



C-17 Appeal Documents - Concurrency Review

Transportation Concurrency Review

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TO: Mark Freiburger, PE
Director of Public Works
City of Sedro-Woolley

FROM: Andrew Bratlien, PE

SUBJECT: Citywide Transportation Concurrency Review

INTRODUCTION

This memorandum describes the methods, assumptions, and findings of the Sedro-Woolley Citywide Transportation Concurrency Review. This includes a review of intersection and segment Levels of Service (LOS) in 2019 and for two pipeline (2025) development scenarios as well as mitigation recommendations to maintain minimum LOS standards.

CONCURRENCY MANAGEMENT BACKGROUND

Concurrency is mandated under the 1990 Growth Management Act (GMA) passed by the Washington State legislature to address and mitigate problems associated with growth. The GMA requires that transportation improvements or strategies necessary to accommodate development must be made concurrently with land development. Concurrency requires transportation improvements to be either (a) in place at the time of development or (b) that a financial commitment is in place to complete the improvements within six years of development (RCW 36.70A.070(6)(b)).

Transportation concurrency requires that the transportation impacts of land use development actions do not reduce transportation Level of Service (LOS) below the responsible agency's adopted LOS standards. If it is determined during the development review process that the proposed land use action would reduce LOS below the adopted standard, the development must be modified to reduce its transportation impact or provide corrective transportation improvements. Transportation improvements, which may include project funding, must be identified and programmed within a six-year period from development permitting. Should any of these requirements fail to be met, the development proposal cannot be granted approval.

2019 CONDITIONS

Traffic Counts

Traffic counts were collected at 45 intersections in and near Sedro-Woolley on non-holiday weekdays in April 2015. Updated traffic counts were collected in 2019 at the following five intersections:

- SR 20 & Township St (October 2019)
- SR 20 & Fruitdale Rd (October 2019)
- SR 9 & John Liner Rd/McGarigle Rd (April 2019)
- Fruitdale Rd & McGarigle Rd (April 2019)
- Fruitdale Rd & Portobello Ave (October 2019)

Intersection turning movement counts were collected from 4:00 – 6:00 PM to capture the PM peak period of travel. Counts were then reviewed to identify the PM peak hour of travel, defined as the highest four consecutive fifteen-minute volume intervals during the PM peak period. The PM peak hour represents the one-hour period when traffic volumes are typically at their peak, and generally corresponds to the period of rush hour traffic with commuters returning home from work. The Sedro-Woolley travel demand and intersection LOS models reflect conditions during the PM peak hour of travel.

Travel Demand Model

The Sedro-Woolley travel demand model was most recently updated in 2015 to reflect PM peak hour traffic volumes in April 2015. As part of this analysis, the travel demand model was updated to include significant land use changes and transportation network improvements which occurred between April 2015 and November 2019.

A list of recently completed (2015-2019) developments was provided by City staff and input to the travel demand model. Recent development growth included a total of 215 new PM peak hour trips internal to the City of Sedro-Woolley. Regional (external) travel demand growth was updated based on 2019 PM peak hour traffic counts.

The updated travel demand model was used to estimate traffic volume growth at intersections which were most recently counted in April 2015.

2019 Level of Service

Level of Service Definition

Level of service (LOS) is a qualitative description of the operating performance of an element of transportation infrastructure such as a roadway or an intersection. LOS is typically expressed as a letter score from LOS A, representing free flow conditions with minimal delays, to LOS F, representing breakdown flow with high delays.

Intersection LOS is based on the average delay experienced by a vehicle traveling through an intersection. Delay at a signalized intersection can be caused by waiting for the signal or waiting for the queue ahead to clear the signal. Delay at roundabouts and stop-controlled intersections is caused by waiting for a gap in traffic or waiting for a queue to clear the intersection or roundabout.

Delay for signalized and stop-controlled intersections was calculated in Synchro 9 software using Highway Capacity Manual 2010 (HCM2010) methodology. Roundabout delay was calculated in Sidra Intersection 8 software using the Sidra capacity model and signalized level of service thresholds, per WSDOT October 2019 Sidra policy guidelines.

Delay is defined differently for signalized and all-way stop controlled intersections than for two-way stop controlled (i.e. stop control on minor approach) intersections. For signalized and all-way stop controlled intersections, level of service thresholds are based upon average control delay for all vehicles (on all approach legs) entering the intersection. For minor-approach-only stop controlled intersections, delay is reported for the movement with the worst (highest) delay. **Table 1** shows the amount of delay used to determine LOS for signalized and unsignalized intersections.

Table 1. Level of Service Thresholds

LOS	Signalized and Roundabout Delay (sec/veh)	Unsignalized Delay (sec/veh)	Segment V/C Ratio
A	≤10	≤10	≤ 0.60
B	>10 – 20	>10 – 15	> 0.60 – 0.70
C	>20 – 35	>15 – 25	> 0.70 – 0.80
D	>35 – 55	>25 – 35	> 0.80 – 0.90
E	>55 – 80	>35 – 50	> 0.90 – 1.00
F	>80	>50	> 1.00

Segment LOS was evaluated for each of 75 arterial segments, as identified in the Transportation Element. Street segment LOS is based on the ratio of traffic volume to street capacity. The Transportation Element defines local standards for street capacity based on functional classification, number of lanes, and other physical characteristics, as shown in **Table 2**.

