FINAL RECOMMENDATIONS REPORT

SR 204 Corridor Study

SR 204 from US 17 to east of King George Blvd, Chatham County, GA

PREPARED FOR

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Background

Develop effective solutions for the SR 204 corridor through robust planning and public involvement

Known Concerns

- Congestion
- Crashes

Project Goals

- Reduce congestion
- Minimize crash frequency and severity
- Maintain reasonable access

Study Limits

SR 204 from US 17 to east of King George Blvd, focusing on:

- SR 204/Ford Ave and SR 204/Pine Grove Intersections
- US 17 and King George Boulevard interchange ramp terminals with SR 204

Study Location Map

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Existing and Future Conditions

Traffic Volume and Model Development

Data Collection

Traffic volume data was collected in November 2023. Specifically, 6-hour turning movement counts were gathered on November 30 at the study intersections, and 48-hour classification counts were collected on November 29-30 along each roadway segment. Travel time data was obtained from the Regional Integrated Transportation Information System (RITIS) platform, using probe data from the data vendor HERE, averaged for all Tuesdays, Wednesdays, and Thursdays in October 2023.

Volume Development

Existing traffic volumes were developed based on the collected traffic counts, following guidance from GDOT's Design Traffic Forecasting Manual. The Average Annual Daily Traffic (AADT) was calculated using the 48-hour classification tube counts, with adjustments for monthly and daily traffic factors. Design Hourly Volumes (DHVs) were calculated for peak hours, incorporating K- and D-factors to represent the proportion of peak hour volume compared to daily volume and peak direction of travel. Truck percentages were also calculated from the classification counts.

For future volumes, a project area growth rate of 1.0% was calculated based on an average of population, employment, travel demand model, and historical traffic data. Historical data was obtained from the U.S. Census Bureau and the Georgia Department of Labor, while future projections were sourced from the Governor's Office of Planning & Budget and the CORE Travel Demand Model.

In Phase II, the traffic queues in the existing model were adjusted to better match current congestion. They were also adjusted in the proposed model to better represent future congestion. The peak hour traffic was adjusted to account for latent demand outside of the modeled network. Proposed developments along SR 25/US 17 were not accounted for in Phase I but were added in Phase II in coordination with the related corridor study along SR 25/US 17. This resulted in greater delay and travel time than in the Phase I analysis – which is more likely to represent future conditions.

Model Development and Calibration

The existing conditions (2023) AM and PM peak Vissim models were developed to create a base model for each peak period. The network geometry was developed using Bing background maps within the Synchro network and imported into Vissim. Signal timing information was obtained from GDOT's Automated Traffic Signal Performance Measures (ATSPM) platform and optimized within Synchro. The Vissim simulations were run for 90 minutes, including a 30-minute seed time and a 60-minute peak hour.

Calibration involved adjusting the model to match collected volumes and travel times. This included increasing demand in congested areas to account for latent demand. The GEH statistic is a formula used to compare the difference between collected and modeled traffic volumes, with a value less than five indicating a good match. The model was calibrated to ensure that the GEH statistic for individual link flows was less than five, and travel times were within 15% of observed values.

Existing and No-Build Operations

Existing Operations Results

The existing conditions were analyzed using a calibrated Vissim model for both AM and PM peak periods. The analysis included delay, level of service (LOS), and queue lengths at various intersections. The LOS is a letter grade assigned to intersections based on the average delay per vehicle, with LOS E and F indicating unacceptable delays. The existing conditions showed that intersections, including SR 204 & Pine Grove Dr, experienced significant delays and long queue lengths, particularly during peak hours.

No-Build Operations Results

The no-build scenario models were built upon the calibrated existing base model, with updated volume inputs and routes based on forecasted volumes. Minor signal timing changes were made to accommodate the new volumes and geometry. The no-build scenario results for the years 2030 and 2050 indicated that delays and queue lengths would increase significantly at several intersections. For example, the intersection of SR 204 & Pine Grove Dr is expected to experience extremely long delays and queues in both the AM and PM peaks by 2050.

Travel Time and Speed

The travel time and speed results showed that vehicles currently travel approximately 20 mph below the 55 mph speed limit along SR 204 in peak directions. By 2050, vehicles are expected to travel approximately 30-35 mph below the speed limit without roadway improvements.

Network Performance

The network performance measures, including total network delay, average network speed, and latent demand, indicated that the total network delay is expected to triple between the open and design years without roadway improvements. The average network speed is expected to drop by

4-8 mph, and the latent demand (vehicles unable to enter the model by the end of the simulation) is expected to increase significantly.

Existing and Projected Traffic Volumes

The SR 204 Bi-Directional Volumes are shown for the roadway segment between Ford Ave and Pine Grove Dr.

Traffic Volumes along SR 204

	Existing	Open Year	Design Year
	2023	**2030**	**2050**
AADT	57,600	65,400	87,050
AM Peak	5,285	5,810	7,360
PM Peak	5,490	6,055	7,895
Truck % (AM/PM)	22% / 15%	22% / 15%	22% / 15%

Crashes

Crash rates along the SR 204 corridor have shown a steady increase over the past several years, with 2023 marking the highest levels recorded. The corridor currently operates as an arterial roadway, with a signalized intersection at Pine Grove Drive and an unsignalized intersection at Ford Ave. The crash rate for SR 204, measured per 100 million vehicle miles, has not surpassed the statewide average for principal arterial, non-freeway roadways; however, it has been gradually approaching that statewide average, particularly in 2023. The injury crash rate for SR 204 continues to remain elevated compared to previous years and is trending closer to the statewide average for arterial injury crashes. Crash and injury rates for SR 204 are higher than those typically seen on freeways statewide. If the intersections at Pine Grove Drive and at Ford Ave. are removed, the corridor would act more like a freeway. Following such a conversion, crash rates would be expected to decrease and align more closely with the lower statewide freeway average.

SR 204 Corridor Crash Rates

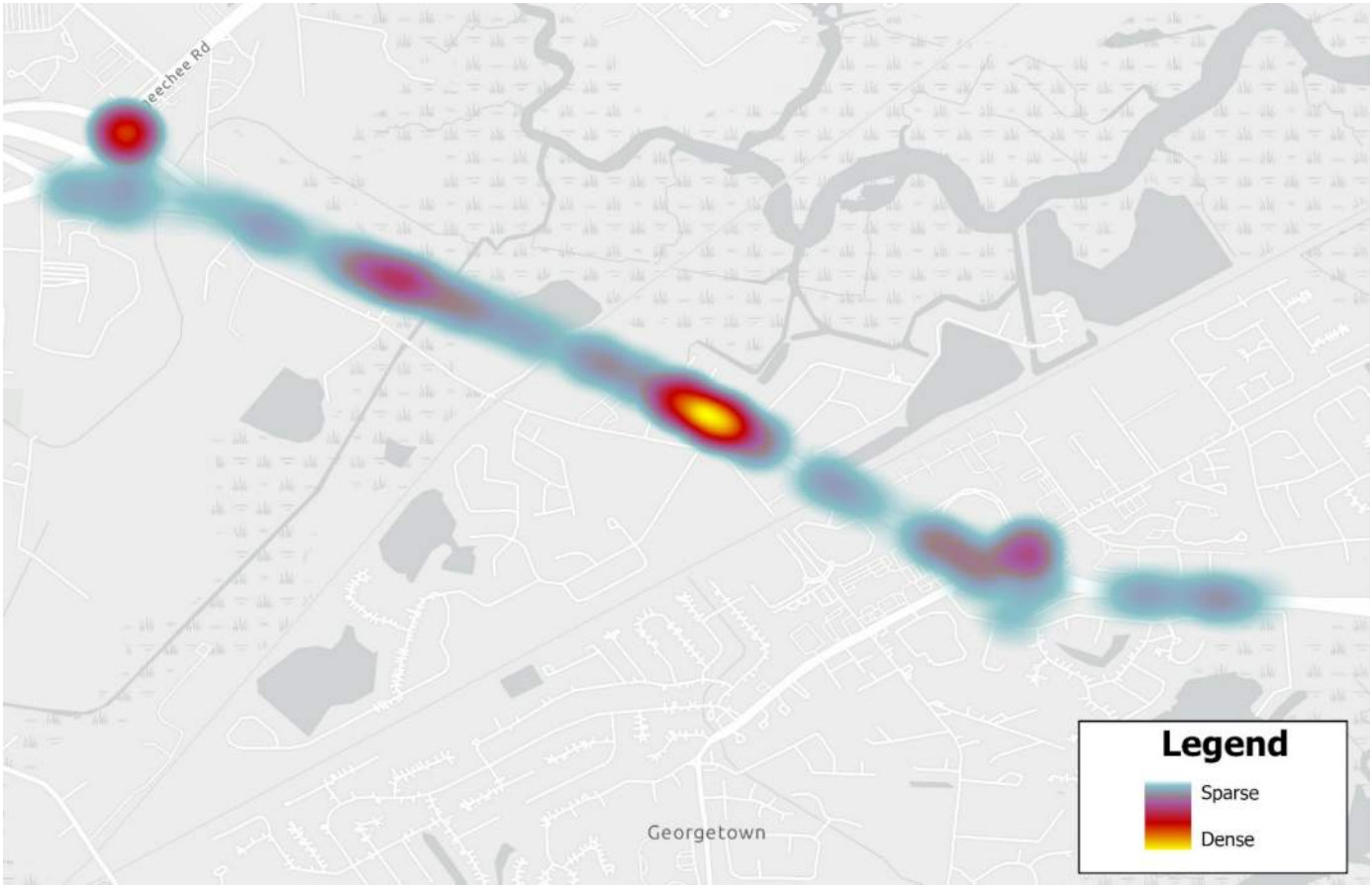
	2019	2020	2021	2022	2023
Total Crashes					
# of Crashes	141	80	169	166	237
Crash Rate*	314	176	369	359	507
Arterial Statewide Average*	559	469	542	568	526
Freeway Statewide Average**	176	152	161	155	135
Injury Crashes					
# of Crashes	38	24	50	44	61
Crash Rate	85	53	109	95	130
Arterial Statewide Average*	137	118	146	218	136
Freeway Statewide Average**	44	41	42	39	33

* Crash rate is crashes per 100 million vehicle miles

** Statewide average of Principal Arterial, Non-Freeway, Urbanized roadways

*** Statewide average of Principal Arterial, Freeway, Urbanized roadways

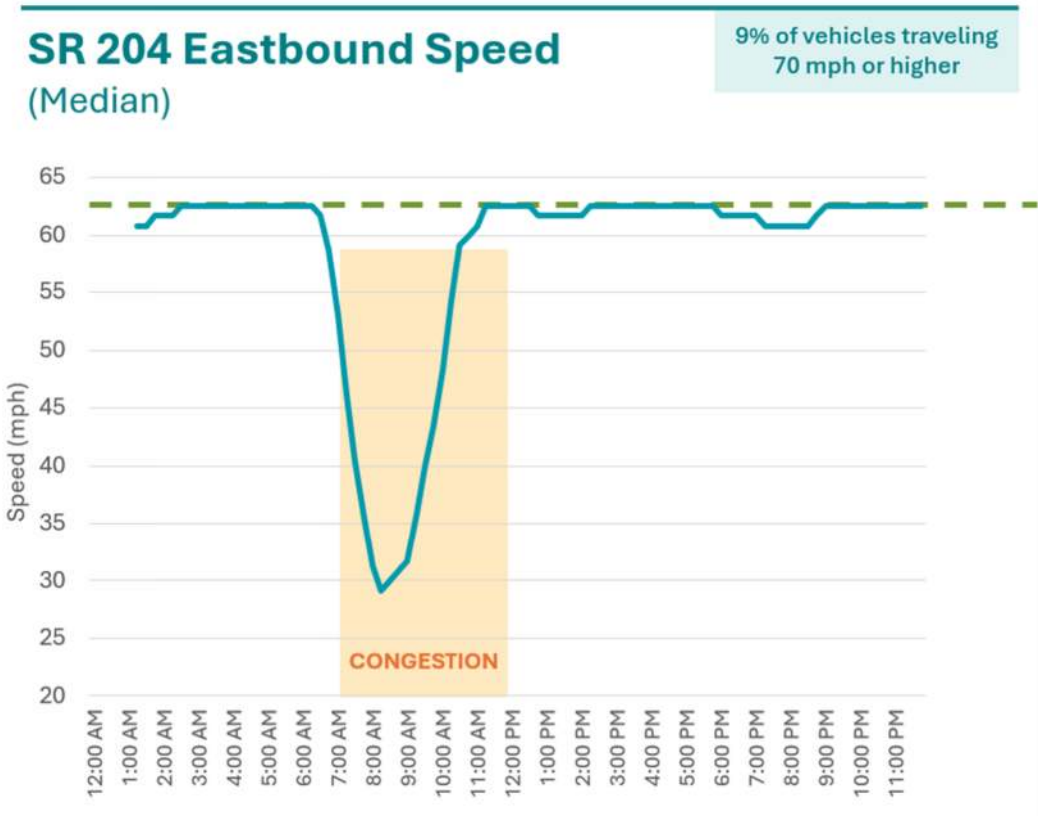
Crash Location Diagram

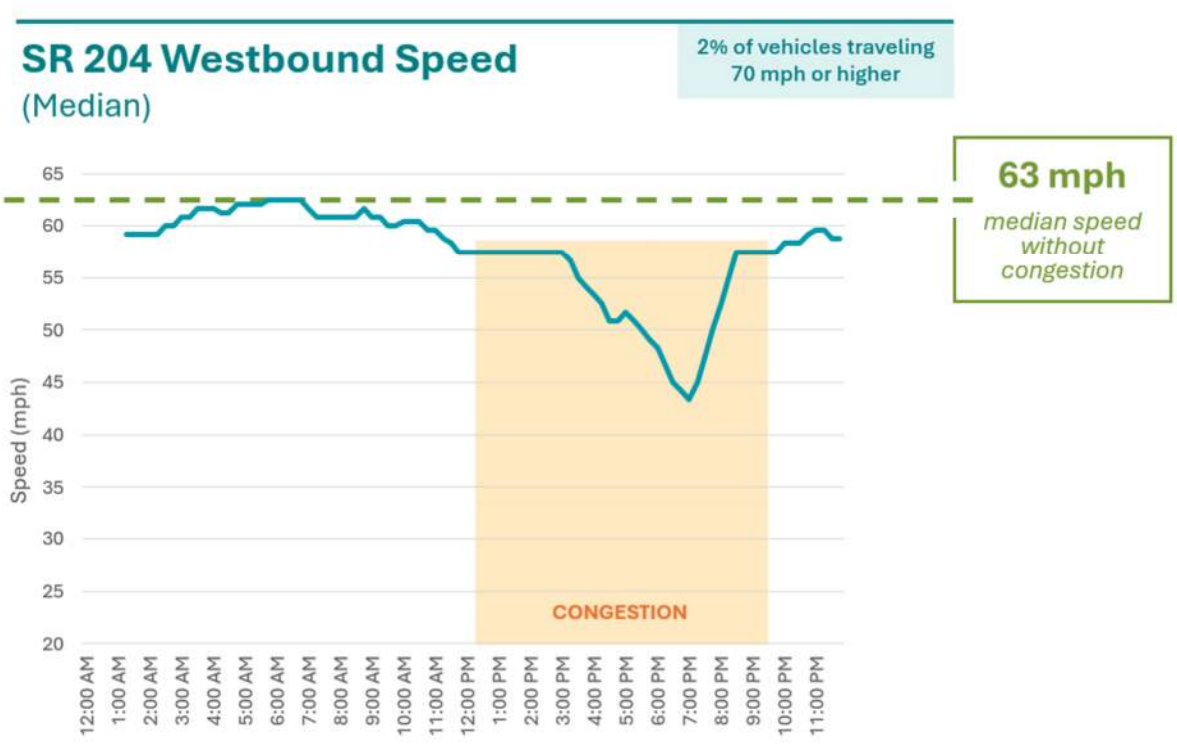


SR 204 Speed Study

After receiving feedback in the first PIOH about high speeds along the corridor, VHB conducted a speed study to ascertain the free-flowing speeds residents are concerned about. The following speeds were captured between Ford Ave and Pine Grove Dr. Keep in mind, the posted speed limit is 55 mph. The median speed without congestion is 63 mph, while 9% of eastbound vehicles and 2% of westbound vehicles are traveling 70 mph or higher.

