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June 28, 2024

Mr. Jared Knerr, PE, PS
Licking County Transportation Improvement District
20 S. Second Street
Newark, OH 43055

RE: 10-Minute Travel Time Group
Six Points Traffic Analysis – (US 62 & Duncan Plains Road/Clover Valley Road)
Traffic Analysis of Potential Alternatives

Dear Mr. Knerr:

ms consultants has conducted a preliminary analysis of two potential Clover Valley Road realignment projects near the Intel site & New Albany Technology Manufacturing District (NATMD). This memo provides a preliminary assessment of the two alternatives, and the level of improvement they might provide over the existing roadway network. Goals in the development of alternatives are to improve traffic operations, safety, and roadway geometry of the US 62/Duncan Plains Road/Clover Valley Road intersections, referred to as "Six Points".

Background

The 10-Minute Travel Time Study (April 2023) developed planning-level traffic forecasts for the area surrounding the Intel plant and New Albany Technology Manufacturing District (NATMD). The study findings showed that large increases in traffic volumes were predicted for nearly every major roadway in the study area, including US 62, Duncan Plains Road, and Clover Valley Road west of Johnstown.

These roadways currently form three closely-spaced intersections. The US 62/Duncan Plains Road is a signalized intersection with left turn lanes on each approach. Clover Valley Road is discontinuous through this area, creating 3-leg intersections at US 62 and at Clover Valley Road. Both Clover Valley Road intersections are located within 500 feet of the US 62/Duncan Plains Road signal. The US 62/Clover Valley Road intersection is unsignalized with a westbound left turn lane on US 62. The Duncan Plains/Clover Valley Road intersection is unsignalized with no turn lanes. Thus, proposed alternatives have been proposed to provide more direct travel paths and improved geometry. These proposed alternatives are shown on **Figure 1**.

Alternatives Analyzed

Alternative CV-1

This alternative would realign Clover Valley Road south of Duncan Plains Road. The US 62/Clover Valley Road intersection would be relocated west approximately 1,000', creating more

distance away from the US 62/Duncan Plains Road signal. The intersection would become a 4-leg design, with a new segment of Clover Valley Road extending north to Duncan Plains Road.

The realigned Clover Valley Road would effectively become a southwest bypass of the US 62/Duncan Plains Road signal. The new Clover Valley Road intersections would have the ability to be closer to 90-degree intersections than the current skewed intersections. A conceptual alignment for Alternative CV-1 is shown on Figure 1. Because this area is expected to experience rapid development in coming years and/or annexation, it is assumed that a 35-45mph design speed would be appropriate. It is assumed that portion east of US 62 would have three lanes (one through lane in each direction plus center turn lane), consistent with the NATMD TIS findings for Green Chapel Road. A five-lane section is also assumed west of US 62 due to its location within the NATMD commercial/retail area.

Alternative 1 would eliminate the US 62/Clover Valley Road intersection. Clover Valley Road would cul-de-sac south of US 62 and be used only for local access trips. County Line Road would be reconstructed and widened to a 3-lane section between Fancher Road and Duncan Plains Road.

Alternative CV-2

This alternative would construct the same Clover Valley Road realignment as in Alternative CV-1 but would also realign the portion of Clover Valley Road north of Duncan Plains Road. The existing Duncan Plains Road/Clover Valley Road intersection would be eliminated, with the new intersection being located about 1,000 feet west of the current location. Both new Clover Valley Road intersections would be closer to 90-degree angles, creating an improvement over the existing skewed intersections.

Improved No-Build

In order to help provide better context of how Alternatives CV-1 and CV-2 would perform, an Improved No-Build concept was also analyzed. The Improved No-Build would widen existing roadways in lieu of building new alignments. The Improved No-Build includes double left turn lanes at each intersection on US 62, plus additional turn lanes on Duncan Plains Road and Clover Valley Road.

Traffic Volumes

Opening Year (2027) and Design Year (2050) traffic projections from the 10-Minute Travel Time Study were used as a baseline. Opening Year was shifted to 2027 to reflect the recently announced schedule delay in completion of the Intel chip manufacturing facility. Traffic volumes were then generated for the two build alternatives. **Figure 2** summarizes the projections for each alternative.

In the Opening Year, Alternative CV-1 is expected to divert about 3,000 vehicles per day onto the new Clover Valley Road connection and away from the US 62/Duncan Plains Road signal. Alternative CV-2 is expected to divert a few additional vehicles from the US 62/Duncan Plains Road signal in Opening Year – approximately 4,000 per day total. By the Design Year, Alternative CV-1 is expected to divert over 9,000 vehicles per day, while Alternative CV-2 is expected to divert nearly 13,000 vehicles per day.

The projected diversion represents approximately 15% reduction in overall volume at the US 62/Duncan Plains Road signal, including a majority of the eastbound left turns at that location. Alternative CV-1 would reduce eastbound left turns by over 70%, while Alternative CV-2 would reduce eastbound left

turns by over 95%. The reduction of eastbound left turns would help allow the US 62/Duncan Plains Road intersection to operate safer and more efficiently.

It should be noted that the expected traffic diversion for Alternative CV-1 would be especially sensitive to the distance away from existing Clover Valley Road, as well as the congestion levels at the US 62/Duncan Plains Road signal. The further west the CV-1 alignment is placed, traffic to/from the north leg of Clover Valley Road will require longer backtracking and be more likely to continue using the US 62/Duncan Plains Road signal.

Traffic Operations

The projected ADTs for the alternatives were converted into peak hour volumes. Synchro was used to estimate level-of-service (LOS) for the study area intersections. In the Opening Year, both alternatives would greatly improve traffic operations at the US 62/Clover Valley Road intersection (in addition to removing the existing skewed intersection). The Opening Year analysis is shown in **Table 1**:

Table 1: Level-of-Service (LOS) and Average Vehicle Delay (in sec./veh.)

	Opening Year (2027)		
	No-Build	**Alternative CV-1**	**Alternative CV-2**
US 62 & Clover Valley Road	F* 160	C 30	C 20
US 62 & Duncan Plains Road	C 30	C 20	C 20
Duncan Plains Road & Clover Valley Road	C* 20	C* 20	B* 10

*unsignalized intersection – value represents highest delay of stopped approaches

For the purpose of the Design Year analyses (**Table 2**), several assumptions were made:

- US 62 is widened to five lanes (two through lanes each direction) in the No-Build condition, as traffic volumes on US 62 are anticipated to exceed 30,000 vehicles per day in the Design Year
- Duncan Plains Road would remain unchanged at US 62, with left turn lanes on each approach
- All intersections are eventually signalized in the Design Year, even in the No-Build condition, to more safely accommodate future volumes

Table 2: Level-of-Service (LOS) and Average Vehicle Delay (in sec./veh.)

	Design Year (2050) Assuming 5-lane section of US 62 (2 through lanes each direction)			
	No-Build	**Improved No-Build** (turn lanes)	**Alternative CV-1**	**Alternative CV-2**
US 62 & Clover Valley Road	F 180	E 60	E 70	E 60
US 62 & Duncan Plains Road	F 290	F 120	F 150	F 130
Duncan Plains Road & Clover Valley Road	F 340	E 70	D* 50	E 60

*Results shown for existing intersection. The relocated intersection would have additional 20 seconds of delays expected for Clover Valley traffic having to pass through both intersections.

By the Design Year, Alternatives CV-1 and CV-2 are expected to provide substantial congestion benefits, reducing delays by half, getting US 62 closer to acceptable LOS ranges. An Improved No-Build was also analyzed in the Design Year to compare how traditional intersection widening would compare to the alternatives with new alignments. The Synchro analysis predicts similar delay benefits for each of the three concepts. However, the close proximity of the study area intersections (each ~500' apart) would present complications for an Improved No-Build condition, resulting in likely worse LOS than reported in Table 3. The primary concerns with an Improved No-Build condition would be:

- Storage and queuing on US 62 between Clover Valley Road and Duncan Plains
    - High through volumes on US 62 causing queuing/blcoking issues in this short distance
    - High traffic volumes projected for both the eastbound left turn onto Duncan Plains Road and the westbound left turn onto Clover Valley Road.
        - Side-by-side double left turn lanes are assumed to be necessary in this area
- Long eastbound queues on Duncan Plains Road extending from US 62 and blocking the Clover Valley north intersection.
- Westbound queues on Duncan Plains Road extending from Clover Valley north and blocking the US 62 intersection.

Synchro analyses indicate that queue lengths from all these intersections are likely to extend into each other, exacerbating congestion and creating safety issues. Thus, Alternative CV-1 and CV-2 are expected to provide overall better operations than widening existing intersections.

Cost Estimates

Conceptual cost estimates were developed for the build alternatives. Unit costs per lane-foot of pavement were used as the basis for these estimates. A higher unit cost was used for the portion of relocated Clover Valley Road south of Duncan Plains Road, where it is assumed that lighting, sidewalks, or other more urban infrastructure would be included. Lower unit costs were used for relocated Clover Valley Road north of Duncan Plains Road, as this would likely remain a more rural design without aesthetic enhancements. Right-of-way costs were based on recent sale prices in the study area and do not include costs associated with any potential displacements. As stated in the Traffic Operations section, all alternatives assume that US 62 has been widened to five lanes prior to the Design Year, thus is not included in the costs.

Alternative CV-1 is expected to have a total project cost of approximately $22 million. Alternative CV-2 is expected to have a total project cost of approximately $26 million. It should be noted that Alternative CV-1 includes costs for improvements at the existing Duncan Plains Road/Clover Valley Road intersection, which are not needed in Alternative CV-2. The Improved No-Build cost is expected to be approximately $14 million. Details on the cost estimates are attached in the appendix.