Table 2. Sedro-Woolley Segment Capacity Standards

Functional Classification	Base Peak Hr Capacity (vphpl)	Has Left-Turn Lane (vph)	Has Access Management (vph)	No Bike Lane (vph)	No Sidewalk (vph)	On-Street Parking (vph)
Principal Arterial	900	+450	+540	-90	-180	-45
Minor Arterial	800	+400	+480	-40	-80	-40
Major Collector	600	+300	+360	-30	-60	-30
Local Access	400	0	0	0	0	0

Level of Service Policy

The Sedro-Woolley Comprehensive Plan defines minimum LOS standards as LOS D on principal and LOS C on all other streets.

Minimum LOS standards for State facilities are set by the Washington State Department of Transportation (WSDOT). SR 20 and SR 9 are both designated by WSDOT as Highways of Statewide Significance (HSS) with minimum LOS D through Sedro-Woolley. In order to maintain consistency with WSDOT LOS standards, the City of Sedro-Woolley has similarly adopted a minimum LOS D standard for both routes.

2019 Level of Service Deficiencies

Existing LOS deficiencies are summarized in **Table 3**.

Table 3. 2019 Intersection LOS Deficiencies

ID	Location	Control Type ¹	2019 LOS (Delay) ²
11	SR 20 & Reed St	TWSC	F (131)
17	Cook Rd & Trail Rd	TWSC	D (31.9)

¹TWSC = minor approach stop control; AWSC = all-way stop control; Signal = signalized; RAB=roundabout
²For TWSC intersections, delay is reported for the worst (i.e. highest-delay) movement; for all other control types, average intersection delay is reported.

The intersection of SR 20 and Reed St operates with high delay on the stop-controlled (Reed St) approaches during the PM peak hour due to high volumes along SR 20. Mitigation may include prohibition of left-turn

movements from Reed St during the PM peak hour. Mitigation options are described in greater detail later in this document.

The intersection of Cook Rd and Trail Rd currently operates at LOS D, which is below the minimum LOS C standard. The intersection will be impacted by the Trail Rd extension, identified as project C3 in the Sedro-Woolley Transportation Element.

The intersection of Township St (SR 9) and John Liner Rd/McGarigle Rd currently operates at LOS C with 20.5 seconds of delay on the westbound (McGarigle Rd) approach. Minimum LOS D is satisfied.

No street segments currently operate below minimum LOS standards. Full intersection and segment LOS summaries are provided in **Attachment 1**.

2025 PIPELINE CONDITIONS

Scenario Design

Pipeline conditions were analyzed for two development scenarios, as shown below. The land use and network improvement assumptions for each scenario are described in greater detail in the following sections.

1. 2025 with Approved Development (**2025 Baseline**):
 - 1A.** Without Jones Rd/John Liner Rd/Trail Rd corridor project
 - 1B.** With Jones/John Liner/Trail Rd corridor project
2. 2025 with Additional Development (**2025 Pending Applications**):
 - 2A.** Without Jones Rd/John Liner Rd/Trail Rd corridor project
 - 2B.** With Jones/John Liner/Trail Rd corridor project

The 2025 Baseline land use scenario included developments which were permitted but not occupied as of November 2019. Two network improvement scenarios were evaluated under the 2025 Baseline development scenario: without (1A) and with (1B) the Jones/John Liner/Trail Rd corridor projects. Transportation network improvement assumptions are described in greater detail later in this document.

The 2025 Pending Applications land use scenario included developments which have submitted permit applications but have not been approved as of November 2019. The 2025 Pending Applications scenarios also included development-constructed transportation improvement projects which were identified by City staff, as described in the following section. Similar to the 2025 Baseline scenarios, the 2025 Pending Applications scenarios included two transportation network improvement scenarios: without (2A) and with (2B) the Jones/John Liner/Trail Rd corridor projects.

Land Development

2025 Baseline

A 2025 Baseline travel demand forecast was calculated based on the sum of local (internal) and regional (external) growth forecasts. Sedro-Woolley staff developed a list of four “pipeline” developments which have permitted but not occupied as of November 2019, representing a total of 115 new PM peak hour trips in the City. Pipeline regional travel demand growth was calculated based on SCOG regional travel demand forecasts for arterials at the City boundaries.

2025 Pending Applications

Sedro-Woolley staff provided a list of five development applications which are pending approval. The developments, identified in **Table 4**, constitute a total of 362 new PM peak hour trips.

Table 4. Pipeline Developments Pending Approval

Name	Description	New PM Trips
Dukes Hill Subdivision	201 single-family units	179
McGarigle Subdivision	85 age-restricted single-family units	70
Gateway Golf Course Subdivision	99 single-family detached units; 16 townhome units	76
F&S Grade Rd Subdivision	31 single-family detached units	31
Debbie Dr Subdivision	6 single-family detached units	6
Total New PM Peak Hour Trips		362

Two of the developments identified in **Table 4** include construction of new roadways which are identified in the Sedro-Woolley Transportation Element. Dukes Hill Subdivision will construct project C18, an extension of Portobello Ave from its existing terminus west to Township St (SR 9). F&S Grade Rd Subdivision will construct project C9B, an extension of Garden of Eden Rd from Jones Rd to intersect F&S Grade Rd to the south. Transportation improvement project assumptions are described in greater detail in the following section.

