

Texas Department of Transportation
TECHNICAL PROVISIONS

STATE HIGHWAY 71 TOLL LANES

Attachment 20-1

TTI Pedestrian and Bicycle Study
State Highway 71 – Del Valle Area

**To: Ed Collins, Austin District
Texas Department of Transportation**

**From: Joan G. Hudson, P.E., Associate Research Engineer
Texas Transportation Institute**

Date: June 15, 2011

The Texas Department of Transportation (TxDOT) is in the process of designing a “superstreet” along SH 71 to reduce congestion. A superstreet is a new type of intersection design which is intended to reduce the delay for motorists. The project increases the number of vehicles through the signalized intersections by eliminating left turn movements. Those left turning motorists would be required to turn right and then make a U-turn to effectively complete the left turn maneuver. See Figure 1.



Figure 1. Proposed Layout of Superstreet

ftp://ftp.dot.state.tx.us/pub/txdot-info/library/projects/austin/SH 71e/schematic_102510.pdf

One concern with the superstreet concept is the safety and accommodation of pedestrians and bicyclists. Crosswalks, pedestrian signals, and pedestrian push buttons will be available at the FM 973 (south leg)/Falwell Lane intersection. No accommodations for pedestrians will be provided at the FM 973 (north leg) intersection with SH 71. As such, the Austin District requested that the Texas Transportation Institute (TTI) conduct a study of SH 71 and FM 973 near the planned superstreet. Two main tasks of the project include:

1. Develop, administer, and analyze a survey of people who attend the Open House meeting held on November 16, 2010, and
2. Collect pedestrian and bicyclist volume and movement data along SH 71 near FM 973 and on FM 973 just south of SH 71.
3. Contact stakeholders to discuss potential walking and bicycling concerns related to the project.

This technical memorandum summarizes the findings of the study and includes recommendations for the District to consider in their planning of the superstreet.

Survey

The survey, developed in English and Spanish, included questions about typical walking or biking routes, trip purposes, and time-of-day for these walking or biking trips focused specifically on the state-maintained roadways in the area. The superstreet area was expanded to include US 183. Researchers asked whether participants felt safe walking or biking on these routes. In addition to the survey, an aerial photo of SH 71 between Riverside Drive and Ross Road was printed and available at the open house meeting for people to draw typical walking and biking routes.

There were 22 participants in the survey, 19 of which indicated that they live in the East Austin/Del Valle area. The questions and results are shown in Appendix A. Of the 19 residents, 18 said they live in neighborhoods and 17 identified the neighborhood or street of their residence. The map in Appendix B shows these neighborhoods. It is important to note that none of the residents in the area immediately adjacent to the proposed superstreet answered the survey. The lack of input from residents living near the project is unfortunate. However, insight was gained through discussions with representatives from several agencies and organizations including:

- Capital Metropolitan Transportation Authority (CapMetro)
- Austin Transitional Housing Center
- Del Valle Community Coalition
- Travis County Correctional Facility
- South Rural Community Center
- Children's Wellness Center

Survey Results

Six of the survey participants walk or bike to the grocery or convenience store, three walk to the bus stop, three to community center, and two walk to work or school. Five people said that they walk or bike to a neighborhood park or public library. Only three of the respondents indicated that they walk or bike along or across the state facilities and none of those three indicated feeling safe doing so.

When speaking of feeling safe walking or biking along or across these roadways, all of the comments provided by respondents focused on reasons why they feel unsafe. Too much traffic, going too fast, too many crashes and the lack of sidewalks top the list of concerns. To address safety, options including crosswalks, sidewalks, pedestrian "walk/do not walk" signals and curb ramps were selected as needed for adults and children alike. Other ideas for improving the safety of children include the addition of crossing guards, police officers, a wall or barrier to protect children from high speed traffic, and hike and bike trails. One person said, "It would not be safe (for children) with any of these measures."

From the aerial photo of the roadway section which was on display at the November 16th Open House, seven people mentioned specific safety concerns or marked their walking/biking routes. SH 71 at Ross Road, east of SH 130, was mentioned a couple of times by people who would like to walk or bike from the Berdoll Farms neighborhood south of SH 71 to Southeast Metro Park on the north side of SH 71. Other people mentioned the high speed of motorists on SH 71 and the occurrence of crashes at the median west of Ross Road as deterrents to walking or bicycling. A pedestrian overpass was suggested.

The Dollar General store located on Ross Road near Del Valle High School was mentioned as a popular destination for the students by two open house attendees. Students walk across Ross Road to reach the store and create a safety concern as they interact with motorists. These attendees were given contact information of Travis County Transportation and Natural Resources staff since Ross Road is not under TxDOT's jurisdiction.

The desire for sidewalks on FM 973 north of SH 71 from Eva Street to businesses like Tolivers (north of Eva Street and south of the Colorado River) was mentioned by a person who used to live in the area and wanted to bike to these businesses. That person said, "There's no space on the roadway for bicycles."

Along SH 71 west of the proposed superstreet, there is a bus stop (Bus Stop Number 1851) on the south side and businesses, a post office, and a residential area on the north side (Austin Pecan Park). Instead of staying on the bus until the turnaround at the correctional facility and getting off on the north side near the destination, parents with children disembark and cross SH 71 midblock, according to the bus driver who attended the open house meeting.

Another person mentioned the post office as needing sidewalks leading to it.

Other people who marked the aerial photo focused on the intersections of SH 71 at US 183 and SH 71 at Riverside Drive as problem locations in terms of crashes and pedestrian accessibility, respectively.

Therefore, the comments received on the survey, at the open house, and written on the aerial photo are generally for sections of SH 71 outside of the superstreet section. Therefore, special attention should be given to the comments made by the various agencies and organizations listed above.

Data Collection

Walking and biking volume and origin/destination data was gathered on Thursday, November 18, 2010 from 6:00am to 6:00pm with two 1-hour breaks in the day from 10-11am and 3-4pm. Daylight hours limited the view prior to 6:30am. Almost 300 pedestrian crossings and six bicyclists were counted crossing and/or traveling along the roadway over the course of the 10-hour period. These were mostly adults and a few teenagers. Data were collected in three parts as shown circled in Figure 2: SH 71 West, SH 71 East and FM 973 (south leg). The highest hourly volume crossing SH 71 was 23 pedestrians, 19 of whom crossed midblock at uncontrolled locations in the western section of SH 71. In the eastern section, many more pedestrians were seen crossing at the signalized intersections of FM 973. There were seven (7) pedestrians who crossed midblock between 5-6pm and six (6) pedestrians who crossed midblock between 2-3pm. Over 100 pedestrians were counted



