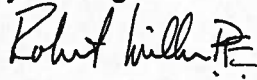




MEMORANDUM

TO: Mayor and Council Members

CC: Marc A. Ott, City Manager
Robert Goode, P.E., Assistant City Manager

FROM: Robert Spillar, P.E., Director, 
Austin Transportation Department

DATE: March 19, 2012

SUBJECT: West Riverside Drive Traffic Analysis

The Austin Transportation Department has been assisting the Parks and Recreation Department with an analysis of possible transportation network revisions to West Riverside Drive, between South First Street and South Lamar Boulevard. One option that has been evaluated is the permanent closure of West Riverside Drive as a city through street.

West Riverside Drive between South First Street and South Lamar Boulevard is an important element of the overall mobility grid in the south end of the central business district. It serves between 9,000 and 10,000 trips per day and is critical to the overall network operations. The Austin City Council directed staff to maintain West Riverside Drive until alternative capacity could be identified either in the Barton Springs Road or Cesar Chavez corridors. These alternate links are very constrained and no-other capacity options have been identified over the years.

The Austin Transportation Department, after careful review of the issue of potential closure of West Riverside Drive, has evaluated the impacts and recommends against its permanent closure. Staff believes that such a permanent closure would not be in keeping with the mobility needs of the community or the policies identified by Council to improve general mobility throughout our community. Austin Transportation does believe that an alternate design could be conceived that would result in a more park-friendly and pedestrian-friendly thoroughfare through the park and will continue to work with PARD to maximize this potential.

I have attached a copy of the final traffic analysis completed by ATD on the issue of possible permanent removal of West Riverside Drive. We know you may be receiving questions from citizens on this issue and wanted to provide you with the latest information. Should you have any questions, please contact me and I would be happy to discuss.



MEMORANDUM

To: Traffic Study Files

FROM: Robert Spillar, P.E. Director, and
Dipti Borkar-Desai, P.E., North Area Engineer
Austin Transportation Department

Robert Spillar, P.E.
Dipti Borkar-Desai, P.E.

DATE: March 5, 2012

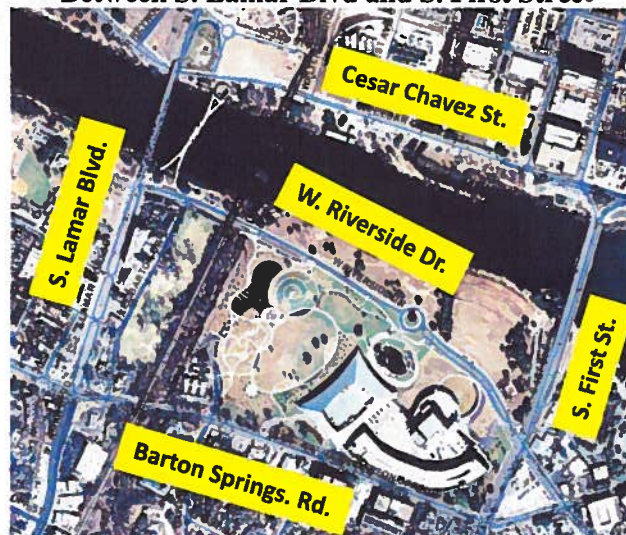
SUBJECT: Analysis of possible removal of W. Riverside Drive from street grid

LOCATION: W. Riverside Drive, between S. First Street and S. Lamar Boulevard

Introduction

This report summarizes a traffic analysis conducted to determine the impact of permanently closing and eliminating W. Riverside Drive between S. Lamar Boulevard and S. First Street through the park along Lady Bird Lake. The selected study area, bounded by Cesar Chavez Street on the north, Barton Springs Road on the south, S. First Street on the east, and S. Lamar Boulevard on the west, is shown in Figure 1.

