

# APPENDIX D AREA 5 TRANSPORTATION

Area 5, bound by George Bush Drive, Montclair Avenue, Luther Street, and Wellborn Road, may begin to transition to higher density land uses once the George Bush Drive/Wellborn Road grade-separated intersection is complete. This change is beyond the horizon of the Southside Area Neighborhood Plan, but was given careful consideration during the planning process to ensure future compatibility with the surrounding neighborhood. Of primary concern is future traffic generation and flow. The traffic study included considers densities beyond those recommended by the Southside Area Neighborhood

Once the George Bush Drive / Wellborn Road grade-separated intersection project is complete, Highlands Street will no longer connect to George Bush Drive and Grove Street and Fidelity Street will no longer connect to Wellborn Road – all becoming dead-end streets.



Figure D.1: Proposed grade-separated intersection.  
Source: TxDOT.

## Roadway Capacity

When the interchange is in place, additional capacity will be available to the immediate transportation network. The interchange improvements will generate approximately 30,000 vehicles per day of additional capacity in the network. In order to gauge how this would affect the Southside planning area, a baseline or existing condition must be established for the thoroughfares in the Southside planning area. Utilizing the City's Travel Demand Model, the current conditions are as follows:

For this exercise, the quantitative measure of effectiveness equals Level of Service (LOS) A through F, with LOS D being an acceptable level of service. LOS D is two-thirds of the street's total capacity. Each thoroughfare, based on its classification, has a capacity of vehicles per day (vehicles per day) based on the Bryan College Station Unified Design Guidelines, see below:

#### **NEIGHBORHOOD STREETS**

Capacity = 2,000 vehicles per day

#### **GENERAL SUBURBAN / URBAN STREETS (MINOR COLLECTORS)**

Capacity = 5,000 vehicles per day

LOS D = 3,333 – 4,166 vehicles per day

Examples are Dexter Drive, Luther Street, Montclair Avenue (proposed designation), and Fairview Avenue (proposed designation)

#### **GENERAL SUBURBAN / URBAN AVENUES / STREETS (MAJOR COLLECTOR)**

Capacity = 10,000 vehicles per day

LOS D = 6,666 – 8,333 vehicles per day

Examples are Anderson Street, Glade Street/Timber Street, Fairview Avenue (existing designation), and Holleman Drive

#### **URBAN BOULEVARD (4- LANE MAJOR ARTERIAL)**

Capacity = 40,000 vehicles per day

LOS D = 26,667 – 33,333 vehicles per day

Examples are Wellborn Road and George Bush Drive

#### **Current Traffic Counts and LOS**

Current traffic counts and LOS were established by projecting 2007 traffic counts to 2011, except for Dexter Dr. Dexter Dr utilized 2004 traffic counts and projected those to 2011. A 3% growth rate was used based on TxDOT historic traffic counts. Those counts and LOS are as follows:

#### **URBAN STREETS (MINOR COLLECTORS)**

Luther Street – 4,100 vehicles per day -LOS D

Fairview Avenue – 6,740 vehicles per day - LOS D (proposed designation)

#### **GENERAL SUBURBAN STREETS (MINOR COLLECTORS) -built currently as a residential street**

Dexter Dr – 1,439 vehicles per day -LOS D

**GENERAL SUBURBAN OR URBAN AVENUES OR STREETS (MAJOR COLLECTOR)**

- Anderson Street - 12,000 vehicles per day -greater than LOS D
- Glade Street/Timber Street – 6,730 vehicles per day -LOS D
- Fairview Avenue – 6,740 vehicles per day - LOS D (existing designation)
- Holleman Drive – 11,000 vehicles per day -greater than LOS D

**URBAN BOULEVARD (4- LANE MAJOR ARTERIAL)**

- Wellborn Road – 23,000 vehicles per day -less than LOS D
- George Bush Drive– 27,000 vehicles per day - LOS D

**Additional Network Capacity**

The additional capacity created by the George Bush Drive and Wellborn Road interchange project is further broken down into eastbound and westbound traffic and northbound and southbound traffic.