Figure 2. Pedestrian Crossing Midblock on SH 71

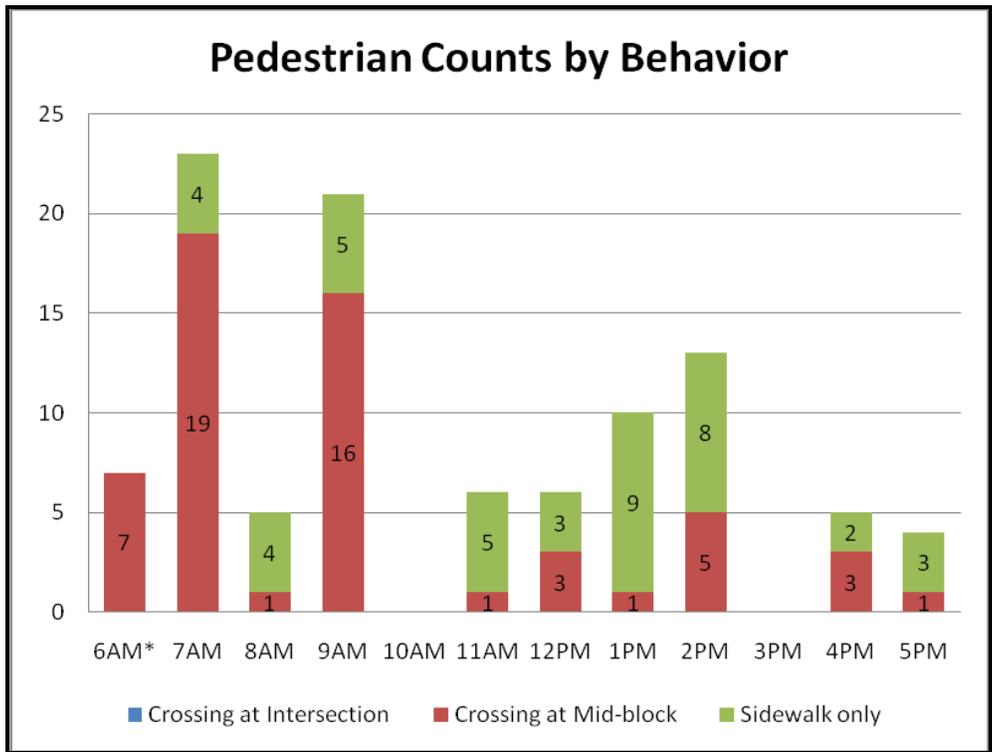
over the course of the ten hour period in each of the two sections of SH 71. A total of 84 pedestrians were counted crossing or walking along FM 973.

Other items to note are listed below:

1. SH 71 was divided into two parts and covered by two observers (Figure 3). Some of the pedestrians may have been counted twice since their activities may extend to two observers' range. This issue doesn't exist in the figures since every activity has its own trajectory.
2. Pedestrians were noted as crossing midblock (uncontrolled location), crossing at the intersection, or walking on the edge of the roadway (sidewalk area) only.
3. Crossing at the intersection was defined as crossing the SH 71 at FM 973 signalized intersections (north leg and south leg).
4. The counts were based on activity, not on pedestrian. For example, one person walking into the convenient store and later walking out was counted as two activities.
5. Starting at about 10:00 AM there were people standing at the intersections asking for money from the motorists. They were only counted twice in the data set (showing up and leaving).
6. Figures 4, 5, and 6 chart the pedestrian and bicycle count data by behavior.

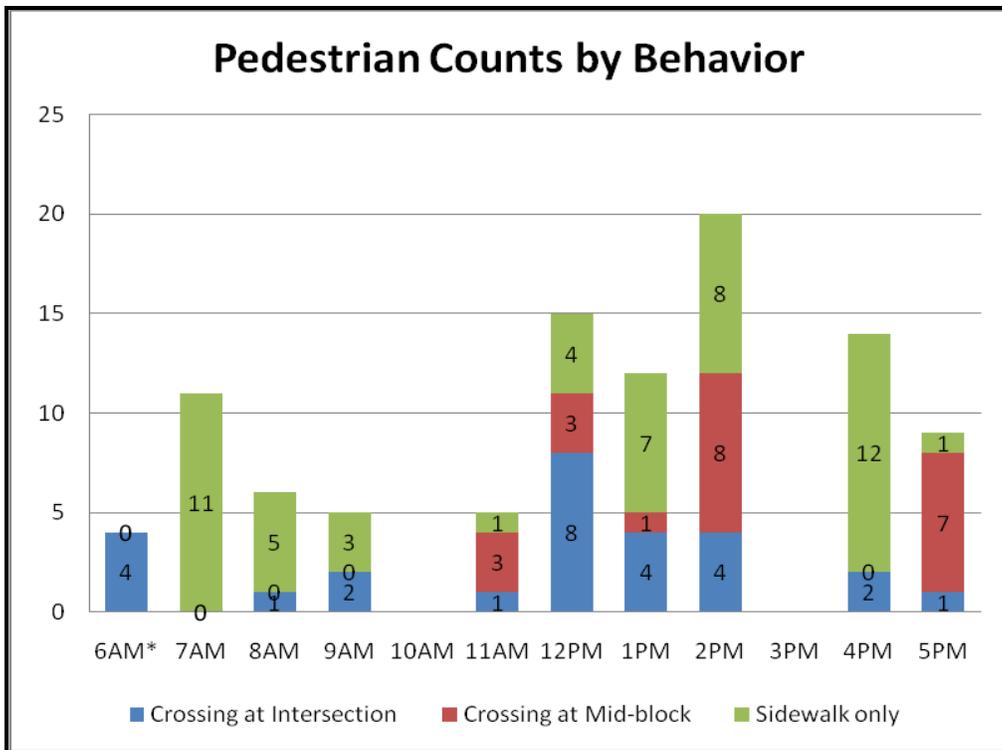


Figure 3. SH 71 West, SH 71 East, and South leg of FM 973



Note: No data was collected from 10-11am and 3-4pm

Figure 4. SH 71 West Pedestrian Counts by Behavior



Note: No data was collected from 10-11am and 3-4pm

Figure 5. SH 71 East Pedestrian Counts by Behavior

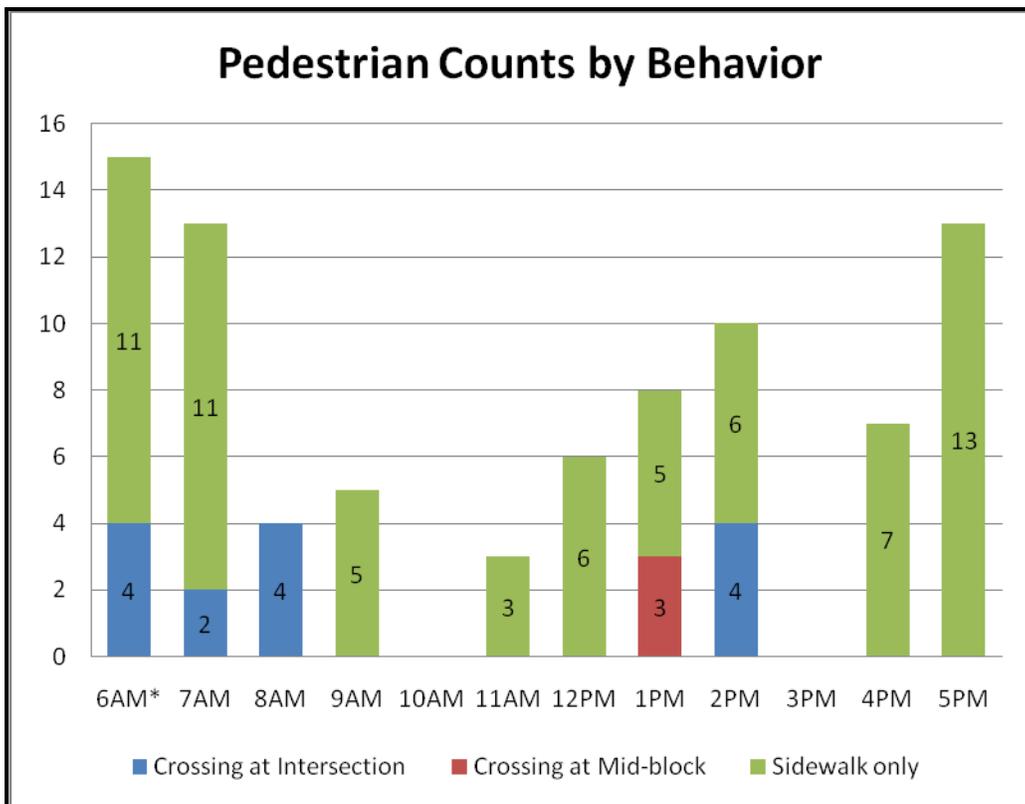


Figure 6. FM 973 South Leg Pedestrian Counts by Behavior

There are no signalized intersections in the western section of SH 71 while the eastern section of SH71 has two signalized intersections (both legs of FM 973). Even so, a similar number of pedestrians were counted crossing the highway in each of these two sections. Clearly defined worn trails exist along both roadways indicating pedestrian use (see photos in Figure 7). This evidence of pedestrian use is confirmed in all three charts showing pedestrians walking along the roadway.