Speed Study Results





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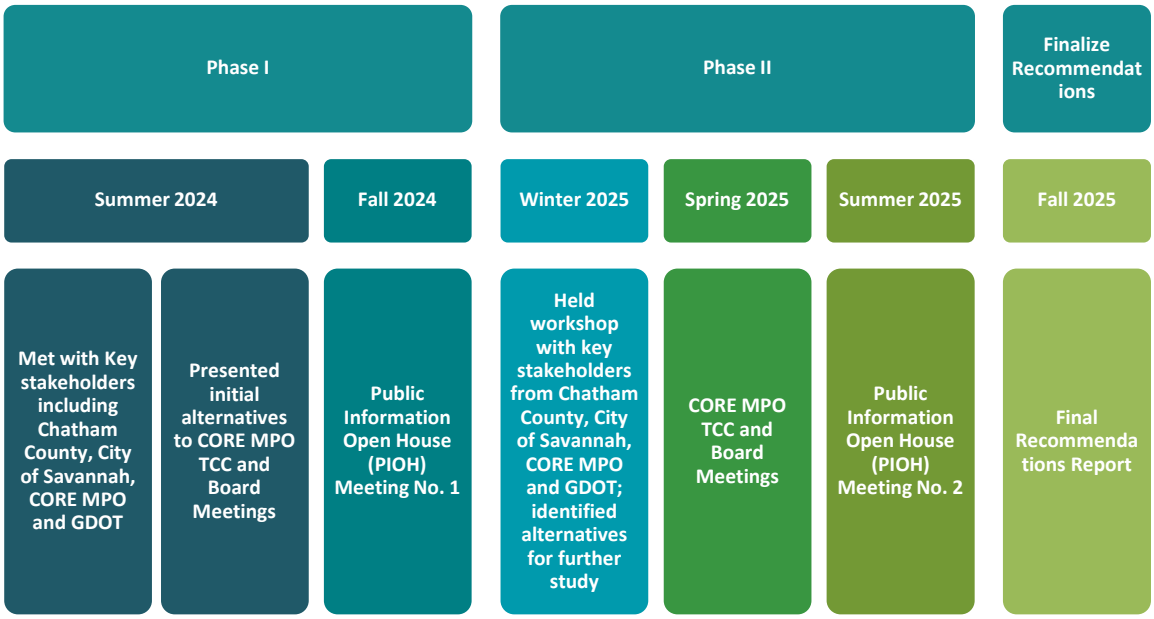
Alternatives Development and Analysis

Study Structure

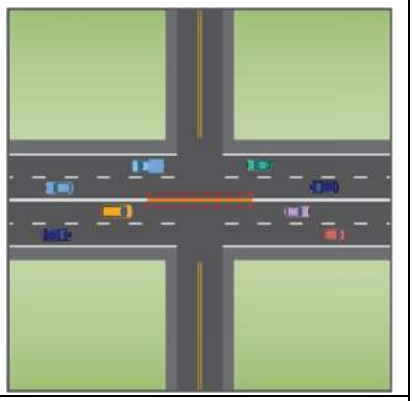
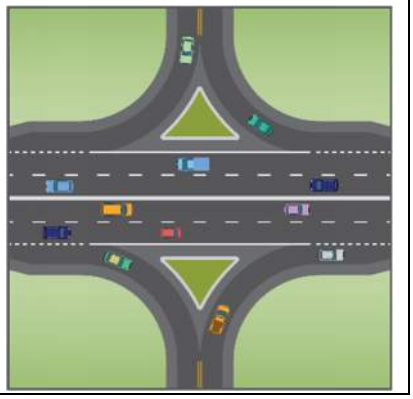
The development and analysis of alternatives was broken into the phases as detailed below:

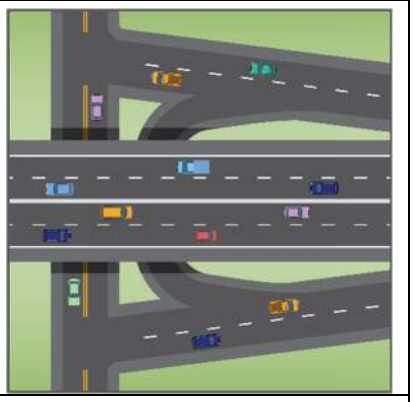


Phase I is a higher-level look at the corridor in which the project team drafted and analyzed the initial alternatives (Short-Term A, B, C and D and Long-Term J, K and L) with feedback from key stakeholders. The alternatives were presented to the public at PIOH No. 1. Feedback from the public and key stakeholders was used to determine which alternatives to move forward for further study in the more detailed Phase II study (Short-Term D and Long-Term K and L). These alternatives were presented to the public at PIOH No. 2. This final recommendations report is the culmination of the alternatives development and analysis.

Types of Improvements

The following types of improvements were considered when developing the alternatives.

Widening SR 204	
Improving Ramp Entrances and Exits	
Closing Existing Median Openings	
Adding Acceleration/Deceleration Lanes	

Adding Dedicated U-Turn Lane	
Adding an Interchange	

Phase I

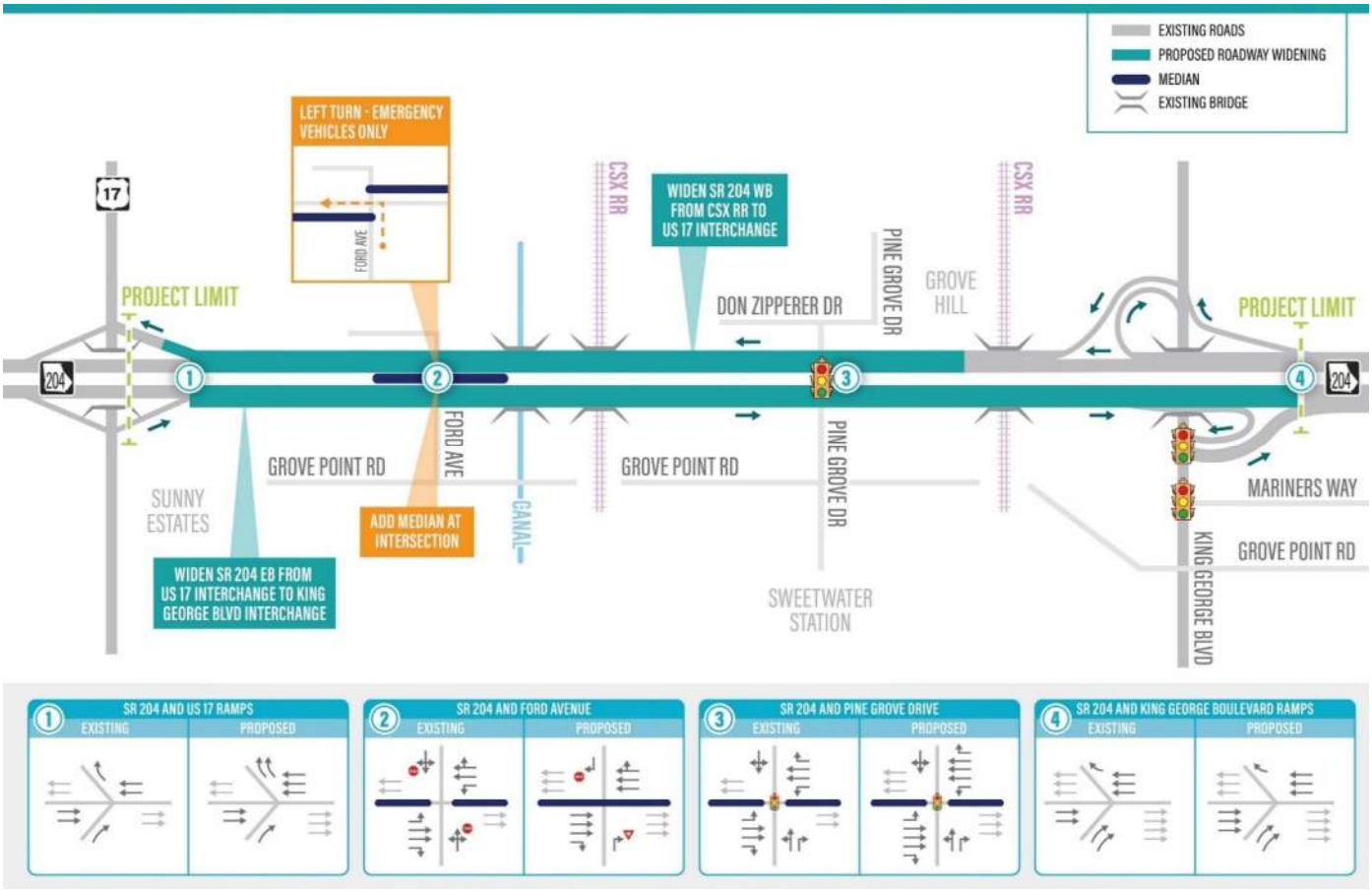
The purpose of Phase I is to evaluate all feasible alternatives that meet the project goals. Both short-term and long-term alternatives were analyzed. Information in this section is preliminary compared with Phase II.

Schematic Alternatives

Short-Term Alternatives

Alternative A

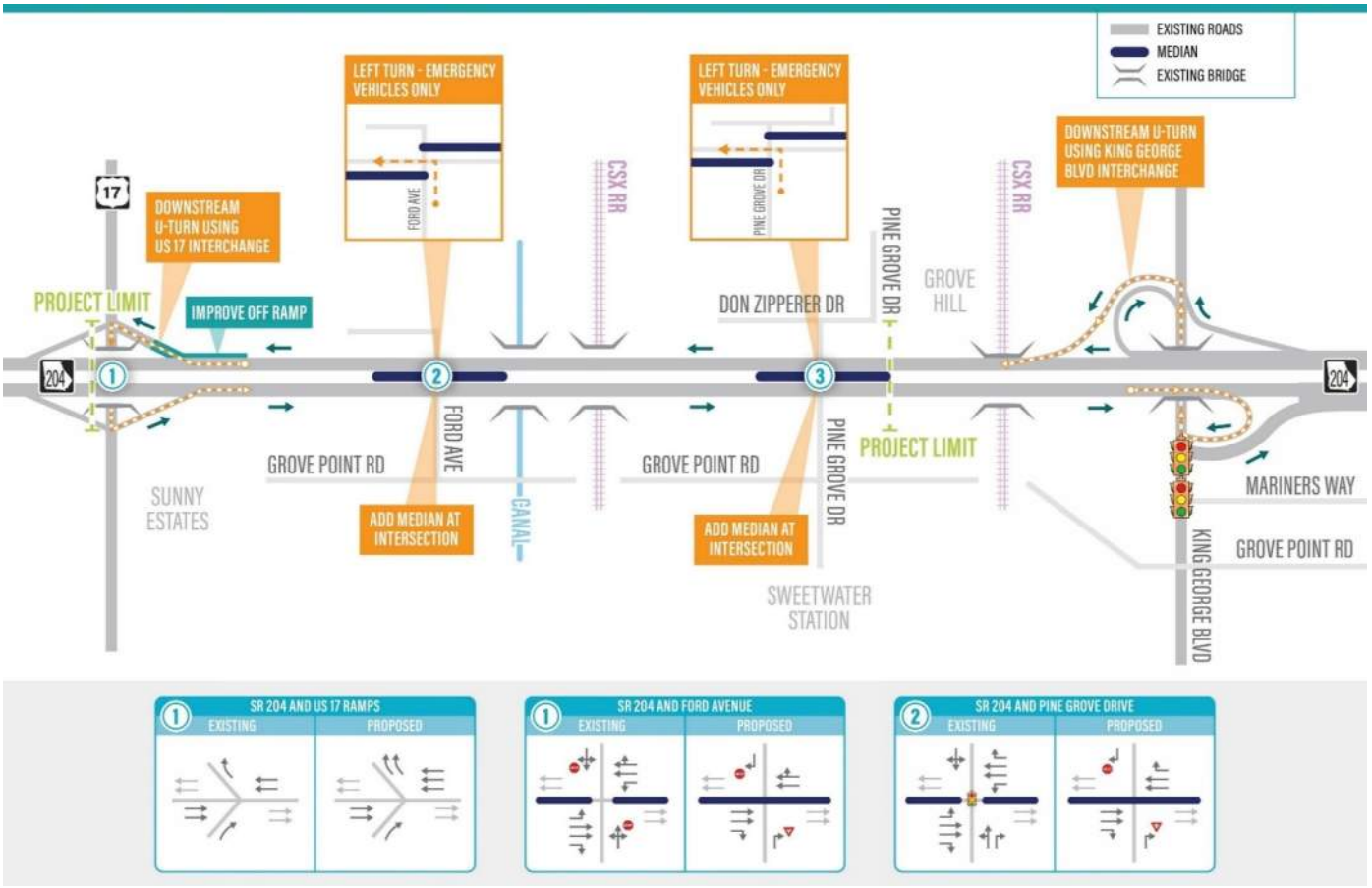
› Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd, closing median at Ford Ave, maintain signalized intersection at Pine Grove Dr



SR 204 Corridor Study

Alternative B

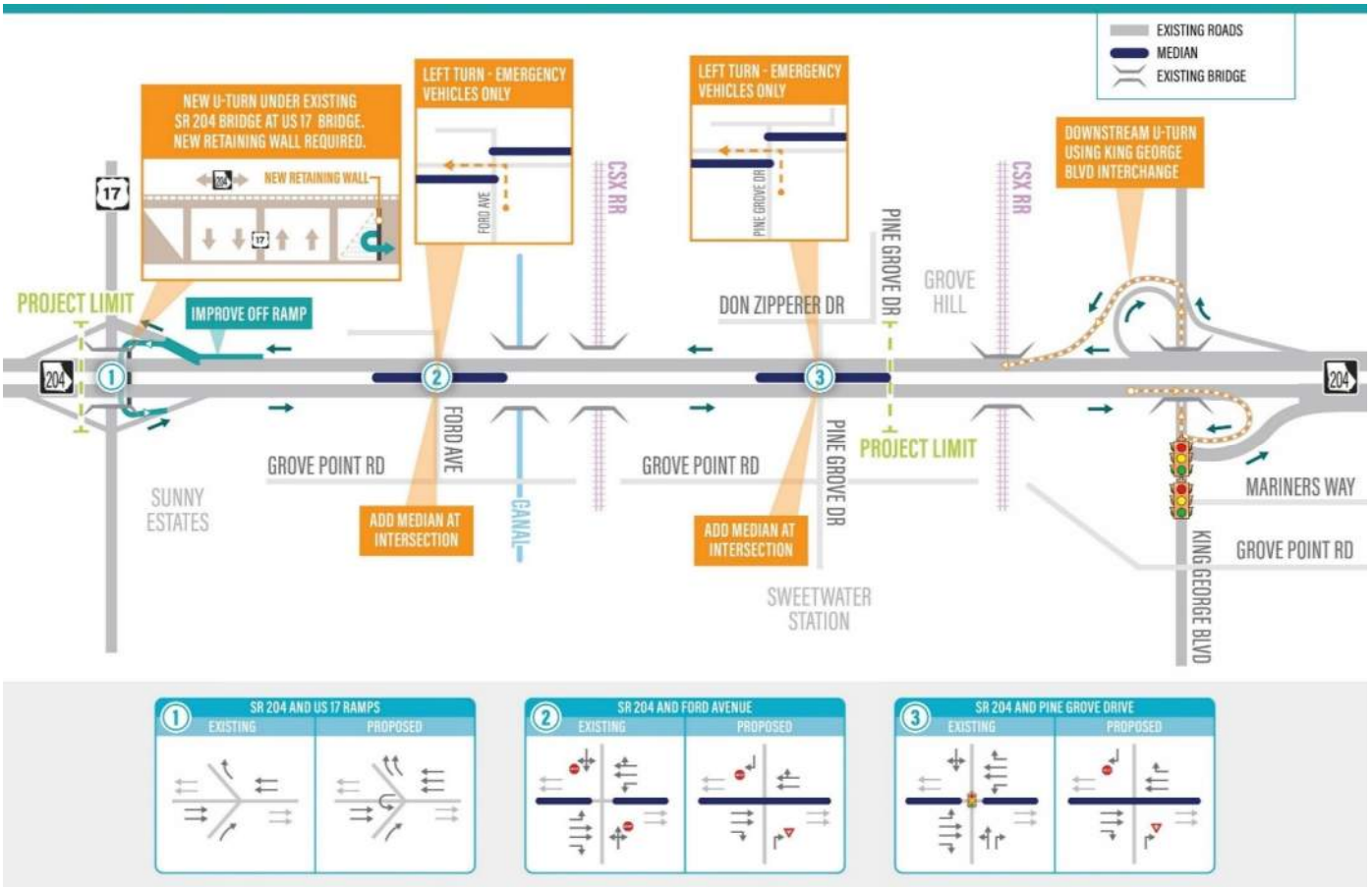
› Close median at Ford Ave and Pine Grove Dr; improve SR 204 WB off ramp to US 17



