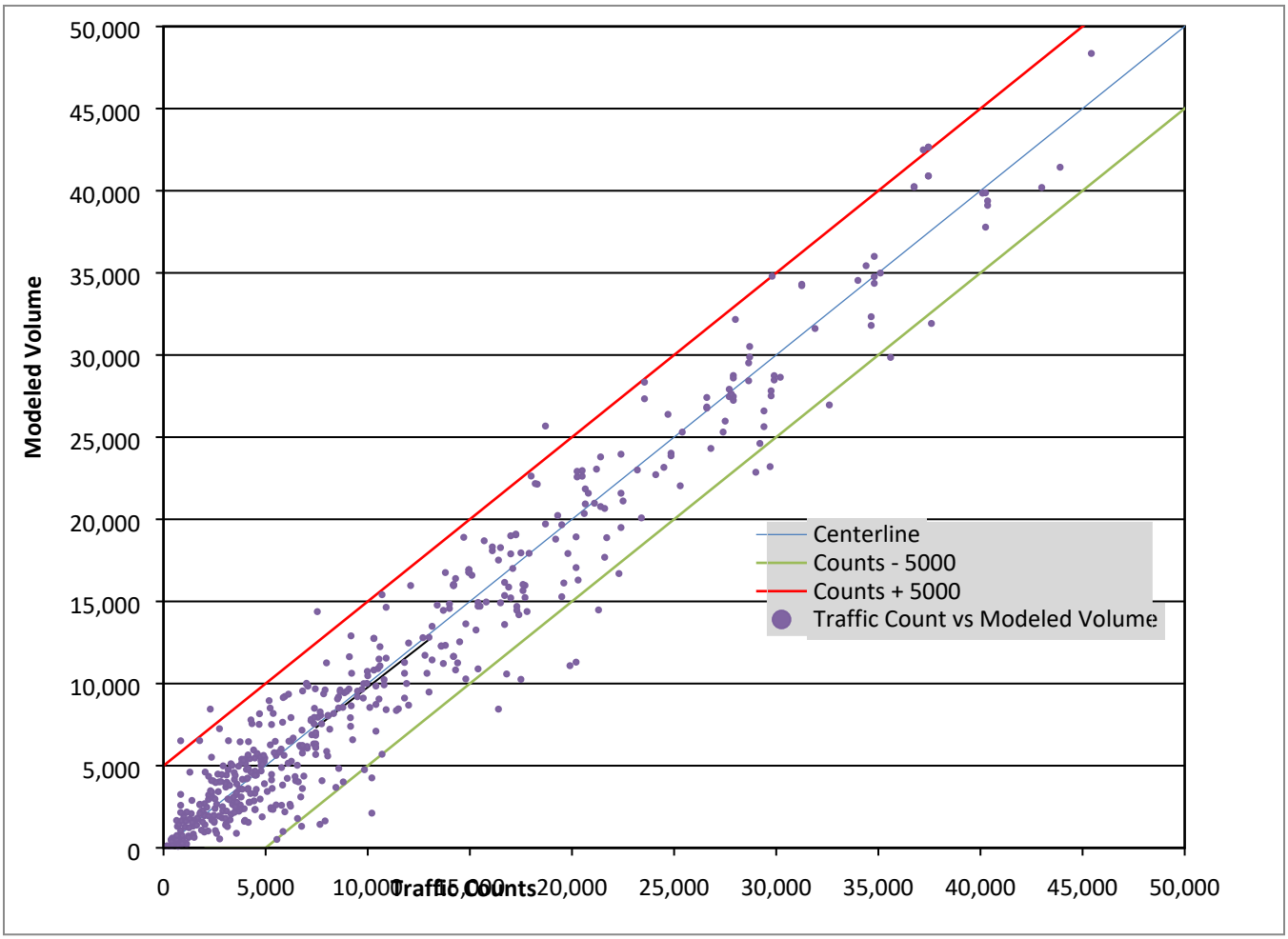
3.3.3.2 R-Square / Scatter Plot

The coefficient of determination (R^2) represents the proportion of variability in values of the dependent variable (traffic volume) that is explained by the model. It helps in the understanding of the model's

predictive power. The CORE MPO TDM achieves a system R^2 equal to 0.95, which is greater than the model validation target (R^2-0.88) that was recommended by federal model validation guidelines.[8]

A scatter plot of modeled volumes versus traffic counts helps identify outliers. As indicated in **Figure 3-3**, nearly all modeled volumes are within +/-5,000 of the corresponding traffic counts. The +/-5,000 range is selected to illustrate and reference data variations.

Figure 3-3: CORE MPO 2015 TDM Link Volume Scatter Plot



[8] Model Validation and Reasonableness Checking Manual, Second Edition, *FHWA, 2010.*

3.3.3.3 Percent Root Mean Square Error

Percent RMSE (%RMSE) is a measure of the average deviation between the actual counts and the base year assigned volumes. It is another indicator to illustrate how closely the model volumes match the traffic counts. The %RMSE is calculated as follows:

$$\%RMSE = \frac{\sqrt{\sum_i \frac{(V_i - C_i)^2}{(N-1)}}}{\frac{\sum_i C_i}{N}} \times 100$$

where,

Vi = model volume at link i;

Ci = traffic count at link i;

N = number of count stations

The CORE MPO 2015 TDM achieved an overall RMSE of 21 percent, which is lower than GDOT's target of 35 percent. Low %RMSEs were also observed for links by volume groups as shown in **Table 3-6**.

Table 3-6: CORE MPO 2015 TDM %RMSE

Volume Group	CORE MPO 2015 TDM	Target Range
0 - 5,000	53%	<100%
5,001 - 10,000	33%	<75%
10,001 - 15,000	21%	<50%
15,001 - 20,000	19%	<30%
20,001 - 30,000	11%	<30%
> 30,000	10%	<30%
System Total	**21%**	**<35%**

4. 2015 BASE YEAR LEVEL OF SERVICE

The purpose of TDM development is to assist in the evaluation of future travel conditions and deficiency analysis in the study area. Besides the traffic volumes, another key output from the TDM is the daily volume to capacity ratio for each roadway segment. Each volume to capacity ratio corresponds to a LOS based on accepted methodologies. LOS is a qualitative measure of traffic flow describing operating conditions. Six LOS are defined by the FHWA in the *Highway Capacity Manual* for use in evaluating roadway operating conditions. They are given letter designations from A to F, with LOS A representing the best operating conditions and F the worst. A facility may operate at a range of levels of service depending upon time of day, day of week or period of the year. A qualitative description and depiction of the different levels of service is provided in **Figure 4-1**. **Figure 4-2** illustrates the 2015 LOS for CORE MPO area.

Figure 4-1: Level of Service Description and Depiction

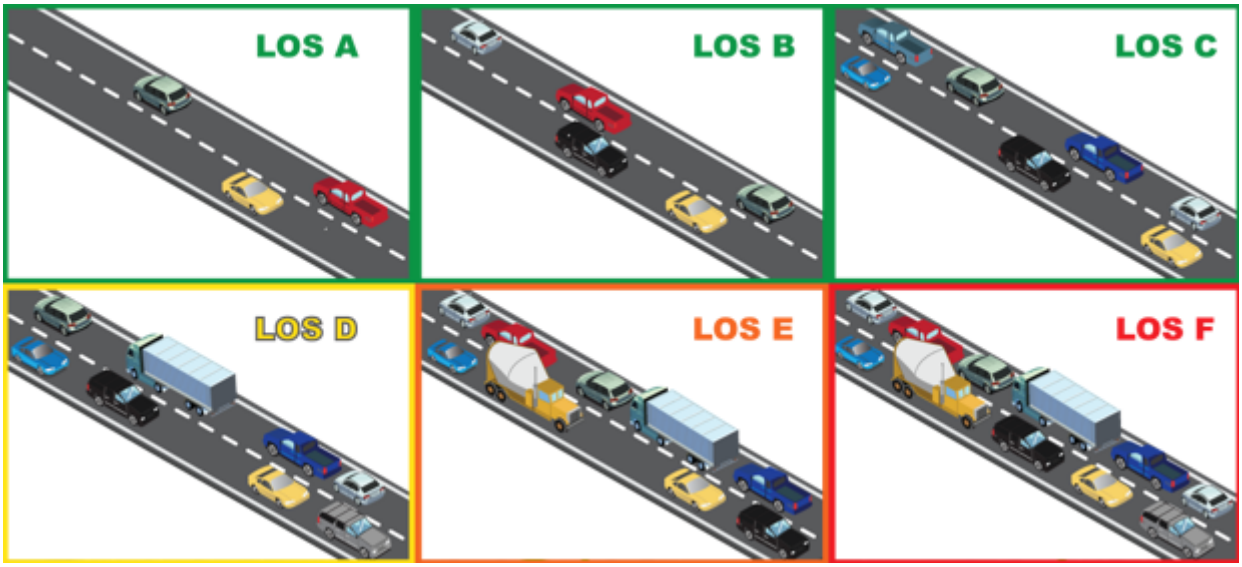
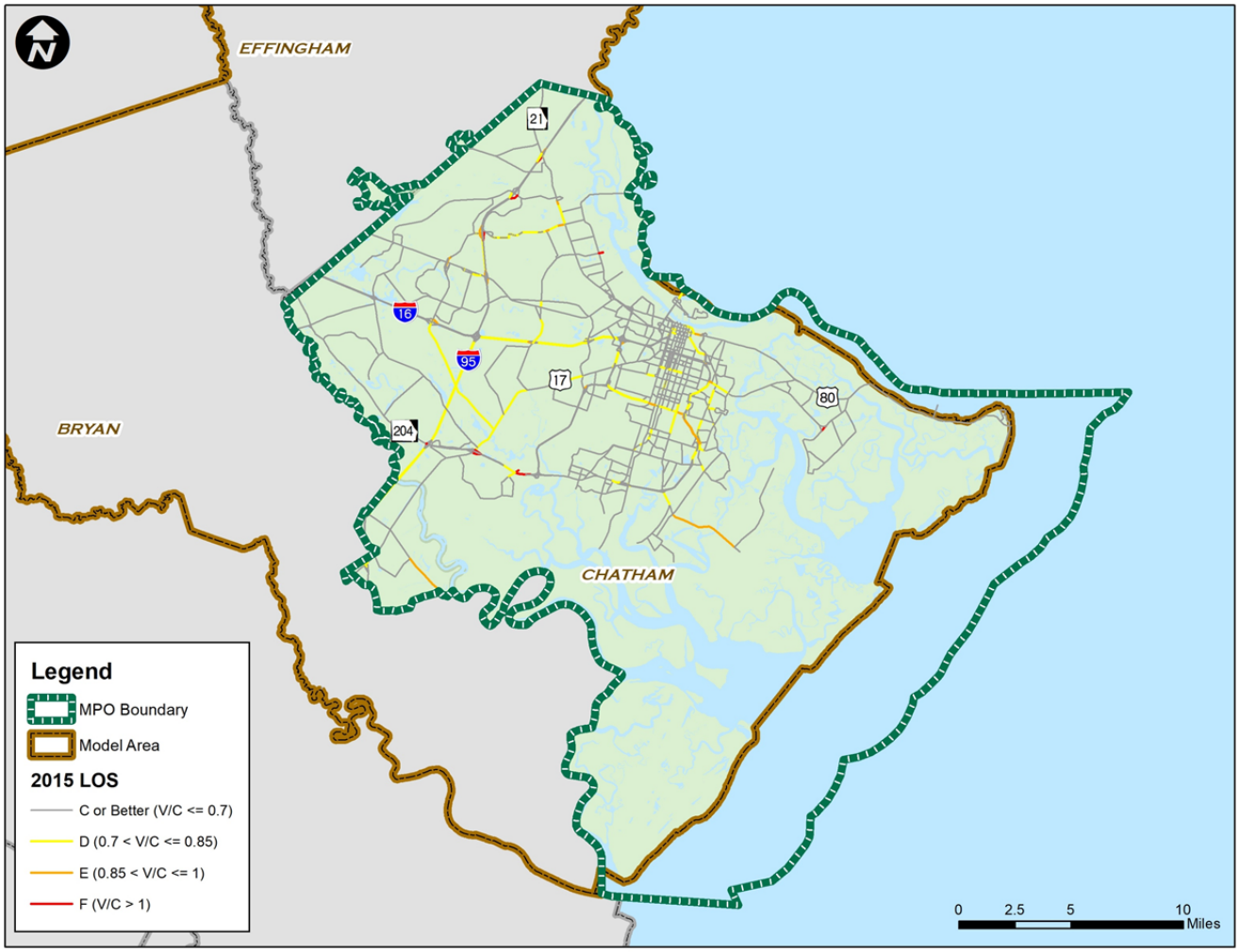


Figure 4-2: 2015 LOS for CORE MPO



5. 2045 TRAVEL DEMAND MODELS

5.1 2045 LONG-RANGE TRANSPORTATION PLAN NETWORKS

As the base year TDM was calibrated and validated, the model was used to assist in evaluating the traffic conditions for the future year 2045. To simulate the future travel demand in the CORE MPO area, the following information was updated based on the information that CORE MPO provided:

- 2045 highway network;
- 2045 socioeconomic data; and
- External station traffic forecasting.

2045 LRTP networks include the following network scenarios based on the inputs from the CORE MPO and their LRTP planning analyses:

- **The 2nd Network - Do-Nothing System Projects Network**: 2015 base year network plus any projects that either opened to traffic since 2015 or currently under construction.
- **The 3rd Network - Existing + Committed (E+C) Projects Network**: 2nd network plus projects with construction phase funded in the STIP year 2018 to 2021.
- **The 4th Network – Completion of STIP Projects Network**: 3rd network plus projects with preliminary engineering phase and right-of-way (ROW) phase funded in the STIP year 2018-2021.
- **The 5th Network – Long Range Transportation System Projects Network:** 4th network plus projects identified to address future transportation needs through 2045.
- **The 6th Network - Financially Constrained Projects.**

Detailed definitions of the networks represented above can be found in **Appendix A-4.** Description of LRTP Networks**.**

The projects that were included in each 2045 network are provided in the LOS maps (**Figure 5-1** through **Figure 5-5**) as well.

5.2 2045 SOCIOECONOMIC PROJECTIONS

The 2045 socioeconomic data was developed by the CORE MPO and used as input into the TDM to forecast the number of future year trips. **Table 5-1** shows socioeconomic data comparison between 2015 and 2045 for the entire TDM area and the MPO area respectively. The observations for the CORE MPO data include the following:

- Population and household, are increasing at similar pace (~25%) in the Three-County area and at a little higher rate (~30%) in the CORE MPO area;

- The total employment growth for both MPO and TDM area is 17%, the category employments also have similar growth among the two area (between 15%-20%)
- School enrollment is increasing at 25% and college enrollment increases at 16%.

Table 5-1: Socioeconomic Data Comparison between 2015 and 2045

SE Variable	Three-County Area Totals			CORE MPO Area Totals		
	2015	2045	% Change	2015	2045	% Change
Population	361,071	469,685	30%	285,078	359,573	26%
Household	134,753	173,815	29%	108,870	136,321	25%
Total Employment	222,931	261,256	17%	199,499	232,877	17%
MTCUW Employment	29,297	35,230	20%	26,461	31,663	20%
Service Employment	159,028	185,686	17%	142,596	165,905	16%
Retail Employment	24,045	27,769	15%	21,264	24,428	15%
AMC Employment	10,561	12,571	19%	9,178	10,881	19%
Median Income	$46,654	$46,654	0%	$43,333	$43,333	0%
School Enrollment	64,383	80,690	25%	46,356	58,589	26%
College Students	28,688	33,285	16%	28,688	33,285	16%
Acreage	1,004,130	1,004,130	0%	606,805	606,805	0%

5.3 EXTERNAL STATION TRAFFIC

Year 2045 external station traffic was estimated based on historic AADT trends at the external stations where traffic count data was available and growth rates of surrounding TAZs. Professional judgment was also used during the estimation process. **Table 5-2** shows the external stations for the model study area.

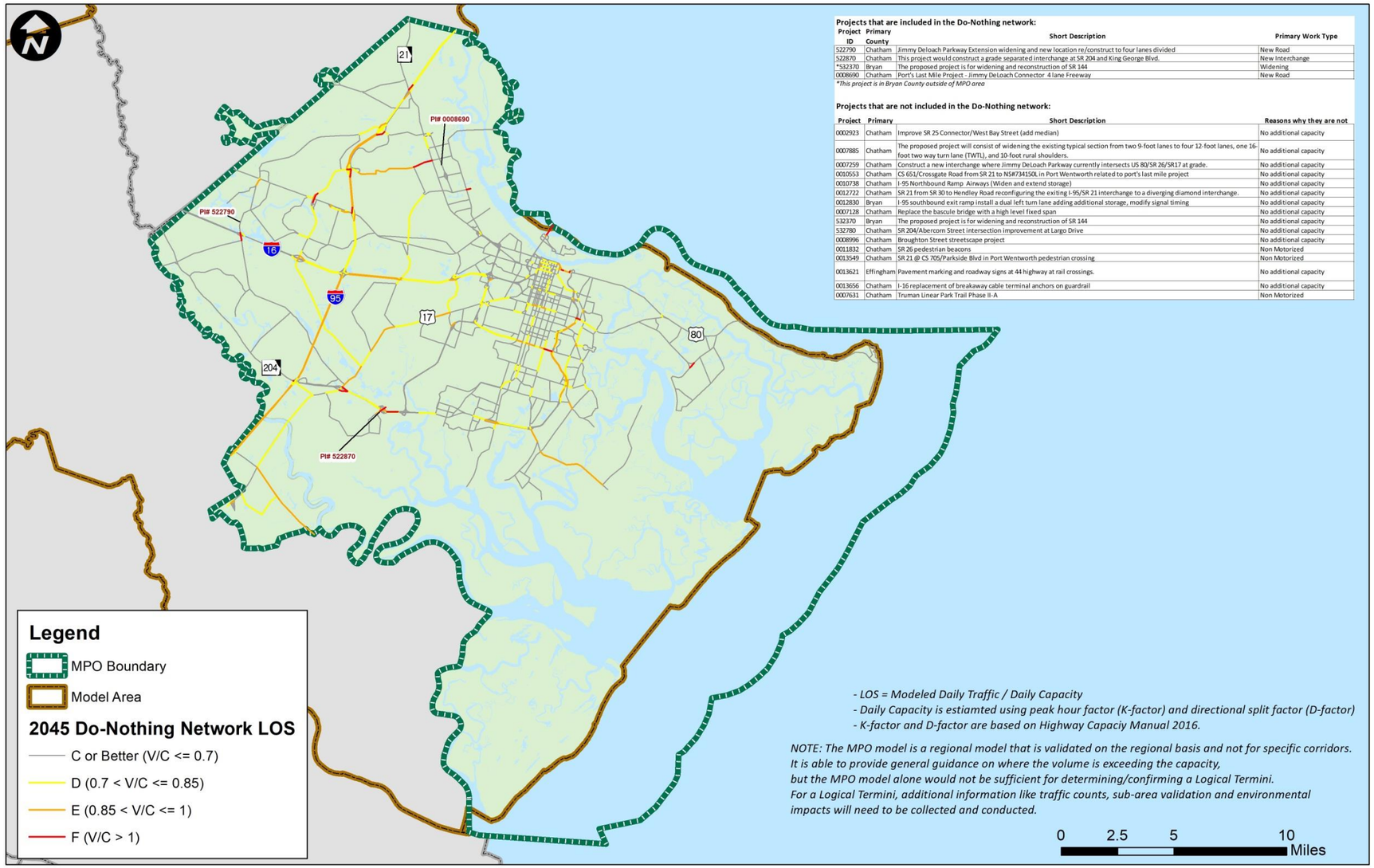
Table 5-2: CORE MPO TDM 2045 External Station Traffic Estimation

External Station	Road Name	2045 Volume	E-E Passenger Percent	E-E Truck Percent	I-E Passenger Car Percent	I-E Truck Car Percent	Direct Port Trips	Indirect Port Trips
880	I-95 South	83,619	56.00%	24.00%	14.00%	2.79%	1.61%	1.61%
881	US-17 South	26,074	35.20%	4.80%	52.79%	6.20%	0.50%	0.50%
882	GA-144	9,964	45.52%	4.48%	45.52%	4.48%	0.00%	0.00%
883	GA-119 South	4,145	44.07%	5.93%	44.07%	5.93%	0.00%	0.00%
884	US-280	2,710	32.41%	7.59%	48.62%	11.38%	0.00%	0.00%
885	Nevils Groveland Road	740	1.00%	0.00%	94.00%	5.00%	0.00%	0.00%
886	GA-67	4,084	68.23%	6.77%	22.74%	2.26%	0.00%	0.00%
887	Ash Branch Road	1,084	71.25%	3.75%	23.75%	1.25%	0.00%	0.00%
888	I-16	41,787	10.80%	4.20%	61.20%	1.75%	11.02%	11.02%
889	GA-46	1,721	0.92%	0.08%	89.08%	9.92%	0.00%	0.00%
890	US-80	6,919	9.00%	1.00%	81.00%	5.29%	1.85%	1.85%
891	Mud Road	2,934	47.27%	2.73%	47.27%	2.73%	0.00%	0.00%
892	GA-119 Connector	4,045	0.93%	0.07%	91.16%	7.84%	0.00%	0.00%
893	GA-17	1,250	1.39%	0.61%	68.61%	23.65%	2.87%	2.87%
894	Oliver Kildare Road	1,286	0.91%	0.09%	93.64%	5.36%	0.00%	0.00%
895	GA-21	5,706	39.04%	10.96%	39.04%	3.38%	3.79%	3.79%
896	GA-119 North	1,510	40.50%	9.50%	40.50%	9.50%	0.00%	0.00%
897	I-95 North	100,712	52.00%	28.00%	13.00%	3.14%	1.93%	1.93%
898	GA-25	3,850	17.39%	2.61%	69.58%	5.03%	2.70%	2.70%
899	US-17 North	29,163	45.00%	5.00%	45.00%	3.53%	0.74%	0.74%

5.4 FUTURE YEAR LEVEL OF SERVICE OUTPUT RESULTS

Figure 5-1 through **Figure 5-5** illustrate the LOS estimated for each 2045 network. These maps were provided to the CORE MPO after each model network scenario was run. The CORE MPO used these maps as one of many tools to develop their project lists for the subsequent scenarios.

Figure 5-1: The 2nd Network - 2045 Do-Nothing



Projects that are included in the Do-Nothing network:

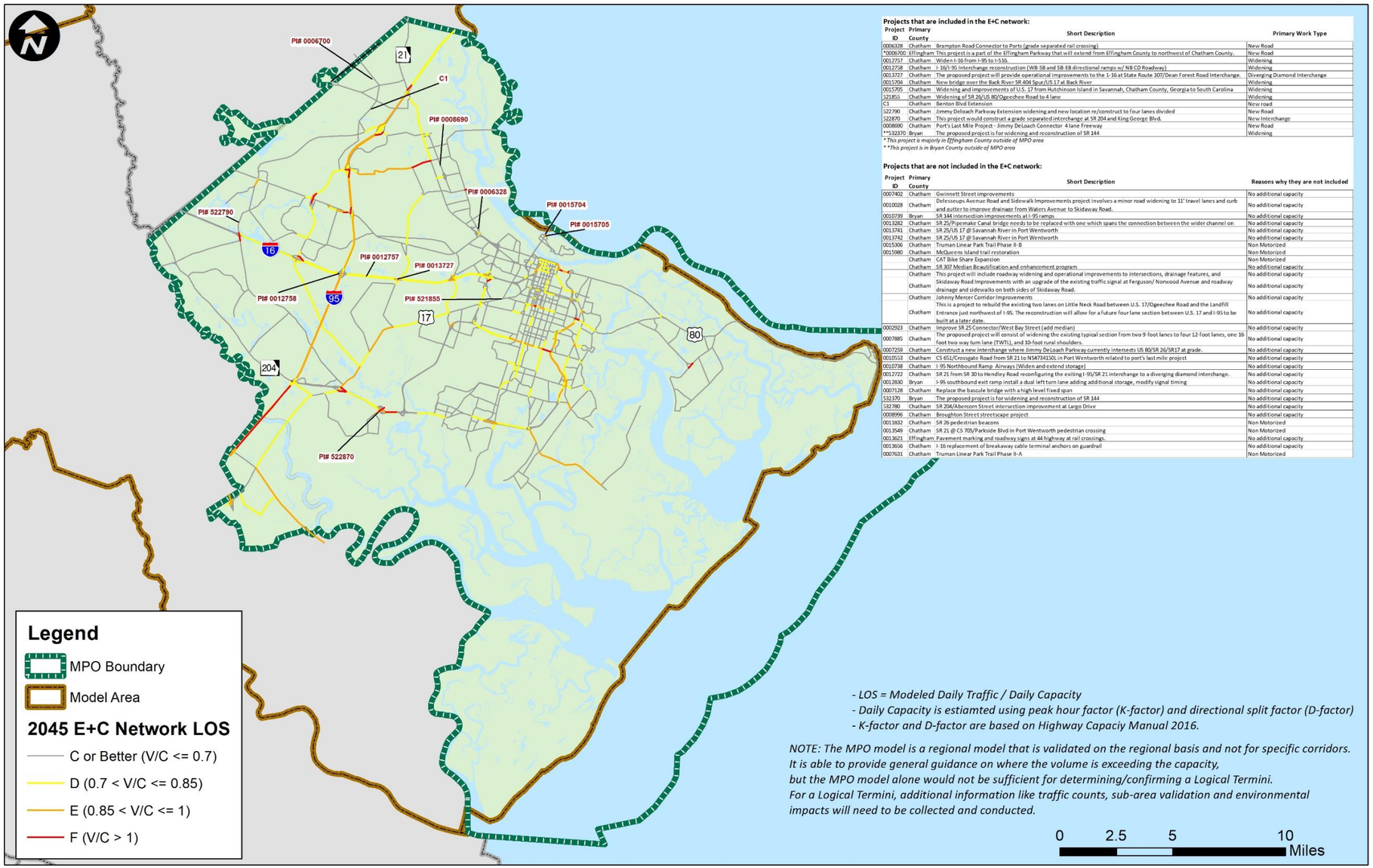
Project ID	Primary County	Short Description	Primary Work Type
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
*532370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening
0008690	Chatham	Port's Last Mile Project - Jimmy DeLoach Connector 4 lane Freeway	New Road

**This project is in Bryan County outside of MPO area*

Projects that are not included in the Do-Nothing network:

Project	Primary	Short Description	Reasons why they are not
0002923	Chatham	Improve SR 25 Connector/West Bay Street (add median)	No additional capacity
0007885	Chatham	The proposed project will consist of widening the existing typical section from two 9-foot lanes to four 12-foot lanes, one 16-foot two way turn lane (TWTL), and 10-foot rural shoulders.	No additional capacity
0007259	Chatham	Construct a new interchange where Jimmy DeLoach Parkway currently intersects US 80/SR 26/SR17 at grade.	No additional capacity
0010553	Chatham	CS 651/Crossgate Road from SR 21 to NS#734150L in Port Wentworth related to port's last mile project	No additional capacity
0010738	Chatham	I-95 Northbound Ramp Airways (Widen and extend storage)	No additional capacity
0012722	Chatham	SR 21 from SR 30 to Hendley Road reconfiguring the exiting I-95/SR 21 interchange to a diverging diamond interchange.	No additional capacity
0012830	Bryan	I-95 southbound exit ramp install a dual left turn lane adding additional storage, modify signal timing	No additional capacity
0007128	Chatham	Replace the bascule bridge with a high level fixed span	No additional capacity
532370	Bryan	The proposed project is for widening and reconstruction of SR 144	No additional capacity
532780	Chatham	SR 204/Abercorn Street intersection improvement at Largo Drive	No additional capacity
0008996	Chatham	Broughton Street streetscape project	No additional capacity
0011832	Chatham	SR 26 pedestrian beacons	Non Motorized
0013549	Chatham	SR 21 @ CS 705/Parkside Blvd in Port Wentworth pedestrian crossing	Non Motorized
0013621	Effingham	Pavement marking and roadway signs at 44 highway at rail crossings.	No additional capacity
0013656	Chatham	I-16 replacement of breakaway cable terminal anchors on guardrail	No additional capacity
0007631	Chatham	Truman Linear Park Trail Phase II-A	Non Motorized

Figure 5-2: The 3rd Network - 2040 E+C



Projects that are included in the E+C network:

Project ID	Primary County	Short Description	Primary Work Type
0006328	Chatham	Brampton Road Connector to Ports (grade separated rail crossing)	New Road
*0006700	Effingham	This project is a part of the Effingham Parkway that will extend from Effingham County to northwest of Chatham County.	New Road
0012757	Chatham	Widen I-16 from I-95 to I-516.	Widening
0012758	Chatham	I-16/I-95 Interchange reconstruction (WB SB and SB EB directional ramps w/ NB CD Roadway)	Widening
0013727	Chatham	The proposed project will provide operational improvements to the I-16 at State Route 307/Dean Forest Road Interchange.	Diverging Diamond Interchange
0015704	Chatham	New bridge over the Back River SR 404 Spur/US 17 at Back River	Widening
0015705	Chatham	Widening and improvements of U.S. 17 from Hutchinson Island in Savannah, Chatham County, Georgia to South Carolina	Widening
521855	Chatham	Widening of SR 26/US 80/Ogeechee Road to 4 lane	Widening
C1	Chatham	Benton Blvd Extension	New road
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
0008690	Chatham	Port's Last Mile Project - Jimmy DeLoach Connector 4 lane Freeway	New Road
**532370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening

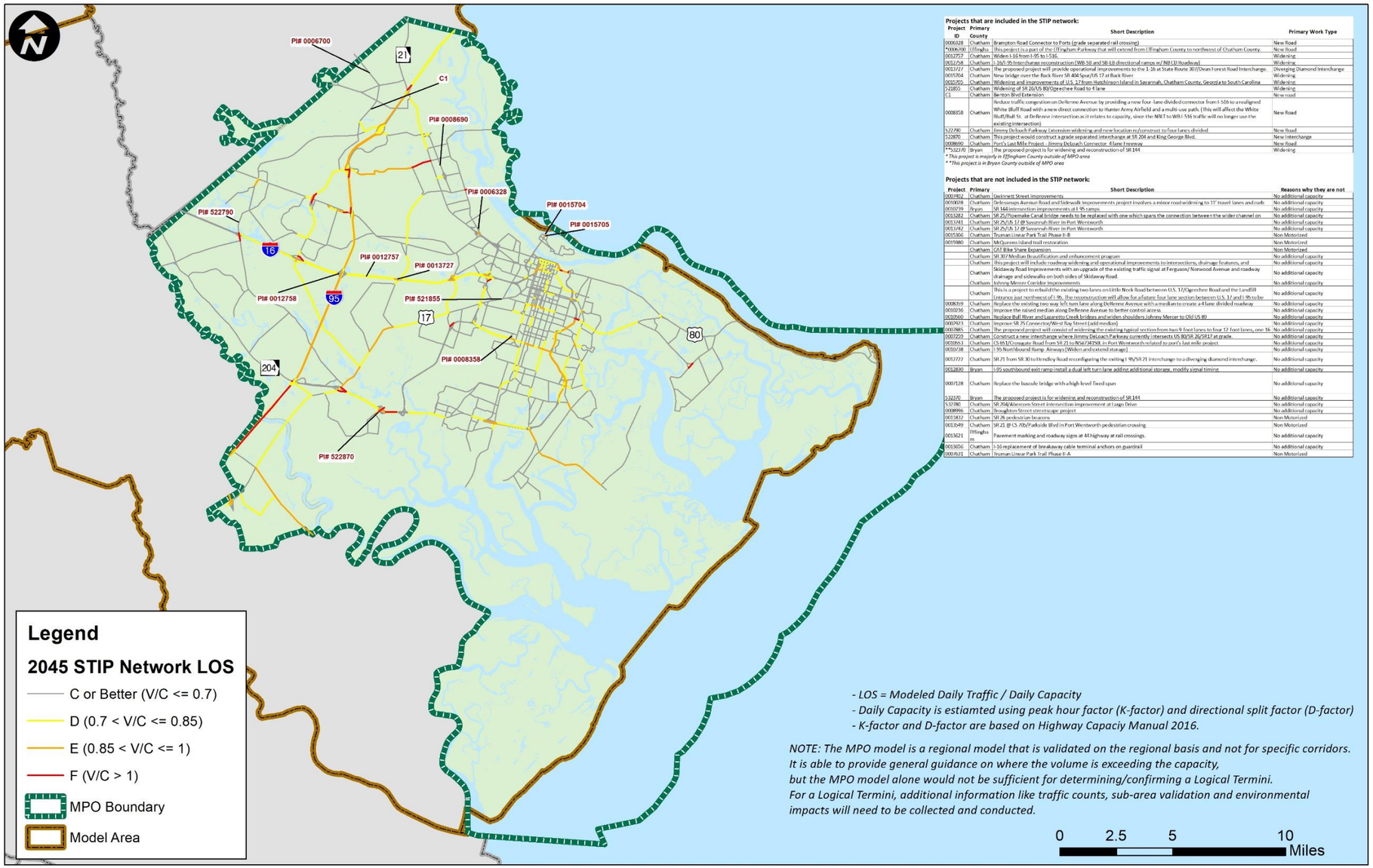
** This project is majorly in Effingham County outside of MPO area*

** *This project is in Bryan County outside of MPO area*

Projects that are not included in the E+C network:

Project ID	Primary County	Short Description	Reasons why they are not included
0007402	Chatham	Gwinnett Street improvements	No additional capacity
0010028	Chatham	Delesseups Avenue Road and Sidewalk Improvements project involves a minor road widening to 11' travel lanes and curb and gutter to improve drainage from Waters Avenue to Skidaway Road.	No additional capacity
0010739	Bryan	SR 144 intersection improvements at I-95 ramps	No additional capacity
0013282	Chatham	SR 25/Pipemake Canal bridge needs to be replaced with one which spans the connection between the wider channel on	No additional capacity
0013741	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0013742	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0015306	Chatham	Truman Linear Park Trail Phase II-B	Non Motorized
0015980	Chatham	McQueens Island trail restoration	Non Motorized
	Chatham	CAT Bike Share Expansion	Non Motorized
	Chatham	SR 307 Median Beautification and enhancement program	No additional capacity
	Chatham	This project will include roadway widening and operational improvements to intersections, drainage features, and	No additional capacity
	Chatham	Skidaway Road Improvements with an upgrade of the existing traffic signal at Ferguson/ Norwood Avenue and roadway	No additional capacity
	Chatham	drainage and sidewalks on both sides of Skidaway Road.	No additional capacity
	Chatham	Johnny Mercer Corridor Improvements	No additional capacity
	Chatham	This is a project to rebuild the existing two lanes on Little Neck Road between U.S. 17/Ogeechee Road and the Landfill	No additional capacity
		Entrance just northwest of I-95. The reconstruction will allow for a future four lane section between U.S. 17 and I-95 to be	
		built at a later date.	
0002923	Chatham	Improve SR 25 Connector/West Bay Street (add median)	No additional capacity
0007885	Chatham	The proposed project will consist of widening the existing typical section from two 9-foot lanes to four 12-foot lanes, one 16	No additional capacity
		foot two way turn lane (TWTL), and 10-foot rural shoulders.	
0007259	Chatham	Construct a new interchange where Jimmy DeLoach Parkway currently intersects US 80/SR 26/SR17 at grade.	No additional capacity
0010553	Chatham	CS 651/Crossgator Road from SR 21 to N5473415OL in Port Wentworth related to port's last mile project	No additional capacity
0010738	Chatham	I-95 Northbound Ramp Airways (Widen and extend storage)	No additional capacity
0012722	Chatham	SR 21 from SR 30 to Hendley Road reconfiguring the exiting I-95/SR 21 interchange to a diverging diamond interchange.	No additional capacity
0012830	Bryan	I-95 southbound exit ramp install a dual left turn lane adding additional storage, modify signal timing	No additional capacity
0007128	Chatham	Replace the bascule bridge with a high level fixed span	No additional capacity
532370	Bryan	The proposed project is for widening and reconstruction of SR 144	No additional capacity
532780	Chatham	SR 204/Abercorn Street intersection improvement at Largo Drive	No additional capacity
0008996	Chatham	Broughton Street streetscape project	No additional capacity
0013832	Chatham	SR 26 pedestrian beacons	Non Motorized
0013549	Chatham	SR 21 @ CS 705/Parkside Blvd in Port Wentworth pedestrian crossing	Non Motorized
0013621	Effingham	Pavement marking and roadway signs at 44 highway at rail crossings.	No additional capacity
0013656	Chatham	I-16 replacement of breakaway cable terminal anchors on guardrail	No additional capacity
0007631	Chatham	Truman Linear Park Trail Phase II-A	Non Motorized

Figure 5-3: The 4th Network - 2045 STIP



Projects that are included in the STIP network:

Project ID	Primary County	Short Description	Primary Work Type
0006328	Chatham	Brampton Road Connector to Ports (grade separated rail crossing)	New Road
*0006700	Effingha m	This project is a part of the Effingham Parkway that will extend from Effingham County to northwest of Chatham County.	New Road
0012757	Chatham	Widen I-16 from I-95 to I-516.	Widening
0012758	Chatham	I-16/I-95 Interchange reconstruction (WB-SB and SB-EB directional ramps w/ NB CD Roadway)	Widening
0013727	Chatham	The proposed project will provide operational improvements to the I-16 at State Route 307/Dean Forest Road Interchange.	Diverging Diamond Interchange
0015704	Chatham	New bridge over the Back River SR 404 Spur/US 17 at Back River	Widening
0015705	Chatham	Widening and improvements of U.S. 17 from Hutchinson Island in Savannah, Chatham County, Georgia to South Carolina	Widening
521855	Chatham	Widening of SR 26/US 80/Ogeechee Road to 4 lane	Widening
C1	Chatham	Benton Blvd Extension	New road
0008358	Chatham	Reduce traffic congestion on DeRenne Avenue by providing a new four-lane divided connector from I-516 to a realigned White Bluff Road with a new direct connection to Hunter Army Airfield and a multi-use path. (this will affect the White Bluff/Bull St. at DeRenne intersection as it relates to capacity, since the NBLT to WB I-516 traffic will no longer use the existing intersection)	New Road
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location to construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
0008690	Chatham	Port's Last Mile Project - Jimmy Deloach Connector - 4 lane freeway	New Road
**522370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening

** This project is majorly in Effingham County outside of MPO area*

*** This project is in Bryan County outside of MPO area*

Projects that are not included in the STIP network:

Project	Primary	Short Description	Reasons why they are not
0001902	Chatham	Gwinnett Street improvements	No additional capacity
0010028	Chatham	Delesseps Avenue Road and Sidewalk improvements project involves a minor road widening to 11' travel lanes and curb	No additional capacity
0010278	Bryan	SR 144 intersection improvements at I-95 ramps.	No additional capacity
0013282	Chatham	SR 25/Tidemake Canal bridge needs to be replaced with one which spans the connection between the wider channel on	No additional capacity
0013741	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0013742	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0015306	Chatham	Truman Linear Park Trail Phase II-B	Non Motorized
0015980	Chatham	McQueens Island trail restoration	Non Motorized
	Chatham	CAT Bike Share Expansion	Non Motorized
	Chatham	SR 307 Median Beautification and enhancement program	No additional capacity
	Chatham	This project will include roadway widening and operational improvements to intersections, drainage features, and	No additional capacity
	Chatham	Skidaway Road Improvements with an upgrade of the existing traffic signal at Ferguson/ Norwood Avenue and roadway drainage and sidewalks on both sides of Skidaway Road.	No additional capacity
	Chatham	Johnny Mercer Corridor improvements	No additional capacity
	Chatham	This is a project to rebuild the existing two lanes on Little Neck Road between U.S. 17/Ogeechee Road and the Landfill Entrance just northwest of I-95. The reconstruction will allow for a future four lane section between U.S. 17 and I-95 to be	No additional capacity
0008359	Chatham	Replace the existing two way left turn lane along DeRenne Avenue with a median to create a 4 lane divided roadway	No additional capacity
0010236	Chatham	Improve the raised median along DeRenne Avenue to better control access.	No additional capacity
0010560	Chatham	Replace Bull River and Lazaretto Creek bridges and widen shoulders Johnny Mercer to Old US 80	No additional capacity
0007921	Chatham	Improve SR 25 Connector/Wi-fi Bay Street (add median)	No additional capacity
0007985	Chatham	The proposed project will consist of widening the existing typical section from two 4 foot lanes to four 12 foot lanes, one 16	No additional capacity
0007259	Chatham	Construct a new interchange where Jimmy DeLoach Parkway currently intersects US 80/SR 26/SR17 at grade.	No additional capacity
0010563	Chatham	CS 651/Crossgate Road from SR 21 to NS#734301 in Port Wentworth related to port's last mile project	No additional capacity
0010238	Chatham	I-95 Northbound Ramp: Airways (Widen and extend storage)	No additional capacity
0012772	Chatham	SR 21 from SR 30 to Hendley Road reconfiguring the existing I-95/SR 21 interchange to a diverging diamond interchange.	No additional capacity
0012830	Bryan	I-95 southbound exit ramp install a dual left turn lane addnl additional storage, modify signal timing	No additional capacity
0001128	Chatham	Replace the bascule bridge with a high level fixed span	No additional capacity
522370	Bryan	The proposed project is for widening and reconstruction of SR 144	No additional capacity
5107981	Chatham	SR 704/Abercorn Street intersection improvement at Largo Drive	No additional capacity
0009981	Chatham	Broughton Street streetscape project	No additional capacity
0013832	Chatham	SR 26 pedestrian beacons	Non Motorized
0013549	Chatham	SR 21 @ CS 70/Parkside Blvd in Port Wentworth pedestrian crossing	Non Motorized
0013621	Effingha m	Pavement marking and roadway signs at 44 highway at rail crossings.	No additional capacity
0013056	Chatham	I-16 replacement of breakaway cable terminal anchors on guardrail	No additional capacity
0001631	Chatham	Truman Linear Park Trail Phase II-A	Non Motorized

Figure 5-4: The 5th Network - 2045 LRTP

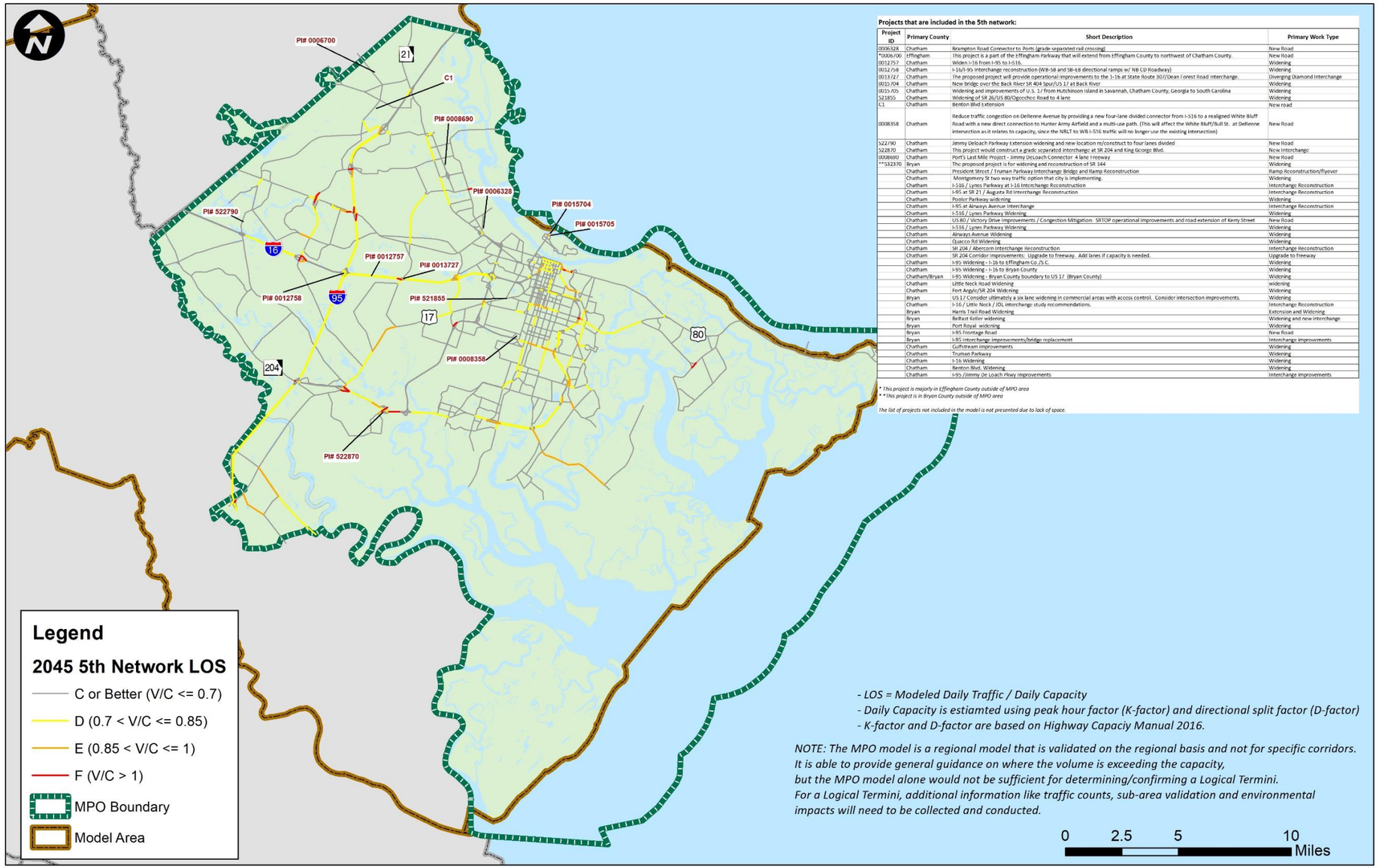
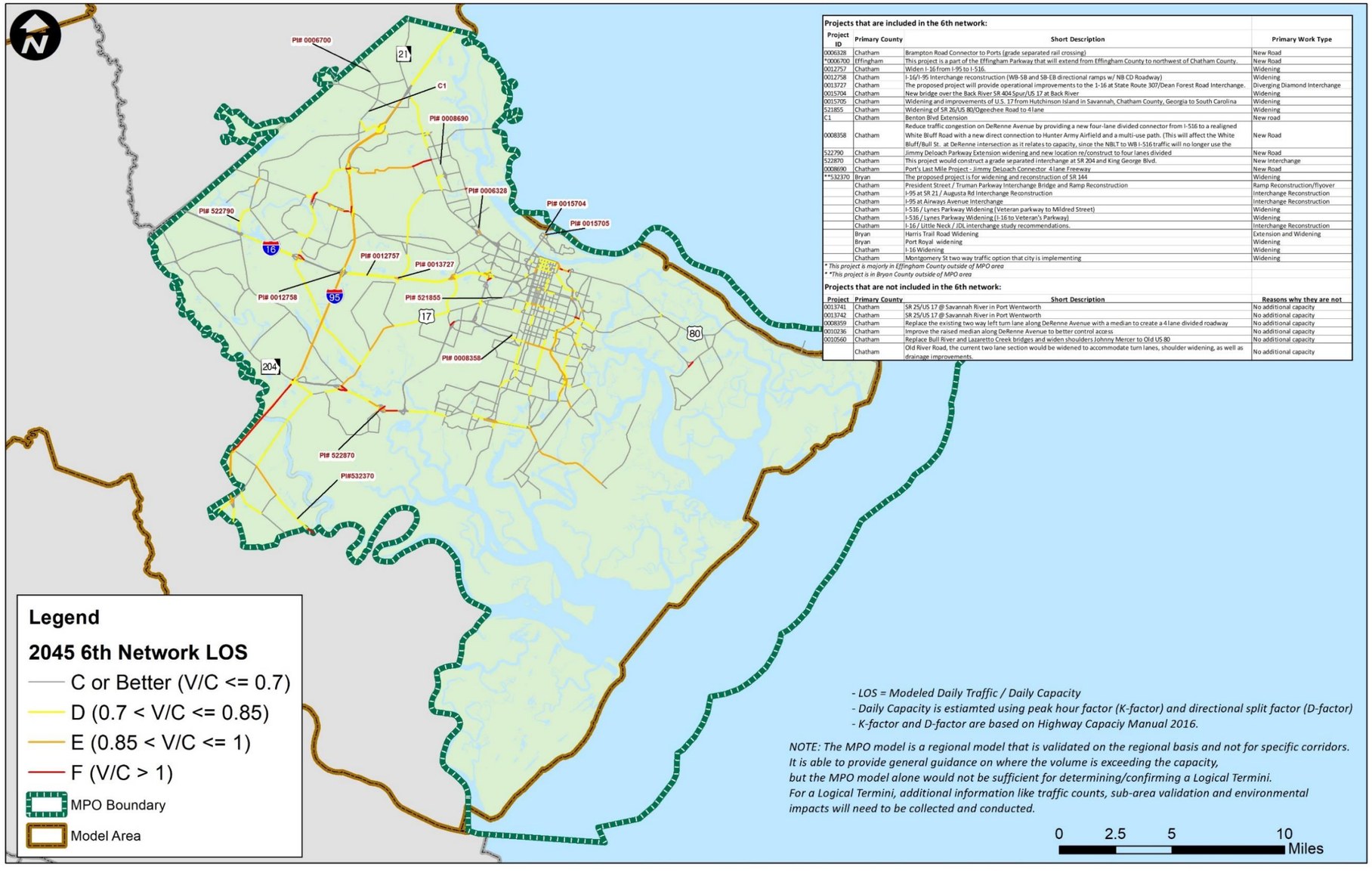


Figure 5-5: The 6th Network – 2045 Financially Constrained



Projects that are included in the 6th network:

Project ID	Primary County	Short Description	Primary Work Type
0006328	Chatham	Brampton Road Connector to Ports (grade separated rail crossing)	New Road
*0006700	Effingham	This project is a part of the Effingham Parkway that will extend from Effingham County to northwest of Chatham County.	New Road
0012757	Chatham	Widen I-16 from I-95 to I-516.	Widening
0012758	Chatham	I-16/I-95 Interchange reconstruction (WB-SB and SB-EB directional ramps w/ NB CD Roadway)	Widening
0013727	Chatham	The proposed project will provide operational improvements to the 1-16 at State Route 307/Dean Forest Road Interchange.	Diverging Diamond Interchange
0015704	Chatham	New bridge over the Back River SR 404 Spur/US 17 at Back River	Widening
0015705	Chatham	Widening and improvements of U.S. 17 from Hutchinson Island in Savannah, Chatham County, Georgia to South Carolina	Widening
521855	Chatham	Widening of SR 26/US 80/Ogeechee Road to 4 lane	Widening
C1	Chatham	Benton Blvd Extension	New road
0008358	Chatham	Reduce traffic congestion on DeRenne Avenue by providing a new four-lane divided connector from I-516 to a realigned White Bluff Road with a new direct connection to Hunter Army Airfield and a multi-use path. (This will affect the White Bluff/Bull St. at DeRenne intersection as it relates to capacity, since the NBLT to WB I-516 traffic will no longer use the	New Road
522790	Chatham	Jimmy Deloach Parkway Extension widening and new location re/construct to four lanes divided	New Road
522870	Chatham	This project would construct a grade separated interchange at SR 204 and King George Blvd.	New Interchange
0008690	Chatham	Port's Last Mile Project - Jimmy DeLoach Connector 4 lane Freeway	New Road
**532370	Bryan	The proposed project is for widening and reconstruction of SR 144	Widening
	Chatham	President Street / Truman Parkway Interchange Bridge and Ramp Reconstruction	Ramp Reconstruction/flyover
	Chatham	I-95 at SR 21 / Augusta Rd Interchange Reconstruction	Interchange Reconstruction
	Chatham	I-95 at Airways Avenue Interchange	Interchange Reconstruction
	Chatham	I-516 / Lynes Parkway Widening (Veteran parkway to Mildred Street)	Widening
	Chatham	I-516 / Lynes Parkway Widening (I-16 to Veteran's Parkway)	Widening
	Chatham	I-16 / Little Neck / JDL interchange study recommendations.	Interchange Reconstruction
	Bryan	Harris Trail Road Widening	Extension and Widening
	Bryan	Port Royal widening	Widening
	Chatham	I-16 Widening	Widening
	Chatham	Montgomery St two way traffic option that city is implementing	Widening

** This project is majorly in Effingham County outside of MPO area*
** *This project is in Bryan County outside of MPO area*

Projects that are not included in the 6th network:

Project	Primary County	Short Description	Reasons why they are not
0013741	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0013742	Chatham	SR 25/US 17 @ Savannah River in Port Wentworth	No additional capacity
0008359	Chatham	Replace the existing two way left turn lane along DeRenne Avenue with a median to create a 4 lane divided roadway	No additional capacity
0010236	Chatham	Improve the raised median along DeRenne Avenue to better control access	No additional capacity
0010560	Chatham	Replace Bull River and Lazaretto Creek bridges and widen shoulders Johnny Mercer to Old US 80	No additional capacity
	Chatham	Old River Road, the current two lane section would be widened to accommodate turn lanes, shoulder widening, as well as drainage improvements.	No additional capacity

APPENDIX

APPENDIX A-1: 2015 AND 2045 SOCIOECONMIC DATA

APPENDIX A-2: 2015 AND 2045 SOCIOECONOMIC DATA REVIEW MEMO

APPENDIX A-3: SAVANNAH TAZ BOUNDARY CHANGES

APPENDIX A-4: DESCRIPTION OF LRTP NETWORKS

A-1. 2015 AND 2045 SOCIOECONOMIC DATA

A-Table 1: Socioeconomic Variables by Zone for 2015

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
-1	0	0	0	0	0	0	0	0	0	$0	70,817
1	86	194	0	0	3	41	0	0	44	$72,554	179
2	105	233	0	0	18	246	0	4	268	$62,065	86
3	359	838	0	0	54	243	0	2	299	$62,065	248
4	285	649	258	0	20	889	6	2	917	$51,125	682
5	387	982	0	0	74	418	22	8	522	$68,520	1,261
6	138	400	0	0	0	412	0	0	412	$68,520	2,214
7	0	0	0	0	0	0	0	0	0	$68,520	11,717
8	0	0	0	0	0	0	0	0	0	$80,337	9,232
9	0	0	0	0	0	0	0	0	0	$74,671	4,148
10	777	1,886	0	0	1	80	100	25	206	$74,671	1,368
11	947	2,098	0	0	0	61	7	15	83	$63,516	727
12	377	812	0	0	15	210	0	2	227	$71,111	559
13	195	426	0	0	0	16	0	0	16	$71,111	390
14	541	1,059	0	0	81	756	3	36	876	$60,700	368
15	315	832	743	0	145	158	5	9	317	$47,344	243
16	519	1,155	458	0	0	40	3	3	46	$77,500	182
17	641	1,492	0	0	0	89	22	9	120	$73,750	6,289
18	368	840	0	0	1	110	3	11	125	$94,412	362
19	245	621	0	0	0	109	26	1	136	$60,972	1,252
20	190	583	983	0	0	306	0	0	306	$49,050	300
21	200	552	0	0	0	86	4	6	96	$80,337	422
22	42	108	0	0	0	50	0	0	50	$80,337	2,361
23	88	242	0	0	0	11	0	0	11	$58,125	453
24	344	811	0	0	19	161	0	0	180	$58,125	398
25	54	122	0	0	22	12	0	0	34	$58,125	504
26	1,032	1,977	0	0	4	101	11	3	119	$60,972	1,259
27	1	1	0	0	0	0	0	0	0	$43,333	797
28	788	2,009	0	0	0	91	18	4	113	$126,528	2,735

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
29	95	194	0	0	0	5	0	0	5	$95,000	2,656
30	1,148	2,737	0	0	1	158	37	19	215	$115,089	3,988
31	0	0	0	0	0	0	0	0	0	$141,324	11,921
32	0	0	0	0	0	0	0	0	0	$109,489	5,280
33	1,079	2,351	0	0	12	280	4	4	300	$109,489	3,428
34	375	640	0	0	77	554	42	1	674	$95,000	2,992
35	327	749	810	0	0	74	0	19	93	$61,458	438
36	295	737	0	0	0	39	3	4	46	$78,702	298
37	170	413	0	0	27	171	0	0	198	$42,083	203
38	29	41	0	0	0	0	0	0	0	$43,333	233
39	115	173	0	0	1	61	0	0	62	$43,333	264
40	417	1,357	374	0	0	317	0	0	317	$80,313	215
41	1,011	2,753	0	0	68	86	64	15	233	$47,849	316
42	100	351	604	0	0	59	0	0	59	$38,750	60
43	190	852	0	0	0	66	0	0	66	$38,750	56
44	282	922	0	0	0	3	0	1	4	$44,500	165
45	141	308	0	0	0	17	0	0	17	$27,409	70
46	226	455	0	0	4	9	7	27	47	$27,409	90
47	203	459	0	0	0	52	0	0	52	$49,375	136
48	105	254	0	0	0	0	0	0	0	$49,375	103
49	166	347	0	0	0	48	0	1	49	$40,096	95
50	262	377	404	0	46	814	77	0	937	$40,096	484
51	0	0	0	0	0	0	0	0	0	$38,750	110
52	0	0	0	0	18	17	0	0	35	$38,750	106
53	98	188	0	0	10	124	0	0	134	$40,292	84
54	0	0	0	0	0	840	0	0	840	$40,292	72
55	0	0	0	0	17	169	0	0	186	$40,292	162
56	0	0	0	0	8	109	0	0	117	$40,292	75
57	0	0	0	0	0	2	1	0	3	$31,042	83
58	215	574	0	0	0	18	3	0	21	$40,292	134
59	7	15	0	0	6	140	0	12	158	$31,042	13
60	258	723	401	0	10	38	0	3	51	$45,500	145

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
61	179	497	1,096	0	0	134	0	0	134	$45,500	97
62	269	574	0	0	0	0	23	55	78	$61,510	402
63	344	913	0	0	15	47	0	12	74	$76,406	416
64	297	794	0	0	526	295	0	14	835	$76,406	959
65	107	335	114	0	0	96	20	0	116	$76,406	737
66	335	905	0	0	0	0	0	0	0	$61,458	2,407
67	456	1,431	0	0	5	28	0	15	48	$45,083	555
68	79	146	0	0	1	9	13	0	23	$50,665	179
69	238	498	0	0	0	68	0	47	115	$50,665	598
70	439	976	0	0	0	171	3	33	207	$52,576	1,650
71	598	1,259	0	0	0	978	0	14	992	$101,912	6,183
72	0	0	0	0	0	0	0	0	0	$67,250	14,765
73	0	0	0	0	0	0	0	0	0	$67,250	19,727
74	0	0	0	0	0	0	0	0	0	$67,250	7,740
75	0	0	0	0	0	0	0	0	0	$67,250	8,737
76	0	0	0	0	0	0	0	0	0	$67,250	2,237
77	0	0	0	0	0	0	0	0	0	$38,631	2,996
78	505	1,561	0	0	0	33	1	9	43	$52,366	1,073
79	233	552	0	0	0	9	0	0	9	$73,750	117
80	1,035	2,775	0	0	0	131	13	23	167	$73,750	666
81	425	1,118	0	0	0	17	0	12	29	$74,671	290
82	188	463	198	0	0	20	5	0	25	$63,516	239
83	243	500	0	0	36	69	4	3	112	$60,700	123
84	46	177	0	0	0	21	0	0	21	$71,111	275
85	379	884	1,573	0	0	339	0	0	339	$49,050	140
86	471	1,550	0	0	244	556	1	0	801	$49,050	224
87	263	522	0	0	23	2,998	13	0	3,034	$31,042	215
101	184	348	0	0	0	30	17	0	47	$101,250	432
102	196	561	0	0	0	5	0	0	5	$40,222	488
103	181	478	0	0	35	561	50	209	855	$40,222	129
104	0	0	0	0	0	570	6	0	576	$101,250	1,878
105	0	0	0	0	0	0	73	0	73	$101,250	23

