

# AIRPORT BOULEVARD CORRIDOR DEVELOPMENT PROGRAM APPENDIX C

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FEBRUARY 2014

## TECHNICAL MEMORANDUM

Date: October 2012

Subject: Airport Boulevard Corridor  
Intersection Traffic Analyses

### Introduction and Purpose

The Airport Boulevard Corridor Development Program recommends improvements for the corridor that improve mobility, safety, and quality of life. The plan provides for all modes of transportation along the corridor from North Lamar Boulevard to US 183 (shown in **Figure 1**). This memorandum focuses on the analyses and recommendations for the signalized intersections along the corridor.

The improvements recommended in this memorandum are organized into two main categories: short-term improvements and medium-term/long-term improvements. The short-term improvements are smaller improvements that are implementable within the existing thoroughfare network and would provide level of service improvements for the existing and projected demand. The long-term improvements will require a higher investment and are major improvements to the network and may involve widening the roadway or major intersection improvements. The long-term improvements will have the highest cost but also the greatest impact.

### Analysis Methodology

The intersections were analyzed using Synchro 8<sup>TM</sup> software and VISSIM<sup>TM</sup> software. VISSIM was used to more accurately model two areas along the corridor that are impacted by the MetroRail line – Airport Boulevard from 45<sup>th</sup> Street to 53<sup>rd</sup> ½ Street and Airport Boulevard at Lamar Boulevard. The MetroRail runs parallel to Airport Boulevard on the west side of the roadway with at-grade crossings at roadways it crosses. The intersections chosen for VISSIM analysis were the higher traffic and congestion intersections within the corridor. The intersections of Guadalupe and Denson were not analyzed with VISSIM given the relatively high level of service.



Figure 1: Vicinity Map

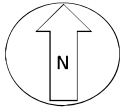
Traffic counts at the intersections were collected on weekdays in June 2011 and September 2011 during the AM peak period (7:00 – 9:00 AM) and the PM peak period (4:00 – 6:00 PM). The peak hour traffic counts are displayed in **Exhibit 1** and **Exhibit 2**. Existing intersection geometries were field verified. Existing traffic signal timings were obtained from the City of Austin.

The intersections were analyzed in Synchro during the AM and PM peak hours for the following scenarios:

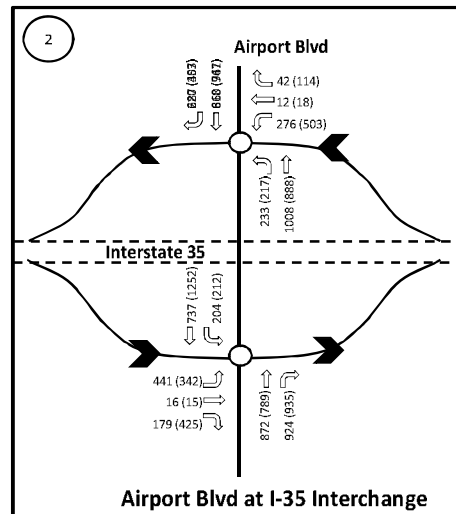
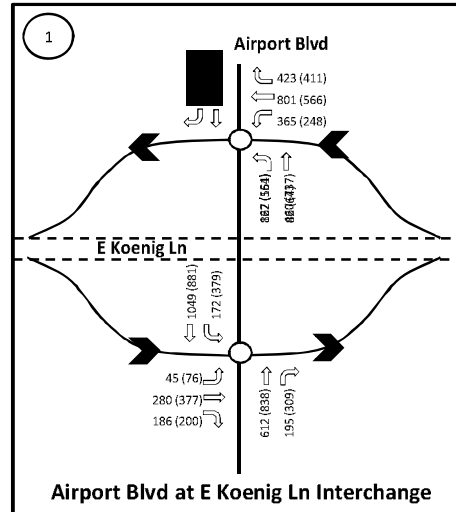
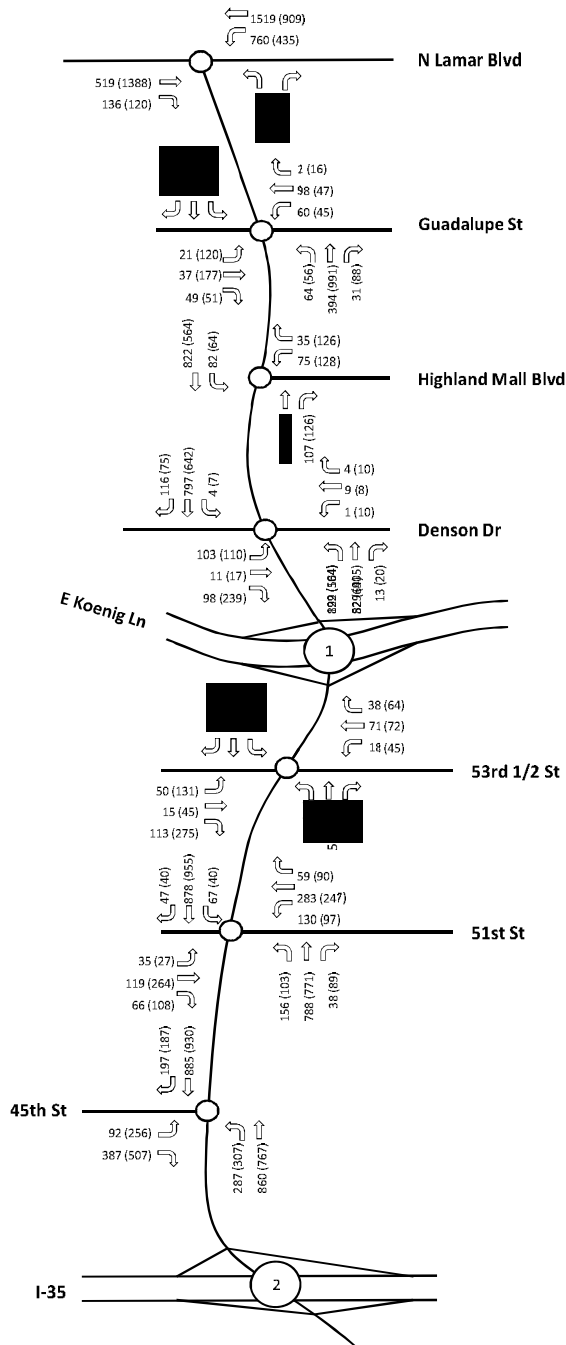
- 2011 Existing Conditions Baseline (2011 traffic volumes with existing roadway network)
- 2011 Short-Term Improvements (2011 traffic volumes with short-term improvement network)
- 2030 Future Conditions Baseline (2030 projected traffic volumes with existing roadway network)
- 2030 Future Conditions with Short-Term Improvements (2030 projected traffic volumes with short-term improvements)
- 2030 Future Conditions with Long-Term Improvements (2030 project traffic volumes with short-term and long-term improvements)

For the 2030 analysis year, each of the existing peak hour traffic volumes was increased by 20% to account for traffic growth within the study area.

The target level of service (LOS) for intersections within the corridor was an overall LOS of D during the AM and PM peak hours. Geometric and traffic signal operational improvements were recommended to reduce the average delay per vehicle at the intersections and improve accommodations for pedestrians and bicyclists.



N.T.S.