Transportation Improvement Projects

Sedro-Woolley staff provided a list of 14 capacity-related transportation improvement projects which are planned for construction by 2026. Per Sedro-Woolley segment LOS policy, capacity-related projects include nonmotorized improvements on arterial routes. **Table 5** summarizes transportation improvement projects which were assumed for each scenario of this analysis.

Development-driven improvement projects, including the Trail Rd/Garden of Eden Rd extension and the Portobello Ave arterial extension, were assumed to be constructed in both 2025 Pending Applications scenarios (2A, 2B).

The six-year transportation improvement project list included four intersection improvements, as identified in **Table 5**, which were evaluated and modeled as necessary to mitigate intersection LOS deficiencies. The necessity of these intersection improvement projects is described in the following section.

Table 5. 2020-2026 Transportation Capacity Improvement Projects by Scenario

ID	Project Name	From/To	Description	Expected Cn Year
<i>2025 Baseline Transportation Capacity Improvement Projects (All Scenarios)</i>				
S16	SR 20 & Township St (SR 9) Intersection Imp.		Signal & channelization impr.	2021
S14C	SR 20/Cascade Trail West Extension Phase 2A	Holtcamp Rd to Hodgkin Rd	Shared use path	2022
C1C	John Liner Rd Bike/Ped Imp.	Reed St to SR 9	Shared use path	2023
<i>Jones/John Liner/Trail Rd Corridor Projects (Scenarios 1B, 2B)</i>				
C19	Patrick St Arterial Extension	Michael St to Jones St	New major collector w/sidewalks	2021
C1B	Jones/John Liner RR Crossing	Sapp Rd to Reed St	New RR undercrossing and new major collector street	2022
C1D	John Liner Rd Arterial Imp.	Reed St to Township St	Reconstruct to major collector section	2024
C9A	Trail Rd Arterial Extension	Cook Rd to F&S Grade Rd	New major collector	2025
C1A	Jones Rd Arterial Imp.	F&S Grade Rd to Sapp Rd	Reconstruct to major collector including sidewalk	2026
<i>2025 Development-Driven Transportation Capacity Improvement Projects (Scenarios 2A, 2B)</i>				
C9B	Trail Rd – Garden of Eden Rd Extension	F&S Grade Rd to Jones Rd	New major collector	TBD
C18	Portobello Ave Arterial Extension	Township St to Cascadia Dr	New major collector	TBD
<i>Intersection Capacity Improvement Projects (Applied as Necessary)</i>				
S2	SR 20 & Reed St Intersection Imp.		Restrict minor approaches to right-in/right-out only	2021
S17	Township St (SR 9) & John Liner Rd/McGarigle Rd Intersection Imp.		New signal or roundabout	2023
S18	SR 9 & State St Intersection Imp.		Add dedicated right-turn lane on west leg	2024
C3	Cook Rd & Trail Rd Intersection Imp.		Intersection improvements	2025

2025 Level of Service

Intersection and segment LOS were analyzed for the 2025 Baseline and 2025 Pending Applications scenarios. Intersection LOS deficiencies are summarized in **Table 6**.

Table 6. Pipeline (2025) Intersection Level of Service Deficiencies

ID	Location	Control Type ¹	2025 Baseline LOS (Delay) ²	2025 Pending LOS (Delay) ²
11	SR 20 & Reed St			
	<i>w/o Jones/John Liner Rd Crossing</i>	TWSC	F (154)	F (204)
	<i>w/ Jones/John Liner Rd Crossing</i>	TWSC	F (54.8)	F (58.5)
	<i>w/ crossing + right-in/right-out (Project S2)</i>	RIRO	C (17.9)	C (17.8)
17	Cook Rd & Trail Rd			
	<i>w/o Trail Rd Extension / TWSC</i>	TWSC	E (35.3)	E (39.5)
	<i>w/ Trail Rd Extension / TWSC</i>	TWSC	F (493)	F (>999)
	<i>w/ Trail Rd Ext. / roundabout (Project C3)</i>	RAB	A (7.9)	B (9.6)
29	Township St (SR 9) & John Liner/McGarigle Rd			
	<i>w/o Jones/John Liner Rd Crossing</i>	TWSC	C (22.6)	D (28.5)
	<i>w/ crossing & two-way stop control</i>	TWSC	F (50.2)	F (181)
	<i>w/ crossing & roundabout (Project S17)</i>	RAB	A (7.5)	A (7.8)
	<i>w/ crossing & signal control (Project S17)</i>	Signal	A (9.3)	B (10.7)

¹TWSC = minor approach stop control; AWSC = all-way stop control; Signal = signalized; RAB=roundabout
²For TWSC intersections, delay is reported for the worst (i.e. highest-delay) movement; for all other control types, average intersection delay is reported.

The intersection of SR 20 and Reed St will continue to operate at LOS F with high minor-approach delay during the PM peak hour. The traffic redistribution associated with the Jones/John Liner Rd undercrossing will reduce delay but will not mitigate the LOS deficiency. Prohibiting left-turns from Reed St onto SR 20 during the PM peak hour will allow the intersection to satisfy minimum LOS standards. This is consistent with improvement project S2 identified in Transportation Element.

