

**FRISCO
STATE HIGHWAY 9
TRAFFIC STUDY**

SH-9 MP 94.36 TO MP 96.25

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Prepared for:



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1.0 EXISTING ROADWAY CONDITIONS

1.1 Project Background

The town of Frisco is located in Summit County along State Highway 9, just south of Interstate 70. The study segment is from MP 94.36 (south of Peak One Dr) to MP 96.25 (north of Main St) on SH-9. This section of road is classified as a principle arterial on mountainous terrain. It varies between 2 and 4 lanes, with a speed limit between 35 and 50 mph, and is the primary route between I-70 and Breckenridge. A vicinity map showing nearby incorporated areas and highways is presented in .

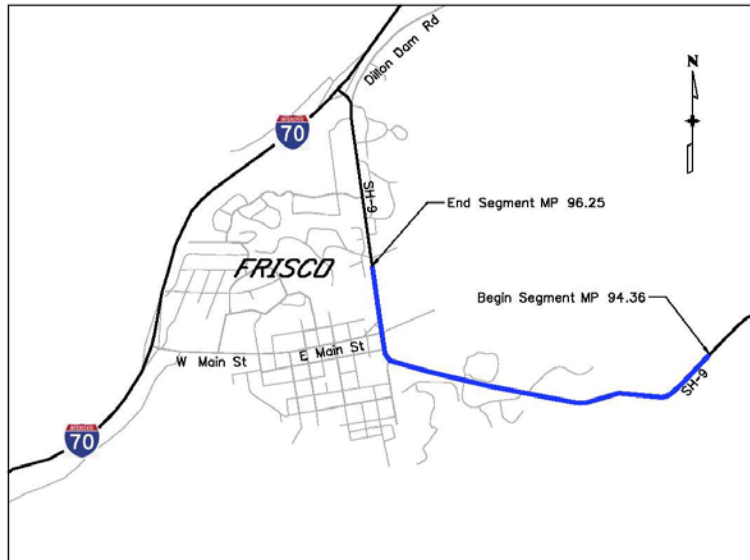


Figure 1. Vicinity Map

The purpose of this study is to analyze the corridor and provide geometric, access, and traffic control recommendations for CDOT’s project to improve SH-9. Turning movement counts were collected at the following intersections for 2 hours during the peak AM and 2 hours during the peak PM time periods.

- Main St / Marina Rd
- Granite St
- 8th Ave
- Bayview Dr
- Peak One Blvd / Water Dance Dr
- Peak One Blvd / Peninsula Rd
- Peak One Dr / Recreation Way
- Granite St / 7th Ave (summer only)

Traffic analyses were conducted using Synchro and Sidra for both existing and projected future conditions. The traffic analyses considered the effects of access management on overall corridor traffic operations. Recommendations from the 2004 Access Management Plan were incorporated based upon the results of the traffic analysis and stakeholder feedback.

1.2 Land Use Characteristics

The study area encompasses approximately 1.89 miles of SH-9 through the southern half of Frisco, Colorado. Most of the study section falls within the city of Frisco’s limits. The land use, in general, along this portion of SH-9 is commercial and residential for the northern half, and undeveloped frontage for the southern half. However, the southernmost intersection serves as access to St. Anthony Summit Medical Center, Summit County Commons, and recreation areas.

1.3 Roadway Characteristics

The posted speed limit on SH-9 ranges from 35 mph in downtown Frisco to 50 mph south of the city. Table 1 and Table 2 give the mile posts of each speed limit, while Figure 2 shows the different speed limits on an aerial view.

