ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE P. I. No. 0006935, Rockdale County
CSSTP-0006-00(935)
SR 20 @ CR 98/West Hightower Trail-
Intersection Improvements

OFFICE Preconstruction

DATE July 1, 2008

FROM for Genetha Rice-Singleton, Assistant Director of Preconstruction

TO SEE DISTRIBUTION

SUBJECT APPROVED PROJECT CONCEPT REPORT

Attached for your files is the approval for subject project.

Attachment

DISTRIBUTION:

Brian Summers
Glenn Bowman
Ken Thompson
Michael Henry
Keith Golden
Angela Alexander
Paul Liles
Bryant Poole
Mike Lobdell
Scott Lee
BOARD MEMBER

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE: P.I. No. 0006935, Rockdale County
STP-0006-00(935)
SR 20 @ CR 98/West Hightower Trail-
Intersection Improvements

OFFICE: Preconstruction

DATE: June 2, 2008

FROM: Geneth Rice-Singleton, Assistant Director of Preconstruction

TO: Gerald M. Ross, P.E., Chief Engineer

SUBJECT: ***PROJECT CONCEPT REPORT***

This project is the SR 20/Loganville Highway, West Hightower Trail and Chandler Road intersection improvements near Conyers, Rockdale County, Georgia. Currently, SR 20 has a free flow movement at the intersection, and West Hightower Trail operates under a two-way stop condition. Chandler Road adds a fifth leg to the intersection and intersects West Hightower Trail and SR 20 at a stop condition at an undesirable skew angle which contributes to poor sight distance and undesirable turning movements. As the area grows in population and traffic with numerous subdivisions being constructed in nearby areas in both Rockdale and DeKalb Counties, this intersection will experience increasing congestion and potential for accidents. The accident information from 2003 to 2006 indicates a total of 40 accidents, 46 injuries and 1 fatality within the project limits. The 2003 Average Daily Traffic (ADT) of 8,911 vehicles per day (VPD) on SR 20/Loganville Highway within the project area is projected to increase to 9,746 by the build year 2010. This volume is projected to increase to 14,067 VPD by the 2030.

The proposed project will remove the Chandler Road leg of the existing five-legged intersection to create a four-legged intersection that is ADA compliant and with a better intersection (skew) angle. The project includes adding 250' left and right turn lanes to all approaches, the installation of a traffic signal at SR 20/Loganville Highway and West Hightower Trail and the construction of a cul-de-sac on Chandler Road. Traffic will be maintained during construction.

Environmental concerns include requiring a Categorical Exclusion will be prepared; a Public hearing is not required; Time saving procedures is appropriate.

The estimated costs for this project are:

	PROPOSED	APPROVED	FUNDING	PROG DATE
Construction (includes E&C)	$ 1,301,000	$ 1,020,000	L230	2010
Right-of-way & utilities	Local	Local		

* PMA signed Rockdale do PE & utilities/ ROW and CST to be done by future agreements.

I recommend this project concept be approved.

GRS: JDQ

Attachment

CONCUR_____
Todd I. Long, P.E., Director of Preconstruction

APPROVED_____
Gerald M. Ross, P.E., Chief Engineer

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

RECEIVED
MAY 5 2008
PRECONSTRUCTION

INTERDEPARTMENT CORRESPONDENCE

FILE: **P.I. No. 0006935**

OFFICE: Environment/Location

DATE: May 2, 2008

FROM: Glenn Bowman, P.E., State Environmental/Location Engineer

TO: Genetha-Rice Singleton, State Transportation Planning Administrator

SUBJECT: **PROJECT CONCEPT REPORT**
CSSTP-0006-00(935) / Rockdale County
SR 20 at W. Hightower Trail

The above subject Concept Report has been reviewed and appears satisfactory subject to the following comment:

1. If the streams are impacted, Rockdale County will be responsible for obtaining mitigation credits as a part of ROW acquisitions.

If you have any questions, please contact Glenn Bowman at (404) 699-4401.

GB/lc

cc: Brian Summers
Jamie Simpson
Angela Alexander
Keith Golden
Bryant Poole

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

District 7 Office

PROJECT CONCEPT REPORT

Project Number: CSSTP-0006-00(935)

County: Rockdale

P. I. Number: 0006935

Federal Route Number: N/A

State Route Number: 20

Recommendation for approval:

DATE 4/17/08 — Project Manager

DATE 4/18/08 — District Engineer

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

DATE_____ — State Transportation Planning Administrator

DATE_____ — Office of Financial Management Administrator

DATE 5/1/08 — State Environment/Location Engineer

DATE_____ — State Traffic Safety and Design Engineer

DATE_____ — Project Review Engineer

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

District 7 Office

PROJECT CONCEPT REPORT

Project Number: CSSTP-0006-00(935)

County: Rockdale

P. I. Number: 0006935

Federal Route Number: N/A

State Route Number: 20

RECEIVED
APR 30 2008
PRECONSTRUCTION

Recommendation for approval:

DATE 4/17/08 Project Manager

DATE 4/18/08 District Engineer

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

DATE 4-24-08 State Transportation Planning Administrator

DATE_____ Office of Financial Management Administrator

DATE_____ State Environment/Location Engineer

DATE_____ State Traffic Safety and Design Engineer

DATE_____ Project Review Engineer

C E V E D
APR 2 5 2008
PRECONSTRUCTION

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

District 7 Office

PROJECT CONCEPT REPORT

Project Number: CSSTP-0006-00(935)
County: Rockdale
P. I. Number: 0006935

Federal Route Number: N/A
State Route Number: 20

Recommendation for approval:

DATE 4/17/08 — Project Manager

DATE 4/18/08 — District Engineer

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

DATE_____ — State Transportation Planning Administrator

DATE_____ — Office of Financial Management Administrator

DATE_____ — State Environment/Location Engineer

DATE 4-21-08 — State Traffic Safety and Design Engineer

DATE_____ — Project Review Engineer

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

District 7 Office

PROJECT CONCEPT REPORT

Project Number: CSSTP-0006-00(935)

County: Rockdale

P. I. Number: 0006935

Federal Route Number: N/A

State Route Number: 20

Recommendation for approval:

DATE 4/17/08 _____ Project Manager

DATE 4/18/08 _____ District Engineer

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

DATE_____ _____ State Transportation Planning Administrator

DATE_____ _____ Office of Financial Management Administrator

DATE_____ _____ State Environment/Location Engineer

DATE_____ _____ State Traffic Safety and Design Engineer

DATE_____ _____ Project Review Engineer

NOTICE OF LOCATION AND DESIGN APPROVAL

CSSTP-0006-00(935), Rockdale County
P. I. 0006935

Notice is hereby given in compliance with Georgia Code 22-2-109 that the Georgia Department of Transportation has approved the Location and Design of this project.

The date of location approval is July 1, 2008

The project proposes to improve the existing intersection at SR 20 (Loganville Highway) and West Hightower Trail in Conyers, Georgia. The project includes adding 250' left and right turn lanes (with 100' tapers) to all approaches, the installation of a traffic signal at SR 20 (Loganville Highway) and West Hightower Trail and the construction of a cul-de-sac on Chandler Road. The proposed project will improve the operation and safety of this intersection. This project lies within land lots 311,330 and 331 of the 16th District of Rockdale County, Georgia.

Drawings or maps or plats of the proposed project, as approved, are on file and are available for public inspection at the Georgia Department of Transportation:

Thomas Parker, Area Engineer
Georgia Department of Transportation
Email: Thom.parker@dot.state.ga.us
805 George Luther Drive
Decatur, Ga. 30032
Phone: (404)-299-4386

Any interested party may obtain a copy of the drawings or maps or plats or portions thereof by paying a nominal fee and requesting in writing to:

Mike Lobdell, District Preconstruction Engineer
Georgia Department of Transportation
Email: mike.lobdell@dot.state.ga.us
5025 New Peachtree Road
Chamblee, Georgia 30341
Phone: (770) 986-1257

Any written request or communication in reference to this project or notice SHOULD include the Project and P. I. Numbers as noted at the top of this notice.

Wolverton & Associates

June 16, 2008

Mr. David Robbins
Georgia DOT – District 7
5025 New Peachtree Road
Chamblee, GA 30341

RE: SR 20 at West Hightower Trail Intersection Improvement Project
W&A Project No. 07-912

Mr. Robbins:

This letter is in response to the questions received by the District 7 Office in regards to the SR 20 at West Hightower Trail Intersection Improvement project, STP-0006-00(935).

- ***In response to the question concerning the use of 70% volumes for Warrant 1:***

  For the intersection of SR 20 @ West Hightower Road, the intersection actually warrants a signal in 2030 using either the 100% or the 70% threshold volumes.

  The MUTCD states that for a speed limit above 40 mph, a volume reduction may be used. This is a conservative method often used to reduce the volume requirements for a potentially dangerous intersection before a signal is warranted.

  Also, capacity analysis was performed using the current intersection configuration which fails as it is currently operating.

- ***In response to the question concerning the use of GDOT procedures for warranting a roundabout:***

  The FHWA guidelines used are considered to be more conservative than the current GDOT guidelines for warranting the use of a roundabout. However, the GDOT method can also be used to show the effect on traffic if a roundabout is installed.

  The GDOT document "The Use of Modern Roundabouts on State Facilities" states that in order for a roundabout to be acceptable, it must meet the following criteria:

  - Only one (1) lane approaches in all directions
  - Total entry ADTs no higher than 20,000
  - Circulating flow no higher than 1200 vph
  - Roundabouts should have somewhat equal entry flow, with a maximum 75/25 split of mainline traffic to side-street traffic

6745 Sugarloaf Parkway ◆ Suite 100 ◆ Duluth, Georgia 30097 ◆ 770-447-8999 ◆ 770-447-9070 Fax
www.wolverton-assoc.com

The subject intersection does have all one lane approaches and the total entry ADT is approximately 9500 vehicles for 2010 and 14,000 vehicles for 2030. These are acceptable values. The circulating flow for the PM Peak hour projected to be 1020 vehicles for 2010, which is acceptable. However, that volume rises to 1527 vehicles for 2030, which is not acceptable. Also, the mainline to side-street ratio is calculated at 85/15 for this intersection, an unacceptable value.

Additionally, capacity analysis indicated that undesirable queuing would result on the peak hour approaches. As a result, the recommendations provided, added turn lanes and a traffic signal, demonstrated the best results.

If you have any questions or require additional information, please feel free to contact me at (770) 447-8999

Wolverton & Associates, Inc.