Alternative Summary

Some key study findings are shown in **Table 3**:

Table 3: Alternative Summary

	No-Build	Improved No-Build	Alternative CV-1	Alternative CV-2
Traffic Operations – Opening Year	One LOS F location	LOS C or better at all locations	LOS C or better at all locations	LOS C or better at all locations
Traffic Operations – Design Year	Three LOS F locations	One LOS F location	One LOS F location	One LOS F location
US 62/Duncan Plains Intersection Traffic	70,000 veh. per day in Design Year	No change	13% reduction in traffic volume	18% reduction in traffic volume
Intersection Spacing	All intersections ~500' apart Queues from each intersection expected to adversely impact adjacent intersections	All intersections ~500' apart Queues from each intersection expected to adversely impact adjacent intersections	US 62 intersections can be spaced >1,000' apart Some queuing issues on Duncan Plains Road	US 62 intersections and Duncan Plains Road intersections can be spaced >1,000' apart No queuing interaction expected
Number of Anticipated Signals on US 62	2	2	2	2
Number of Skewed Intersections	3	3	2	1
Construction Cost*	Routine Maintenance	$13M	$17 M	$19 M
Right-of-Way**	None	$1M	$5 M	$7 M

*Current year dollars including 30% contingency, 15% engineering, and 8% for construction administration

**Right-of-Way costs based on $300,000/acre valuation. Does not include potential for damages/relocations. Alternatives CV-1 and CV-2 offer more flexibility on alignments to minimize potential damages/relocations. Damages/relocations could be higher in Improved No-Build because widening existing roadways offers limited flexibility in alignments.

Conclusions & Summary

This study analyzed the potential effects of two new road network alternatives for the US 62/Duncan Plains Road/Clover Valley Road intersection areas (a.k.a. "Six Points") in western Licking County. Alternative CV-1 would realign Clover Valley Road south of Duncan Plains Road, while Alternative CV-2 would realign Clover Valley Road both north and south of Duncan Plains Road.

Key findings of the study include:

- Both Alternative CV-1 and Alternative CV-2 are expected to divert substantial traffic away from the US 62/Duncan Plains signal
- Both Alternative CV-1 and Alternative CV-2 are expected to greatly improve operations in the Six Points area, particularly in the Design Year
- Widening existing roadways for additional turn lanes (Improved No-Build) can achieve similar LOS/delay benefits, but queuing and blocking is expected to be an issue due to the close proximity of the existing intersections.
- Alternative CV-1 and Alternative CV-2 would offer the ability to create much better intersection/signal spacing on US 62, while eliminating skewed intersection(s).
- Alternative CV-2 would offer the ability to create much improved intersection/signal spacing on Duncan Plains Road, while also providing somewhat more delay benefits than Alternative CV-1.
- The potential traffic diversion and benefits of Alternative CV-2 would not be sensitive to the exact alignment of the relocated Clover Valley Road
    - The traffic diversion and benefits of Alternative CV-1 would be sensitive to the specific alignment chosen. The further west the realigned Clover Valley is placed, the fewer vehicles will divert away from the US 62/Duncan Plains Road signal.

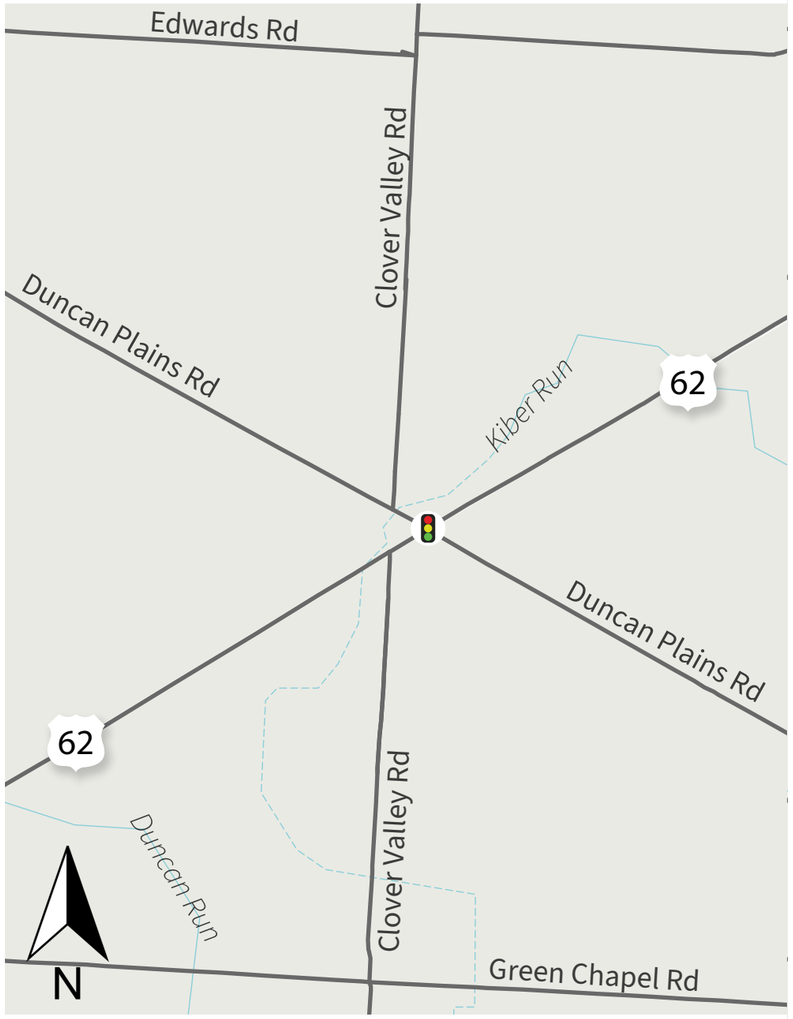
Please feel free to contact me anytime to discuss any questions you have regarding this study.

Sincerely,

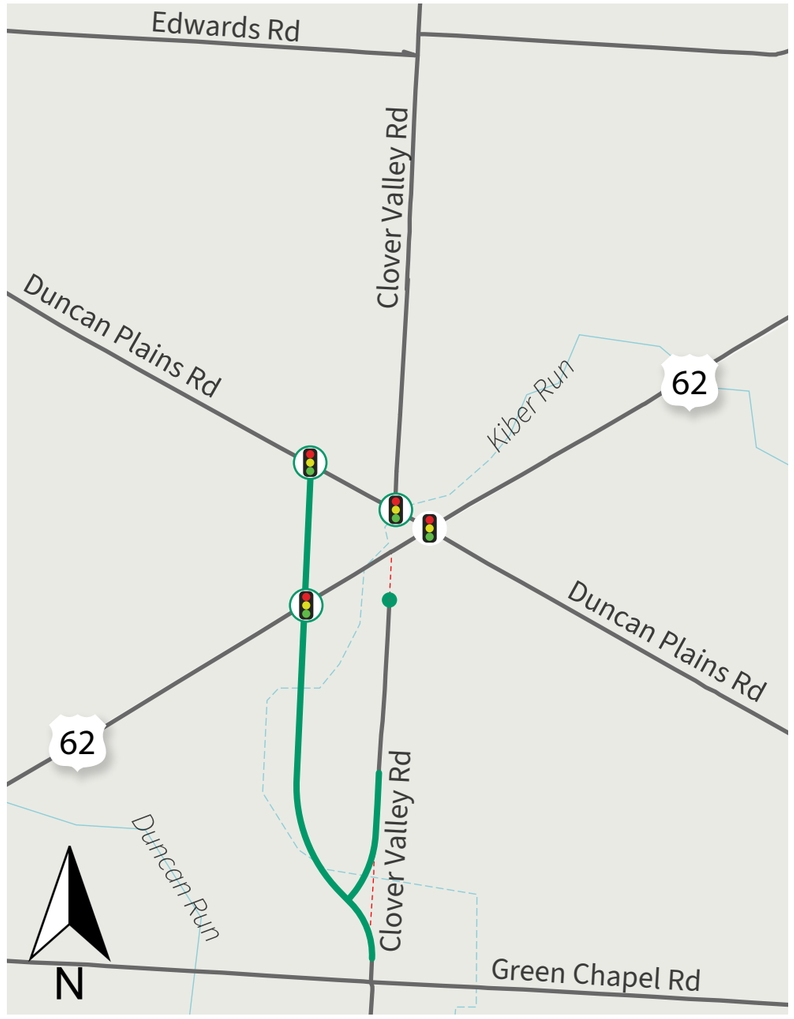
Ryan Bush, P.E., AICP
Traffic Engineer

N:\03\60\10xxx_LCTID_IntelTrafficStudy\00_Six Points Intersection Study\2024-06-28_SixPoints_TrafficAnalysis.docx

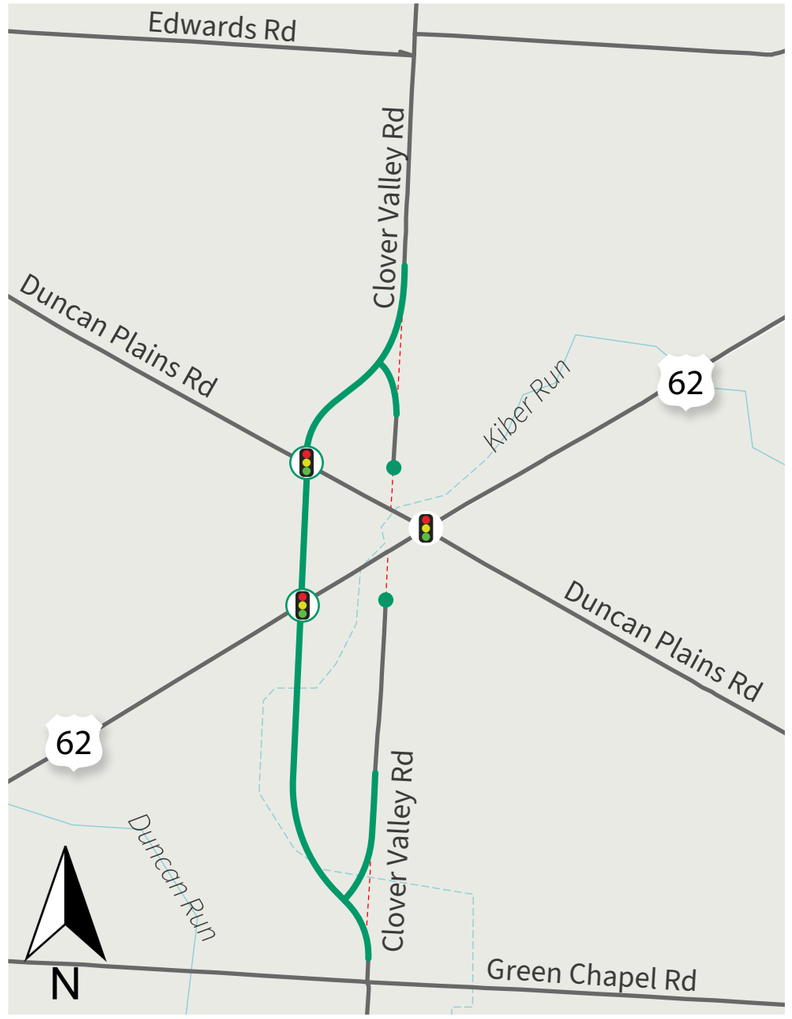
Existing Roadway:



Alternative CV-1:



Alternative CV-2:



Legend:

- Existing Roadway
- New road alignment
- Existing road to be removed
- New signal (or roundabout)
- Existing signal

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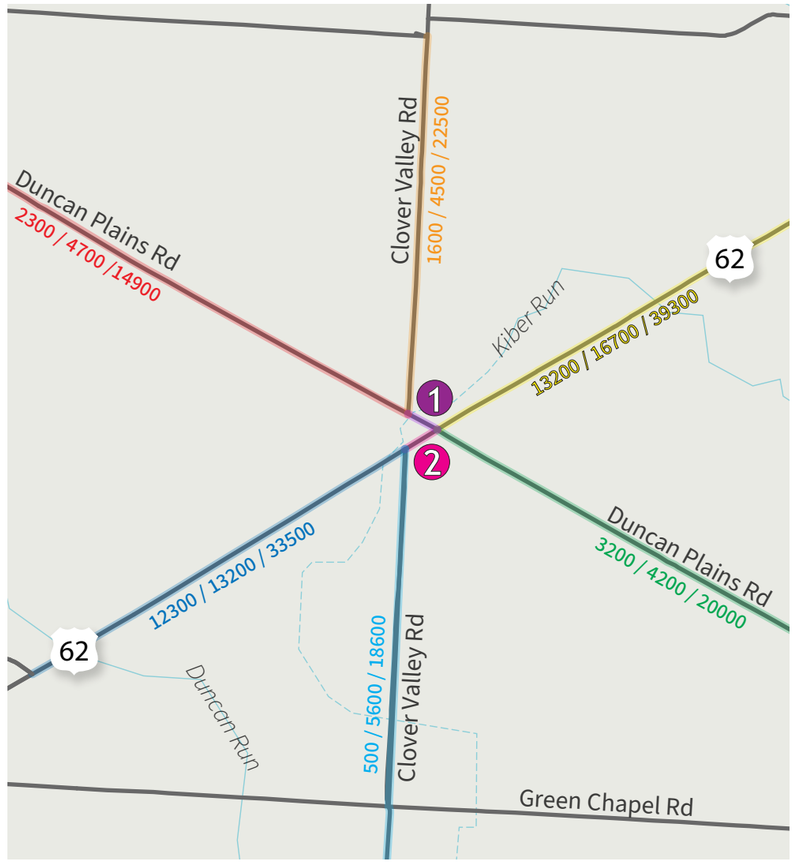
Figure 1
Alternatives Comparison
"Six Points" Intersection Realignment Study
June 2024

Licking County Transportation Improvement District

Existing Roadway:



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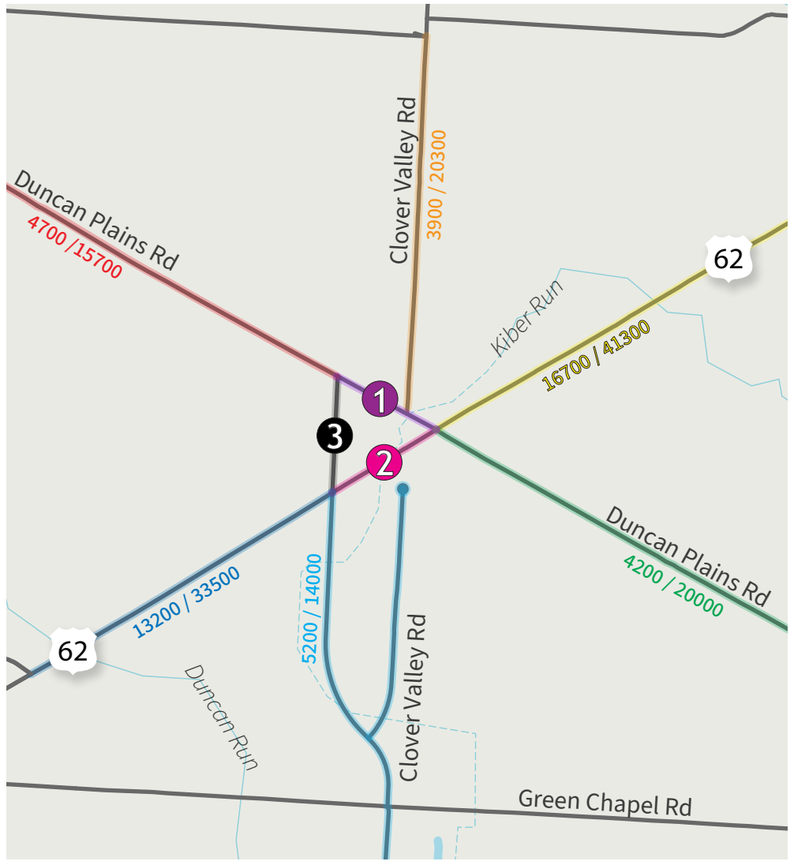
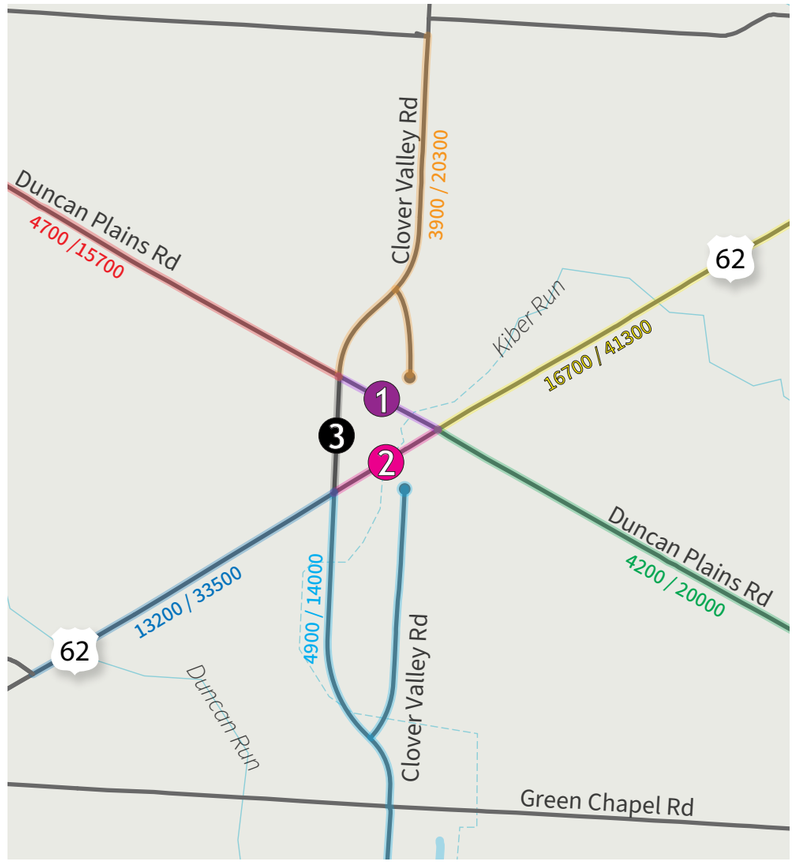


Alternative CV-2:



Existing Volumes: Current Year / Opening Year (2027) / Design Year (2050)

Build Alternative Volumes: Opening Year (2027) / Design Year (2050)

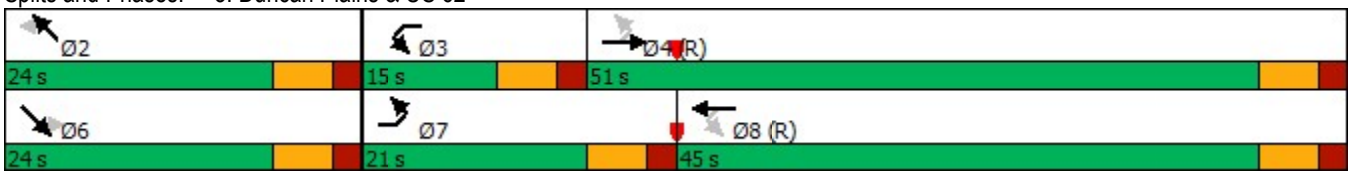
Traffic Volumes (ADT)

	Segment Name	Current Year	Opening Year (2027)			Design Year (2050)		
			No-Build	Alternative CV-1	Alternative CV-2	No-Build	Alternative CV-1	Alternative CV-2
1	**Duncan Plains Road** between Clover Valley Road and U.S. 62	3,500	8,400	5,100	4,000	35,800	25,800	22,000
2	**U.S. 62** between Clover Valley Road and Duncan Plains Road	12,800	18,500	15,200	14,100	43,800	34,700	30,900
3	**Clover Valley Road Extension** between U.S. 62 and Duncan Plains Road	NA	NA	3,300	4,400	NA	9,100	12,950