- Added capacity on George Bush Drive = 10,000 vehicles per day
- Added capacity on Wellborn Road = 20,000 vehicles per day

Because some of the thoroughfares are not currently operating at an acceptable LOS, a conservative assumption is made that 10,000 vehicles per day of the volume traveling on thoroughfares northbound and southbound will be re-directed to Wellborn Road and 5,000 vehicles per day traveling eastbound and westbound will be re-directed to George Bush Drive to bring the thoroughfares to an acceptable LOS. The remaining 15,000 vehicles per day of added capacity available for future development.

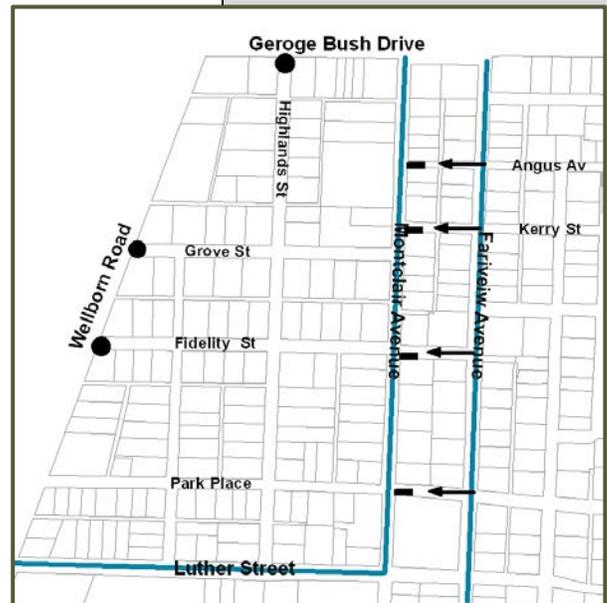


Figure D.2: Area V Possible Traffic Movement Changes.  
Source: City of College Station

Existing Land Use	Units	Trip Multiplier	Vehicles Per Day
Single family	132 units	132 x 9.57	1,263 vpd
Multi-family	30 units	30 x 6.65	200 vpd
Southgate Commercial	26,391 s.f.	26.4 x 42.94	1,134 vpd
Grove Office	2,880 s.f.	2.9 x 11.01	32 vpd
Aggieland Outfitters	3,530 s.f.	3.5 x 42.94	151 vpd
Unitarian Church	5,001 s.f.	5 x 9.11	46 vpd
Equity Real Estate Office	3,650 s.f.	3.7 x 11.01	41 vpd
Two 2-pump Gas Stations	4 gas pumps	4 x 162.78	651 vpd
			<b>3,518 vehicles per day</b>

Table D.1: Street Network Capacity.  
Source: City of College Station

Furthermore a 25% reduction in trips generated by use of other modes of travel such as walking, biking and utilizing transit can be assumed, generating an additional 3,750 vehicles per day. However, for the purposes of this exercise, a 25% reduction will not be taken and only the additional capacity of 15,000 vehicles per day is used in the analysis. The 25% reduction is assumed using a recent Traffic Impact Analysis (TIA) for the Callaway Subdivision bounded by Luther Street, Holleman Drive, Marion Pugh Drive, and Wellborn Road. The 25% reduction was derived in the TIA through two methods. The first was using the 2000 census for the zip code 77840. The census indicated that 71.4% drove alone to work. To confirm this assumption vehicle trips were counted for the PM peak period for an adjacent apartment complex to the Callaway Subdivision. The trip rate was .29 trips per person as opposed to .40 trips per person identified in the *ITE Trip Generation Report*. This is a 27.5% reduction, so the 25% reduction is a reasonable assumption.

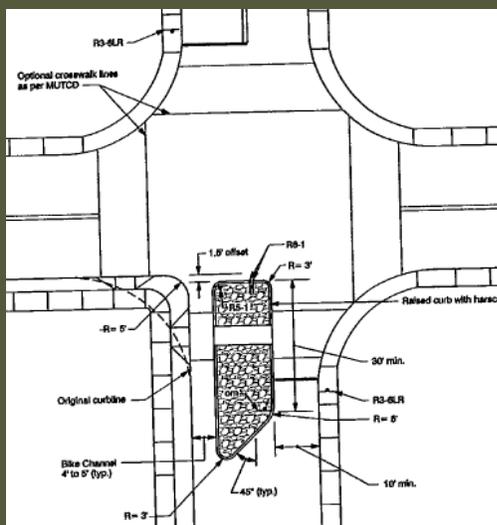


Figure D.3 Half Street Closure  
Source: US Traffic Calming Manual

Again, the additional trip capacity will only be available after the George Bush and Wellborn interchange is in place. Additional measures can also be put in place, such as Montclair Avenue being upgraded to a modified minor collector, adding an additional 3,000 vehicles per day capacity to the 2,000 vehicles per day.