The intersection of Cook Rd and Trail Rd will degrade to LOS E in the 2025 Baseline Without-Trail Rd scenario. The 2025 Pending Applications scenario will result in slightly higher delay but no reduction in LOS. After the construction of the Trail Rd extension, the intersection will operate at LOS F with very high delay on the north and south approaches. Mitigation may include a single-lane roundabout, which is consistent with improvement project C3 identified in the Transportation Element.

The intersection of Township St (SR 9) and John Liner Rd/McGarigle Rd will operate at LOS C in the 2025 Baseline Without Trail Rd scenario. The addition of pending applications will increase delay, resulting in LOS D, but will not trigger an LOS deficiency. The construction of the Jones/John Liner Rd undercrossing will result in LOS F, with very high delays on the John Liner Rd approach. Mitigation may include a single-lane roundabout or signal, which is consistent with project S17 identified in the Transportation Element.

The intersection of SR 9 and State St is identified for improvement in the Transportation Element, but the improvement will not be necessary in the six-year concurrency horizon. The intersection operates at LOS D in all 2025 analysis scenarios and satisfies the minimum LOS D standard for SR 9.

No segment LOS deficiencies will occur by 2025. 2025 Baseline intersection and segment LOS results are summarized in Attachment 2. 2025 Pending Applications LOS results are summarized in Attachment 3. Full intersection LOS reports may be provided upon request.

FINDINGS

- Pending development will generate 362 new PM peak hour trips.
- Trips associated with pending development will increase delay at several intersections but will not cause any new LOS deficiencies.
- Township St (SR 9) and John Liner Rd/McGarigle Rd intersection:
 - The intersection of Township St (SR 9) and John Liner Rd/McGarigle Rd currently satisfies minimum LOS D standard but will reach LOS F by 2025, assuming the construction of the Jones/John Liner Rd corridor projects.
- Cook Rd and Trail Rd intersection:
 - Currently operates at LOS D, below the minimum LOS C standard.
 - Will degrade to LOS E by 2025, assuming no extension of Trail Rd
 - Will degrade to LOS F including very high minor-approach delays with the planned Trail Rd extension.
- SR 20 and Reed St intersection:
 - Currently operates at LOS F.
 - Will continue to operate at LOS F with high minor-approach delay during PM peak hour.
- All Comprehensive Plan street segments will satisfy minimum LOS standards through 2025.

RECOMMENDATIONS

- Township St (SR 9) and John Liner Rd/McGarigle Rd intersection: A single-lane roundabout or signal is recommended concurrent with the Jones Rd/John Liner Rd undercrossing to maintain minimum LOS
- Cook Rd and Trail Rd intersection: A single-lane roundabout or traffic signal is recommended to mitigate the existing LOS deficiency.
- SR 20 and Reed St intersection: Prohibit left turn movements from Reed St during PM peak hour.

Attachment 1. 2019 LOS Results

Attachment 2. 2025 LOS Results



2019 Intersection LOS Results

ID	Location	Control Type ¹	2019 LOS (Delay) ²	Deficient?
1	SR 20 & Collins Rd	Signal	B (11.3)	
2	SR 20 & Rhodes Rd	Signal	B (10.8)	
3	SR 20 & Trail Rd	Signal	C (26.7)	
4	SR 20 & SR 9 (west)	Signal	B (14.4)	
5	SR 20 & Ferry St	Signal	B (15.8)	
6	SR 20 & Cook Rd	RAB	A (9.5)	
7	SR 20 & F&S Grade Rd	TWSC	C (16.3)	
8	SR 20 & Patrick St	RAB	A (4.4)	
9	SR 20 & Metcalf St	TWSC	D (25.1)	
10	SR 20 & Murdock St	TWSC	D (26.1)	
11	SR 20 & Reed St	TWSC	D (31.3)	
12	SR 20 & Central Ave	TWSC	C (23.2)	
13	SR 20 & Ball St	TWSC	C (21.4)	
14	SR 20 & Township St (SR 9)	Signal	D (48.8)	
15	SR 20 & Fruitdale Rd	Signal	B (10.8)	
16	SR 20 & Helmick Rd	TWSC	B (10.4)	
17	Cook Rd & Trail Rd	TWSC	D (31.9)	Yes
18	Cook Rd & Ferry St	RAB	A (6.8)	
19	SR 9 & State St	Signal	D (40.9)	
20	State St & Metcalf St	AWSC	B (14.1)	
21	State St & Reed St	TWSC	B (13.2)	
22	State St & Township St	AWSC	B (13)	
23	State St & Railroad St	AWSC	A (8.1)	
24	Hoehn Rd & Fruitdale Rd	TWSC	A (9.3)	
26	Ferry St & Metcalf St	AWSC	B (12.2)	
27	Ferry St & Reed St	TWSC	B (11.8)	
28	Ferry St & Township St	TWSC	C (16.4)	
29	Township St (SR 9) & John Liner Rd	TWSC	C (20.5)	
30	SR 9 & Kalloch Rd	TWSC	B (11.2)	
31	Jameson St & 3rd St	AWSC	A (8.7)	
32	Jameson St & Township St	TWSC	B (12.7)	
33	John Liner Rd & Reed St	TWSC	B (10.7)	
34	McGarigle Rd & Carter St	TWSC	A (8.8)	
36	Fruitdale Rd & McGarigle Rd	TWSC	B (10)	
37	Fruitdale Rd & Portobello Ave	TWSC	B (10.6)	
41	Fruitdale Rd & Kalloch Rd	TWSC	A (8.6)	
42	Minkler Rd & Fruitdale Rd	TWSC	B (11.1)	
43	SR 9 & Jameson St	RAB	A (6.1)	

¹TWSC = minor approach stop control; AWSC = all-way stop control; Signal = signalized; RAB = roundabout

²For TWSC intersections, delay is reported for the worst (i.e. highest-delay) movement; for all other control types, average intersection delay is reported.