Lane Group	EBL	EBT	WBL	WBT	SEL	SET	NWL	NWT
Lane Configurations								
Traffic Volume (vph)	255	676	67	534	45	73	97	67
Future Volume (vph)	255	676	67	534	45	73	97	67
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		6		2
Permitted Phases	4		8		6		2	
Detector Phase	7	4	3	8	6	6	2	2
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	21.0	51.0	15.0	45.0	24.0	24.0	24.0	24.0
Total Split (%)	23.3%	56.7%	16.7%	50.0%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	64.5	54.3	53.5	46.2	13.0	13.0	13.0	13.0
Actuated g/C Ratio	0.72	0.60	0.59	0.51	0.14	0.14	0.14	0.14
v/c Ratio	0.63	0.73	0.20	0.77	0.59	0.53	0.64	0.75
Control Delay	13.3	20.3	7.1	26.9	62.8	30.3	53.5	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	20.3	7.1	26.9	62.8	30.3	53.5	31.5
LOS	B	C	A	C	E	C	D	C
Approach Delay		18.5		25.1		38.2		37.7
Approach LOS		B		C		D		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Duncan Plains & US 62



Intersection	
Int Delay, s/veh	4.5

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	197	6	5	178	233	240
Future Vol, veh/h	197	6	5	178	233	240
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	214	7	5	193	253	261

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	587	384	514	0	-	0
Stage 1	384	-	-	-	-	-
Stage 2	203	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	472	664	1052	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	470	664	1052	-	-	-
Mov Cap-2 Maneuver	470	-	-	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	831	-	-	-	-	-

Approach	SB	SE	NW
HCM Control Delay, s	19	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SBLn1
Capacity (veh/h)	-	-	1052	-	474
HCM Lane V/C Ratio	-	-	0.005	-	0.466
HCM Control Delay (s)	-	-	8.4	0	19
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0	-	2.4

Intersection	
Int Delay, s/veh	16.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	690	9	212	682	12	293
Future Vol, veh/h	690	9	212	682	12	293
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	4	2	2
Mvmt Flow	750	10	230	741	13	318

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	760	0	1956	755
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	1201	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	852	-	70	409
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	285	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	852	-	51	409
Mov Cap-2 Maneuver	-	-	-	-	51	-
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	208	-

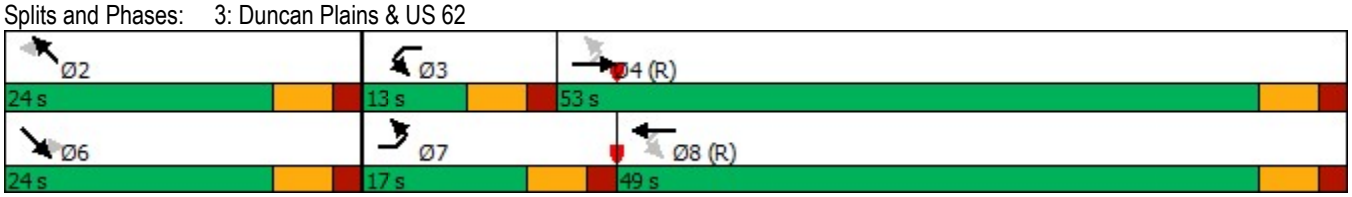
Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	97.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	320	-	-	852	-
HCM Lane V/C Ratio	1.036	-	-	0.27	-
HCM Control Delay (s)	97.2	-	-	10.8	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	11.9	-	-	1.1	-

Lane Group	EBL	EBT	WBL	WBT	SEL	SET	NWL	NWT
Lane Configurations								
Traffic Volume (vph)	59	676	67	534	45	73	97	67
Future Volume (vph)	59	676	67	534	45	73	97	67
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		6		2
Permitted Phases	4		8		6		2	
Detector Phase	7	4	3	8	6	6	2	2
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	17.0	53.0	13.0	49.0	24.0	24.0	24.0	24.0
Total Split (%)	18.9%	58.9%	14.4%	54.4%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	60.4	54.6	60.1	54.5	12.9	12.9	12.9	12.9
Actuated g/C Ratio	0.67	0.61	0.67	0.61	0.14	0.14	0.14	0.14
v/c Ratio	0.15	0.73	0.20	0.66	0.27	0.53	0.65	0.43
Control Delay	6.9	15.9	6.0	17.2	36.3	30.5	54.1	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	15.9	6.0	17.2	36.3	30.5	54.1	29.1
LOS	A	B	A	B	D	C	D	C
Approach Delay		15.2		16.2		31.9		40.7
Approach LOS		B		B		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 78.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Duncan Plains & US 62



Intersection	
Int Delay, s/veh	5.2

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Vol, veh/h	94	102	129	63	73	156
Future Vol, veh/h	94	102	129	63	73	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	111	140	68	79	170

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	502	174	0	0	208	0
Stage 1	174	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	529	869	-	-	1363	-
Stage 1	856	-	-	-	-	-
Stage 2	730	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	495	869	-	-	1363	-
Mov Cap-2 Maneuver	495	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	683	-	-	-	-	-

Approach	NB	SE	NW
HCM Control Delay, s	13.4	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBLn1	NWL	NWT	SET	SER
Capacity (veh/h)	638	1363	-	-	-
HCM Lane V/C Ratio	0.334	0.058	-	-	-
HCM Control Delay (s)	13.4	7.8	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	1.5	0.2	-	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	97	80	107	124	150	98
Future Vol, veh/h	97	80	107	124	150	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	87	116	135	163	107

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	584	217	270	0	-	0
Stage 1	217	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	474	823	1293	-	-	-
Stage 1	819	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	428	823	1293	-	-	-
Mov Cap-2 Maneuver	428	-	-	-	-	-
Stage 1	740	-	-	-	-	-
Stage 2	701	-	-	-	-	-

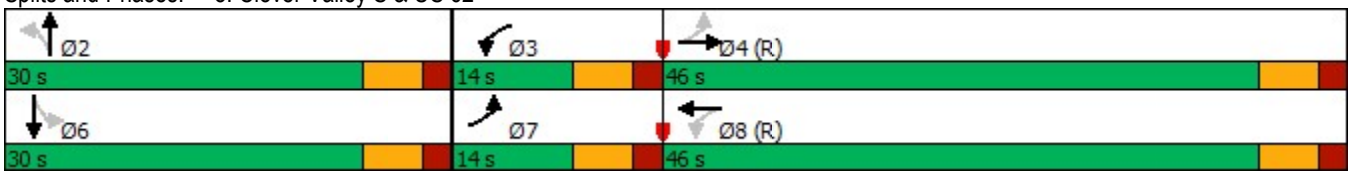
Approach	SB	SE	NW
HCM Control Delay, s	15.1	3.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SBLn1
Capacity (veh/h)	-	-	1293	-	547
HCM Lane V/C Ratio	-	-	0.09	-	0.352
HCM Control Delay (s)	-	-	8.1	0	15.1
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0.3	-	1.6

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	44	646	111	648	12	152	5	101
Future Volume (vph)	44	646	111	648	12	152	5	101
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	20.0	13.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	14.0	46.0	14.0	46.0	30.0	30.0	30.0	30.0
Total Split (%)	15.6%	51.1%	15.6%	51.1%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	52.6	45.4	56.1	51.2	18.8	18.8	18.8	18.8
Actuated g/C Ratio	0.58	0.50	0.62	0.57	0.21	0.21	0.21	0.21
v/c Ratio	0.13	0.77	0.36	0.68	0.05	0.79	0.05	0.38
Control Delay	7.8	27.0	10.1	19.1	26.2	42.3	28.6	28.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	27.0	10.1	19.1	26.2	42.3	28.6	28.5
LOS	A	C	B	B	C	D	C	C
Approach Delay		25.8		17.8		41.7		28.5
Approach LOS		C		B		D		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 72.3%	ICU Level of Service C
Analysis Period (min) 15	

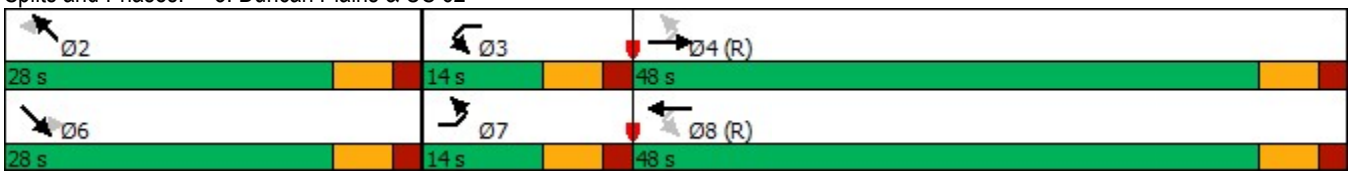
Splits and Phases: 8: Clover Valley S & US 62



Lane Group	EBL	EBT	WBL	WBT	SEL	SET	NWL	NWT
Lane Configurations								
Traffic Volume (vph)	12	676	67	534	45	73	97	67
Future Volume (vph)	12	676	67	534	45	73	97	67
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		6		2
Permitted Phases	4		8		6		2	
Detector Phase	7	4	3	8	6	6	2	2
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	14.0	48.0	14.0	48.0	28.0	28.0	28.0	28.0
Total Split (%)	15.6%	53.3%	15.6%	53.3%	31.1%	31.1%	31.1%	31.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	59.9	54.3	64.0	62.4	13.0	13.0	13.0	13.0
Actuated g/C Ratio	0.67	0.60	0.71	0.69	0.14	0.14	0.14	0.14
v/c Ratio	0.03	0.73	0.20	0.57	0.26	0.52	0.65	0.31
Control Delay	7.8	18.3	5.9	11.6	36.0	29.5	53.5	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	18.3	5.9	11.6	36.0	29.5	53.5	32.8
LOS	A	B	A	B	D	C	D	C
Approach Delay		18.1		11.0		31.1		44.3
Approach LOS		B		B		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 78.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Duncan Plains & US 62



Intersection	
Int Delay, s/veh	12.1

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	94	149	5	63	108	6	5	115	63	5	150	51
Future Vol, veh/h	94	149	5	63	108	6	5	115	63	5	150	51
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	102	162	5	68	117	7	5	125	68	5	163	55