**Exhibit 1 - N. Section Background Traffic**  
**Airport Boulevard Corridor**  
**Austin, TX**

**Legend**

X(Y) = 2011 Mid-Week Traffic Volumes

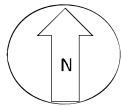
X = AM Peak Hour Volume

Y = PM Peak Hour Volume

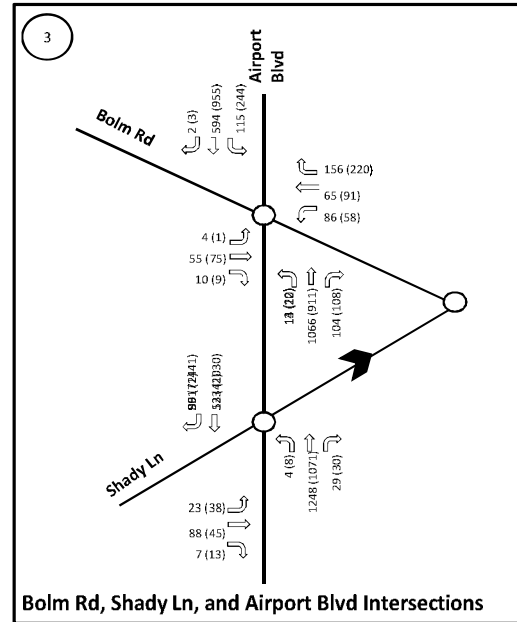
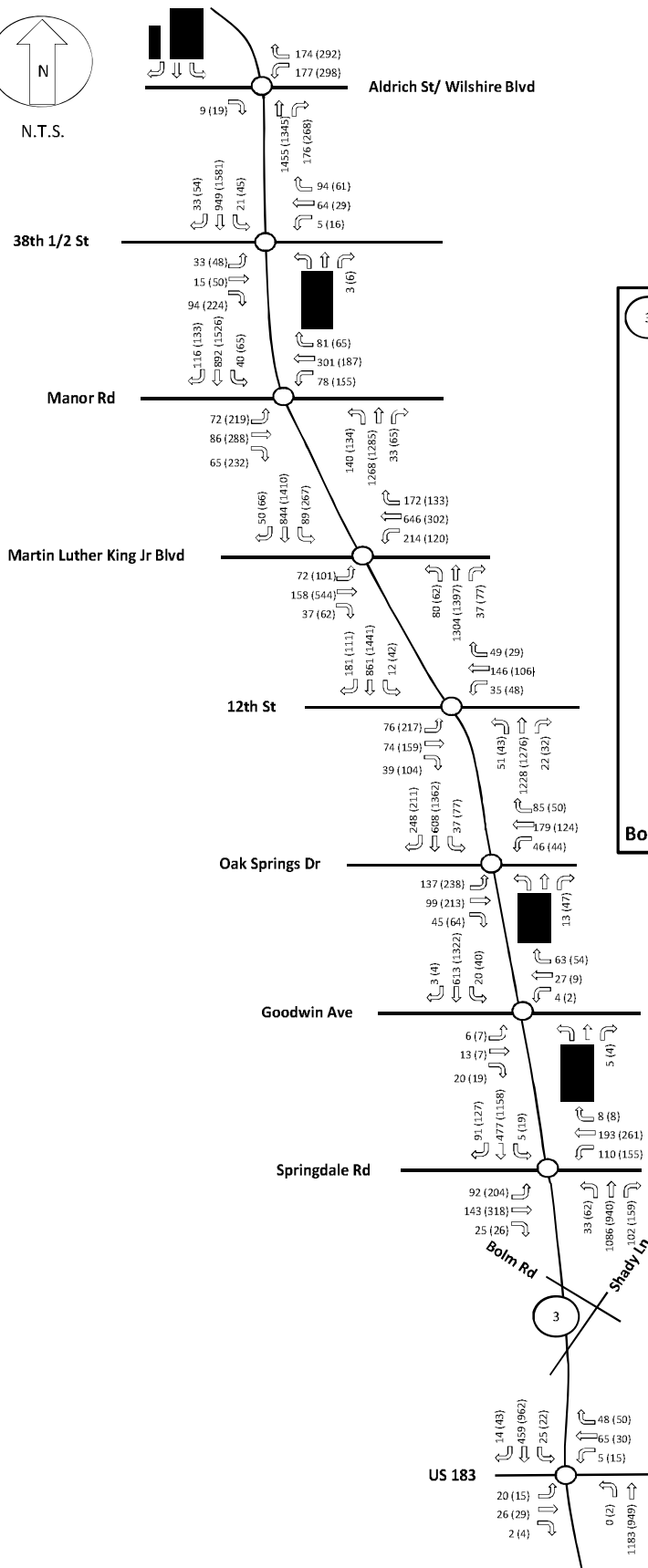
➡=One Way Connection



**Kimley-Horn  
and Associates, Inc.**



N.T.S.



**Exhibit 2 - S. Section Background Traffic**  
Airport Boulevard Corridor  
Austin, TX

**Legend**

X(Y) = 2011 Mid-Week Traffic Volumes

X = AM Peak Hour Volume

Y = PM Peak Hour Volume

➡ = One Way Connection



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and Associates, Inc.**

## Existing Conditions

Airport Boulevard operates on a coordinated signal network maintained by the City of Austin. Interchanges are located at IH-35 and at Koenig Lane. South of MLK, Airport Boulevard is a TxDOT roadway (SH 111), although the traffic signals are controlled by the City of Austin. **Table 1** provides the existing delay and LOS by intersection along the corridor.