2019 Segment LOS Results

ID	Name	Limits	Functional Classification	2019 V/C	2019 LOS
2001	SR 20	Collins Rd to Rhodes Rd	Principal Art.	0.82	D
2002	SR 20	Rhodes Rd to W State St	Principal Art.	0.80	D
2003	SR 20	State St to SR 9	Principal Art.	0.48	A
2004	SR 20	SR 9 to W Ferry St	Principal Art.	0.59	A
2005	SR 20	W Ferry St to Cook Rd	Principal Art.	0.45	A
2006	SR 20	Cook Rd to F&S Grade Rd	Principal Art.	0.76	C
2007	SR 20	F&S Grade Rd to Patrick St	Principal Art.	0.79	C
2008	SR 20	Patrick St to Metcalf St	Principal Art.	0.75	C
2009	SR 20	Metcalf St to Reed St	Principal Art.	0.80	D
2010	SR 20	Reed St to Township St	Principal Art.	0.73	C
3001	SR 20	Township St to Fruitdale	Minor Art.	0.57	A
3002	SR 20	Fruitdale Rd to Helmick Rd	Minor Art.	0.39	A
3003	SR 9	City Limit to W Nelson St	Minor Art.	0.76	C
3004	[reserved]			0.00	-
3005	SR 9	W Nelson St to W State St	Minor Art.	0.58	A
3006	SR 9	W State St to SR 20	Minor Art.	0.25	A
3007	[reserved]			0.00	-
3008	[reserved]			0.00	-
3009	[reserved]			0.00	-
3010	Cook Rd	City Limit to Trail Rd	Minor Art.	0.59	A
3011	Cook Rd	Trail Rd to Ferry St	Minor Art.	0.55	A
3012	Cook Rd	Ferry St to SR 20	Minor Art.	0.42	A
3013	F&S Grade Rd	City Limit to Murrow St	Minor Art.	0.09	A
3014	F&S Grade Rd	Murrow St to SR 20	Minor Art.	0.10	A
3015	[reserved]			0.00	-
3016	[reserved]			0.00	-
3017	Ferry St	SR 20 to Metcalf St	Minor Art.	0.42	A
3018	Ferry St	Metcalf St to Reed St	Minor Art.	0.28	A
3019	Ferry St	Reed St to Township St	Minor Art.	0.20	A
3020	State St	SR 20 to SR 9	Minor Art.	0.48	A
3021	State St	SR 9 to Metcalf St	Minor Art.	0.58	A
3022	State St	Metcalf St to 3rd St	Minor Art.	0.46	A
3023	State St	3rd St to Reed St	Minor Art.	0.45	A
3024	State St	Reed St to Township St	Minor Art.	0.45	A
3025	[reserved]			0.00	-
3026	Township St	State St to Ferry St	Minor Art.	0.32	A
3027	Township St	Ferry St to Wicker Rd	Minor Art.	0.38	A
3028	Township St	Wicker Rd to SR 20	Minor Art.	0.35	A
3029	Township St (SR 9)	SR 20 to McGarigle Rd	Minor Art.	0.51	A
3030	Township St (SR 9)	McGarigle Rd to Sapp Rd	Minor Art.	0.45	A
3031	Township St (SR 9)	Sapp Rd to Bassett Rd	Minor Art.	0.38	A
3032	Township St (SR 9)	Bassett Rd to Kalloch	Minor Art.	0.31	A
3033	[reserved]			0.00	-