Mario V. Macrina
Senior Project Manager

MM:kg

BOARD OF COMMISSIONERS
ROY J. MIDDLEBROOKS, CHAIRMAN
Jason A. Hill, Commissioner Post I
JaNice Van Ness, Commissioner Post II

JULIE MILLS, CHIEF OF STAFF
JENNIFER O. RUTLEDGE, COUNTY CLERK

Department of Public Services & Engineering

YOLANDA J. MACK, DIRECTOR
TELEPHONE: 770-785-5919
Facsimile: 770- 785-6909/770-785-6968

To: Wade Woodard,
District Seven Utilities

From: Shannon L. Hebb, P.E.
SPLOST Project Manager

Date: June 12, 2008

Subject: SR 20 (Loganville Highway) @ West Hightower Trail STP-0006-00(935), P.I. # 0006935
Utility Cost Estimate

This project is part of the 2005 SPLOST Program and the design is to improve the intersection of SR 20 (Loganville Highway) @ West Hightower Trail. The project will also improve the connection of Chandler Road which is very close to the intersection. The existing intersection is a two-way stop and has a yellow flashing warning beacon. Utilities in the immediate project area along with their estimated cost for relocations are as follows:

AT&T	$11,000.00
Comcast	$11,000.00
Rockdale County Water & Sewer	$1,600.00
Walton EMC	$36,000.00
TOTAL	**$ 59,600.00**

Please, if you have any question please contact Roger S. Heatley at 770.918.6504.

cc: Project File
Yolanda Mack, Director of PS&E
Miguel Valentin, P.E., Deputy Director of PS&E
David Robbins, GDOT District 7
Mario Macrina, Wolverton & Assoc.

Department of Transportation
State of Georgia

Interdepartmental Correspondence

FILE	R/W Cost Estimate	**OFFICE**	Atlanta
		DATE	May 12, 2008
FROM	Phil Copeland, Right of Way Administrator		
TO	Kevin Wilson District Seven Design		

SUBJECT **Preliminary Right of Way Cost Estimate**
Project: CSSTP-0006-00(935)Rockdale
P.I. No.: 0006935
Description: SR 20 and West Hightower Intersection Improvement

As per your request, attached is a copy of the approved Preliminary Right of Way Cost Estimates on the above referenced projects.

Please note the area of Required R/W was furnished with your request. **Please include total Required R/W areas for the entire corridor in all future requests.**

If you have any questions, please contact Jerry Milligan at the West Annex Right of Way Office at (770) 986-1541.

PC:GAM
Attachments
c: Brian Summers, Engineering Services
Wes Brock, R/W
Windy Bickers, Financial Management
File

Preliminary Right of Way Cost Estimate

Phil Copeland
Right of Way Administrator
By: Jerry Milligan

Date: May 12, 2008
Project: CSSTP-0006-00(935)Rockdale
Existing/Required R/W: Varies/Varies
Project Termini : 0.14 miles North and 0.14 miles South of SR 20
Project Description: SR 20 @ West Hightower Intersection Improvement

P.I. Number: 0006935
No. Parcels: 27

Land: Residential R/W: 7,449 sf @ $ 1.25/sf	$ 9,311		
Commercial R/W: 6,192sf @ $ 5.75/sf	35,604	$	44,915
Improvements : misc. site improvements			15,000
Relocation: Commercial (0)			
Residential (0)			0
Damage : Proximity			
Consequential			
Cost to Cure			0
Net Cost		$	59,915

Net Cost		$	59,915
Scheduling Contingency	55 %		32,953
Adm/Court Cost	60 %		55,721
		$	148,589

Total Cost $148,600

Note: The Market Appreciation (40%) is not included in the updated Preliminary Cost Estimate.

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

District 7 Office

PROJECT CONCEPT REPORT

Project Number: CSSTP-0006-00(935)

County: Rockdale

P. I. Number: 0006935

Federal Route Number: N/A

State Route Number: 20

Recommendation for approval:

DATE 4/17/08 _____ Project Manager

DATE 4/18/08 _____ District Engineer

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

DATE_____ _____ State Transportation Planning Administrator

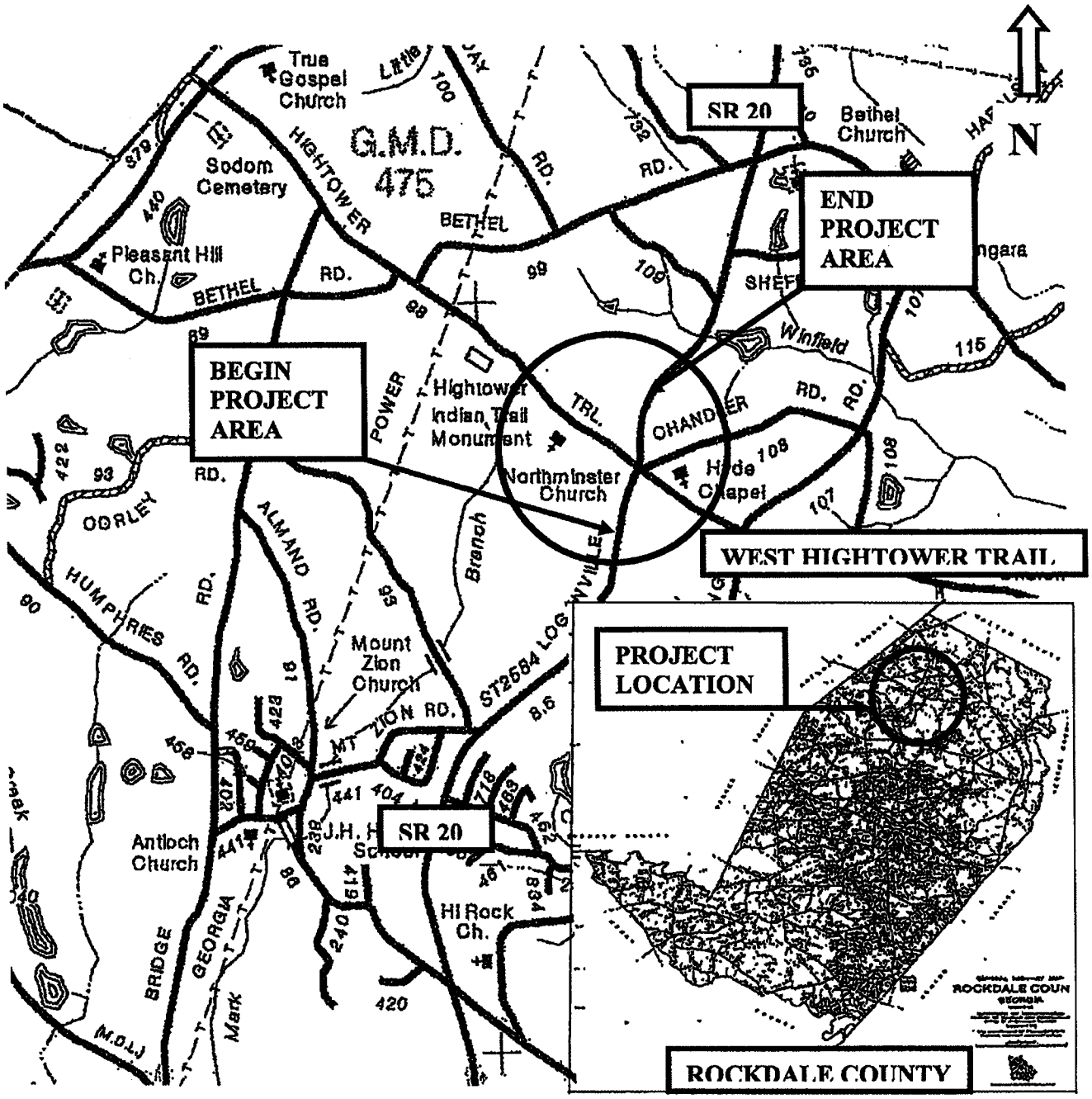
DATE_____ _____ Office of Financial Management Administrator

DATE_____ _____ State Environment/Location Engineer

DATE_____ _____ State Traffic Safety and Design Engineer

DATE_____ _____ Project Review Engineer

LOCATION MAP



Project: CSSTP-0006-00(935) **PI No.:** 0006935
Description: S.R. 20 at West Hightower Trail

Need and Purpose:
The purpose of the proposed project is to improve the operation and safety of the State Route (SR) 20 (Loganville Highway) and West Hightower Trail intersection near Conyers, Rockdale County, Georgia.

- SR 20 is an Urban Minor Arterial that runs from Pleasant Hill Road south to Sigman Road, which provides access to Interstate 20 (I-20).
- West Hightower Trail is an Urban Minor Arterial, which runs in an east-west direction from Bethel Road to Norris Lake Road.
- Chandler Road is an Urban Local Street, which runs northeast from the intersection of SR 20 (Loganville Highway) and West Hightower Trail to Zingara Road.

The existing average daily traffic (ADT) on SR 20 (Loganville Highway) in the vicinity of the SR 20/ West Hightower Trail intersection is approximately 8,911 vehicles per day (vpd), and is anticipated to increase to approximately 9,467 vpd by the build year (2010) and 14,067 vpd by the design year (2030). The existing ADT on West Hightower Trail in the vicinity of this intersection is approximately 1,486 vpd, and is anticipated to increase to approximately 1,577 vpd by the build year (2010) and 2,343 vpd by the design year.

Currently, SR 20 (Loganville Highway) has free-flow movement at this intersection, and West Hightower Trail operates under a two-way stop condition. Based on traffic data recorded in the vicinity of the SR 20/West Hightower Trail intersection, SR 20 experiences high truck traffic (14.8 percent). Chandler Road (a residential roadway) adds a fifth leg to the intersection and intersects West Hightower Trail and SR 20 at a stop condition at an undesirable skew angle which contributes to poor sight distance and undesirable turning movements.

The traffic volumes referenced above indicate that the project corridor is experiencing increasing traffic volumes that will result in a reduction in vehicular safety and increased congestion. Table 1 shows the projected build year (2010) level of service (LOS) and projected design year (2030) LOS for both the No-Build and Build conditions for the SR 20 (Loganville Highway)/West Hightower Trail intersection.

Table 1. Projected LOS for the SR 20 (Loganville Highway)/West Hightower Trail Intersection under the No-Build and Build Conditions

Year	Peak Hour	No Build	Build
2010 (Build Year)	AM	D	A
	PM	D	A
2030 (Design Year)	AM	F	A
	PM	F	A

As shown in Table 1, the SR 20 (Loganville Highway)/West Hightower Trail intersection is expected to function at a LOS D/D (AM/PM) by 2010 and LOS F/F (AM/PM) by 2030 without the proposed improvements. With the construction of the proposed improvements, the proposed project is expected to

improve the intersection to a LOS A/A (AM/PM) by both the build year and design year. The addition of left- and right-turn lanes on SR 20 and West Hightower Trail and the installation of a traffic signal at this intersection would improve traffic operations at this intersection, and would provide storage capacity for vehicles making turning movements, which would allow the mainline traffic to flow unimpeded.

The accident rate at this intersection is high, including one fatality. Accident data for this intersection for the years 2003 though 2006 are shown in Table 2. All of the accidents that occurred at this intersection between 2003 and 2006 were angle accidents.