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
106	467	1,271	0	0	29	31	0	0	60	$40,222	105
107	245	713	863	0	0	72	0	0	72	$23,000	136
108	0	0	0	0	0	21	0	0	21	$35,938	433
109	165	498	0	0	10	8	0	0	18	$33,523	70
110	352	968	0	0	27	23	24	2	76	$33,523	298
111	395	1,030	0	0	0	7	0	0	7	$23,429	120
112	192	519	0	0	0	5	0	0	5	$24,954	51
113	246	532	0	0	38	129	1	0	168	$39,213	70
114	117	305	0	0	4	93	0	0	97	$24,954	20
115	186	387	0	0	68	51	2	0	121	$24,954	33
116	484	1,136	434	0	38	656	25	8	727	$53,654	287
117	61	182	0	0	41	222	40	28	331	$53,654	80
118	25	49	0	0	50	115	17	71	253	$36,875	23
119	23	59	806	0	0	73	0	0	73	$53,654	73
120	180	479	0	0	4	91	0	49	144	$36,875	103
121	152	1,481	0	0	0	113	0	0	113	$43,333	171
122	87	451	0	4,499	0	287	0	0	287	$31,875	117
123	196	1,179	210	0	84	20	0	0	104	$31,875	103
124	345	1,267	1,538	0	0	150	0	0	150	$46,125	172
125	0	0	0	0	0	0	0	0	0	$46,125	29
126	596	1,789	0	0	15	11	0	1	27	$46,111	230
127	280	761	619	0	35	65	0	6	106	$29,821	134
128	118	271	0	0	22	11	0	0	33	$41,400	51
129	27	66	0	0	499	348	4	11	862	$41,400	116
130	85	191	0	0	0	343	10	0	353	$39,213	42
131	71	206	0	0	443	25	14	0	482	$24,878	76
132	225	396	0	0	0	70	3	0	73	$24,878	38
133	188	419	0	0	0	4	0	0	4	$0	50
134	89	176	0	0	0	0	0	0	0	$0	37
135	41	99	0	0	9	6	0	0	15	$0	25
136	76	193	0	0	0	0	0	20	20	$24,878	32
137	120	309	0	0	13	0	0	8	21	$31,957	40

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
138	278	657	0	0	0	9	0	0	9	$31,957	48
139	0	0	0	0	0	0	0	0	0	$31,957	56
140	0	0	0	0	0	0	0	0	0	$18,750	72
141	212	644	0	0	0	0	0	0	0	$37,321	53
142	5	16	759	0	0	75	0	0	75	$31,957	222
143	0	0	0	0	18	10	88	2	118	$101,250	454
144	0	0	0	0	0	408	0	0	408	$101,250	85
145	0	0	0	0	0	170	0	0	170	$101,250	40
146	0	0	0	0	12	19	133	5	169	$101,250	47
147	16	92	0	0	0	174	0	0	174	$55,729	18
148	166	567	0	0	0	274	0	0	274	$0	21
149	0	0	0	0	13	127	0	0	140	$101,250	96
150	149	433	239	0	3	562	3	7	575	$77,750	97
151	17	61	520	0	0	45	28	45	118	$18,750	47
152	93	284	468	0	6	52	1	0	59	$18,750	88
153	57	137	0	0	0	0	0	0	0	$31,957	14
154	115	310	0	0	3	0	0	0	3	$18,750	22
155	99	254	0	0	24	728	0	0	752	$18,750	38
156	54	132	0	0	0	0	0	0	0	$18,750	12
157	111	172	0	0	0	8	0	0	8	$26,346	35
158	108	213	0	0	0	0	0	0	0	$26,346	27
159	109	268	0	0	5	19	0	0	24	$30,132	35
160	234	572	0	0	0	57	0	0	57	$21,500	52
161	179	499	0	0	0	21	0	0	21	$30,938	38
162	334	781	0	0	3	0	0	0	3	$30,938	62
163	282	946	0	0	0	0	0	0	0	$45,764	54
164	155	359	0	0	3	0	0	0	3	$30,132	40
165	138	294	435	0	0	42	9	0	51	$26,346	41
166	69	203	0	0	0	0	9	16	25	$30,461	21
167	58	126	0	0	0	0	0	0	0	$34,911	16
168	94	204	0	0	3	0	0	0	3	$34,911	27
169	262	882	0	0	0	6	0	100	106	$23,125	41

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
170	499	1,338	0	0	165	363	0	0	528	$19,890	187
171	414	857	0	0	1	0	0	3	4	$23,125	71
172	224	567	0	0	6	0	2	22	30	$24,500	49
173	151	331	0	0	0	6	0	0	6	$24,500	28
174	238	595	0	0	20	11	0	9	40	$46,250	39
175	85	265	0	0	212	303	4	37	556	$31,378	117
176	0	0	0	0	3	0	0	0	3	$45,060	81
177	126	274	446	0	54	43	0	0	97	$82,614	36
178	49	131	0	0	0	9	0	0	9	$82,614	18
179	58	111	0	0	0	2	0	0	2	$76,071	19
180	134	316	0	0	0	23	19	0	42	$76,071	35
181	58	161	0	0	0	0	0	0	0	$76,071	19
182	70	146	0	0	0	46	0	0	46	$76,071	21
183	14	128	0	473	50	29	0	0	79	$21,818	23
184	150	562	0	1,308	12	161	0	0	173	$21,818	61
185	83	181	0	0	0	26	0	0	26	$74,792	27
186	93	214	0	0	0	6	0	0	6	$74,792	23
187	189	425	609	0	0	52	0	15	67	$80,431	42
188	89	191	857	0	0	80	0	0	80	$80,431	26
189	118	270	0	0	0	4	0	0	4	$82,614	19
190	205	470	0	0	29	31	0	0	60	$82,614	42
191	339	715	0	0	0	9	1	12	22	$45,060	87
192	305	890	0	0	5	27	0	3	35	$31,378	63
193	218	601	0	0	0	26	0	0	26	$20,029	69
194	104	280	0	0	0	50	3	34	87	$20,029	47
195	169	174	0	0	6	5,382	0	0	5,388	$12,917	84
197	157	405	0	0	6	221	12	15	254	$12,917	115
198	403	1,021	0	0	5	157	25	112	299	$35,938	209
199	249	685	0	0	9	195	0	0	204	$36,875	130
200	0	0	0	0	0	0	0	0	0	$80,337	1,454
201	169	348	210	0	0	36	3	7	46	$82,614	37
202	179	361	0	0	3	38	0	0	41	$62,778	56

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
203	108	216	0	0	0	2	0	0	2	$74,464	34
204	285	644	0	0	0	4	1	0	5	$74,464	66
205	147	282	0	0	0	62	0	0	62	$74,792	36
206	118	265	0	0	0	4	0	0	4	$74,792	44
207	216	554	0	0	22	70	36	53	181	$21,818	66
208	469	1,233	0	0	36	71	0	0	107	$18,843	283
209	125	417	0	0	22	391	65	6	484	$31,250	53
210	193	472	0	0	3	52	0	0	55	$42,896	63
211	124	399	0	0	0	3	0	0	3	$82,361	46
212	53	339	0	0	92	24	0	0	116	$82,361	37
213	173	359	530	0	55	57	0	0	112	$62,778	67
214	109	217	0	0	0	0	0	0	0	$62,778	32
215	94	165	0	0	0	331	3	0	334	$62,778	38
216	35	66	611	0	56	133	1	0	190	$62,778	56
217	10	17	0	0	90	915	42	0	1,047	$46,654	49
218	1	3	0	0	56	151	0	0	207	$46,654	11
219	25	46	0	0	18	267	0	4	289	$46,654	21
220	0	0	0	0	0	2,144	0	0	2,144	$46,654	31
221	75	159	0	0	0	0	0	12	12	$46,654	23
222	82	105	0	0	19	751	0	0	770	$46,654	36
223	78	161	0	0	0	50	0	0	50	$46,654	32
224	67	124	121	0	18	189	0	0	207	$46,654	39
225	107	241	0	0	6	55	0	0	61	$42,896	66
226	117	360	0	0	0	169	45	0	214	$31,250	50
227	297	883	418	0	0	45	9	0	54	$33,438	148
228	1	680	0	0	8	2,394	0	0	2,402	$42,333	387
229	207	578	0	0	41	31	0	13	85	$27,396	49
230	0	0	0	0	223	637	27	0	887	$77,750	53
231	356	938	0	0	0	603	3	0	606	$54,464	192
232	90	132	0	0	289	244	1	0	534	$54,464	27
233	322	656	616	0	22	229	0	0	251	$71,917	139
234	65	155	0	0	0	0	0	0	0	$77,750	46

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
235	23	68	0	0	0	0	0	0	0	$77,750	20
236	43	79	17	0	1	422	16	25	464	$77,750	35
237	0	0	0	0	13	1,320	6	7	1,346	$77,750	51
238	224	379	0	0	27	68	0	0	95	$27,396	55
239	198	560	0	3,296	0	95	0	8	103	$42,333	132
240	255	1,112	0	0	0	0	0	0	0	$42,333	166
241	0	0	0	0	161	525	21	5	712	$26,250	53
242	0	0	0	0	81	367	0	0	448	$26,250	26
243	120	202	91	0	82	2,933	115	57	3,187	$26,250	162
244	0	0	0	74	488	1,575	9	0	2,072	$26,250	75
245	2	3	0	0	15	69	3	0	87	$26,250	17
246	0	0	0	0	212	302	0	4	518	$26,250	34
247	1	2	0	0	1,281	1,169	14	0	2,464	$44,893	83
248	488	741	0	1,657	1	900	8	5	914	$31,042	73
249	148	465	0	0	20	477	1	26	524	$44,893	84
250	81	308	0	0	13	378	4	7	402	$44,893	41
251	0	0	0	0	315	947	43	18	1,323	$44,893	57
252	0	0	0	0	358	148	3	0	509	$44,893	23
253	101	360	729	250	17	11,543	236	1	11,797	$42,333	4,819
254	553	1,462	0	0	28	61	0	17	106	$26,667	276
255	502	1,628	674	0	8	620	0	5	633	$41,719	119
256	489	1,345	638	0	0	120	0	0	120	$44,250	207
257	642	1,537	0	0	22	84	0	1	107	$47,431	632
258	198	422	0	0	110	582	1	0	693	$31,568	80
259	47	129	0	0	114	201	0	0	315	$21,782	36
260	501	1,150	0	0	0	12	0	0	12	$21,782	66
261	715	1,832	760	0	0	78	0	3	81	$39,545	259
262	413	1,103	14	0	4	2	4	0	10	$33,229	123
263	152	451	0	0	507	649	0	2	1,158	$60,588	162
264	429	1,431	0	0	3	51	6	0	60	$52,917	196
265	730	1,880	0	0	0	455	0	20	475	$36,569	174
266	161	425	0	0	0	27	0	5	32	$38,631	102

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
267	0	0	0	0	15	324	0	0	339	$45,812	40
268	445	1,217	0	0	12	3	0	0	15	$24,348	54
269	189	275	0	0	0	58	0	0	58	$38,631	84
270	0	0	0	561	452	50	0	0	502	$38,631	87
271	153	309	0	0	344	242	0	0	586	$24,348	33
272	57	110	0	0	672	323	11	2	1,008	$38,631	1,469
273	275	1,733	0	0	55	105	0	0	160	$45,812	170
274	0	0	0	6,264	0	237	0	0	237	$45,812	62
275	514	1,453	1,089	0	0	144	16	0	160	$45,812	217
276	193	411	0	0	380	167	0	0	547	$45,812	60
277	738	2,126	0	0	0	15	0	0	15	$66,319	834
278	246	651	0	0	0	23	0	0	23	$70,547	512
279	548	1,331	0	0	0	165	0	5	170	$55,000	266
280	536	1,739	893	0	0	76	0	1	77	$50,012	327
281	762	2,116	696	0	256	286	1	13	556	$53,750	290
282	252	494	0	0	3	14	0	2	19	$35,625	137
283	38	70	0	0	0	0	0	0	0	$35,625	268
284	11	27	0	0	0	0	0	0	0	$67,250	176
285	462	1,090	0	0	0	105	0	9	114	$67,250	5,336
286	254	507	0	0	28	1,320	15	44	1,407	$26,250	82
288	20	67	0	0	0	782	0	9	791	$44,893	25
289	0	0	0	0	24	31	0	6	61	$26,667	18
290	42	145	0	0	165	313	13	2	493	$41,719	31
291	106	187	0	0	262	292	0	16	570	$14,940	64
292	708	1,564	0	0	223	503	25	0	751	$30,639	159
293	186	394	0	0	157	476	17	0	650	$33,229	90
294	512	1,113	0	0	0	13	0	0	13	$31,848	51
295	211	623	99	0	201	2,020	0	6	2,227	$49,079	152
296	320	820	0	0	0	17	0	15	32	$70,547	534
297	4	10	692	0	3	43	10	0	56	$35,776	66
298	181	515	0	0	0	40	0	0	40	$66,319	164
300	10	10	0	0	0	0	0	0	0	$0	328

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
301	0	0	0	0	0	24	13	128	165	$0	935
302	0	0	0	0	0	0	0	0	0	$0	79
303	0	0	0	0	0	533	0	0	533	$0	214
305	0	0	0	0	0	0	12	0	12	$0	100
306	0	0	0	1,193	5	41	3	0	49	$4,357	50
307	0	0	0	107	0	37	30	8	75	$4,357	11
308	0	0	0	0	41	173	0	0	214	$51,250	50
309	0	0	0	0	58	337	199	0	594	$51,250	9
310	1	1	0	0	105	1,460	27	0	1,592	$51,250	9
311	0	0	0	0	3	76	0	0	79	$51,250	2
312	7	14	0	0	3	560	0	0	563	$51,250	11
313	13	60	0	0	105	969	3	0	1,077	$51,250	11
314	44	70	0	0	138	986	46	16	1,186	$51,250	13
315	0	0	0	0	145	2,196	339	16	2,696	$51,250	12
316	3	79	0	0	15	2,060	2	5	2,082	$51,250	13
317	25	44	0	0	97	686	0	0	783	$51,250	10
318	44	65	0	241	0	220	0	8	228	$55,729	11
319	68	84	0	0	0	295	11	4	310	$55,729	12
320	45	61	0	0	0	414	0	2	416	$51,250	11
321	80	123	0	70	4	378	0	13	395	$51,250	13
322	37	61	0	0	159	963	19	23	1,164	$51,250	13
323	15	20	0	0	24	1,166	8	0	1,198	$51,250	14
324	18	30	0	0	15	120	5	0	140	$51,250	6
325	0	0	0	0	0	1,051	0	0	1,051	$51,250	6
326	93	400	0	592	15	275	43	5	338	$4,357	41
327	150	1,078	0	0	4	19	0	0	23	$4,357	26
328	1	597	0	1,114	0	85	0	0	85	$13,636	22
329	0	0	0	0	50	69	2	0	121	$51,250	7
331	1	356	0	0	0	38	0	0	38	$51,250	14
332	43	68	0	0	0	59	1	26	86	$51,250	6
333	94	104	103	0	31	574	0	20	625	$55,729	13
334	58	68	0	0	109	214	0	0	323	$55,729	7

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
335	31	39	36	0	0	7	0	0	7	$55,729	13
336	45	60	0	0	0	7	0	0	7	$55,729	6
337	63	194	0	0	1	110	0	72	183	$55,729	12
338	127	226	0	0	0	174	9	0	183	$35,776	12
339	107	200	0	0	0	142	0	0	142	$43,182	12
340	104	156	321	0	0	145	2	0	147	$43,182	14
341	47	84	0	726	0	586	0	0	586	$43,182	7
342	20	44	0	0	12	780	0	0	792	$39,375	8
343	87	205	0	0	6	56	1	0	63	$39,375	14
344	29	54	0	0	1	49	2	0	52	$39,375	5
345	1	5	0	0	20	41	0	0	61	$39,375	7
346	15	138	0	0	0	52	0	0	52	$39,375	6
347	34	75	0	0	0	112	0	4	116	$39,375	7
348	130	246	0	152	20	213	0	0	233	$39,375	15
349	43	82	0	0	27	82	0	0	109	$39,375	8
350	63	96	0	0	0	285	0	2	287	$43,182	7
351	148	263	0	0	0	59	12	0	71	$43,182	14
352	290	370	0	0	0	139	0	0	139	$43,182	12
353	208	390	0	69	0	50	4	0	54	$35,776	19
354	174	417	0	0	0	15	2	0	17	$35,776	15
355	135	303	0	0	13	16	0	0	29	$17,083	16
356	274	464	0	88	0	539	2	7	548	$17,083	19
357	0	0	0	0	0	0	0	0	0	$39,750	34
358	182	331	0	0	4	109	0	5	118	$39,750	18
359	49	84	0	0	5	130	0	0	135	$39,750	9
360	9	21	0	0	20	36	0	0	56	$39,750	9
361	37	92	0	0	0	47	0	0	47	$39,750	7
362	64	110	0	0	9	1	5	0	15	$39,750	6
363	141	275	0	0	0	132	24	0	156	$39,750	15
364	139	364	0	0	0	126	0	0	126	$17,083	16
365	93	286	0	0	211	7	0	1	219	$17,083	13
366	175	449	0	0	0	25	0	0	25	$28,125	22

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
367	166	413	0	765	13	53	0	0	66	$14,978	21
368	63	131	0	0	0	14	13	0	27	$14,978	7
369	45	52	0	0	68	121	0	0	189	$14,978	8
370	18	39	0	0	20	75	0	1	96	$19,917	7
371	213	464	0	368	12	61	0	0	73	$19,917	22
372	9	22	0	0	10	11	0	0	21	$19,917	7
373	25	76	0	0	13	0	0	0	13	$19,917	8
374	192	581	0	0	3	20	0	0	23	$19,917	26
375	0	0	0	0	29	61	0	0	90	$19,917	8
376	18	39	0	0	0	288	0	22	310	$14,978	10
377	35	50	0	0	0	283	0	0	283	$14,978	9
378	237	606	0	0	6	145	0	0	151	$14,978	25
379	72	140	0	0	0	0	0	0	0	$28,125	15
380	73	247	0	0	0	20	0	0	20	$30,461	20
381	211	251	0	843	3	61	0	0	64	$13,525	15
382	16	43	0	0	6	44	0	0	50	$13,525	8
383	23	46	0	2,176	0	329	0	0	329	$13,525	9
384	57	142	0	0	0	134	0	0	134	$26,121	7
385	153	343	0	0	8	25	0	0	33	$26,121	22
386	22	62	0	0	12	0	0	0	12	$26,121	8
387	1	4	0	0	0	0	0	0	0	$26,121	5
388	99	226	0	0	3	88	0	0	91	$26,121	15
389	15	29	0	0	0	22	0	0	22	$26,121	5
390	36	80	0	0	5	44	0	0	49	$13,525	6
391	202	528	0	0	46	57	0	8	111	$46,250	38
392	111	208	0	0	67	71	5	0	143	$13,525	28
393	43	86	0	0	10	108	0	0	118	$13,525	14
394	30	109	0	0	6	91	0	0	97	$13,525	12
395	27	67	0	0	6	135	9	0	150	$26,121	8
396	154	323	0	0	22	10	14	0	46	$26,121	28
397	25	68	0	0	8	0	0	0	8	$26,121	9
401	0	0	0	0	0	0	10	0	10	$0	2,005

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
402	0	0	0	0	0	0	0	0	0	$0	149
403	0	0	0	0	0	0	160	0	160	$0	64
404	0	0	0	0	0	23	321	0	344	$0	210
405	0	0	0	0	0	0	9	0	9	$0	96
406	206	649	0	0	84	498	56	1	639	$23,289	110
407	138	413	0	0	0	81	34	0	115	$23,289	61
408	81	239	0	0	8	0	80	0	88	$23,289	56
409	0	0	0	0	0	85	1,371	4	1,460	$0	84
410	0	0	0	0	0	0	0	0	0	$0	344
411	0	0	0	0	4	0	150	0	154	$0	607
412	0	0	0	0	0	2,554	120	0	2,674	$0	475
413	0	0	0	0	0	791	0	0	791	$44,271	87
414	114	266	0	0	1	10	1	3	15	$44,271	124
415	92	211	0	0	26	41	45	15	127	$36,250	127
416	323	823	0	0	3	121	0	0	124	$36,250	170
417	188	373	0	0	8	169	0	7	184	$0	166
418	55	139	0	0	86	154	235	25	500	$0	155
419	41	117	0	0	8	0	4	0	12	$23,289	32
420	155	462	613	0	0	56	9	0	65	$22,316	69
421	614	1,537	0	0	0	35	6	0	41	$16,397	147
422	247	607	0	0	0	19	34	0	53	$16,397	74
423	22	436	0	0	0	747	55	281	1,083	$4,357	177
424	1	316	0	0	61	102	12	7	182	$13,636	40
425	38	59	741	0	13	70	4	0	87	$13,636	38
426	147	440	0	0	0	153	0	0	153	$11,993	34
427	0	0	0	0	0	509	149	0	658	$13,636	97
428	24	52	0	0	0	0	0	0	0	$13,636	35
429	2	5	0	0	0	14	16	35	65	$13,636	64
430	59	136	0	0	4	27	8	8	47	$13,636	38
431	93	231	0	0	3	0	17	0	20	$13,636	84
432	4	7	0	0	3	18	99	0	120	$13,636	108
433	0	0	0	0	9	0	49	24	82	$13,636	65

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
435	364	1,033	0	0	0	182	411	12	605	$28,684	235
436	252	513	0	0	0	1	0	0	1	$23,235	51
437	111	300	0	0	0	0	0	0	0	$23,235	33
438	70	160	0	0	6	0	0	0	6	$23,235	25
439	0	0	0	0	0	16	0	0	16	$11,993	53
440	0	0	780	0	0	272	0	0	272	$11,993	96
441	213	664	0	0	0	23	0	0	23	$11,993	42
442	325	855	0	0	3	362	0	0	365	$11,993	59
443	468	1,286	0	0	3	1	2	0	6	$27,963	72
444	307	775	0	0	0	25	0	0	25	$27,000	82
445	1	1	0	473	38	36	0	0	74	$21,818	12
446	276	672	0	0	0	5	0	0	5	$19,432	82
447	204	541	114	0	0	15	0	29	44	$0	59
448	90	338	992	0	0	85	5	0	90	$26,953	72
449	0	0	0	0	0	1,006	168	287	1,461	$26,953	95
450	0	0	0	0	0	0	0	0	0	$40,474	57
451	658	1,659	667	0	0	62	0	0	62	$40,474	344
452	1	2	0	0	0	0	0	0	0	$11,993	123
453	33	119	0	0	23	0	0	0	23	$0	89
454	1	2	0	0	0	0	639	88	727	$0	71
455	135	424	0	0	1	37	11	0	49	$0	117
457	10	11	0	0	28	225	226	116	595	$0	105
458	7	23	0	0	15	194	113	0	322	$26,953	41
459	139	615	0	1,079	0	100	0	2	102	$26,953	200
461	15	60	0	0	0	283	8	48	339	$26,953	60
462	227	713	0	0	0	0	0	0	0	$29,435	172
463	251	725	0	0	0	0	0	0	0	$29,435	97
464	234	530	0	0	8	26	3	13	50	$34,267	157
465	262	667	285	0	6	35	7	6	54	$34,267	165
466	14	44	0	0	8	16	4	5	33	$34,267	95
467	242	664	0	0	0	0	0	0	0	$17,652	279
468	689	2,021	0	0	0	41	0	0	41	$40,000	201

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
469	29	63	0	0	0	0	0	0	0	$40,000	81
470	0	0	0	0	4	104	127	6	241	$40,000	123
471	71	187	0	0	0	20	2	0	22	$40,000	171
472	20	46	0	0	0	78	32	74	184	$40,000	144
473	0	0	0	0	0	143	0	6	149	$0	52
474	432	621	0	0	291	2,510	433	180	3,414	$36,630	960
475	0	0	0	0	0	0	1	0	1	$36,630	123
476	20	61	0	0	6	65	220	16	307	$40,000	203
477	0	0	0	0	0	525	126	172	823	$27,518	301
478	0	0	0	0	0	50	50	0	100	$27,518	170
479	4	11	0	0	230	290	479	117	1,116	$27,518	312
480	0	0	0	0	8	58	2	0	68	$27,518	149
481	0	0	0	0	0	2	0	0	2	$41,583	25
482	3	6	0	0	5	14	134	0	153	$41,583	108
483	134	483	0	0	0	122	139	29	290	$41,583	106
484	0	0	0	0	0	50	0	95	145	$41,583	71
485	132	410	525	0	61	112	57	0	230	$41,583	115
487	29	100	0	0	0	0	0	0	0	$41,583	35
489	11	26	0	0	0	70	0	0	70	$41,583	55
491	1	4	0	0	32	17	0	0	49	$34,706	66
492	142	411	0	0	81	238	49	42	410	$34,706	199
493	521	1,321	0	0	115	33	29	20	197	$24,730	211
494	111	269	671	0	0	389	0	0	389	$45,682	86
495	179	415	358	0	6	43	35	0	84	$45,682	80
501	0	0	0	0	0	0	0	0	0	$77,325	2,681
502	0	0	0	0	0	1,430	0	1,890	3,320	$49,931	473
504	0	0	0	0	0	4	12	0	16	$49,931	342
505	195	476	0	0	5	66	16	3	90	$49,931	171
506	37	91	0	0	0	0	503	36	539	$35,944	293
507	153	353	0	0	23	99	1	0	123	$35,944	347
510	148	364	525	0	9	445	62	14	530	$49,931	554
511	0	0	0	0	3	237	62	0	302	$49,931	218

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
512	20	34	0	0	0	70	0	0	70	$49,931	472
513	107	276	0	0	4	12	15	0	31	$77,325	587
514	0	0	0	0	0	0	0	0	0	$77,325	4,179
515	1	1	0	0	0	0	349	1	350	$77,325	4,163
516	0	0	0	0	0	54	167	0	221	$77,325	685
517	35	103	0	0	26	0	1	0	27	$77,325	888
518	0	0	0	0	0	509	22	0	531	$77,325	726
519	0	0	0	0	0	209	29	36	274	$77,325	270
520	0	0	0	0	19	150	140	62	371	$77,325	176
521	0	0	0	0	33	138	252	98	521	$77,325	109
522	99	267	0	0	0	12	0	0	12	$40,840	576
523	62	151	0	0	0	261	42	32	335	$40,840	908
524	572	1,193	801	0	42	530	157	130	859	$40,840	327
525	70	139	0	0	0	36	4	0	40	$40,840	67
526	38	63	0	0	61	542	145	78	826	$40,840	241
527	32	57	0	0	6	526	45	0	577	$40,840	142
528	0	0	0	0	0	0	2	0	2	$40,840	533
529	0	0	0	0	0	118	24	0	142	$77,325	196
530	0	0	0	0	0	1,523	5,895	8	7,426	$77,325	153
531	0	0	0	0	241	220	3,676	0	4,137	$77,325	2,558
532	0	0	0	0	0	6	0	0	6	$77,325	244
533	0	0	0	0	27	1,775	13	0	1,815	$77,325	642
534	11	22	0	0	97	1,786	43	735	2,661	$77,325	1,603
535	33	70	0	0	119	600	236	109	1,064	$45,363	594
536	22	48	0	0	108	362	9	14	493	$45,363	141
537	0	0	0	0	219	223	1,200	163	1,805	$45,363	326
538	0	0	0	0	0	0	0	0	0	$45,363	355
539	0	0	0	0	0	78	809	1	888	$45,363	299
540	0	0	0	0	211	366	129	42	748	$63,764	361
541	115	305	0	0	3	86	128	5	222	$63,764	1,013
542	0	0	0	0	8	266	425	0	699	$63,764	1,646
543	14	28	0	0	0	97	162	0	259	$63,764	146

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
544	161	802	0	0	28	425	112	235	800	$32,219	481
545	21	99	0	0	18	88	6	0	112	$32,219	172
546	47	108	0	0	150	201	33	53	437	$27,518	297
547	213	750	1,109	0	63	214	64	120	461	$27,518	1,050
548	304	447	0	0	292	3,586	219	342	4,439	$36,630	951
549	242	472	896	0	0	100	0	10	110	$36,630	788
550	101	151	0	0	6	151	21	6	184	$36,630	986
551	921	2,363	0	0	0	700	0	74	774	$82,754	1,061
552	12	32	0	0	0	0	0	0	0	$82,754	1,025
553	1,677	5,039	0	0	0	303	0	5	308	$57,731	1,767
554	1,040	3,016	0	0	202	260	7	45	514	$82,754	1,231
555	408	1,316	0	0	0	7	0	1	8	$57,731	308
556	478	1,483	0	0	10	75	0	0	85	$47,132	834
557	2	4	0	0	0	25	0	0	25	$47,132	814
558	732	1,846	120	0	14	691	1	0	706	$47,132	1,188
559	9	28	0	0	0	103	0	0	103	$22,386	201
560	106	282	0	0	17	17	0	11	45	$22,386	173
561	218	560	0	0	31	44	0	29	104	$0	505
562	27	71	0	0	31	7	0	0	38	$40,000	333
563	33	69	312	0	0	27	0	3	30	$40,000	1,190
564	95	225	0	0	24	18	0	7	49	$22,386	797
565	682	1,737	0	0	18	93	3	34	148	$64,135	1,311
566	231	512	0	0	14	47	0	1	62	$64,135	809
567	15	49	0	0	105	97	0	0	202	$23,281	422
568	99	301	0	0	0	16	0	4	20	$56,053	516
569	42	100	0	0	0	20	0	59	79	$40,000	368
570	25	57	0	0	0	0	0	0	0	$40,000	206
571	108	256	0	0	0	11	0	0	11	$17,652	290
572	0	0	0	0	0	0	0	0	0	$45,363	960
573	0	0	0	0	0	0	0	0	0	$77,325	85
574	0	0	0	0	0	0	0	0	0	$64,135	473
601	199	570	670	0	69	101	0	20	190	$77,325	1,867