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	124	0	0	167	0	0	735	628	121	722	629	165
Stage 1	-	-	-	-	-	-	257	257	-	369	369	-
Stage 2	-	-	-	-	-	-	478	371	-	353	260	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1463	-	-	1411	-	-	335	400	930	342	399	879
Stage 1	-	-	-	-	-	-	748	695	-	651	621	-
Stage 2	-	-	-	-	-	-	568	620	-	664	693	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1463	-	-	1411	-	-	184	354	930	211	353	879
Mov Cap-2 Maneuver	-	-	-	-	-	-	184	354	-	211	353	-
Stage 1	-	-	-	-	-	-	696	662	-	605	578	-
Stage 2	-	-	-	-	-	-	355	577	-	475	660	-

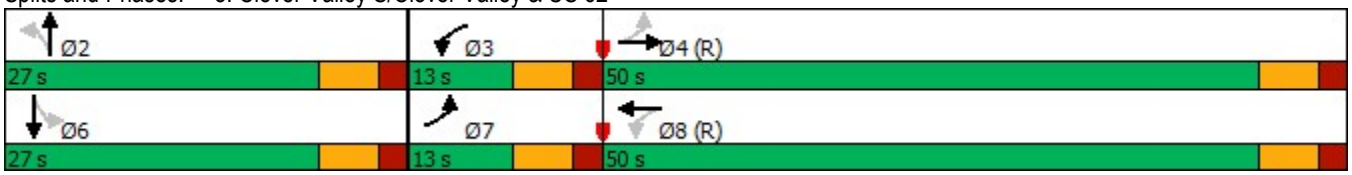
Approach	NB	SB	SE	NW
HCM Control Delay, s	2.9	2.7	20	24.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBL	NBT	NBR	NWLn1	SELn1	SBL	SBT	SBR
Capacity (veh/h)	1463	-	-	407	436	1411	-	-
HCM Lane V/C Ratio	0.07	-	-	0.55	0.456	0.049	-	-
HCM Control Delay (s)	7.6	-	-	24.1	20	7.7	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3.2	2.3	0.2	-	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	71	619	98	627	12	172	5	115
Future Volume (vph)	71	619	98	627	12	172	5	115
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	20.0	13.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	13.0	50.0	13.0	50.0	27.0	27.0	27.0	27.0
Total Split (%)	14.4%	55.6%	14.4%	55.6%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	54.6	49.0	54.8	49.1	18.5	18.5	18.5	18.5
Actuated g/C Ratio	0.61	0.54	0.61	0.55	0.21	0.21	0.21	0.21
v/c Ratio	0.21	0.69	0.29	0.70	0.06	0.82	0.05	0.49
Control Delay	7.8	21.4	8.0	20.3	27.9	47.9	28.2	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	21.4	8.0	20.3	27.9	47.9	28.2	31.1
LOS	A	C	A	C	C	D	C	C
Approach Delay		20.0		18.7		47.1		31.0
Approach LOS		C		B		D		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 24.8	Intersection LOS: C
Intersection Capacity Utilization 71.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: Clover Valley S/Clover Valley & US 62

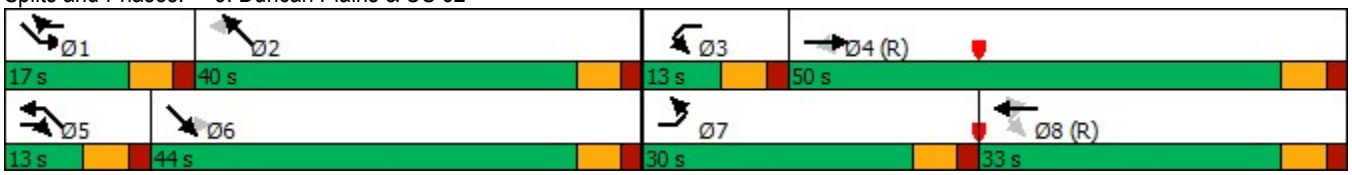


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	NWL	NWT
Lane Configurations										
Traffic Volume (vph)	732	1460	150	181	1139	438	381	521	113	528
Future Volume (vph)	732	1460	150	181	1139	438	381	521	113	528
Turn Type	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	5	3	8	1	1	6	5	2
Permitted Phases			4	8		8	6		2	
Detector Phase	7	4	5	3	8	1	1	6	5	2
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	13.0	24.0	13.0	13.0	24.0	13.0	24.0
Total Split (s)	30.0	50.0	13.0	13.0	33.0	17.0	17.0	44.0	13.0	40.0
Total Split (%)	25.0%	41.7%	10.8%	10.8%	27.5%	14.2%	14.2%	36.7%	10.8%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None	None	None
Act Effct Green (s)	24.0	44.0	57.0	34.0	27.0	44.0	49.0	38.0	41.0	34.0
Actuated g/C Ratio	0.20	0.37	0.48	0.28	0.22	0.37	0.41	0.32	0.34	0.28
v/c Ratio	2.25	1.22	0.20	1.19	1.56	0.71	1.85	1.96	0.75	1.49
Control Delay	585.3	127.0	5.3	159.9	289.0	29.8	421.7	462.4	50.9	263.2
Queue Delay	0.0	0.9	0.0	0.0	0.5	0.0	0.0	0.3	70.7	0.0
Total Delay	585.3	127.9	5.3	159.9	289.5	29.8	421.7	462.7	121.7	263.2
LOS	F	F	A	F	F	C	F	F	F	F
Approach Delay		263.1			211.4			451.7		243.8
Approach LOS		F			F			F		F

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.25
Intersection Signal Delay: 288.4 — Intersection LOS: F
Intersection Capacity Utilization 157.2% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 3: Duncan Plains & US 62



Lane Group	SBL	SEL	SET	NWT
Lane Configurations				
Traffic Volume (vph)	824	19	604	724
Future Volume (vph)	824	19	604	724
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		6	2
Permitted Phases		6		
Detector Phase	4	6	6	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	34.0	56.0	56.0	56.0
Total Split (%)	37.8%	62.2%	62.2%	62.2%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	28.0		50.0	50.0
Actuated g/C Ratio	0.31		0.56	0.56
v/c Ratio	1.67		1.48	1.78
Control Delay	333.4		248.5	374.7
Queue Delay	0.0		0.0	0.0
Total Delay	333.4		248.5	374.7
LOS	F		F	F
Approach Delay	333.4		248.5	374.7
Approach LOS	F		F	F

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.78	
Intersection Signal Delay: 338.3	Intersection LOS: F
Intersection Capacity Utilization 151.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 6: Duncan Plains & Clover Valley N

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Traffic Volume (vph)	1656	511	1530	115
Future Volume (vph)	1656	511	1530	115
Turn Type	NA	Prot	NA	Prot
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	13.0	24.0	24.0
Total Split (s)	58.0	36.0	94.0	26.0
Total Split (%)	48.3%	30.0%	78.3%	21.7%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	52.0	30.0	88.0	20.0
Actuated g/C Ratio	0.43	0.25	0.73	0.17
v/c Ratio	1.24	1.26	0.64	1.96
Control Delay	145.5	150.4	13.8	460.9
Queue Delay	0.7	0.0	48.8	1.1
Total Delay	146.2	150.4	62.6	462.0
LOS	F	F	E	F
Approach Delay	146.2		84.6	462.0
Approach LOS	F		F	F

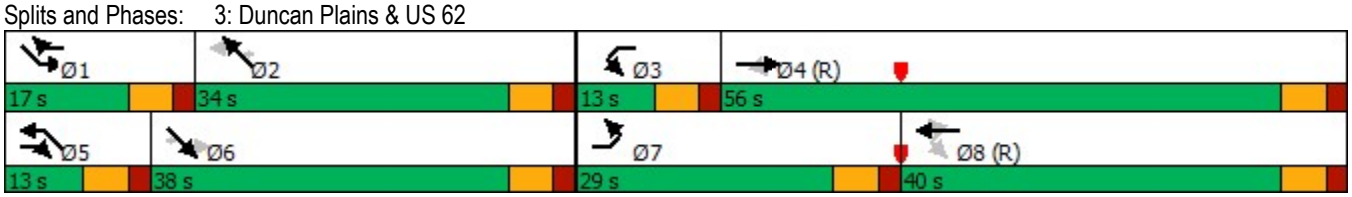
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62 (52%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.96	
Intersection Signal Delay: 175.2	Intersection LOS: F
Intersection Capacity Utilization 141.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 8: Clover Valley S & US 62

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	732	1460	150	181	1139	438	381	521	515	113	528	181
Future Volume (vph)	732	1460	150	181	1139	438	381	521	515	113	528	181
Turn Type	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8	1	1	6		5	2	
Permitted Phases			4	8		8	6		6	2		2
Detector Phase	7	4	5	3	8	1	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	13.0	24.0	13.0	13.0	24.0	24.0	13.0	24.0	24.0
Total Split (s)	29.0	56.0	13.0	13.0	40.0	17.0	17.0	38.0	38.0	13.0	34.0	34.0
Total Split (%)	24.2%	46.7%	10.8%	10.8%	33.3%	14.2%	14.2%	31.7%	31.7%	10.8%	28.3%	28.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	23.0	50.0	63.0	41.0	34.0	51.0	43.0	32.0	32.0	35.0	28.0	28.0
Actuated g/C Ratio	0.19	0.42	0.52	0.34	0.28	0.42	0.36	0.27	0.27	0.29	0.23	0.23
v/c Ratio	1.21	1.08	0.19	1.19	1.24	0.63	1.85	1.14	0.83	0.75	1.32	0.38
Control Delay	136.8	67.1	5.7	160.1	152.1	23.3	411.8	114.7	24.3	54.8	197.9	8.1
Queue Delay	2.2	10.1	0.0	0.0	0.2	1.8	0.0	0.2	2.3	70.7	0.0	0.0
Total Delay	139.0	77.2	5.7	160.1	152.3	25.1	411.8	114.9	26.6	125.5	197.9	8.1
LOS	F	E	A	F	F	C	F	F	C	F	F	A
Approach Delay		92.0			121.4			162.6			146.1	
Approach LOS		F			F			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.85	
Intersection Signal Delay: 122.9	Intersection LOS: F
Intersection Capacity Utilization 121.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Duncan Plains & US 62