Also, additional measures could be considered to redirect traffic away from the interior of the Southside planning area and to George Bush Drive and Wellborn Road, such as the use of half street closures between Montclair Avenue and Fairview Avenue at Angus Avenue, Kerry Street, Fidelity Street, at Park Place. See map below for proposed locations.

Half closures are raised, landscaped medians placed at the intersections that divert vehicles by closing half of the street width allowing only one way traffic into an area.

### Translating Network Capacity into Land Use

Three example scenarios were utilized as a basis in determining land use patterns that may take advantage of the additional capacity. Based on the Institute of Transportation Engineers (ITE) trip generation rates, 15,000 additional vehicles per day translates into either:

- 349,325 square feet (or 26 acres) of General Commercial zoning (based on 13,500 square-foot per acre maximum), or
- 38 acres of High Density Multi-family (4 persons per unit and 30 units per acre), or
- 32 acres of mixed-use development.

### Existing Land Use in Area 5

The following land uses currently exist in Area 5. The estimated trips are based on the *ITE Trip Generation Report*

The existing land uses and their trips generated will be replaced by redevelopment.

**Example Land Use Scenario**

A more detailed example land use scenario was developed at a more intense level in regard to land use density. The intent of this exercise is to demonstrate that the transportation network would be able to support the more intense land uses.

The map represents Area 5 and is subdivided with six areas of the example land uses and the trip generation rates based on the *ITE Trip Generation Report*.

1. Four Story Mixed Use, five story apartments that equates to 11,000 beds and 65,000 sqft of general commercial (7.75 acres)

\*65,000 sqft of general commercial =  $6.5 \times 42.94 = 2,791$  vehicles per day

\*1100 multi-family beds x 3.31 = 3,641 vehicles per day

**\*Total = 6,432 vehicles per day**

2. Ten story Hotel at 100 rooms/acre, at approximately four acres equates to 400 rooms

\*400 Hotel rooms x 8.17 = **3,268 vehicles per day**

3. 19 acres of Townhomes, 14 dwelling units/acre equates to 266 dwelling units

\*266 DU Townhomes x 5.81 = **1,546 vehicles per day**

4. Four acres of high-density multi-family at 30 dwelling units/acre approximately 5 to 6 stories equates to 120 dwelling units or 480 beds

\*480 multi-family beds x 3.31 = **1,589 vehicles per day**

5. Two and a half acres of General Commercial zoning

6. Three acres of General Commercial zoning

Figure D.4: Area V Land Use Scenario.  
Source: City of College Station



\*5.5 acres of general commercial x 13,500 sqft per acre = 74,250 sqft

\*74.25 x 42.94 = **3,188 vehicles per day**

#### **Example Land Use Scenario Total = 16,023 vehicles per day**

Total existing land use in Area 5 generates approximately 3,518 vehicles per day. Because there are approximately 15,000 additional trips available once the improvements are complete, the existing trips can be subtracted from the new trips generated because those land uses are replaced by the proposal above. **The net additional vehicles per day is approximately 12,505 vehicles per day, falling below the 15,000 additional vehicles per day threshold.**

Further analysis has been conducted to insure that the trips generated by the sample scenario above can be accommodated by the transportation network within and at the perimeter of Area 5. The following assumptions have been made as part of this analysis:

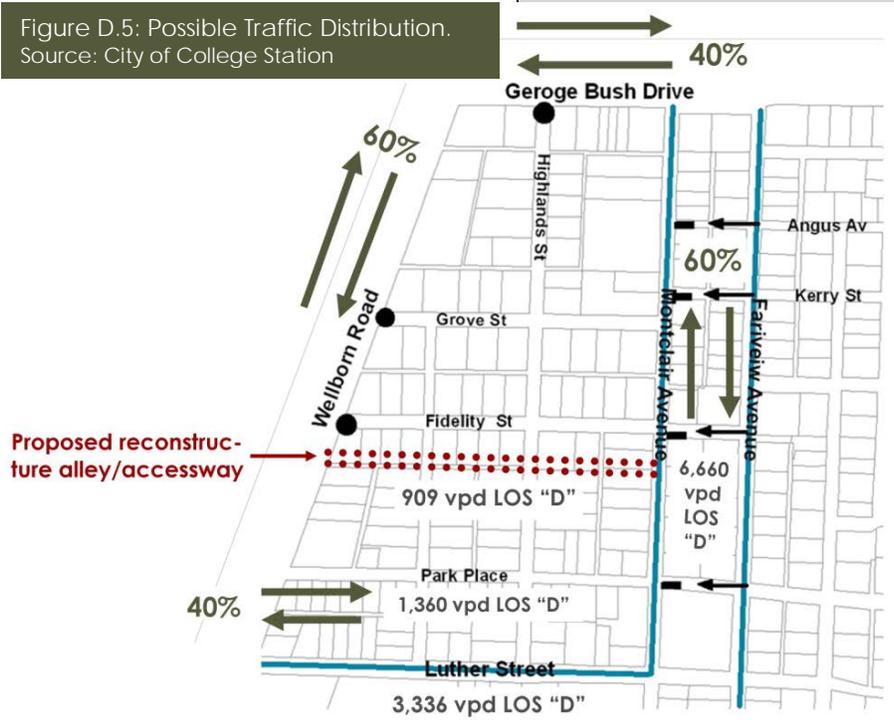
- 60% of trips generated will travel north and southbound.
- 40% of trips generated will travel east and westbound.
- Utilizing half street closures traffic will not be able to travel into the neighborhood eastbound and instead will be forced onto Wellborn Road and George Bush Drive.
- Montclair Avenue will be modified (left turns at intersections) to provide 8,000 vehicles per day capacity.
- 12,505 vehicles per day will have to be accommodated and distributed thru the transportation network.
- The alley way just south of Fidelity Street will have to be reconstructed to provide a third access point to Wellborn Road. This access will not provide a true local road capacity of 2,000 vehicles per day, instead a capacity of 1,200 vehicles per day is assumed.
- A 25% trip reduction for people walking biking and using transit was not assumed, though such a reduction may indeed occur.

The map illustration below will help with the following analysis. With the assumptions in place the analysis is as follows. 40% of 12,505 vehicles per day equals 5,002 eastbound and westbound. 60% of 12,505 vehicles per day equals 7,503 vehicles per day traveling northbound and southbound. Of the 7,503 vehicles per day traveling northbound and southbound, Montclair Avenue will accommodate 6,660 vehicles per day to remain at a LOS "D". The rest of the 843 vehicles per day will tend toward Wellborn Road via Luther Street, Park Place, and the proposed access way. So the remaining 843 vehicles per day northbound and southbound traffic will be added to the 5,002 vehicles per day already slated to travel eastbound and westbound, for a total

of 5,845 vehicles per day, and eventually accessing Wellborn Road. Luther Street will accommodate 3,336 vehicles per day of the 5,845 vehicles per day to keep it at LOS "D". Park Place will accommodate 1,660 vehicles per day of the 5,845 vehicles per day to keep it at LOS "D" and the new access way will accommodate the remainder 909 vehicles per day and will function at LOS "D".

It is recommended that the remainder of the internal transportation network to Area 5 remain in place to accommodate internal circulation, and as redevelopment occurs, additional connectivity through public ways or alley ways be provided internal to Area 5.

Figure D.5: Possible Traffic Distribution.  
Source: City of College Station



**Peak Traffic Times**

The previous assumptions have all dealt with trips for a whole day "vehicles per day" or a 24 hour count. The majority of the proposed land uses do not generate trips within the peak hour time (7:00a.m.–8:00a.m. and 5:00p.m.–6:00p.m). Commercial establishments usually open at 10:00 a.m. Hotels do not generate peak hour traffic; instead, they generate traffic at a steady pace throughout the day. If we assume all multi-family are college students, their peak hours will also vary based on class schedule.

