

5.0 Preferred Conceptual Alternatives

The purpose of this section is not to select a single conceptual alternative; rather its purpose is to identify the preferred conceptual alternatives throughout the study area based on the evaluation criteria in *Chapter 4*. Conceptual alternatives evaluated in *Chapter 4* and not selected for inclusion in the Preferred Conceptual Alternatives are not to be dismissed from further consideration. Those conceptual alternatives evaluated in but not included in the Preferred Conceptual Alternatives are still feasible solutions in achieving the goals of the study, however, those alternatives were deemed to be not as viable as the Preferred Conceptual Alternatives because of a multitude of factors including economic constraints, environmental impacts, safety considerations, and traffic operation.

5.1 Preferred Access Management Concept (Medina Line Rd to South Hametown Rd)

4 Lanes with Raised Median – The raised median concept is preferable because it limits access to Right-in / Right-out movements which results in safer access points. The raised median concept is preferred over the no-build concept and two-way left turn concept because it will manage access as the Western end of the corridor is subject to future development.

The purpose of this improvement is to address access management concerns in this segment of the corridor based on future land use changes and development by reducing direct access and consolidating access points in order to enhance safety and preserve traffic mobility.

5.2 Preferred Intersection Concepts (Concepts with Independent Utility)

Medina Line Rd and SR 18 Intersection

Addition of Left Turn Lanes on Medina Line Rd – The addition of single left turn lanes on the Medina Line approaches is preferable to a no-build concept because it will eliminate the long delays experienced in a no-build future 2030 failure condition. The cost for the left-turn lane improvements are justified by the increasing importance of Medina Line Rd as a collector to SR 18 as residential development in western Summit County and eastern Medina County continues. Right-of-way impacts associated with this concept are minimal, and there are no resulting neighborhood quality of life issues.

The purpose of this improvement is to address future congestion concerns (2030 LOS F in both Peak Hours) through the addition of left turns which improves the 2030 operation to a LOS C in both Peak Hours. Although a safety issue was not identified at this intersection the reduction in congestion will lead to enhanced safety.

Harmony Hills Dr and SR 18

Two-stage Left Turn – The installation of a two-stage left turn is the preferred concept at the Harmony Hills Dr and SR 18 intersection because it significantly reduces the delay for vehicles making left turns onto SR 18 in economically responsible manner. A no-build alternative would neglect the needs of Harmony Hills Dr residents during the peak hours, and the construction of indirect left turn lanes at Medina Line Rd has substantially higher travel times because vehicles would traveling extra distance and through a traffic signal.

The purpose of this improvement is to address a future congestion concern (196 seconds delay on the Harmony Hills Dr approach in the 2030 PM Peak Hour) by providing a two-stage left turn thereby reducing the future PM Peak Hour side street delay to 50 seconds. This improvement has a minor impact with respect to the corridor as the 2030 PM Peak Hour volume on the southbound approach is only 10 vehicles.

North Hametown Rd and SR 18 Intersection

Two-stage Left Turn - The installation of a two-stage left turn is the preferred concept at the North Hametown Rd and SR 18 intersection because it significantly reduces the delay for vehicles making left turns onto SR 18 in economically responsible manner. A no-build alternative would neglect the needs of southbound North Hametown Rd travelers resulting in excessive delays in the PM Peak Hour (1204 seconds.) The construction of indirect left turn lanes at Medina Line would decrease travel times for trucks (cars can make U-turns at Creek Run Dr,) but would be cost prohibitive given the small volume of trucks at North Hametown Rd, in addition to degrading traffic operation at the Medina Line Rd intersection.

The purpose of this improvement is to address a future congestion concern (1204 seconds delay on the North Hametown Rd approach in the 2030 PM Peak Hour) by providing a two-stage left turn thereby reducing the future PM Peak Hour side street delay to 84 seconds. This improvement has a minor impact with respect to the corridor as the 2030 PM Peak Hour volume on the southbound approach is only 50 vehicles.