SR 204 Corridor Study

Alternative C

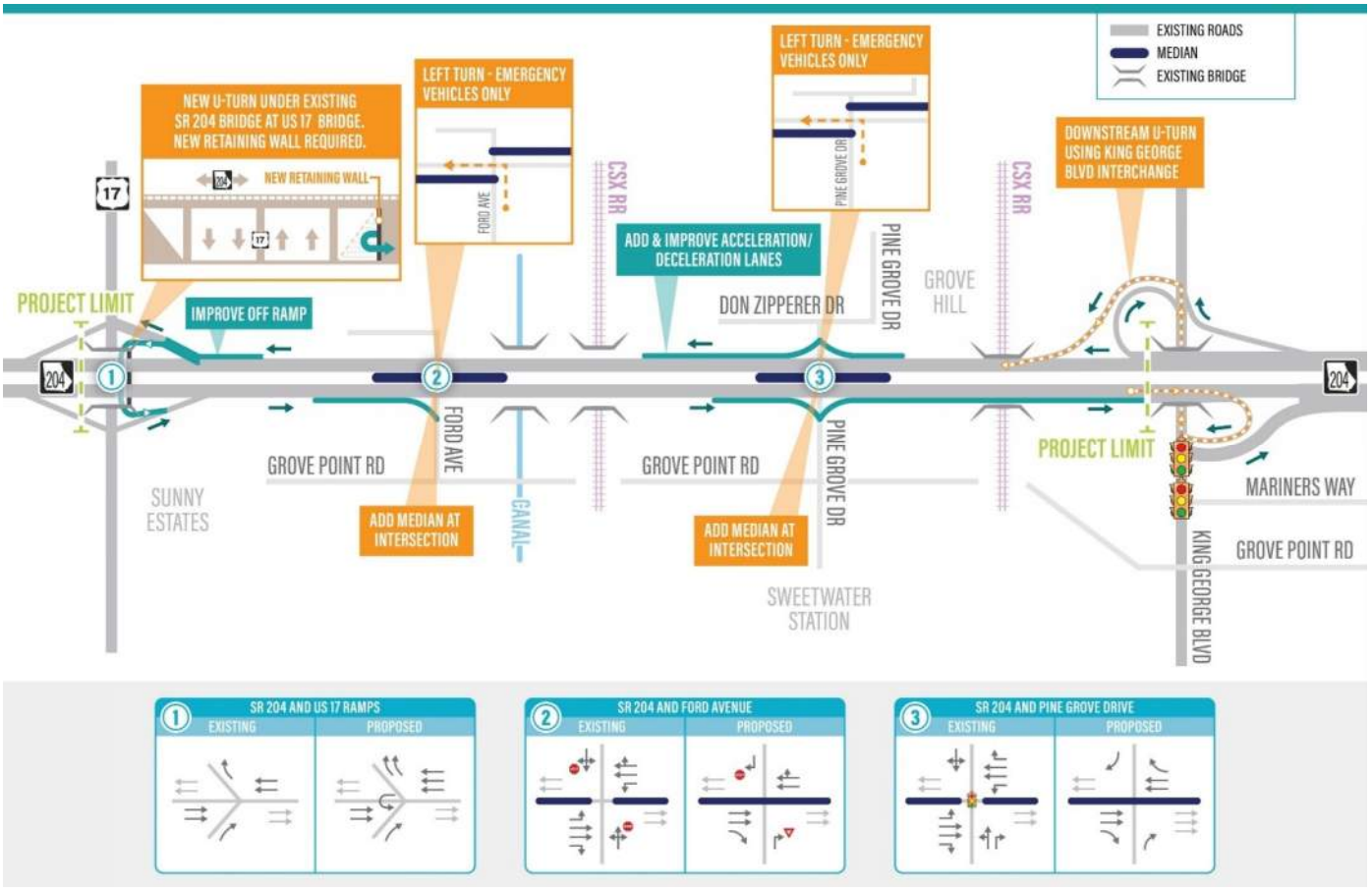
› Close median at Ford Ave and Pine Grove Dr; improve SR 204 WB off ramp to US 17; add U-turn underneath existing SR 204 bridge at US 17



SR 204 Corridor Study

Alternative D

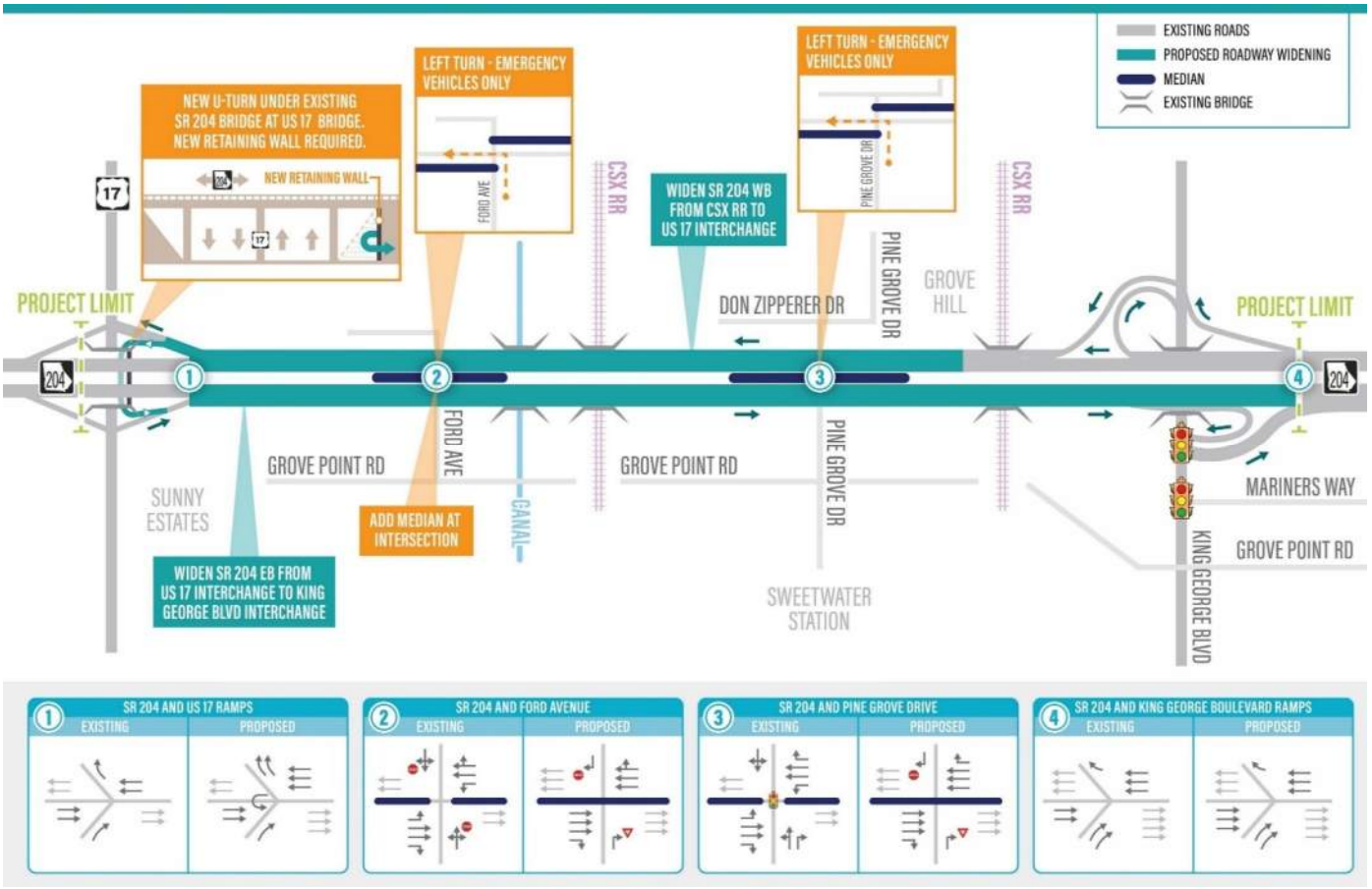
› Close median at Ford Ave and Pine Grove Dr; improve SR 204 WB off ramp to US 17; add U-turn underneath existing SR 204 bridge at US 17; add acceleration/deceleration lanes along SR 204 at Ford Ave and Pine Grove Dr



Long-Term Alternatives

Alternative J

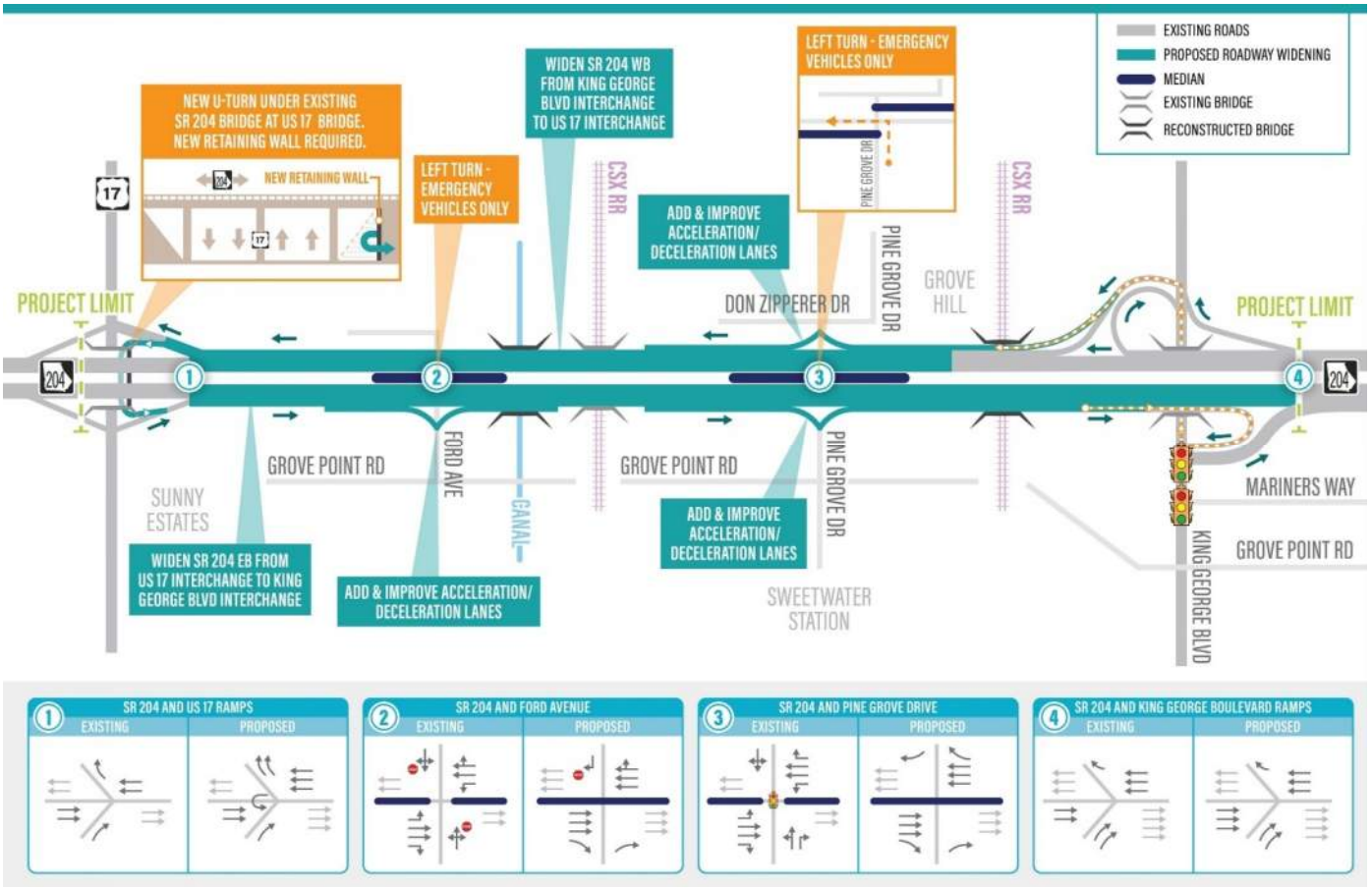
› Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd; close median at Ford Ave and Pine Grove Dr; add U-turn underneath existing SR 204 bridge at US 17



SR 204 Corridor Study

Alternative K

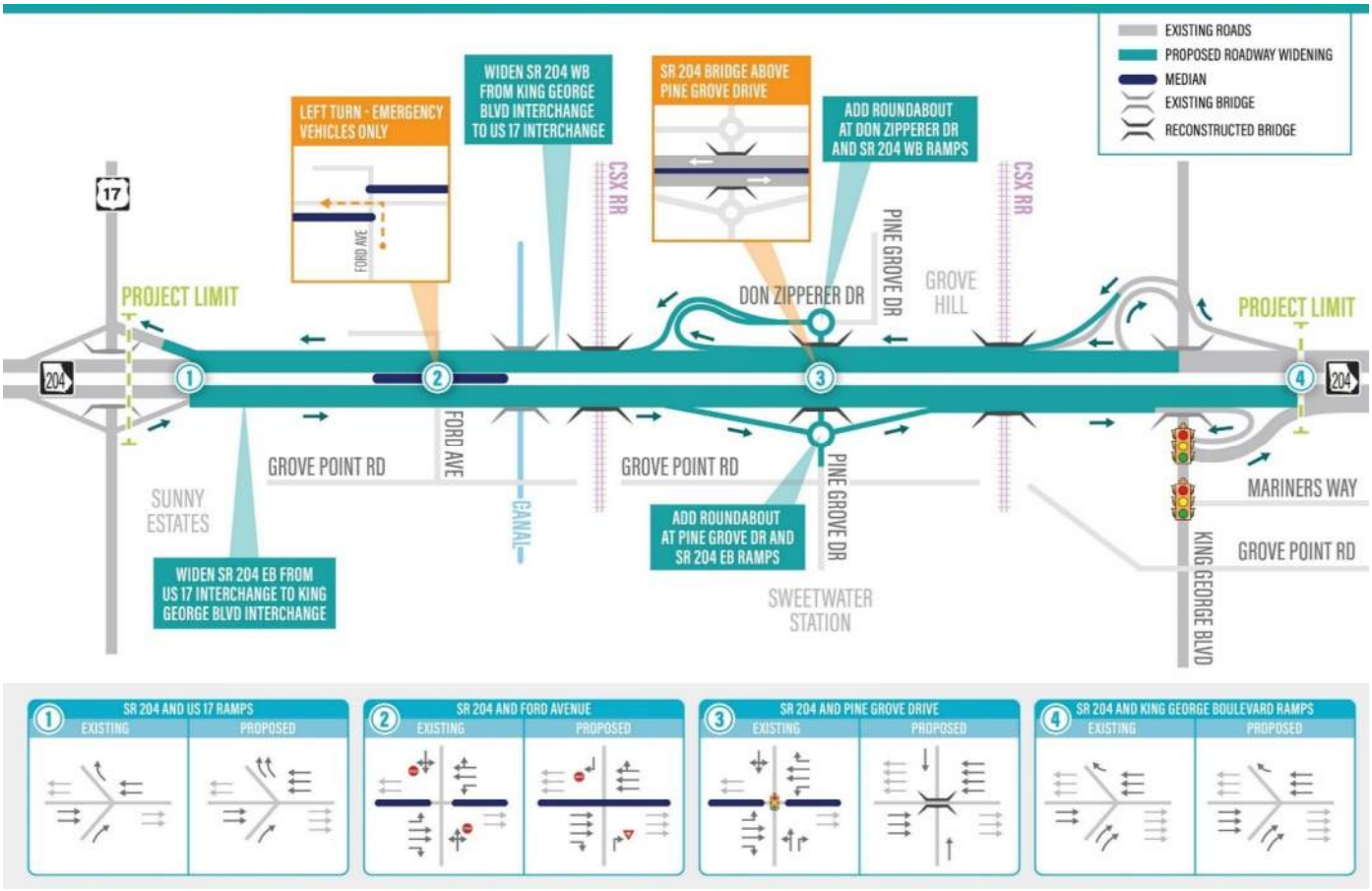
› Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd; close median and add acceleration/deceleration lanes along SR 204 at Ford Ave and Pine Grove Dr; add U-turn underneath existing SR 204 bridge at US 17



SR 204 Corridor Study

Alternative L

› Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd; grade separate Pine Grove Dr with ramps and roundabout terminals



Cost Comparison

Scoping-level cost estimates were assembled for these initial alternatives.