TABLE 1: SOUTHBOUND SPEED LIMITS

Mile Point	Approximate Location	Southbound Speed Limits (MPH)
96.25 - 95.36	North of Main St to 0.1 miles south of Water Dance Dr	35
95.36 – 94.36	0.1 miles south of Water Dance Dr to south of Recreation Way	50

TABLE 2: NORTHBOUND SPEED LIMITS

Mile Point	Approximate Location	Northbound Speed Limits (MPH)
94.36 - 95.38	South of Recreation Way to just south of Water Dance Dr	50
95.38 - 95.64	Just south of Water Dance Dr to just north of Bayview Dr	40
95.64 - 96.25	Just north of Bayview Dr to north of Main St	35



Figure 2. SH-9 Speed Limits

The horizontal alignment of this section of SH-9 generally runs east/west, but is defined by CDOT as a north/south running highway. It is mostly straight, with a gradual curve south of Main Street, and another one north of Recreation Way. The highway profile along the northern portion of the segment is flat, but the segment from Peak One Blvd to Recreation Way is at a 5% grade.

2.0 EXISTING TRAFFIC CONDITIONS

2.1 Existing Traffic Volumes

Turning Movement Counts (TMCs) along SH-9 were collected on Friday, February 24, 2017 and Thursday, July 13, 2017. The counts were taken from 7:30-9:30 AM and 4:00-6:00 PM. Vehicle classification and pedestrian information were included in the data collection. The winter counts were taken at 7 locations, while the summer counts included an additional off-highway intersection. Raw traffic count data as well as peak hour volume figures are provided in the appendix.

2.2 Synchro Analysis

Level-Of-Service (LOS) analyses were conducted at all intersections where turning movement counts were collected. LOS is a measure of the quality of traffic flow and is defined by a letter grade ranging from A (uninterrupted flow) to F (heavily congested conditions). The volume inputs were taken from the system peak hour, while an individual peak hour factor (PHF) for each intersection was used. Analyses were carried out using Synchro 9th Edition.

Table 3 shows *HCM 2010* LOS criteria for signalized and unsignalized intersections. For signalized controlled intersections, LOS is reported for the intersection as a whole. At unsignalized intersections, the LOS for the worst performing movement is reported. Typically, left-turn traffic from the stop-controlled approach will be the worst performing movement LOS D or better is generally considered acceptable (though not always attainable) for peak period conditions in urbanized areas.

TABLE 3: LOS CRITERIA

Level of Service (LOS)	Average Delay		Traffic Characteristics
	Signalized Intersection (seconds/vehicle)	Unsignalized Intersection (seconds/vehicle)	
A	<= 10	<= 10	Free Flow / Insignificant Delays
B	> 10 – 20	> 10 - 15	Stable Flow / Minimal Delays
C	> 20 – 35	>15 - 25	Stable Flow / Acceptable Delays
D	> 35 – 55	>25 - 35	Approaching Unstable / Tolerable Delays
E	> 55 – 80	> 35 - 50	Unstable Flow / Significant Delays
F	> 80	> 50	Forced Flow / Excessive Delays

Where an intersection operates at LOS is E or F, a volume-to-capacity ratio (v/c) has been reported for the worst-case movement. Where v/c exceeds 1.00, traffic demand during peak periods exceeds the capacity for the movement. This condition will cause queues to grow, potentially filling auxiliary lanes and blocking adjacent traffic lanes until demand decreases.

2.3 Existing Traffic Operations (Winter)

The results indicate that most intersections operated at acceptable levels (LOS D or better) in February 2017, as shown in Table 4. The exception is the intersection of SH-9 and 8th Ave. The eastbound left turn onto SH-9 operates at LOS F for both time periods. The eastbound left at SH-9 and Bayview Dr operates at an LOS E in the PM, however, the V/C ratio and queue length

is low, so it is not a significant area of concern. All of the signalized intersections operated at acceptable levels.

Pedestrian volumes were low enough in the winter to be ignored. The Synchro models, as a result, do not include operational impacts of pedestrian crossings.