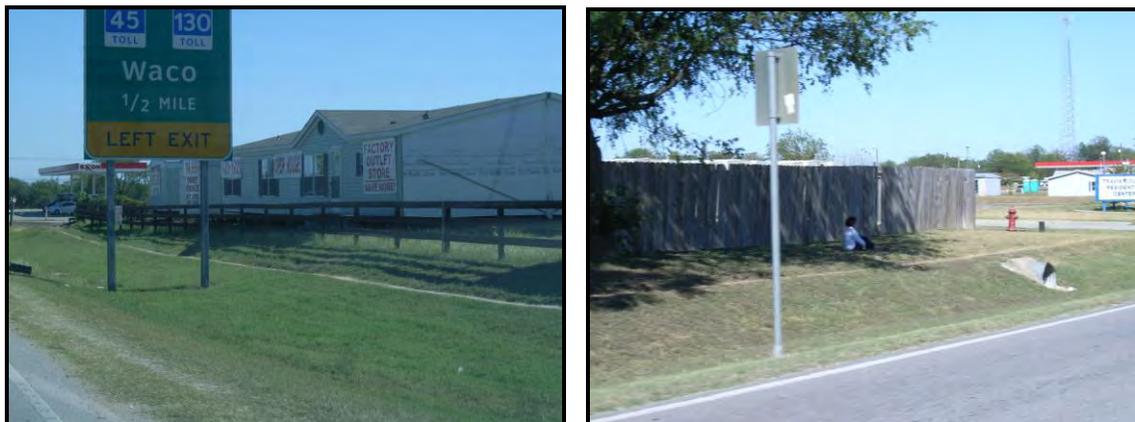


Figure 7. Worn paths on (a) the south side of SH 71 and (b) the west side of FM 973

Charts showing approximate age of the pedestrian by time of day are available in Appendix C. As seen in Figures 4-6 above, there were 10 or more pedestrians per hour in each of these sections. The maximum hour for SH 71 pedestrian activity occurred from 7:00 to 8:00 AM when 23 people were counted walking

along or across the west section and 11 people were seen walking along or across the east section. The maximum hour for FM 973 occurred from 6:00 to 7:00 AM (even though visibility was limited by darkness) when 15 pedestrians walked along or across the roadway. On average, 10 pedestrians per hour were counted on SH 71. Over half of the pedestrians seen on the west leg of SH 71 were crossing midblock. Just under a third of the pedestrians counted in the eastern section crossed midblock SH 71. Almost all of the pedestrians counted on FM 973 were walking along the roadway. Table 1 summarizes the pedestrian totals for each section.

Table 1. Pedestrian Volume on SH 71

Hour	Crossing Midblock SH 71 West	Walking Along SH 71 West	Total Peds/Hr SH 71 West	Crossing SH 71 East at FM 973	Crossing Midblock SH 71 East	Walking Along SH 71 East	Total Peds/Hr SH 71 East
6-7am*	7	0	7	4	0	0	4
7-8am	19	4	23	0	0	11	11
8-9am	1	4	5	1	0	5	6
9-10am	16	5	21	2	0	3	5
11-12noon	1	5	6	1	3	1	5
12-1pm	3	3	6	8	3	4	15
1-2pm	1	9	10	4	1	7	12
2-3pm	5	8	13	4	8	8	20
4-5pm	3	2	5	2	0	12	14
5-6pm	1	3	4	1	7	1	9
10-hr Total	57	43	100	27	22	52	101

* Darkness limited sight of pedestrians before 6:30am.

Table 2. Pedestrian Volume on FM 973

Hour	Crossing FM 973 at SH 71	Crossing Midblock FM 973	Walking Along FM 973	Total Peds/Hr FM 973
6-7am*	4	0	11	15
7-8am	2	0	11	13
8-9am	4	0	0	4
9-10am	0	0	5	5
11-12noon	0	0	3	3
12-1pm	0	0	6	6
1-2pm	0	3	5	8
2-3pm	4	0	6	10
4-5pm	0	0	7	7
5-6pm	0	0	13	13
10-hr Total	14	3	67	84

* Darkness limited sight of pedestrians before 6:30am.

Lines were drawn on a satellite image of the study area and extended beyond the roadway to better indicate the pedestrian's origin and destination. These lines are shown in Figures 8-10 where each pedestrian is represented by a line. The pedestrians who crossed the roadway are not counted as walking along even though they might have walked adjacent to the roadway for some part of their walking trip. A closer view of each of the primary crossing points showing arrows for the direction of travel is included in Appendix D.