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
602	164	360	0	0	96	260	0	0	356	$77,325	363
603	297	735	0	0	0	51	0	0	51	$77,325	519
605	495	1,444	0	0	0	40	0	0	40	$77,325	777
606	19	49	0	0	0	0	0	0	0	$77,325	195
607	31	81	0	0	8	38	0	0	46	$77,325	981
608	25	53	0	0	0	11	0	0	11	$77,325	245
609	354	1,164	0	0	0	61	0	0	61	$77,325	618
610	1,375	3,636	1,374	0	0	159	9	58	226	$77,325	2,802
611	317	974	0	0	0	0	4	0	4	$77,325	1,045
612	59	167	0	0	0	26	2	32	60	$44,103	1,812
613	1	4	0	0	0	0	6	0	6	$77,325	406
614	1,947	5,358	0	0	703	2,314	53	1	3,071	$77,325	1,650
615	63	169	0	0	4	0	0	0	4	$44,103	670
616	223	578	0	0	5	19	11	30	65	$44,103	739
617	182	459	0	0	100	432	0	6	538	$48,218	434
618	0	0	0	0	0	0	0	0	0	$53,125	16
619	742	1,419	0	0	282	2,137	82	109	2,610	$77,325	433
620	319	707	0	0	10	208	9	0	227	$45,363	395
621	407	824	527	0	163	269	2	8	442	$48,218	380
622	195	511	0	0	26	257	83	0	366	$63,764	348
623	436	1,092	0	0	221	566	36	38	861	$54,476	571
624	4	12	0	0	8	7	0	0	15	$54,476	220
625	106	290	0	0	0	6	0	2	8	$53,125	479
626	266	681	383	0	0	91	39	36	166	$53,125	272
627	137	380	0	0	0	31	0	67	98	$44,103	396
628	5	11	0	0	0	0	0	11	11	$44,103	621
629	18	55	0	0	0	0	0	0	0	$53,125	725
630	4	8	0	0	0	0	0	0	0	$53,125	867
631	0	0	0	0	0	0	0	0	0	$53,125	331
632	33	80	0	0	8	0	0	0	8	$53,125	344
633	6	15	0	0	0	0	31	12	43	$53,125	253
634	13	33	0	0	0	0	0	2	2	$53,125	98

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
635	2	5	0	0	0	0	0	0	0	$53,125	644
636	14	31	0	0	0	0	0	0	0	$53,125	714
637	39	114	0	0	0	1	0	1	2	$53,125	524
638	136	333	0	0	0	25	0	0	25	$54,476	468
639	261	834	0	0	0	0	0	0	0	$54,476	678
640	396	1,215	1,829	0	4	210	15	2	231	$54,476	775
641	284	853	0	0	0	2	4	0	6	$54,476	535
642	470	1,356	0	0	0	13	0	6	19	$63,764	588
643	818	2,480	0	0	0	127	0	0	127	$63,764	996
644	920	2,800	0	0	0	9	1	34	44	$68,750	834
645	735	2,268	0	0	8	72	1	1	82	$68,750	772
646	131	335	0	0	0	169	0	0	169	$68,750	1,023
648	580	1,350	0	0	12	199	1	0	212	$68,750	1,664
649	24	80	0	0	0	0	0	0	0	$68,750	734
650	9	21	0	0	0	0	0	0	0	$68,750	740
651	0	0	0	0	0	0	0	0	0	$68,750	398
652	3	3	0	0	0	0	0	0	0	$68,750	295
653	30	80	0	0	0	0	0	0	0	$68,750	280
654	50	155	0	0	0	0	0	0	0	$68,750	231
655	19	67	0	0	0	9	0	0	9	$68,750	1,478
656	12	32	0	0	0	0	0	0	0	$68,750	884
657	0	0	1,386	0	0	125	0	0	125	$68,750	628
658	14	33	0	0	0	0	0	0	0	$68,750	1,265
659	37	98	0	0	0	0	0	8	8	$68,750	1,163
660	35	123	0	250	0	134	0	0	134	$65,679	1,837
661	65	198	0	0	0	0	0	0	0	$65,679	1,601
662	53	169	0	0	0	2	0	0	2	$65,679	1,310
663	8	19	0	0	0	0	0	0	0	$65,679	574
664	66	229	0	0	0	15	0	0	15	$65,679	861
665	27	108	0	0	0	0	0	0	0	$65,679	656
666	73	243	0	0	0	0	0	0	0	$65,679	270
667	206	710	0	0	0	0	0	9	9	$65,679	1,286

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
668	51	167	0	0	0	13	3	1	17	$65,679	1,424
669	24	87	0	0	68	12	0	0	80	$65,679	1,739
670	475	1,082	0	0	168	150	0	0	318	$46,517	1,110
671	38	105	1,622	0	35	138	0	11	184	$46,517	326
672	928	2,655	0	0	5	16	23	19	63	$46,517	2,559
673	396	1,248	0	0	20	424	0	0	444	$23,281	920
674	404	965	0	0	0	113	0	5	118	$51,263	367
675	1,261	3,369	0	0	108	181	673	17	979	$39,434	854
676	457	1,123	0	0	3	60	7	0	70	$49,094	2,638
677	647	1,590	0	0	0	133	0	0	133	$46,310	232
678	1,343	3,703	718	0	8	223	12	5	248	$75,260	657
679	94	299	0	0	0	4	41	0	45	$82,000	8,106
680	13	35	0	0	0	0	0	0	0	$44,103	302
681	694	1,283	81	0	0	134	0	3	137	$77,325	341
682	0	0	0	0	1,152	234	0	0	1,386	$77,325	69
683	0	0	0	0	0	0	0	0	0	$77,325	1,631
684	0	0	0	0	0	65	0	0	65	$53,125	94
685	30	93	0	0	0	0	0	1	1	$24,063	666
686	61	184	0	0	0	0	0	14	14	$24,063	6,279
687	143	368	0	0	20	67	0	0	87	$24,063	2,568
688	225	637	0	0	5	18	56	2	81	$31,615	3,252
689	413	1,237	0	0	0	15	1	10	26	$31,615	2,775
690	35	97	0	0	0	0	0	11	11	$31,615	1,014
691	28	80	0	0	0	0	0	0	0	$31,615	920
692	34	106	0	0	0	0	0	0	0	$31,615	1,903
693	32	83	0	0	20	3	5	27	55	$31,615	3,105
694	132	361	1,544	0	50	163	0	11	224	$31,615	4,277
695	2	4	0	0	0	0	0	0	0	$24,063	2,315
696	25	72	0	0	0	0	28	1	29	$24,063	5,157
697	264	757	0	0	9	69	4	0	82	$24,063	4,225
698	32	82	0	0	9	79	0	4	92	$57,147	987
699	107	294	0	0	14	837	59	0	910	$57,147	3,584

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
700	78	221	0	0	0	4	1	0	5	$57,147	2,163
701	273	820	0	0	0	79	0	0	79	$57,147	4,213
702	52	157	0	0	0	0	0	3	3	$57,147	4,434
703	45	100	0	0	0	0	0	14	14	$57,147	4,198
704	25	59	0	0	6	9	0	0	15	$35,857	3,932
705	248	704	0	0	0	6	154	8	168	$35,857	2,915
706	459	1,252	536	0	42	87	6	5	140	$35,857	3,265
707	190	571	0	0	6	59	1	29	95	$45,735	3,007
708	88	253	0	0	0	2	0	6	8	$45,735	2,240
709	227	700	0	0	0	4	190	15	209	$45,735	1,947
710	27	84	0	0	0	0	0	0	0	$45,735	1,531
711	164	457	0	0	159	0	13	0	172	$45,735	972
712	48	128	0	0	20	0	6	0	26	$45,735	2,186
713	41	98	0	0	0	0	0	0	0	$45,735	782
714	74	217	0	0	161	4	0	0	165	$45,735	3,131
715	125	320	0	0	36	7	0	0	43	$45,735	2,376
716	88	247	0	0	12	59	94	11	176	$35,857	3,846
717	0	0	0	0	0	0	0	0	0	$0	109,387
718	46	142	0	0	0	0	0	0	0	$59,141	1,386
719	102	298	0	0	0	0	0	13	13	$59,141	1,379
720	13	35	0	0	0	0	0	0	0	$59,141	3,505
721	110	302	0	0	0	84	2	0	86	$59,141	289
722	197	602	0	0	0	16	0	7	23	$59,141	339
723	113	314	0	0	20	26	7	0	53	$59,141	471
724	131	345	0	0	1	209	0	48	258	$59,141	480
725	0	0	0	0	0	0	0	0	0	$59,141	2,607
726	0	0	0	0	0	0	0	0	0	$59,141	2,601
727	0	0	0	0	0	0	0	0	0	$59,141	1,551
728	0	0	0	0	179	103	0	0	282	$59,141	2,124
729	985	3,074	0	0	8	97	0	5	110	$48,115	380
730	637	1,597	4,275	0	269	2,947	90	153	3,459	$43,438	686
731	304	765	0	0	132	266	2	0	400	$43,438	553

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
732	191	506	196	0	49	265	0	8	322	$43,438	670
733	0	0	0	0	27	182	34	83	326	$86,184	165
734	295	1,053	0	0	188	529	42	1	760	$86,184	1,479
735	349	1,194	0	0	15	561	39	13	628	$86,184	1,157
736	21	50	0	0	22	247	0	0	269	$86,184	1,977
737	741	2,213	0	0	0	77	9	11	97	$107,770	1,738
738	158	382	0	0	0	59	1	0	60	$93,347	5,996
739	190	497	832	0	1	90	3	2	96	$93,347	6,178
740	272	702	0	0	4	354	0	5	363	$93,347	20,563
741	47	140	0	0	0	5	0	9	14	$93,347	8,080
742	322	861	0	0	0	59	3	16	78	$105,167	2,916
743	683	1,896	0	0	10	180	22	11	223	$105,167	6,929
744	106	309	0	0	0	15	4	0	19	$105,167	2,028
745	714	2,331	0	0	0	41	3	9	53	$105,167	1,786
746	0	0	1,594	0	0	0	0	0	0	$105,167	1,892
747	9	29	0	0	0	0	0	0	0	$105,167	967
748	0	0	0	0	0	0	0	0	0	$66,845	2,203
749	1	1	0	0	0	0	0	0	0	$66,845	2,203
750	43	128	0	0	0	12	2	0	14	$66,845	1,044
751	9	28	0	0	104	110	31	0	245	$66,845	490
752	209	501	0	0	0	11	0	0	11	$66,845	657
753	315	899	0	0	10	191	0	25	226	$66,845	369
754	295	948	0	0	0	42	0	0	42	$66,845	1,345
771	421	1,281	0	0	17	1,091	7	42	1,157	$56,696	763
772	264	812	0	0	9	14	26	0	49	$56,696	221
773	209	498	0	0	13	178	1	16	208	$49,891	448
774	310	1,135	0	0	4	69	34	17	124	$33,917	1,369
775	5	15	0	0	0	0	0	0	0	$33,917	3,348
776	13	64	0	0	14	24	0	0	38	$33,917	172
777	109	372	0	0	17	14	0	31	62	$63,000	2,840
778	107	321	682	0	0	70	0	4	74	$63,000	3,594
779	144	460	0	0	0	5	15	0	20	$56,696	3,750

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
780	86	267	18	0	68	38	0	0	106	$56,696	1,514
781	237	769	0	0	0	0	0	0	0	$56,696	1,276
782	53	169	0	0	5	335	31	0	371	$68,693	1,217
783	249	689	1,471	0	0	150	228	76	454	$68,693	3,106
784	238	712	0	0	24	196	0	6	226	$63,000	294
785	177	585	0	0	0	25	0	1	26	$63,000	394
786	324	997	0	0	0	0	0	2	2	$63,000	378
787	199	696	0	0	4	61	46	3	114	$63,065	504
788	619	1,864	0	0	26	202	3	11	242	$63,065	574
789	201	557	0	0	13	129	1	14	157	$63,000	1,036
790	316	893	0	0	832	564	6	14	1,416	$39,145	1,690
791	714	1,727	0	0	146	192	0	5	343	$56,719	389
792	130	324	0	0	19	156	0	2	177	$56,719	317
793	857	2,695	0	0	91	293	36	2	422	$78,047	925
794	535	1,692	0	0	97	754	53	8	912	$78,047	1,293
795	255	688	767	0	0	75	3	4	82	$39,145	1,093
796	280	713	0	0	1	16	0	0	17	$56,719	1,534
797	61	165	0	0	0	0	0	15	15	$39,145	744
798	87	186	0	0	33	117	0	28	178	$49,891	1,438
799	187	524	0	0	0	2	0	0	2	$61,681	947
800	125	290	2,687	0	0	2,484	0	55	2,539	$61,681	3,787
801	431	1,430	0	0	5	17	0	17	39	$33,917	6,709
802	177	463	0	0	32	41	4	0	77	$51,714	1,903
803	120	325	0	0	0	13	4	0	17	$51,714	1,645
804	121	269	0	0	0	0	7	0	7	$51,714	6,011
805	175	408	0	0	9	0	4	2	15	$51,714	1,078
806	38	91	0	0	0	0	0	0	0	$51,714	303
807	216	658	0	0	13	0	0	197	210	$51,310	2,000
808	162	489	583	0	0	53	0	0	53	$51,310	3,200
809	338	953	0	0	28	0	7	52	87	$51,310	2,332
810	127	382	0	0	0	2	0	0	2	$51,310	1,310
811	169	533	787	0	0	75	1	10	86	$51,310	3,864

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
812	328	939	0	0	10	10	15	2	37	$76,979	2,445
813	131	378	0	0	0	0	0	5	5	$76,979	2,197
814	110	306	0	0	0	0	0	0	0	$76,979	602
815	111	367	0	0	0	0	0	0	0	$76,979	1,389
816	27	72	0	0	0	0	0	0	0	$76,979	600
817	479	1,351	0	0	23	24	0	0	47	$61,681	7,090
818	304	793	0	0	0	4	5	0	9	$51,714	1,729
819	597	1,841	0	0	0	89	1	24	114	$61,681	5,078
820	78	225	0	0	0	85	0	1	86	$92,866	2,824
821	87	229	0	0	0	608	27	0	635	$68,693	3,645
822	60	136	0	0	0	0	0	2	2	$49,891	764
823	44	131	0	0	0	5	0	0	5	$92,866	1,205
824	26	70	0	0	0	0	0	0	0	$61,681	616
825	85	223	0	0	0	0	0	2	2	$92,866	1,856
826	130	420	0	0	0	21	0	2	23	$61,681	1,787
827	186	550	0	0	0	4	41	10	55	$92,866	3,734
828	337	961	0	0	0	17	29	25	71	$92,866	1,872
829	426	1,286	0	0	0	145	0	2	147	$100,298	4,745
830	404	1,259	815	0	9	289	5	0	303	$100,298	1,468
831	273	838	0	0	3	10	0	0	13	$56,964	1,427
832	273	822	0	0	0	2	0	0	2	$56,964	821
833	343	1,098	0	0	0	16	1	1	18	$56,964	1,367
834	147	457	0	0	3	0	0	20	23	$71,693	2,726
835	80	249	0	0	0	6	2	0	8	$71,693	2,637
836	198	662	2,578	0	0	220	0	0	220	$71,693	1,214
837	314	1,091	0	0	3	40	1	0	44	$71,693	2,341
838	256	811	0	0	0	27	0	19	46	$71,693	3,166
839	84	272	0	0	109	192	16	61	378	$78,047	1,555
840	120	356	0	0	0	32	0	50	82	$78,047	3,739
841	6	14	0	0	0	0	0	5	5	$78,047	11,063
842	1	4	0	0	0	46	906	0	952	$78,047	2,717
843	89	279	0	0	0	2	0	0	2	$78,047	451

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
844	58	188	0	0	5	0	1	4	10	$63,000	677
845	36	76	0	0	0	0	0	0	0	$68,693	257
846	115	317	0	0	13	96	949	1	1,059	$68,693	3,301
847	109	303	0	0	0	0	0	3	3	$68,693	651
848	201	547	0	0	3	6	0	2	11	$68,693	1,912
849	10	28	0	0	0	0	0	0	0	$56,696	566
850	68	189	0	0	0	0	0	0	0	$56,696	4,769
851	54	171	0	0	0	0	1	0	1	$56,696	847
852	167	505	0	0	8	7	19	0	34	$63,000	12,265
853	95	254	0	0	0	13	0	0	13	$63,000	3,093
854	70	197	0	0	0	0	0	0	0	$63,000	3,050
855	48	153	0	0	0	9	0	0	9	$63,000	3,023
856	194	569	0	0	0	16	0	4	20	$71,827	7,601
857	83	252	0	0	4	0	0	0	4	$71,827	2,275
858	28	72	0	0	0	0	0	6	6	$60,915	5,527
859	48	122	0	0	0	0	0	16	16	$60,536	5,793
860	121	313	0	0	0	0	0	0	0	$60,536	8,339
861	43	90	0	0	0	0	0	0	0	$60,536	4,968
862	19	43	0	0	0	0	0	25	25	$60,536	3,297
863	15	35	0	0	0	0	0	0	0	$60,915	1,105
864	99	251	0	0	0	43	0	11	54	$60,915	9,596
865	69	193	0	0	0	13	0	36	49	$60,915	3,046
866	97	256	0	0	0	4	6	2	12	$60,915	3,817
867	119	335	0	0	0	0	0	2	2	$59,100	11,121
868	316	987	742	0	29	72	0	0	101	$59,100	5,206
869	20	74	0	0	0	0	0	0	0	$60,915	1,289
870	111	291	0	0	0	0	0	0	0	$60,915	7,457
871	5	10	0	0	0	0	0	0	0	$60,536	6,514
872	17	38	0	0	0	0	0	0	0	$60,536	8,431
873	197	586	0	0	0	26	0	0	26	$60,915	14,157
874	57	167	0	0	0	0	0	0	0	$60,536	11,201
875	14	28	0	0	0	0	0	0	0	$60,536	1,576

A-Table 2: Socioeconomic Variables by Zone for 2045

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
-1	0	0	0	0	0	0	0	0	0	$0	70,817
1	190	454	0	0	3	49	0	0	52	$72,554	179
2	209	493	0	0	21	294	1	5	321	$62,065	86
3	463	1,098	0	0	64	290	0	3	357	$62,065	248
4	389	909	315	0	25	1,064	7	3	1,098	$51,125	682
5	491	1,242	0	0	89	500	27	10	626	$68,520	1,261
6	145	417	0	0	0	494	0	0	494	$68,520	2,214
7	0	0	0	0	0	0	0	0	0	$68,520	11,717
8	0	0	0	0	0	0	0	0	0	$80,337	9,232
9	0	0	0	0	0	0	0	0	0	$74,671	4,148
10	927	2,262	0	0	2	95	120	30	246	$74,671	1,368
11	988	2,188	0	0	0	64	7	15	86	$63,516	727
12	399	862	0	0	16	219	0	2	237	$71,111	559
13	199	436	0	0	0	17	0	0	17	$71,111	390
14	548	1,075	0	0	84	786	3	37	910	$60,700	368
15	378	972	907	0	150	165	6	10	331	$47,344	243
16	560	1,255	551	0	0	47	3	4	54	$77,500	182
17	653	1,522	0	0	0	107	26	11	145	$73,750	6,289
18	696	1,640	0	0	2	132	4	13	150	$94,412	362
19	337	851	0	0	0	113	27	1	142	$60,972	1,252
20	195	595	1,200	0	0	318	0	0	318	$49,050	300
21	213	582	0	0	0	89	4	7	100	$80,337	422
22	46	118	0	0	0	52	0	0	52	$80,337	2,361
23	92	252	0	0	0	11	0	0	11	$58,125	453
24	348	821	0	0	20	167	0	0	187	$58,125	398
25	67	152	0	0	23	13	0	0	35	$58,125	504
26	1,037	1,990	0	0	4	105	12	3	124	$60,972	1,259
27	5	16	0	0	0	0	0	0	0	$43,333	797
28	814	2,062	0	0	0	95	19	4	118	$126,528	2,735
29	105	217	0	0	0	6	0	0	6	$95,000	2,656
30	1,229	2,917	0	0	1	164	39	20	224	$115,089	3,988

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
31	0	0	0	0	0	0	0	0	0	$141,324	11,921
32	0	0	0	0	0	0	0	0	0	$109,489	5,280
33	1,201	2,679	0	0	12	291	4	4	311	$109,489	3,428
34	501	920	0	0	80	566	44	1	691	$95,000	2,992
35	342	779	989	0	0	86	0	20	106	$61,458	438
36	310	767	0	0	0	40	3	4	47	$78,702	298
37	174	425	0	0	28	178	0	0	206	$42,083	203
38	32	51	0	0	0	0	0	0	0	$43,333	233
39	134	238	0	0	2	73	0	0	74	$43,333	264
40	421	1,369	450	0	0	330	0	0	330	$80,313	215
41	1,016	2,767	0	0	71	90	66	15	242	$47,849	316
42	120	411	737	0	0	65	0	0	65	$38,750	60
43	210	912	0	0	0	66	0	0	66	$38,750	56
44	302	982	0	0	0	3	0	1	4	$44,500	165
45	161	368	0	0	0	18	0	0	18	$27,409	70
46	246	515	0	0	4	10	8	28	49	$27,409	90
47	223	519	0	0	0	58	0	0	58	$49,375	136
48	123	308	0	0	0	0	0	0	0	$49,375	103
49	168	352	0	0	0	49	0	1	51	$40,096	95
50	264	382	486	0	48	847	80	0	974	$40,096	484
51	0	0	0	0	0	0	0	0	0	$38,750	110
52	0	0	0	0	19	18	0	0	36	$38,750	106
53	109	213	0	0	12	149	0	0	161	$40,292	84
54	0	0	0	0	0	1,005	0	0	1,005	$40,292	72
55	0	0	0	0	20	202	0	0	222	$40,292	162
56	0	0	0	0	9	131	0	0	140	$40,292	75
57	0	0	0	0	0	2	2	0	4	$31,042	83
58	226	599	0	0	0	21	3	0	25	$40,292	134
59	7	15	0	0	8	167	0	14	189	$31,042	13
60	268	748	482	0	11	44	0	3	58	$45,500	145
61	189	522	1,338	0	0	135	0	0	135	$45,500	97
62	279	599	0	0	0	0	24	57	81	$61,510	402

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
63	388	1,033	0	0	16	49	0	12	77	$76,406	416
64	454	1,219	0	0	547	307	0	14	868	$76,406	959
65	111	345	137	0	0	99	21	0	121	$76,406	737
66	335	905	0	0	0	0	0	0	0	$61,458	2,407
67	460	1,441	0	0	5	29	0	15	50	$45,083	555
68	123	266	0	0	1	10	14	0	24	$50,665	179
69	242	508	0	0	0	71	0	49	120	$50,665	598
70	443	986	0	0	0	178	3	34	215	$52,576	1,650
71	659	1,423	0	0	0	1,017	0	14	1,032	$101,912	6,183
72	0	0	0	0	0	0	0	0	0	$67,250	14,765
73	0	0	0	0	0	0	0	0	0	$67,250	19,727
74	0	0	0	0	0	0	0	0	0	$67,250	7,740
75	0	0	0	0	0	0	0	0	0	$67,250	8,737
76	0	0	0	0	0	0	0	0	0	$67,250	2,237
77	0	0	0	0	0	0	0	0	0	$38,631	2,996
78	509	1,571	0	0	0	34	1	10	45	$52,366	1,073
79	274	652	0	0	0	11	0	0	11	$73,750	117
80	1,199	3,175	0	0	0	157	16	28	200	$73,750	666
81	500	1,306	0	0	0	20	0	14	34	$74,671	290
82	229	553	238	0	0	20	6	0	26	$63,516	239
83	284	590	0	0	37	72	5	3	117	$60,700	123
84	46	177	0	0	0	22	0	0	22	$71,111	275
85	471	1,114	1,921	0	0	353	0	0	353	$49,050	140
86	563	1,780	0	0	254	579	1	0	834	$49,050	224
87	274	547	0	0	28	3,589	16	0	3,632	$31,042	215
101	187	355	0	0	0	40	23	0	63	$101,250	432
102	206	588	0	0	0	6	0	0	6	$40,222	488
103	271	728	0	0	41	672	60	250	1,023	$40,222	129
104	38	100	0	0	0	738	8	0	746	$101,250	1,878
105	46	120	0	0	0	0	98	0	98	$101,250	23
106	521	1,421	0	0	35	30	0	0	65	$40,222	105
107	281	813	1,054	0	0	88	0	0	88	$23,000	136

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
108	0	0	0	0	0	27	0	0	27	$35,938	433
109	196	578	0	0	12	10	0	0	22	$33,523	70
110	383	1,048	0	0	32	28	29	3	92	$33,523	298
111	426	1,110	0	0	0	9	0	0	9	$23,429	120
112	223	599	0	0	0	6	0	0	6	$24,954	51
113	305	682	0	0	46	154	2	0	202	$39,213	70
114	140	363	0	0	5	112	0	0	116	$24,954	20
115	245	537	0	0	81	61	3	0	145	$24,954	33
116	499	1,186	530	0	46	785	29	10	871	$53,654	287
117	109	342	0	0	49	266	48	34	397	$53,654	80
118	38	99	0	0	52	151	18	74	295	$36,875	23
119	86	269	984	0	0	82	0	0	82	$53,654	73
120	193	529	0	0	4	104	0	51	159	$36,875	103
121	200	1,641	0	0	0	136	0	0	136	$43,333	171
122	89	457	0	4,836	0	298	0	0	298	$31,875	117
123	209	1,229	253	0	88	22	0	0	110	$31,875	103
124	366	1,332	1,878	0	0	250	0	0	250	$46,125	172
125	0	0	0	0	0	0	0	0	0	$46,125	29
126	625	1,878	0	0	16	11	0	1	29	$46,111	230
127	301	826	756	0	36	67	0	7	109	$29,821	134
128	125	291	0	0	23	12	0	0	34	$41,400	51
129	60	166	0	0	519	342	4	11	876	$41,400	116
130	144	341	0	0	0	387	11	0	398	$39,213	42
131	75	216	0	0	530	30	17	0	578	$24,878	76
132	266	496	0	0	0	84	3	0	88	$24,878	38
133	229	519	0	0	0	5	0	0	5	$0	50
134	101	206	0	0	0	0	0	0	0	$0	37
135	44	107	0	0	11	18	0	0	29	$0	25
136	88	223	0	0	0	0	0	24	24	$24,878	32
137	126	325	0	0	15	0	0	10	25	$31,957	40
138	331	797	0	0	0	11	0	0	11	$31,957	48
139	0	0	0	0	0	0	0	0	0	$31,957	56

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
140	0	0	0	0	0	0	0	0	0	$18,750	72
141	265	784	0	0	0	0	0	0	0	$37,321	53
142	5	16	927	0	0	79	0	0	79	$31,957	222
143	0	0	0	0	24	14	117	3	158	$101,250	454
144	0	0	0	0	0	542	0	0	542	$101,250	85
145	230	600	0	0	0	226	0	0	226	$101,250	40
146	46	127	0	0	15	26	177	7	225	$101,250	47
147	69	212	0	0	0	209	0	0	209	$55,729	18
148	212	680	0	0	0	365	0	0	365	$0	21
149	38	100	0	0	17	168	0	0	185	$101,250	96
150	151	438	287	0	3	568	3	8	581	$77,750	97
151	29	90	635	0	0	55	37	60	152	$18,750	47
152	200	534	571	0	9	69	1	0	78	$18,750	88
153	87	217	0	0	0	10	0	0	10	$31,957	14
154	179	460	0	0	3	0	0	0	3	$18,750	22
155	163	404	0	0	32	969	0	0	1,001	$18,750	38
156	118	282	0	0	0	0	0	0	0	$18,750	12
157	135	222	0	0	0	9	0	0	9	$26,346	35
158	132	263	0	0	0	0	0	0	0	$26,346	27
159	124	308	0	0	5	20	0	0	25	$30,132	35
160	249	612	0	0	0	41	0	0	41	$21,500	52
161	220	599	0	0	0	25	0	0	25	$30,938	38
162	396	931	0	0	3	0	0	0	3	$30,938	62
163	304	1,006	200	0	0	20	0	0	20	$45,764	54
164	176	418	0	0	3	0	0	0	3	$30,132	40
165	162	344	531	0	0	45	10	0	55	$26,346	41
166	75	220	0	0	0	0	9	16	25	$30,461	21
167	70	156	0	0	0	0	0	0	0	$34,911	16
168	106	234	0	0	3	0	0	0	3	$34,911	27
169	303	982	0	0	0	7	0	119	127	$23,125	41
170	623	1,638	0	0	198	434	0	0	632	$19,890	187
171	460	971	0	0	2	0	0	4	5	$23,125	71