## Short-Term Improvements

Several short-term intersection improvements are recommended as a result of the intersection analyses and field observations. **Table 1** shows the average delay and LOS results from the analysis of the 2011 existing baseline scenario as well as the 2011 short-term improvements scenario. The following describes the short-term improvement recommendations by intersection.

### Airport Boulevard & Koenig Lane Interchange

- *Remove the free right turn lanes on all four corners of the interchange.* This will improve the pedestrian access through the intersection and will also act as traffic calming for traffic turning from Koenig Lane onto Airport Boulevard. The free right turn lanes increase the distance for pedestrians to cross the intersection and leave them exposed to vehicular traffic that does not have to stop at the signalized intersection. The free right turn lanes also encourage motorists to enter Airport Boulevard at a high rate of speed, which conflicts with the multimodal goals of the corridor. The removal of the free right turn lanes will improve the pedestrian safety and make more right-of-way available to be used for development at a critical point on the corridor.

### Airport Boulevard & 53<sup>rd</sup> ½ Street

- *Add protected/permitted phasing for 53<sup>rd</sup> ½ Street approaches (eastbound and westbound).* Currently the minor approaches operate as permitted only phasing, which requires the left turning vehicles to wait until the opposing through vehicles have cleared. Providing protected/permitted phasing will reduce the delay experienced by the side street vehicles.

### Airport Boulevard & 51<sup>st</sup> Street

- *Remove the adjacent signal at 51<sup>st</sup> and Clarkson.* The intersection of 51<sup>st</sup> St & Clarkson Ave is approximately 100 feet from the intersection of Airport Blvd & 51<sup>st</sup> St. Because of the close proximity between the intersections and the rail line between the intersections, the east-west approaches had to operate split phased, which added delay for traffic at the intersection of Airport Blvd & 51<sup>st</sup> Street. Based on the early

recommendation to remove the traffic signal at 51<sup>st</sup> & Clarkson and concurrence from the City of Austin traffic staff, *this improvement has already been completed.*

- *Install a new traffic signal controller.* A new controller would better handle the rail influence on the intersection and improve the phasing operations for the intersection. *Similar to the previous improvement, this improvement has already been made.*

#### Airport Boulevard & Wilshire Boulevard/ Aldrich Street

- *Improve the bicycle access through the intersection.* This signalized intersection has a raised median that prohibits vehicles from crossing east-west through the intersection to prevent cut through traffic movement. This also prevents bicyclists from making this movement. An opening should be constructed in the raised median to allow bicyclists to travel through the intersection, while still prohibiting the movement for automobile traffic.
- *Restripe the lanes to add a second southbound left turn and a second eastbound left turn lane.* This intersection was built to accommodate dual southbound left turns and dual westbound left turns, although it is currently striped to allow only one left turn lane on each approach. As the Mueller development has grown, traffic volumes on those movements have increased. By restriping the southbound and westbound turn lanes, the intersection delay will be reduced.

#### Airport Boulevard & Manor Road

- *Make northbound and southbound left turns protected/permitted phasing.* The existing northbound and southbound left turning movements operate as protected only phasing, which increases delay for vehicles at the intersection. Adding permitted phasing would allow turning vehicles to utilize gaps in the conflicting through traffic as opposed to relying on protected left turn green time only. This will require geometric modifications to align the left turning approaches.
- *Add an eastbound right turn bay.* The intersection is congested during the peak hours. Adding an eastbound right turn lane would increase capacity and improve traffic operations at the intersection.

#### Airport Boulevard & Martin Luther King Boulevard

- *Realign the northbound and southbound turn bays, add a second southbound left turn lane, and make phasing protected/permitted.* The existing northbound and southbound left turn movements operate as protected only phasing which increases delay for vehicles at the intersection. Adding permitted phasing would allow turning vehicles to utilize gaps in the conflicting through traffic as opposed to relying on

protected left turn green time. This will require geometric modifications to align the left turning approaches. The second southbound left turn lane is to increase the capacity of the movement which is current operating at a poor level of service.