Austin Texas SH71/FM973 Pedestrian Activity Map Morning Session 6AM-10AM

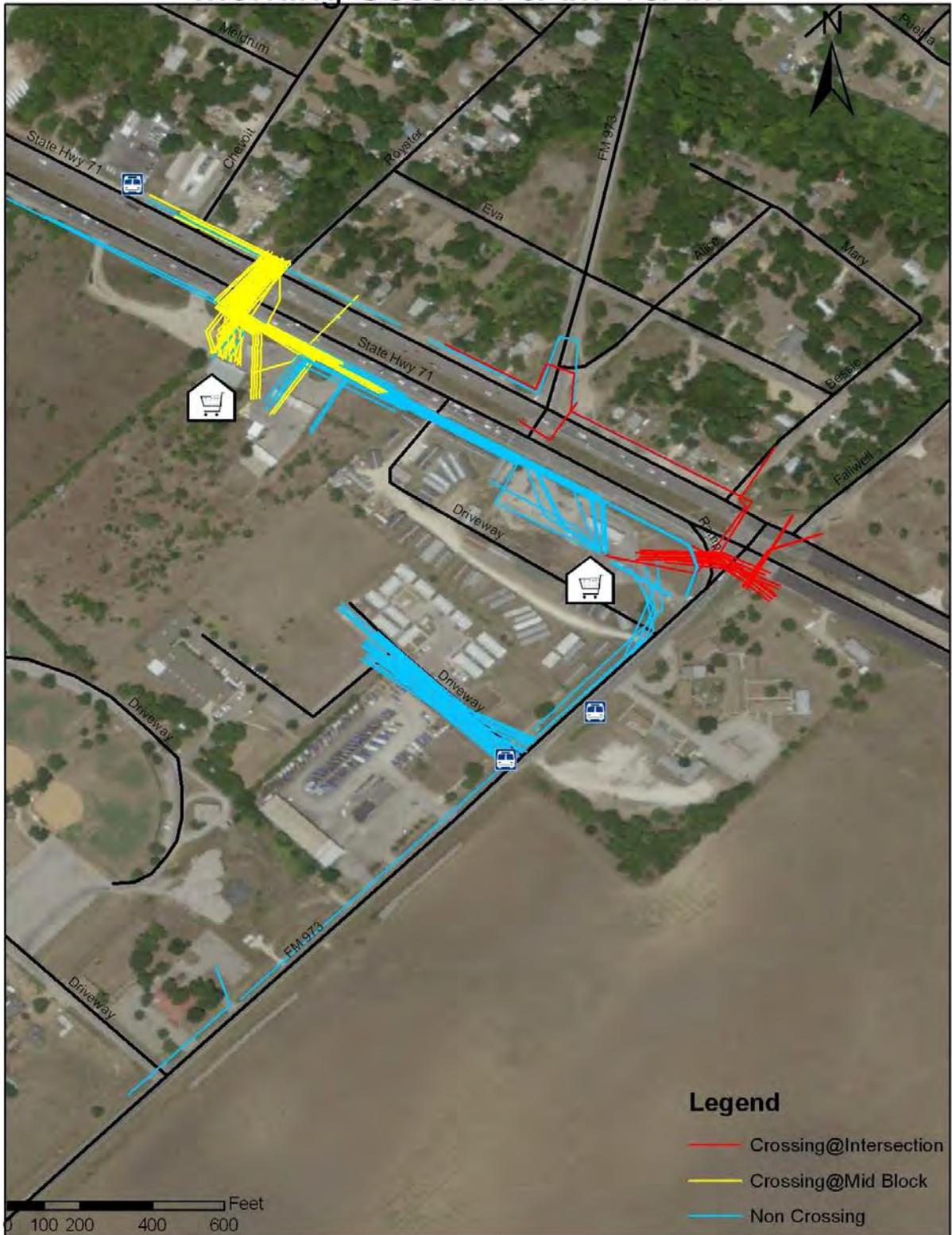


Figure 8. Morning Pedestrian Travel

Austin Texas SH71/FM973 Pedestrian Activity Map Noon Session 11AM-3PM



Figure 9. Noon-time Pedestrian Travel

Austin Texas SH71/FM973 Pedestrian Activity Map Afternoon Session 4PM-6PM



Figure 10. Afternoon Pedestrian Travel

Stakeholder Discussions

The pedestrian data collection results indicate that many pedestrians are crossing SH 71 near Royster Avenue to reach the bus stop located near the Sonic Drive-In at Cheviot Lane (see Figure 11). This is especially true in the morning hours. Since Capital Metropolitan Transportation Authority (CapMetro) handles the placement and construction of bus stops, researchers were asked to contact them to discuss concerns. In addition to CapMetro, several other agencies were contacted to understand the needs of the community including: Travis County Correctional Facility, Austin Transitional Housing Center, the Del Valle Community Coalition, South Rural Community Center, and the Children's Wellness Center.

Capital Metro

From the discussions, it is clear that CapMetro would like to have an improved and accessible westbound bus stop. Any modifications to this stop would necessitate upgrading the stop to meet current standards. They have funding available to support this work. When asked if they would move this westbound bus stop to the east, CapMetro staff indicated that they would be willing to shift the bus stop to the east as long as it remains west of FM 973 (south leg). Moving to the east of FM 973 (south leg) is not preferred.

CapMetro would also like to install an eastbound bus stop on the south side of SH 71. They are willing to pay for the bus stop and the sidewalks leading to it if TxDOT gives the approval. They point to the FM 969/Martin Luther King Jr. Boulevard east of Airport Boulevard project where TxDOT had limited right-of-way and drainage ditches on either side and still managed to install sidewalks and accessible bus stops on both sides of the roadway.

Bus pull-outs are also needed on SH 71 so that the bus driver can move the bus off of the main lanes to load and unload. CapMetro staff said that ideally the pull-out would be similar to the one on Loop 1/MoPac East Frontage Road north of RM 2244. Photos of sidewalks and pullouts on FM 969 and Loop 1/MoPac north of RM2244 are available in Appendix E.

A meeting of TxDOT and CapMetro was held on April 14, 2011 to discuss these issues.

Austin Transitional Housing Center

The Austin Transitional Housing Center is located behind the convenience stores with a driveway connecting to SH 71. This center houses almost 350 people most of whom are transit dependent. Release times begin at 5:30am when residents leave for jobs. Between 6:30 and 7:00am, others are released to search for jobs. The residents are encouraged to use the bus stop located on the Travis County Correctional Facility by the baseball fields. A section of fence was removed to enable access to the stop. However, it appears that many of the residents choose not to use that stop and instead cross SH 71 to reach the westbound stop near Cheviot Lane.

To compound matters, the administrators of the correctional facility recently decided to remove the bus stop due to damage caused to the pavement structure and problems during weekends when motor vehicle



Figure 11. Westbound Bus Stop at Cheviot Lane

parking around the fields constrains bus travel. Administrators have been in discussion with CapMetro about this bus stop removal.

Travis County Correctional Facility

Many people travel to and from the correctional facility by bus, according to the facility director. They come to visit relatives, to assist people who are being released, or are themselves being released. The director indicated that people who are released often choose to walk. He requests that a sidewalk be installed as part of this superstreet project along the west side of FM 973 in front of their facility leading to SH 71. He also suggests a bus stop on eastbound SH 71 near the driveway to the transitional center so that residents are less tempted to cross the highway. However, he has no funding to support such a project.

South Rural Community Center

Research staff also contacted the South Rural Community Center staff who indicated that many people come to their facility which houses a clinic and support services for families. The clients reportedly walk, bus, bike, and drive to the facility. Adults are sometimes seen with children in tow.

What has resulted from people walking to and from the facilities mentioned above is a hard-packed trail on the western side of FM 973.

Del Valle Community Coalition and Children's Wellness Center

The Del Valle Community Coalition staff person recommended researchers speak with the director of the Children's Wellness Center on Ross Road. Although the center is on Ross Road which is located east of the superstreet project, the director indicated that she has heard from people who regularly walk the section of SH 71 where the superstreet is planned. Researchers provided questions and the director called several people who live in the area. The questions and answers are as follows:

- Do you walk along or across the FM 973 and SH 71?

Along and across 973 and 71. Some of us ride bikes too but it is not safe and our children cannot attend ACC, even though they have been accepted because it is not safe for them to ride their bikes to the bus stop.

- If you cross, do you cross at a traffic signal?

Yes, but there are no crosswalks.

- How do you feel when walking in the area?

Very unsafe. Please check the wrecks on this strip on 973 and around 71 along Del Valle proper. The numbers grow each year. The main problem is the truck (drivers) who speed and pass lanes, even at the top of the hill. Many of us actually have to dodge the trucks.

- Have there been times when you have to run to get across the street for fear of being hit?

Yes and I have had to run away from the road to avoid being hit.

- What obstacles do you face when walking along or across the roadways?

Flying rocks/dirt. No room to walk side by side with my children, too dark in the morning to get to work, no bike lane, trucks, trucks and more trucks who never seem to get stopped for dangerous driving.

- Do you ride the bus and get on or off at the bus stops in the area?

Yes.

- Where are you typically walking to/from? In other words, are you walking from home or the bus stop to destinations in the area?

Further down south on 973, off Pierce Lane, Elroy Road, Jacobson Road

- What improvements would you most like to see on these roadways?

A flyway or walking bridge from Ross Rd to the Metropolitan Park across from 71 so that the children and families can safely cross to the park. Bike lanes/walking lane. Signs that enforce speed limits and driving laws. Cross walks with traffic lights that help people cross. Bus stops that have a shelter for rain and sun.

- Anything else you'd like to add?

A longer side lane to turn into Ross Rd from 71, a wider 973 road from 71 to MLK near Hornsby. A pass for the toll roads so that those who have the quality of life lowered by the toll way can actually afford to use the road.