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
172	265	667	0	0	8	0	2	26	36	$24,500	49
173	167	371	0	0	0	7	0	0	7	$24,500	28
174	253	635	0	0	21	11	0	10	42	$46,250	39
175	104	317	0	0	221	315	4	38	578	$31,378	117
176	0	0	0	0	3	0	0	0	3	$45,060	81
177	154	330	536	0	56	44	0	0	100	$82,614	36
178	54	141	0	0	0	9	0	0	9	$82,614	18
179	72	141	0	0	0	2	0	0	2	$76,071	19
180	148	346	0	0	0	28	23	0	51	$76,071	35
181	72	191	0	0	0	0	0	0	0	$76,071	19
182	84	176	0	0	0	55	0	0	55	$76,071	21
183	49	228	0	508	60	35	0	0	94	$21,818	23
184	202	712	0	1,406	14	192	0	0	206	$21,818	61
185	97	211	0	0	0	31	0	0	31	$74,792	27
186	120	274	0	0	0	7	0	0	7	$74,792	23
187	203	455	744	0	0	63	0	18	81	$80,431	42
188	103	221	1,046	0	0	88	0	0	88	$80,431	26
189	123	280	0	0	0	4	0	0	4	$82,614	19
190	235	530	0	0	31	30	0	0	61	$82,614	42
191	379	795	0	0	0	8	2	12	22	$45,060	87
192	325	945	0	0	5	28	0	3	36	$31,378	63
193	237	653	0	0	0	27	0	0	27	$20,029	69
194	123	332	0	0	0	52	3	35	90	$20,029	47
195	169	174	0	0	7	5,597	0	0	5,604	$12,917	84
197	176	457	0	0	7	229	12	15	264	$12,917	115
198	451	1,181	0	0	6	188	30	135	358	$35,938	209
199	251	692	0	0	9	203	0	0	212	$36,875	130
200	0	0	0	0	0	0	0	0	0	$80,337	1,454
201	199	408	253	0	0	37	3	8	48	$82,614	37
202	199	411	0	0	3	46	0	0	49	$62,778	56
203	154	317	0	0	0	3	0	0	3	$74,464	34
204	331	746	0	0	0	5	2	0	7	$74,464	66

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
205	193	384	0	0	0	75	0	0	75	$74,792	36
206	164	367	0	0	0	4	0	0	4	$74,792	44
207	251	654	0	0	26	83	43	63	216	$21,818	66
208	578	1,533	0	0	43	85	0	0	128	$18,843	283
209	137	447	0	0	26	468	78	8	580	$31,250	53
210	205	502	0	0	3	62	0	0	65	$42,896	63
211	136	429	0	0	0	3	0	0	3	$82,361	46
212	131	539	0	0	110	28	0	0	139	$82,361	37
213	253	564	647	0	66	69	0	0	135	$62,778	67
214	121	247	0	0	0	0	0	0	0	$62,778	32
215	102	185	0	0	0	396	4	0	400	$62,778	38
216	55	116	735	0	67	159	2	0	228	$62,778	56
217	30	67	0	0	107	1,095	51	0	1,253	$46,654	49
218	1	3	0	0	67	181	0	0	248	$46,654	11
219	33	66	0	0	21	320	1	5	347	$46,654	21
220	0	0	0	0	0	2,567	0	0	2,567	$46,654	31
221	83	179	0	0	0	0	0	14	14	$46,654	23
222	90	125	0	0	23	899	0	0	922	$46,654	36
223	86	181	0	0	0	60	0	0	60	$46,654	32
224	75	144	146	0	21	227	0	0	248	$46,654	39
225	115	261	0	0	8	66	0	0	73	$42,896	66
226	137	410	0	0	0	203	54	0	257	$31,250	50
227	311	922	510	0	0	50	11	0	61	$33,438	148
228	39	868	0	0	9	2,865	0	0	2,874	$42,333	387
229	209	583	0	0	43	33	0	13	88	$27,396	49
230	0	0	0	0	232	663	28	0	922	$77,750	53
231	358	943	0	0	0	627	3	0	630	$54,464	192
232	106	167	0	0	301	254	2	0	556	$54,464	27
233	324	661	752	0	23	238	0	0	261	$71,917	139
234	67	160	0	0	0	0	0	0	0	$77,750	46
235	39	103	0	0	0	0	0	0	0	$77,750	20
236	45	84	20	0	1	438	17	26	482	$77,750	35

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
237	16	35	0	0	13	1,373	6	8	1,400	$77,750	51
238	226	384	0	0	28	70	0	0	98	$27,396	55
239	236	748	0	3,543	0	114	0	10	124	$42,333	132
240	293	1,300	0	0	0	0	0	0	0	$42,333	166
241	23	50	0	0	193	629	26	6	854	$26,250	53
242	11	25	0	0	97	439	0	0	535	$26,250	26
243	126	216	109	0	98	3,510	137	68	3,814	$26,250	162
244	23	50	0	80	584	1,886	10	0	2,480	$26,250	75
245	13	28	0	0	18	82	3	0	104	$26,250	17
246	23	50	0	0	254	361	0	5	621	$26,250	34
247	1	2	0	0	1,534	1,399	17	0	2,949	$44,893	83
248	499	766	0	1,780	2	1,077	9	6	1,095	$31,042	73
249	159	490	0	0	25	571	1	31	628	$44,893	84
250	92	333	0	0	15	452	5	9	481	$44,893	41
251	23	50	0	0	377	1,133	52	21	1,583	$44,893	57
252	23	50	0	0	429	178	3	0	610	$44,893	23
253	139	548	863	296	20	13,817	283	1	14,121	$42,333	4,819
254	557	1,472	0	0	29	63	0	18	111	$26,667	276
255	506	1,638	823	0	8	645	0	5	659	$41,719	119
256	493	1,355	779	0	0	125	0	0	125	$44,250	207
257	654	1,565	0	0	26	100	0	1	128	$47,431	632
258	235	527	0	0	114	605	1	0	720	$31,568	80
259	126	309	0	0	136	241	0	0	377	$21,782	36
260	580	1,330	0	0	0	14	0	0	14	$21,782	66
261	753	1,923	928	0	0	81	0	3	85	$39,545	259
262	420	1,123	17	0	4	2	5	0	10	$33,229	123
263	177	521	0	0	527	675	0	2	1,204	$60,588	162
264	454	1,501	0	0	3	53	6	0	62	$52,917	196
265	741	1,907	0	0	0	474	0	21	494	$36,569	174
266	193	505	0	0	0	29	0	5	34	$38,631	102
267	61	200	0	0	16	337	0	0	352	$45,812	40
268	477	1,297	0	0	12	3	0	0	15	$24,348	54

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
269	221	355	0	0	0	60	0	0	60	$38,631	84
270	0	0	0	603	470	52	0	0	522	$38,631	87
271	185	389	0	0	358	252	0	0	610	$24,348	33
272	89	190	0	0	699	336	11	2	1,048	$38,631	1,469
273	412	2,183	0	0	57	109	0	0	166	$45,812	170
274	0	0	0	9,000	0	247	0	0	247	$45,812	62
275	560	1,603	1,330	0	0	149	17	0	166	$45,812	217
276	239	561	0	0	395	174	0	0	569	$45,812	60
277	755	2,181	0	0	0	16	0	0	16	$66,319	834
278	281	736	0	0	0	24	0	0	24	$70,547	512
279	597	1,471	0	0	0	172	0	5	177	$55,000	266
280	589	1,890	1,090	0	0	95	0	1	96	$50,012	327
281	818	2,276	850	0	266	294	1	13	574	$53,750	290
282	331	674	0	0	3	16	0	3	22	$35,625	137
283	50	98	0	0	0	0	0	0	0	$35,625	268
284	45	111	0	0	0	0	0	0	0	$67,250	176
285	497	1,175	0	0	0	109	0	10	119	$67,250	5,336
286	265	532	0	0	34	1,581	19	52	1,685	$26,250	82
288	20	67	0	0	0	936	0	11	947	$44,893	25
289	7	20	0	0	25	32	0	7	64	$26,667	18
290	79	250	0	0	172	325	14	2	513	$41,719	31
291	135	257	0	0	273	304	0	16	593	$14,940	64
292	746	1,655	0	0	232	523	26	0	781	$30,639	159
293	211	464	0	0	164	495	18	0	677	$33,229	90
294	519	1,133	0	0	0	14	0	0	14	$31,848	51
295	227	667	121	0	209	2,100	0	7	2,316	$49,079	152
296	355	905	0	0	0	17	0	15	33	$70,547	534
297	111	260	845	0	3	75	13	0	92	$35,776	66
298	230	675	0	0	0	24	0	0	24	$66,319	164
300	54	111	0	0	0	0	0	0	0	$0	328
301	43	100	0	0	0	25	13	133	171	$0	935
302	0	0	0	0	0	0	0	0	0	$0	79

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
303	43	100	0	0	0	555	0	0	555	$0	214
305	0	0	0	0	0	0	13	0	13	$0	100
306	0	0	0	1,282	5	43	3	0	51	$4,357	50
307	0	0	0	115	0	39	31	8	78	$4,357	11
308	0	0	0	0	49	207	0	0	257	$51,250	50
309	0	0	0	0	69	403	238	0	711	$51,250	9
310	1	1	0	0	126	1,747	32	0	1,905	$51,250	9
311	0	0	0	0	3	91	0	0	94	$51,250	2
312	13	28	0	0	3	670	0	0	673	$51,250	11
313	19	74	0	0	126	1,160	3	0	1,289	$51,250	11
314	50	84	0	0	165	1,180	55	19	1,420	$51,250	13
315	0	0	0	0	173	2,629	406	19	3,227	$51,250	12
316	9	93	0	0	18	2,466	2	6	2,493	$51,250	13
317	31	58	0	0	116	821	0	0	937	$51,250	10
318	50	79	0	259	0	263	0	10	273	$55,729	11
319	79	109	0	0	0	353	13	5	372	$55,729	12
320	51	75	0	0	0	495	0	3	498	$51,250	11
321	86	137	0	75	5	453	0	15	473	$51,250	13
322	43	75	0	0	190	1,153	23	28	1,393	$51,250	13
323	21	34	0	0	29	1,395	9	0	1,433	$51,250	14
324	24	44	0	0	18	144	6	0	168	$51,250	6
325	0	0	0	0	0	1,257	0	0	1,257	$51,250	6
326	99	446	0	636	16	286	45	5	352	$4,357	41
327	150	1,078	0	0	4	20	0	0	24	$4,357	26
328	1	597	0	1,197	0	101	0	0	101	$13,636	22
329	0	0	0	0	60	82	3	0	145	$51,250	7
331	45	456	0	0	0	46	0	0	46	$51,250	14
332	49	82	0	0	0	71	2	31	104	$51,250	6
333	100	118	124	0	37	687	0	24	747	$55,729	13
334	69	93	0	0	130	256	0	0	386	$55,729	7
335	31	39	43	0	0	9	0	0	9	$55,729	13
336	67	110	0	0	0	8	0	0	9	$55,729	6

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
337	74	219	0	0	2	132	0	87	220	$55,729	12
338	159	301	0	0	0	231	12	0	243	$35,776	12
339	115	212	0	0	0	147	0	0	147	$43,182	12
340	112	169	386	0	0	151	2	0	153	$43,182	14
341	55	96	0	780	0	609	0	0	609	$43,182	7
342	20	44	0	0	12	811	0	0	823	$39,375	8
343	87	205	0	0	7	59	1	0	66	$39,375	14
344	29	54	0	0	1	51	2	0	54	$39,375	5
345	27	60	0	0	21	43	0	0	65	$39,375	7
346	41	193	0	0	0	54	0	0	54	$39,375	6
347	34	75	0	0	0	116	0	4	120	$39,375	7
348	130	246	0	163	21	222	0	0	243	$39,375	15
349	43	82	0	0	28	85	0	0	113	$39,375	8
350	71	108	0	0	0	296	0	2	298	$43,182	7
351	156	276	0	0	0	61	12	0	73	$43,182	14
352	298	383	0	0	0	145	0	0	145	$43,182	12
353	240	465	0	74	0	67	6	0	73	$35,776	19
354	206	492	0	0	0	19	3	0	22	$35,776	15
355	149	334	0	0	13	16	0	0	30	$17,083	16
356	288	495	0	95	0	561	2	8	570	$17,083	19
357	0	0	0	0	0	0	0	0	0	$39,750	34
358	182	331	0	0	4	114	0	5	123	$39,750	18
359	61	109	0	0	5	135	0	0	140	$39,750	9
360	21	46	0	0	21	37	0	0	58	$39,750	9
361	49	117	0	0	0	49	0	0	49	$39,750	7
362	76	135	0	0	9	1	5	0	16	$39,750	6
363	146	285	0	0	0	138	25	0	162	$39,750	15
364	153	395	0	0	0	131	0	0	131	$17,083	16
365	107	317	0	0	220	8	0	1	228	$17,083	13
366	199	499	0	0	0	30	0	0	30	$28,125	22
367	170	423	0	822	13	55	0	0	68	$14,978	21
368	67	141	0	0	0	15	13	0	28	$14,978	7

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
369	59	87	0	0	71	126	0	0	197	$14,978	8
370	32	74	0	0	21	78	0	1	101	$19,917	7
371	227	499	0	396	12	63	0	0	75	$19,917	22
372	23	57	0	0	11	11	0	0	22	$19,917	7
373	39	111	0	0	13	0	0	0	13	$19,917	8
374	206	616	0	0	3	20	0	0	23	$19,917	26
375	14	35	200	0	31	63	0	0	94	$19,917	8
376	32	74	0	0	0	300	0	23	323	$14,978	10
377	36	52	0	0	0	294	0	0	294	$14,978	9
378	241	616	0	0	7	151	0	0	157	$14,978	25
379	94	187	0	0	0	0	0	0	0	$28,125	15
380	79	263	0	0	0	20	0	0	20	$30,461	20
381	223	276	0	906	3	74	0	0	77	$13,525	15
382	28	68	0	0	8	53	0	0	61	$13,525	8
383	23	46	0	2,339	0	394	0	0	394	$13,525	9
384	72	172	0	0	0	161	0	0	161	$26,121	7
385	165	368	0	0	9	30	0	0	40	$26,121	22
386	37	92	0	0	14	0	0	0	14	$26,121	8
387	16	34	0	0	0	0	0	0	0	$26,121	5
388	111	251	200	0	3	106	0	0	109	$26,121	15
389	30	59	0	0	0	27	0	0	27	$26,121	5
390	51	110	0	0	6	53	0	0	59	$13,525	6
391	217	568	0	0	48	59	0	9	116	$46,250	38
392	123	233	0	0	80	85	6	0	171	$13,525	28
393	55	111	0	0	12	129	0	0	142	$13,525	14
394	45	139	0	0	8	109	0	0	116	$13,525	12
395	42	97	0	0	8	162	11	0	180	$26,121	8
396	166	348	0	0	26	11	16	0	54	$26,121	28
397	40	98	0	0	9	0	0	0	9	$26,121	9
401	0	0	0	0	0	0	10	0	10	$0	2,005
402	0	0	0	0	0	0	0	0	0	$0	149
403	0	0	0	0	0	0	166	0	166	$0	64

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
404	0	0	0	0	0	24	334	0	358	$0	210
405	0	0	0	0	0	0	9	0	9	$0	96
406	250	787	0	0	101	596	66	1	765	$23,289	110
407	141	423	0	0	0	97	40	0	138	$23,289	61
408	103	309	0	0	9	0	96	0	105	$23,289	56
409	0	0	0	0	0	88	1,426	4	1,518	$0	84
410	0	0	0	0	0	0	0	0	0	$0	344
411	0	0	0	0	4	0	156	0	160	$0	607
412	0	0	0	0	0	2,656	124	0	2,781	$0	475
413	0	0	0	0	0	947	0	0	947	$44,271	87
414	132	311	0	0	2	11	2	4	18	$44,271	124
415	110	256	0	0	31	49	54	18	151	$36,250	127
416	341	868	0	0	3	145	0	0	148	$36,250	170
417	206	418	0	0	9	202	0	9	220	$0	166
418	137	339	0	0	103	185	282	30	599	$0	155
419	44	127	0	0	9	0	5	0	14	$23,289	32
420	170	512	748	0	0	67	10	0	77	$22,316	69
421	643	1,637	0	0	0	42	7	0	49	$16,397	147
422	262	657	0	0	0	22	41	0	63	$16,397	74
423	29	486	0	0	0	777	57	293	1,127	$4,357	177
424	74	566	0	0	74	127	15	9	224	$13,636	40
425	111	309	905	0	15	79	5	0	99	$13,636	38
426	253	743	0	0	0	183	0	0	183	$11,993	34
427	321	1,097	0	0	0	609	179	0	787	$13,636	97
428	53	149	0	0	0	0	0	0	0	$13,636	35
429	31	105	0	0	0	16	19	41	77	$13,636	64
430	88	236	0	0	5	32	10	10	57	$13,636	38
431	108	281	0	0	3	0	20	0	23	$13,636	84
432	4	7	0	0	3	21	119	0	144	$13,636	108
433	0	0	0	0	11	0	58	29	98	$13,636	65
435	392	1,103	0	0	0	189	428	12	629	$28,684	235
436	258	529	0	0	0	1	0	0	1	$23,235	51

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
437	139	370	0	0	0	0	0	0	0	$23,235	33
438	98	227	0	0	7	0	0	0	7	$23,235	25
439	87	253	0	0	0	19	0	0	19	$11,993	53
440	0	0	952	0	0	326	0	0	326	$11,993	96
441	300	914	0	0	0	28	0	0	28	$11,993	42
442	412	1,105	0	0	3	434	0	0	437	$11,993	59
443	569	1,556	0	0	3	1	3	0	7	$27,963	72
444	375	956	0	0	0	30	0	0	30	$27,000	82
445	1	1	0	508	46	43	0	0	89	$21,818	12
446	287	704	0	0	0	6	0	0	6	$19,432	82
447	215	573	137	0	0	15	0	35	50	$0	59
448	123	438	1,211	0	0	90	6	0	96	$26,953	72
449	0	0	0	0	0	1,133	202	344	1,678	$26,953	95
450	0	0	0	0	0	0	0	0	0	$40,474	57
451	757	1,909	814	0	0	69	0	0	69	$40,474	344
452	1	2	0	0	0	5	0	0	5	$11,993	123
453	50	169	0	0	28	0	0	0	28	$0	89
454	1	2	0	0	0	0	764	106	870	$0	71
455	168	524	0	0	2	44	14	0	59	$0	117
457	13	21	0	0	34	269	270	138	711	$0	105
458	10	33	0	0	18	232	135	0	386	$26,953	41
459	239	915	0	1,317	0	112	0	3	115	$26,953	200
461	90	284	0	0	0	347	9	58	414	$26,953	60
462	260	813	0	0	0	0	0	0	0	$29,435	172
463	284	825	0	0	0	0	0	0	0	$29,435	97
464	267	630	0	0	9	31	4	15	59	$34,267	157
465	295	767	343	0	8	42	8	8	65	$34,267	165
466	17	54	0	0	9	19	4	6	39	$34,267	95
467	246	674	0	0	0	0	0	0	0	$17,652	279
468	701	2,055	0	0	0	43	0	0	43	$40,000	201
469	33	73	0	0	0	0	0	0	0	$40,000	81
470	0	0	0	0	4	108	132	7	251	$40,000	123

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
471	75	197	0	0	0	21	2	0	23	$40,000	171
472	24	56	0	0	0	81	33	76	191	$40,000	144
473	0	0	0	0	0	171	0	8	179	$0	52
474	464	721	0	0	348	3,005	519	215	4,086	$36,630	960
475	0	0	0	0	0	0	1	0	1	$36,630	123
476	24	71	0	0	7	67	228	16	319	$40,000	203
477	0	0	0	0	0	628	150	206	985	$27,518	301
478	0	0	0	0	0	50	50	0	100	$27,518	170
479	6	16	0	0	276	357	584	140	1,356	$27,518	312
480	0	0	0	0	9	69	3	0	81	$27,518	149
481	0	0	0	0	0	3	0	0	3	$41,583	25
482	3	6	0	0	6	17	160	0	183	$41,583	108
483	156	553	0	0	0	146	166	35	347	$41,583	106
484	22	70	0	0	0	60	0	114	174	$41,583	71
485	151	470	641	0	74	134	69	0	276	$41,583	115
487	48	160	0	0	0	0	0	0	0	$41,583	35
489	14	36	0	0	0	83	0	0	83	$41,583	55
491	62	154	0	0	38	20	0	0	58	$34,706	66
492	203	561	0	0	97	285	59	50	491	$34,706	199
493	636	1,604	0	0	138	40	35	24	237	$24,730	211
494	129	314	819	0	0	466	0	0	466	$45,682	86
495	197	460	437	0	8	51	42	0	100	$45,682	80
501	0	0	0	0	0	0	0	0	0	$77,325	2,681
502	0	0	0	0	0	1,712	0	2,263	3,975	$49,931	473
504	0	0	0	0	0	10	7	0	17	$49,931	342
505	230	576	0	0	6	79	19	4	108	$49,931	171
506	43	107	0	0	0	0	602	43	645	$35,944	293
507	188	453	0	0	28	118	1	0	147	$35,944	347
510	236	614	641	0	11	533	75	16	635	$49,931	554
511	0	0	0	0	3	284	74	0	361	$49,931	218
512	24	44	0	0	0	83	0	0	83	$49,931	472
513	142	376	0	0	5	15	18	0	37	$77,325	587

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
514	0	0	0	0	0	0	0	0	0	$77,325	4,179
515	1	1	0	0	0	0	417	1	418	$77,325	4,163
516	0	0	0	0	0	64	200	0	265	$77,325	685
517	42	123	0	0	31	0	1	0	32	$77,325	888
518	0	0	0	0	0	609	26	0	636	$77,325	726
519	0	0	0	0	0	250	34	43	327	$77,325	270
520	0	0	0	0	23	179	167	75	444	$77,325	176
521	0	0	0	0	40	165	301	117	623	$77,325	109
522	202	487	0	0	0	16	0	0	16	$40,840	576
523	165	371	0	0	0	347	56	42	445	$40,840	908
524	806	1,693	978	0	56	705	209	173	1,143	$40,840	327
525	173	359	0	0	0	48	6	0	54	$40,840	67
526	66	122	0	0	82	721	193	103	1,099	$40,840	241
527	55	106	0	0	9	700	60	0	768	$40,840	142
528	234	500	0	0	0	0	2	0	2	$40,840	533
529	0	0	0	0	0	141	29	0	170	$77,325	196
530	0	0	0	0	0	1,823	7,057	10	8,890	$77,325	153
531	0	0	0	0	288	263	4,400	0	4,951	$77,325	2,558
532	0	0	0	0	0	7	0	0	7	$77,325	244
533	0	0	0	0	32	2,125	16	0	2,173	$77,325	642
534	15	32	0	0	116	2,138	52	880	3,187	$77,325	1,603
535	37	80	0	0	158	798	314	145	1,416	$45,363	594
536	26	58	0	0	143	481	12	18	654	$45,363	141
537	0	0	0	0	291	296	1,596	217	2,400	$45,363	326
538	0	0	0	0	0	0	0	0	0	$45,363	355
539	4	10	0	0	0	104	1,076	1	1,181	$45,363	299
540	4	10	0	0	281	487	171	56	995	$63,764	361
541	121	322	0	0	3	115	170	7	295	$63,764	1,013
542	0	0	0	0	10	354	565	0	930	$63,764	1,646
543	18	38	0	0	0	129	216	0	345	$63,764	146
544	193	902	0	0	34	509	134	282	958	$32,219	481
545	45	174	0	0	21	106	7	0	134	$32,219	172

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
546	71	183	0	0	179	241	40	63	523	$27,518	297
547	309	1,050	1,334	0	75	257	76	143	551	$27,518	1,050
548	368	647	0	0	349	4,304	263	410	5,326	$36,630	951
549	266	547	1,094	0	0	109	0	12	121	$36,630	788
550	165	351	0	0	8	180	25	8	221	$36,630	986
551	924	2,371	0	0	0	728	0	76	805	$82,754	1,061
552	15	40	0	0	0	0	0	0	0	$82,754	1,025
553	1,815	5,439	0	0	0	315	0	5	321	$57,731	1,767
554	1,178	3,416	0	0	210	270	7	47	535	$82,754	1,231
555	477	1,516	0	0	0	7	0	1	8	$57,731	308
556	534	1,633	0	0	12	90	0	0	102	$47,132	834
557	58	154	0	0	0	30	0	0	30	$47,132	814
558	788	1,996	144	0	17	827	2	0	846	$47,132	1,188
559	73	228	0	0	0	124	0	0	124	$22,386	201
560	138	382	0	0	20	21	0	13	53	$22,386	173
561	282	760	0	0	37	46	0	35	118	$0	505
562	31	81	0	0	32	8	0	0	39	$40,000	333
563	106	269	381	0	0	35	0	3	38	$40,000	1,190
564	119	300	0	0	29	21	0	8	59	$22,386	797
565	738	1,887	0	0	21	111	4	40	177	$64,135	1,311
566	342	812	0	0	17	56	0	1	75	$64,135	809
567	24	74	0	0	126	116	0	0	241	$23,281	422
568	138	401	0	0	0	20	0	5	25	$56,053	516
569	78	200	0	0	0	21	0	61	82	$40,000	368
570	29	67	0	0	0	0	0	0	0	$40,000	206
571	112	266	0	0	0	12	0	0	12	$17,652	290
572	91	250	0	0	0	0	0	0	0	$45,363	960
573	0	0	0	0	0	0	0	0	0	$77,325	85
574	9	25	0	0	0	0	0	0	0	$64,135	473
601	241	690	818	0	83	121	0	24	228	$77,325	1,867
602	199	460	0	0	115	314	0	0	429	$77,325	363
603	332	835	0	0	0	61	0	0	61	$77,325	519

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
605	933	2,694	0	0	0	45	0	0	45	$77,325	777
606	26	69	0	0	0	0	0	0	0	$77,325	195
607	38	101	0	0	9	45	0	0	54	$77,325	981
608	32	73	0	0	0	13	0	0	13	$77,325	245
609	582	1,814	0	0	0	73	0	0	73	$77,325	618
610	1,813	4,886	1,678	0	0	190	11	69	270	$77,325	2,802
611	545	1,624	0	0	0	0	5	0	5	$77,325	1,045
612	286	767	0	0	0	35	2	42	80	$44,103	1,812
613	491	1,404	0	0	0	0	7	0	7	$77,325	406
614	2,385	6,608	0	0	841	2,770	63	2	3,676	$77,325	1,650
615	101	269	0	0	5	0	0	0	5	$44,103	670
616	450	1,178	0	0	7	25	15	41	87	$44,103	739
617	186	469	0	0	133	574	0	8	715	$48,218	434
618	0	0	0	0	0	0	0	0	0	$53,125	16
619	970	2,069	0	0	337	2,558	105	131	3,130	$77,325	433
620	501	1,207	0	0	14	276	11	0	302	$45,363	395
621	589	1,324	643	0	216	358	2	11	587	$48,218	380
622	377	1,011	0	0	34	341	110	0	485	$63,764	348
623	618	1,592	0	0	294	752	48	50	1,145	$54,476	571
624	186	512	0	0	10	9	0	0	20	$54,476	220
625	333	890	0	0	0	9	0	3	11	$53,125	479
626	493	1,281	468	0	0	121	52	47	220	$53,125	272
627	364	980	0	0	0	41	0	89	131	$44,103	396
628	232	611	0	0	0	0	0	15	15	$44,103	621
629	56	155	0	0	0	0	0	0	0	$53,125	725
630	4	8	0	0	0	0	0	0	0	$53,125	867
631	0	0	0	0	0	0	0	0	0	$53,125	331
632	71	180	0	0	10	0	0	0	10	$53,125	344
633	44	115	0	0	0	0	42	16	58	$53,125	253
634	48	126	0	0	0	0	0	3	3	$53,125	98
635	229	605	0	0	0	0	0	0	0	$53,125	644
636	52	131	0	0	0	0	0	0	0	$53,125	714

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
637	266	714	0	0	0	1	0	1	2	$53,125	524
638	318	833	0	0	0	25	0	0	25	$54,476	468
639	644	1,884	0	0	0	8	0	0	8	$54,476	678
640	578	1,715	2,233	0	5	299	19	3	326	$54,476	775
641	667	1,903	0	0	0	3	5	0	8	$54,476	535
642	652	1,856	0	0	0	17	0	8	26	$63,764	588
643	1,201	3,530	0	0	0	169	1	0	170	$63,764	996
644	1,030	3,125	0	0	0	11	1	40	52	$68,750	834
645	862	2,643	0	0	9	86	2	1	98	$68,750	772
646	241	660	0	0	0	202	0	0	202	$68,750	1,023
648	690	1,675	0	0	14	285	2	0	301	$68,750	1,664
649	49	155	0	0	0	0	0	0	0	$68,750	734
650	119	346	0	0	0	0	0	0	0	$68,750	740
651	110	325	0	0	0	0	0	0	0	$68,750	398
652	11	28	0	0	0	0	0	0	0	$68,750	295
653	140	405	0	0	0	0	0	0	0	$68,750	280
654	160	480	0	0	0	0	0	0	0	$68,750	231
655	53	167	0	0	0	11	0	0	11	$68,750	1,478
656	46	132	0	0	0	0	0	0	0	$68,750	884
657	25	75	1,692	0	0	144	0	0	144	$68,750	628
658	39	108	0	0	0	0	0	0	0	$68,750	1,265
659	147	423	0	0	0	0	0	10	10	$68,750	1,163
660	167	514	0	269	0	160	0	0	160	$65,679	1,837
661	175	523	0	0	0	0	0	0	0	$65,679	1,601
662	163	494	0	0	0	2	0	0	2	$65,679	1,310
663	118	344	0	0	0	0	0	0	0	$65,679	574
664	91	304	0	0	0	18	0	0	18	$65,679	861
665	52	183	0	0	0	0	0	0	0	$65,679	656
666	81	268	0	0	0	0	0	0	0	$65,679	270
667	214	735	0	0	0	0	0	11	11	$65,679	1,286
668	59	192	0	0	0	16	3	1	21	$65,679	1,424
669	32	112	0	0	81	15	0	0	96	$65,679	1,739