Springside Drive and SR 18 Intersection

Addition of Turn Lanes on Springside Dr – The addition of turn lanes on Springside Dr is the preferred concept at the intersection of Springside Dr and SR 18 because it improves all intersection approaches to an acceptable LOS which is critical given the importance of Springside Dr as a gateway to retail to the South and employment centers and hotels to the North. A no-build concept at this intersection is unacceptable given the failure conditions experience in the existing and future conditions on both Springside and SR 18 approaches.

The purpose of this improvement is to address existing and future congestion concerns and to correct an existing safety issue at the intersection. Through the addition of turn lanes the existing (AM Peak LOS C and PM Peak LOS F) and the future (AM Peak LOS D and PM Peak LOS F) operations are improved to LOS B and LOS C in the 2030 AM and PM Peak Hours, respectively. Two safety issues were identified at the intersection: 40% rear-end crashes and 21% left-turn crashes. The frequency of rear-end crashes will be reduced by improving congestion and removing the number of stops, while the high percentage of left-turn crashes will be decreased by the addition of turn lanes on Springside Dr.

5.3 Preferred SR 18 Capacity Addition Concept (South Hametown to Montrose West)

Montrose West Relocation – The relocation of Montrose West Ave to the Heritage Woods intersection is the preferred concept for the capacity addition to the SR 18 corridor between South Hametown Rd and Montrose West Ave for several reasons. First, the Montrose West Relocation is much more economically feasible than the Basic Lane Addition. Second, the Montrose West Relocation only requires one additional through lane on SR 18 as opposed to the Basic Lane Addition which requires two additional through lanes. Finally, the Montrose West Relocation eliminates the need for a split-phase signal at the Crystal Lake Rd and SR 18 intersection. A no-build concept along the SR 18 corridor between South Hametown and Montrose West is unacceptable because capacity enhancements to SR 18 are required to improve the flow of traffic to and from I-77, a primary goal of this goal.

The purpose of these improvements is to address multiple congestion and safety issues identified in this section of the corridor. *Table 5-1* shows a summary of the existing and future LOS for No-Build and Build conditions at the three intersections along this portion of the corridor.

Intersection	No-Build				Montrose West Relocation	
	Existing		2030		2030	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
South Hametown Rd	F	C	F	F	A	B
Heritage Woods Dr	D	E	F	F	B	B
Crystal Lake Rd Montrose West Ave	F	F	F	F	B	C

Table 5-1 – Summary of Montrose West Relocation Intersections

In addition to the congestion problems at the aforementioned intersections there also exist segment LOS deficiencies along SR 18 between South Hametown and the I-77 interchange; however, these are directly related to the congestion at the Crystal Lake Rd/Montrose West Ave intersection which is the primary bottleneck in the corridor meaning the segment congestion will dissipate once the Montrose West Ave leg of the intersection is relocated to Heritage Woods Dr. The entire segment of the corridor between South Hametown Rd and the I-77 interchange is identified as a safety issue, along with the intersections at Heritage Woods Dr

and Crystal Lake Rd/Montrose West Ave. The safety concerns in this section of the corridor will be mitigated by reducing congestion, improving signalization, and removing the south leg of the Crystal Lake Rd/Montrose West Ave intersection.

5.4 Preferred I-77 Mainline Concepts

Early SR 18 Split – The early SR 18 split is the preferred northbound I-77 mainline concept because it effectively removes the existing weave movement between northbound SR 21 to northbound I-77 traffic and northbound I-77 traffic exiting at SR 18. This concept offers a unique opportunity to eliminate a mainline weave without braiding any ramps. A no-build concept for the northbound mainline would degrade the operation of I-77 between SR 21 and SR 18 over time as a result of the influx of traffic on SR 21 generated by the rapidly developing region to the south.

The purpose of this improvement is to address a future congestion issue (Northbound I-77 LOS D in the 2030 AM Peak Hour) by eliminating the northbound weave between the SR-21 entrance and SR-18 exit ramps. Although safety was not identified as an issue in this area, the elimination of the existing weave will result in a 100% reduction in crashes resulting from that conflict point.