Recommendations

Based on the data collection results as well as input from the stakeholders in the SH 71/FM 973 area, many pedestrians walk along and across the roadways. To increase the safety and provide accommodations for pedestrians in this area, the following recommendations are made:

1. Relocate the westbound bus stop on the north side of SH 71 near Cheviot Lane to the section of SH 71 between the two legs of FM 973. By relocating the stop, current accessibility standards must be met. People are more likely to cross SH 71 at the FM 973 (south leg) signalized intersection since it will be closer to the bus stop and pedestrians will continue to be accommodated with crosswalks, pedestrian signals, curb ramps, and pedestrian push buttons.
2. Install sidewalks along both sides of SH 71 between Cheviot Lane and FM 973 (south leg).
3. Install a sidewalk along the west side of FM 973 between SH 71 and the Travis County Correctional Facility southernmost driveway.
4. Improve the southbound bus stop on FM 973 to current accessibility standards.
5. Install a bus stop on the south side of eastbound SH 71 near the Austin Transitional Center driveway.
6. Re-evaluate pedestrian travel after the superstreet is installed to see if pedestrians continue to cross SH 71 at uncontrolled locations.

Appendix A: Survey Results

Survey for Walking and Bicycling in the Area of SH 71, US 183, and FM 973 Austin District 16-Nov-10

There were 22 survey responses received at the Open House Meeting on November 16, 2010. The following answers were received.

1. Where do you live?

East Austin/Del Valle area	19	
Other	2	
	1	Owns property in East Austin/Del Valle

2. If you live in the East Austin/Del Valle area, do you live in?

ð A neighborhood. Name of neighborhood or street _____	18	Colorado Crossing and Berdoll Farms listed most. See Google Map for neighborhood information.
ð Rural area	1	
ð Not applicable	1	

3. Do you work in the East Austin/Del Valle area?

<input type="checkbox"/> Yes	10
<input type="checkbox"/> No	12

4. Do you bike or walk to the following? (check all that apply)

<input type="checkbox"/> Grocery/convenience store	6	
<input type="checkbox"/> Bus stop – where do you or your children usually catch the bus?	3	
<input type="checkbox"/> Work or school	2	
<input type="checkbox"/> Community center	3	
<input type="checkbox"/> Doctor or other medical appointments	0	
<input type="checkbox"/> Other _____	5	neighborhood park (2), weekend recreation, on my street, to public library
<input type="checkbox"/> No. I do not walk or bike. Go to Question 7.	10	

5. Do you walk or bike along or across SH 71, US 183 or FM 973?

<input type="checkbox"/> Yes	3
<input type="checkbox"/> No	12

If yes, do you feel safe walking or biking along or across these roadways?

<input type="checkbox"/> Yes	0
<input type="checkbox"/> No	3

<input type="checkbox"/> Explain _____	Although this was for people who said that they do walk on the roadway mentioned, several took the time to indicate that they do not feel safe and several listed reasons shown below.
Comments: 1) Try to avoid, others in the neighborhood do travel on these busy roads. Too much traffic. 2) There is too much traffic and daily accidents. 3) Not right now. Too dangerous. No sidewalks or bike lanes. 4) Too dangerous. 5) We need pedestrian crosswalks with stop bars. Please support more pedestrian and bike routes. 6) Need sidewalks near commercial areas. 7) Cars go too fast.	

6. What time do you typically walk or bike across or along SH 71, US 183 or FM 973? (check all that apply)

<input type="checkbox"/> Peak periods (weekdays from 6:30-9:30 AM or 4-7 PM)	2
<input type="checkbox"/> Mid-day (non-peak periods)	1
<input type="checkbox"/> Nights	0
<input type="checkbox"/> Weekends	4

7. What needs to be present for children to walk or bicycle across or along SH 71, US 183 and FM 973? (check all that apply)

<input type="checkbox"/> Crosswalks at the signalized intersections	12
<input type="checkbox"/> "Walk/Do Not Walk" lights at the traffic signals	9
<input type="checkbox"/> Sidewalks	12
<input type="checkbox"/> Sidewalk ramps for wheelchair accessibility	8

<input type="checkbox"/> Other _____	safety monitors; bright lighting/signals and signage announcing crosswalks/bicycle routes/lanes; it would not be safe with any of these measures; police; recreation (a reason to walk, somewhere to go); any and everything cause we don't have anything; some kind of wall or barrier to protect children and adults from high speed traffic; hike/bike trails.
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8. Would you cross SH 71, US 183, and FM 973 at the signalized intersections if the following amenities existed? (check all that apply)

<input checked="" type="checkbox"/> Crosswalks	11
<input checked="" type="checkbox"/> "Walk/Do Not Walk" lights	9
<input checked="" type="checkbox"/> Sidewalks	10
<input checked="" type="checkbox"/> Sidewalk ramps for wheelchair accessibility	6
<input checked="" type="checkbox"/> Other _____	No; Signage; It would not be safe with any of these measures; Over the street bridge; Need these in the future when more businesses are established, example Dollar General on Ross Road.

9. Please feel free to share other transportation safety concerns.

This is an accident (fatality) waiting to happen especially for children.
Need weekend bus service. Need to anticipate commerce and development and provide for peds.
Thanks for your openness to feedback and public input.
Traffic on FM969.
There is no way I would ever bike or walk along either the way it is.
71 should be three lanes until Ross Road
Need more walking safety features on busy highways.
Bike riders do not feel safe sharing the road with cars.

10. What is your age group?

<input checked="" type="checkbox"/> 18-19 (you must be 18 or older to participate in this survey)	0
<input checked="" type="checkbox"/> 20-24	0
<input checked="" type="checkbox"/> 25-44	10
<input checked="" type="checkbox"/> 45-64	9
<input checked="" type="checkbox"/> 65 and over	1

Appendix B: Neighborhood of Survey Participants

Includes respondents who listed their neighborhood/street (includes 17 out of 19 people). Neighborhood is indicated with a blue balloon in aerial photo.