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
670	484	1,107	0	0	201	179	0	0	380	$46,517	1,110
671	94	255	1,980	0	41	165	0	13	219	$46,517	326
672	937	2,680	0	0	6	19	28	23	76	$46,517	2,559
673	514	1,565	0	0	25	508	0	0	532	$23,281	920
674	701	1,765	0	0	0	135	0	6	141	$51,263	367
675	1,415	3,769	0	0	129	217	806	20	1,172	$39,434	854
676	496	1,223	0	0	3	72	8	0	84	$49,094	2,638
677	880	2,194	0	0	0	160	1	0	160	$46,310	232
678	1,484	4,082	877	0	9	267	14	6	296	$75,260	657
679	465	1,299	0	0	0	4	49	0	53	$82,000	8,106
680	51	135	0	0	0	0	0	0	0	$44,103	302
681	922	1,933	97	0	0	160	0	4	164	$77,325	341
682	0	0	0	0	1,379	280	0	0	1,659	$77,325	69
683	0	0	0	0	0	0	0	0	0	$77,325	1,631
684	0	0	0	0	0	67	0	0	67	$53,125	94
685	37	113	0	0	0	0	0	1	1	$24,063	666
686	140	409	0	0	0	0	0	18	18	$24,063	6,279
687	274	743	0	0	27	89	0	0	116	$24,063	2,568
688	356	1,012	0	0	7	23	75	3	108	$31,615	3,252
689	544	1,612	0	0	0	20	2	13	35	$31,615	2,775
690	112	317	0	0	0	0	0	14	14	$31,615	1,014
691	105	299	0	0	0	0	0	0	0	$31,615	920
692	165	481	0	0	0	0	0	0	0	$31,615	1,903
693	39	103	0	0	27	3	7	36	73	$31,615	3,105
694	263	736	2,130	0	66	217	1	15	299	$31,615	4,277
695	9	24	0	0	0	0	0	0	0	$24,063	2,315
696	104	297	0	0	0	0	37	1	39	$24,063	5,157
697	395	1,132	0	0	12	91	6	0	109	$24,063	4,225
698	39	102	0	0	12	106	0	6	123	$57,147	987
699	238	669	0	0	19	963	79	0	1,061	$57,147	3,584
700	85	241	0	0	0	6	1	0	7	$57,147	2,163
701	352	1,045	0	0	0	105	0	0	105	$57,147	4,213

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
702	131	382	0	0	0	0	0	4	4	$57,147	4,434
703	124	325	0	0	0	0	0	18	18	$57,147	4,198
704	164	451	0	0	8	11	0	0	19	$35,857	3,932
705	252	714	0	0	0	8	185	10	202	$35,857	2,915
706	463	1,262	739	0	51	104	8	6	168	$35,857	3,265
707	329	963	0	0	8	71	1	35	115	$45,735	3,007
708	92	263	0	0	0	2	0	8	10	$45,735	2,240
709	291	880	1,200	0	0	154	228	18	400	$45,735	1,947
710	91	264	0	0	0	0	0	0	0	$45,735	1,531
711	228	637	0	0	190	0	16	0	206	$45,735	972
712	52	138	0	0	25	0	7	0	31	$45,735	2,186
713	45	108	0	0	0	0	0	0	0	$45,735	782
714	213	609	0	0	193	4	0	0	197	$45,735	3,131
715	129	330	0	0	43	8	0	0	51	$45,735	2,376
716	152	427	0	0	14	71	112	13	209	$35,857	3,846
717	0	0	0	0	0	0	0	0	0	$0	109,387
718	261	757	0	0	0	0	0	0	0	$59,141	1,386
719	105	308	0	0	0	0	0	17	17	$59,141	1,379
720	228	650	0	0	0	0	0	0	0	$59,141	3,505
721	113	312	0	0	0	112	3	0	114	$59,141	289
722	200	612	0	0	0	21	0	10	31	$59,141	339
723	116	324	0	0	27	34	10	0	71	$59,141	471
724	134	355	0	0	2	277	0	64	343	$59,141	480
725	215	615	0	0	0	0	0	0	0	$59,141	2,607
726	35	100	0	0	0	0	0	0	0	$59,141	2,601
727	40	115	0	0	0	0	0	0	0	$59,141	1,551
728	215	615	0	0	238	138	0	0	376	$59,141	2,124
729	1,034	3,214	0	0	9	116	0	6	131	$48,115	380
730	787	2,026	5,896	0	322	3,528	108	183	4,140	$43,438	686
731	402	1,045	0	0	158	319	3	0	479	$43,438	553
732	289	786	236	0	58	317	0	10	386	$43,438	670
733	3	10	0	0	28	190	35	86	339	$86,184	165

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
734	351	1,233	0	0	196	550	44	1	790	$86,184	1,479
735	405	1,374	0	0	16	584	41	13	654	$86,184	1,157
736	24	60	0	0	23	257	0	0	280	$86,184	1,977
737	798	2,397	0	0	0	80	10	11	100	$107,770	1,738
738	193	482	0	0	0	79	2	0	81	$93,347	5,996
739	311	847	1,148	0	2	120	4	3	128	$93,347	6,178
740	393	1,052	0	0	5	470	0	7	483	$93,347	20,563
741	389	1,125	0	0	0	7	0	13	20	$93,347	8,080
742	443	1,211	550	0	0	79	4	21	104	$105,167	2,916
743	915	2,566	0	0	14	240	29	14	296	$105,167	6,929
744	311	899	0	0	0	20	6	0	25	$105,167	2,028
745	835	2,681	0	0	0	54	4	13	71	$105,167	1,786
746	260	750	2,199	0	0	0	0	0	0	$105,167	1,892
747	130	379	0	0	0	0	0	0	0	$105,167	967
748	260	750	0	0	0	0	0	0	0	$66,845	2,203
749	206	591	0	0	0	0	0	0	0	$66,845	2,203
750	286	828	0	0	0	17	3	0	19	$66,845	1,044
751	130	378	0	0	138	147	42	0	326	$66,845	490
752	330	851	0	0	0	14	0	0	14	$66,845	657
753	436	1,249	0	0	14	254	0	34	302	$66,845	369
754	538	1,648	0	0	0	56	0	0	56	$66,845	1,345
771	512	1,561	0	0	20	1,377	9	50	1,456	$56,696	763
772	271	832	0	0	11	17	31	0	58	$56,696	221
773	269	668	0	0	15	213	2	19	248	$49,891	448
774	331	1,208	0	0	0	73	45	20	137	$33,917	1,369
775	226	742	0	0	5	19	0	3	27	$33,917	3,348
776	43	164	0	0	19	32	0	0	50	$33,917	172
777	282	902	0	0	20	17	0	37	74	$63,000	2,840
778	280	851	694	0	0	74	0	5	79	$63,000	3,594
779	317	990	0	0	0	6	18	0	24	$56,696	3,750
780	259	797	22	0	81	46	0	0	127	$56,696	1,514
781	244	789	0	0	0	0	0	0	0	$56,696	1,276

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
782	158	459	0	0	7	482	42	0	531	$68,693	1,217
783	458	1,264	1,497	0	0	164	304	101	568	$68,693	3,106
784	338	1,012	0	0	29	235	0	8	272	$63,000	294
785	277	885	0	0	0	30	0	1	31	$63,000	394
786	424	1,297	0	0	0	0	0	3	3	$63,000	378
787	390	1,270	745	0	5	73	55	4	136	$63,065	504
788	629	1,894	0	0	31	241	3	13	288	$63,065	574
789	394	1,137	0	0	15	155	1	16	187	$63,000	1,036
790	509	1,473	0	0	996	675	7	16	1,695	$39,145	1,690
791	717	1,737	0	0	175	230	0	6	411	$56,719	389
792	133	334	0	0	23	186	0	3	212	$56,719	317
793	932	2,910	0	0	109	358	43	3	513	$78,047	925
794	610	1,907	0	0	116	909	64	10	1,099	$78,047	1,293
795	355	988	780	0	0	77	4	5	86	$39,145	1,093
796	355	928	0	0	2	19	0	0	21	$56,719	1,534
797	71	195	0	0	0	0	0	18	18	$39,145	744
798	208	526	0	0	40	140	0	34	214	$49,891	1,438
799	247	694	0	0	0	2	1	0	3	$61,681	947
800	246	630	2,734	0	0	2,974	0	65	3,039	$61,681	3,787
801	615	2,039	0	0	7	29	0	22	58	$33,917	6,709
802	205	543	0	0	38	49	5	0	93	$51,714	1,903
803	180	495	0	0	0	15	5	0	20	$51,714	1,645
804	149	349	0	0	0	0	9	0	9	$51,714	6,011
805	235	578	0	0	11	0	5	3	19	$51,714	1,078
806	66	171	0	0	0	0	0	0	0	$51,714	303
807	219	668	0	0	15	2	0	236	253	$51,310	2,000
808	216	649	593	0	0	59	1	0	60	$51,310	3,200
809	341	963	0	0	34	5	8	63	110	$51,310	2,332
810	130	392	0	0	0	2	0	0	2	$51,310	1,310
811	254	783	801	0	0	111	1	12	123	$51,310	3,864
812	379	1,089	0	0	12	37	19	3	70	$76,979	2,445
813	182	528	0	0	0	0	0	6	6	$76,979	2,197

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
814	113	316	0	0	0	0	0	0	0	$76,979	602
815	162	517	0	0	0	0	0	0	0	$76,979	1,389
816	30	82	0	0	0	0	0	0	0	$76,979	600
817	680	1,917	0	0	28	29	0	0	56	$61,681	7,090
818	364	963	0	0	0	4	7	0	11	$51,714	1,729
819	625	1,921	0	0	0	106	1	29	136	$61,681	5,078
820	204	598	0	0	0	71	0	1	72	$92,866	2,824
821	296	804	0	0	0	708	36	0	744	$68,693	3,645
822	120	306	0	0	0	0	0	3	3	$49,891	764
823	108	321	0	0	0	6	0	0	6	$92,866	1,205
824	54	150	0	0	0	0	0	0	0	$61,681	616
825	210	593	0	0	0	0	0	3	3	$92,866	1,856
826	158	500	0	0	0	25	0	3	27	$61,681	1,787
827	250	740	0	0	0	4	49	12	66	$92,866	3,734
828	401	1,151	0	0	0	21	35	30	86	$92,866	1,872
829	490	1,476	0	0	0	174	0	3	177	$100,298	4,745
830	468	1,449	829	0	11	346	6	0	363	$100,298	1,468
831	351	1,088	0	0	3	16	0	0	19	$56,964	1,427
832	276	832	0	0	0	3	0	0	3	$56,964	821
833	346	1,108	0	0	0	19	2	1	22	$56,964	1,367
834	225	707	0	0	3	0	0	24	27	$71,693	2,726
835	221	701	0	0	0	7	2	0	9	$71,693	2,637
836	201	672	2,623	0	0	233	0	0	233	$71,693	1,214
837	392	1,341	0	0	3	48	1	0	52	$71,693	2,341
838	259	821	0	0	0	32	0	23	55	$71,693	3,166
839	159	487	0	0	130	229	19	73	451	$78,047	1,555
840	123	366	0	0	0	39	0	60	99	$78,047	3,739
841	9	24	0	0	0	0	0	5	5	$78,047	11,063
842	4	14	0	0	0	55	1,086	0	1,140	$78,047	2,717
843	131	398	0	0	0	2	0	0	2	$78,047	451
844	251	768	0	0	6	0	1	5	12	$63,000	677
845	40	86	0	0	0	0	0	0	0	$68,693	257

Traffic Analysis Zones	Household	Population	Enrollment		Employment					Income	Acres
			School	College	Retail	Service	MTCUW	AMC	Total		
846	324	892	0	0	17	127	1,262	1	1,408	$68,693	3,301
847	211	584	0	0	0	0	0	4	4	$68,693	651
848	306	837	0	0	3	7	1	3	14	$68,693	1,912
849	12	33	0	0	0	0	0	0	0	$56,696	566
850	75	209	0	0	0	0	0	0	0	$56,696	4,769
851	61	191	0	0	0	0	2	0	2	$56,696	847
852	174	525	0	0	9	8	22	0	40	$63,000	12,265
853	102	274	0	0	0	15	0	0	15	$63,000	3,093
854	161	477	0	0	0	0	0	0	0	$63,000	3,050
855	139	433	0	0	0	11	0	0	11	$63,000	3,023
856	266	769	0	0	0	21	0	6	26	$71,827	7,601
857	107	319	0	0	5	0	0	0	5	$71,827	2,275
858	64	172	0	0	0	0	0	8	8	$60,915	5,527
859	84	222	0	0	0	0	0	21	21	$60,536	5,793
860	125	323	0	0	0	0	0	0	0	$60,536	8,339
861	79	190	0	0	0	0	0	0	0	$60,536	4,968
862	55	143	0	0	0	0	0	33	33	$60,536	3,297
863	19	45	0	0	0	0	0	0	0	$60,915	1,105
864	171	451	0	0	0	57	0	15	72	$60,915	9,596
865	105	293	0	0	0	17	0	48	65	$60,915	3,046
866	169	456	0	0	0	5	8	4	17	$60,915	3,817
867	301	935	0	0	0	0	0	3	3	$59,100	11,121
868	498	1,587	755	0	39	90	0	0	129	$59,100	5,206
869	24	84	0	0	0	0	0	0	0	$60,915	1,289
870	183	491	0	0	0	0	0	0	0	$60,915	7,457
871	9	20	0	0	0	0	0	0	0	$60,536	6,514
872	53	138	0	0	0	0	0	0	0	$60,536	8,431
873	306	886	0	0	0	34	0	0	34	$60,915	14,157
874	129	367	0	0	0	0	0	0	0	$60,536	11,201
875	50	128	0	0	0	0	0	0	0	$60,536	1,576

A-2: 2015 AND 2045 SOCIOECONOMIC DATA REVIEW MEMO

A-2-1: 2015 Socioeconomic Data Review Memo

Date

04/04/2018

To

Coastal Region Metropolitan Planning Organization (CORE MPO)

From

Habte Kassa, GDOT

MEMORANDUM

CC

Jing Xu, AICP, HNTB
Chandra Khare, HNTB

Subject

Review of CORE MPO
2015 Socioeconomic Data

This memo summarizes HNTB's review, on behalf of the Georgia Department of Transportation (GDOT), of the 2015 travel demand model socio-economic (SE) data prepared by the Metropolitan Planning Organization (MPO) for the Coastal Region Metropolitan Planning Organization (CORE MPO) Long Range Transportation Plan (LRTP).

The following section includes reviews and observations of the CORE MPO SE data for the 2015 base year that will be used as input into the travel demand model (TDM). The SE data was reviewed at two geographic levels: the aggregated TDM region including the entirety of Bryan, Chatham and Effingham counties and individual traffic analysis zones (TAZs).

The **regional level** included a summary overview of:

1. 2015 Total Population;
2. 2015 Total Households;
3. 2015 Total Employees and Employees by Category;
4. 2015 Total Students; and
5. Density Ratios.

The **individual TAZ-level** review included a reasonableness check on:

1. TAZs with No 2015 SE data;
2. 2015 Persons per Household Ratio;
3. 2015 Household Density;
4. 2015 Population Density;

5. 2015 Student to Service Employment Ratio;
6. 2015 Employment Relative to Acres; and
7. 2015 School Enrollment.

Absent local development knowledge, the review was based on the existing 2015 SE data provided, *Georgia MPO Travel Demand Models Socio-Economic Data Development Guides*. This document offers the observed facts that need attention and confirmation.

REGIONAL LEVEL SE DATA REVIEW

Table 1 provides a summary of the SE data in the TDM area for 2015 for each county (Bryan, Chatham and Effingham) and by the overall TDM area.

TABLE 1: TDM AREA SE DATA SUMMARY

Area	SE Variable	2015
Bryan County	Population	32,985
	Households	11,423
	Employment (Total)	7,119
	Service	4,603
	Retail	1,106
	Agriculture & Construction	533
	Manufacturing	877
	Student	16,481
Chatham County	Population	273,795
	Households	104,907
	Employment (Total)	130,385
	Service	79,594
	Retail	15,263
	Agriculture & Construction	5,855
	Manufacturing	29,673
	Student	81,981
Effingham County	Population	54,291
	Households	18,423
	Employment (Total)	7,785
	Service	4,520
	Retail	783

	Agriculture & Construction	622
	Manufacturing	1,860
	Student	8,277
TDM Area	Population	361,071
	Households	134,753
	Employment (Total)	145,289
	Service	88,717
	Retail	17,152
	Agriculture & Construction	7,010
	Manufacturing	32,410
	Student	106,739

Table 2 represents some commonly used ratios to check the SE data. At the regional level, the persons per household ratio, population density, household density, and employees per household ratio in 2015 appear to be within reasonable ranges compared to GDOT's recommended ranges. The school enrollment to total population ratio (30%) appears to be slightly higher than the recommended range, therefore need to be rechecked.

TABLE 2: COMMONLY USED RATIOS OF DENSITY

Ratio	2015	GDOT's Recommended Range
Persons per Household	2.68	2-3
Population per Acre	0.36	< 10
Household per Acre	0.13	< 6
Employees per Household	1.08	1-3
Proportion of Population Enrolled in Schools	0.30	Around 0.20 (i.e. 20%)

TRAFFIC ANALYSIS ZONE (TAZ) LEVEL SE DATA REVIEW

A TAZ-level review was conducted following *GDOT's Socio-Economic Data Development Guides* to ensure the future SE data values are consistent with what is deemed as reasonable.

1. TAZs with No SE Data

All TAZs have 2015 SE data recorded. There are 35 TAZs with zero total population, households, and employment; 82 TAZs with zero total population and households; and 80 TAZs with population and households but no employment. It is recommended the MPO verify these TAZs to be within the National Refugee Area or other vacant land. These TAZs are also highlighted in the SE data spreadsheet sent by the MPO.

TABLE 3: TAZS WITH NO 2015 SE DATA

Zero Value Field	TAZ ID
Population, Households, and Employment	7, 8, 9, 31, 32, 51, 73, 75, 76, 77, 125, 139, 140, 200, 302, 357, 402, 410, 450, 478, 502, 514, 538, 573, 574, 631, 651, 684, 717, 725, 726, 727, 746, 748
Population and Households Only	52, 54, 55, 56, 57, 104, 105, 108, 143, 144, 145, 146, 149, 176, 220, 230, 237, 241, 242, 244, 246, 251, 252, 267, 270, 274, 289, 301, 303, 305, 306, 307, 308, 309, 311, 315, 325, 329, 375, 401, 403, 404, 405, 409, 411, 412, 413, 427, 433, 439, 440, 449, 470, 473, 475, 477, 480, 481, 484, 501, 504, 511, 516, 518, 519, 520, 521, 528, 529, 530, 531, 532, 533, 537, 539, 540, 542, 572, 657, 682, 728, 733
Employment Only	27, 38, 48, 66, 72, 74, 134, 141, 153, 156, 158, 163, 167, 181, 214, 234, 235, 240, 283, 284, 300, 379, 387, 428, 437, 462, 463, 467, 469, 487, 552, 570, 605, 606, 618, 629, 630, 635, 636, 638, 649, 650, 652, 653, 654, 656, 658, 661, 663, 665, 666, 680, 691, 692, 695, 710, 713, 718, 720, 747, 749, 781, 806, 814, 815, 816, 842, 845, 849, 850, 854, 860, 861, 863, 869, 870, 871, 872, 874, 875

2. Persons per Household Ratios

According to *GDOT's Socio-Economic Data Development Guides* the ratio of persons per household should range between 1 and 7. Values exceeding 7 should correspond to some form of group housing within the TAZ. 10 TAZs (represented in Table 4) has a ratio of persons per household higher than 7 in 2015 and needs to be verified by the MPO.

TABLE 4: TAZS WITH 2015 PERSONS PER HOUSEHOLD > 7

TAZ ID	Person per HH 2015
121	9.74
183	9.14
228	680.00
316	26.33
327	7.19
328	597.00
331	356.00
346	9.20

TAZ ID	Person per HH 2015
423	19.82
424	316.00

3. Household Density

According to *GDOT's Socio-Economic Data Development Guide,* the number of households per acre in most TAZs should be less than 6. A value of 6 typically corresponds to a three-story multifamily building. Values exceeding 6 should accordingly correspond to larger or denser multifamily housing. Table 5 lists 42 TAZs with households per acre greater than 6. It is recommended the MPO staff verify the housing type in these TAZs.

TABLE 5: TAZS WITH HOUSEHOLDS PER ACRE GREATER THAN 6.00

TAZ ID	Household per Acre (2015)	TAZ ID	Household per Acre (2015)
148	7.90	352	24.17
169	6.39	353	10.95
174	6.10	354	11.60
189	6.21	355	8.44
248	6.68	356	14.42
260	7.59	358	10.11
268	8.24	362	10.67
294	10.04	363	9.40
321	6.15	364	8.69
332	7.17	365	7.15
333	7.23	366	7.95
334	8.29	367	7.90
336	7.50	368	9.00
338	10.58	371	9.68
339	8.92	374	7.38
340	7.43	378	9.96
341	6.71	381	14.07
343	6.21	384	8.14

TAZ ID	Household per Acre (2015)
348	8.67
350	9.00
351	10.57

TAZ ID	Household per Acre (2015)
385	6.95
388	6.60
443	6.50

4. Population Density

According to *GDOT's Socio-Economic Data Development Guide,* the ratio of population to acres usually do not exceed 10. TAZs with population per acre higher than 10 are generally identified as multifamily or group housing land use. Figure 1 shows 2015 population density and the higher densities (colored in brown) are found in the Chatham county which needs to be reviewed.

FIGURE 1: 2015 POPULATION DENSITY (PERSON/ACRE)

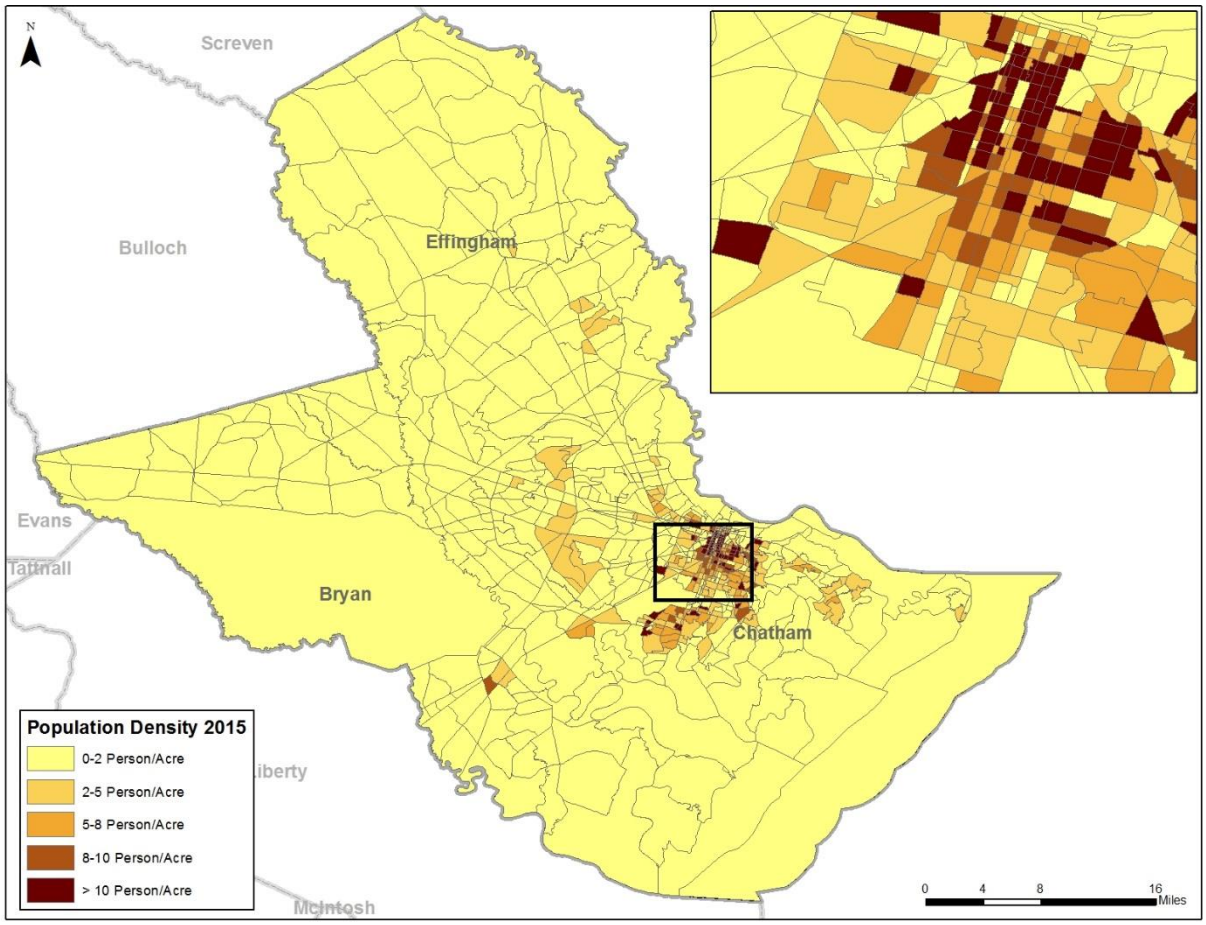


Table 6 lists 83 TAZs with 2015 population per acre greater than 10. It is recommended these TAZs are reviewed and confirmed by the MPO staff to be all TAZs with significant group housing or dense mobile homes.

TABLE 6: TAZS WITH 2015 POPULATION PER ACRE GREATER THAN 10.00

TAZ ID	Population per Acre (2015)	TAZ ID	Population per Acre (2015)
43	15.21	341	12.00
106	12.10	343	14.64
112	10.18	344	10.80
114	15.25	346	23.00
115	11.73	347	10.71
123	11.45	348	16.40
132	10.42	349	10.25
138	13.69	350	13.71
141	12.15	351	18.79
148	27.00	352	30.83
154	14.09	353	20.53
156	11.00	354	27.80
160	11.00	355	18.94
161	13.13	356	24.42
162	12.60	358	18.39
163	17.52	361	13.14
169	21.51	362	18.33
171	12.07	363	18.33
172	11.57	364	22.75
173	11.82	365	22.00
174	15.26	366	20.41
187	10.12	367	19.67
189	14.21	368	18.71
190	11.19	371	21.09

TAZ ID	Population per Acre (2015)
192	14.13
229	11.80
248	10.15
255	13.68
260	17.42
265	10.80
268	22.54
273	10.19
294	21.82
327	41.46
328	27.14
331	25.43
332	11.33
336	10.00
337	16.17
338	18.83
339	16.67
340	11.14

TAZ ID	Population per Acre (2015)
374	22.35
378	24.24
380	12.35
381	16.73
384	20.29
385	15.59
388	15.07
390	13.33
391	13.89
396	11.54
421	10.46
426	12.94
436	10.06
441	15.81
442	14.49
443	17.86
468	10.05

5. 2015 Available Employment Acres

According to *GDOT's Socio-Economic Data Development Guide,* available land should be reviewed to confirm sufficient land capacity accommodates future development allocation. The acres available and the acres needed for employment are calculated using the following equations:

*Acres Available for Employment = [# acres – (# households / 4)] * 0.25*

*Acres Needed for Employment = (0.00573921028 acres / employee) * (# employees)*

The acres needed for employment should be less than or equal to the acres available for employment. If this is not the case, then there may be certain TAZs that support multi-story office buildings and high-density housing. If the value of acres available for employment is negative, this may be explained by denser housing (greater than 4 households per acre) or multi-family housing throughout the area.

There are 110 TAZs, listed in Table 7, that have negative acres available for employment or fewer acres available than needed. It is recommended the MPO staff verify if these are TAZs with dense housing or multi-story office buildings.