Scoping Cost Estimates – Preliminary

	SR 204 Alt A	SR 204 Alt B	SR 204 Alt C	SR 204 Alt D	SR 204 Alt J	SR 204 Alt K	SR 204 Alt L
CST	19,010,000	3,420,000	7,360,000	15,020,000	23,180,000	37,480,000	68,070,000
ROW	4,910,000	-	-	30,000	4,910,000	7,690,000	10,080,000
UTL	-	-	-	-	-	430,000	510,000
MTG	900,000	-	-	180,000	900,000	1,350,000	1,570,000
PE	3,670,000	720,000	1,570,000	3,210,000	4,520,000	6,900,000	8,940,000
CEI	1,910,000	350,000	740,000	1,510,000	2,320,000	3,750,000	6,810,000
Total Cost	**30,400,000**	**4,490,000**	**9,670,000**	**19,950,000**	**35,830,000**	**57,600,000**	**95,980,000**

Operational Analysis

Travel Time Analysis

Corridor Travel Times

SR 204 - Eastbound

Time	Alternative	Total Distance (miles)	Travel Time (min, AM)
Short-Term	No Build	2.7	4.9
	Alt A	2.7	3.4
	Alt B	2.7	3.4
	Alt C	2.7	3.3
	Alt D	2.7	3.3
Long-Term	No Build	2.7	6.1
	Alt J	2.7	3.5
	Alt K	2.7	3.5
	Alt L	2.7	3.4

SR 204 - Westbound

Time	Alternative	Total Distance (miles)	Travel Time (min, PM)
Short-Term	No Build	4.4	10.4
	Alt A	4.4	5.8
	Alt B	4.4	5.4
	Alt C	4.4	5.5
	Alt D	4.4	5.5
Long-Term	No Build	4.4	16.0
	Alt J	4.4	7.9
	Alt K	4.4	6.3
	Alt L	4.4	6.2

Ramp from US 17 to SR 204 - Eastbound

Time	Alternative	Total Distance (miles)	Travel Time (min, AM)
Short-Term	No Build	2.7	6.6
	Alt A	2.7	3.7
	Alt B	2.7	3.9
	Alt C	2.7	4.1
	Alt D	2.7	4.2
Long-Term	No Build	2.7	7.9
	Alt J	2.7	4.0
	Alt K	2.7	3.9
	Alt L	2.7	3.9

Ford Avenue Left Turns

Ford Ave - Westbound Left (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	No Build	N/A	3.8	10.3
	Alt A	US 17 Ramp Terminals	5.3	10.0
	Alt B	US 17 Ramp Terminals	5.3	9.7
	Alt C	US 17 U-Turn (new)	5.3	7.4
	Alt D	US 17 U-Turn (new)	5.3	7.4
Long-Term	No Build	N/A	3.8	16.5
	Alt J	US 17 U-Turn (new)	5.3	9.8
	Alt K	US 17 U-Turn (new)	5.3	8.4
	Alt L	US 17 Ramp Terminals	5.3	10.5

Ford Ave - Northbound Left (outbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	No Build	N/A	1.5	4.2
	Alt A	Pine Grove Dr	1.5	3.0
	Alt B	King George Blvd Ramp Terminals	3.3	5.2
	Alt C	King George Blvd Ramp Terminals	3.3	5.2
	Alt D	King George Blvd Ramp Terminals	3.3	5.1
Long-Term	No Build	N/A	1.5	4.6
	Alt J	King George Blvd Ramp Terminals	3.3	5.1
	Alt K	King George Blvd Ramp Terminals	3.3	5.0
	Alt L	Pine Grove Dr Ramp Terminals (new)	1.6	2.5

Pine Grove Drive (North) Left/Right Turns

Pine Grove Dr - Eastbound Left (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	No Build	N/A	1.5	3.9
	Alt A	N/A	1.5	3.2
	Alt B	King George Blvd Ramp Terminals	3.3	5.2
	Alt C	King George Blvd Ramp Terminals	3.3	5.2
	Alt D	King George Blvd Ramp Terminals	3.3	5.2
Long-Term	No Build	N/A	1.5	5.9
	Alt J	King George Blvd Ramp Terminals	3.3	5.1
	Alt K	King George Blvd Ramp Terminals	3.3	5.0
	Alt L	N/A	1.5	2.0

Pine Grove Dr - Southbound Left (outbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)	Travel Time (min, AM)
Short-Term	No Build	N/A	1.4	3.5	3.8
	Alt A	N/A	1.4	2.9	3.7
	Alt B	US 17 Ramp Terminals	4.4	8.6	8.6
	Alt C	US 17 U-Turn (new)	4.3	6.5	6.6
	Alt D	US 17 U-Turn (new)	4.3	5.9	6.6
Long-Term	No Build	N/A	1.4	3.3	3.3
	Alt J	US 17 U-Turn (new)	4.3	6.1	6.8
	Alt K	US 17 U-Turn (new)	4.3	6.1	6.5
	Alt L	N/A	1.4	2.0	2.2

Pine Grove Dr - Westbound Right (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	No Build	N/A	3.0	9.2
	Alt A	N/A	3.0	4.4
	Alt B	N/A	3.0	4.1
	Alt C	N/A	3.0	4.2
	Alt D	N/A	3.0	4.2
Long-Term	No Build	N/A	3.0	13.9
	Alt J	N/A	3.0	6.8
	Alt K	N/A	3.0	4.9
	Alt L	N/A	3.5	5.8

Pine Grove Dr - Westbound Left (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	3.0	10.0
	Alt A	N/A	3.0	6.9
	Alt B	US 17 Ramp Terminals	6.0	10.7
	Alt C	US 17 U-Turn (new)	6.0	8.3
	Alt D	US 17 U-Turn (new)	6.0	8.2
Long-Term	**No Build**	N/A	3.0	15.7
	Alt J	US 17 U-Turn (new)	6.0	10.6
	Alt K	US 17 U-Turn (new)	6.0	9.0
	Alt L	N/A	3.5	6.0

Pine Grove Dr - Northbound Left (outbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	1.5	4.2
	Alt A	N/A	1.5	3.0
	Alt B	King George Blvd Ramp Terminals	3.3	5.2
	Alt C	King George Blvd Ramp Terminals	3.3	5.2
	Alt D	King George Blvd Ramp Terminals	3.3	5.1
Long-Term	**No Build**	N/A	1.5	4.6
	Alt J	King George Blvd Ramp Terminals	3.3	5.1
	Alt K	King George Blvd Ramp Terminals	3.3	5.0
	Alt L	N/A	1.6	2.5

Other Alternatives Considered

Alternative Design Concept		Considerations
	Widening SR 204 to three lanes in both directions from the CSX railroad bridge west of Pine Grove Dr to the King George Blvd interchange ramps. Install new traffic signal at Pine Grove Dr.	The partial widening would provide less benefit compared with the proposed alternatives (widening US 17 to King George) and may increase crashes.
	Convert the SR 204 at Pine Grove Dr intersection to a signalized restricted crossing U-turn intersection (RCUT). This would allow left turns from SR 204 onto Pine Grove Rd but no left turns out.	The signalized intersection would continue to cause excess delay on SR 204 and would see a much smaller reduction in crashes than fully closing the median.
	Convert the SR 204 at Ford Ave intersection to an unsignalized restricted crossing U-turn intersection (RCUT). This would allow left turns from SR 204 onto Ford Ave but no left turns out.	The RCUT would provide some reduction in crashes, but much less than fully closing the median.
	Connect Grove Point Rd with Fountain Rd and US 17 to the west.	The extension would impact commercial properties, especially Keller's Flea Market. Travel times to and from Ford Ave would typically be longer than the proposed alternatives.
	Connect Grove Point Road from Ford Ave to Pine Grove Dr/Sweetwater Station Dr using a bridge over the CSX railroad while closing the median and removing Ford Ave access to SR 204.	Bridge and its approaches would be costly and cause excessive impacts to surrounding properties and would conflict with the electric transmission line. Travel times to/ from Ford Ave would typically be longer than the proposed alternatives.

	Connect Grove Point Road from Pine Grove Dr/ Sweet-water Station Dr to King George Blvd using a bridge over the CSX railroad while closing the median and removing the signal and Pine Grove Dr access to SR 204.	Bridge and its approaches would be costly and impactful to surrounding properties and the electric transmission line. Travel times to/from Pine Grove Dr/ Sweetwater Station Dr would typically be longer than the proposed alternatives.
	Connect Grove Point Road from Ford Ave to Pine Grove Dr/Sweetwater Station Dr using an at grade crossing of the CSX railroad while closing the median and removing Ford Ave access to SR 204.	An at grade railroad crossing risks collisions between vehicles and trains, leading to potential fatalities, injuries, and property damage. Travel times to/from Ford Ave would typically be longer than the proposed alternatives.
	Connect Grove Point Road from Pine Grove Dr/ Sweet-water Station Dr to King George Blvd using an at grade crossing of the CSX railroad while closing the median and removing the signal and Pine Grove Dr access to SR 204.	An at grade railroad crossing risks collisions between vehicles and trains, leading to potential fatalities, injuries, and property damage. Travel times to/from Pine Grove Dr/Sweetwater Station Dr would typically be longer than the proposed alternatives.
	In conjunction with alternatives that close the Pine Grove Dr median opening, connect Grove Point Rd to Don Zipperer Dr with a new roadway underneath the SR 204 bridge over the western branch of CSX railroad.	Cost of constructing the new roadway and impacts to commercial properties likely outweigh benefits of maintaining a direct connection between the Grove Hill neighborhood and Sweetwater Station and other properties south of SR 204.
	Connect Lake Shore Drive at the rear of the Grove Hill neighborhood to King George Blvd using an at grade crossing of the CSX railroad while closing the median and removing the signal and Grove Hill access to SR 204.	An at grade railroad crossing risks collisions between vehicles and trains, leading to potential fatalities, injuries, and property damage. Travel times to/from Grove Hill would typically be longer than the proposed alternatives.
	Connect Lake Shore Drive at the rear of the Grove Hill neighborhood to King George Blvd using a bridge over the CSX railroad while closing the median and removing the signal and Grove Hill access to SR 204.	Bridge and its approaches would be costly and impactful to surrounding residences and commercial properties. It would require the acquisition of at least three residential lots and displace at least two existing property owners. Travel times to/from Grove Hill would typically be longer than the proposed alternatives.

Summary

Alternative comparison matrices were created for both short-term and long-term alternatives.

Short-Term Alternatives Comparison – Preliminary

Alternatives	A	B	C	D
Safety Benefit	Low	Medium	Medium	High
Traffic Operations*				
Overall Delay	▼ Medium Reduction	▼ Medium Reduction	▼ Medium Reduction	▼ Medium Reduction
SR 204 Travel Time	▼ Medium Reduction	▼ Medium Reduction	▼ Medium Reduction	▼ Medium Reduction
Ford Ave Travel Time	▲ Small Increase	▲ Small Increase	▲ Small Increase	▲ Small Increase
Pine Grove Travel Time	▼ Small Reduction	▲ Medium Increase	▲ Small Increase	▲ Small Increase
Environmental Impacts	Medium	Small	Small	Small
Community Impact	Small	Small	Small	Small
Residential and Commercial Displacements	None	None	None	None
Cost**	$30,000,000	$4,500,000	$9,700,000	$20,000,000

*Compared with Design Year No Build Conditions in 2030

**Cost is in today's dollars - does not include construction inflation

Long-Term Alternatives Comparison – Preliminary

Alternatives	D	K	L
Safety Benefit	Medium	High	High
Traffic Operations*			
Overall Delay	▼ Large Reduction	▼ Large Reduction	▼ Large Reduction
SR 204 Travel Time	▼ Large Reduction	▼ Large Reduction	▼ Large Reduction
Ford Ave Travel Time	▼ Medium Reduction	▼ Medium Reduction	▼ Medium Reduction
Pine Grove Travel Time	▼ Medium Reduction	▼ Medium Reduction	▼ Large Reduction
Environmental Impacts	Medium	High	High
Community Impact	Small	Medium	Medium
Residential and Commercial Displacements	None	None	5 to 7
Cost**	$36,000,000	$58,000,000	$96,000,000

*Compared with Design Year No Build Conditions in 2050

**Cost is in today's dollars - does not include construction inflation

Phase II

Initial Recommendations

The initial recommendations for the SR 204 Corridor Study are based on the Phase I study analysis, public input from PIOH #1 and an alternatives workshop with:

- Chatham County Department of Engineering
- Coastal Region (CORE) Metropolitan Planning Organization (MPO)
- GDOT Traffic Operations
- GDOT Office of Planning
- GDOT District 5

Short-Term Alternatives

The following short-term alternatives are eliminated from consideration:

- Alternative A: Does not reduce crash frequency and severity. Leaving the signal at Pine Grove Dr will cause increasing congestion as traffic volumes increase. Less desirable access to Ford Ave than Alternatives B, C and D.
- Alternative B: Does not reduce crash frequency and severity as much as Alternative D. Less desirable access to Ford Ave and Pine Grove Dr than Alternatives C and D.
- Alternative C: Does not reduce crash frequency and severity as much as Alternative D. Less desirable access to Ford Ave and Pine Grove Dr than Alternative D.

The following short-term alternative is moved forward for further analysis:

- Alternative D: Close median at Ford Ave and Pine Grove Dr; improve SR 204 WB off ramp to US 17; add U-turn underneath existing SR 204 bridge at US 17; add acceleration/deceleration lanes along SR 204 at Ford Ave and Pine Grove Dr.

Long-Term Alternatives

The following long-term alternative is eliminated from consideration:

- Alternative J: Does not reduce crash frequency and severity as much as Alternatives K and L. Less desirable access to Ford Ave and Pine Grove Dr than Alternatives K and L.

The following long-term alternatives are moved forward for further analysis:

- Alternative K: Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd; close median and add acceleration/ deceleration lanes along SR 204 at Ford Ave and Pine Grove Dr; add U-turn underneath existing SR 204 bridge at US 17.
- Alternative L: Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd; grade separate Pine Grove Dr with ramps and roundabout terminals; add U-turn underneath existing SR 204 bridge at US 17.

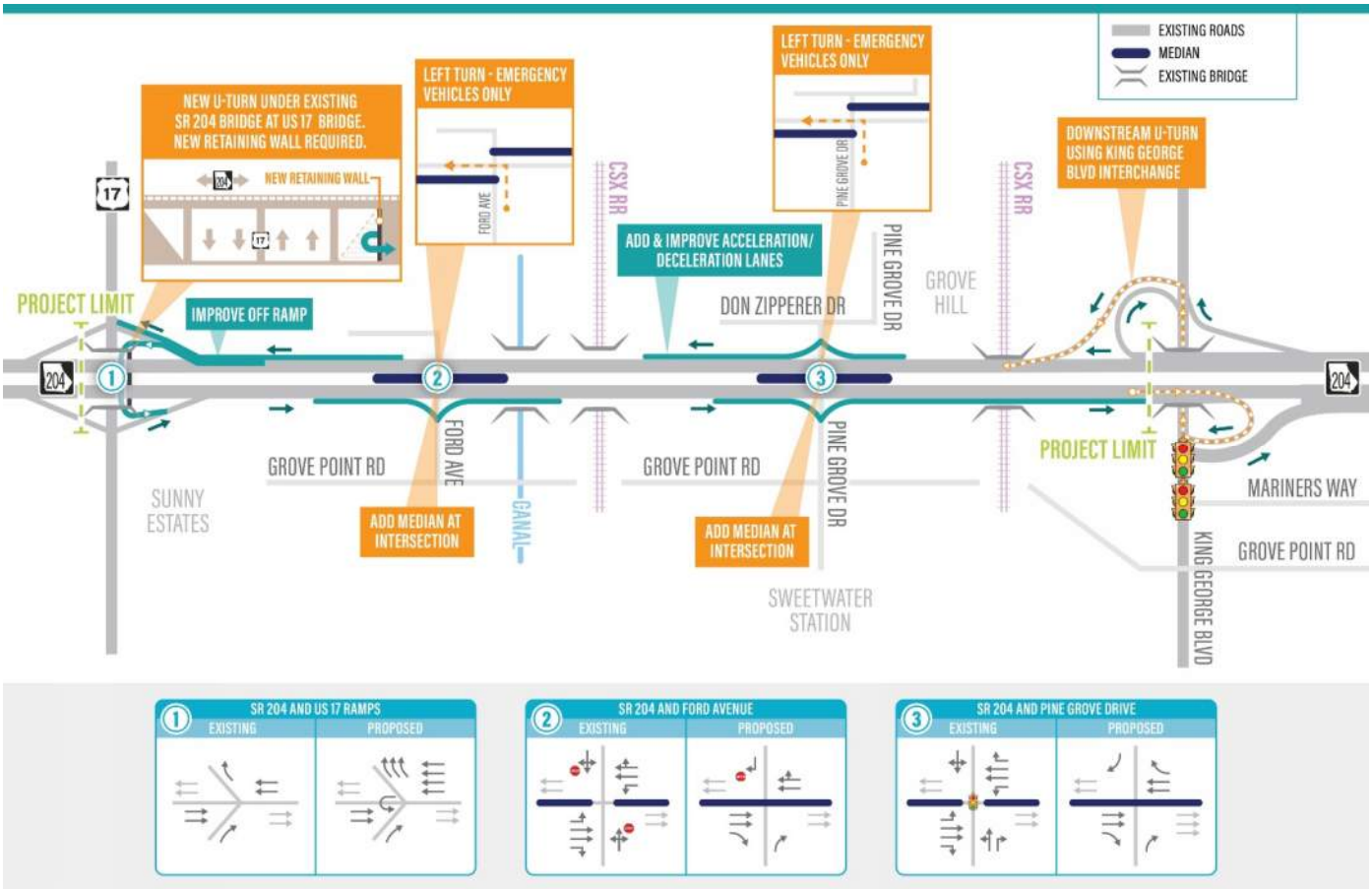
Conceptual Alternatives

The following alternative schematics are developed into conceptual drawings and included in Appendix B.