#### Airport Boulevard & 12<sup>th</sup> Street

- *Make northbound and southbound left turns protected/permitted phasing.* The existing northbound and southbound left turn movements operate as protected only phasing, which increases delay for vehicles at the intersection. Adding permitted phasing would allow left turning vehicles to utilize gaps in the conflicting through traffic as opposed to relying on protected left turn green time only. This may require geometric modifications to align the left turning approaches.

#### Airport Boulevard & Springdale Road

- *Provide a second through lane for the eastbound and westbound approaches across the intersection.* This intersection currently operates as split phased and the majority of the cycle length is provided to the north/south approaches on Airport Boulevard. To help reduce the delay experienced on the side street, the eastbound and westbound left turn bays can become shared left-through lanes. The proposed configuration will add capacity to the side street through movements and decrease the delay for the approach and the intersection without using extra green time from the major movements. Springdale Road appears to have sufficient pavement to receive dual through lanes at the intersection, but the dual lanes will need to merge back to a single lane past the intersection.



**Table 1: 2011 Intersection Analyses**

INTERSECTION	2011		2011		2011		2011	
	AM Peak Hour Existing Condition		PM Peak Hour Existing Condition		AM Peak Hour Short Term Improvements		PM Peak Hour Short Term Improvements	
	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
<b>SIGNALIZED INTERSECTIONS</b>								
	29.6	C	31.3	C	-	-	-	-
Airport Blvd @ Guadalupe St	11.6	B	19.8	B	-	-	-	-
Airport Blvd @ Highland Mall	6.0	A	8.1	A	-	-	-	-
Airport Blvd @ Denson Dr	10.0	B	11.8	B	-	-	-	-
Airport Blvd @ Koenig Ln Westbound	43.8	D	53.3	D	-	-	-	-
Airport Blvd @ Koenig Ln Eastbound	23.3	C	46.2	D	-	-	-	-
Airport Blvd @ 53rd 1/2 St (Bruning Ave)	16.2	B	15.8	B	18.4	B	17.3	B
Airport Blvd @ 51st St	62.2	E	97.0	F	38.9	D	38.0	D
Airport Blvd @ 46th St	-	-	-	-	-	-	-	-
Airport Blvd @ 45th St	28.2	C	35.6	D	-	-	-	-
Airport Blvd @ I-35 SB	22.9	C	22.5	C	-	-	-	-
Airport Blvd @ I-35 NB	24.5	C	16.3	B	-	-	-	-
Airport Blvd @ Wilshire Blvd/ Aldrich St	21.9	C	28.1	C	14.6	B	18.6	B
Airport Blvd @ 38 1/2 St	19.8	B	16.7	B	-	-	-	-
Airport Blvd @ Manor Rd	22.3	C	38.8	D	18.6	B	32.3	C
Airport Blvd @ MLK Blvd	46.7	D	44.7	D	42.5	D	36.5	D
Airport Blvd @ 12th St	16.7	B	19.7	B	15.7	B	19.2	B
Airport Blvd @ Oak Springs Dr	26.3	C	23.2	C	-	-	-	-
Airport Blvd @ Goodwin Ave	5.6	A	3.8	A	-	-	-	-
Airport Blvd @ Springdale Rd	31.9	C	40.4	D	30.2	C	37.1	D
Airport Blvd @ Bolm St	17.1	B	21.8	C	-	-	-	-
Airport Blvd @ Shady Ln	6.5	A	3.9	A	-	-	-	-
Airport Blvd @ Levander Loop	10.4	B	6.9	A	-	-	-	-

## Long-Term Improvements

Several long-term intersection improvements were made as a result of the intersection analyses and field observations. Each of the 2011 peak hour traffic volumes was increased by 20% to account for traffic growth within the study area. **Table 2** shows the average delay and LOS results from the analysis of the 2030 baseline scenario (no improvements from existing), 2030 scenario with short-term improvements, and 2030 with long-term improvements. The following describes the long-term improvement recommendations by intersection.

### Airport Boulevard & Denson Drive

- *Adjust geometry to add eastbound and westbound left turn lanes and provide protected/permitted phasing for east and west approaches.* The current eastbound and westbound approaches are marked as shared through-left and through-right lanes. If the lanes were restriped for a devoted left turn lane for the east and west approaches, the intersection could operate with protected/permitted phasing on the minor approaches which would improve the overall level of service of the intersection.
- *Provide queue jumping for the transit service.* This intersection is also a major stop for transit, so queue jumping signalization is recommended so buses can merge back into the flow of traffic during peak times.