Lane Group	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	824	22	19	604	724	974
Future Volume (vph)	824	22	19	604	724	974
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			6	2	
Permitted Phases		4	6			2
Detector Phase	4	4	6	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	61.0	61.0	59.0	59.0	59.0	59.0
Total Split (%)	50.8%	50.8%	49.2%	49.2%	49.2%	49.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	55.0	55.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.46	0.46	0.44	0.44	0.44	0.44
v/c Ratio	1.10	0.03	0.34	0.80	0.96	0.93
Control Delay	96.3	10.0	41.1	37.8	41.1	21.3
Queue Delay	1.8	0.0	0.0	6.4	43.6	39.7
Total Delay	98.1	10.0	41.1	44.1	84.7	61.0
LOS	F	B	D	D	F	E
Approach Delay	95.8			44.0	71.1	
Approach LOS	F			D	E	

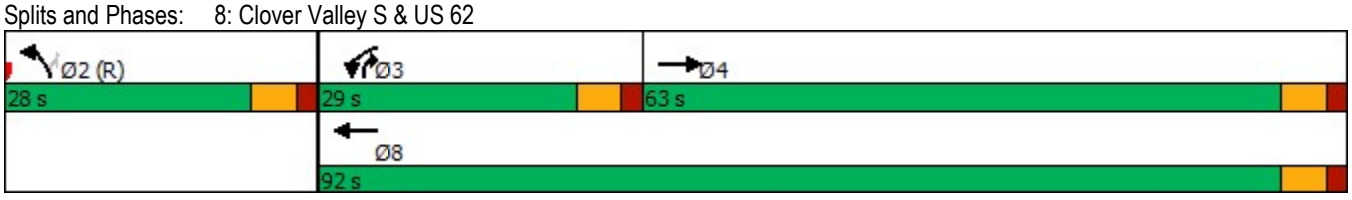
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 72.3	Intersection LOS: E
Intersection Capacity Utilization 93.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Duncan Plains & Clover Valley N

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1656	511	1530	115	707
Future Volume (vph)	1656	511	1530	115	707
Turn Type	NA	Prot	NA	Prot	pm+ov
Protected Phases	4	3	8	2	3
Permitted Phases					2
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	13.0	24.0	24.0	13.0
Total Split (s)	63.0	29.0	92.0	28.0	29.0
Total Split (%)	52.5%	24.2%	76.7%	23.3%	24.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	None	None	None	C-Max	None
Act Effct Green (s)	57.6	22.4	86.0	22.0	50.4
Actuated g/C Ratio	0.48	0.19	0.72	0.18	0.42
v/c Ratio	1.12	0.87	0.66	0.39	0.65
Control Delay	93.4	37.2	15.3	47.1	30.5
Queue Delay	0.5	0.0	21.5	0.0	0.6
Total Delay	93.9	37.2	36.8	47.1	31.1
LOS	F	D	D	D	C
Approach Delay	93.9		36.9	33.3	
Approach LOS	F		D	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 57.8	Intersection LOS: E
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

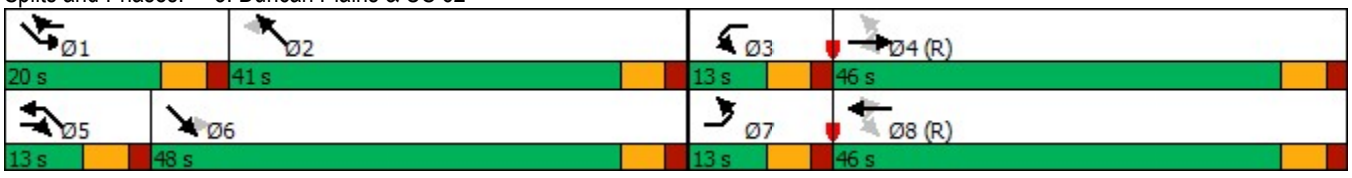
Splits and Phases: 8: Clover Valley S & US 62



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	NWL	NWT
Lane Configurations										
Traffic Volume (vph)	205	1460	150	181	1139	438	381	521	113	528
Future Volume (vph)	205	1460	150	181	1139	438	381	521	113	528
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	5	3	8	1	1	6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	7	4	5	3	8	1	1	6	5	2
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	13.0	24.0	13.0	13.0	24.0	13.0	24.0
Total Split (s)	13.0	46.0	13.0	13.0	46.0	20.0	20.0	48.0	13.0	41.0
Total Split (%)	10.8%	38.3%	10.8%	10.8%	38.3%	16.7%	16.7%	40.0%	10.8%	34.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None	None	None
Act Effct Green (s)	47.0	40.0	53.0	47.0	40.0	60.0	55.0	42.0	42.0	35.0
Actuated g/C Ratio	0.39	0.33	0.44	0.39	0.33	0.50	0.46	0.35	0.35	0.29
v/c Ratio	1.35	1.35	0.21	1.19	1.05	0.57	1.54	1.14	0.75	1.45
Control Delay	197.3	194.7	8.0	157.7	79.5	20.3	287.0	106.7	50.0	243.9
Queue Delay	1.4	0.0	0.0	0.0	0.0	0.3	0.0	0.6	0.0	0.0
Total Delay	198.7	194.7	8.0	157.7	79.5	20.6	287.0	107.3	50.0	243.9
LOS	F	F	A	F	E	C	F	F	D	F
Approach Delay		179.8			72.9			172.5		217.2
Approach LOS		F			E			F		F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.54	
Intersection Signal Delay: 149.5	Intersection LOS: F
Intersection Capacity Utilization 130.3%	ICU Level of Service H
Analysis Period (min) 15	

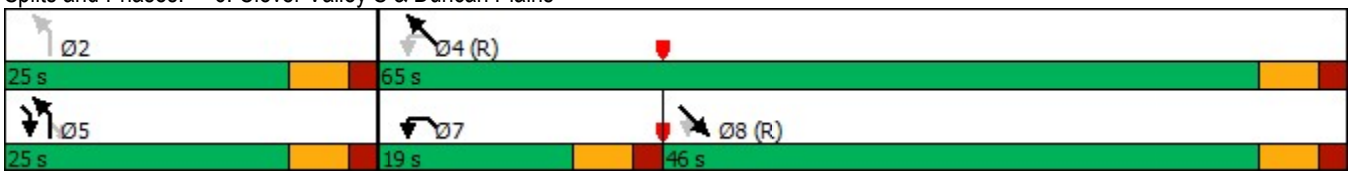
Splits and Phases: 3: Duncan Plains & US 62



Lane Group	NBL	NBR	SET	SER	NWL	NWT	Ø2
Lane Configurations							
Traffic Volume (vph)	179	347	502	121	245	567	
Future Volume (vph)	179	347	502	121	245	567	
Turn Type	pm+pt	Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	5		8	5	7	4	2
Permitted Phases	2	5		8	4		
Detector Phase	5	5	8	5	7	4	
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	20.0	13.0	13.0	20.0	20.0
Total Split (s)	25.0	25.0	46.0	25.0	19.0	65.0	25.0
Total Split (%)	27.8%	27.8%	51.1%	27.8%	21.1%	72.2%	28%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Recall Mode	None	None	C-Max	None	None	C-Max	Max
Act Effct Green (s)	19.0	19.0	42.2	67.2	59.0	59.0	
Actuated g/C Ratio	0.21	0.21	0.47	0.75	0.66	0.66	
v/c Ratio	0.52	0.60	0.62	0.11	0.56	0.50	
Control Delay	37.3	7.8	22.4	0.9	11.2	9.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	37.3	7.8	22.4	0.9	11.2	9.8	
LOS	D	A	C	A	B	A	
Approach Delay	17.9		18.2			10.2	
Approach LOS	B		B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:NWTL and 8:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

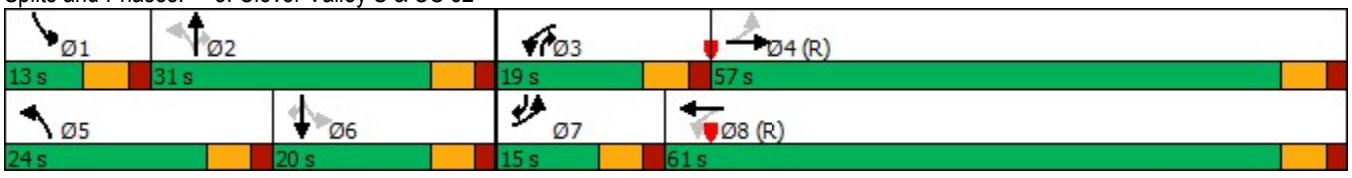
Splits and Phases: 6: Clover Valley S & Duncan Plains



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	178	1479	278	1396	115	349	358	20	233	133
Future Volume (vph)	178	1479	278	1396	115	349	358	20	233	133
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	3	8	5	2	3	1	6	7
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	3	1	6	7
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	24.0	24.0	24.0	13.0	13.0	20.0	13.0
Total Split (s)	15.0	57.0	19.0	61.0	24.0	31.0	19.0	13.0	20.0	15.0
Total Split (%)	12.5%	47.5%	15.8%	50.8%	20.0%	25.8%	15.8%	10.8%	16.7%	12.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	60.0	51.0	68.0	55.0	37.7	30.2	49.2	27.1	20.1	35.1
Actuated g/C Ratio	0.50	0.42	0.57	0.46	0.31	0.25	0.41	0.23	0.17	0.29
v/c Ratio	0.98	1.14	1.18	0.95	0.44	0.81	0.55	0.11	0.81	0.26
Control Delay	89.2	103.4	138.1	31.9	35.6	58.3	24.0	30.6	69.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.2	103.4	138.1	31.9	35.6	58.3	24.0	30.6	69.8	8.0
LOS	F	F	F	C	D	E	C	C	E	A
Approach Delay		101.9		49.4		40.2			46.5	
Approach LOS		F		D		D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 67.2	Intersection LOS: E
Intersection Capacity Utilization 103.2%	ICU Level of Service G
Analysis Period (min) 15	