Table 2. Accident Data for the SR 20 (Loganville Highway)/West Hightower Trail Intersection

Year	Total No. of Accidents	No. of Injuries	No. of Fatalities
2003	5	4	0
2004	7	13	0
2005	15	8	0
2006	13	21	1

It is anticipated that, without the proposed safety and operational improvements, accident rates at this intersection will increase. By constructing a cul-de-sac on Chandler Road at this intersection to eliminate the existing skewed angle at this approach, constructing left-and right-turn lanes along SR 20 and West Hightower Trail, and installing a traffic signal at this intersection, the overall operation and safety of this intersection will be improved. With the proposed construction of a cul-de-sac on Chandler Road, access for residents along Chandler Road to West Hightower Trail would continue to be provided via Zingara Road, which intersects West Hightower Trail approximately 0.4 miles east of the existing SR 20/West Hightower Trail/Chandler Road intersection.

Description of the proposed project:
Project CSSTP-0006-00(935) in Rockdale County is proposed to improve the existing intersection at SR 20 (Loganville Highway) and West Hightower Trail near Conyers, Georgia. The project includes adding 250' left and right turn lanes (with 100' tapers) to all approaches, the installation of a traffic signal at SR 20 (Loganville Highway) and West Hightower Trail and the construction of a cul-de-sac on Chandler Road. The proposed project will improve the operation and safety of this intersection.

Project Length: 0.27 miles (SR 20)
0.27 miles (West Hightower Trail)

Is the project located in a Non-attainment area? .....X.....**Yes** .....**No.** The project includes adding left and right turn lanes to all approaches, the installation of a traffic signal at SR 20 (Loganville Highway) and West Hightower Trail. This project will improve operation and safety at the intersection and will not add capacity.

PDP Classification: Major_____ Minor ___X_____

Federal Oversight: Full Oversight ( ), Exempt(X), State Funded( ), or Other ( )

Functional Classification: Urban Minor Arterial

U. S. Route Number(s): N/A **State Route Number(s):** SR20

Traffic (AADT): SR 20
Build Year: (2010) 9,467 Design Year: (2030) 14,067

Existing design features:

- Typical Section:

SR 20 - 2 – 12 ft. Lanes with 2 ft. paved shoulder and 8 ft. grassed shoulders

- Posted speed 45 mph Minimum radius for curve: N/A
- Maximum super-elevation rate for curve: 6%
- Maximum grade: 3 %
- Width of right-of-way: 100 ft.
- Major structures: N/A
- Major interchanges or intersections along the project: SR 20 at West Hightower Trail
- Existing length of roadway segment: SR 20 (0.27 miles)

West Hightower Trail - 2 – 12 ft. Lanes with 2 ft. paved shoulder and 8 ft. grassed shoulders

- Posted speed 45 mph Minimum radius for curve: N/A
- Maximum super-elevation rate for curve: 6%
- Maximum grade: 4 %
- Width of right-of-way: Varies 80-90ft.
- Major structures: N/A
- Major interchanges or intersections along the project: West Hightower Trail at SR 20
- Existing length of roadway segment: West Hightower Trail (0.27 miles)

Proposed Design Features:

- Proposed typical section(s):
  SR 20 - Rural Section consisting of 2 – 12 ft. lanes with 10' shoulders (2' paved 8' grassed) with turn lanes.

  West Hightower Trail - Rural Section consisting of 2 – 12 ft. lanes with a 10' shoulders (2' paved 8' grassed) on one side and a 12' urban shoulder consisting of 30" curb & gutter, 2' grass strip and 5' sidewalk on the other with turn lanes.

- Proposed Design Speed Mainline 45 mph
- Proposed Maximum grade Mainline 4 % Maximum grade allowable 7 %
- Proposed Maximum grade Side Street 4 % Minimum grade allowable N/A%
- Proposed Maximum grade driveway Residential 15% , Commercial 11%
- Proposed Maximum radius of curve 6500' Minimum radius allowable 643'
- Right-of-Way
  - Width 90'- 140'
  - Easements: Temporary (X), Permanent (X), Utility ( ), Other ( ).
  - Type of access control: Full ( ), Partial ( ), By Permit (X), Other ( ).
  - Number of parcels: 8 Number of displacements: 0
    - Business: _____
    - Residences: _____
    - Mobile homes: _____
    - Other: _____
- Structures:
  - Bridges: None
  - Retaining walls: None anticipated
- Major intersections and interchanges: SR 20 at West Hightower Trail
- Traffic control during construction: Maintain traffic on existing alignment
- Design Exceptions to controlling criteria anticipated:

	UNDETERMINED	YES	NO
HORIZONTAL ALIGNMENT:	( )	( )	(X)
ROADWAY WIDTH:	( )	( )	(X)
SHOULDER WIDTH:	( )	( )	(X)
VERTICAL GRADES:	( )	( )	(X)
CROSS SLOPES:	( )	( )	(X)
STOPPING SIGHT DISTANCE:	( )	( )	(X)
SUPERELEVATION RATES:	( )	( )	(X)
HORIZONTAL CLEARANCE:	( )	( )	(X)
SPEED DESIGN:	( )	( )	(X)
VERTICAL CLEARANCE:	( )	( )	(X)
BRIDGE WIDTH:	( )	( )	(X)
BRIDGE STRUCTURAL CAPACITY:	( )	( )	(X)

- Design Variances: A Design Variance is anticipated for reducing the paved shoulder width from 6.5' to 2'. The proposed total shoulder width will remain 10' (2' paved and 8' grass) as required by the GDOT Design Policy Manual.
- Environmental concerns:
  - Cemetery located on Chandler Road
  - Potential historic houses in project area
  - Two streams (Nationwide Permit if required, No Individual Permit – Minimal impacts < 200' anticipated)
- Level of environmental analysis:
  - Are Time Savings Procedures appropriate? Yes (X), No ( ),
  - Categorical exclusion (X),
  - Environmental Assessment/Finding of No Significant Impact (FONSI) ( ), or
  - Environmental Impact Statement (EIS) ( ).

- Utility involvements:
  - Atlanta Gas Light
  - AT&T
  - Comcast Communications
  - Rockdale County Water and Sewer
  - Walton EMC

VE Study Required Yes( ) No(X)

Project responsibilities:

- Design: Wolverton and Associates/Rockdale County
- Right-of-Way Acquisition: Rockdale County
- Relocation of Utilities: Rockdale County
- Letting to contract: Rockdale County
- Supervision of construction: Rockdale County
- Providing material pits: Rockdale County / Contractor
- Providing detours: N/A

Coordination

- Minutes of Initial Concept/Concept Team meeting – Included
- P A R meetings, dates and results: N/A
- FEMA, USCG, and/or TVA: N/A
- Public involvement: PIOH required (Date and location to be determined)
- Local government comments: See attached email comments
- Other projects in the area: ARC RO 254A – SR 20 from Sigman Road to Pleasant Hill Road (Long Range)
- Railroads: N/A

Scheduling – Responsible Parties' Estimate

- Time to complete the environmental process: 9 Months.
- Time to complete preliminary construction plans: 6 Months.
- Time to complete right-of-way plans: 2 Months.
- Time to complete the Section 404 Permit: 4 Months.
- Time to complete final construction plans: 4 Months.
- Time to complete to purchase right-of-way: 12 Months.
- List other major items that will affect the project schedule: N/A

Other alternates considered:

- Alternative 1: No Build. This alternative was not chosen because it did not meet the projects need and purpose.
- Alternative 2: Providing a one-lane roundabout at the intersection of SR 20 and West Hightower Trail. This alternative was not chosen when the projected volumes exceeded a roundabouts capacity.
- Alternative 3: Realign Chandler Road to tie into SR 20 at a 90 degree angle north of the intersection. This alternative was not chosen because of the potential right of way impacts and the operational problems that would be caused by having an intersection located opposite the proposed southbound turn lanes. This option would cause similar problems to the existing intersection condition.
- Alternative 4: Realign Chandler Road to tie into SR 20 at a 90 degree angle north of the intersection and make the new intersection a right in/right out. This alternative was not chosen because of the potential right of way impacts and the operational problems that would be caused by having an intersection located opposite the proposed southbound turn lanes. For this alternative to function properly, a raised median would have to be constructed along SR 20 to prevent left turns from Chandler Road onto SR 20. This option would also cause an increase to the current project limits.

Attachments:

1. Cost Estimates:
    a. Construction including E&C $1,261,507
    b. Right-of-Way $120,000
    c. Utilities $20,000
2. Concept Layout
3. Typical sections
4. Accident summaries – See traffic study
5. Capacity analysis – See traffic study
6. Minutes of Initial Concept/Concept meeting
7. Location and Design Notice - To be advertized by Rockdale County upon approval of Concept Report
8. Traffic Report
9. Benefit to Cost Analysis

Estimate Report for file "SR 20 @ WEST HIGHTOWER TRAIL"

Section ROADWAY

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	112133.00	TRAFFIC CONTROL - STP-0006-00(935)	112133.00
210-0100	1	LS	100000.00	GRADING COMPLETE - STP-0006-00(935)	100000.00
310-1101	3100	TN	22.00	GR AGGR BASE CRS, INCL MATL	68200.00
318-3000	690	TN	24.12	AGGR SURF CRS	16642.80
402-1812	1980	TN	79.60	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	157608.00
402-3121	810	TN	63.86	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	51726.60
402-3130	1170	TN	65.35	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	76459.50
402-3190	610	TN	63.79	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,INCL BITUM MATL & H LIME	38911.90
413-1000	560	GL	1.96	BITUM TACK COAT	1097.60
441-0016	90	SY	41.89	DRIVEWAY CONCRETE, 6 IN TK	3770.10
441-0018	840	SY	53.56	DRIVEWAY CONCRETE, 8 IN TK	44990.40
441-0104	380	SY	34.31	CONC SIDEWALK, 4 IN	13037.80
441-4030	450	SY	54.52	CONC VALLEY GUTTER, 8 IN	24534.00
441-6222	1000	LF	19.26	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	19260.00
444-1000	500	LF	7.98	SAWED JOINTS IN EXIST PAVEMENTS - PCC	3990.00
446-1100	4000	LF	3.21	PVMT REINF FABRIC STRIPS, TP 2, 18 INCH WIDTH	12840.00
500-9999	131	CY	175.24	CLASS B CONC, BASE OR PVMT WIDENING	22956.44
550-1180	100	LF	46.84	STORM DRAIN PIPE, 18 IN, H 1-10	4684.00
550-1240	200	LF	53.16	STORM DRAIN PIPE, 24 IN, H 1-10	10632.00
550-1360	100	LF	87.01	STORM DRAIN PIPE, 36 IN, H 1-10	8701.00
550-1420	100	LF	111.91	STORM DRAIN PIPE, 42 IN, H 1-10	11191.00
550-2180	600	LF	32.85	SIDE DRAIN PIPE, 18 IN, H 1-10	19710.00
550-3324	4	EA	1005.30	SAFETY END SECTION 24 IN, STORM DRAIN, 4:1 SLOPE	4021.20
550-3336	2	EA	2165.43	SAFETY END SECTION 36 IN, STORM DRAIN, 4:1 SLOPE	4330.86
550-3418	20	EA	626.89	SAFETY END SECTION 18 IN, SIDE DRAIN, 4:1 SLOPE	12537.80
550-3618	12	EA	664.53	SAFETY END SECTION 18 IN, SIDE DRAIN, 6:1 SLOPE	7974.36
603-2181	500	SY	44.24	STN DUMPED RIP RAP, TP 3, 18 IN	22120.00
603-2182	500	SY	55.10	STN DUMPED RIP RAP, TP 3, 24 IN	27550.00
603-7000	1000	SY	5.15	PLASTIC FILTER FABRIC	5150.00
634-1200	6	EA	102.34	RIGHT OF WAY MARKERS	614.04
641-1100	500	LF	46.93	GUARDRAIL, TP T	23465.00
641-5001	2	EA	633.52	GUARDRAIL ANCHORAGE, TP 1	1267.04
641-5012	2	EA	1813.66	GUARDRAIL ANCHORAGE, TP 12	3627.32
668-1100	3	EA	2833.11	CATCH BASIN, GP 1	8499.33
668-2100	3	EA	3118.14	DROP INLET, GP 1	9354.42
				Section Sub Total:	**$953,587.51**