### Airport Boulevard & 51<sup>st</sup> Street

- *Add a southbound right turn lane for stacking. Prohibit southbound right turns when train is approaching.* In the existing condition when a train preempts the signal at 51<sup>st</sup> Street, the north-south through movements are still able to progress while the east-west movements are restricted. However, the southbound approach is effectively constricted to one through lane once a southbound right turning vehicle arrives and waits to turn until the train preemption is complete. A southbound right turn lane would provide a stacking location for waiting vehicles outside of the through lane.

### Airport Boulevard & 45<sup>th</sup> Street; Airport Boulevard & 46<sup>th</sup> Street

- *Provide a new traffic signal at Airport Blvd & 46<sup>th</sup> St, restrict northbound left turns at Airport Blvd & 45<sup>th</sup> St to buses, close the access to Airport Blvd from 46<sup>th</sup> St on the west side, and provide an indirect left access to 45<sup>th</sup> St using the signal at 46<sup>th</sup> St.* Currently a high volume of traffic exiting from IH-35 southbound takes a right turn to merge onto Airport Boulevard northbound. This traffic then merges across two lanes of traffic in less than 200 feet to the inadequate left lane on 45<sup>th</sup> Street to go westbound on 45<sup>th</sup> St. To provide more stacking space and reduce the

backups into the interchange at IH-35, a new traffic signal is proposed at 46<sup>th</sup> St that would provide an indirect left access for vehicles wanting to turn onto 45<sup>th</sup> St. This improvement would involve closing the northbound left turn lane at 45<sup>th</sup> St except for buses, and removing the connection to 46<sup>th</sup> Street from Airport Blvd on the west side of the intersection. Northbound traffic would then have more time to merge into the left turn lane and would be able to take a U-turn at 46<sup>th</sup> Street and take a right turn on 45<sup>th</sup> Street. This improvement will also provide a signalized pedestrian crossing at 46<sup>th</sup> St.

#### Airport Boulevard & Manor Rd

- *Construct a second eastbound left turn bay.* A second eastbound left turn bay is recommended to handle future traffic demand at this intersection, which will require construction on that approach.

#### Airport Boulevard & Martin Luther King Boulevard

- *Add right turn bays at all approaches.* The future intersection volumes make the intersection operate close to capacity. Adding right turn bays will remove the right turning vehicles from the through movements, which will improve operations at the intersection.

#### Airport Boulevard & Oak Springs

- *Construct a second eastbound left turn bay.* A dual eastbound left turn bay is recommended based on the increased volumes and resulting delay in the future. The projected intersection volume makes the intersection operate close to capacity. The added capacity of the dual left turn bay will allow more green time for the major intersection movements while still improving the eastbound left turn movement delay.

#### Airport Boulevard & Springdale Road

- *Add protected/permitted phasing for Springdale Road approaches (eastbound and westbound). Reconfigure eastbound lane geometry to left, through, and through-right lanes and westbound lane geometry to left, through, and through-right lanes.* Currently the minor approaches operate using split phasing, which requires the minor approaches to operate independently and creates increased delay. Providing protected/permitted phasing will reduce the delay experienced by the side street because the east and west approaches will operate simultaneously maximizing the side street green time. This improvement was not implemented in the short term because it will require geometric modifications to the intersection to operate the Springdale Road left turn movements simultaneously.

#### Airport Boulevard & Shady Lane; Airport Boulevard & Bolm Road

- *Option 1: Unsignalize Shady Lane and make the eastbound approach right-in right-out.* The adjacent signalized intersections of Airport Blvd & Shady Lane and Airport Blvd & Bolm Road is not ideal and the signalized operations should be consolidated at one intersection. The existing and proposed volumes on the eastbound approach of Shady Grove Lane are minor and should be converted to right-in right-out operation. The east leg is already just a receiving lane with no westbound approach; this leg should be fully removed.
- *Option 2: Reconstruct Bolm Road, Shady Lane, and Airport Boulevard into a roundabout.* The intersections of Airport Boulevard & Bolm Road, Airport Boulevard & Shady Lane, and Bolm Road & Shady Lane are within close proximity to each other. Using city-owned and private Right of Way, the three intersections could be reconstructed as a roundabout. This could create a more cohesive and efficient way to serve all six legs entering the two intersections.