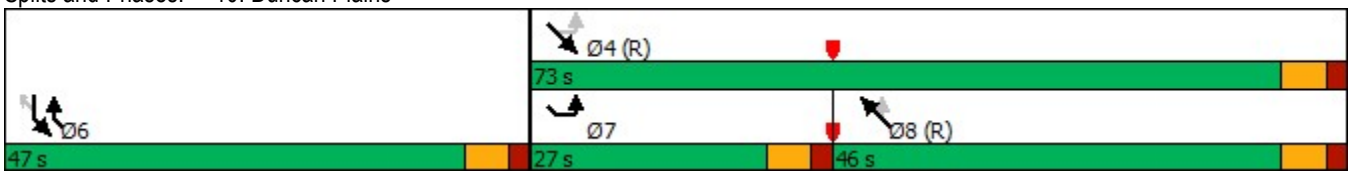
Splits and Phases: 8: Clover Valley S & US 62



Lane Group	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	579	267	366	482	545	626
Future Volume (vph)	579	267	366	482	545	626
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	6		7	4	8	6
Permitted Phases		6	4			8
Detector Phase	6	6	7	4	8	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	13.0	20.0	20.0	20.0
Total Split (s)	47.0	47.0	27.0	73.0	46.0	47.0
Total Split (%)	39.2%	39.2%	22.5%	60.8%	38.3%	39.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	41.0	41.0	67.0	67.0	40.0	87.0
Actuated g/C Ratio	0.34	0.34	0.56	0.56	0.33	0.72
v/c Ratio	1.04	0.42	1.07	0.50	0.95	0.58
Control Delay	86.9	9.0	101.9	18.4	37.5	13.1
Queue Delay	24.2	0.0	0.0	0.9	16.5	1.9
Total Delay	111.1	9.0	101.9	19.3	54.0	15.0
LOS	F	A	F	B	D	B
Approach Delay	78.9			55.0	33.2	
Approach LOS	E			D	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SETL and 8:NWT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 53.1	Intersection LOS: D
Intersection Capacity Utilization 96.0%	ICU Level of Service F
Analysis Period (min) 15	

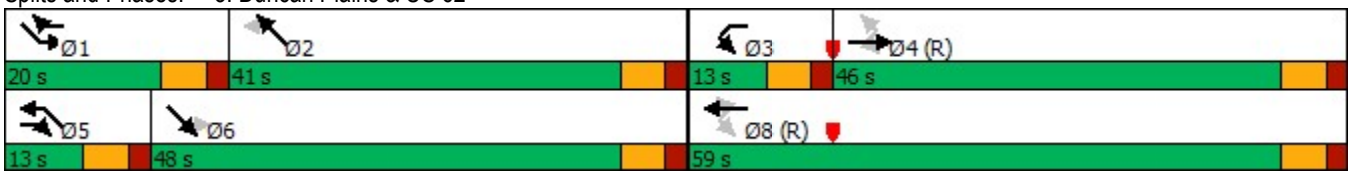
Splits and Phases: 10: Duncan Plains



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	NWL	NWT
Lane Configurations										
Traffic Volume (vph)	24	1460	150	181	1139	438	381	521	113	528
Future Volume (vph)	24	1460	150	181	1139	438	381	521	113	528
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA
Protected Phases		4	5	3	8	1	1	6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	5	3	8	1	1	6	5	2
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	13.0	13.0	24.0	13.0	13.0	24.0	13.0	24.0
Total Split (s)	46.0	46.0	13.0	13.0	59.0	20.0	20.0	48.0	13.0	41.0
Total Split (%)	38.3%	38.3%	10.8%	10.8%	49.2%	16.7%	16.7%	40.0%	10.8%	34.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	None	C-Max	None	None	None	None	None
Act Effct Green (s)	40.0	40.0	53.0	53.0	53.0	73.0	55.0	42.0	42.0	35.0
Actuated g/C Ratio	0.33	0.33	0.44	0.44	0.44	0.61	0.46	0.35	0.35	0.29
v/c Ratio	0.35	1.35	0.21	1.19	0.79	0.48	1.54	0.90	0.71	1.45
Control Delay	46.9	194.7	7.4	157.1	33.4	12.4	287.3	55.9	44.1	243.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	194.7	7.4	157.1	33.4	12.4	287.3	55.9	44.1	243.9
LOS	D	F	A	F	C	B	F	E	D	F
Approach Delay		175.3			40.9			151.7		216.4
Approach LOS		F			D			F		F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.54	
Intersection Signal Delay: 131.6	Intersection LOS: F
Intersection Capacity Utilization 130.3%	ICU Level of Service H
Analysis Period (min) 15	

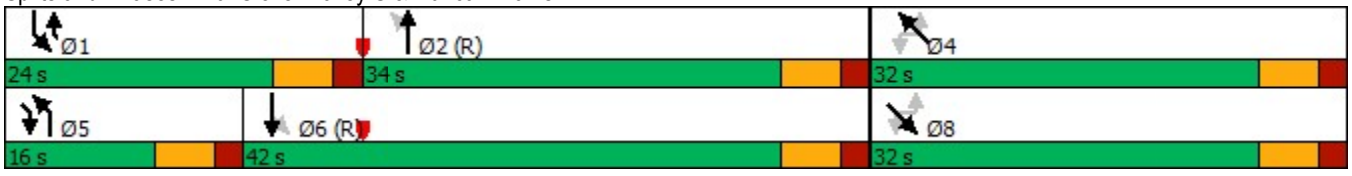
Splits and Phases: 3: Duncan Plains & US 62



Lane Group	NBL	NBT	SBL	SBT	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations										
Traffic Volume (vph)	179	529	448	376	19	482	121	10	545	444
Future Volume (vph)	179	529	448	376	19	482	121	10	545	444
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA	pm+ov
Protected Phases	5	2	1	6		8	5		4	1
Permitted Phases	2		6		8		8	4		4
Detector Phase	5	2	1	6	8	8	5	4	4	1
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	20.0	20.0	20.0	20.0	20.0	13.0	20.0	20.0	20.0
Total Split (s)	16.0	34.0	24.0	42.0	32.0	32.0	16.0	32.0	32.0	24.0
Total Split (%)	17.8%	37.8%	26.7%	46.7%	35.6%	35.6%	17.8%	35.6%	35.6%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	37.2	28.0	52.0	36.8	26.0	26.0	41.2	26.0	26.0	50.0
Actuated g/C Ratio	0.41	0.31	0.58	0.41	0.29	0.29	0.46	0.29	0.29	0.56
v/c Ratio	0.43	1.01	1.11	0.57	0.26	0.97	0.17	0.13	1.10	0.52
Control Delay	13.7	73.6	103.7	24.3	34.2	66.4	3.1	28.7	101.5	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	73.6	103.7	24.3	34.2	66.4	3.1	28.7	101.5	12.3
LOS	B	E	F	C	C	E	A	C	F	B
Approach Delay		58.6		66.3		53.1			61.1	
Approach LOS		E		E		D			E	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 60.3	Intersection LOS: E
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

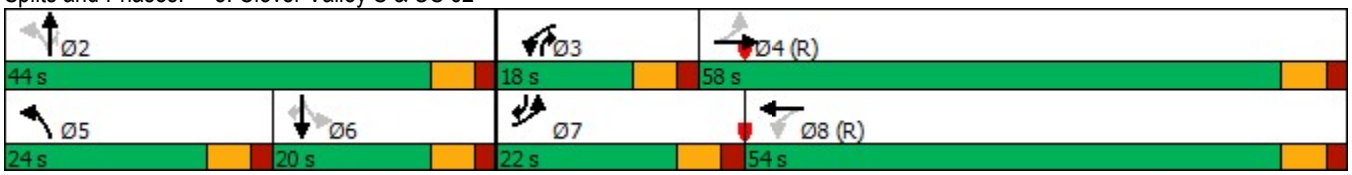
Splits and Phases: 6: Clover Valley S & Duncan Plains



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	292	1364	234	1310	115	416	291	20	277	220
Future Volume (vph)	292	1364	234	1310	115	416	291	20	277	220
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+ov
Protected Phases	7	4	3	8	5	2	3		6	7
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	3	6	6	7
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	24.0	13.0	24.0	24.0	24.0	13.0	20.0	20.0	13.0
Total Split (s)	22.0	58.0	18.0	54.0	24.0	44.0	18.0	20.0	20.0	22.0
Total Split (%)	18.3%	48.3%	15.0%	45.0%	20.0%	36.7%	15.0%	16.7%	16.7%	18.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Act Effct Green (s)	68.0	52.0	60.0	48.0	38.0	38.0	56.0	20.0	20.0	42.0
Actuated g/C Ratio	0.57	0.43	0.50	0.40	0.32	0.32	0.47	0.17	0.17	0.35
v/c Ratio	1.07	1.03	1.06	1.02	0.52	0.77	0.42	0.17	0.97	0.38
Control Delay	105.2	66.1	111.9	48.1	38.5	47.0	21.3	48.8	95.5	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.2	66.1	111.9	48.1	38.5	47.0	21.3	48.8	95.5	16.0
LOS	F	E	F	D	D	D	C	D	F	B
Approach Delay		72.6		57.7		36.8			59.8	
Approach LOS		E		E		D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 59.8	Intersection LOS: E
Intersection Capacity Utilization 101.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 8: Clover Valley S & US 62



COST ESTIMATE
Alternative CV-1

Jun-24

Assume: US 62 already widened to 5 lanes
Assume urban design for relocated Clover Valley South
Assume rural design for relocated Clover Valley North (CV-2 portion)
100 foot RW for relocated Clover Valley Road
120 foot RW of relocated Clover Valley Road in vicinity of US 62
80 foot RW for improved existing Clover Valley Road or Duncan Plains Road

$300	Rural roadway widening/reconstruction (per lane-foot)
$350	Suburban new roadway (per lane-foot)
$ 150,000	Traffic signal cost