TABLE 7: TAZS WHERE ACRES NEEDED FOR EMPLOYMENT ARE MORE THAN ACRES AVAILABLE

TAZ ID	Acres Available for employment	Acres Needed for employment
106	-2.94	0.19
114	-2.31	0.21
115	-3.38	0.57
132	-4.56	0.16
138	-5.38	0.03
148	-5.13	0.71
153	-0.06	0.00
154	-1.69	0.01
156	-0.38	0.00
160	-1.63	0.16
161	-1.69	0.09
162	-5.38	0.01
163	-4.13	0.00
169	-6.13	0.57
171	-8.13	0.02
172	-1.75	0.20
173	-2.44	0.02
174	-5.13	0.18
186	-0.06	0.03
187	-1.31	0.53
189	-2.63	0.01
190	-2.31	0.21
192	-3.31	0.14
195	10.44	25.94

TAZ ID	Acres Available for employment	Acres Needed for employment
327	-2.88	0.11
332	-1.19	0.31
333	-2.63	3.24
334	-1.88	1.23
336	-1.31	0.03
337	-0.94	0.84
338	-4.94	0.36
339	-3.69	0.44
340	-3.00	0.52
341	-1.19	2.79
342	0.75	2.27
343	-1.94	0.21
344	-0.56	0.29
347	-0.38	0.28
348	-4.38	1.11
349	-0.69	0.44
350	-2.19	0.52
351	-5.75	0.28
352	-15.13	0.42
353	-8.25	0.18
354	-7.13	0.08
355	-4.44	0.13
356	-12.38	1.62
358	-6.88	0.30

TAZ ID	Acres Available for employment	Acres Needed for employment
201	-1.31	0.42
204	-1.31	0.01
205	-0.19	0.13
220	7.75	10.34
229	-0.69	0.29
232	1.13	2.55
238	-0.25	0.46
248	-12.25	3.36
255	-1.63	1.58
260	-14.81	0.06
265	-2.13	0.72
268	-14.31	0.06
271	-1.31	2.51
286	4.63	5.74
292	-4.50	3.50
294	-19.25	0.02
309	2.25	2.31
310	2.19	6.48
313	1.94	4.37
314	0.50	6.12
315	3.00	16.06
316	3.06	6.36
317	0.94	2.21
318	0.00	1.20
319	-1.25	1.14
320	-0.06	1.08
321	-1.75	1.39

TAZ ID	Acres Available for employment	Acres Needed for employment
359	-0.81	0.24
361	-0.56	0.21
362	-2.50	0.07
363	-5.06	0.49
364	-4.69	0.55
365	-2.56	0.98
366	-5.44	0.12
367	-5.13	0.82
368	-2.19	0.13
369	-0.81	0.77
371	-7.81	0.52
374	-5.50	0.10
378	-9.31	0.67
379	-0.75	0.00
381	-9.44	0.90
383	0.81	1.23
384	-1.81	0.41
385	-4.06	0.15
388	-2.44	1.87
390	-0.75	0.11
391	-3.13	0.52
392	0.06	0.57
395	0.31	0.55
396	-2.63	0.20
421	-1.63	0.10
426	-0.69	0.68
436	-3.00	0.01

TAZ ID	Acres Available for employment	Acres Needed for employment
322	0.94	3.92
323	2.56	3.37
324	0.38	0.61
325	1.50	2.37

TAZ ID	Acres Available for employment	Acres Needed for employment
441	-2.81	1.31
442	-5.56	0.52
443	-11.25	0.05
530	38.25	38.45

6. Students to Service Employment Ratios

In TAZs that contain schools, there is typically one service employee to every 12 students. If the ratio is significantly higher than 12, those TAZs should be confirmed that unique or atypical schools exist or are planned. Table 8 represents the 35 TAZs which the MPO staff needs to check.

TABLE 8: TAZS WITH STUDENTS TO SERVICE RATIO HIGHER THAN 12.00

TAZ ID	Students to service 2015
82	66.00
123	19.09
177	223.00
262	14.00
270	20.78
366	36.43
370	14.15
380	52.69
382	145.07
432	114.50
452	81.00
480	47.65
539	88.22
541	45.24

TAZ ID	Students to service 2015
627	36.38
644	42.00
677	15.79
683	78.48
697	20.83
700	319.00
705	380.00
714	187.00
775	17.21
785	111.40
796	45.86
809	13.80
823	255.00
827	184.00

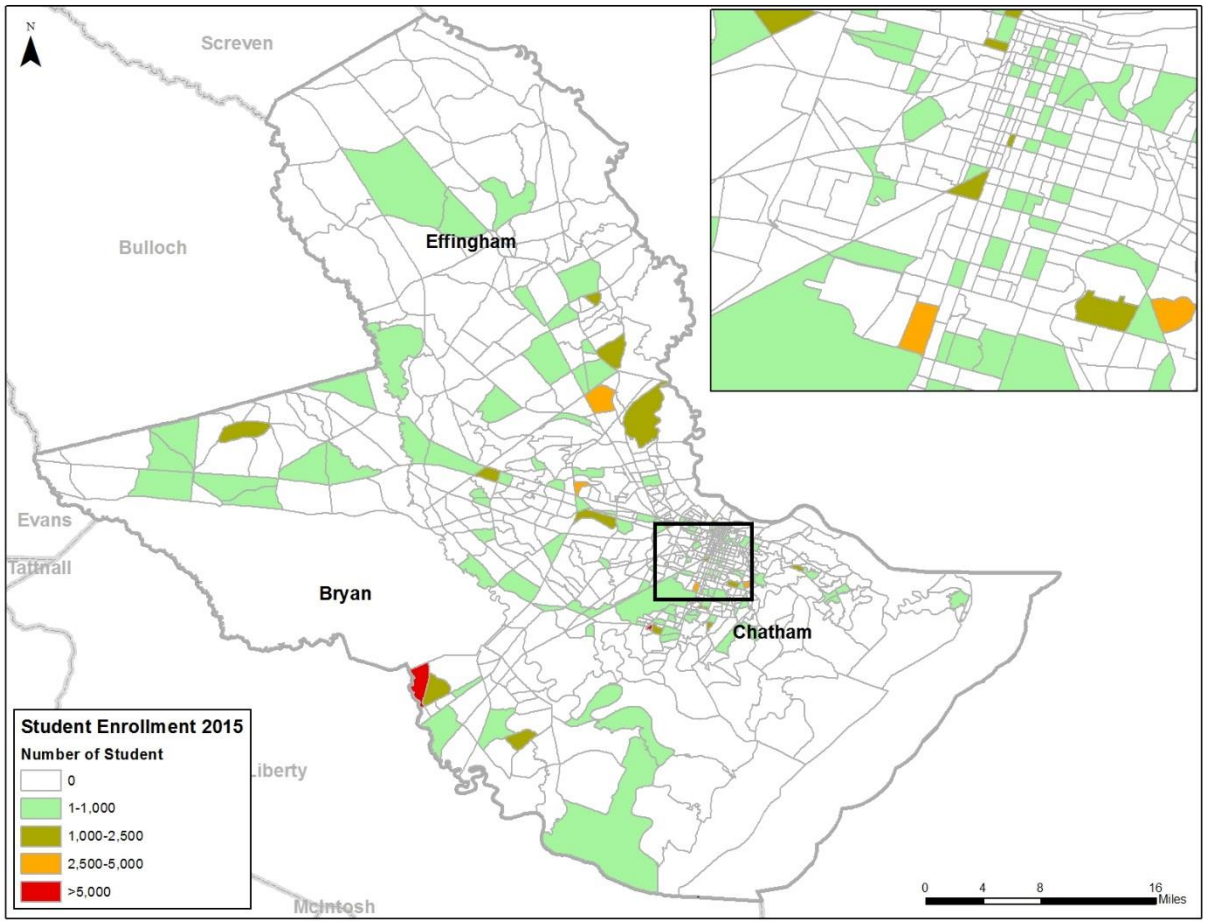
TAZ ID	Students to service 2015
559	18.51
568	86.67
569	58.50
609	18.13

TAZ ID	Students to service 2015
837	46.83
839	24.45
873	61.30

7. School Enrollment

Overall, the ratio of non-college school enrollment to total population is 30% which is slightly higher than the recommended range of 20%. Figure 1 illustrates all the school locations with number of school enrollment. The school locations shown in the map need to be verified by MPO staff.

FIGURE 2: 2015 SCHOOL LOCATIONS



CONCLUSIONS

It is recommended that MPO staff review and confirm the following items. A spreadsheet including the following review TAZs highlighted is attached to this document as well:

- Check the population, household, and employment values for TAZs 7, 8, 9, 31, 32, 51, 73, 75, 76, 77, 125, 139, 140, 200, 302, 357, 402, 410, 450, 478, 502, 514, 538, 573, 574, 631, 651, 684, 717, 725, 726, 727, 746 and 748. These TAZs have zero values for population, household, and employment.
- Check the population and household value for TAZs 52, 54, 55, 56, 57, 104, 105, 108, 143, 144, 145, 146, 149, 176, 220, 230, 237, 241, 242, 244, 246, 251, 252, 267, 270, 274, 289, 301, 303, 305, 306, 307, 308, 309, 311, 315, 325, 329, 375, 401, 403, 404, 405, 409, 411, 412, 413, 427, 433, 439, 440, 449, 470, 473, 475, 477, 480, 481, 484, 501, 504, 511, 516, 518, 519, 520, 521, 528, 529, 530, 531, 532, 533, 537, 539, 540, 542, 572, 657, 682, 728 and 733. These TAZs have zero total population and households.
- Check the employment value for TAZs 27, 38, 48, 66, 72, 74, 134, 141, 153, 156, 158, 163, 167, 181, 214, 234, 235, 240, 283, 284, 300, 379, 387, 428, 437, 462, 463, 467, 469, 487, 552, 570, 605, 606, 618, 629, 630, 635, 636, 638, 649, 650, 652, 653, 654, 656, 658, 661, 663, 665, 666, 680, 691, 692, 695, 710, 713,

718, 720, 747, 749, 781, 806, 814, 815, 816, 842, 845, 849, 850, 854, 860, 861, 863, 869, 870, 871, 872, 874 and 875. These TAZs have zero employment.

- Check the population and household value, and the housing types, of TAZs 121, 183, 228, 316, 327, 328, 331, 346, 423, 424. These TAZs have a population to household ratio greater than 7, which should correspond to some form of group housing within the TAZ.
- Check the housing types for TAZs 148, 169, 174, 189, 248, 260, 268, 294, 321, 332, 333, 334, 336, 338, 339, 340, 341, 343, 348, 350, 351, 352, 353, 354, 355, 356, 358, 362, 363, 364, 365, 366, 367, 368, 371, 374, 378, 381, 384, 385, 388 and 443. These TAZs have households per acre greater than 6, which indicates multi-family or group housing land use in the TAZ.
- Check the housing types for TAZs 43, 106, 112, 114, 115, 123, 132, 138, 141, 148, 154, 156, 160, 161, 162, 163, 169, 171, 172, 173, 174, 187, 189, 190, 192, 229, 248, 255, 260, 265, 268, 273, 294, 327, 328, 331, 332, 336, 337, 338, 339, 340, 341, 343, 344, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 358, 361, 362, 363, 364, 365, 366, 367, 368, 371, 374, 378, 380, 381, 384, 385, 388, 390, 391, 396, 421, 426, 436, 441, 442, 443 and 468. These TAZs have population per acre greater than 10, which indicates multi-family or group housing land use in the TAZ.
- Check if TAZs 106, 114, 115, 132, 138, 148, 153, 154, 156, 160, 161, 162, 163, 169, 171, 172, 173, 174, 186, 187, 189, 190, 192, 195, 201, 204, 205, 220, 229, 232, 238, 248, 255, 260, 265, 268, 271, 286, 292, 294, 309, 310, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 327, 332, 333, 334, 336, 337, 338, 339, 340, 341, 342, 343, 344, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 358, 359, 361, 362, 363, 364, 365, 366, 367, 368, 369, 371, 374, 378, 379, 381, 383, 384, 385, 388, 390, 391, 392, 395, 396, 421, 426, 436, 441, 442, 443 and 530 have dense housing or multi-story office buildings, since they have acres available for employment less than acres needed for employment.
- Check that adequate service employment is allocated to TAZs 82, 123, 177, 262, 270, 366, 370, 380, 382, 432, 452, 480, 539, 541, 559, 568, 569, 609, 627, 644, 677, 683, 697, 700, 705, 714, 775, 785, 796, 809, 823, 827, 837, 839 and 873. These TAZs have a ratio of number of students to service employees higher than 12.
- Check school enrollments. The proportion of population enrolled in schools in the model region is higher than the recommended range.

A-2-2: 2045 Socioeconomic Data Review Memo

Georgia Department of Transportation
Office of Planning

Date

04/04/2018

To

Coastal Region Metropolitan Planning Organization (CORE MPO)

From

Habte Kassa, GDOT

MEMORANDUM

CC

Jing Xu, AICP, HNTB
Chandra Khare, HNTB

Subject

Review of CORE MPO
2045 Socioeconomic Data

This memo summarizes HNTB's review, on behalf of the Georgia Department of Transportation (GDOT), of the 2045 travel demand model socio-economic (SE) data prepared by the Metropolitan Planning Organization (MPO) for the Coastal Region Metropolitan Planning Organization (CORE MPO) Long Range Transportation Plan (LRTP).

The following section includes reviews and observations of the CORE MPO SE data for the 2045 forecast year that will be used as input into the travel demand model (TDM). The SE data was reviewed at two geographic levels: the aggregated TDM region including the entirety of Bryan, Chatham and Effingham counties and individual traffic analysis zones (TAZs).

The **regional level** included a summary overview of:

6. 2045 Total Population and Growth Rate from 2015 to 2045;
7. 2045 Total Households and Growth Rate from 2015 to 2045;
8. 2045 Total Employment and employment by Category and Growth Rates from 2015 to 2045;
9. 2045 Total Students and Growth Rate from 2015 to 2045; and
10. 2045 Density Ratios.

The **individual TAZ-level** review included a reasonableness check on:

8. TAZs with No 2045 SE data;
9. Growth Rates between 2015 and 2045 SE data;
10. 2045 Persons per Household Ratios;
11. 2045 Household Density;
12. 2045 Population Density;
13. 2045 Available Employment Acres;

14. 2045 Student to Service Employment Ratios; and
15. 2045 Student Enrollment.

Absent local development knowledge, the review was based on the 2045 SE data provided, *Georgia MPO Travel Demand Models Socio-Economic Data Development Guides*. This document offers the observed facts that need attention and confirmation. The observations do not necessarily suggest any revisions assuming the SE data reasonably reflects the region's approved development plans.

REGIONAL LEVEL SE DATA REVIEW

Table 1 provides a summary of the SE data in the TDM area for 2015 and 2045 and shows the growth in absolute and percentage terms for each county and by the overall TDM area. The average annual growth rate between 2015 and 2045 for population is 0.88% for the entire TDM area. The average annual growth rate for households is 0.85% and 0.6% for employment. Among the four categories of employment, the Manufacturing has the highest average annual growth rate (0.7%). The retail, and Agriculture and Construction have similar growth rates, 0.63% and 0.61% respectively. The average annual growth rate of the service employment is the lowest (0.56%) among the four categories for the entire TDM area. The average annual growth rate of student is 0.22%.

Bryan county has higher annual average growth rate for population (1.55%), household (1.55%) and the total employment (0.92%). But the student number is reduced in year 2045 which needs to be checked. Chatham county has highest number of population, household and employment, and the average annual growth rates are close to the growth rates for the entire TDM area. The average annual growth rates are 0.74%, 0.72%, 0.57% and 0.23% for population, household, total employment and student respectively. Effingham county has higher growth rate than the average growth rate for the TDM area for population (1.13%), household (1.12%) and employment (0.79%). The student growth is much higher for this county, 1.27%.

TABLE 1: TDM AREA SE DATA SUMMARY

Area	SE Variable	2015	2045	Absolute Growth	Growth Rate (2015 – 2045)	Average Annual Growth Rate (2015 - 2045)
Bryan County	Population	32,985	52,283	19,298	59%	1.55%
	Households	11,423	18,134	6,711	59%	1.55%
	Employment (Total)	7,119	9,384	2,265	32%	0.92%
	Service	4,603	5,861	1,258	27%	0.81%
	Retail	1,106	1,566	460	42%	1.17%
	Agriculture & Construction	533	700	167	31%	0.91%
	Manufacturing	877	1,258	381	43%	1.21%
	Student	16,481	14,097	-2,384	-14%	-0.52%
Chatham County	Population	273,795	341,420	67,625	25%	0.74%
	Households	104,907	129,942	25,035	24%	0.72%
	Employment (Total)	130,385	154,629	24,244	19%	0.57%

Area	SE Variable	2015	2045	Absolute Growth	Growth Rate (2015 – 2045)	Average Annual Growth Rate (2015 - 2045)
	Service	79,594	93,371	13,777	17%	0.53%
	Retail	15,263	18,211	2,948	19%	0.59%
	Agriculture & Construction	5,855	6,880	1,025	18%	0.54%
	Manufacturing	29,673	36,167	6,494	22%	0.66%
	Student	81,981	87,807	5,826	7%	0.23%
Effingham County	Population	54,291	75,982	21,691	40%	1.13%
	Households	18,423	25,739	7,316	40%	1.12%
	Employment (Total)	7,785	9,859	2,074	27%	0.79%
	Service	4,520	5,512	992	22%	0.66%
	Retail	783	945	162	21%	0.63%
	Agriculture & Construction	622	841	219	35%	1.01%
	Manufacturing	1,860	2,560	700	38%	1.07%
	Student	8,277	12,072	3,795	46%	1.27%
TDM Area	Population	361,071	469,685	108,614	30%	0.88%
	Households	134,753	173,815	39,062	29%	0.85%
	Employment (Total)	145,289	173,872	28,583	20%	0.60%
	Service	88,717	104,743	16,026	18%	0.56%
	Retail	17,152	20,722	3,570	21%	0.63%
	Agriculture & Construction	7,010	8,422	1,412	20%	0.61%
	Manufacturing	32,410	39,985	7,575	23%	0.70%
	Student	106,739	113,976	7,237	7%	0.22%

Table 2 represents some commonly used ratios to check the SE data. The average household size increased slightly from 2015 to 2045, which is in-line with GDOT's *Socio-Economic Data Development Guide*. The availability of jobs per person decreased marginally with the ratio of population to employment increasing from 2.49 in 2015 to 2.70 in 2045. The employees per household decreased from 1.08 in 2010 to 1.00 in 2045. The proportion of school enrollment decreased from 30% in 2015 to 24% in 2045. At the regional level, the persons per household ratio, population density, household density, and employees per household ratio in 2045 appear to be within reasonable ranges compared to GDOT. The school enrollment to total population ratio is 24%, which is also within the recommended range.

TABLE 2: COMMONLY USED RATIOS OF DENSITY

Ratio	2015	2045	Change (2015 - 2045)	GDOT's Recommended Range
Persons per Household	2.68	2.70	0.02	2-3
Population to Employment	2.49	2.70	0.22	Generally stay constant
Population per Acre	0.36	0.47	0.11	< 10
Household per Acre	0.13	0.17	0.04	< 6
Employees per Household	1.08	1.00	-0.08	1-3
Proportion of Population Enrolled in Schools	0.30	0.24	-0.05	Around 0.20 (i.e. 20%)

TRAFFIC ANALYSIS ZONE (TAZ) LEVEL SE DATA REVIEW

A TAZ-level review was conducted following *GDOT's Socio-Economic Data Development Guides* to ensure the future SE data values are consistent with what is deemed as reasonable.

1. TAZs with No SE Data

All TAZs have 2045 SE data recorded. There are 28 TAZs with zero total population, households, and employment; 55 TAZs with zero total population and households; and 82 TAZs with zero employment. It is recommended the MPO verify these TAZs to be within the National Refugee Area or other vacant land. These TAZs are also highlighted in the SE data spreadsheet sent by the MPO.

TABLE 3: TAZS WITH NO 2045 SE DATA

Zero Value Field	TAZ ID
Population, Households, and Employment	7, 8, 9, 31, 32, 51, 73, 75, 76, 77, 125, 139, 140, 200, 302, 357, 402, 410, 450, 478, 502, 514, 538, 573, 631, 684, 717
Population and Households Only	52, 54, 55, 56, 57, 108, 143, 144, 176, 220, 230, 270, 274, 305, 306, 307, 308, 309, 311, 315, 325, 329, 401, 403, 404, 405, 409, 411, 412, 413, 433, 440, 449, 470, 473, 475, 477, 480, 481, 501, 504, 511, 516, 518, 519, 520, 521, 529, 530, 531, 532, 533, 537, 542, 682
Employment Only	27, 38, 48, 66, 72, 74, 134, 141, 153, 156, 158, 163, 167, 181, 214, 234, 235, 240, 283, 284, 300, 379, 387, 437, 462, 463, 467, 469, 487, 552, 570, 574, 605, 606, 618, 629, 630, 635, 636, 638, 649, 650, 651, 652, 653, 654, 656, 658, 661, 663, 665, 666, 680, 691, 692, 695, 710, 718, 720, 725, 726, 747, 749, 781, 806, 814, 815, 816, 842, 845, 849, 850, 854, 860, 861, 863, 869, 870, 871, 872, 874, 875

2. Growth Rates between 2015 and 2045 SE Data

As per *GDOT's Socio-Economic Data Development Guides,* TAZs that have 2045 households growing by more than 500% should be reviewed for any planned developments. There are 26 TAZs where households grew by more than 500% (see Table 4). Among these 26 TAZs, 23 also have population growth more than 500%. Three more TAZs with population growth higher than 500% are 27, 300 and 652. It is recommended the MPO staff review and confirm these TAZs is suitable for high growth.

TABLE 4: TAZS WITH HOUSEHOLD GROWTH BY MORE THAN 500 %

TAZ ID	2015 Household	2045 Household	Household Growth
228	1	39	3800%
245	2	13	550%
297	4	111	2675%
331	1	45	4400%
345	1	27	2600%
387	1	16	1500%
424	1	74	7300%
429	2	31	1450%
491	1	62	6100%
557	2	58	2800%
559	9	73	711%
613	1	491	49000%
624	4	186	4550%
628	5	232	4540%
633	6	44	633%
635	2	229	11350%
637	39	266	582%
650	9	119	1222%
663	8	118	1375%
704	25	164	556%
720	13	228	1654%
741	47	389	728%

TAZ ID	2015 Household	2045 Household	Household Growth
747	9	130	1344%
749	1	206	20500%
750	43	286	565%
751	9	130	1344%

3. 2045 Persons per Household Ratios

According to *GDOT's Socio-Economic Data Development Guides* the ratio of persons per household should range between 1 and 7. Values exceeding 7 should correspond to some form of group housing within the TAZ. 8 TAZs (represented in Table 5) has a ratio of persons per household higher than 7 in both 2015 and 2015 and needs to be verified by the MPO.

TABLE 5: TAZS WITH 2045 PERSONS PER HOUSEHOLD > 7

TAZ ID	Person per HH 2015	Person per HH 2045
121	9.74	8.21
228	680.00	22.26
316	26.33	10.33
327	7.19	7.19
328	597.00	597.00
331	356.00	10.13
423	19.82	16.76
424	316.00	7.65

4. 2045 Household Density

According to *GDOT's Socio-Economic Data Development Guide,* the number of households per acre in most TAZs should be less than 6. A value of 6 typically corresponds to a three-story multifamily building. Values exceeding 6 should accordingly correspond to larger or denser multifamily housing. Table 6 lists 62 TAZs with households per acre greater than 6. Most of those TAZs (42) also have a household density greater than 6 in 2015 as well. 20 TAZs which have household density higher than 6 in only 2045 have been highlighted in the Table. It is recommended the MPO staff verify the housing type in these TAZs.

TABLE 6: TAZS WITH HOUSEHOLDS PER ACRE GREATER THAN 6.00

TAZ ID	Household per Acre (2015)	Household per Acre (2045)	TAZ ID	Household per Acre (2015)	Household per Acre (2045)
114	**5.85**	**7.00**	350	9.00	10.14
115	**5.64**	**7.42**	351	10.57	11.14
132	**5.92**	**7.00**	352	24.17	24.83
138	**5.79**	**6.90**	353	10.95	12.63
148	7.90	10.10	354	11.60	13.73
153	**4.07**	**6.21**	355	8.44	9.31
154	**5.23**	**8.14**	356	14.42	15.16
156	**4.50**	**9.83**	358	10.11	10.11
162	**5.39**	**6.39**	**359**	**5.44**	**6.78**
169	6.39	7.39	**361**	**5.29**	**7.00**
171	**5.83**	**6.48**	362	10.67	12.67
174	6.10	6.49	363	9.40	9.73
189	6.21	6.47	364	8.69	9.56
248	6.68	6.84	365	7.15	8.23
260	7.59	8.79	366	7.95	9.05
268	8.24	8.83	367	7.90	8.10
294	10.04	10.18	368	9.00	9.57
319	**5.67**	**6.58**	**369**	**5.63**	**7.38**
321	6.15	6.62	371	9.68	10.32
332	7.17	8.17	374	7.38	7.92
333	7.23	7.69	378	9.96	10.12
334	8.29	9.86	**379**	**4.80**	**6.27**
336	7.50	11.17	381	14.07	14.87
337	**5.25**	**6.17**	384	8.14	10.29
338	10.58	13.25	385	6.95	7.50
339	8.92	9.58	388	6.60	7.40

TAZ ID	Household per Acre (2015)	Household per Acre (2045)
340	7.43	8.00
341	6.71	7.86
343	6.21	6.21
346	**2.50**	**6.83**
348	8.67	8.67

TAZ ID	Household per Acre (2015)	Household per Acre (2045)
390	**6.00**	**8.50**
426	**4.32**	**7.44**
441	**5.07**	**7.14**
442	**5.51**	**6.98**
443	6.50	7.90

5. 2045 Population Density

According to *GDOT's Socio-Economic Data Development Guide,* the ratio of population to acres usually do not exceed 10. TAZs with population per acre higher than 10 are generally identified as multifamily or group housing land use. Figure 1 shows 2045 population density and the higher densities are found in the Chatham county which needs to be reviewed.

FIGURE 1: 2045 POPULATION DENSITY (PERSON/ACRE)

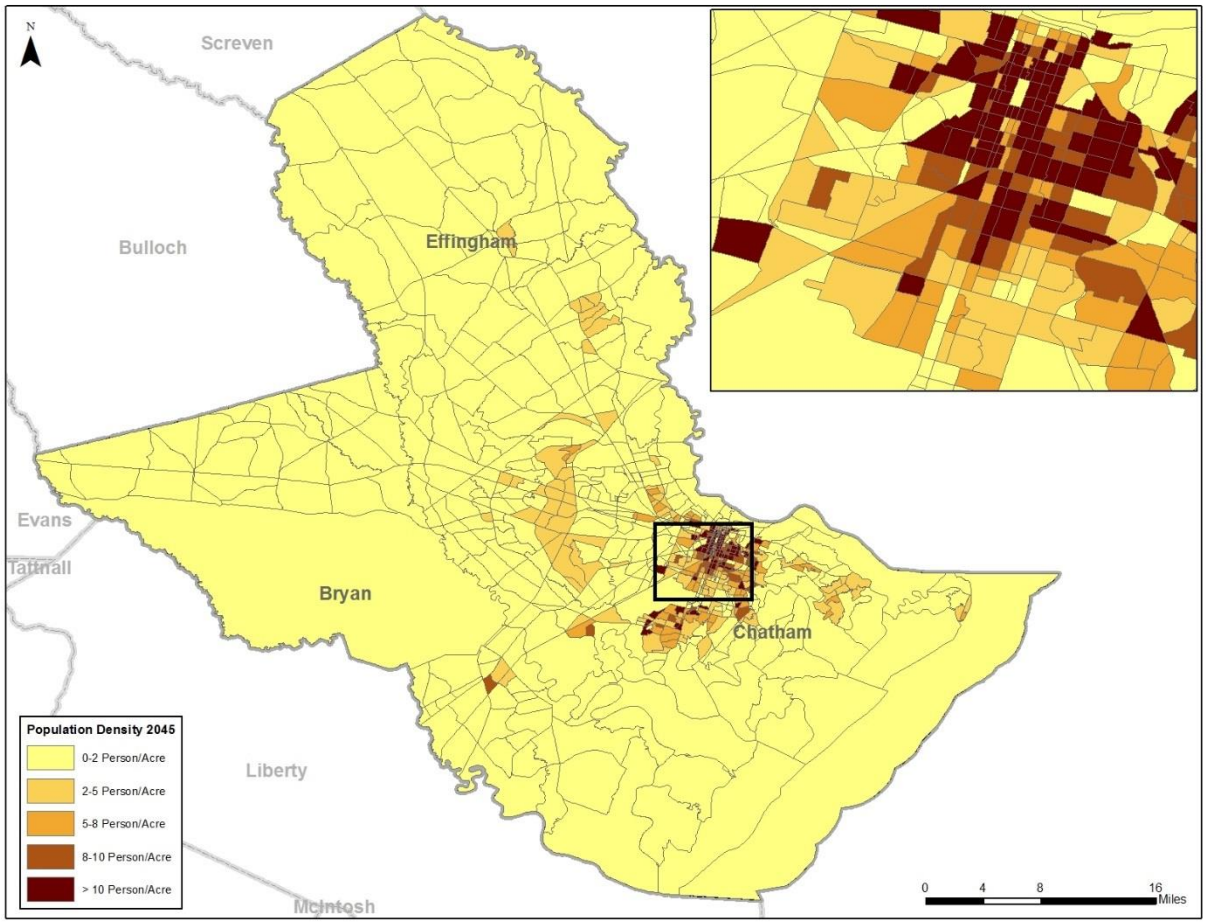


Table 7 lists TAZs with 2045 population per acre greater than 10. Among these 116 TAZs, 83 TAZs, had population density greater than 10 per acre in 2015. The 33 TAZs with only higher density than 10 population per acre in 2045 are highlighted as bold. It is recommended these TAZs are reviewed and confirmed by the MPO staff to be all TAZs with significant group housing or dense mobile homes.