#### Improved Rail Preemption (Corridor-wide improvement)

- *Install improved rail preemption technology.* In some locations the Capital MetroRail systems operate in close proximity to the north section of Airport Boulevard. This creates added delay on the side streets and Airport Boulevard when a train preempts the signal eliminating the west leg of the intersection. In some locations, the rail preemption can close the gates for a minute or more. Improved rail preemption technology could decrease the preemption time and decrease the intersection delay for the adjacent intersection that is being impacted. Intersection improvements have already been recommended for key intersections to mitigate the Capital MetroRail influence, but improved rail preemption technology can improve delay even further.

**Table 2: 2030 Intersection Analyses**

INTERSECTION	2030		2030		2030		2030		2030		2030	
	AM Peak Hour Without Improvements		PM Peak Hour Without Improvements		AM Peak Hour With Short Term Improvements		PM Peak Hour With Short Term Improvements		AM Peak Hour With Long Term Improvements		PM Peak Hour With Long Term Improvements	
	DELAY (SEC/VH)	LOS	DELAY (SEC/VH)	LOS	DELAY (SEC/VH)	LOS	DELAY (SEC/VH)	LOS	DELAY (SEC/VH)	LOS	DELAY (SEC/VH)	LOS
<b>SIGNALIZED INTERSECTIONS</b>												
	25.5	C	36.7	D	-	-	-	-	-	-	-	-
Airport Blvd @ Guadalupe St	11.4	B	22.7	C	-	-	-	-	-	-	-	-
Airport Blvd @ Highland Mall	6.4	A	8.7	A	-	-	-	-	-	-	-	-
Airport Blvd @ Denson Dr	14.2	B	16.6	B	-	-	-	-	15.7	B	17.8	B
Airport Blvd @ Koenig Ln Westbound	62.3	E	75.2	E	-	-	-	-	-	-	-	-
Airport Blvd @ Koenig Ln Eastbound	26.9	C	61.1	E	-	-	-	-	-	-	-	-
Airport Blvd @ 53rd 1/2 St (Bruning Ave)	18.0	B	18.3	B	20.7	C	21.5	C			-	-
Airport Blvd @ 51st St	106.2	F	154.2	F	51.8	D	50.0	D	41.9	D	42.2	D
Airport Blvd @ 46th St	-	-	-	-	-	-	-	-	7.4	A	16.0	B
Airport Blvd @ 45th St	38.9	D	53.0	D	-	-	-	-	14.7	B	22.5	C
Airport Blvd @ I-35 SB	38.1	D	26.7	C	-	-	-	-	-	-	-	-
Airport Blvd @ I-35 NB	32.7	C	18.9	B	-	-	-	-	-	-	-	-
Airport Blvd @ Wilshire Blvd/ Aldrich St	26.4	C	32.7	C	17.0	B	20.1	C	26.5	C	22.3	C
Airport Blvd @ 38 1/2 St	20.4	C	17.6	B	-	-	-	-				
Airport Blvd @ Manor Rd	27.0	C	60.3	E	21.9	C	50.1	D	21.3	C	37.3	D
Airport Blvd @ MLK Blvd	78.0	E	65.6	E	73.8	E	54.1	D	49.6	D	42.3	D
Airport Blvd @ 12th St	18.9	B	23.7	C	19.1	B	21.4	C				
Airport Blvd @ Oak Springs Dr	33.8	C	33.3	C	-	-	-	-	30.3	C	25.4	C
Airport Blvd @ Goodwin Ave	6.6	A	5.1	A	-	-	-	-	-	-	-	-
Airport Blvd @ Springdale Rd	37.0	D	56.2	E	35.1	D	50.9	D	31.4	C	40.9	D
Airport Blvd @ Bolm St	23.0	C	24.5	C	-	-	-	-	-	-	-	-
Airport Blvd @ Shady Ln	6.9	A	4.2	A	-	-	-	-	-	-	-	-
Airport Blvd @ Levander Loop	12.1	B	7.8	A	-	-	-	-	-	-	-	-