TABLE 4: WINTER 2017 LEVELS-OF-SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS(V/C)	Delay (s)	LOS(V/C)
SH-9/Main St	Signal	15.3	B	21.8	C
SH-9/Granite St	Two-Way Stop	15.1 (EBR)	C	13.8 (EBR)	B
SH-9/8 th Ave	Two-Way Stop	87.6 (EBL)	F (.27)	175.2 (EBL)	F (.72)
SH-9/Bayview Dr	Two-Way Stop	25.9 (EBL)	D	42.6 (EBL)	E (.09)
SH-9/Water Dance	Signal	10.3	B	13.6	B
SH-9/Peninsula Rd	Two-Way Stop	0.0	A	0.0	A
SH-9/Recreation Way	Signal	5.8	A	11.2	B

2.4 Existing Traffic Operations (Summer)

The counts taken in the summer include the intersections counted in the winter, plus the intersection of Granite St and 7th Ave. As shown in Table 5, the summer LOS was similar to that of the winter. The intersection of SH-9 and Bayview Dr operates at an LOS of F in the PM peak, due to the difficulty of turning left onto SH-9. The intersections south of the center of town have higher side street volumes in the summer, as the recreational areas are being used more. While this increases the LOS by one letter grade at several locations, the intersections still operate at acceptable levels.

The pedestrian volumes during the summer were significantly higher than during the winter. In the PM peak hour, there were 51 pedestrians crossing SH-9 at Main Street. Because of this, two Synchro models for each time period were created. One modeled SH-9/Main Street with no pedestrians, while the other assumed a pedestrian crossings for every cycle. The actual impacts of pedestrians will fall somewhere between the two models, so the Synchro results are displayed as a range in Table 5.

TABLE 5: SUMMER 2017 LEVELS-OF-SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS(V/C)	Delay (s)	LOS(V/C)
SH-9/Main St	Signal	17.2-21.6	B-C	21.1-25.2	C
SH-9/Granite St	Two-Way Stop	13.5 (EBR)	B	14.7 (EBR)	B
SH-9/8 th Ave	Two-Way Stop	83.5 (EBL)	F (.42)	390.7 (EBL)	F (1.18)
SH-9/Bayview Dr	Two-Way Stop	32.5 (EB)	D	56.7 (EBL)	F (.14)
SH-9/Water Dance	Signal	9.4	A	15.2	B
SH-9/Peninsula Rd	Two-Way Stop	0.0	A	10.5	B
SH-9/Recreation Way	Signal	7.0	A	12.8	B
Granite St/7 th Ave	Two-Way Stop	10.6 (NB)	B	12.7 (NB)	B

3.0 2037 NO BUILD TRAFFIC CONDITIONS

3.1 2037 Traffic Volumes

When modeling the expected 2037 volumes in Synchro, a conservative growth rate of 1.5% per year was assumed for highway and side-street traffic demand. This rate was based on CDOT projections on both the highway and Frisco side streets. The yearly growth rate resulted in a 20-year growth factor of 1.35. The roadway geometry in the Synchro model was kept the same as it was in the existing scenario. The signal timing, however, was allowed to optimize.

3.2 2037 Traffic Operations (Winter)

When the volumes were increased by 1.35, the delays at the intersections significantly increased, as can be seen in Table 6. The signals continue to operate at an acceptable LOS. The two-way stop intersections, however, perform significantly worse than in the existing conditions. The intersection of SH-9 and Bayview Dr is expected to operate at LOS F for both morning and afternoon. This is because the eastbound left turns have difficulty turning onto SH-9 with increased thru volume. It should also be noted that although the intersections at Water Dance and Recreation Way are still operating acceptably, they have increased from LOS B to LOS D in the PM. This is because the thru traffic on SH-9 is nearing capacity with a single through lane.