**Figure 1: W. Riverside Drive
Between S. Lamar Blvd and S. First Street**



The roadway cross-section on W. Riverside Drive varies within the study area between S. Lamar Boulevard and S. First Street:

- At its intersection with S. Lamar Boulevard, W. Riverside Drive provides three westbound lanes and two eastbound lanes (See figure 2),
- At Lee Barton Drive, one eastbound lane drops as a right turn only (figure 2),
- Between Lee Barton Drive and the parking lot for the fountain, W. Riverside Drive functions as a three-lane divided roadway with two westbound lanes and one eastbound lane (figure 2),
- At the fountain parking lot, the cross section reduces to one lane in each direction eastbound and westbound, extending to the roundabout just north of Palmer Events Center (figure 2 & 3).

Figure 2: W. Riverside Drive between S. Lamar Boulevard and S. First Street



- The roundabout is currently a two lane roundabout serving east-west traffic, and providing driveway access on the southern leg to a circulating roadway just north of the Palmer Events Center (figure 3).
- East of the roundabout, Riverside Drive provides a four-lane divided roadway crosssection with two lanes in each direction of traffic and a median of varying width. Parking exists on the westbound direction and the eastbound lanes provide access to the Long Center (figure 3).

- W. Riverside Drive provides two westbound and three eastbound lanes at its intersection with S. First Street (figure 3).

Figure 3: W. Riverside Drive between S. Lamar Boulevard and S. First Street



The intersections of W. Riverside Drive with S. First Street and S. Lamar Boulevard are currently signalized. Turning movement counts at these intersections are graphically illustrated in Figures 4 and 5.

W. Riverside Drive currently serves as an east-west connection between S. First Street and S. Lamar Boulevard. It provides critical capacity in support of traffic operations on Cesar Chavez Street and Barton Springs Road. As part of a sparse grid system south of the river, it serves as an important reliever route when events or traffic block either Cesar Chavez or Barton Springs. Daily traffic volume counts on W. Riverside Drive exceed 9,000 vehicle trips per day and on weekends exceed 10,000 vehicle trips per day (See Table 3).