TABLE 7: TAZS WITH 2045 POPULATION PER ACRE GREATER THAN 10.00

TAZ ID	Population per Acre (2015)	Population per Acre (2045)
43	15.21	16.29
106	12.10	13.53
112	10.18	11.75
114	15.25	18.15
115	11.73	16.27

TAZ ID	Population per Acre (2015)	Population per Acre (2045)
338	18.83	25.08
339	16.67	17.67
340	11.14	12.07
341	12.00	13.71
343	14.64	14.64

TAZ ID	Population per Acre (2015)	Population per Acre (2045)
123	11.45	11.93
132	10.42	13.05
133	**8.38**	**10.38**
138	13.69	16.60
141	12.15	14.79
145	**0.00**	**15.00**
147	**5.11**	**11.78**
148	27.00	32.38
153	**9.79**	**15.50**
154	14.09	20.91
155	**6.68**	**10.63**
156	11.00	23.50
160	11.00	11.77
161	13.13	15.76
162	12.60	15.02
163	17.52	18.63
164	**8.98**	**10.45**
166	**9.67**	**10.48**
169	21.51	23.95
171	12.07	13.68
172	11.57	13.61
173	11.82	13.25
174	15.26	16.28
181	**8.47**	**10.05**
184	**9.21**	**11.67**
186	**9.30**	**11.91**
187	10.12	10.83
189	14.21	14.74

TAZ ID	Population per Acre (2015)	Population per Acre (2045)
344	10.80	10.80
346	23.00	32.17
347	10.71	10.71
348	16.40	16.40
349	10.25	10.25
350	13.71	15.43
351	18.79	19.71
352	30.83	31.92
353	20.53	24.47
354	27.80	32.80
355	18.94	20.88
356	24.42	26.05
358	18.39	18.39
359	**9.33**	**12.11**
361	13.14	16.71
362	18.33	22.50
363	18.33	19.00
364	22.75	24.69
365	22.00	24.38
366	20.41	22.68
367	19.67	20.14
368	18.71	20.14
369	**6.50**	**10.88**
370	**5.57**	**10.57**
371	21.09	22.68
373	**9.50**	**13.88**
374	22.35	23.69
378	24.24	24.64

TAZ ID	Population per Acre (2015)	Population per Acre (2045)
190	11.19	12.62
192	14.13	15.00
201	**9.41**	**11.03**
204	**9.76**	**11.30**
205	**7.83**	**10.67**
212	**9.16**	**14.57**
229	11.80	11.90
248	10.15	10.49
255	13.68	13.76
260	17.42	20.15
265	10.80	10.96
268	22.54	24.02
271	**9.36**	**11.79**
273	10.19	12.84
292	**9.84**	**10.41**
294	21.82	22.22
321	**9.46**	**10.54**
326	**9.76**	**10.88**
327	41.46	41.46
328	27.14	27.14
331	25.43	32.57
332	11.33	13.67
334	**9.71**	**13.29**
336	**10.00**	**18.33**
337	16.17	18.25

TAZ ID	Population per Acre (2015)	Population per Acre (2045)
379	**9.33**	**12.47**
380	12.35	13.15
381	16.73	18.40
384	20.29	24.57
385	15.59	16.73
386	**7.75**	**11.50**
388	15.07	16.73
389	**5.80**	**11.80**
390	13.33	18.33
391	13.89	14.95
394	**9.08**	**11.58**
395	**8.38**	**12.13**
396	11.54	12.43
397	**7.56**	**10.89**
421	10.46	11.14
424	**7.90**	**14.15**
426	12.94	21.85
427	**0.00**	**11.31**
436	10.06	10.37
437	**9.09**	**11.21**
441	15.81	21.76
442	14.49	18.73
443	17.86	21.61
444	**9.45**	**11.66**
468	10.05	10.22

6. 2045 Available Employment Acres

According to *GDOT's Socio-Economic Data Development Guide,* available land should be reviewed to confirm sufficient land capacity accommodates future development allocation. The acres available and the acres needed for employment are calculated using the following equations:

*Acres Available for Employment = [# acres – (# households / 4)] * 0.25*

*Acres Needed for Employment = (0.00573921028 acres / employee) * (# employees)*

The acres needed for employment should be less than or equal to the acres available for employment. If this is not the case, then there may be certain TAZs that support multi-story office buildings and high-density housing. If the value of acres available for employment is negative, this may be explained by denser housing (greater than 4 households per acre) or multi-family housing throughout the area.

There are 148 TAZs, listed in Table 8, that have negative acres available for employment or fewer acres available than needed. Among these TAZs 110 TAZs had fewer acres available than needed in 2015 as well. It is recommended the MPO staff verify if these TAZs have such development as dense housing or multi-story buildings.

TABLE 8: TAZS WHERE 2045 ACRES NEEDED FOR EMPLOYMENT ARE MORE THAN ACRES AVAILABLE

TAZ ID	Acres Available for employment	Acres Needed for employment
106	-6.31	0.23
112	**-1.19**	**0.02**
113	**-1.56**	**0.85**
114	-3.75	0.25
115	-7.06	0.69
130	**1.50**	**1.53**
132	-7.13	0.19
133	**-1.81**	**0.01**
138	-8.69	0.03
141	**-3.31**	**0.00**
145	**-4.38**	**1.83**
147	**0.19**	**0.88**
148	-8.00	0.94
153	-1.94	0.00
154	-5.69	0.02

TAZ ID	Acres Available for employment	Acres Needed for employment
322	0.56	4.69
323	2.19	4.03
324	0.00	0.74
325	1.50	2.84
327	-2.88	0.11
332	-1.56	0.37
333	-3.00	3.87
334	-2.56	1.47
336	-2.69	0.03
337	-1.63	1.00
338	-6.94	0.48
339	-4.19	0.45
340	-3.50	0.54
341	-1.69	2.91
342	0.75	2.36

TAZ ID	Acres Available for employment	Acres Needed for employment
155	**-0.69**	**2.33**
156	-4.38	0.00
158	**-1.50**	**0.00**
160	-2.56	0.17
161	-4.25	0.10
162	-9.25	0.01
163	-5.50	0.00
164	**-1.00**	**0.01**
165	**0.13**	**0.46**
167	**-0.38**	**0.00**
169	-8.69	0.69
171	-11.00	0.03
172	-4.31	0.23
173	-3.44	0.02
174	-6.06	0.19
177	**-0.63**	**0.26**
180	**-0.50**	**0.18**
182	**0.00**	**0.28**
186	-1.75	0.04
187	-2.19	0.64
188	**0.06**	**0.61**
189	-2.94	0.01
190	-4.19	0.22
191	**-1.94**	**0.26**
192	-4.56	0.14
195	10.44	26.97
201	-3.19	0.44
203	**-1.13**	**0.01**

TAZ ID	Acres Available for employment	Acres Needed for employment
343	-1.94	0.22
344	-0.56	0.30
345	**0.06**	**0.34**
346	**-1.06**	**0.19**
347	-0.38	0.29
348	-4.38	1.15
349	-0.69	0.46
350	-2.69	0.54
351	-6.25	0.29
352	-15.63	0.44
353	-10.25	0.24
354	-9.13	0.11
355	-5.31	0.13
356	-13.25	1.69
358	-6.88	0.31
359	-1.56	0.24
361	-1.31	0.21
362	-3.25	0.08
363	-5.38	0.51
364	-5.56	0.57
365	-3.44	1.01
366	-6.94	0.14
367	-5.38	0.85
368	-2.44	0.14
369	-1.69	0.80
370	**-0.25**	**0.26**
371	-8.69	0.54
373	**-0.44**	**0.06**

TAZ ID	Acres Available for employment	Acres Needed for employment
204	-4.19	0.01
205	-3.06	0.16
213	**0.94**	**1.01**
220	7.75	12.38
222	**3.38**	**4.52**
229	-0.81	0.30
232	0.13	2.66
238	-0.38	0.48
248	-12.94	4.02
255	-1.88	1.65
259	**1.13**	**1.61**
260	-19.75	0.08
265	-2.81	0.75
268	-16.31	0.06
271	-3.31	2.61
276	**0.06**	**2.57**
286	3.94	6.88
292	-6.88	3.64
294	-19.69	0.02
309	2.25	2.76
310	2.19	7.76
312	**1.94**	**2.56**
313	1.56	5.23
314	0.13	7.32
315	3.00	19.23
316	2.69	7.61
317	0.56	2.64
318	-0.38	1.44

TAZ ID	Acres Available for employment	Acres Needed for employment
374	-6.38	0.11
376	**0.50**	**0.93**
378	-9.56	0.70
379	-2.13	0.00
380	**0.06**	**0.10**
381	-10.19	1.08
383	0.81	1.47
384	-2.75	0.49
385	-4.81	0.18
386	**-0.31**	**0.06**
388	-3.19	2.24
389	**-0.63**	**0.11**
390	-1.69	0.13
391	-4.06	0.54
392	-0.69	0.68
393	**0.06**	**0.54**
394	**0.19**	**0.29**
395	-0.63	0.65
396	-3.38	0.23
397	**-0.25**	**0.04**
421	-3.44	0.12
426	-7.31	0.81
427	**4.19**	**4.95**
436	-3.38	0.01
437	**-0.44**	**0.00**
438	**0.13**	**0.32**
441	-8.25	1.57
442	-11.00	0.63

TAZ ID	Acres Available for employment	Acres Needed for employment
319	-1.94	1.37
320	-0.44	1.29
321	-2.13	1.66

TAZ ID	Acres Available for employment	Acres Needed for employment
443	-17.56	0.05
444	**-2.94**	**0.06**
530	38.25	46.03

7. 2045 Students to Service Employment Ratios

In TAZs that contain schools, there is typically one service employee to every 12 students. In the 2045 SE data, there are 14 TAZs with students to service employment ratio higher than 12. Among these 14, 5 TAZs have higher students to service employment ratio in 2015 too. Table 9 represents the 14 TAZs which the MPO needs to check.

TABLE 9: TAZS WITH STUDENTS TO SERVICE RATIO HIGHER THAN 12.00 IN 2045

TAZ ID	Students to service 2015	Students to service 2045
82	66.00	76.32
123	19.09	22.08
177	223.00	257.88
262	14.00	16.19
270	20.78	21.47
335	**12.00**	**12.06**
445	**0.00**	**12.13**
447	**0.00**	**114.54**
709	**0.00**	**501.25**
742	**0.00**	**14.26**
746	**0.00**	**43.97**
795	**0.00**	**93.13**
830	**0.00**	**34.64**
868	**0.00**	**28.38**

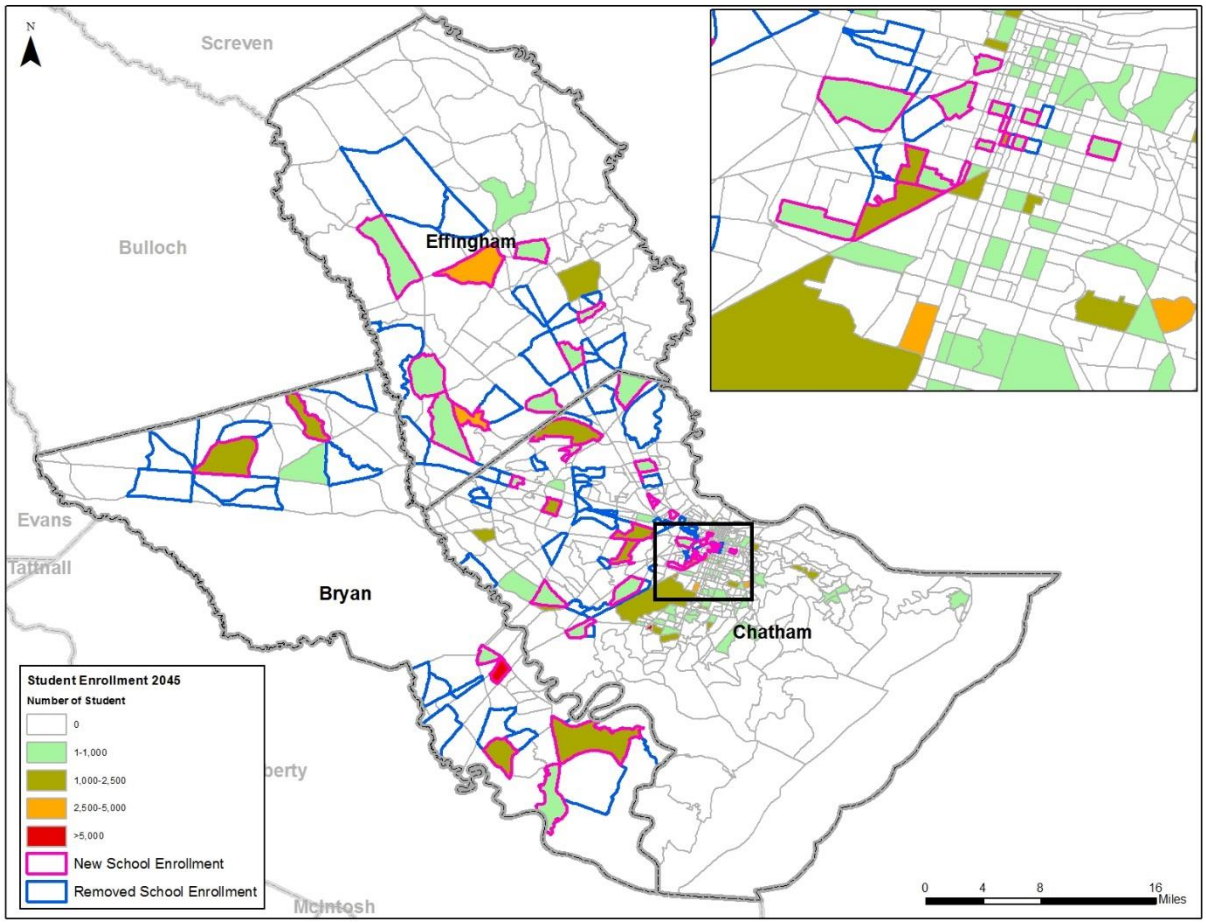
8. School Enrollment

Overall, the ratio of non-college school enrollment to total population is 24% which is slightly higher than the recommended range of 20%. Table 10 represents 6 TAZs where the student growth in 2045 have been more than 100%. There has been new school development which have been represented in Table 11. Figure 2 illustrates all the school locations with number of school enrollment.

TABLE 10: TAZS WHERE 2045 STUDENT GROWTH ARE MORE THAN 100%

TAZ ID	2015 Student	2045 Student	Student Growth
420	258	748	190%
657	530	1,692	219%
671	418	1,980	374%
706	14	739	5181%
778	70	694	891%
783	592	1,497	153%

FIGURE 2: 2045 SCHOOL LOCATIONS



From Figure 2 it can be seen that there are many TAZs which has new school as well there are TAZs from where school enrollment has been removed. Table 11 and Table 12 respectively lists the TAZs with new school development and TAZs with removed school enrollment. MPO's review and confirmation of the school changes are required.

TABLE 11: TAZS WITH NEW SCHOOL DEVELOPMENT

TAZ ID	2015 Student	2045 Student
163	0	200
367	0	822
371	0	396
375	0	200
381	0	906

TAZ ID	2015 Student	2045 Student
601	0	818
610	0	1,678
626	0	468
640	0	2,233
678	0	877

TAZ ID	2015 Student	2045 Student
383	0	2,339
388	0	200
425	0	905
440	0	952
445	0	508
447	0	137
448	0	1,211
451	0	814
459	0	1,317
465	0	343
485	0	641
494	0	819
495	0	437
510	0	641
547	0	1,334
549	0	1,094
558	0	144
563	0	381

TAZ ID	2015 Student	2045 Student
681	0	97
694	0	2,130
709	0	1,200
730	0	5,896
732	0	236
739	0	1,148
742	0	550
746	0	2,199
780	0	22
787	0	745
795	0	780
800	0	2,734
808	0	593
811	0	801
830	0	829
836	0	2,623
868	0	755

TABLE 12: TAZS WITH REMOVED SCHOOL DEVELOPMENT

TAZ ID	2015 Student	2045 Student
366	765	0
370	368	0
380	843	0
382	2,176	0
431	743	0
432	458	0
437	983	0

TAZ ID	2015 Student	2045 Student
677	616	0
680	17	0
683	3,296	0
687	91	0
688	74	0
692	1,657	0
697	979	0

TAZ ID	2015 Student	2045 Student
452	810	0
458	374	0
461	604	0
469	404	0
479	401	0
480	1,096	0
484	114	0
512	198	0
515	1,573	0
533	434	0
536	806	0
539	4,499	0
540	210	0
541	1,538	0
544	619	0
559	759	0
567	239	0
568	520	0
569	468	0
609	435	0
627	473	0
628	1,308	0
631	609	0
632	857	0
644	210	0
668	121	0

TAZ ID	2015 Student	2045 Student
699	674	0
700	638	0
705	760	0
714	561	0
718	6,264	0
719	1,089	0
724	893	0
725	696	0
738	99	0
740	692	0
747	1,193	0
748	107	0
775	241	0
785	1,114	0
789	103	0
791	36	0
796	321	0
797	726	0
804	152	0
809	69	0
812	88	0
823	765	0
827	368	0
837	843	0
839	2,176	0
873	613	0

CONCLUSIONS

It is recommended that MPO staff review and confirm the following items. A spreadsheet including the following review TAZs highlighted is attached to this document as well:

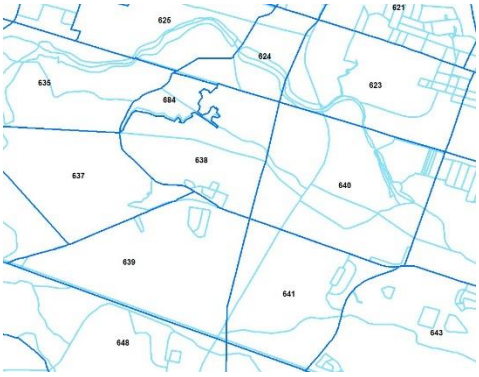
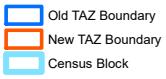
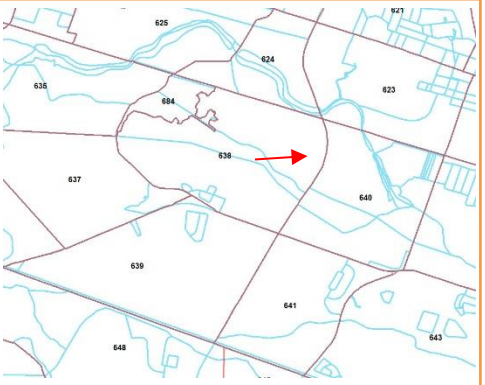
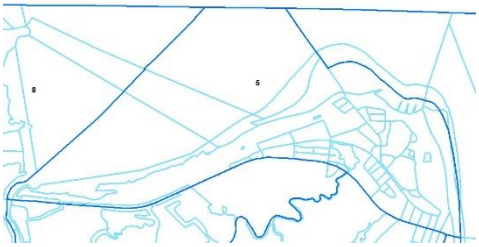
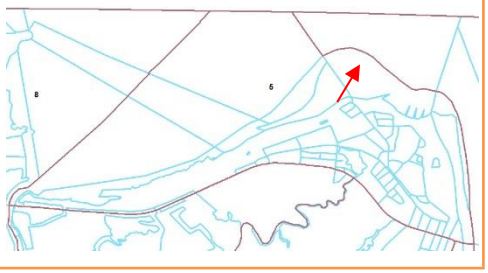
- Confirm that the population to employment ratio increases from 2015 to 2045. This is due to the population being estimated to grow faster than employment.
- Confirm the proportion of population enrolled in schools decreases from 0.30 to 0.24.
- Confirm no future development is expected for TAZs 7, 8, 9, 31, 32, 51, 73, 75, 76, 77, 125, 139, 140, 200, 302, 357, 402, 410, 450, 478, 502, 514, 538, 573, 631, 684 and 717, all of which have zero values for population, households and employment.
- Confirm no future residential development is expected for TAZs 52, 54, 55, 56, 57, 108, 143, 144, 176, 220, 230, 270, 274, 305, 306, 307, 308, 309, 311, 315, 325, 329, 401, 403, 404, 405, 409, 411, 412, 413, 433, 440, 449, 470, 473, 475, 477, 480, 481, 501, 504, 511, 516, 518, 519, 520, 521, 529, 530, 531, 532, 533, 537, 542 and 682, all of which have zero values for population and households.
- Confirm no future industrial or business development is expected for 27, 38, 48, 66, 72, 74, 134, 141, 153, 156, 158, 163, 167, 181, 214, 234, 235, 240, 283, 284, 300, 379, 387, 437, 462, 463, 467, 469, 487, 552, 570, 574, 605, 606, 618, 629, 630, 635, 636, 638, 649, 650, 651, 652, 653, 654, 656, 658, 661, 663, 665, 666, 680, 691, 692, 695, 710, 718, 720, 725, 726, 747, 749, 781, 806, 814, 815, 816, 842, 845, 849, 850, 854, 860, 861, 863, 869, 870, 871, 872, 874 and 875, all of which have zero values for employment.
- Confirm household growth by more than 500% from 2015 to 2045 is accurate for TAZs 228, 245, 297, 331, 345, 387, 424, 429, 491, 557, 559, 613, 624, 628, 633, 635, 637, 650, 663, 704, 720, 741, 747, 749, 750 and 751.
- Confirm TAZs 228, 424, 121, 316, 327, 328, 331 and 423 will have 2045 persons per household ratios more than 7.
- Confirm TAZs 114, 115, 132, 138, 148, 153, 154, 156, 162, 169, 171, 174, 189, 248, 260, 268, 294, 319, 321, 332, 333, 334, 336, 337, 338, 339, 340, 341, 343, 346, 348, 350, 351, 352, 353, 354, 355, 356, 358, 359, 361, 362, 363, 364, 365, 366, 367, 368, 369, 371, 374, 378, 379, 381, 384, 385, 388, 390, 426, 441, 442 and 443 will have dense housing or multi-story buildings, as all of these TAZs have a ratio of households per acre greater than 6.00.
- Confirm TAZs 43, 106, 112, 114, 115, 123, 132, 133, 138, 141, 145, 147, 148, 153, 154, 155, 156, 160, 161, 162, 163, 164, 166, 169, 171, 172, 173, 174, 181, 184, 186, 187, 189, 190, 192, 201, 204, 205, 212, 229, 248, 255, 260, 265, 268, 271, 273, 292, 294, 321, 326, 327, 328, 331, 332, 334, 336, 337 338, 339, 340, 341, 343, 344, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 358, 359, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 373, 374, 378, 379, 380, 381, 384, 385, 386, 388, 389, 390, 391, 394, 395, 396, 397, 421, 424, 426, 427, 436, 437, 441, 442, 443, 444 and 468 will have significant group housing or dense mobile homes, as all of these TAZs have persons per acre greater than 10.
- Confirm TAZs 106, 112, 113, 114, 115, 130, 132, 133, 138, 141, 145, 147, 148, 153, 154, 155, 156, 158, 160, 161, 162, 163, 164, 165, 167, 169, 171, 172, 173, 174, 177, 180, 182, 186, 187, 188, 189, 190, 191, 192, 195, 201, 203, 204, 205, 213, 220, 222, 229, 232, 238, 248, 255, 259, 260, 265, 268, 271, 276, 286, 292, 294, 309, 310, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 327, 332, 333,

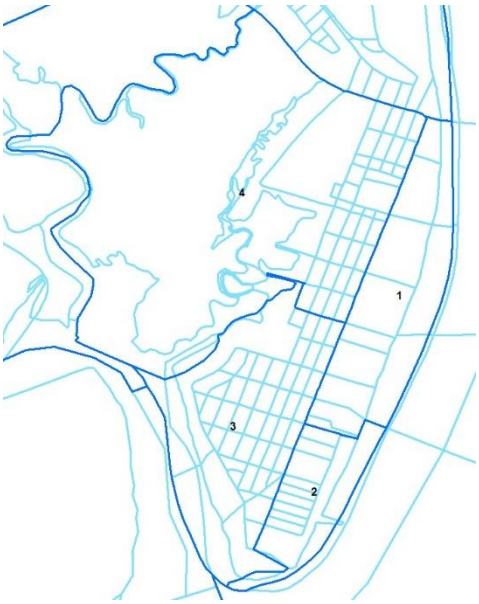
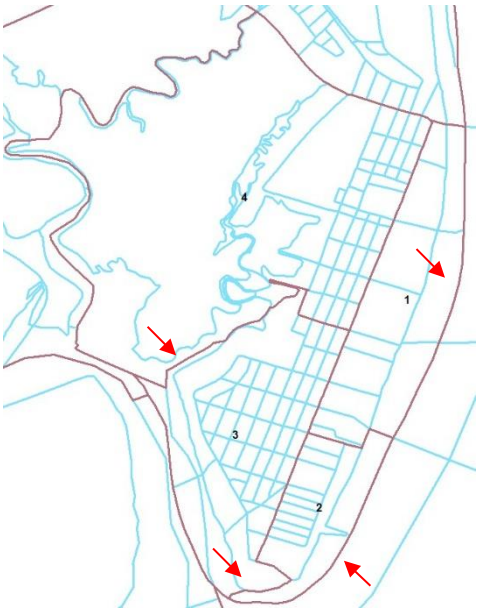
334, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 358, 359, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 373, 374, 376, 378, 379, 380, 381, 383, 384, 385, 386, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 421, 426, 427, 436, 437, 438, 441, 442, 443, 444 and 530 have dense development projected since they have acres available for employment less than acres needed for projected employment.

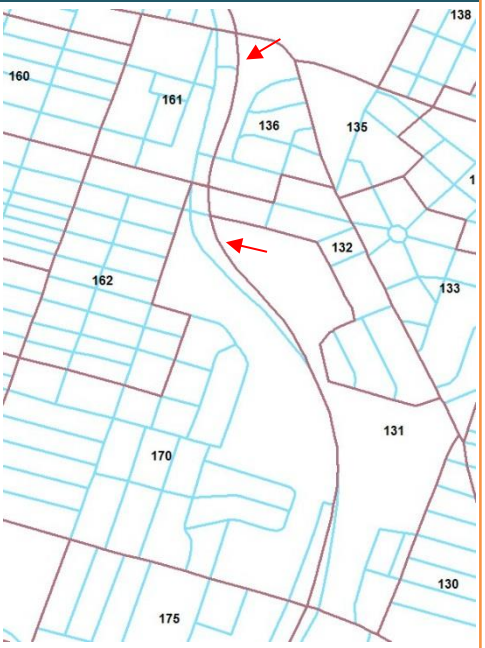
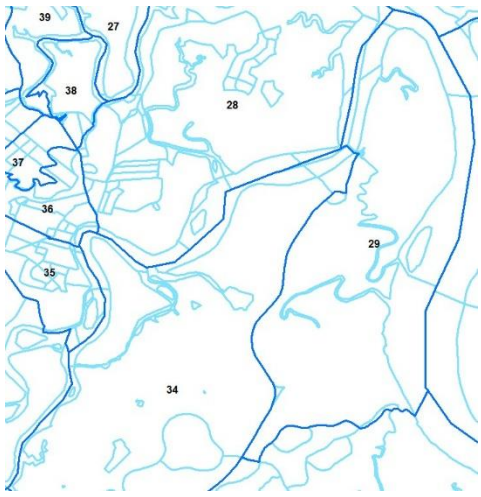
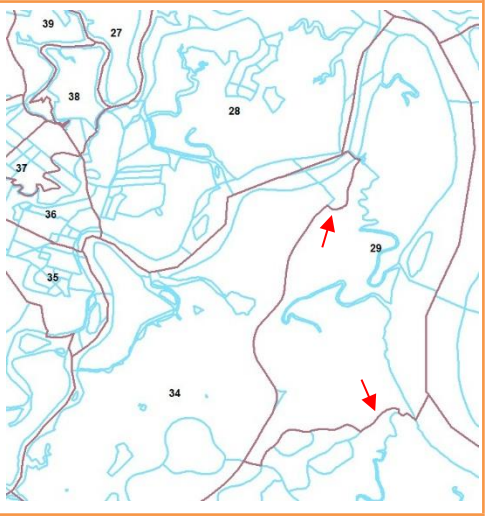
- Confirm the school enrollment and service employment for TAZs 82, 123, 177, 262, 270, 335, 445, 447, 709, 742, 746, 795, 830 and 868, all of which have a student to service employee ratio greater than 12.
- Confirm school enrolment growth by more than 100% from 2015 to 2045 is accurate for 420, 657, 671, 706, 778 and 783.
- Confirm new school development for TAZs 163, 367, 371, 375, 381, 383, 388, 425, 440, 445, 447, 448, 451, 459, 465, 485, 494, 495, 510, 547, 549, 558, 563, 601, 610, 626, 640, 678, 681, 694, 709, 730, 732, 739, 742, 746, 780, 787, 795, 800, 808, 811, 830, 836 and 868.
- Confirm school enrollment removed for development for TAZs 366, 370, 380, 382, 431, 432, 437, 452, 458, 461, 469, 479, 480, 484, 512, 515, 533, 536, 539, 540, 541, 544, 559, 567, 568, 569, 609, 627, 628, 631, 632, 644, 668, 677, 680, 683, 687, 688, 692, 697, 699, 700, 705, 714, 718, 719, 724, 725, 738, 740, 747, 748, 775, 785, 789, 791, 796, 797, 804, 809, 812, 823, 827, 837, 839 and 873.

A-3. Savannah TAZ Boundary Changes

A-Table 3: Savannah TAZ Boundary Changes

Before	Change	After Boundary Changes
	Revise TAZ 623, 624, 638, 639, 640, 641 to match Census Block boundaries 	
	Revise TAZ 531 and 532 to follow Jimmy Deloach Pkwy	
	Revise TAZ 5 to match Census Block boundaries	

Before	Change	After Boundary Changes
	Revise TAZ 1, 2, 3, 4 to match Census Block boundaries	
	Revise TAZ 140, 142, 152, 153 to match Census Block boundaries	

Before	Change	After Boundary Changes
	Revise TAZ 131, 132, 136, 161, 170 to match Census Block boundaries	
	Revise TAZ 29, 34 to match Census Block boundaries	

A-4. DESCRIPTION OF LRTP NETWORKS

Long Range Transportation Plan (LRTP) Networks

1. 2015 Base year (1st Network)

2. Do-nothing system projects (2nd Network)

- 2015 Base year (1st Network) + any projects which either opened to traffic since the base year or currently under construction

3. Existing + Committed (E+C) system projects (3rd Network)

- Do-Nothing (2nd Network) + projects with construction (CST) funded in the STIP years 2018-2021

4. Completion of STIP system projects (4th Network)

- E+C (3rd Network) + projects with preliminary engineering (PE) and right of way (ROW) funded in the STIP years 2018-2021

5. Long Range Transportation Plan System projects (5th Network)

- Completion of STIP (4th Network) + all identified projects to address future transportation needs through 2045

6. Financially Constrained (6th Network)