Short-Term Alternative

Alternative D

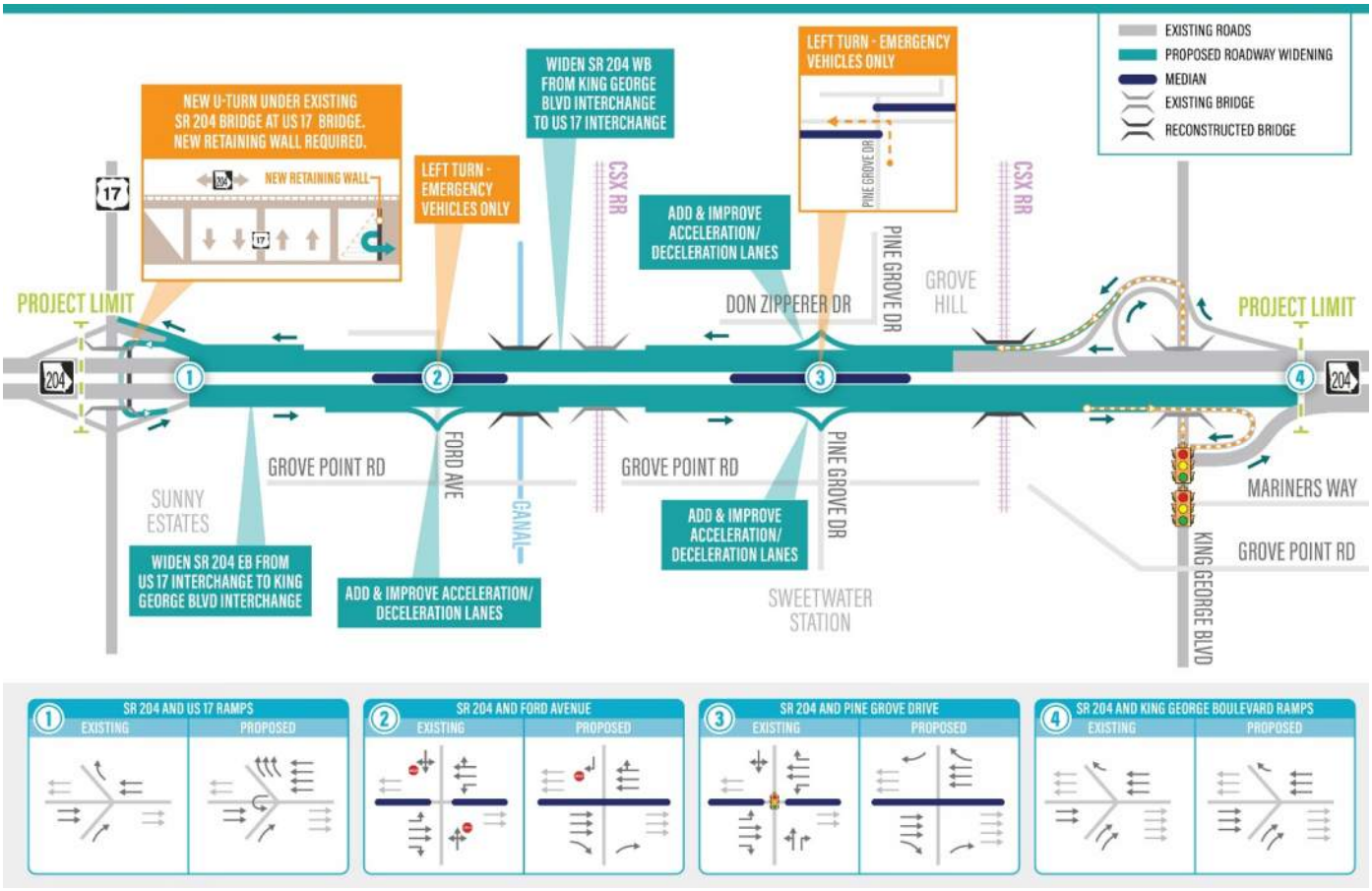
› Close median at Ford Ave and Pine Grove Dr; improve SR 204 WB off ramp to US 17; add U-turn underneath existing SR 204 bridge at US 17; add acceleration/deceleration lanes along SR 204 at Ford Ave and Pine Grove Dr.



Long-Term Alternatives

Alternative K

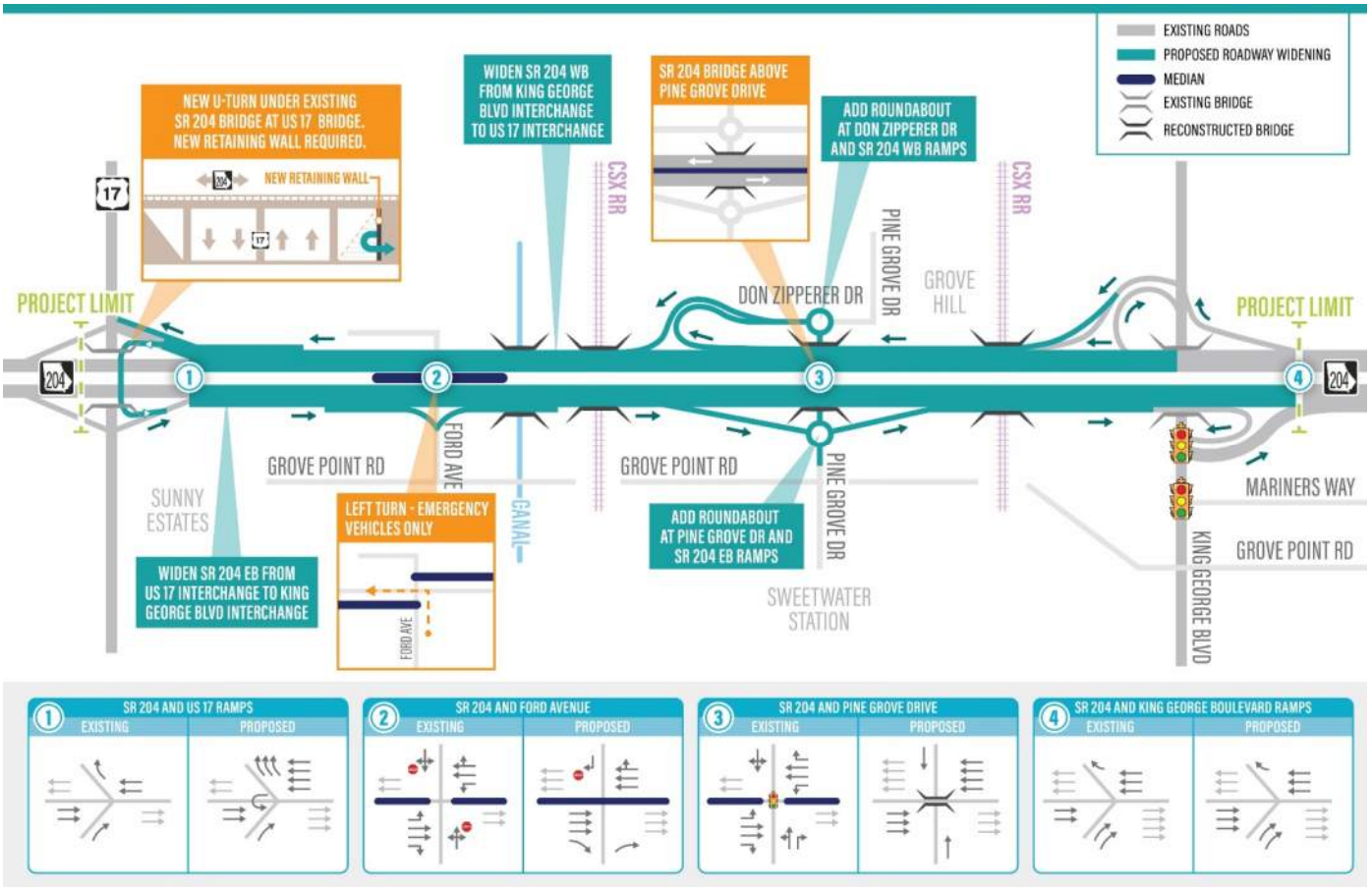
› Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd; close median and add acceleration/ deceleration lanes along SR 204 at Ford Ave and Pine Grove Dr; add U-turn underneath existing SR 204 bridge at US 17.



SR 204 Corridor Study

Alternative L

› Widen SR 204 from 4 to 6 lanes between US 17 and King George Blvd; grade separate Pine Grove Dr with ramps and roundabout terminals; add U-turn underneath existing SR 204 bridge at US 17.



Cost Comparison

Concept level cost estimates are assembled for the following alternatives.

Concept Cost Estimates

	SR 204 Alt D	SR 204 Alt K	SR 204 Alt L
CST	$16,050,000	$45,870,000	$101,020,000
ROW	$410,000	$7,690,000	$10,080,000
UTL	$280,000	$400,000	$480,000
MTG	$180,000	$1,350,000	$1,570,000
PE	$3,420,000	$7,680,000	$11,590,000
CEI	$1,610,000	$4,590,000	$10,110,000
Total Cost	**$21,950,000**	**$67,580,000**	**$134,850,000**

Operational Analysis

Travel Time Analysis

Corridor Travel Times

SR 204 - Eastbound

Time	Alternative	Total Distance (miles)	Travel Time (min, AM)
Short-Term	**No Build**	2.7	4.6
	Alt D	2.7	3.3
Long-Term	**No Build**	2.7	6.2
	Alt K	2.7	3.2
	Alt L	2.7	3.2

SR 204 - Westbound

Time	Alternative	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	4.4	9.9
	Alt D	4.4	5.4
Long-Term	**No Build**	4.4	19.1
	Alt K	4.4	7.1
	Alt L	4.4	7.0

Ramp from US 17 to SR 204 - Eastbound

Time	Alternative	Total Distance (miles)	Travel Time (min, AM)
Short-Term	**No Build**	2.7	6.6
	Alt D	2.7	4.4
Long-Term	**No Build**	2.7	7.9
	Alt K	2.7	5.3
	Alt L	2.7	5.2

Ford Ave Left Turns

Ford Ave - Westbound Left (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	3.8	10.0
	Alt D	US 17 U-Turn (new)	5.2	7.3
Long-Term	**No Build**	N/A	3.8	17.8
	Alt K	US 17 U-Turn (new)	5.2	10.2
	Alt L	US 17 U-Turn (new)	5.2	9.4

Ford Ave - Northbound Left (outbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	0.8	1.5
	Alt D	King George Blvd Ramp Terminals	4.1	6.0
Long-Term	**No Build**	N/A	0.8	1.5
	Alt K	King George Blvd Ramp Terminals	4.0	6.0
	Alt L	Pine Grove Dr Ramp Terminals (new)	2.4	3.7

Pine Grove Dr (north) Left/Right Turns

Pine Grove Dr - Eastbound Left (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	1.5	4.3
	Alt D	King George Blvd Ramp Terminals	3.3	5.2
Long-Term	**No Build**	N/A	1.5	4.7
	Alt K	King George Blvd Ramp Terminals	3.3	5.1
	Alt L	N/A	1.5	2.1

Pine Grove Dr - Southbound Left (outbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)	Travel Time (min, AM)
Short-Term	**No Build**	N/A	1.4	3.7	3.7
	Alt D	US 17 U-Turn (new)	4.3	6.0	6.5
Long-Term	**No Build**	N/A	1.4	3.4	3.3
	Alt K	US 17 U-Turn (new)	4.3	7.5	7.0
	Alt L	N/A	1.4	2.0	2.1

Pine Grove Dr - Westbound Right (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	3.0	8.0
	Alt D	N/A	3.0	4.1
Long-Term	**No Build**	N/A	3.0	18.3
	Alt K	N/A	3.0	6.0
	Alt L	N/A	3.5	6.8

Pine Grove Dr (south) Left Turns

Pine Grove Dr - Westbound Left (inbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	3.0	9.5
	Alt D	US 17 U-Turn (new)	5.9	8.2
Long-Term	**No Build**	N/A	3.0	19.1
	Alt K	US 17 U-Turn (new)	5.9	11.1
	Alt L	N/A	3.5	6.8

Pine Grove Dr - Northbound Left (outbound)

Time	Alternative	U-Turn Location	Total Distance (miles)	Travel Time (min, PM)
Short-Term	**No Build**	N/A	1.5	4.3
	Alt D	King George Blvd Ramp Terminals	3.3	5.1
Long-Term	**No Build**	N/A	1.5	4.7
	Alt K	King George Blvd Ramp Terminals	3.3	5.1
	Alt L	N/A	1.6	2.6

Summary

Short-Term and Long-Term Alternatives Comparison

Alternatives	**D**	**K**	**L**
Safety Benefit	High	High	High
Traffic Operations*			
Overall Delay	▼ Medium Reduction	▼ Large Reduction	▼ Large Reduction
SR 204 Travel Time	▼ Medium Reduction	▼ Large Reduction	▼ Large Reduction
Ford Ave Travel Time	▲ Small Increase	▼ Small Reduction	▼ Medium Reduction
Pine Grove Travel Time	▲ Small Increase	▼ Medium Reduction	▼ Large Reduction
Environmental Impacts	Small	High	High
Community Impact	Small	Medium	Medium
Residential and Commercial Displacements	None	None	5 to 7
Cost**	$22,000,000	$68,000,000	$135,000,000

*Alt D is Compared with Design Year No Build Conditions in 2030, Alts K and L are Compared with Design Year No Build Conditions in 2050

**Cost is in today's dollars - does not include construction inflation

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Public Involvement

Public Information Open House (PIOH) #1

PIOH #1 Summary

Date of the In Person PIOH Number of Attendees	10/29/2024 94 people	End of Comment Period on Virtual Public Meeting Website	11/26/24
Number of Postcards Mailed Out	4,822		
List of Officials Attending (list name and title)	Commissioner Tanya Milton Commissioner Aaron Whitely City of Savannah Traffic Engineer Steve Henry		
Number of In-Person Comments Received	8 comment cards, 3 Court Reporter Comments Taken		
Current Number of Online Comments Received Concerns: How did you hear about the meeting?	17 post-PIOH, 6 pre-PIOH Concerns: safety, high speeds, traffic congestion, delays, property impacts Some concern over removing traffic signal at Pine Grove Dr, others want it removed Requested acceleration/deceleration lanes Newspaper 1 Signs 1 County Website 0 Word of Mouth 1 Social Media 2 Postcard 2 Other 2		

Public Information Open House (PIOH) #2

PIOH #2 Summary

Date of the In Person PIOH Number of Attendees	8/19/2025 64 people	End of Comment Period on Virtual Public Meeting Website	9/19/2025
Number of Postcards Mailed Out	1,452		
List of Officials Attending (list name and title)	Joseph Capello (GDOT) Commissioner Tanya Milton		
Number of In-Person Comments Received	9		
Current Number of Online Comments Received	10 post-PIOH, 3 pre-PIOH		
Concerns:	Alternative D: Concerns with the capacity of the off ramp from 204 to 17 Alternatives fail to address the issue of Capacity at US 17 exit to SR 204 Alternative K: makes the most sense Alternative L: Cost-Prohibitive Closing Pine Grove interchange will inconvenience residents by adding 2 miles/trip and potentially an additional 30 minutes at peak hours. New Interchange needed at Pine Grove Veterans Parkway should be widened to 4 lanes and extended to I-95 with a Peach Pass Lane Noise Impacts on Don Zipper Drive and Wimbledon Drive Request Noise Abatement for Don Zipper Drive Project Completion Time Excessive Speed on Sr 204 Fire Station #15 Response Times		
How did you hear about the meeting?	Newspaper Billboard Signs County Website Word of Mouth Social Media Postcard Other		

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Final Recommendations

The final recommendations for the SR 204 Corridor Study are based on study analysis and feedback from and discussions with the following stakeholders:

- Chatham County Commissioners Tanya Milton and Aaron Whitely
- Chatham County Department of Engineering
- City of Savannah
- Coastal Region (CORE) Metropolitan Planning Organization (MPO)
- GDOT Office of Planning
- GDOT District 5
- Chatham County and City of Savannah Emergency Services
- Public

It is recommended to move ahead with design and programming of short-term Alternative D. This project will close the median at Ford Ave and Pine Grove Dr; improve the SR 204 westbound off ramp to US 17; add a U-turn underneath the existing SR 204 bridge at US 17; and add acceleration/ deceleration lanes along SR 204 at Ford Ave and Pine Grove Dr. The project will also add reasonable short-term improvements to SR 25/US 17 that help improve traffic flow near the SR 204 ramp terminals. This project meets the corridor study goals of reducing congestion, minimizing crash frequency and severity, and maintaining reasonable access for the residents living along the corridor.

As traffic continues to grow along the SR 204 Corridor, it is recommended to evaluate long-term Alternatives K and L to provide needed capacity upgrades in the future.

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Appendices

A. Existing and No-Build Operational & Safety Analysis

B. Conceptual Drawings

- B1. Alternative D
- B2. Alternative K
- B3. Alternative L

C. Presentations

- C1. CORE MPO TCC and Board Meetings 8/1/2024 and 8/7/2024
- C2. CORE MPO TCC and Board Meetings 4/17/2025 and 4/23/2025

D. Public Involvement Plan and Materials

- D1. Public Involvement Plan
- D2. Public Information Open House (PIOH) #1
  - D2a. Display Boards
  - D2b. Handout
  - D2c. Responses to Comments Letter
- D3. Public Information Open House (PIOH) #2
  - D3a. Display Boards
  - D3b. Handout
  - D3c. Responses to Comments Letter

TRAFFIC ANALYSIS

SR 204 Corridor Study

Existing & No-Build Operational & Safety Analysis

PREPARED FOR

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JULY 2024

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Introduction

Project Background & Study Area

The purpose of this project is to analyze several short-term and long-term alternatives to address operational and safety concerns along SR 204 in Chatham County, Georgia.