Figure 4: AM Peak Turning Movement Counts

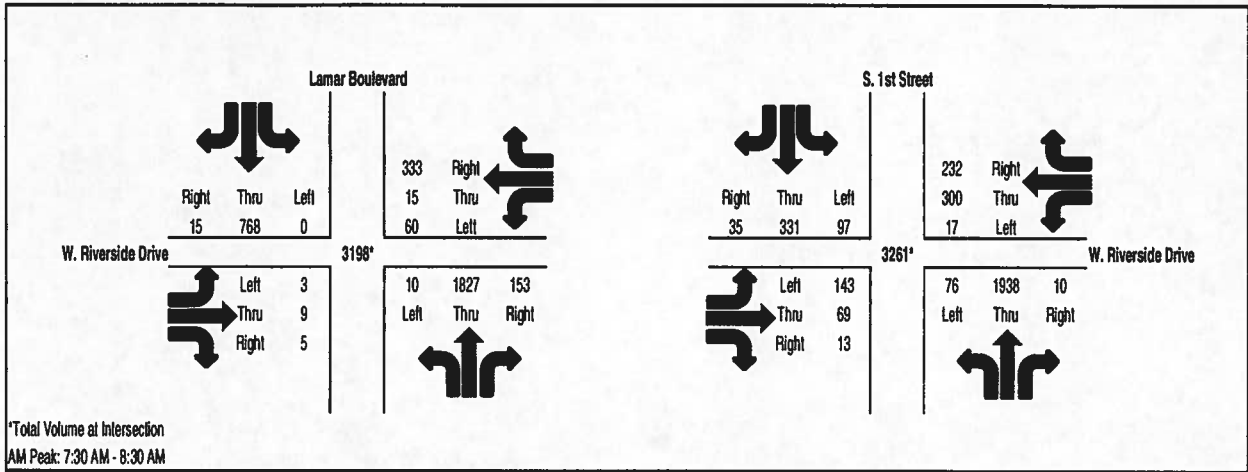


Figure 5: PM Peak Turning Movement Counts

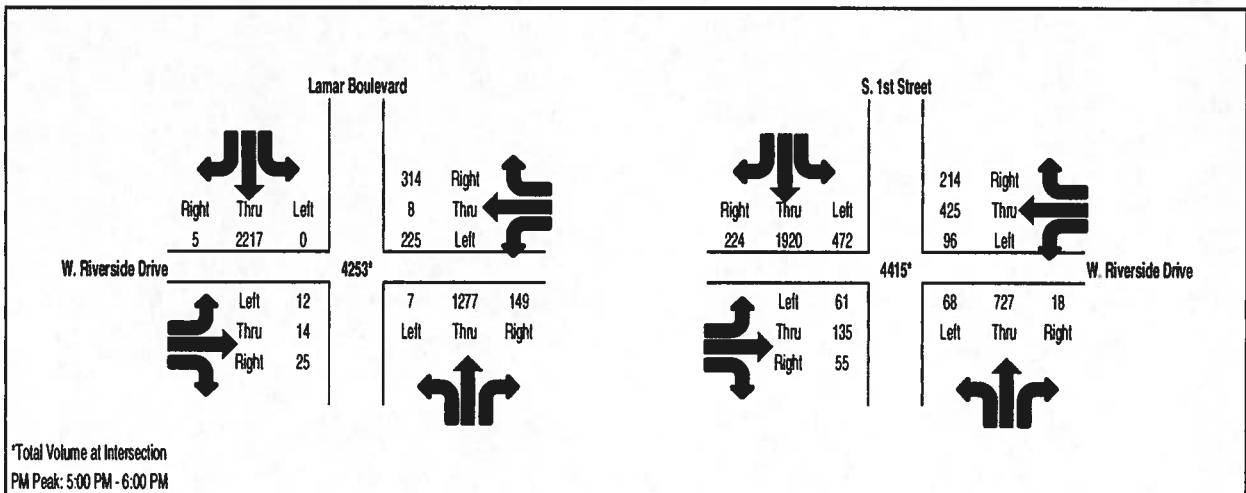
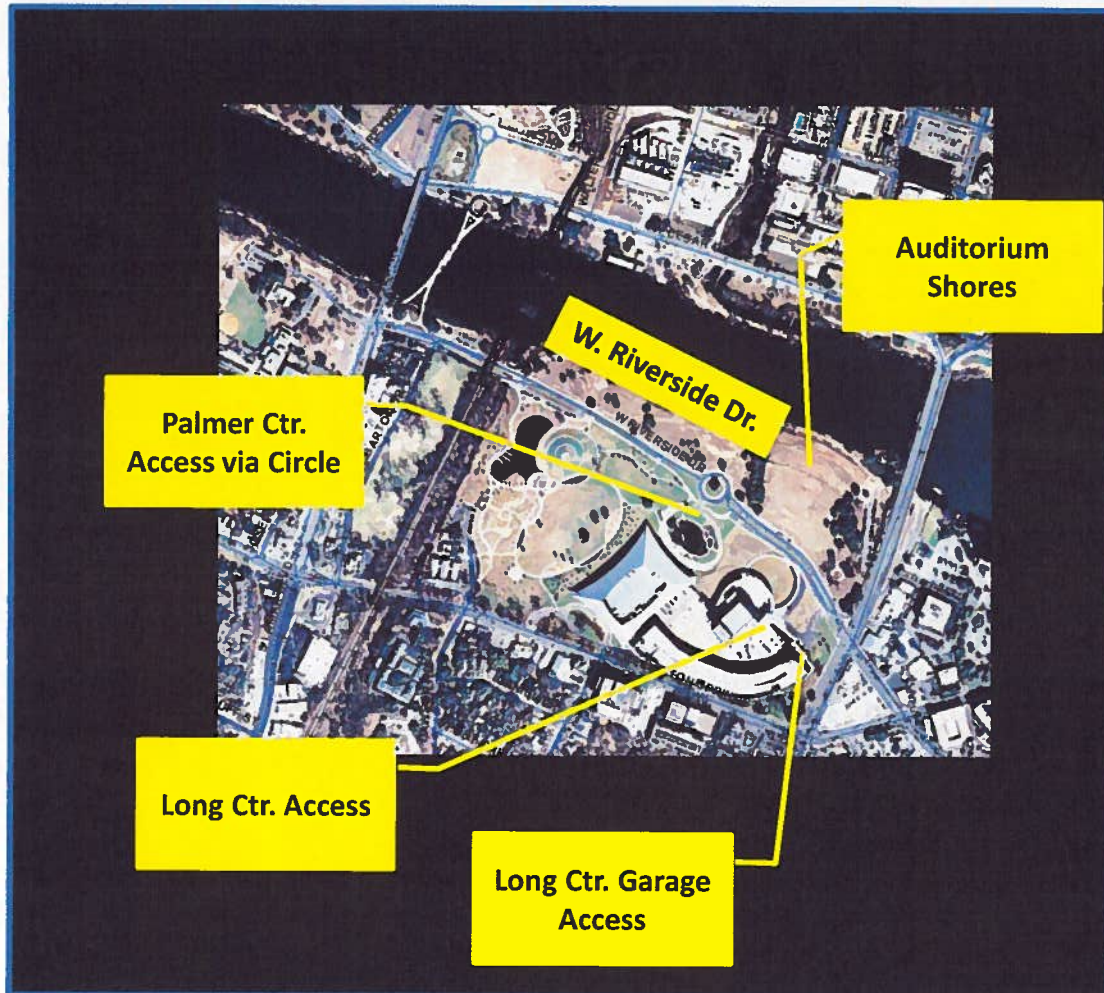