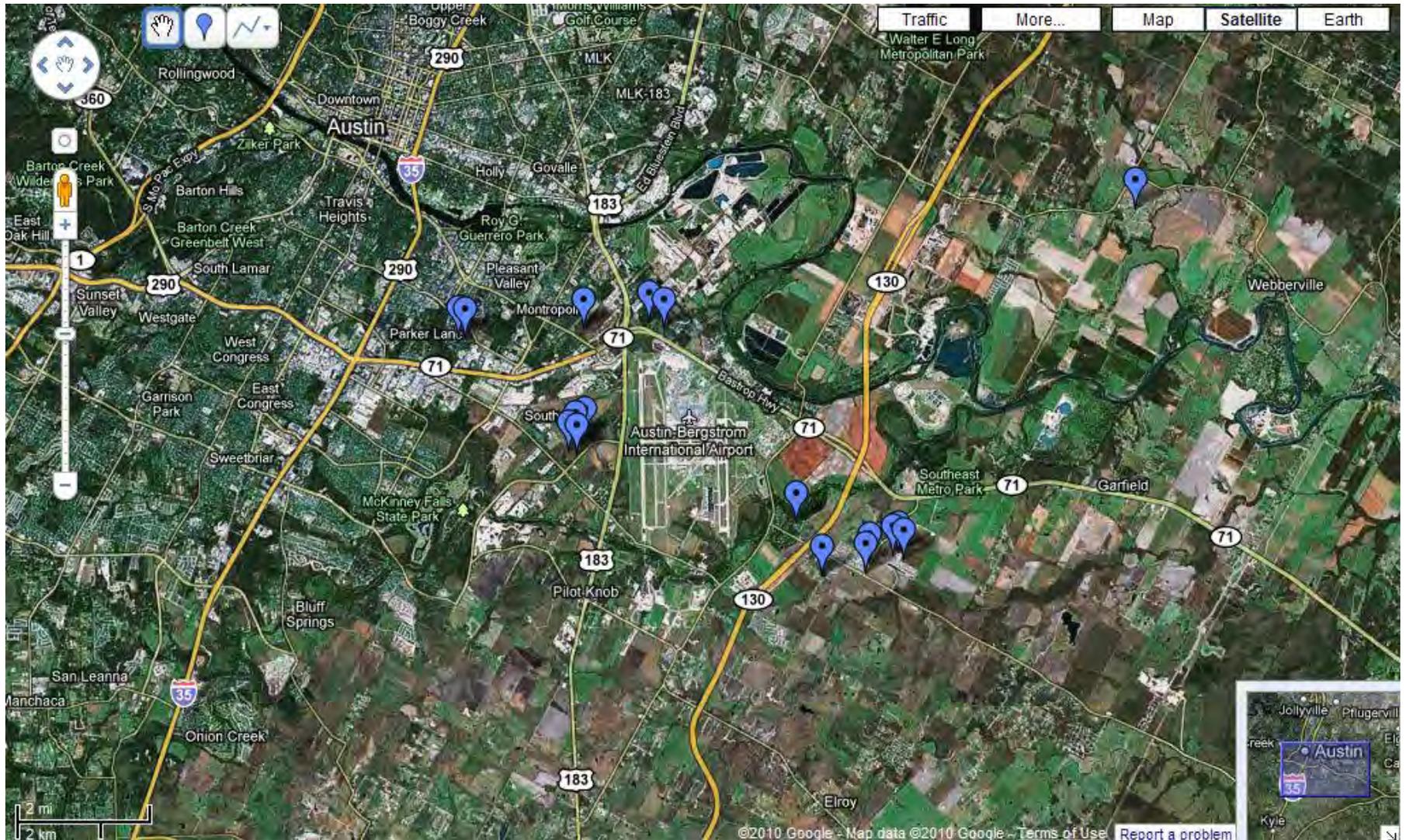


Figure 12. Residential Areas of Survey Respondents

Appendix C: Pedestrian Counts by Age

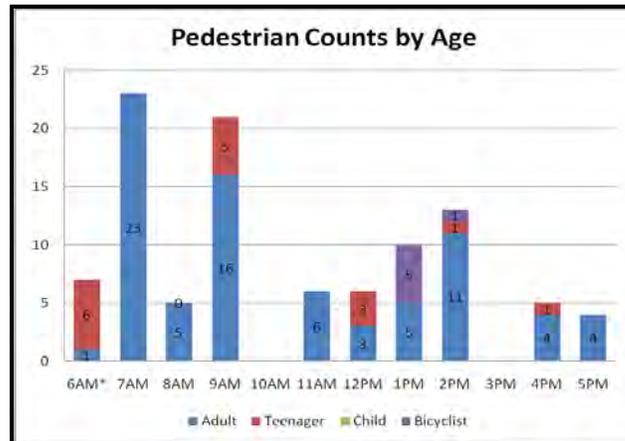


Figure 13. SH 71 West Pedestrian Volume by Age

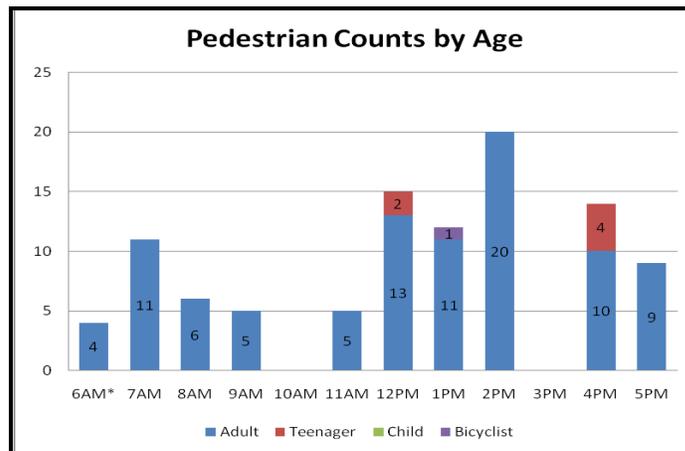


Figure 14. SH 71 East Pedestrian Volume by Age

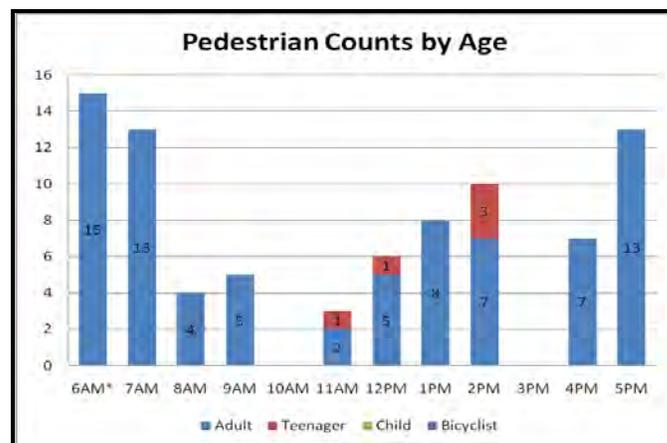