**Local Roadway Level of Service**

The previous analysis only considered thoroughfares. The following analysis includes the local residential roadway network in the Level of Service analysis.

The methodology used establishes the trips that are being generated by the current land uses and compares it to the capacity of the local residential roadways. The following assumptions were made with this analysis:

- The thoroughfares will operate at acceptable LOS "D" or better utilizing the 15,000 additional vehicles per day capacity threshold, based on previous analysis.
- The existing commercial land uses border the planning area and can be assumed will utilize Wellborn Road, Geroge Bush Drive, and Texas Avenue to ingress and egress.
- The existing duplex & multi-family is composed of college students who may utilize other modes of travel (i.e. transit, walking and biking) so a 25% trip reduction can be applied

- Local residential roadway capacity equals 2,000 vehicles per day LOS “D” equals 1,333 – 1,666 vehicles per day
- Only residential roadways that did not end in a cul-de-sac were included
- Combination roadways were counted as one for connectivity purposes
- 60% traveling northbound and southbound
- 40% traveling eastbound and westbound

With these assumptions in place, the analysis is as follows. The table below lists the current land uses in the planning area, excluding the commercial along the border of the planning area.

Subdivision	Single-Family	Duplex	Multi-Family	Total
Anderson Ridge			580	580
Ball Subdivision	3			3
Breezy Heights Addition	88	12		100
College Park	170	6		176
Dulaney Subdivision	5			5
The Glade	11			11
Holick	33			33
Hdrilcka	32	2		34
Kapchincki's Subdivision	56			56
Leacrest	47			47
Little Knight		18		18
Madison Pointe			252	252
McCulloch's Subdivision	129	27	22	178
Southgate Village			200	200
(South) Oakwood	82			82
Parkway Circle			184	184
Pecan Tree Estates	1	34		35
Pershing Park	12			12
Redmond Terrace	65		166	231
Renaissance Park			144	144
Southeast College Park	53			53
Skrivanek	40			40
Southland Addition	24			24
University South	3			3
University Place			96	96
WM Sparks Subdivision	9	3		12
Welch Place			23	23
West Park Addition	110	2	30	142
Wolfpen Village	43		56	99
Woodson Village	115			115
<b>Total</b>	<b>1131</b>	<b>104</b>	<b>1753</b>	<b>2988</b>

Table D.2: Southside Area Land Uses.  
Source: City of College Station

- Single family = 1,131 units x 9.57 = 10,824 vehicles per day
- Duplex = 104 units x 4 persons = 416 x 3.31= 1,377 minus 25% = 1,033 vehicles per day
- Multi-family = 1,753 units x 4 persons = 7,012 x 3.31 = 23,210 minus 25% = 17,408 vehicles per day\*\*
- **Total trips = 29,265 vehicles per day**
  - 60% north and southbound = 17,559 vehicles per day
  - 40% east and westbound = 11,706 vehicles per day

*\*\*All of the multi-family units (except 200 units at Southgate Village) take direct access to thoroughfare streets and not to neighborhood streets.*

Neighborhood Streets:

Northbound and Southbound

- Maryem Street
- Montclair Avenue/Eleanor Street
- Highland Street
- Welsh Avenue (non-thoroughfare portion)
- Hereford Street/Ayrshire Street
- Suffolk Avenue/Pershing Avenue
- Lee Avenue
- Newton Road
- Holik Street
- Arizona Street
- Phoenix Street
- Carolina Street
- Detroit Street
- Georgia Street
- Redmond Drive
- Rosemary Lane

Eastbound and Westbound

- Milliff Road
- Park Place
- Old Jersey Street/Angus Street
- Thomas Street/Village Drive
- Grove Street/Kerry Street
- Fidelity Street
- Thompson Street
- Nevada Street

There are 24 neighborhood streets included in this analysis. If you use the LOS "D" threshold of 1,660 vehicles per day and multiply by 24, the total neighborhood street capacity is 39,840 vehicles per day; approximately 10,000 trips greater the trips generated by the existing land uses. 16 of the streets are northbound and southbound, that equates to 26,560 vehicles per day. Eight of the streets are eastbound and westbound, that equates to 13,280 vehicles per day.