Southbound C-D System - The construction of a southbound C-D system between SR 18 and SR 21 is the preferred mainline concept to eliminate the existing southbound weave condition. The southbound C-D system is preferred to a no-build concept because the elimination of the southbound mainline weave is necessitated by SR 18 capacity improvements releasing the Montrose West bottleneck and removing the metering of the southbound I-77 entrance ramp. In addition to its compatibility with the Modified Cloverleaf interchange concept, the construction of the southbound C-D system is preferred to the Early 21 Split because it more economical and has less substantial right-of-way impacts.

The purpose of this improvement is to address a future congestion issue (2030 PM Peak Hour LOS D) on the southbound I-77 mainline resulting from a platoon of southbound traffic entering the freeway system after the bottleneck at the Crystal Lake Rd/Montrose West Ave is released by the Montrose West Relocation. Although safety was not identified as an issue for this area, the Southbound C-D System will reduce the number of vehicles performing conflicting movements as only SR-18 traffic entering SR-21 will have to switch lanes within the ramp system.

5.5 Preferred SR 18 & I-77 Interchange Concept

Modified Cloverleaf

The Modified Cloverleaf is the preferred interchange concept at I-77 and SR 18 because it is advantageous compared to the no-build and other intersection reconfiguration concepts. The Modified Cloverleaf removes the existing weave conditions on SR 18 and eliminates undesirable loop exit ramps on the mainline, both undesirable aspects of the existing full cloverleaf interchange that would be preserved by a no-build concept. The Modified Cloverleaf operates more efficiently than either the Tight Diamond or Offset SPUI, in addition to more being more cost effective because it maximizes the reuse of existing ramp alignments and does not require any additional structures.

The purpose of this improvement is to address congestion and safety issues within the existing interchange along with upgrading its geometric deficiencies. Congestion issues associated with existing cloverleaf configuration (2030 AM Peak Hour LOS D along I-77 between the northbound loop ramps and 2010/2030 PM Peak Hour LOS D/F along SR 18 between westbound loop ramps) will be addressed when the weave movements are eliminated through the removal of the exit loop ramps. Safety issues within the interchange (eastbound to southbound entrance ramp, northbound to westbound exit ramp, and SR 18 through the interchange) will be mitigated by the removal of exit loop ramps and signalization of the exit ramps at SR-18. Geometrically deficient shoulder widths on the existing ramps will be upgraded to current design standards as part of the Modified Cloverleaf reconfiguration.

5.6 Preferred I-77 and SR 21 Interchange Concept

No-Build

A no-build concept is preferred to an upgrade of existing geometric deficiencies because analysis of crash data and traffic operation show no evidence of any safety or congestion resulting from the interchange's geometric deficiencies.

5.7 Summary of Preferred Conceptual Alternatives

Access Management (Medina Line Rd to South Hametown Rd)

- **4 Lanes with Raised Median**
 - Two 12' lanes with 10' outside shoulder, 6' inside shoulders and 6' aesthetically treated raised median

Medina Line Rd and SR 18 Intersection

- **Addition of Left Turn Lanes on Medina Line Rd**
 - Addition of single left turn lanes on the northbound and southbound approaches of Medina Line Rd

Harmony Hills Dr and SR 18

- **Two-stage Left Turn**
 - Widening of the median to accommodate storage for a two-stage left turn from northbound Harmony Hills Dr

North Hametown Rd and SR 18 Intersection

- **Two-stage Left Turn**
 - Widening of the median to accommodate storage for a two-stage left turn from northbound North Hametown Rd
 - Addition of right turn lane on westbound SR 18

Springside Dr and SR 18 Intersection

- **Addition of Turn Lanes on Springside Dr**
 - Addition of a second left turn lane on northbound Springside Dr
 - Addition of a right turn lane on southbound Springside Dr

SR 18 Capacity Additions (South Hametown Rd to Montrose West Ave)

- **Montrose West Relocation**
 - Removal of the south leg of the Crystal Lake Rd/Montrose West Ave intersection
 - Relocation of Montrose West Ave access to Heritage Woods Dr via a new intersection just south of the intersection at SR 18
 - Addition of a single through lane on SR 18 in both directions
 - Addition of a right turn lane and free-flow right turn on northbound South Hametown Rd at SR 18
 - Widening of SR 18 to accommodate the future addition of a second left turn lane to South Hametown Rd
 - Additional of a second left turn lane on westbound SR 18 into Heritage Woods Dr to accommodate Montrose West Relocation
 - Addition of a second left turn lane on eastbound SR 18 into Crystal Lake Rd
 - Addition of a northbound right turn lane into Embassy Parkway
 - Addition of a second left turn lane out of Embassy Parkway onto Crystal Lake Rd