ID	Name	Limits	Functional Classification	2019 V/C	2019 LOS
3034	[reserved]			0.00	-
4001	3rd St	Sterling St to Jameson St	Major Coll.	0.19	A
4002	3rd St	Jameson St to State St	Major Coll.	0.00	-
4003	Batey Rd	W Nelson St to Jameson St	Major Coll.	0.09	A
4004	Fruitdale Rd	River Rd to Hoehn Rd	Major Coll.	0.04	A
4005	Fruitdale Rd	Hoehn Rd to Minkler Rd	Major Coll.	0.05	A
4006	Fruitdale Rd	Minkler Rd to Wicker Rd	Major Coll.	0.14	A
4007	Fruitdale Rd	Wicker Rd to SR 20	Major Coll.	0.13	A
4008	Fruitdale Rd	SR 20 to McGarigle Rd	Major Coll.	0.18	A
4009	Fruitdale Rd	McGarigle to Thompson Dr	Major Coll.	0.20	A
4010	Fruitdale Rd	Thompson Dr to Kalloch	Major Coll.	0.01	A
4011	Jameson St	Batey Rd to 3rd St	Major Coll.	0.28	A
4012	Jameson St	3rd St to 6th St	Major Coll.	0.13	A
4013	Jameson St	6th St to Township St	Major Coll.	0.11	A
4014	Jameson St	Township St to Railroad Ave	Major Coll.	0.07	A
4015	John Liner Rd	Reed St to Township St	Major Coll.	0.06	A
4016	[reserved]			0.00	-
4017	McGarigle Rd	Township St to Fruitdale	Major Coll.	0.17	A
4018	Metcalf St	State St to Ferry St	Major Coll.	0.24	A
4019	Metcalf St	Ferry St to SR 20	Major Coll.	0.22	A
4020	Minkler Rd	State St to Fruitdale Rd	Major Coll.	0.13	A
4021	Nelson St	SR 9 to Batey Rd	Major Coll.	0.28	A
4022	Railroad Ave	Jameson St to State St	Major Coll.	0.20	A
4023	Reed St	State St to Ferry St	Major Coll.	0.02	A
4024	Reed St	Ferry St to SR 20	Major Coll.	0.02	A
4025	Reed St	SR 20 to John Liner Rd	Major Coll.	0.20	A
4026	Reed St	John Liner Rd to Sapp Rd	Major Coll.	0.18	A
4027	Rhodes Rd	SR 20 to SR 9	Major Coll.	0.05	A
4028	[reserved]			0.00	-
4029	Sapp Rd	Reed St to Township Rd	Major Coll.	0.09	A
4030	State St	Township to Railroad Ave	Major Coll.	0.19	A
4031	Sterling St	3rd St to 6th St	Major Coll.	0.09	A
4032	Sterling St	6th St to Township St	Major Coll.	0.02	A
4033	Township St	River Rd to Sterling St	Major Coll.	0.21	A
4034	Township St	Sterling St to Jameson St	Major Coll.	0.23	A
4035	Township St	Jameson St to State St	Major Coll.	0.25	A
4036	Trail Road	SR 20 to Cook Rd	Major Coll.	0.27	A
4037	Wicker Rd	Township St to Fruitdale	Major Coll.	0.30	A
4038	[reserved]			0.00	-
5001	Jones Rd	F&S Grade Rd to Garden of Eden	Local	0.24	A
5002	Jones Rd	Garden of Eden to Sapp Rd	Local	0.05	A
5003	Garden of Eden Rd	F&S Grade Rd to Jones Rd	Local	0.19	A
5004	Garden of Eden Rd	Jones Rd to Kiens Ln (Pvt)	Local	0.31	A
5005	[reserved]		Local	0.00	-

ID	Name	Limits	Functional Classification	2019 V/C	2019 LOS
5006	[reserved]			0.00	-
5007	Bassett Rd	Eikleberry Ct (Pvt) to SR 9	Local	0.03	A
5008	[reserved]			0.00	-
5009	[reserved]			0.00	-
5010	[reserved]			0.00	-
5011	[reserved]			0.00	-



2025 Intersection LOS Results

ID	Location	Control Type ¹	2025 LOS (Delay) ²		Deficient?	
			Baseline	Alternative	Baseline	Alternative
1	SR 20 & Collins Rd	Signal	B (13.7)	B (13.6)		
2	SR 20 & Rhodes Rd	Signal	B (11.1)	B (10.7)		
3	SR 20 & Trail Rd	Signal	C (25.1)	C (23.8)		
4	SR 20 & SR 9 (west)	Signal	B (16.7)	B (16.8)		
5	SR 20 & Ferry St	Signal	B (15.6)	B (16.1)		
6	SR 20 & Cook Rd	RAB	B (11.8)	B (11.4)		
7	SR 20 & F&S Grade Rd	TWSC	C (16)	C (15.7)		
8	SR 20 & Patrick St	RAB	A (6.5)	A (6.5)		
9	SR 20 & Metcalf St	TWSC	D (25.7)	D (25.1)		
10	SR 20 & Murdock St	TWSC	C (23)	C (23)		
11	SR 20 & Reed St	TWSC	C (24.8)	D (25.3)		
12	SR 20 & Central Ave	TWSC	C (22.8)	C (22.6)		
13	SR 20 & Ball St	TWSC	C (21.2)	C (21)		
14	SR 20 & Township St (SR 9)	Signal	B (19.9)	C (21)		
15	SR 20 & Fruitdale Rd	Signal	B (11)	B (11.6)		
16	SR 20 & Helmick Rd	TWSC	B (10.6)	B (10.6)		
17	Cook Rd & Trail Rd	TWSC	F (492.8)	F (999)	Yes	Yes
18	Cook Rd & Ferry St	RAB	A (5.7)	A (5.6)		
19	SR 9 & State St	Signal	D (44.5)	D (43.6)		
20	State St & Metcalf St	AWSC	B (12.1)	B (12)		
21	State St & Reed St	TWSC	B (11.9)	B (11.9)		
22	State St & Township St	AWSC	B (11)	B (11.4)		
23	State St & Railroad St	AWSC	A (8.1)	A (8.1)		
24	Hoehn Rd & Fruitdale Rd	TWSC	A (9.4)	A (9.4)		
26	Ferry St & Metcalf St	AWSC	B (10.9)	B (10.6)		
27	Ferry St & Reed St	TWSC	B (11.4)	B (11.2)		
28	Ferry St & Township St	TWSC	B (12.7)	B (12.7)		
29	Township St & John Liner Rd	TWSC	F (50.2)	F (178.7)	Yes	Yes
30	SR 9 & Kalloch Rd	TWSC	B (12.1)	B (12.3)		
31	Jameson St & 3rd St	AWSC	A (8.2)	A (8.2)		
32	Jameson St & Township St	TWSC	B (11.6)	B (11.7)		
33	John Liner Rd & Reed St	TWSC	C (18.1)	C (21.8)		
34	McGarigle Rd & Carter St	TWSC	A (8.9)	A (9.8)		
36	Fruitdale Rd & McGarigle Rd	TWSC	B (10.3)	B (10.9)		
37	Fruitdale Rd & Portobello Ave	TWSC	B (13.9)	B (14.7)		
41	Fruitdale Rd & Kalloch Rd	TWSC	A (8.8)	A (8.8)		
42	Minkler Rd & Fruitdale Rd	TWSC	B (11.3)	B (11.2)		
43	SR 9 & Jameson St	RAB	A (6.7)	A (5.4)		
44	F&S Grade Rd & Trail Rd	TWSC	A (9.8)	C (15.2)		
45	Jones Rd & Garden of Eden Rd	TWSC	B (10.1)	C (16.4)		
46	Jones Rd & Patrick St	TWSC	B (11.6)	B (13.3)		