TABLE 6: WINTER 2037 LEVELS-OF-SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS(V/C)	Delay (s)	LOS(V/C)
SH-9/Main St	Signal	23.6	C	24.1	C
SH-9/Granite St	Two-Way Stop	22.1 (EBR)	C	18.9 (EBR)	C
SH-9/8 th Ave	Two-Way Stop	497.5 (EBL)	F (1.08)	1937 (EBL)	F (4.01)
SH-9/Bayview Dr	Two-Way Stop	94.1 (EBL)	F (.36)	134.7 (EBL)	F (.37)
SH-9/Water Dance	Signal	32.4	C	36.0	D
SH-9/Peninsula Rd	Two-Way Stop	0.0	A	0.0	A
SH-9/Recreation Way	Signal	10.4	B	38.9	D

3.3 2037 Traffic Operations (Summer)

Much like the winter models, when the volumes were increased by 1.35, the delays at the intersections significantly increased, as can be seen in Table 7. The signalized intersections continue to operate at an acceptable LOS, although the two-way stop intersections perform significantly worse than in the existing conditions. The intersection of SH-9 and Bayview Dr is expected to operate at LOS F for both morning and afternoon. This is due to the eastbound left turns having difficulty turning onto SH-9 because of the increased through volume. The intersections of SH-9 and 8th Ave is also expected to operate at LOS F. It should be noted that although the intersections at Water Dance and Recreation Way are still operating acceptably, they have increased from LOS B to LOS D in the PM. This is due to the thru traffic on SH-9 approaching capacity.

For the future scenarios, it is assumed that the intersection of SH-9 and Main St will be operating on a pedestrian recall. Pedestrian recall means that pedestrian phases run for their full length every signal cycle whether they are activated or not. The side effect of pedestrian recall operations is that green indication may be held longer on phases where there is no vehicle demand. Since the cycles have been allowed to optimize, this does not change the delay much from the no pedestrian scenario.

TABLE 7: SUMMER 2037 LEVELS-OF-SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS(V/C)	Delay (s)	LOS(V/C)
SH-9/Main St	Signal	32.0	C	32.5	C
SH-9/Granite St	Two-Way Stop	18.0 (EBR)	C	21.7 (EBR)	C
SH-9/8 th Ave	Two-Way Stop	565.1 (EBL)	F (1.53)	3416 (EBL)	F (6.58)
SH-9/Bayview Dr	Two-Way Stop	126.1 (EB)	F (.37)	459.7(EBL)	F (.88)
SH-9/Water Dance	Signal	22.6	C	42.4	D
SH-9/Peninsula Rd	Two-Way Stop	0.0	A	10.5	B
SH-9/Recreation Way	Signal	14.8	B	37.3	D
Granite St/7 th Ave	Two-Way Stop	11.5 (NB)	B	15.4 (NB)	C

4.0 PLAN DEVELOPMENT AND EVALUATION

The geometric recommendations were based on the 2004 Access Management Plan, traffic volume forecasts, input from the City, County, and CDOT. State Highway Access Code design criteria were used to determine whether or not an acceleration or deceleration lane is needed, and, if so, what the required length is at each location.

4.1 Plan Recommendations

Table 8 gives a summary of existing access, the access recommended by the 2004 Access Management Plan, and the 2017 access recommendations provided by this study. As can be seen in the table, the allowed movements in the 2017 recommendations remained almost identical to the allowed movements proposed by the 2004 ACP. The access # in the table is associated to the Access Management Plan.