					30%	15%	8%		Right-of-Way				
County Line Road Improvements - South	**Length**	**# of Lanes**	**Unit Cost**	**Subtotal**	**Contingency**	**Engineering**	**CA/CI**	**Total**	**Length**	**New width**	**New Area**	**Cost/Acre**	**Total Cost**
New alignment - 5 lanes	800	5	$350	$ 1,400,000	$ 420,000	$ 210,000	$ 110,000	$ 2,140,000	800	120	2.20	$ 300,000	$ 660,000
New alignment - 3 lanes	3200	3	$350	$ 3,360,000	$ 1,010,000	$ 500,000	$ 270,000	$ 5,140,000	3200	100	7.35	$ 300,000	$ 2,200,000
Existing roadway tie-in	500	2	$300	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000	500	50	0.57	$ 300,001	$ 170,000
cul-de-sac	250	2	$300	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000	250	20	0	$ 300,000	$ 30,000
structure over Kiber Run	50	60	$150	$ 450,000	$ 140,000	$ 70,000	$ 40,000	$ 700,000					
structure over Kiber Run	50	60	$150	$ 450,000	$ 140,000	$ 70,000	$ 40,000	$ 700,000					
structure over Kiber Run	50	40	$150	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000					
County Line Road Improvements - Middle													
New alignment - 5 lanes	900	5	$350	$ 1,580,000	$ 470,000	$ 240,000	$ 130,000	$ 2,420,000	900	120	2.48	$ 300,000	$ 740,000
New alignment - 4 lanes	700	4	$350	$ 980,000	$ 290,000	$ 150,000	$ 80,000	$ 1,500,000	700	100	1.61	$ 300,000	$ 480,000
Traffic signal at US 62	1	1	$150,000	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000					
Duncan Plains Road @ existing Clover Valley Road (north)													
Reconstruct DP for turn lanes between CV and CV	800	3	$300	$ 720,000	$ 220,000	$ 110,000	$ 60,000	$ 1,110,000	800	20	0.37	$ 300,000	$ 110,000
Westbound right turn lane	400	1	$300	$ 120,000	$ 40,000	$ 20,000	$ 10,000	$ 190,000	400	20	0.18	$ 300,000	$ 60,000
Turn lanes on CV north leg	400	1	$300	$ 120,000	$ 40,000	$ 20,000	$ 10,000	$ 190,000	400	20	0.18	$ 300,001	$ 60,000
Traffic signal at exist Clover Valley	1	1	$150,000	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000					
structure over Kiber Run	50	50	$150	$ 375,000	$ 110,000	$ 60,000	$ 30,000	$ 575,000					
Duncan Plains Road @ relocated Clover Valley Road													
Eastbound right turn lane	400	1	$300	$ 120,000	$ 40,000	$ 20,000	$ 10,000	$ 190,000	400	40	0.37	$ 300,000	$ 110,000
Reconstruct for turn lane tapers	500	2	$300	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000	500	10	0.11	$ 300,000	$ 30,000
Traffic signal at relocated Clover Valley	1	1	$150,000	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000					

Construction Cost $ 17,155,000

Right-of-Way Cost $ 4,650,000

Total Project Cost including R/W
Alternative CV-1 $ 21,810,000

COST ESTIMATE
Alternative CV-2

Jun-24

ms consultants, inc.
engineers, architects, planners

Assume: US 62 already widened to 5 lanes
Assume urban design for relocated Clover Valley South
Assume rural design for relocated Clover Valley North (CV-2 portion)
100 foot RW for relocated Clover Valley Road
120 foot RW of relocated Clover Valley Road in vicinity of US 62
80 foot RW for improved existing Clover Valley Road

$300	Rural roadway widening/reconstruction (per lane-foot)
$350	Suburban new roadway (per lane-foot)
$ 150,000	Traffic signal cost

					30%	15%	8%		Right-of-Way				
County Line Road Improvements - South	**Length**	**# of Lanes**	**Unit Cost**	**Subtotal**	**Contingency**	**Engineering**	**CA/CI**	**Total**	**Length**	**New width**	**New Area**	**Cost/Acre**	**Total Cost**
New alignment - 5 lanes	800	5	$350	$ 1,400,000	$ 420,000	$ 210,000	$ 110,000	$ 2,140,000	800	120	2.20	$ 300,000	$ 660,000
New alignment - 3 lanes	3200	3	$350	$ 3,360,000	$ 1,010,000	$ 500,000	$ 270,000	$ 5,140,000	3200	100	7.35	$ 300,000	$ 2,200,000
Existing roadway tie-in	500	2	$300	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000	500	50	0.57	$ 300,001	$ 170,000
cul-de-sac	250	2	$300	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000	250	20	0.11	$ 300,000	$ 30,000
structure over Kiber Run	50	60	$150	$ 450,000	$ 140,000	$ 70,000	$ 40,000	$ 700,000					
structure over Kiber Run	50	60	$150	$ 450,000	$ 140,000	$ 70,000	$ 40,000	$ 700,000					
structure over Kiber Run	50	40	$150	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000					
County Line Road Improvements - Middle													
New alignment - 5 lanes	900	5	$350	$ 1,580,000	$ 470,000	$ 240,000	$ 130,000	$ 2,420,000	900	120	2.48	$ 300,000	$ 740,000
New alignment - 4 lanes	700	4	$350	$ 980,000	$ 290,000	$ 150,000	$ 80,000	$ 1,500,000	700	100	1.61	$ 300,000	$ 480,000
Traffic signal at US 62	1	1	$150,000	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000					
County Line Road Improvements - North of Duncan Plains													
New alignment - 3 lanes	500	3	$300	$ 450,000	$ 140,000	$ 70,000	$ 40,000	$ 700,000	500	100	1.15	$ 300,000	$ 340,000
New alignment - 2 lanes	2000	2	$300	$ 1,200,000	$ 360,000	$ 180,000	$ 100,000	$ 1,840,000	2000	100	4.59	$ 300,000	$ 1,380,000
Existing roadway - tie in	500	2	$300	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000	500	50	0.57	$ 300,000	$ 170,000
cul-de-sac	250	2	$300	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000	250	20	0.11	$ 300,001	$ 30,000
Duncan Plains Road @ relocated Clover Valley Road													
Reconstruct for turn lanes @ relocated CV	700	4	$300	$ 840,000	$ 250,000	$ 130,000	$ 70,000	$ 1,290,000	700	40	0.64	$ 300,000	$ 190,000
Reconstruct for turn lane tapers	700	2	$300	$ 420,000	$ 130,000	$ 60,000	$ 30,000	$ 640,000	100	20	0.05	$ 300,000	$ 10,000
Traffic signal at relocated Clover Valley	1	1	$150,000	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000					

Construction Cost $ 19,370,000

Right-of-Way Cost $ 6,400,000

Total Project Cost including R/W
Alternative CV-2 $ 25,770,000

COST ESTIMATE
Improved No-Build

Jun-24

Assume: US 62 already widened to 5 lanes

	$300	Rural roadway widening/reconstruction (per lane-foot)
	$350	Suburban new roadway (per lane-foot)
140 foot RW for widened US 62 btw CV and DP	$ 150,000	Traffic signal cost
120 foot RW of future existing US 62 R/W		
80 foot RW for improved existing Clover Valley Road or Duncan Plains Road		

					30%	15%	8%		Right-of-Way				
County Line Road Improvements - South	**Length**	**# of Lanes**	**Unit Cost**	**Subtotal**	**Contingency**	**Engineering**	**CA/CI**	**Total**	**Length**	**New width**	**New Area**	**Cost/Acre**	**Total Cost**
Northbound RT lane	500	1	$300	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000	500	10	0.11	$ 300,000	$ 30,000
Resurfacing	500	2	$20	$ 20,000	$ 10,000	$ 3,000	$ 2,000	$ 35,000	500		0.00	$ 300,000	$ -
US 62 Improvements (beyond 5-lane cross-section)													
Approach taper west of CV	1000	5.5	$350	$ 1,930,000	$ 580,000	$ 290,000	$ 150,000	$ 2,950,000	1000	10	0.23	$ 300,000	$ 70,000
Nine-lane section - CV to DP	500	9	$350	$ 1,580,000	$ 470,000	$ 240,000	$ 130,000	$ 2,420,000	500	20	0.23	$ 300,000	$ 70,000
Westbound LTL @ Duncan Plains	400	1	$350	$ 140,000	$ 40,000	$ 20,000	$ 10,000	$ 210,000	400	20	0.18	$ 300,000	$ 60,000
Approach taper east of DP	1000	5.5	$350	$ 1,930,000	$ 580,000	$ 290,000	$ 150,000	$ 2,950,000	1000	10	0.23	$ 300,000	$ 70,000
Resurfacing	2500	5	$20	$ 250,000	$ 80,000	$ 40,000	$ 20,000	$ 390,000					
Traffic signal upgrades	2	1	$150,000	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000					
structure widening over Kiber Run	50	40	$150	$ 300,000	$ 90,000	$ 50,000	$ 20,000	$ 460,000					
Duncan Plains Road Improvements													
Approach taper west of CV	500	1	$300	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000	500	20	0.23	$ 300,000	$ 70,000
Eastbound LT lane	300	1	$300	$ 90,000	$ 30,000	$ 10,000	$ 7,000	$ 137,000	300	20	0.14	$ 300,000	$ 40,000
Five-lane section - CV to 62	500	5	$350	$ 880,000	$ 260,000	$ 130,000	$ 70,000	$ 1,340,000	500	40	0.46	$ 300,000	$ 140,000
Westbound RT lane at 62	300	1	$300	$ 90,000	$ 30,000	$ 10,000	$ 10,000	$ 140,000	300	20	0.14	$ 300,000	$ 40,000
Resurfacing	1000	2.5	$20	$ 50,000	$ 20,000	$ 10,000	$ 4,000	$ 84,000					
Traffic signal at exist Clover Valley	1	1	$150,000	$ 150,000	$ 50,000	$ 20,000	$ 10,000	$ 230,000					
structure over Kiber Run	50	75	$150	$ 562,500	$ 170,000	$ 80,000	$ 50,000	$ 862,500					
Clover Valley Road Improvements - North													
Southbound right turn lane	400	1	$300	$ 120,000	$ 40,000	$ 20,000	$ 10,000	$ 190,000	400	20	0.18	$ 300,000	$ 60,000

Construction Cost $ 13,088,500

Right-of-Way Cost $ 650,000

Total Project Cost including R/W
Improved No-Build **$ 13,740,000**