I-77 Mainline

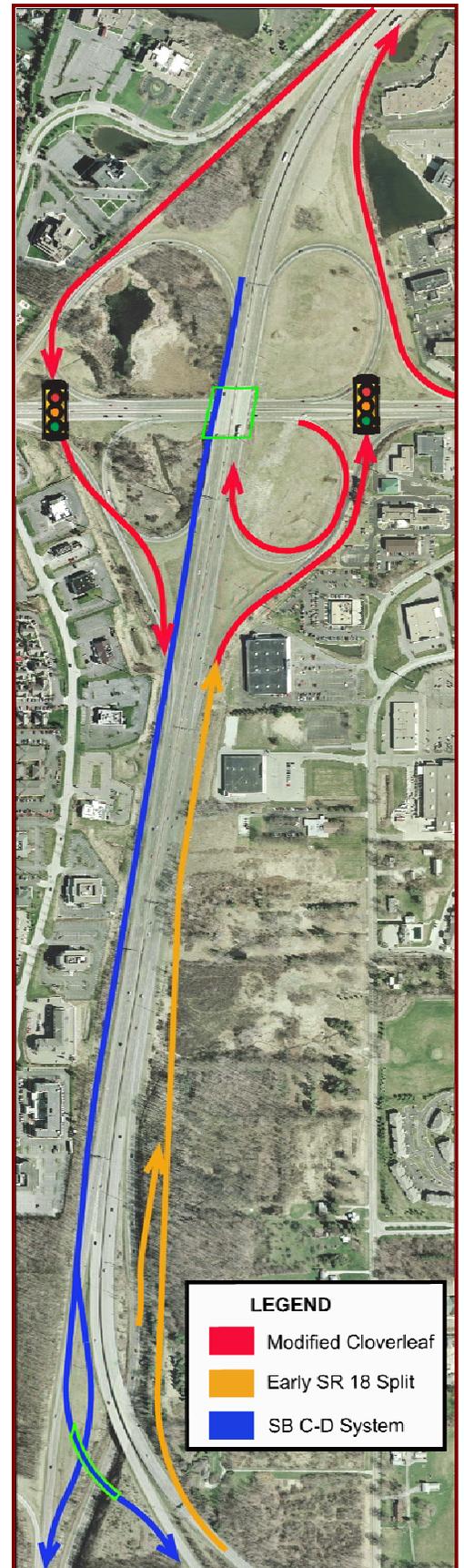
- **Early SR 18 Split**
 - Early exit of northbound I-77 to SR 18 as a single lane exit south of the merge with northbound SR 21
 - Construction of a single lane slip ramp from northbound SR 21 to SR 18 just north of structure SUM-77-2230R
 - Construction of two lane ramp parallel to the mainline carrying both northbound I-77 and northbound SR 21 traffic exiting at SR 18
- **Southbound C-D System**
 - Early exit of southbound I-77 to southbound SR 21 as a two-lane exit at the SUM-77-2321 structure
 - Construction of a three-lane southbound C-D roadway parallel to the mainline formed by the two-lane southbound I-77 to southbound SR 21 ramp and the single lane SR 18 to I-77/SR 21 southbound
 - Construction of a single lane flyover ramp carrying SR 18 to southbound I-77 traffic over the two lanes of southbound SR 21

SR 18 & I-77 Interchange

- **Modified Cloverleaf**
 - Removal of the two mainline loop exit ramps
 - Conversion of the remaining two exit ramps to signalized intersections at SR 18 with dual left turns and dual right turns
 - Addition of dual right turn lanes for the two-lane eastbound SR 18 to southbound I-77 ramp (one lane drops on ramp)
 - Construction of an additional through lane on SR 18 in both directions between Crystal Lake and Springside

I-77 and SR 21 Interchange

- **No-Build Interchange**



Preferred Freeway Improvements