TABLE 8: ACCESS RECOMMENDATIONS

SH9 MP	ACCESS#	SIDE	DESCRIPTION	EXISTING ACCESS	2004 ACCESS MANAGEMENT PLAN	2017 ACCESS RECOMMENDATION
94.88	66	East	Recreation Way	Full Move (signal)	Full Movement	Full Movement, as designed by Iron Springs project
94.88	66	West	Peak One Drive	Full Move (signal)	Full Movement	Full Movement, as designed by Iron Springs project
95.23	67	East	Recreation Way	RIRO	RIRO	RIRO, restrict left turns with raised median. Retain RT accel lane. Consider pedestrian/ bicycle treatment.
95.23	67	West	Peak One Blvd	RIRO	RIRO	RIRO, restrict left turns with raised median. Consider pedestrian/ bicycle treatment.
95.45	68	East	Water Dance Drive	Full Move (signal)	Full Movement	Full Movement, retain traffic signal and LT Decel Lane
95.45	68	West	CR 1004	Full Move (signal)	Full Movement	Full Movement, retain traffic signal, LT and RT Decel Lanes
95.57	69	West	Bayview Drive	Full Move	RIRO	RIRO, restrict left turns with raised median
95.92	70	West	8th Avenue	Full Move	Full Move (unsignal) unless 3/4 or RIRO is necessary	3/4 Movement, restrict left turns with regulatory signage. Include LT Decel Lane and RT Decel Lane.
95.92	70	East	Treatment Plant	Full move	Full Move (unsignal) unless 3/4 or RIRO is necessary	Full Movement, no LT Decel Lane is needed
95.97	71	West	Granite Street	3/4- Left Turn In	RIRO	RIRO, restrict left turns with raised median
96.01	72	West	Private D/W	RIRO	Close upon redevelopment	RIRO, restrict left turns with raised median
96.02	73	East	Marina Road	Full Move (signal)	Full Movement	Full Movement, retain traffic signal and LT Decel lane
96.02	73	West	Main Street	Full Move (signal)	Full Movement	Full Movement, retain traffic signal and LT Decel lane. Replace RT bypass lane with non-channelized RT decel lane to facilitate pedestrian/bike activity on the north side of Main Street. Add pedestrian phase across Main Street, but pedestrian crossings of the north intersection leg to remain prohibited.

The thru volumes are expected to reach capacity by 2037 in the locations that only have one thru lane for each direction. It is recommended that a thru lane be added in those locations so that all of SH-9 has 2 thru lanes in each direction.

With the projected increase in volumes at the turn lanes through Frisco, it was necessary to reevaluate the lengths of the auxiliary lanes at each intersection. Table 9 shows the highest projected turning movement for the 2037 build scenario, as well as the required length of the storage and acceleration/deceleration. In most cases, the State Highway Access Code requires the auxiliary lane length to be longer than what is currently in place.

TABLE 9: AUXILIARY LANE LENGTHS

INTERSECTION AT SH-9	LANE	2037 HIGHEST PEAK HOUR TURN VOLUME	SPEED LIMIT (MPH)	STATE HIGHWAY ACCESS CODE STORAGE LENGTH	STATE HIGHWAY ACCESS CODE ACCEL/DECEL LENGTH ¹	RECOMMENDED AUXILIARY LANE LENGTH INCLUDING TAPER
Main St/Marina Dr	NBL	250	35	250	310	560
	SBL	30		30	310	340
	SBR	390			310	310
8th Ave/Treatment Plant	NBL	180	35	180	310	490
	SBR	80			310	220 ²
Water Dance/CR-1004	SBL	20	35	25	310	335
	SBR	230			310	310
	NBL	40			310	310
Recreation Way/Peak One	WBR Accel	100	50		760	760
	EBR Accel	40			760	760
Recreation Way/Peak One Dr	NBL	100	50	100	500	600
	NBR	30			500	500
	SBL	100		100	500	600
	SBR	80			500	500

1: Acceleration and deceleration lengths shall be adjusted for any grade of three percent or more.

2: AASHTO Green Book deceleration length.

4.2 Stakeholder Input

As a supplement to engineering considerations, input from a local stakeholder group was considered. Comments on the recommended plan were accepted from the Project Leadership Team at a meeting held on May 4th, 2017. Changes to the recommended plan made at that meeting include the addition of a right turn acceleration lane from Peak One Blvd, elimination of raised median at 8th Avenue to accommodate left turns for fire trucks, and the addition of a grade separated pedestrian crossing of the highway at Peak One Blvd/Recreation Way. Minutes from the meeting are included in the Appendix.

Originally, a raised median was proposed on SH-9 to restrict the left turn movement out of 8th Ave. However, the nearby fire station requires left turn access to the highway. Two methods of restricting the access while continuing to allow emergency vehicle access to be maintained were considered; a raised “porkchop” island on 8th Ave that guides traffic to the right while designed to allow a fire truck to make the left turn around it and “left turns prohibited” signing without physical improvements.