¹TWSC = minor approach stop control; AWSC = all-way stop control; Signal = signalized; RAB = roundabout

²For TWSC intersections, delay is reported for the worst (i.e. highest-delay) movement; for all other control types, average intersection delay is reported.



2025 Segment LOS Results

ID	Name	Limits	Functional Classification	2025 V/C		2025 LOS	
				Base	Alt.	Base	Alt.
2001	SR 20	Collins Rd to Rhodes Rd	Principal Art.	0.72	0.72	C	C
2002	SR 20	Rhodes Rd to W State St	Principal Art.	0.80	0.80	D	D
2003	SR 20	State St to SR 9	Principal Art.	0.48	0.48	A	A
2004	SR 20	SR 9 to W Ferry St	Principal Art.	0.59	0.59	A	A
2005	SR 20	W Ferry St to Cook Rd	Principal Art.	0.45	0.45	A	A
2006	SR 20	Cook Rd to F&S Grade Rd	Principal Art.	0.76	0.76	C	C
2007	SR 20	F&S Grade Rd to Patrick St	Principal Art.	0.79	0.79	C	C
2008	SR 20	Patrick St to Metcalf St	Principal Art.	0.75	0.75	C	C
2009	SR 20	Metcalf St to Reed St	Principal Art.	0.80	0.80	D	D
2010	SR 20	Reed St to Township St	Principal Art.	0.73	0.73	C	C
3001	SR 20	Township St to Fruitdale	Minor Art.	0.57	0.57	A	A
3002	SR 20	Fruitdale Rd to Helmick Rd	Minor Art.	0.39	0.39	A	A
3003	SR 9	City Limit to W Nelson St	Minor Art.	0.76	0.76	C	C
3004	[reserved]			0.00	0.00	-	-
3005	SR 9	W Nelson St to W State St	Minor Art.	0.58	0.58	A	A
3006	SR 9	W State St to SR 20	Minor Art.	0.25	0.25	A	A
3007	[reserved]			0.00	0.00	-	-
3008	[reserved]			0.00	0.00	-	-
3009	[reserved]			0.00	0.00	-	-
3010	Cook Rd	City Limit to Trail Rd	Minor Art.	0.59	0.59	A	A
3011	Cook Rd	Trail Rd to Ferry St	Minor Art.	0.55	0.55	A	A
3012	Cook Rd	Ferry St to SR 20	Minor Art.	0.42	0.42	A	A
3013	F&S Grade Rd	City Limit to Murrow St	Minor Art.	0.09	0.09	A	A
3014	F&S Grade Rd	Murrow St to SR 20	Minor Art.	0.10	0.10	A	A
3015	[reserved]			0.00	0.00	-	-
3016	[reserved]			0.00	0.00	-	-
3017	Ferry St	SR 20 to Metcalf St	Minor Art.	0.42	0.42	A	A
3018	Ferry St	Metcalf St to Reed St	Minor Art.	0.28	0.28	A	A
3019	Ferry St	Reed St to Township St	Minor Art.	0.20	0.20	A	A
3020	State St	SR 20 to SR 9	Minor Art.	0.48	0.48	A	A
3021	State St	SR 9 to Metcalf St	Minor Art.	0.58	0.58	A	A
3022	State St	Metcalf St to 3rd St	Minor Art.	0.46	0.46	A	A
3023	State St	3rd St to Reed St	Minor Art.	0.45	0.45	A	A
3024	State St	Reed St to Township St	Minor Art.	0.45	0.45	A	A
3025	[reserved]			0.00	0.00	-	-
3026	Township St	State St to Ferry St	Minor Art.	0.32	0.32	A	A
3027	Township St	Ferry St to Wicker Rd	Minor Art.	0.38	0.38	A	A
3028	Township St	Wicker Rd to SR 20	Minor Art.	0.35	0.35	A	A
3029	Township St (SR 9)	SR 20 to McGarigle Rd	Minor Art.	0.51	0.51	A	A
3030	Township St (SR 9)	McGarigle Rd to Sapp Rd	Minor Art.	0.45	0.45	A	A
3031	Township St (SR 9)	Sapp Rd to Bassett Rd	Minor Art.	0.43	0.50	A	A
3032	Township St (SR 9)	Bassett Rd to Kalloch	Minor Art.	0.31	0.31	A	A
3033	[reserved]			0.00	0.00	-	-