Section PERMANENT EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
700-6910	2	AC	1084.13	PERMANENT GRASSING	2168.26
700-7000	4	TN	60.72	AGRICULTURAL LIME	242.88
700-7010	5	GL	22.95	LIQUID LIME	114.75

700-8000	3	TN	296.43	FERTILIZER MIXED GRADE	889.29
700-8100	100	LB	2.48	FERTILIZER NITROGEN CONTENT	248.00
				Section Sub Total:	**$3,663.18**

Section TEMPORARY EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	1	AC	730.08	TEMPORARY GRASSING	730.08
163-0240	20	TN	174.44	MULCH	3488.80
163-0300	2	EA	1721.91	CONSTRUCTION EXIT	3443.82
163-0501	10	EA	823.90	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 1	8239.00
163-0503	10	EA	540.38	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 3	5403.80
163-0522	30	EA	88.73	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS - TYPE A SILT FENCE	2661.90
163-0523	30	EA	143.29	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS - TYPE C SILT FENCE	4298.70
163-0550	10	EA	297.02	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	2970.20
165-0010	1600	LF	0.81	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	1296.00
165-0030	800	LF	1.63	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	1304.00
165-0040	60	EA	66.12	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	3967.20
165-0085	10	EA	190.58	MAINTENANCE OF SILT CONTROL GATE, TP 1	1905.80
165-0087	5	EA	168.29	MAINTENANCE OF SILT CONTROL GATE, TP 3	841.45
165-0101	2	EA	592.87	MAINTENANCE OF CONSTRUCTION EXIT	1185.74
165-0105	10	EA	102.35	MAINTENANCE OF INLET SEDIMENT TRAP	1023.50
167-1000	2	EA	1207.94	WATER QUALITY MONITORING AND SAMPLING	2415.88
167-1500	12	MO	984.19	WATER QUALITY INSPECTIONS	11810.28
171-0010	3100	LF	1.81	TEMPORARY SILT FENCE, TYPE A	5611.00
171-0030	1600	LF	4.04	TEMPORARY SILT FENCE, TYPE C	6464.00
643-8200	200	LF	3.12	BARRIER FENCE (ORANGE), 4 FT	624.00
				Section Sub Total:	**$69,685.15**

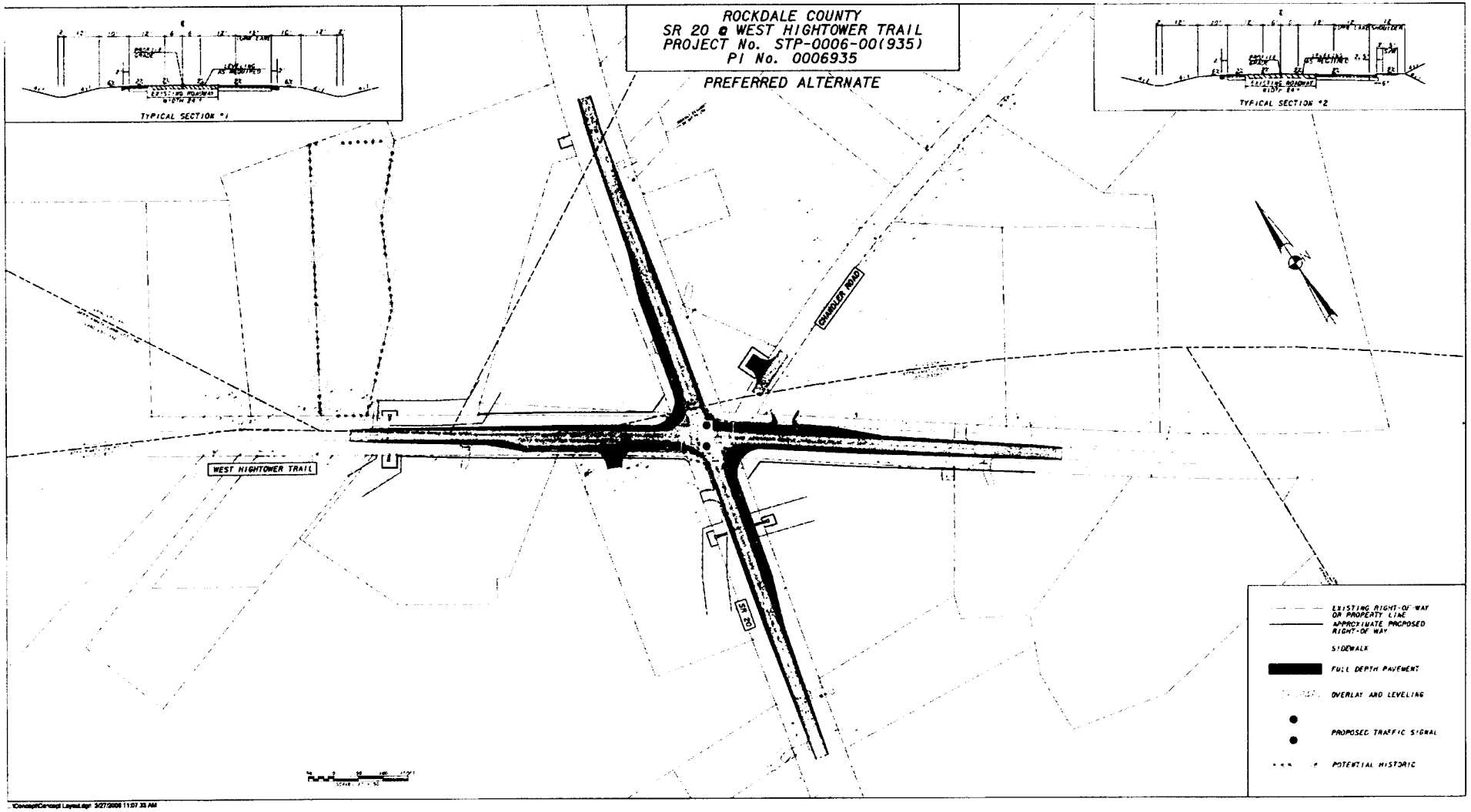
Section SIGNING AND MARKING AND SIGNALS

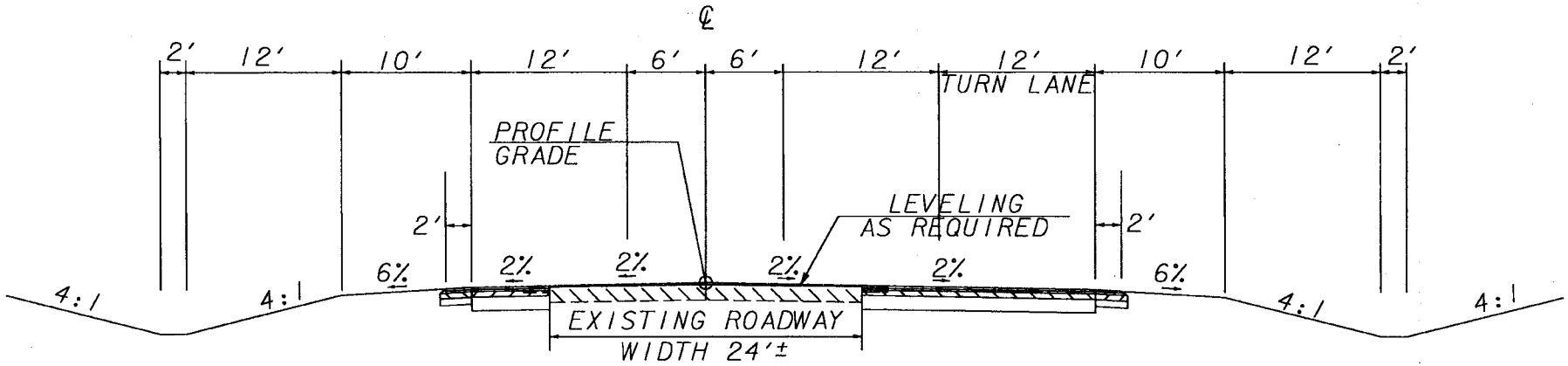
Item Number	Quantity	Units	Unit Price	Item Description	Cost
636-1020	50	SF	15.11	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	755.50
636-1031	50	SF	19.00	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING TP 6	950.00
636-2070	100	LF	8.09	GALV STEEL POSTS, TP 7	809.00
636-2080	100	LF	9.36	GALV STEEL POSTS, TP 8	936.00
636-2090	100	LF	8.91	GALV STEEL POSTS, TP 9	891.00
639-3004	4	EA	10993.91	STEEL STRAIN POLE, TP IV	43975.64
647-1000	1	LS	50739.19	TRAFFIC SIGNAL INSTALLATION NO -	50739.19
653-0120	21	EA	73.81	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	1550.01
653-1501	6350	LF	0.69	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	4381.50
653-1502	6460	LF	0.65	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	4199.00
653-1704	120	LF	4.19	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	502.80
653-1804	1600	LF	2.11	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	3376.00
653-2501	2	LM	1359.19	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	2718.38
653-2502	2	LM	1381.90	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	2763.80
653-3501	800	GLF	0.56	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	448.00

653-4501	1	GLM	892.13	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	892.13
				Section Sub Total:	**$119,887.95**