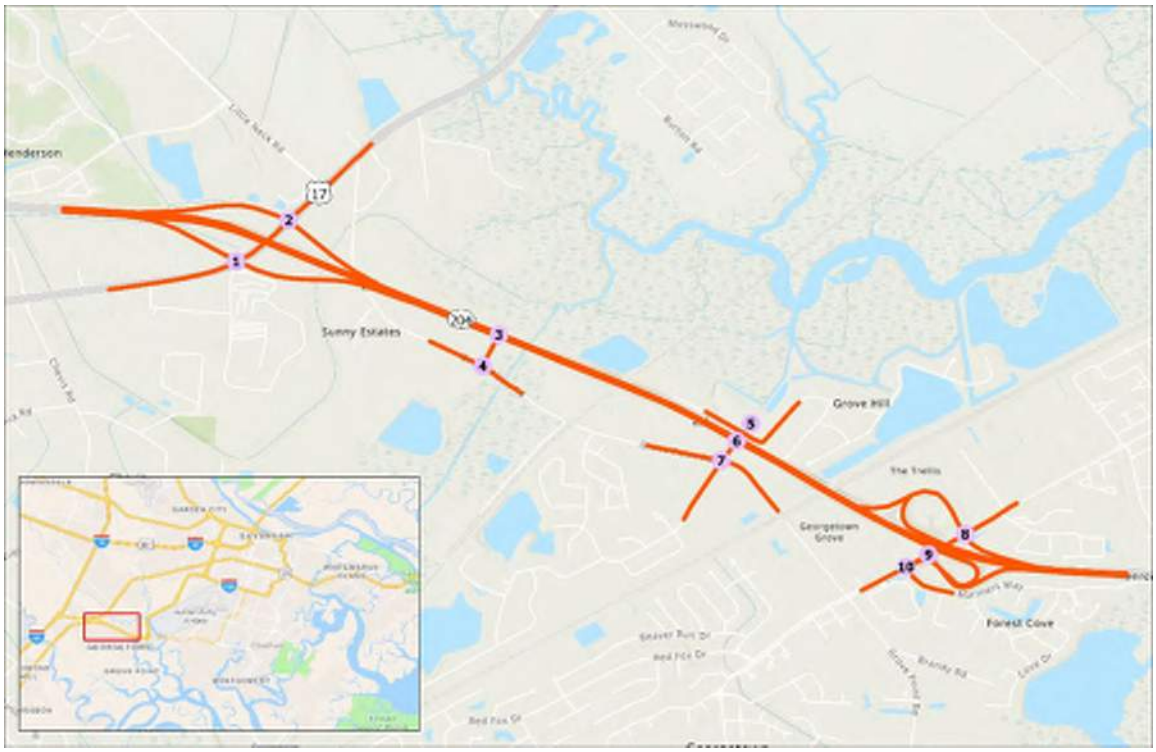
The project study area is along SR 204, from west of US 17 to east of King George Blvd, within the community of Georgetown. The connecting roadways of US 17, Ford Ave, Grove Point Rd, Pine Grove Dr, Don Zipperer Dr, Sweetwater Station Dr, King George Blvd, and Mariners Way were included in the analysis.

The intersections within the study area are listed below:

1. US 17 & SR 204 EB Ramps
2. US 17 & SR 204 WB Ramps
3. SR 204 & Ford Ave
4. Ford Ave & Grove Point Rd
5. Pine Grove Dr & Don Zipperer Dr
6. SR 204 & Pine Grove Dr
7. Pine Grove Dr & Grove Point Rd
8. King George Blvd & SR 204 WB Ramps
9. King George Blvd & SR 204 EB Ramps
10. King George Blvd & Mariners Way

A map of the study area is shown below in **Figure 1**.

Figure 1. SR 204 Corridor Study Area



Data Collection

Traffic Volumes

Traffic volume data collection occurred in November 2023. 6-hour turning movement counts (6-9 AM, 3-6 PM) were collected on November 30 at the study intersections. 48-hour classification counts were collected on November 29-30 along each roadway segment. Raw traffic counts can be found in **Appendix A**.

Travel Times

Travel time data was obtained from the Regional Integrated Transportation Information System (RITIS) platform. Probe data, from the data vendor HERE, was downloaded from RITIS and averaged for all Tuesdays, Wednesdays, and Thursdays in the month of October 2023. October was selected because it has no major holidays that would influence traffic. Eastbound and westbound travel times were collected along SR 204, from just west of the US 17 ramps to the bridge over King George Blvd, as shown in **Figure 2** below. **Table 1** presents the collected travel times from RITIS.

Figure 2. RITIS Travel Time Segments

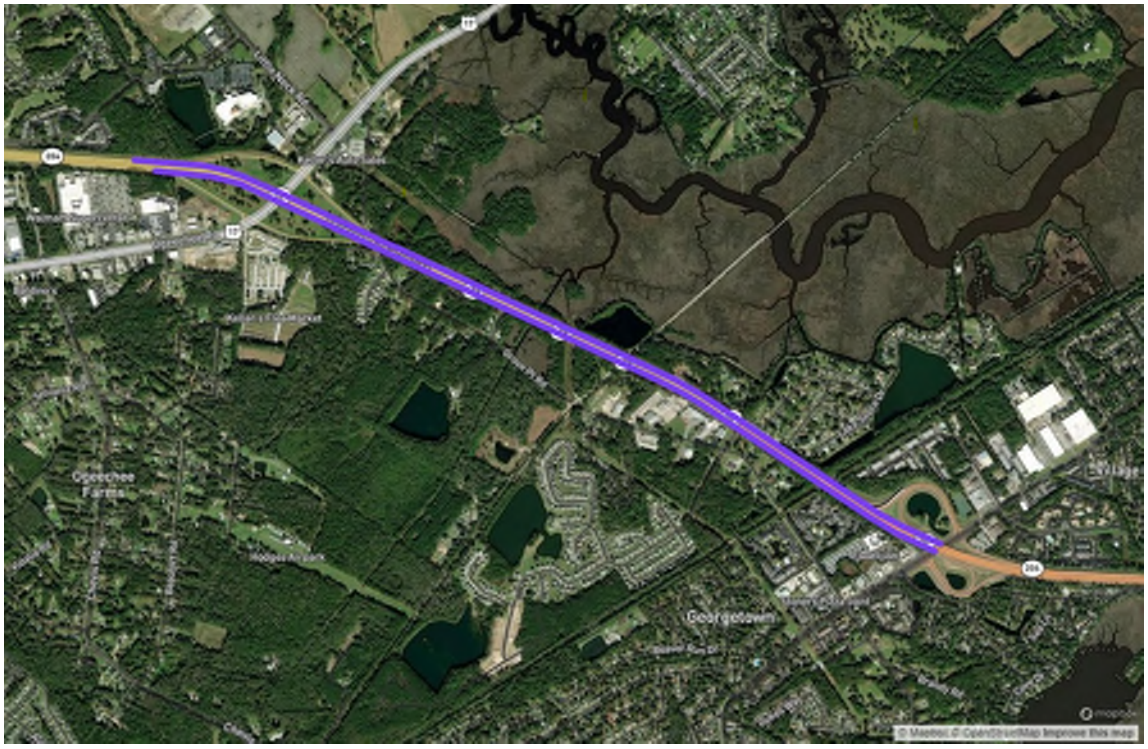


Table 1. Collected Travel Times

Direction	AM Peak	PM Peak
SR 204 Eastbound	4.6 min	2.9 min
SR 204 Westbound	2.6 min	4.0 min

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Volume Development

Existing traffic volumes were developed, based on the collected traffic counts. The volume development process followed guidance from GDOT's *Design Traffic Forecasting Manual*. The volume development calculations can be seen in **Appendix B** and the traffic diagrams are presented in **Appendix C**.

Average Annual Daily Traffic

The Average Annual Daily Traffic (AADT) was calculated for each of the roadway segments within the study area using the 48-hour classification tube counts. Monthly and daily traffic factors, based on the collection dates, were applied to the raw data counts. The resulting AADT was then rounded to the nearest 25 vehicles for each segment.

Traffic diagrams were created by applying a proportion of the turning movement counts (TMCs) to each AADT segment. The resulting AADT movements were then balanced between intersections.

Design Hourly Volumes

Based on the tube counts for the study area, the AM and PM peak hours were determined to be 7:15-8:15 AM and 4:45-5:45 PM.

The Design Hourly Volumes (DHVs) were calculated for each peak hour in a similar manner as the AADTs, with the additional step of calculating and applying K- and D- factors. K-factors represent the proportion of the peak hour volume, compared to the daily volume along a roadway segment. D-factors represent the proportion of the peak hour volume in the peak direction of travel. The directional DHVs could then be calculated as the AADT multiplied by the K-factor and D-factor. The resulting DHV was then rounded to the nearest 5 vehicles for each segment.

Traffic diagrams were similarly created by applying the proportion of the AM or PM TMC to each directional DHV. The resulting DHV movements were then balanced between intersections.

Truck Percentages

Truck percentages were calculated from the classification counts for the peak hours and the daily average. Single Unit (FHWA Classifications 4-7) and Combination Unit (FHWA Classifications 8-13) are shown in the volume development calculations (**Appendix B**) and traffic diagrams (**Appendix C**).

Note that classification errors occurred on Ford Ave, between SR 204 and Grove Point Rd, and on King George Blvd north of SR 204. In these areas, passenger cars were misclassified as single-unit trucks, which can occur in congested areas if vehicles stop or move very slowly over the data collection tubes. These truck percentages were replaced with those of adjacent segments in the traffic analysis.

Growth Rate

A project area growth rate was calculated for future year scenarios, based on an average of population, employment, travel demand model, and historical traffic data.

Historical population and employment data was obtained for Chatham from the U.S. Census Bureau. The census data is presented for each year from 2012-2022 in **Table 2**. Average growth rates of 1.0% and 1.7% were calculated for historical population and employment data, respectively.

Table 2. Chatham County Census Data

Year	Population	Employment
2012	266,344	132,612
2013	271,102	134,825
2014	275,303	137,930
2015	279,290	141,706
2016	282,613	146,458
2017	285,506	148,205
2018	287,049	150,275
2019	288,496	152,956
2020	289,649	152,536
2021	294,815	155,074
2022	296,266	155,714
Average Growth Rate	**1.0%**	**1.7%**

Source: U.S. Census Bureau, Tables DP05 & DP03, American Community Survey 5-Year Estimates

Population projections for Chatham County were obtained from the Governor's Office of Planning & Budget. A base year of 2022, along with projections for 2030, 2040, and 2050 are shown in **Table 3**. An average growth rate of 0.7% was calculated.

Table 3. Chatham County Population Projections

Year	Population
2022	299,900
2030	322,799
2040	342,865
2050	361,274
Average Growth Rate	**0.7%**

Source: Governor's Office of Planning & Budget, County Residential Population

Employment projections for the Coastal Georgia Local Workforce Development Area were obtained from the Georgia Department of Labor. A base year of 2020 and projections for year 2030 are shown in **Table 4**. An average growth rate of 1.6% was calculated.

Table 4. Coastal Georgia Employment Projections

Year	Employment
2020	287,620
2030	336,250
Average Growth Rate	**1.6%**

Source: Georgia Department of Labor, Long-Range Employment Projections

The 2015 and 2045 CORE Travel Demand Model (TDM) daily volumes for links within the study area are presented in **Table 5**. A weighted average growth rate of 0.5% was calculated.

Table 5. CORE Travel Demand Model – Daily Volumes

Model Link	2015	2045	Growth Rate
SR 204 w/o US 17	25,365	26,163	0.1%
SR 204 b/n US 17 ramps	23,084	24,146	0.2%
SR 204 e/o US 17	33,740	36,060	0.2%
SR 204 w/o King George Blvd	36,254	43,401	0.6%
SR 204 e/o King George Blvd	57,285	66,338	0.5%
US 17 s/o SR 204	27,249	36,589	1.0%
US 17 n/o SR 204	26,018	30,355	0.5%
King George Blvd s/o SR 204	20,629	25,212	0.7%
King George Blvd n/o SR 204	14,327	15,870	0.3%
	Weighted Average Growth Rate		**0.5%**

GDOT's Traffic Analysis & Data Application (TADA GDOT) was used to calculate historical traffic growth for count stations within and near the study area, as shown in **Table 6**. A weighted average growth rate of 2.3% was calculated. The count station along SR 204 between US 17 and King George Blvd did not have sufficient data to calculate a growth rate.

Table 6. TADA Historical Traffic Data

Location	Count Station	Growth Rate
SR 204 w/o US 17	051-0321	2.3%
SR 204 e/o King George Blvd	051-0323	2.9%
SR 204 WB on-ramp from US 17	051-R024	2.5%
SR 204 WB off-ramp to US 17	051-R023	1.9%
US 17 s/o SR 204	051-0194	2.0%
King George Blvd s/o Grove Point Rd	051-7066	-0.2%
Weighted Average Growth Rate		**2.3%**

A weighted average growth rate was calculated for the study area using the weights and growth rates presented in **Table 7**. The TDM's growth rate had the most weight, because it predicts future local traffic, while historical traffic only uses past data and the population and employment rates are based on regional data. **Based on the calculations below, an annual growth rate of 1.0% is proposed for the project study area.**

Table 7. Overall Weighted Average Growth Rate

Growth Rate Category	Weight	Growth Rate
Population	1	0.8%
Employment	1	1.6%
Historical Traffic	1	2.3%
Traffic Projections	2	0.5%
Weighted Average Growth Rate		1.1%
Proposed (Rounded) Growth Rate		**1.0%**

3

Existing Vissim Model Development

Existing Conditions (2023) AM and PM peak Vissim models were developed to create a base model for each peak period. The existing conditions model was calibrated to volumes and travel times in the study area.

Network Geometry and Signal Timing

The network geometry was developed by overlaying the links on the Bing background map within the Synchro network. The Synchro network geometry was later imported into Vissim and the model geometry was finalized through the following methods:

- Entry links were extended to allow for sufficient queuing from each signal.
- Desired speed areas were added to match existing speed limits along each roadway.
- Reduced speed areas were added to left turns and right turns consistently throughout the network.
- Lane configurations and storage lengths were confirmed through Google Earth and Google Streetview.
- Crossing, merging, and diverging link connectors at intersections were evaluated to determine the proper conflict areas, based upon the geometry of the intersection and the signal phasing for protected or permitted left turns.

Signal timing information was obtained from GDOT's Automated Traffic Signal Performance Measures (ATSPM) platform, including the existing phasing, cycle lengths, and splits. Offsets were then optimized within Synchro. This data was then imported from Synchro into Vissim through Ring Barrier Controller (RBC) files, which were attached to each signal controller. Right-turn-on-reds that are permitted were added through the use of stop signs and connected to the corresponding through phase for the approach.

Passenger Car and Heavy Vehicle Volumes

General-purpose (passenger car and heavy vehicle) volumes were coded in the Vissim model, based on the volumes obtained from the volume development process, presented in **Appendix C**. Each intersection approach was coded with three static routes, representing the left, through, and right volume movements. Each entry link into the model was coded with volume inputs,

which were coded as the sum of the nearest intersection approach. No additional sink/source volumes were identified when balancing the traffic volumes.

Truck percentages were coded for each volume input entering the network, based upon the classification count on the entering roadway. Separate truck percentages were entered for single-unit and combination-unit trucks.

Simulation Time

All Vissim simulations were run for a total of 90 minutes (5,400 seconds) including the 30-minute seed time discussed above, and a 60-minute peak hour from which all performance data is collected for analysis.

A Vissim simulation starts with zero vehicles on the network; therefore, time must be added to the beginning of the simulation peak period in order to 'pre-load' vehicles on to the network before data collection begins. The simulations are seeded for 30 minutes (1,800 seconds) using 75% of the design hour traffic volumes.

Number of Runs

Because of the random, stochastic nature of microsimulation, the Vissim models need to be run for multiple iterations with differing random seeds. For each iteration, a new seed number will vary the stochastic functions in the simulation and produce slightly different traffic flow conditions. Each scenario will be run 10 times with different seed numbers and the output will be averaged from all 10 runs when reporting measures of effectiveness and other performance characteristics of the scenarios. The same seed numbers will be used across all simulated scenarios to maintain consistency in results comparison.

Driver Behavior Changes

Vissim model calibration often requires the user to change default values to the driver behavior parameters in order to replicate observed congestion and other local field conditions. During calibration, the cooperative lane change option was selected for the Urban (motorized) driver behavior. This change made lane changing easier and faster for vehicles, which is often required in urban environments. The waiting time before diffusion was also increased to 120 seconds to allow vehicles longer wait times at signalized intersections.

Simulation Parameters

A 90-minute simulation period was used for all simulation runs for this study, which is comprised of a 30-minute seeding period that inputs traffic volumes at 75% of the peak hour flow rates and a 60-minute analysis period that inputs traffic at peak hour flow rates for the duration of the simulation. Each scenario was simulated 10 times using a different random seed for each run and the output is averaged from all 10 runs when reporting measures of effectiveness to account for variations in network operations performance. The existing conditions base model is calibrated based on historical speed and travel time data available through HERE via RITIS. A summary of the parameters and calibration settings are summarized in **Table 8** below.