ID	Name	Limits	Functional Classification	2025 V/C		2025 LOS	
				Base	Alt.	Base	Alt.
3034	[reserved]			0.00	0.00	-	-
4001	3rd St	Sterling St to Jameson St	Major Coll.	0.19	0.19	A	A
4002	3rd St	Jameson St to State St	Major Coll.	0.11	0.11	A	A
4003	Batey Rd	W Nelson St to Jameson St	Major Coll.	0.08	0.07	A	A
4004	Fruitdale Rd	River Rd to Hoehn Rd	Major Coll.	0.04	0.04	A	A
4005	Fruitdale Rd	Hoehn Rd to Minkler Rd	Major Coll.	0.05	0.05	A	A
4006	Fruitdale Rd	Minkler Rd to Wicker Rd	Major Coll.	0.14	0.14	A	A
4007	Fruitdale Rd	Wicker Rd to SR 20	Major Coll.	0.13	0.13	A	A
4008	Fruitdale Rd	SR 20 to McGarigle Rd	Major Coll.	0.18	0.18	A	A
4009	Fruitdale Rd	McGarigle to Thompson Dr	Major Coll.	0.20	0.20	A	A
4010	Fruitdale Rd	Thompson Dr to Kalloch	Major Coll.	0.01	0.01	A	A
4011	Jameson St	Batey Rd to 3rd St	Major Coll.	0.28	0.28	A	A
4012	Jameson St	3rd St to 6th St	Major Coll.	0.13	0.13	A	A
4013	Jameson St	6th St to Township St	Major Coll.	0.11	0.11	A	A
4014	Jameson St	Township St to Railroad Ave	Major Coll.	0.07	0.07	A	A
4015	John Liner Rd	Reed St to Township St	Major Coll.	0.06	0.06	A	A
4016	[reserved]			0.00	0.00	-	-
4017	McGarigle Rd	Township St to Fruitdale	Major Coll.	0.17	0.17	A	A
4018	Metcalf St	State St to Ferry St	Major Coll.	0.24	0.24	A	A
4019	Metcalf St	Ferry St to SR 20	Major Coll.	0.22	0.22	A	A
4020	Minkler Rd	State St to Fruitdale Rd	Major Coll.	0.13	0.13	A	A
4021	Nelson St	SR 9 to Batey Rd	Major Coll.	0.28	0.28	A	A
4022	Railroad Ave	Jameson St to State St	Major Coll.	0.20	0.20	A	A
4023	Reed St	State St to Ferry St	Major Coll.	0.02	0.02	A	A
4024	Reed St	Ferry St to SR 20	Major Coll.	0.02	0.02	A	A
4025	Reed St	SR 20 to John Liner Rd	Major Coll.	0.20	0.20	A	A
4026	Reed St	John Liner Rd to Sapp Rd	Major Coll.	0.18	0.18	A	A
4027	Rhodes Rd	SR 20 to SR 9	Major Coll.	0.05	0.05	A	A
4028	[reserved]			0.00	0.00	-	-
4029	Sapp Rd	Reed St to Township Rd	Major Coll.	0.07	0.07	A	A
4030	State St	Township to Railroad Ave	Major Coll.	0.19	0.19	A	A
4031	Sterling St	3rd St to 6th St	Major Coll.	0.09	0.09	A	A
4032	Sterling St	6th St to Township St	Major Coll.	0.02	0.02	A	A
4033	Township St	River Rd to Sterling St	Major Coll.	0.21	0.21	A	A
4034	Township St	Sterling St to Jameson St	Major Coll.	0.23	0.23	A	A
4035	Township St	Jameson St to State St	Major Coll.	0.25	0.25	A	A
4036	Trail Road	SR 20 to Cook Rd	Major Coll.	0.27	0.27	A	A
4037	Wicker Rd	Township St to Fruitdale	Major Coll.	0.35	0.33	A	A
4038	[reserved]			0.00	0.00	-	-
5001	Jones Rd	F&S Grade Rd to Garden of Eden Rd	Local	0.24	0.10	A	A
5002	Jones Rd	Garden of Eden to Sapp Rd	Local	0.25	0.38	A	A
5003	Garden of Eden Rd	F&S Grade Rd to Jones Rd	Local	0.48	0.14	A	A

ID	Name	Limits	Functional Classification	2025 V/C		2025 LOS	
				Base	Alt.	Base	Alt.
5004	Garden of Eden Rd	Jones Rd to Kiens Ln (Pvt)	Local	0.24	0.26	A	A
5005	[reserved]		Local	0.00	0.00	-	-
5006	[reserved]			0.00	0.00	-	-
5007	Bassett Rd	Eikleberry Ct (Pvt) to SR 9	Local	0.03	0.03	A	A
5008	[reserved]			0.00	0.00	-	-
5009	[reserved]			0.00	0.00	-	-
5010	[reserved]			0.00	0.00	-	-
5011	[reserved]			0.00	0.00	-	-