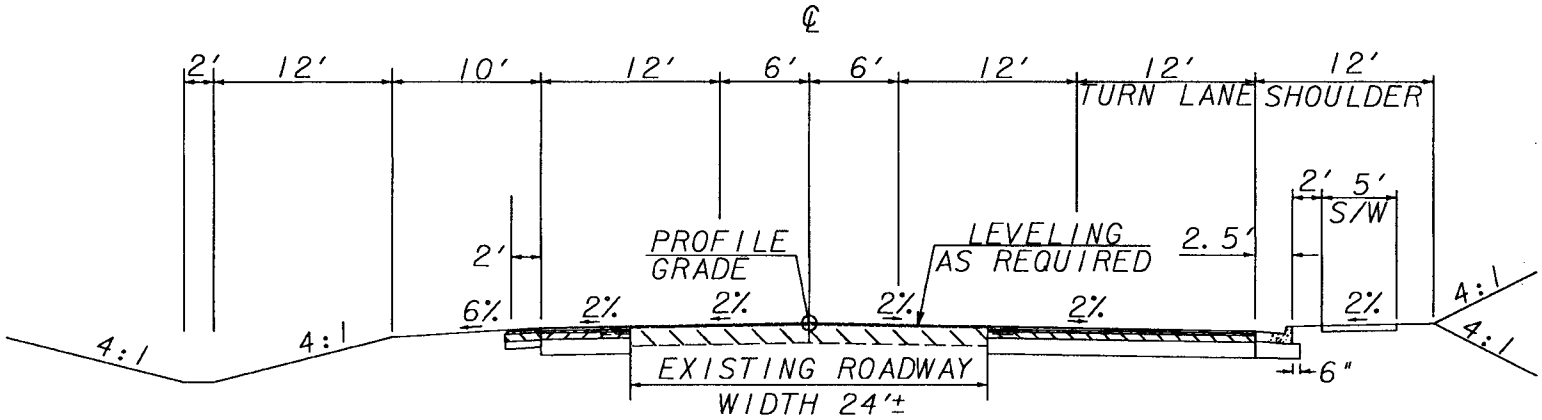
Total Estimated Cost: $1,146,823.79

Subtotal Construction Cost	**$1,146,823.79**
E&C Rate 10.0 %	$114,682.38
Inflation Rate 0 % @ 0 Years	$0.00
Total Construction Cost	**$1,261,506.17**
Right Of Way	$120,000.00
ReImb. Utilities	$20,000.00
Grand Total Project Cost	**$1,401,506.17**


ROCKDALE COUNTY
SR 20 @ WEST HIGHTOWER TRAIL
PROJECT No. STP-0006-00(935)
PI No. 0006935
PREFERRED ALTERNATE
TYPICAL SECTION #1
TYPICAL SECTION #2
CHANDLER ROAD
WEST HIGHTOWER TRAIL
SR 20
EXISTING RIGHT-OF-WAY OR PROPERTY LINE
APPROXIMATE PROPOSED RIGHT-OF-WAY
SIDEWALK
FULL DEPTH PAVEMENT
OVERLAY AND LEVELING
PROPOSED TRAFFIC SIGNAL
POTENTIAL HISTORIC



TYPICAL SECTION #1



TYPICAL SECTION #2

770-447-8999
770-447-9070 Fax
www.wolverton-assoc.com

Wolverton & Associates

6745 Sugarloaf Parkway ♦ Suite 100
Duluth, Georgia 30097

STATUS UPDATE MEETING MINUTES

LOCATION: GDOT District 7 Chamblee Office, Conference Room 144

MEETING DATE: Wednesday, January 23, 2008, 10:00 AM

RE: S.R. 20 @ WEST HIGHTOWER TRAIL ROAD INTERSECTION IMPROVEMENTS PROJECT INITIAL CONCEPT MEETING
Rockdale County Project No. 0006935

ATTENDEES:
Shannon Hebb – Rockdale County
Dave Robbins – District 7 Preconstruction GDOT
Adrian Jackson – District 7 Preconstruction GDOT
Pam Black – GDOT
Mike Lobdell – GDOT
Michelle Cheves – GDOT
Wade Woodard – GDOT
Kevin Wilson – GDOT
Scott Lee – GDOT
Mario Macrina – Wolverton & Associates, Inc.
Dennis Riles – Wolverton & Associates, Inc.

- Mario Macrina opened the meeting with an introduction and welcomed everyone.
- After all introductions were made, Dennis Riles proceeded to give a brief description of the existing and proposed conditions of S.R. 20 @ West Hightower Trail Road.
- Mr. Macrina began reviewing the concept report. General comments were made on the Cover Page and Location Map.
- Scott Lee indicated that the "Need and Purpose" statement needed to be revised to discuss the five legged intersection with stop control. Mr. Lee also stated that the concept report shows the 85th percentile speed within the "Need and Purpose" is 61 mph. The GDOT Design Policy Manual recommends that roadways be designed according to the 85th percentile.
- Mr. Lee questioned if the design of S.R.20 needed to be designed for 60 mph to more closely meet 85th percentile speed of the roadway.
- Mr. Macrina and Shannon Hebb stated that the addition of the signal at the intersection should decrease the travel speed through the intersection. They also discussed using traffic calming devices to decrease the speed that vehicles are traveling (Signage, Rumble Strips and Law Enforcement).
- Mike Lobdell recommended that the speed design be increased to 60 mph.

- Mr. Macrina stated that increasing the speed design, the project's construction cost would increase significantly. A cost comparison should be made on the current speed design of 45 mph vs. the recommended design speed of 60 mph.

- Adrian Jackson stated that the overall Schedule shown in the concept will need to be updated.

- Mr. Macrina stated that Wolverton & Associates would explore other options on the speed design issue with the Rockdale County. GDOT indicated that they were open to exploring other possibilities.

- The meeting was concluded at 11:00 am.

NOTICE OF LOCATION AND DESIGN APPROVAL

CSSTP-0006-00(935), Rockdale County
P. I. 0006935

Notice is hereby given in compliance with Georgia Code 22-2-109 that the Georgia Department of Transportation has approved the Location and Design of this project.

The date of location approval is_____

The project proposes to improve the existing intersection at SR 20 (Loganville Highway) and West Hightower Trail in Conyers, Georgia. The project includes adding 250' left and right turn lanes (with 100' tapers) to all approaches, the installation of a traffic signal at SR 20 (Loganville Highway) and West Hightower Trail and the construction of a cul-de-sac on Chandler Road. The proposed project will improve the operation and safety of this intersection. This project lies within land lots 311,330 and 331 of the 16th District of Rockdale County, Georgia.

Drawings or maps or plats of the proposed project, as approved, are on file and are available for public inspection at the Georgia Department of Transportation:

Thomas Parker, Area Engineer
Georgia Department of Transportation
Email: Thom.parker@dot.state.ga.us
805 George Luther Drive
Decatur, Ga. 30032
Phone:(404)-299-4386

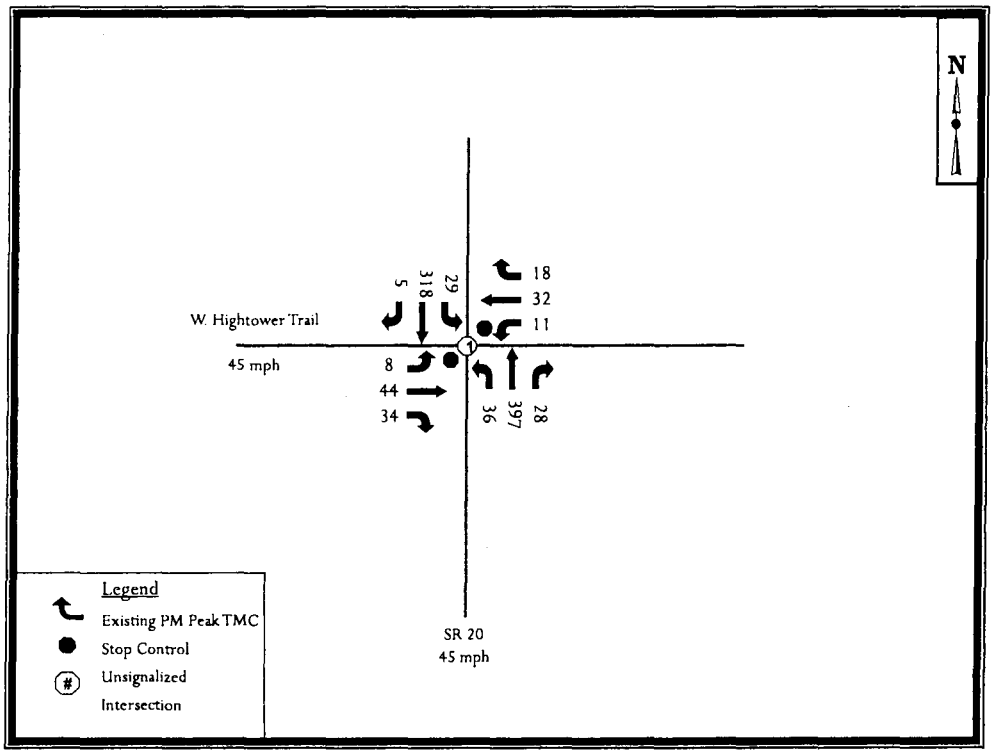
Any interested party may obtain a copy of the drawings or maps or plats or portions thereof by paying a nominal fee and requesting in writing to:

Mike Lobdell, District Preconstruction Engineer
Georgia Department of Transportation
Email: mike.lobdell@dot.state.ga.us
5025 New Peachtree Road
Chamblee, Georgia 30341
Phone: (770) 986-1257

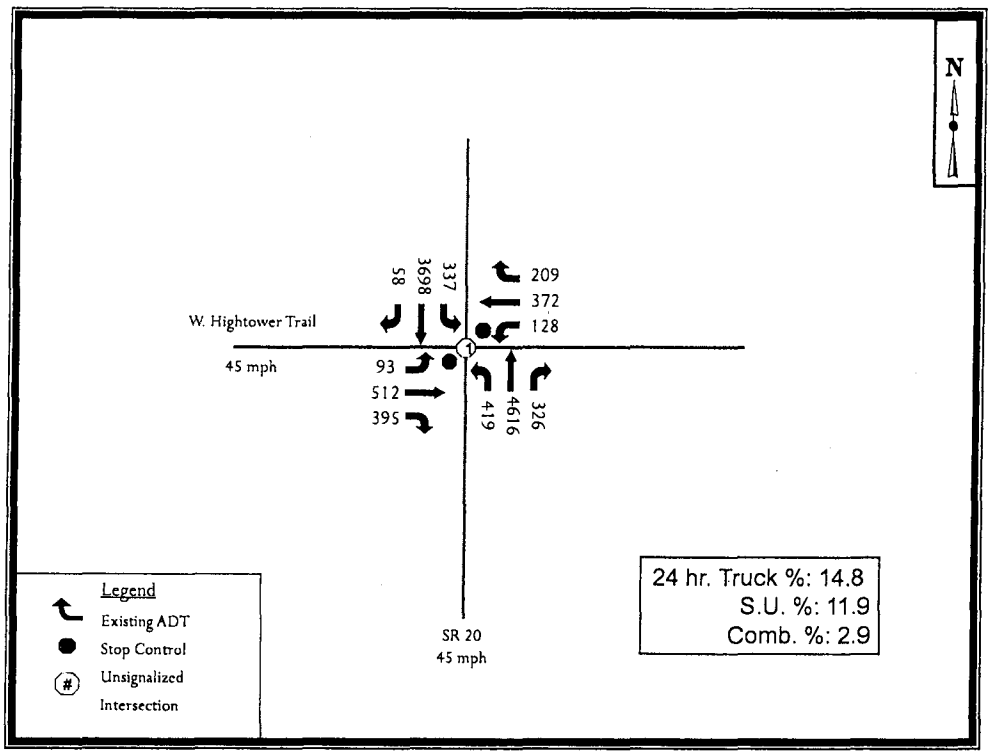
Any written request or communication in reference to this project or notice SHOULD include the Project and P. I. Numbers as noted at the top of this notice.