Table 1: Daily Traffic Volumes on W. Riverside Drive

Daily Traffic Volumes on W. Riverside Drive		
Year	Day of the Week	Total Volume (Vehs)
2011	Wednesday	9,584
2012	Saturday	10,928

W. Riverside Drive serves as a primary access route to the entertainment assets such as the Palmer Events Center, Long Center for Performing Arts, and special events on Auditorium Shores, in addition to serving as an east-west connection between S. Lamar Boulevard and S. First Street (See Figure 6).

Figure 6: Key Access to Entertainment Assets



Traffic Study

The focus of the traffic study was to estimate the increase in vehicle delay at study area intersections if Riverside Drive within the park were to be eliminated. Intersections in the immediate vicinity were of principal concern since they would experience the greatest change in traffic conditions. Intersections included in the analysis were:

- S. Lamar at Barton Springs Rd.
- S. First at Barton Springs Rd.
- Lavaca St. at Cesar Chavez St.
- Guadalupe Street at Cesar Chavez St.

- S. Lamar at W. Riverside Dr.
- S. First at W. Riverside Dr.

An attempt to estimate increased delay within the network at more remote intersections was not made. Likewise, delay due to increased travel distances due to the missing link within the network was also not estimated. The analysis presented in this report simply analyzes the change in operation at the above six intersections and the impact on critical corridor delay. It was assumed that only minor intersection revisions would be incorporated within the analysis and that no network reconfiguration would be analyzed at this stage of investigation. For example, a conversion of the First Street/Riverside/Barton Springs Triangle to a large roundabout or similar aggressive network redesign was not assumed. Only a simple closure and removal of the Riverside link was assumed in the analysis.

Based on this approach, it can be reasoned that a permanent closure of W. Riverside Drive through the park would result in eastbound and westbound traffic diverting to either Cesar Chavez Street or Barton Springs Road as an alternative. Assuming the closure of W. Riverside Drive, AM and PM turning movement counts at the intersections of W. Riverside Drive were redistributed using generally accepted industry practices for redistributing traffic within a network for similar traffic studies. A 50/50 split of traffic between Cesar Chavez and Barton Springs Road was assumed as the base scenario. In order to account for a potential range of conditions, a sensitivity analysis of the percentage of traffic using Cesar Chavez Street and Barton Springs Road was conducted, allowing a 10 percent variance between the distributions as follows:

- Scenario 1 (base assumption) – 50% traffic on Cesar Chavez Street & 50% traffic on Barton Springs Road
- Scenario 2 (more reliance on Cesar Chavez) – 60% traffic on Cesar Chavez Street and 40% traffic on Barton Springs Road
- Scenario 3 (more reliance on Barton Springs) – 40% traffic on Cesar Chavez Street and 60% traffic on Barton Springs Road

Analysis was performed using the microcomputer program “Synchro” by Trafficware, which is based on the procedures contained in the Highway Capacity Manual, the nationally accepted standard for traffic studies.

Findings

The traffic analysis evaluated study area intersections for impacts during the AM and PM peak hours. Results are summarized in Table 2 and Table 3. Analysis shows that based on AM and PM peak hours, there is an increase in the total intersection delay at intersections receiving the additional traffic volumes (e.g., Lamar at

Barton Springs, S. First at Barton Springs, Lavaca at Cesar Chavez, Guadalupe at Cesar Chavez) and a reduction in delay achieved at the donating intersections (e.g., S. Lamar at Riverside and S. First at Riverside).

Table 2: Total Intersection Delay – AM Peak Hour

Intersection	Existing Conditions	Delay Build Conditions- Scenario 1	Delay Build Conditions- Scenario 2	Delay Build conditions- Scenario 3	AM Pk Hour Change in Delay		
		50% Cesar Chavez Street & 50% Barton Springs Road	60% Cesar Chavez Street & 40% Barton Springs Road	40% Cesar Chavez Street & 60% Barton Springs Road	Scenario 1	Scenario 2	Scenario 3
	Total Delay (Veh-Hours)	Total Delay (Veh-Hours)	Total Delay (Veh-Hours)	Total Delay (Veh-Hours)	Vehicle Hours of Delay		
S. Lamar Boulevard and Barton Springs Road	48.0	55.7	54.7	56.9	7.7	6.7	8.9
S. First Street and Barton Springs Road	45.5	53.7	51.3	56.4	8.2	5.8	10.9
Lavaca Street and Cesar Chavez Street	38.9	40.5	40.9	40.2	1.6	2.0	1.3
Guadalupe Street and Cesar Chavez Street	19.7	22.5	23.3	21.9	2.8	3.6	2.2
S. Lamar Boulevard and W. Riverside Drive	14.4	5.7	5.7	5.8	-8.7	-8.7	-8.6
S. First Street and W. Riverside Drive	26.8	19.1	18.9	19.3	-7.7	-7.9	-7.5

Table 3: Total Intersection Delay – PM Peak Hour

Intersection	Existing Conditions	Delay Build Conditions- Scenario 1	Delay Build Conditions- Scenario 2	Delay Build conditions- Scenario 3	PM Pk Hour Change in Delay		
		50% Cesar Chavez Street & 50% Barton Springs Road	60% Cesar Chavez Street & 40% Barton Springs Road	40% Cesar Chavez Street & 60% Barton Springs Road	Scenario 1	Scenario 2	Scenario 3
	Total Delay (Veh-Hours)	Vehicle Hours of Delay	Total Delay (Veh-Hours)	Vehicle Hours of Delay	Vehicle Hours of Delay		
S. Lamar Boulevard and Barton Springs Road	59.5	74.1	68.5	80.5	14.6	9.0	21.0
S. First Street and Barton Springs Road	56.5	80.2	75.4	89.0	23.7	18.9	32.5
Lavaca Street and Cesar Chavez Street	19.9	21.3	21.6	21.0	1.4	1.7	1.1
Guadalupe Street and Cesar Chavez Street	34.2	45.6	44.3	46.9	11.4	10.1	12.7
S. Lamar Boulevard and W. Riverside Drive	27.3	5.1	5.1	5.1	-22.2	-22.2	-22.2
S. First Street and W. Riverside Drive	55.6	40.6	37.7	44.4	-14.9	-17.8	-11.2

The change in delay by critical corridor can be achieved by adding the individual intersection delay by corridor. For example, to estimate the increased delay along South First Street due to the contemplated closure of W. Riverside, one would sum the change in delay at S. First at Barton Springs, S. First at Riverside, Cesar

Chavez at Lavaca, and Cesar Chaves at Guadalupe intersections. Delay changes by corridor are shown in Table 4 for the AM and PM Peak periods (note range in values represents the range in distribution values assumed).