Figure 15. FM 973 (south leg) Pedestrian Volume by Age

Appendix D: Close Up Views



Figure 16. SH 71 at FM 973 South Leg

Morning Period - 6-10AM

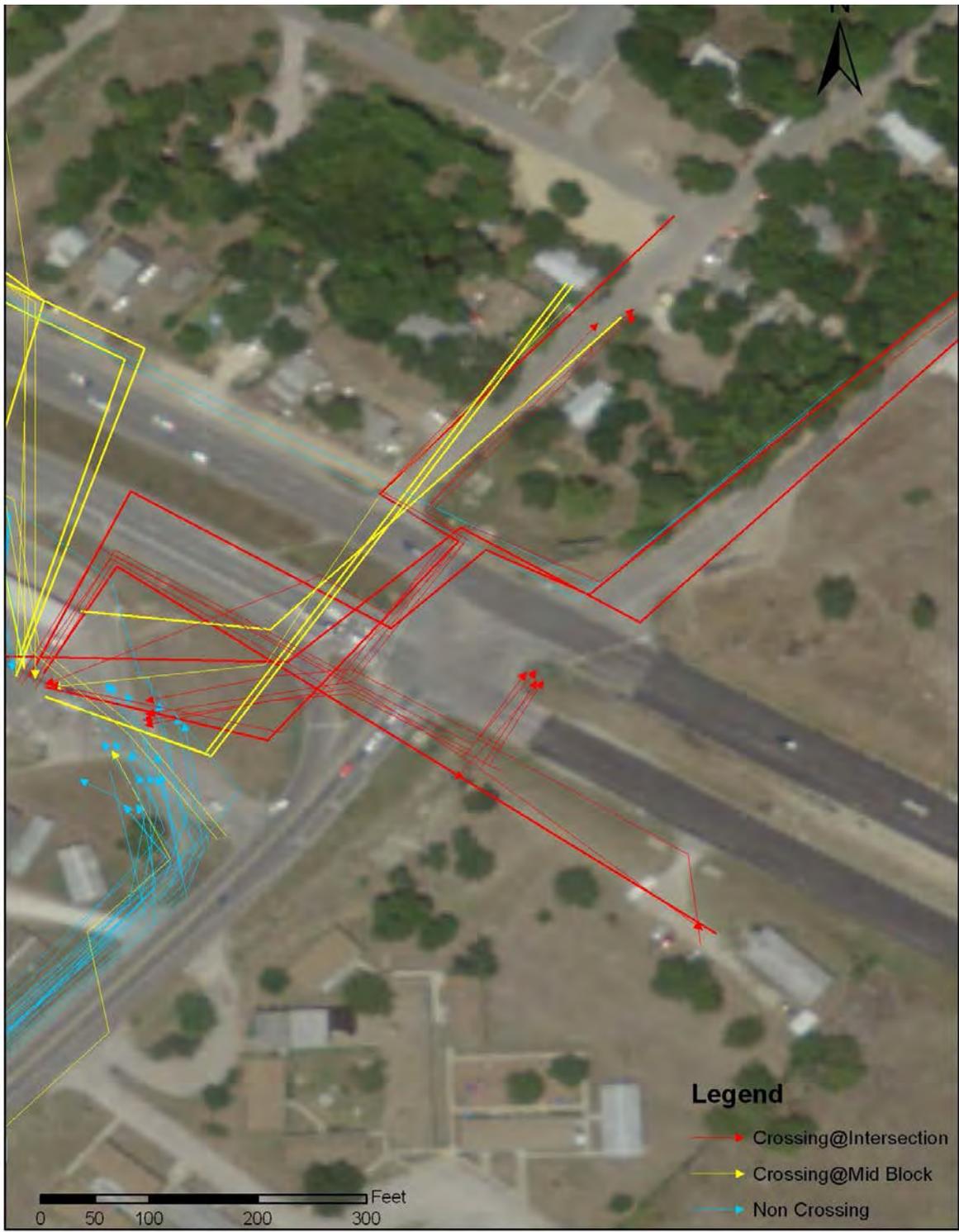


Figure 17. SH 71 at FM 973 South Leg
Noon Period - 11-3PM



Figure 18. SH 71 at FM 973 South Leg

Afternoon Period – 4-6PM

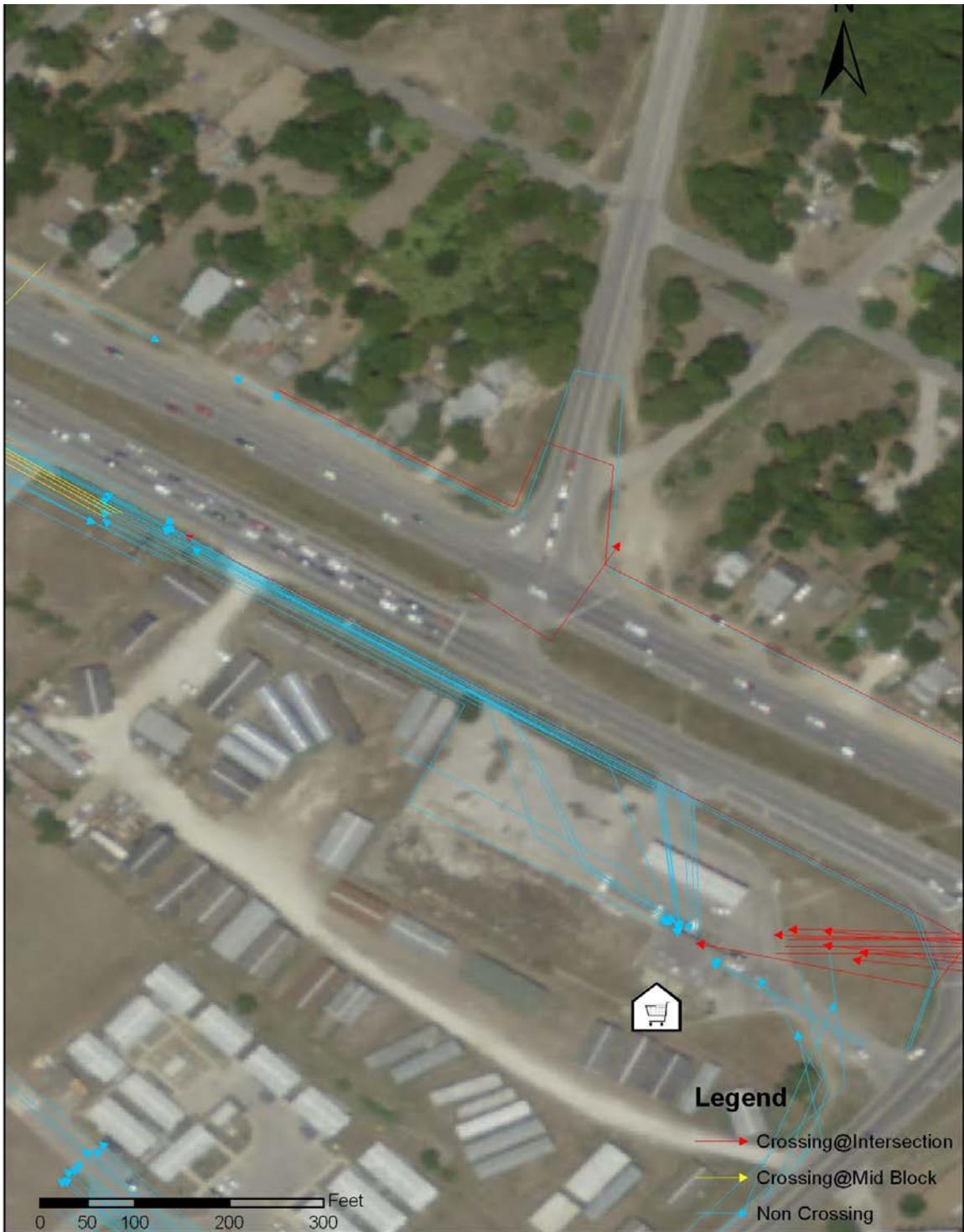
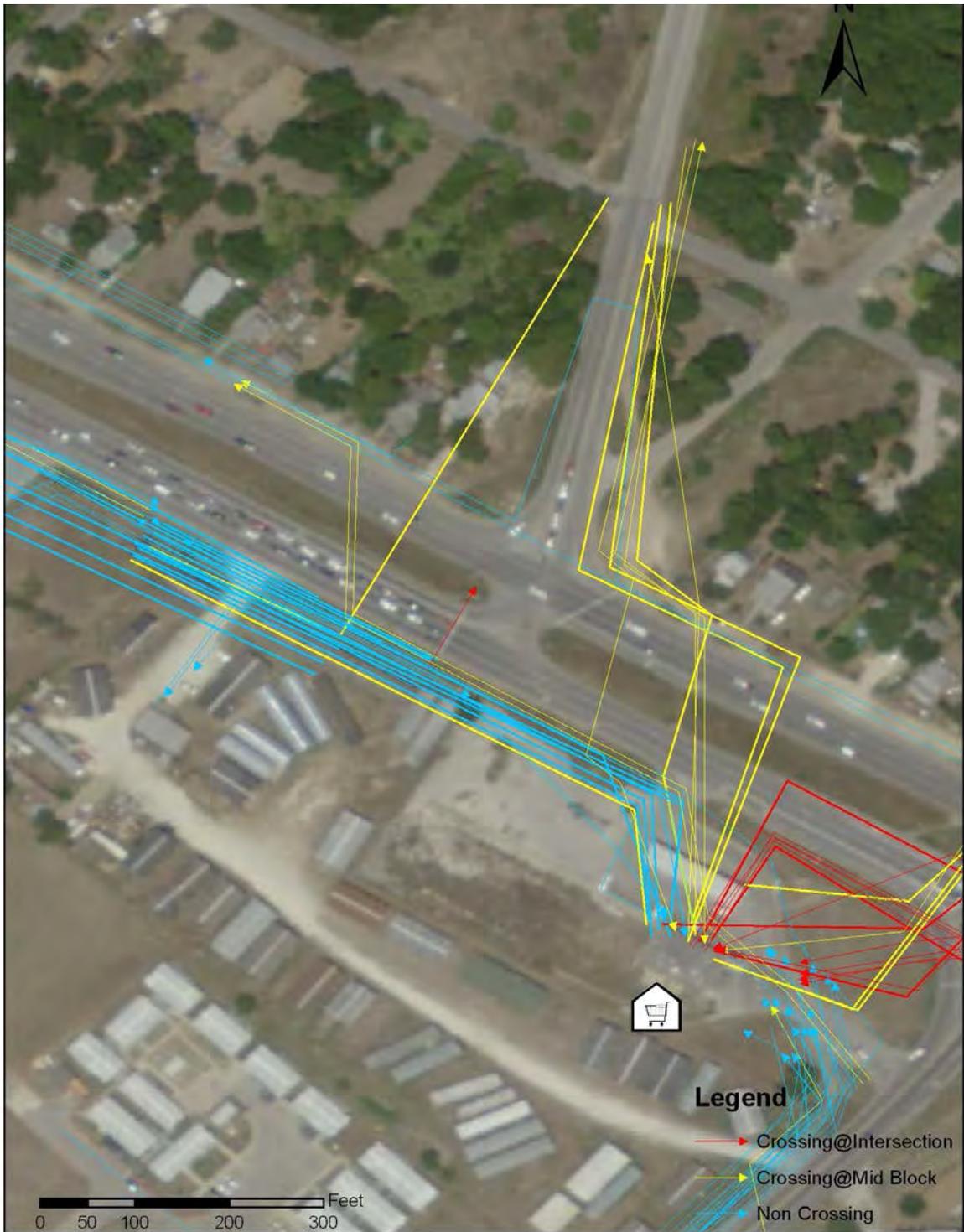