Per Table 14-20 of the American Association of State Highway and Transportation Officials (AASHTO) *Highway Safety Manual, 1st Edition*, the prohibition is expected to reduce left turn crashes by 40 to 80 percent. The safety benefits of these treatments are expected to be more pronounced as highway traffic increases and the LOS for the left turns worsens. Drivers experiencing poor LOS tend to grow impatient and may select gaps in traffic that cannot be safely entered.

Motorist left-turn prohibition compliance with either the porkchop or signing-only options is unlikely to meet that of a raised median along the highway. While a porkchop treatment is expected to achieve higher compliance levels for discouraging left turns than the signing-only option, the Transportation Research Board's *Access Management Manual, Second Edition* states "experience has shown that they are largely ineffective for this purpose and are frequently violated by drivers."

If the porkchop option is selected, it must be designed to accommodate the locally used fire truck. Driving on the wrong side of 8th Ave may be permissible in this application since the truck should only be performing the prohibited left turn when flashing lights and sirens are operating. If the signing-only option is selected, two 36"x36" Left Turn Prohibited (R3-2) signs should be installed in the SH-9 median facing 8th Ave. A 30"x30" Emergency Vehicle (W11-8) sign should be installed on SH-9 for both directions of travel in advance of 8th Ave. Additionally, the center line on 8th Ave may be curved as it approaches the intersection to direct drivers towards the right, further discouraging a left turn onto SH-9.

4.3 Pedestrians

Based on the summer counts, high pedestrian traffic is not present at any of the study intersections besides Main St. The pedestrian phases at all the signalized intersections should be extended to meet MUTCD requirements, if they do not do so all ready. Pedestrian crossings of SH 9 at Main St were 34 in AM peak hour and 51 in PM peak hour. With these crossing volumes, it is recommended that the traffic signal be timed in manner that does not force it out of coordination with adjacent signals when the pedestrian phase is called.

Despite the lack of pedestrian facilities along the north side of the Main St and the uncontrolled right turn bypass lane, there is some pedestrian traffic along this segment. Elimination of the right turn bypass lane would allow a sidewalk connection from 7th Avenue to SH 9 to be made and support a pedestrian crossing of Main St. A pedestrian crossing of the north side of SH 9 at the Main St intersection should not be installed due to the significant impact they would have on traffic signal operations.

A grade-separated pedestrian crossing of SH-9 at Peninsula Rd (Peak One Blvd/Recreation Way) should be considered. There is a Summit Stage stop on the west side of SH-9 at that location, but no pedestrian crossing to get to the Frisco Adventure Park on the east side of the highway. This pedestrian crossing would provide a safe means for people to get from the bus stop to the park and improve access to the regional trail system.

4.4 Roundabouts

Roundabouts were considered for the signalized intersections along the corridor. The intersections at Main St, Water Dance, and Recreation Way were modeled in Sidra using the

predicted winter 2037 build volumes for the PM peak hour. The detailed results can be found in the Appendix.

The roundabouts at Water Dance and Recreation Way were modeled with two approach lanes from both directions of SH-9, and one approach lane from the side streets. Water Dance operated at an LOS B while Recreation Way operated at an LOS A. To achieve an acceptable level of service at Main St, a roundabout with three lanes northbound was required.

After reviewing the results from operational analyses, it was concluded that all three signalized intersections should remain. The three-lane roundabout at Main St required significant Right-Of-Way impacts, and was still expected to operate at a worse LOS than the signalized intersection. The roundabouts at Water Dance and Recreation Way did operate acceptably, but the signalized intersections better serve pedestrian crossings than roundabouts and do not require additional Right-Of-Way.