Wolverton & Associates Project 07-912
SR 20 @ W. Hightower Road
GDOT Project Number: STP-0006-00(935)
Rockdale County Project Number: O-40
Intersection Safety Improvement Study Volumes

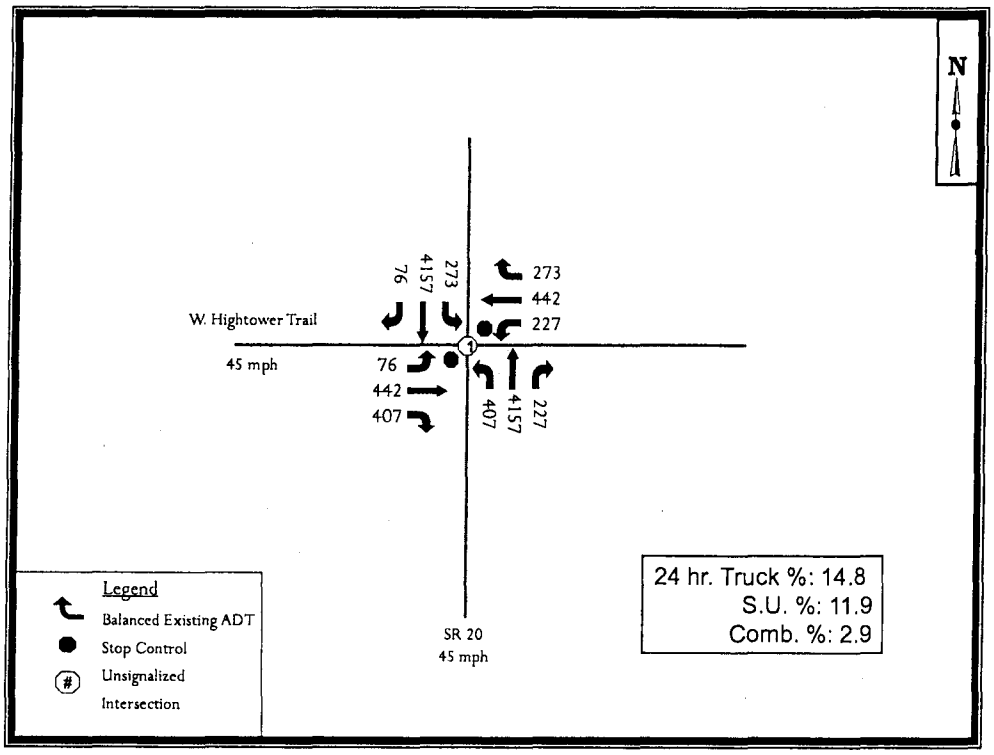
Existing PM TMC Counts:



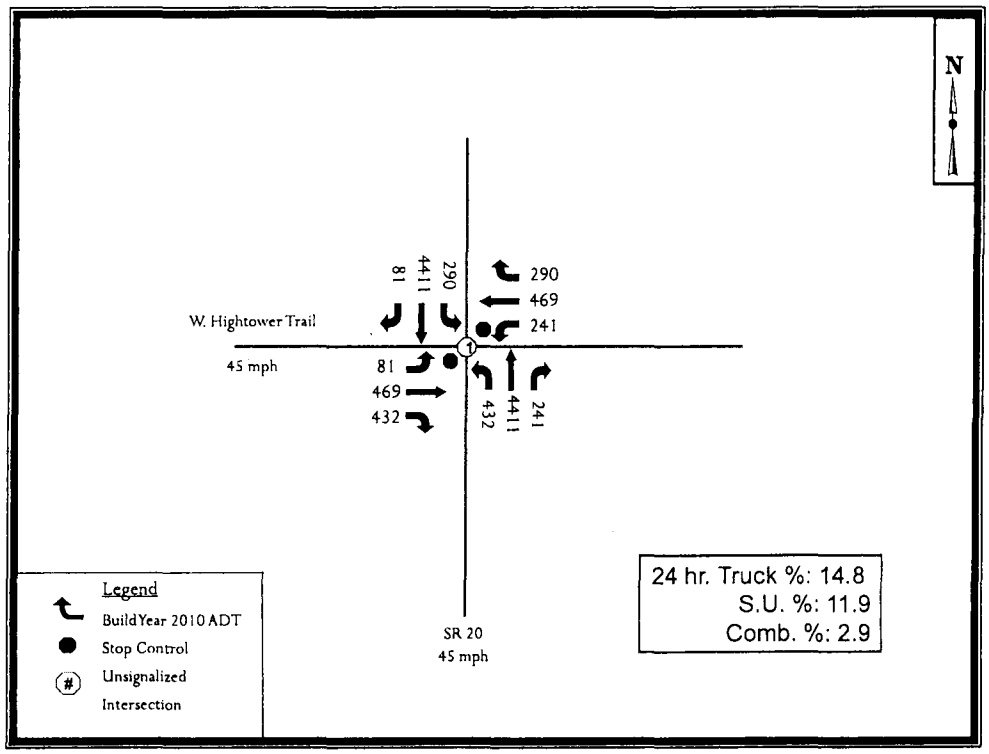
Existing ADT:



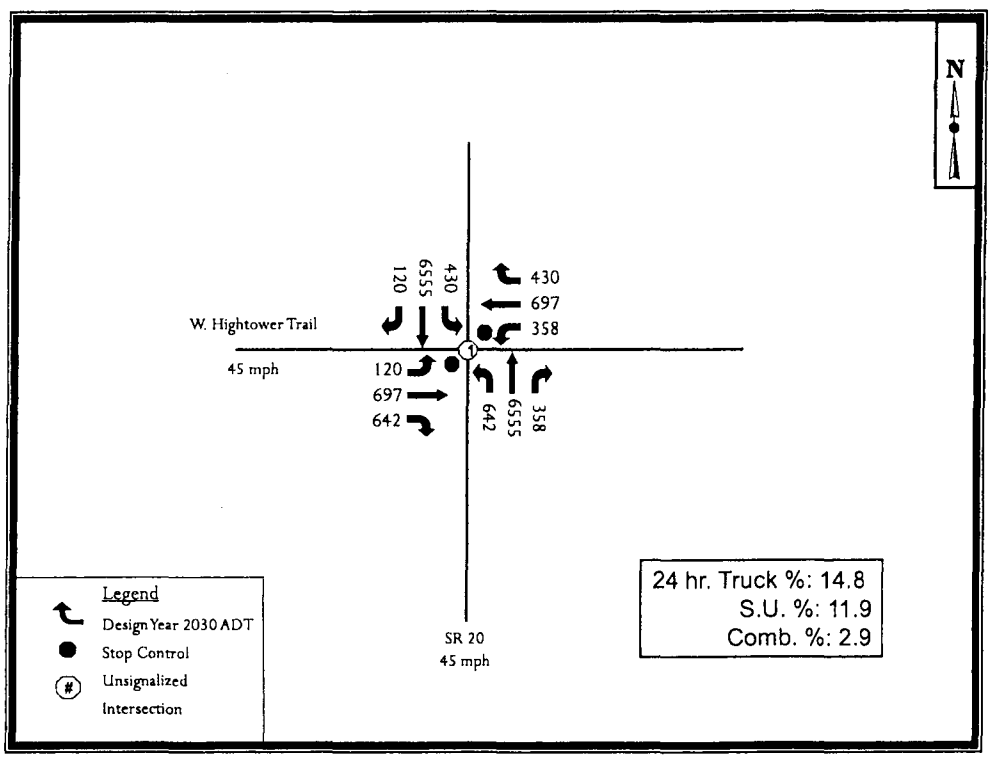
Existing Balanced ADT:



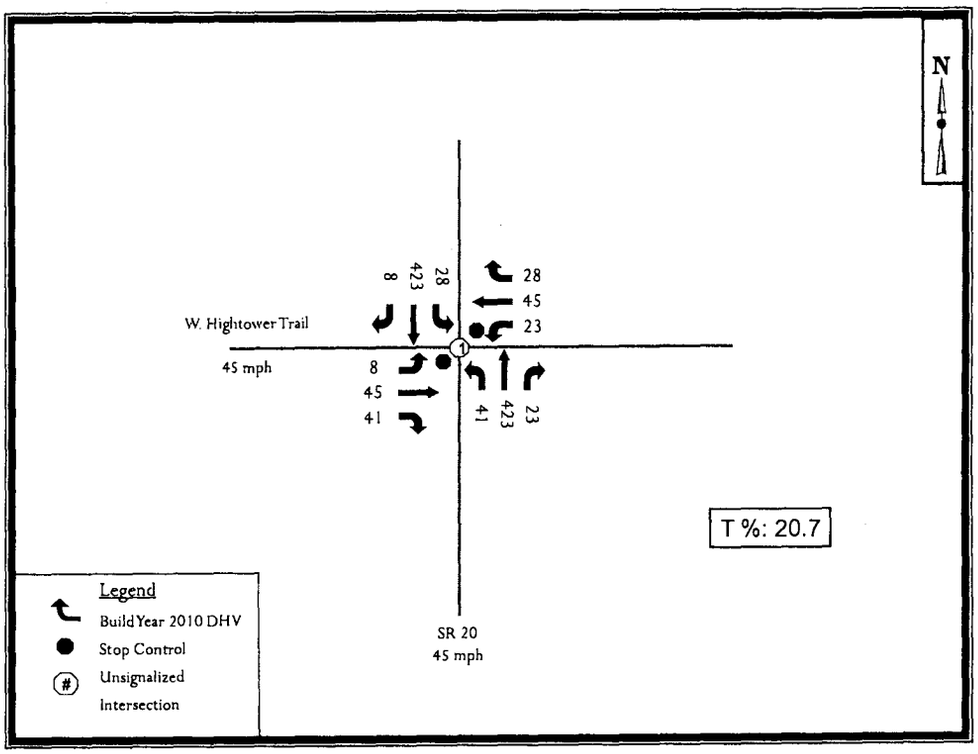
Build Year 2010 ADT:



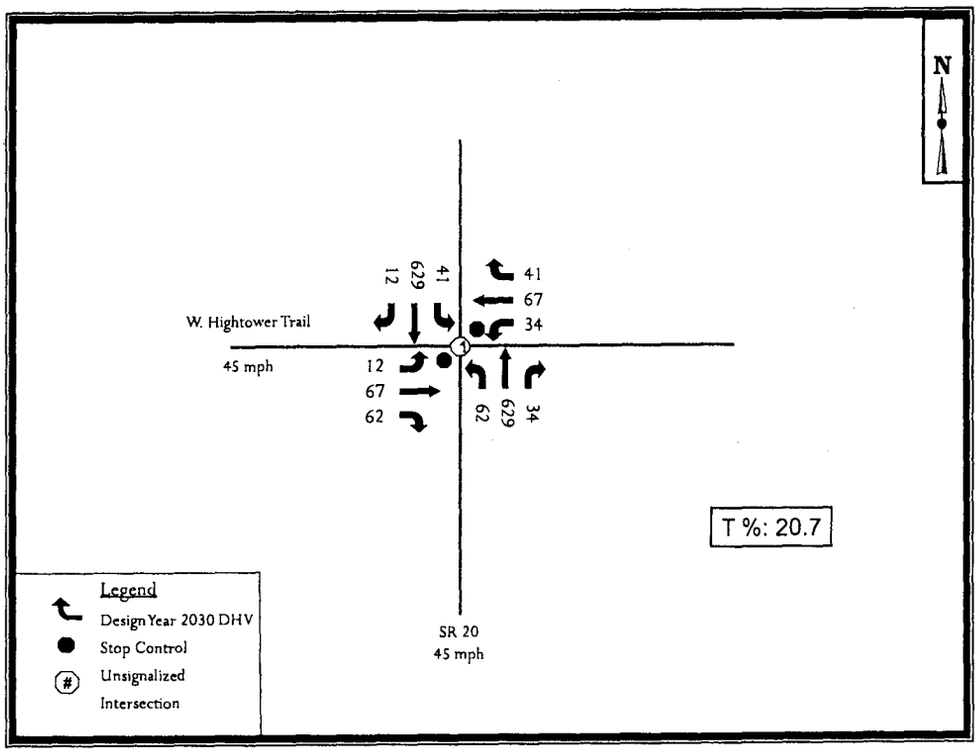
Design Year 2030 ADT:



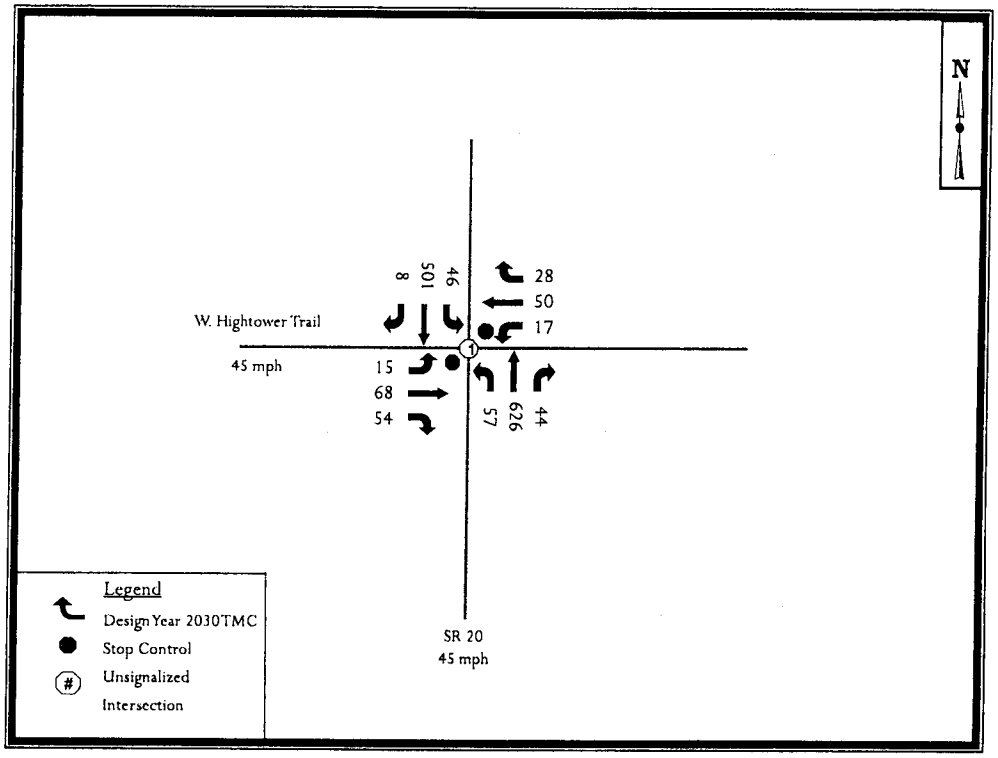
Build Year 2010 DHV:



Design Year 2030 DHV:



Study Design Year Volumes Based on TMC's:



The last two figures display the volumes that are generated from the OEL standard method for projecting volumes and the standard TMC and growth rate projections respectively. Originally the projections were not done using the OEL Standard method because it was not known to us that the volumes would need to be approved by OEL.

After using both method to find the volumes; our report projections and the OEL method projections seems to be similar with most of the volumes less than 10% different.

Movement	Existing PM TMC	K Factor	Existing ADT	Balanced ADT	Growth Rate	Build Year 2010 ADT	Design Year 2030 ADT	K Factor	Build Year 2010 DHV	Design Year 2030 DHV
NBL	36	8.6%	419	407	2%	432	642	9.6%	41	62
NB	397	8.6%	4616	4157	2%	4411	6555	9.6%	423	629
NBR	28	8.6%	326	227	2%	241	358	9.6%	23	34
SBL	29	8.6%	337	273	2%	290	430	9.6%	28	41
SB	318	8.6%	3698	4157	2%	4411	6555	9.6%	423	629
SBR	5	8.6%	58	76	2%	81	120	9.6%	8	12
EBL	8	8.6%	93	76	2%	81	120	9.6%	8	12
EB	44	8.6%	512	442	2%	469	697	9.6%	45	67
EBR	34	8.6%	395	407	2%	432	642	9.6%	41	62
WBL	11	8.6%	128	227	2%	241	358	9.6%	23	34
WB	32	8.6%	372	442	2%	469	697	9.6%	45	67
WBR	18	8.6%	209	273	2%	290	430	9.6%	28	41

Date: December 4, 2007

Response to: Comments on Project Concept report

In the project concept report, the Vehicle Classification by Functional Classification and Hour for Urban Minor Arterials is a statewide average found on the Georgia Department of Transportation website. This average is 3.97% trucks for the 6 PM hour and 5.4% for an average 24-hour period. This data is not specific to the SR 20 & W. Hightower Road location.

Based on classification counts that were collected on SR 20 just north of the intersection of W. Hightower Road on August 22, 2007, we found that the 24-hour truck percentage was 14.8%. The following table shows the tabulated percentages from the classification count data which is attached.

	Northbound		Soutbound		Average		Total
	S.U.	COMB.	S.U.	COMB.	S.U.	COMB.	
AM Peak	15.6%	5.1%	15.9%	4.6%	15.8%	4.9%	20.7%
PM Peak	6.8%	1.6%	8.1%	4.5%	7.5%	3.1%	10.6%
24 hour	12.4%	3.0%	11.4%	2.9%	11.9%	2.9%	14.8%

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Northbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
08/22/07	0	9	3	0	1	0	0	0	0	0	0	0	0	0	13
00:15	0	3	1	1	2	0	0	0	0	0	0	0	0	0	7
00:30	0	3	4	1	0	0	0	0	0	0	0	0	0	0	8
00:45	0	2	2	0	1	0	0	0	0	0	0	0	0	0	5
	0	17	10	2	4	0	0	0	0	0	0	0	0	0	33
01:00	0	3	2	1	0	0	0	0	0	0	0	0	0	0	6
01:15	0	3	2	1	2	0	0	0	0	0	0	0	0	0	8
01:30	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
01:45	0	2	1	0	1	0	0	0	0	0	0	0	0	0	4
	0	14	7	2	3	0	0	0	0	0	0	0	0	0	26
02:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:15	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
02:30	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:45	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
	0	7	7	0	1	0	0	0	0	0	0	0	0	0	15
03:00	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
03:15	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
03:30	0	6	2	1	1	0	0	0	0	0	0	0	0	0	10
03:45	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
	0	15	8	1	3	0	0	0	0	0	0	0	0	0	27
04:00	0	4	1	1	2	0	0	0	0	0	0	0	0	0	8
04:15	0	9	2	1	2	0	0	0	0	0	0	0	0	0	14
04:30	0	4	2	1	0	0	0	1	0	0	0	0	0	0	8
04:45	0	3	2	0	2	0	0	0	0	0	0	0	0	0	7
	0	20	7	3	6	0	0	1	0	0	0	0	0	0	37
05:00	0	3	8	0	2	0	0	0	0	0	0	0	0	0	13
05:15	0	16	8	2	4	0	0	2	0	0	0	0	0	0	32
05:30	0	20	11	3	4	0	0	1	0	0	0	0	0	0	39
05:45	0	21	9	1	3	0	0	1	0	0	0	0	0	0	35
	0	60	36	6	13	0	0	4	0	0	0	0	0	0	119
06:00	0	26	9	2	4	0	0	2	0	0	0	0	0	0	43
06:15	0	28	14	3	5	0	0	2	0	0	1	0	0	0	53
06:30	0	39	27	7	13	1	0	4	0	0	0	0	0	0	91
06:45	0	48	28	4	13	0	0	4	0	0	0	0	0	0	97
	0	141	78	16	35	1	0	12	0	0	1	0	0	0	284
07:00	0	58	21	3	9	0	0	4	0	0	0	0	0	0	95
07:15	0	52	18	5	6	1	0	5	0	1	1	0	0	0	89
07:30	0	44	25	6	13	0	0	3	0	0	0	0	0	0	91
07:45	1	40	20	5	7	0	0	3	0	0	1	0	0	0	77
	1	194	84	19	35	1	0	15	0	1	2	0	0	0	352
08:00	0	42	21	4	6	0	0	1	1	0	0	0	0	0	75
08:15	0	42	15	4	6	0	0	3	0	0	0	0	1	0	71
08:30	1	36	13	1	4	0	0	3	0	0	0	0	0	0	58
08:45	0	27	14	2	10	0	0	2	0	0	0	0	0	0	55
	1	147	63	11	26	0	0	9	1	0	0	0	1	0	259
09:00	0	28	13	3	7	0	0	2	0	0	0	0	0	0	53
09:15	0	27	11	4	9	0	0	2	0	0	0	0	0	0	53
09:30	0	27	15	3	6	0	0	4	0	0	0	0	0	0	55
09:45	0	21	10	2	5	0	0	2	0	0	0	0	0	0	40
	0	103	49	12	27	0	0	10	0	0	0	0	0	0	201
10:00	0	27	10	2	8	0	0	2	0	0	0	0	0	0	49
10:15	0	26	12	0	5	0	0	1	0	0	0	0	0	0	44
10:30	0	10	8	1	3	0	0	1	0	0	0	0	0	0	23
10:45	0	20	6	0	5	0	0	1	0	0	0	0	0	0	32
	0	83	36	3	21	0	0	5	0	0	0	0	0	0	148
11:00	0	27	12	1	4	0	0	1	0	0	0	0	0	0	45
11:15	0	12	16	0	4	0	0	2	0	0	0	0	0	0	34
11:30	0	24	15	0	4	0	0	0	0	0	0	0	0	0	43
11:45	0	20	13	0	2	0	0	1	0	0	0	0	0	0	36
	0	83	56	1	14	0	0	4	0	0	0	0	0	0	158
Total	2	884	441	76	188	2	0	60	1	1	3	0	1	0	1659
Percent	0.1%	53.3%	26.6%	4.6%	11.3%	0.1%	0.0%	3.6%	0.1%	0.1%	0.2%	0.0%	0.1%	0.0%	