Table 4: Delay by Affected Corridor and Time Period (AM and PM Pk Hour)

	Change in Vehicle Hours of Delay		
	Scenario 1	Scenario 2	Scenario 3
AM Peak Hour Corridor Delay			
South First Street Corridor Delay increase:	4.9	3.5	6.9
South Lamar Boulevard Corridor Delay increase:	-0.9	-2.0	0.3
Barton Springs Road Corridor	16.0	12.5	19.8
Cesar Chavez Corridor	4.4	5.6	3.5
PM Peak Hour Corridor Delay	Change in Vehicle Hours of Delay		
South First Street Corridor Delay increase:	21.5	13.0	35.2
South Lamar Boulevard Corridor Delay increase:	-7.6	-13.1	-1.2
Barton Springs Road Corridor	38.3	28.0	53.5
Cesar Chavez Corridor	12.8	11.8	13.8

As will be noted, in the morning peak hour (Table 4), the east west corridors (Barton Springs and Cesar Chavez), as well as the South First Street Corridor are negatively affected by the loss of W. Riverside Drive. Delay in these corridors increases by between 3 and 6 hours of total vehicle hours of delay for Cesar Chavez, by between 12 and 19 total vehicle hours of delay for Barton Springs, and by between 3 and 7 hours of vehicle delay in the South First Street Corridor (during the AM Peak Hour). Impact to the S. Lamar corridor during the AM peak hour is negligible, actually improving slightly in its delay characteristics (by less than 2 hours of vehicle hours of delay reduction).

In the PM Peak hour (Table 3), the South First, Barton Springs, and Cesar Chavez corridors once again demonstrate a deterioration in terms of vehicle hours of delay. The South First Corridor demonstrates as much

as 35 hours of increased vehicle delay. The Barton Springs Corridor demonstrates as much as a 53-hour increase in total vehicle hours of delay and the Cesar Chavez corridor demonstrates as much as a 13-hour increase in total vehicle hours of delay. Only the S. Lamar corridor shows any benefits from closure of the W. Riverside connection with reductions in PM Peak hour vehicle hours of delay by as much as 13 total vehicle hours of delay. In each case, any reduction in delay within the S. Lamar Street Corridor is more than off-set by the increase in total vehicle hours of delay in the other three critical corridors.

Analysis and Recommendations

Travel Demand: W. Riverside Drive serves as an important major east-west connection between S. First Street and S. Lamar Boulevard. It provides critical capacity in support of traffic operations on Cesar Chavez Street and Barton Springs Road. Daily traffic volume counts on W. Riverside Drive total over 9,000 vehicle trips per day and on weekends exceed 10,000 vehicle trips per day (See Table 1)

Table 1(repeated): Daily Traffic Volumes on W. Riverside Drive

Daily Traffic Volumes on W. Riverside Drive		
Year	Day of the Week	Total Volume (Vehs)
2011	Wednesday	9,584
2012	Saturday	10,928

Travel Delay: The capacity provided by W. Riverside Drive is vital to the overall roadway network both in terms of east-west travel and in terms of north-south travel. Removal of the W. Riverside Drive corridor during the AM and PM peak hours can be shown to negatively affect the Cesar Chavez, Barton Springs, and South First Street Corridors. Each of these arterials is critical to the overall operation of the grid in south downtown. Each of these corridors has been identified by the Austin Transportation Department as key gateways into the central core of the city. Any deterioration in the mobility provided by these gateway arterials would not be consistent with the mobility needs of the city and would be contrary to existing policy that seeks to improve accessibility to the central city.