Table 8. Existing Model Calibration Parameters

Parameter	Value
Vissim Version	2021.00 – 05
Simulation Resolution	10 steps/sec
Simulation Duration	5400 sec (1800 sec seed, 3600 sec evaluation)
Number of Simulation Runs	10
Vehicle Types	Car, HGV, Bus
Vehicle Fleet	**Car** 19.2% LtTruck – Ford F-150 15.1% LtTruck – Chevrolet Silverado 13.5% Car_Toyota_Camry 12.9% Car_Honda_Accord 10.6% SUV – Ford Explorer 6.4% Van_Nissan_Quest 6.0% Car_Nissan_Altima 5.8% SUV – Jeep Grand Cherokee 5.5% Car – Plymouth Voyager 5.0% SUV – GMC Yukon XL **SU Truck** 100% Single-Unit (33.5 ft) **CU Truck** 66.1% WB-50 Tractor Trailer (55.0 ft) 14.6% WB-40 Tractor Trailer (45.7 ft) 6.8% US Flatbed (32.6 ft) 6.5% WB-67D Tractor Trailer (39.6 ft) 6.1% WB-65 Tractor Trailer (73.6 ft)
Car Following Model	Wiedemann 74
Driving Behavior Types	Urban Arterial (all defaults except below): Select cooperative lane change option Waiting time before diffusion: 120 sec

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Existing Vissim Model Calibration

The Federal Highway Administration (FHWA) Traffic Analysis Toolbox Volume III[1] includes acceptable targets developed by the Wisconsin Department of Transportation, which are listed in **Table 9**. These targets were developed specifically for freeway models and were adapted for urban roadway networks to use on this project. Each of these criteria were compared to outputs from the existing conditions base model to ensure the model is calibrated.

Note that the GEH statistic, named after its inventory Geoffrey E. Havers, compares the collected volumes to the model volumes. The equation for the GEH statistic is shown below.

$$GEH = \sqrt{\frac{2(m-c)^2}{m+c}}$$

m = modeled traffic volumes (veh/hr)

c = collected traffic volumes (veh/hr)

Table 9. Calibration Acceptance Targets

Criteria and Measures	Calibration Acceptance Targets
Hourly Flows, Model Versus Observed	
Individual Link Flows	
Within 15%, for 700 veh/hr < Flow < 2700 veh/hr	> 85% of cases
Within 100 veh/hr, for Flow < 700 veh/hr	> 85% of cases
Within 400 veh/hr, for Flow > 2700 veh/hr	> 85% of cases
GEH Statistic < 5 for Individual Link Flows	> 85% of cases
Travel Times, Model Versus Observed	
Journey Times, Network	
Within 15% (or 1 min, if higher)	> 85% of cases
Visual Audits	
Individual Link Speeds	
Visually Acceptable Speed-Flow Relationship	To analyst's satisfaction

[1] Traffic Analysis Toolbox Volume III, FHWA, Publication No. FHWA-HRT-04-040

Volumes

The model volumes were calibrated to the collected volume counts at each signalized intersection within the study area. A summary of the volume calibration results can be seen in **Table 10**. To be calibrated, a movement must have a GEH statistic of less than five. 100% of the movements meet this requirement, exceeding the calibration target of 85%. Additionally, the individual link flows are calibrated for each volume bracket, as shown in the table below.

Table 10. Volume Calibration Summary

Criteria and Measures	AM % Met	PM % Met
Hourly Flows, Model Versus Observed		
Individual Link Flows		
Within 15%, for 700 veh/hr < Flow < 2700 veh/hr	100%	100%
Within 100 veh/hr, for Flow < 700 veh/hr	100%	100%
Within 400 veh/hr, for Flow > 2700 veh/hr	100%	100%
GEH Statistic < 5 for Individual Link Flows	100%	100%

The volume calibration report for each intersection movement is attached in **Appendix D**.

Travel Times

The travel time results table below compares the existing travel times and the travel time outputs from the Vissim model. The extents of the travel time routes measured in the model match those collected from RITIS along SR 204. Initially, the model travel times were lower than the actual travel times. It was determined that volume inputs in congested areas of the network were not representative of the demand. This is because turning movement counts do not account for the queues and latent demand that is attempting to enter an intersection or roadway segment.

Multiple iterations of increased demand were simulated, until the travel times were calibrated. In the AM peak, the traffic was increased by 20% on the eastbound SR 204 and northbound US 17 entry links. In the PM peak, the westbound SR 204 volume input was increased by 10%. This represents latent demand, or trips that would be completed if improvements are made; therefore, no changes were made to the existing volume counts above.

As shown in **Table 11**, the resulting percent difference is less than 15 percent between each of the model outputs and the existing travel times, meaning the model's travel times are calibrated.

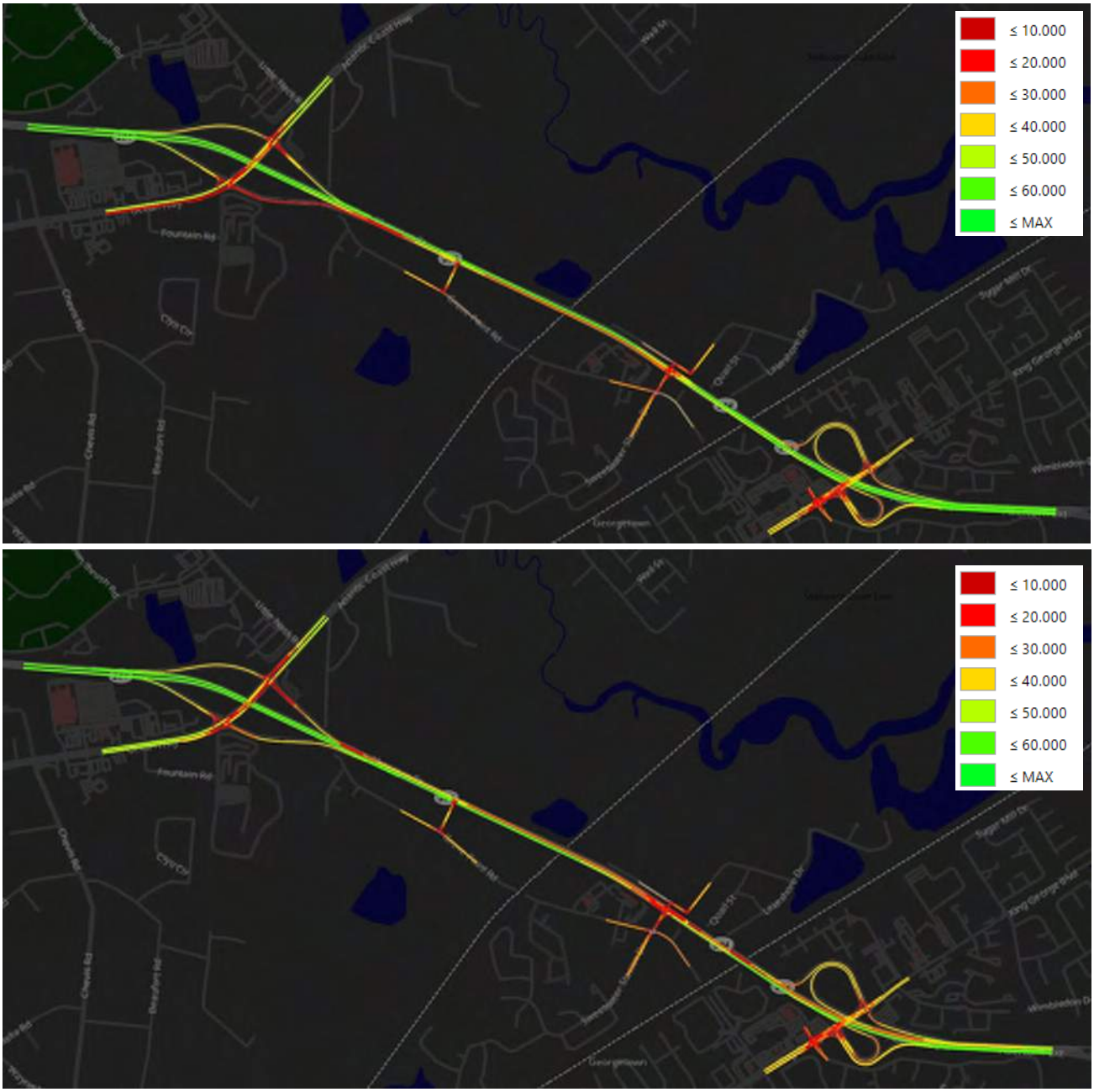
Table 11. Travel Time Calibration Summary

Segment	Actual Travel Time (min)	Model Travel Time (min)	Difference (min)	% Difference
AM Peak				
SR 204 – Eastbound	4.64	4.05	0.58	13%
SR 204 – Westbound	2.64	2.98	0.34	13%
PM Peak				
SR 204 – Eastbound	2.86	3.05	0.19	6%
SR 204 – Westbound	3.98	4.49	0.51	13%

Speeds

Vehicle speeds were examined periodically throughout the Vissim model simulation runs to determine if they were realistic to the project area and the roadways. The speed profiles from Vissim can be seen in **Figure 3**. Lower speeds occur in the peak direction along SR 204, as well as near the US 17 interchange and the Pine Grove Dr intersection.

Figure 3. Vissim Speed Profiles, AM Peak (top) and PM Peak (bottom)



5

Existing & No-Build Operations Results

No-Build Modeling

The No-Build Vissim models were built upon the calibrated Existing base model. The volume inputs and routes were updated using the forecasted volumes. The geometry was modified along US 17 to add a third lane in each direction in the Design Year only, with the assumption that some type of capacity improvement will occur along US 17 or at the SR 204 interchange by 2050. This allows the Design Year models to not be impeded by excessive queuing, particularly along the WB Off-Ramp from SR 204.

Lastly, minor signal timing changes were made to the cycle lengths and split times, based on the new volumes and geometry.

Delay, LOS, & Queue Lengths

This section presents and discusses the delay, level of service (LOS), and queue lengths from the calibrated base model and the no-build models. The LOS measure is a letter grade assigned to intersections, based on its weighted average delay in seconds per vehicle. LOS E and F are typically assumed to be unacceptable levels of delay. The LOS criteria and descriptions are presented in **Table 12** for signalized and unsignalized intersections.

Table 12. Level of Service Criteria & Descriptions

Level of Service	Signalized Intersection Delay (sec/veh)	Unsignalized Intersection Delay (sec/veh)	Description
A	≤10	≤10	Little or no delay
B	>10 – 20	>10 – 15	Short traffic delay
C	>20 – 35	>15 – 25	Average traffic delay
D	>35 – 55	>25 – 35	Long traffic delay
E	>55 – 80	>35 – 50	Very long traffic delay
F	>80	>50	Extremely long traffic delay, or failure

The existing and no-build delay, LOS, and queue lengths are presented in **Table 13** and **Table 14**Error! Reference source not found. for the AM and PM peaks, respectively. No-Build LOS

results are also shown in **Figure 4** and **Figure 5**. Very long queue lengths are shown at SR 204 & Pine Grove Dr in the eastbound direction for the AM peak and in the westbound direction for the PM peak. Vehicles traveling northbound on Ford Ave also experience long delays in the AM peak.

Table 13. Existing & No-Build AM Peak Intersection Results

Node	Intersection	Approach	Existing			No Build (2030)			No Build (2050)		
			Delay	LOS	Max Queue (ft)	Delay	LOS	Max Queue (ft)	Delay	LOS	Max Queue (ft)
1	US 17 & SR 204 EB Ramps	Overall	37.3	D	-	54.8	D	-	85.3	F	-
		NB	57.3	E	2,140	68.2	E	2,140	103.2	F	2,150
		SB	20.2	C	690	49.2	D	980	84.3	F	985
		EB	45.4	D	155	32.9	C	145	33.3	C	150
2	US 17 & SR 204 WB Ramps	Overall	14.3	B	-	19.3	B	-	79.2	E	-
		NB	6.0	A	625	6.6	A	120	8.5	A	105
		SB	8.1	A	575	0	-	0	127.4	F	1,460
		WB	35.3	D	350	31.0	C	350	55.0	D	380
3	SR 204 & Ford Ave	Overall	4.0	A	-	4.4	A	-	4.9	A	-
		NB	53.0	F	75	56.2	F	75	60.1	F	75
		EB	5.6	A	3,880	6.5	A	3,875	7.8	A	5,780
		WB	0.2	A	0	0.2	A	0	0.4	A	25
4	Grove Point Rd & Ford Ave	Overall	2.5	A	-	2.4	A	-	2.5	A	-
		SB	5.2	A	75	5.1	A	80	5.0	A	70
		EB	0.3	A	0	0.3	A	0	0.3	A	0
		WB	0.5	A	0	0.5	A	0	0.5	A	0
5	Pine Grove Dr & Don Zipperer Dr	Overall	19.6	C	-	18.7	C	-	29.4	D	-
		NB	0.1	A	155	0.1	A	160	0.1	A	155
		EB	36.4	E	60	33.5	D	60	64.4	F	60
		WB	24.2	C	45	22.5	C	45	30.6	D	60
6	SR 204 & Pine Grove Dr	Overall	83.6	F	-	110.0	F	-	200.6	F	-
		NB	125.4	F	3230'	166.5	F	3600'	306.6	F	4805'
		SB	7.8	A	575'	8.7	A	680'	14.4	B	1235'
		EB	55.6	E	160'	56.6	E	170'	58.0	E	200'
		WB	10.3	B	15'	10.0	A	15'	14.5	B	25'
7	Grove Point Rd & Pine Grove Dr	Overall	8.8	A	-	9.5	A	-	13.0	B	-
		NB	9.9	A	100	10.8	B	110	15.3	C	140
		SB	7.7	A	90	7.8	A	85	8.2	A	100
		EB	7.7	A	60	8.1	A	60	13.5	B	65
		WB	5.3	A	25	5.4	A	25	15.9	C	25
8	King George Blvd & SR 204 WB Ramps	Overall	1.4	A	-	1.7	A	-	2.6	A	-
		NB	3.2	A	170	3.8	A	175	6.6	A	270
		SB	0.6	A	70	0.7	A	105	1.0	A	105
		EB	1.1	A	0	1.1	A	0	1.2	A	0
		WB	0.5	A	55	0.6	A	60	1.0	A	70
9	King George Blvd & SR 204 EB Ramps	Overall	5.6	A	-	6.2	A	-	8.9	A	-
		NB	5.6	A	465	6.2	A	470	9.2	A	485
		SB	4.6	A	190	5.3	A	225	8.1	A	360
		WB	11.3	B	85	11.0	B	80	11.5	B	90
10	King George Blvd & Mariners Way	Overall	12.0	B	-	13.1	B	-	28.7	C	-
		NB	9.1	A	540	10.5	B	600	28.8	C	830
		SB	5.4	A	100	5.5	A	115	7.6	A	125
		EB	51.1	D	215	51.6	D	220	74.3	E	230
		WB	22.5	C	75	21.6	C	80	42.0	D	135