4.5 Summit Stage Bus Line

The Summit Stage Bus Line currently runs along SH-9 every half hour during peak hour times, and every hour in between. Along with its other stops, the line has one stop on Granite St and one stop on Main St. This requires the busses to turn off on Granite St, continue to Main St via 5th St, and then turn back onto SH-9. With the recommendation for Granite St left turn restrictions, northbound busses will not be able to follow their existing route. The route may instead use 8th Ave, and then travel to Granite St via 7th Ave. It is recommended that Summit Stage be notified of the change during design of the project.

5.0 2037 WITH BUILD TRAFFIC CONDITIONS

5.1 Build Geometry

In the “Build” Synchro models, roadway geometry such as the number of thru lanes and allowable movements at each intersection, is modeled after the changes discussed in the previous section. Due to the recommended access changes, traffic demand is shifted to the anticipated routes.

5.2 2037 Build Traffic Operations (Winter)

As can be seen in Table 10, LOS improves at several of the unsignalized intersections when the plan recommendations are incorporated. The intersections at 8th Ave and Bayview Dr, which had been operating at LOS F are now only LOS C. While the restricted left turns at this intersection are rerouted to Main St and increase the volume there, they do not have much of an impact on the overall intersection LOS. The addition of a thru lane also improves the LOS at the Water Dance and Recreation Way intersections since the SH-9 thru movements are no longer close to capacity.

TABLE 10. WINTER 2037 LEVELS-OF-SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS(V/C)	Delay (s)	LOS(V/C)
SH-9/Main St	Signal	22.5	C	28.3	C
SH-9/Granite St	Two-Way Stop	22.1 (EBR)	C	18.9 (EBR)	C
SH-9/8 th Ave	Two-Way Stop	16.7 (NBL)	C	16.4 (EBL)	C
SH-9/Bayview Dr	Two-Way Stop	17.1 (EBR)	C	14.8 (EBR)	B
SH-9/Water Dance	Signal	10.3	B	17.5	B
SH-9/Peninsula Rd	Two-Way Stop	0.0	A	0.0	A
SH-9/Recreation Way	Signal	5.2	A	12.4	B

5.3 2037 Build Traffic Operations (Summer)

As can be seen in Table 11, LOS improves with recommended access changes. The average delays are slightly higher in the summer than in the winter due to higher side road volumes. Notably, the intersection of SH-9 and Main St operates at LOS D in the PM peak. Despite that increase in delay, all of the intersections are expected to operate acceptably with the recommended improvements.

TABLE 11. SUMMER 2037 LEVELS-OF-SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS(V/C)	Delay (s)	LOS(V/C)
SH-9/Main St	Signal	28.8	C	36.4	D
SH-9/Granite St	Two-Way Stop	18.0 (EBR)	C	20.2 (EBR)	C
SH-9/8 th Ave	Two-Way Stop	15.9 (EBR)	C	19.7 (NBL)	C
SH-9/Bayview Dr	Two-Way Stop	14.8 (EBR)	C	16.1 (EBR)	C
SH-9/Water Dance	Signal	9.4	A	17.2	B
SH-9/Peninsula Rd	Two-Way Stop	0.0	A	0.0	A
SH-9/Recreation Way	Signal	7.4	A	13.8	B
Granite St/7 th Ave	Two-Way Stop	10.2 (NB)	B	12.0 (NB)	B

6.0 CONCLUSION

While none of the study intersections with SH 9 currently operate at unacceptable levels, the expected increase in highway traffic over the next twenty years will drive highway traffic to levels where that is no longer the case. Particularly for left turns from stop-controlled approaches, over-capacity may lead to high-risk driving behaviors and the potential for more crashes. To mitigate these risks, access control is recommended along with the planned addition of through lanes along the highway.

In addition to access restrictions the following design elements are recommended:

- Removal of the southbound right turn “bypass” lane at Main Street
- Pedestrian grade separation of SH 9 at Peninsula Road (Peak One Blvd/Recreation Way)
- Maintain left turns from 8th St for emergency vehicles only by using regulatory signing rather than a raised median.
- Adjust summer signal timing at Main Street to accommodate pedestrian crossings without the signal stepping out of coordination