Daily volumes on W. Riverside Drive suggest a strong demand throughout the day for use of this link. Peak hour volumes collected during this study represent only 10 percent of the daily volumes. Delay generated during the peak hours that demonstrate a negative affect on critical corridors (S. First, Cesar Chavez, and Barton Springs) are likely replicated throughout the day. This suggests that parallel arterials and the primary

affected north south corridors would likely not absorb an increase of 9,000 to 10,000 trips diverted into the remaining grid on a permanent basis.

Access: W. Riverside Drive plays an important role in providing access to both the Palmer Center and Long Center. Both of these entertainment assets have formal entrances onto W. Riverside Drive. Both would benefit from improved access designs proposed for W. Riverside Drive rather than its removal. Specifically, access to the Long Center could be greatly enhanced if westbound departures were allowed from their front drive, allowing guests to move north in the Lamar Boulevard corridor or west in the Barton Springs Corridor while guests wishing to depart to the east or south could use the S. First Street Corridor. This would reduce traffic impacts to the Barton Hills and other neighborhoods along the south side of the river during events at the Long Center. Similarly, the ceremonial entrance to the Palmer Center is underutilized because of the current design of the circular drive. With a single point of entrance from the W. Riverside roundabout, the entrance is difficult to access with larger vehicles such as school buses and is often overlooked by visitors. Improved access to the circle drive could provide for improved schoolbus queuing and similar activities.

W. Riverside Drive provides direct access into the heart of the entertainment assets within the study area (e.g., Palmer Center, Long Center, Auditorium Shores, and park). This route provides EMS and AFD with a primary access route into these facilities. Although these activities could likely be accommodated in a redesign of the park (inclusive of a closed W. Riverside Drive) it would not be preferable from an emergency response basis. Smaller or specially equipped vehicles might be required if there were no paved surface allowing direct access to the north side of the Long and Palmer Centers and south side of Auditorium Shores. Circuitous routing for emergency responders could also lengthen response times in some cases.

Recommendation: Based on the preliminary analysis thusfar completed, including a review of daily volumes using the W. Riverside Corridor through the park, the potential impact to delay in critical corridors (Cesar Chavez, Barton Springs, and S. First Street), and the potential impact on access to significant destinations and emergencies within the boundaries of the study area, ATD recommends against permanent closure of W. Riverside Drive between S. First Street and S. Lamar Boulevard. As is now possible, temporary closures that are planned and scheduled so as to minimize conflicts with surrounding activities can continue to be accommodated.

It is also reasonable to contemplate that an alternate design of this roadway could be conceived that would better meet the needs of all its users, including:

- Trips that need to use this link on a daily basis to access activities at the park or elsewhere within the community,
- Improved access to critical parking infrastructure on both the east and west ends of the park,
- Improved emergency and regular access to the Palmer Center, Long Center, Garages, and Auditorium Shores,
- Improved loading and unloading of events at area venues,
- Schoolbus loading and unloading for events (see Figure 7)
- The ability to provide planned and scheduled closures for special events,
- The ability to provide a pedestrian zone that is consistent with the park concept and activities currently and planned at the park.
- Festival Street for community festivals and other events.

Figure 7: Existing Bus Staging on W. Riverside Drive



Preliminary proposed plans by PARD that envision a redesigned alignment and two roundabouts would accomplish many of these goals:

- Maintain capacity for access.
- Maintain grid connection.
- Allow for efficient coordinated planned event closures
- Result in improved recreational pedestrian environment.
- Provide improved event management.

The Austin Transportation Department is supportive of the PARD process to develop a final park concept as long as it maintains an acceptable transportation grid option for W. Riverside Drive. As demonstrated by the traffic analysis, this roadway plays a critical role in the success of our street grid within the City. Eliminating this grid link on a full-time basis would not be consistent with the stated mobility needs of the community and would not be an option recommended by the Austin Transportation Department. Designs which maintain the link while improving its functionality within the grid for the identified current uses would be in keeping with our mobility needs.