Table 14. Existing & No-Build PM Peak Intersection Results

Node	Intersection	Approach	Existing			No Build (2030)			No Build (2050)		
			Delay	LOS	Max Queue (ft)	Delay	LOS	Max Queue (ft)	Delay	LOS	Max Queue (ft)
1	US 17 & SR 204 EB Ramps	Overall	17.8	B	-	19.2	B	-	23.3	C	-
		NB	15.4	B	645	13.7	B	600	18.2	B	1,005
		SB	14.7	B	715	18.7	B	880	20.6	C	925
		EB	52.3	D	255	47.5	D	235	65.5	E	335
2	US 17 & SR 204 WB Ramps	Overall	31.7	C	-	30.7	C	-	33.8	C	-
		NB	29.7	C	735	39.3	D	735	43.0	D	860
		SB	26.9	C	1,030	0	-	0	0	-	0
		WB	37.2	D	3,325	25.8	C	1,175	27.5	C	1,385
3	SR 204 & Ford Ave	Overall	3.8	A	-	3.0	A	-	3.8	A	-
		NB	17.3	C	85	18.8	C	80	23.8	C	90
		EB	0.2	A	0	0.2	A	0	0.9	A	320
		WB	6.3	A	3,760	5.1	A	3,755	6.4	A	3,755
4	Grove Point Rd & Ford Ave	Overall	3.1	A	-	3.0	A	-	2.9	A	-
		SB	5.1	A	80	5.1	A	80	5.2	A	80
		EB	0.3	A	0	0.3	A	0	0.3	A	0
		WB	0.5	A	0	0.5	A	0	0.5	A	0
5	Pine Grove Dr & Don Zipperer Dr	Overall	18.3	C	-	19.3	C	-	24.9	C	-
		NB	0.2	A	30	0.2	A	45	0.2	A	40
		EB	35.6	E	65	37.8	E	65	50.6	F	95
		WB	30.5	D	55	33.1	D	55	31.3	D	55
6	SR 204 & Pine Grove Dr	Overall	48.8	D	-	71.6	E	-	175.3	F	-
		NB	32.1	C	1675'	41.7	D	2060'	132.5	F	2940'
		SB	60.1	E	2775'	93.6	F	3115'	211.6	F	4205'
		EB	86.5	F	165'	85.1	F	170'	88.8	F	205'
		WB	3.3	A	0'	3.1	A	0'	6.8	A	10'
7	Grove Point Rd & Pine Grove Dr	Overall	12.4	B	-	12.6	B	-	14.5	B	-
		NB	9.6	A	75	10.0	B	75	13.5	B	85
		SB	14.5	B	205	14.8	B	220	15.6	C	265
		EB	8.1	A	80	8.3	A	85	12.7	B	90
		WB	0	-	0	0	-	0	0	-	0
8	King George Blvd & SR 204 WB Ramps	Overall	2.0	A	-	2.1	A	-	2.3	A	-
		NB	1.2	A	115	1.3	A	115	1.5	A	145
		SB	0.7	A	95	0.7	A	75	0.9	A	100
		EB	3.3	A	75	3.4	A	15	4.0	A	95
		WB	1.5	A	90	1.9	A	100	2.5	A	115
9	King George Blvd & SR 204 EB Ramps	Overall	7.0	A	-	7.4	A	-	8.3	A	-
		NB	5.3	A	175	5.8	A	190	6.1	A	210
		SB	5.5	A	170	5.7	A	175	6.8	A	200
		WB	14.5	B	150	15.1	B	170	15.7	B	175
10	King George Blvd & Mariners Way	Overall	12.4	B	-	12.8	B	-	14.7	B	-
		NB	8.3	A	185	9.8	A	195	10.4	B	205
		SB	6.7	A	325	6.9	A	340	8.1	A	385
		EB	52.7	D	220	51.6	D	220	55.5	E	230
		WB	24.8	C	75	24.6	C	75	21.9	C	85

Figure 4. Intersection LOS Results, No Build Open Year

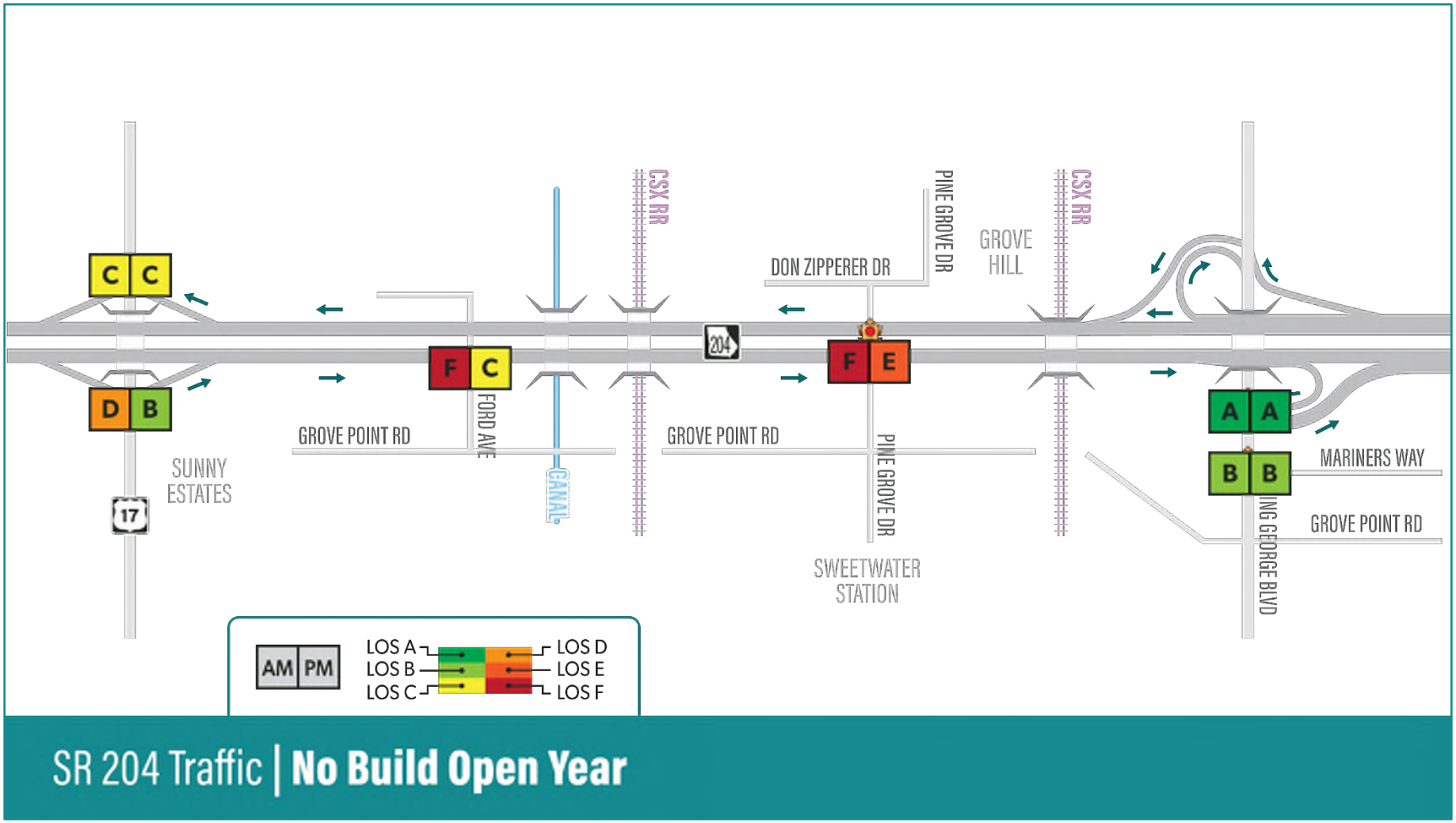
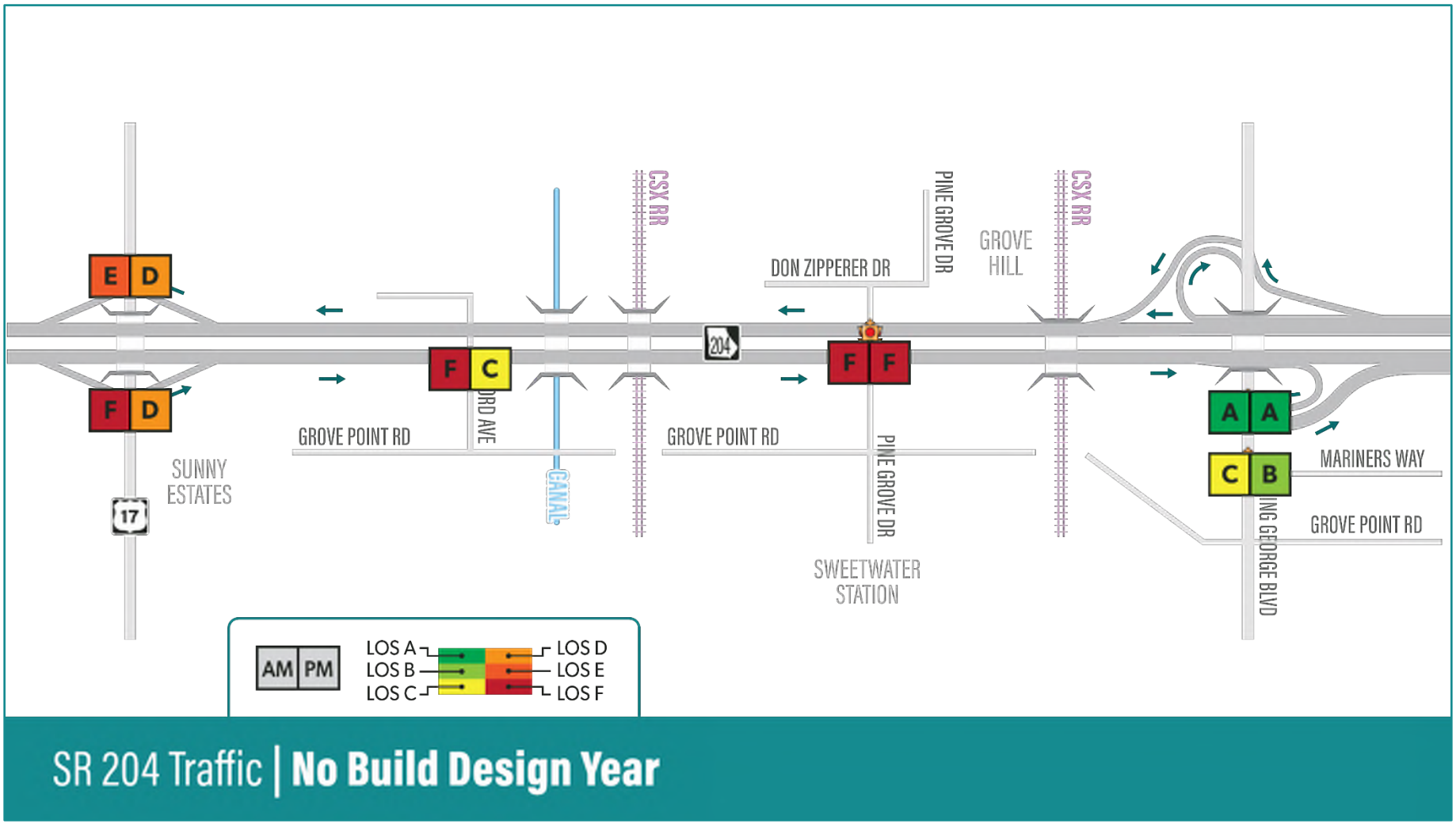


Figure 5. Intersection LOS Results, No Build Design Year



Travel Time & Speed

The existing and no-build travel time results are listed below in **Table 15**. The average speeds are calculated based on the travel time and distance of the route. Vehicles travel approximately 20 mph below the 55 mph speed limit along SR 204 in the peak directions. By 2050, vehicles are expected to travel approximately 30-35 mph below the speed limit.

Table 15. Existing & No-Build Travel Time & Speed Results

Segment	Existing		No Build (2030)*		No Build (2050)*	
	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)
AM Peak						
SR 204 – Eastbound	4.05	35.3	4.96	32.6	6.20	26.0
SR 204 – Westbound	2.98	51.1	3.16	51.0	3.19	50.5
PM Peak						
SR 204 – Eastbound	3.05	46.9	3.46	46.6	3.90	41.3
SR 204 – Westbound	4.49	33.9	5.18	31.1	7.40	21.8

*Travel time segments extended east of King George Blvd ramps

Network Performance

Three performance measures were taken network-wide from the existing and no-build Vissim models: total network delay, average network speed, and latent demand. These performance measures are presented below in **Table 16**. In Vissim, latent demand is defined as the number of vehicles that were unable to enter the model by the end of the simulation. The total network delay and latent demand is higher in the AM peak, along with slower average speeds. Between the open and design years, the total network delay is expected to triple, average network speed is expected to drop by 4-8 mph, and 1000-1500 vehicles of latent demand would be added.

Table 16. Existing & No-Build Network Performance Results

Performance Measure	Existing	No Build (2030)	No Build (2050)
AM Peak			
Total Network Delay (hr)	318	556	1,476
Average Network Speed (mph)	34.0	31.0	22.8
Latent Demand (veh)	341	737	2,029
PM Peak			
Total Network Delay (hr)	280	306	883
Average Network Speed (mph)	31.5	31.7	27.7
Latent Demand (veh)	29	69	1,087

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Existing Crash Analysis

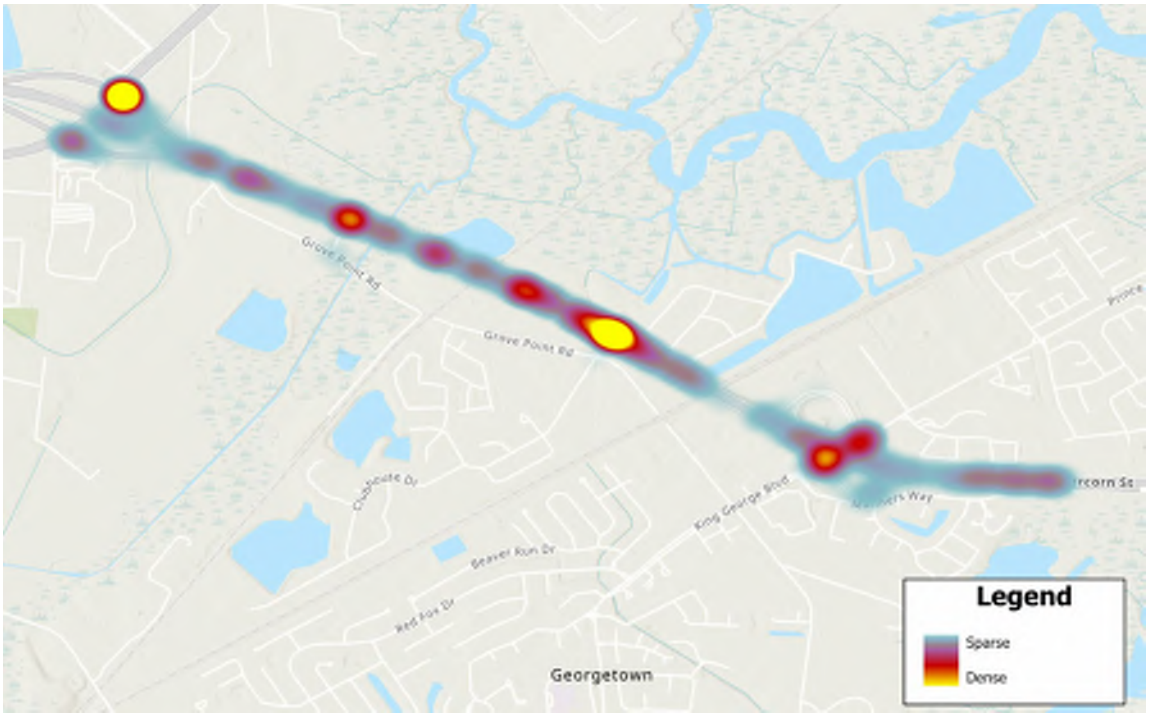
A crash analysis of the most recent five years (2018-2022) was conducted in the study area. Data was obtained from GDOT's crash database platform, Numetric. A summary of the crash data for the study area is presented in **Table 17**. Rear end crashes were the most commonly occurring crash type. The total number of crashes decreased in 2020 during the beginning of the COVID-19 pandemic; however, crashes increased in the following two years, greater than levels prior to the pandemic. One fatal crash occurred in 2020, which was an angle crash at SR 204 and Pine Grove Dr between a westbound through vehicle and a southbound through vehicle.

Table 17. Crash Analysis Summary

	Segment Summary	2018	2019	2020	2021	2022
Manner of Collision	Angle	25	17	9	18	12
	Rear End	124	172	88	185	180
	Sideswipe-Same Direction	25	15	8	32	38
	Sideswipe-Opposite Direction	1	1	0	0	1
	Not A Collision with Motor Vehicle	22	12	14	23	12
	Head On	2	3	4	6	7
	Unclassified	4	0	0	1	2
Total Crashes		203	220	123	265	252
Total Non-Fatal Injury Crashes		45	60	36	67	61
Total Injuries		48	88	55	119	87
Total Fatality Crashes		0	0	1	0	0
Total Fatalities		0	0	1	0	0
Bicycle Related Crashes		0	0	0	0	0
Pedestrian Related Crashes		2	0	0	1	0

A heat map of crashes occurring between 2018-2022 is shown in **Figure 6**. The greatest density of crashes was observed near the westbound ramp terminal at US 17 and the intersection of Pine Grove Dr.

Figure 6. Crash Heat Map



The total and injury crash rates for the SR 204 corridor are shown in **Table 18**, along with a comparison to Georgia's statewide average for Urbanized, Non-Freeway, Principal Arterials.

Table 18. SR 204 Segment Crash Rates

Segment Summary	2018	2019	2020	2021	2022
Total Crashes					
Number of Crashes	135	141	80	169	166
Crash Rate (per 100 MVM)	304	314	176	369	359
Statewide Average Crash Rate (per 100 MVM)	*581*	*559*	*469*	*542*	*568*
Injury Crashes					
Number of Crashes	32	38	24	50	44
Crash Rate (per 100 MVM)	72	85	53	109	95
Statewide Average Crash Rate (per 100 MVM)	*141*	*137*	*118*	*146*	*143*

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Next Steps

The operations analysis will be continued with the testing of short-term and long-term Build alternatives. The alternatives will be analyzed by developing Vissim models for each alternative in the Open and Design years. These models will be compared to the No-Build scenario models. All future-year models will be based on the calibrated Existing model presented in this report.

A safety analysis will also be conducted, utilizing the Interactive Highway Safety Design Model (IHSDM) software. IHSDM supports crash prediction of Build alternatives, which will allow each alternative to have a benefit-cost ratio, depending on the crash cost savings and construction cost for each.

The methodology and results from these analyses will be documented and submitted as a final operations and safety report.