Figure 19. SH 71 at FM 973 North Leg
Morning Period - 6-10AM



**Figure 20. SH 71 at FM 973 North Leg
Noon Period – 11-3PM**



**Figure 21. SH 71 East Section at FM 973 North Leg
Afternoon Period – 4-6PM**



Figure 22. SH 71 at Royster Avenue

Morning Period - 6-10AM

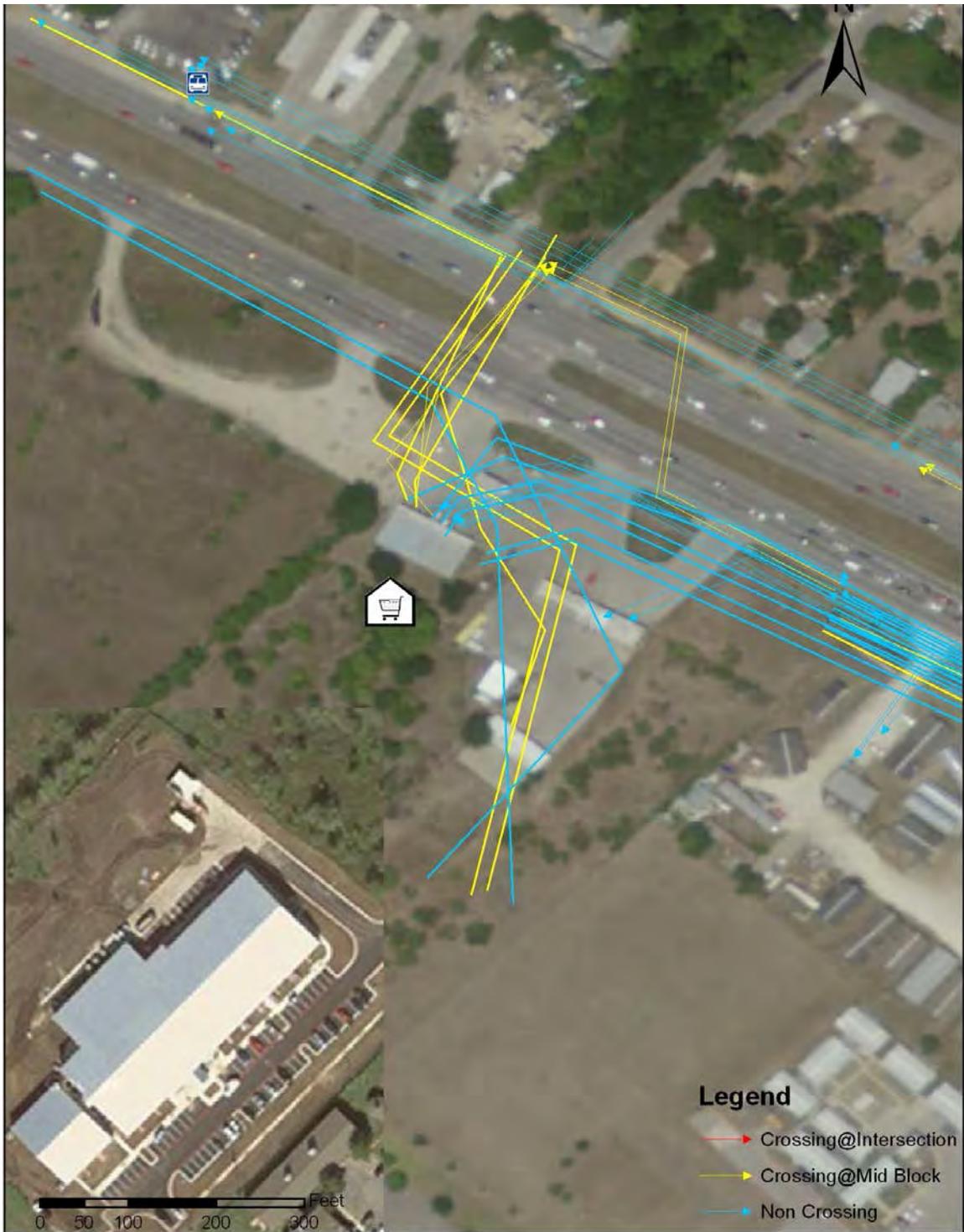


Figure 23. SH 71 at Royster Avenue

Noon Period – 11-3PM



Figure 24. SH 71 at Royster Avenue
Afternoon Period – 4-6PM

Appendix E: Photos of Example Sidewalks and Bus Stops



Figure 25. Bus Pull-Out on FM 969



Figure 26. Sidewalk on FM 969 Eastbound

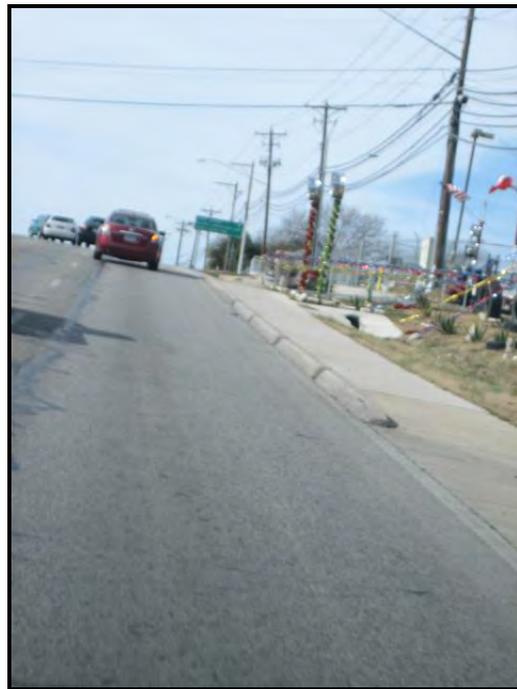


Figure 27. FM 969 Westbound (note sidewalk and drainage)



Figure 28. Loop 1 EFR north of RM 2244 (good example)