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Northbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
12 PM	0	36	17	0	10	0	0	1	0	0	0	0	0	0	64
12:15	0	39	15	0	5	0	0	0	0	0	0	0	0	0	59
12:30	0	24	18	0	4	0	0	1	0	0	0	0	0	0	47
12:45	0	38	13	0	9	0	0	0	0	0	0	0	0	0	60
	0	137	63	0	28	0	0	2	0	0	0	0	0	0	230
13:00	0	18	19	0	7	0	0	3	0	0	0	0	0	0	47
13:15	0	32	15	0	3	0	0	0	0	0	0	0	0	0	50
13:30	0	16	13	0	5	0	0	0	0	0	0	0	0	0	34
13:45	0	16	17	0	4	0	0	2	0	0	0	0	1	0	40
	0	82	64	0	19	0	0	5	0	0	0	0	1	0	171
14:00	0	27	18	1	10	0	0	4	0	0	0	0	0	0	60
14:15	1	39	15	0	12	0	1	1	0	0	0	0	0	0	69
14:30	0	33	18	1	6	0	0	1	1	0	0	0	0	0	60
14:45	0	42	8	1	1	0	0	1	0	0	0	0	0	0	53
	1	141	59	3	29	0	1	7	1	0	0	0	0	0	242
15:00	0	50	22	0	4	0	0	2	0	0	0	0	0	0	78
15:15	0	28	22	1	6	0	0	0	0	1	0	0	0	0	58
15:30	0	39	12	0	7	0	0	1	0	0	0	0	0	0	59
15:45	0	44	28	1	6	0	0	3	0	0	0	0	0	0	82
	0	161	84	2	23	0	0	6	0	1	0	0	0	0	277
16:00	0	47	17	0	8	0	0	0	0	0	0	0	0	0	72
16:15	0	57	20	0	10	0	0	6	0	0	1	0	0	0	94
16:30	0	61	21	0	9	0	0	0	0	0	0	0	0	0	91
16:45	0	65	25	0	8	0	0	2	0	0	0	0	0	0	100
	0	230	83	0	35	0	0	8	0	0	1	0	0	0	357
17:00	0	76	19	0	9	0	0	2	0	0	0	0	0	0	106
17:15	0	79	23	1	7	0	1	1	0	0	0	0	0	0	112
17:30	1	76	21	1	4	0	0	2	0	0	0	0	0	0	105
17:45	1	72	24	2	4	0	0	1	0	1	0	0	0	0	105
	2	303	87	4	24	0	1	6	0	1	0	0	0	0	428
18:00	0	60	22	1	11	1	0	3	0	1	0	0	0	0	99
18:15	0	44	16	1	5	0	0	3	0	0	0	0	0	0	69
18:30	0	39	13	0	6	0	0	0	0	0	0	0	0	0	58
18:45	0	48	15	2	5	0	0	2	0	0	0	0	0	0	72
	0	191	66	4	27	1	0	8	0	1	0	0	0	0	298
19:00	0	42	14	3	7	0	0	0	0	0	0	0	0	0	66
19:15	0	39	16	1	4	0	0	2	0	0	0	0	0	0	62
19:30	0	30	16	3	4	0	0	0	1	0	0	0	1	0	55
19:45	0	30	14	1	3	1	0	0	0	0	0	0	0	0	49
	0	141	60	8	18	1	0	2	1	0	0	0	1	0	232
20:00	0	21	15	2	4	0	0	2	0	0	0	0	0	0	44
20:15	0	32	13	1	8	0	0	1	0	0	0	0	1	0	56
20:30	0	34	18	0	7	0	0	1	0	0	0	0	0	0	60
20:45	0	36	19	2	3	0	0	1	0	0	0	0	0	0	61
	0	123	65	5	22	0	0	5	0	0	0	0	1	0	221
21:00	0	24	9	1	2	0	0	0	0	0	0	0	0	0	36
21:15	0	34	11	0	3	0	0	1	0	0	0	0	0	0	49
21:30	0	32	8	0	4	1	0	2	0	0	0	0	0	0	47
21:45	0	26	8	1	4	0	0	1	0	0	0	0	0	0	40
	0	116	36	2	13	1	0	4	0	0	0	0	0	0	172
22:00	0	26	6	0	3	0	0	1	0	0	0	0	0	0	36
22:15	0	20	9	2	1	0	0	0	0	0	0	0	0	0	32
22:30	0	16	2	0	2	0	0	0	0	0	0	0	0	0	20
22:45	0	12	4	0	1	0	0	0	0	0	0	0	0	0	17
	0	74	21	2	7	0	0	1	0	0	0	0	0	0	105
23:00	0	6	4	1	1	0	0	0	0	0	0	0	0	0	12
23:15	0	12	4	1	4	0	0	1	0	0	0	0	0	0	22
23:30	0	6	2	1	0	0	0	0	0	0	0	0	0	0	9
23:45	0	12	3	0	1	0	0	0	0	0	0	0	0	0	16
	0	36	13	3	6	0	0	1	0	0	0	0	0	0	59
Total	3	1735	701	33	251	3	2	55	2	3	1	0	3	0	2792
Percent	0.1%	62.1%	25.1%	1.2%	9.0%	0.1%	0.1%	2.0%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	
Grand Total	5	2619	1142	109	439	5	2	115	3	4	4	0	4	0	4451
Percent	0.1%	58.8%	25.7%	2.4%	9.9%	0.1%	0.0%	2.6%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Southbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
08/22/07	0	10	3	2	0	0	0	0	0	0	0	0	0	0	15
00:15	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
00:30	0	4	6	0	3	0	0	0	0	0	0	0	0	0	13
00:45	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
	0	20	13	2	3	0	0	0	0	0	0	0	0	0	38
01:00	0	2	3	0	0	0	0	0	0	0	0	0	0	0	5
01:15	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
01:30	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
01:45	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
	0	6	8	0	0	0	0	0	0	0	0	0	0	0	14
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:15	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:30	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:45	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
	0	7	4	0	0	0	0	0	0	0	0	0	0	0	11
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:15	0	2	3	0	0	0	0	0	0	0	0	0	0	0	5
03:30	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
03:45	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
	0	13	9	0	0	0	0	0	0	0	0	0	0	0	22
04:00	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
04:15	0	10	3	0	2	0	0	0	0	0	0	0	0	0	15
04:30	0	8	3	0	0	0	0	0	0	0	0	0	0	0	11
04:45	0	11	3	0	0	0	0	0	0	0	0	0	0	0	14
	0	32	11	0	2	0	0	0	0	0	0	0	0	0	45
05:00	0	19	4	0	0	0	0	0	0	0	0	0	0	0	23
05:15	0	24	9	2	3	0	0	2	0	0	0	0	0	0	40
05:30	0	22	9	2	4	0	0	1	0	0	0	0	1	0	39
05:45	0	29	7	1	1	0	0	0	0	0	0	0	0	0	38
	0	94	29	5	8	0	0	3	0	0	0	0	1	0	140
06:00	0	25	7	1	3	0	0	1	0	0	0	0	0	0	37
06:15	0	31	11	2	5	0	0	1	0	0	0	0	0	0	50
06:30	0	35	13	4	5	0	0	1	0	0	0	0	0	0	58
06:45	0	33	15	5	7	0	0	3	0	0	0	0	0	0	63
	0	124	46	12	20	0	0	6	0	0	0	0	0	0	208
07:00	0	39	18	4	5	0	0	4	0	0	0	0	0	0	70
07:15	0	50	21	5	10	0	0	5	0	0	0	0	0	0	91
07:30	0	65	23	5	16	0	0	2	0	0	0	0	0	0	111
07:45	0	57	21	6	8	0	0	5	1	0	0	0	0	0	98
	0	211	83	20	39	0	0	16	1	0	0	0	0	0	370
08:00	0	37	24	3	5	0	0	2	0	0	0	0	0	0	71
08:15	0	37	17	3	7	1	0	2	0	0	0	0	0	0	67
08:30	0	34	14	4	6	0	0	1	0	0	0	0	0	0	59
08:45	0	35	16	2	5	0	0	1	0	0	0	0	0	0	59
	0	143	71	12	23	1	0	6	0	0	0	0	0	0	256
09:00	0	35	22	4	8	0	0	2	0	0	0	0	0	0	71
09:15	0	43	22	3	4	0	0	4	0	0	0	0	0	0	76
09:30	0	35	17	4	7	0	0	1	0	0	0	0	0	0	64
09:45	0	31	16	2	9	0	0	1	0	0	0	0	0	0	59
	0	144	77	13	28	0	0	8	0	0	0	0	0	0	270
10:00	0	29	25	4	8	0	0	1	0	0	0	0	0	0	67
10:15	0	34	19	1	7	0	0	0	0	0	0	0	0	0	61
10:30	0	43	24	0	14	0	0	1	0	0	0	0	0	0	82
10:45	0	36	17	0	7	0	0	1	0	0	0	0	0	0	61
	0	142	85	5	36	0	0	3	0	0	0	0	0	0	271
11:00	0	32	13	0	4	0	0	2	0	1	0	0	0	0	52
11:15	0	26	11	2	2	0	0	1	0	0	0	0	0	0	42
11:30	0	23	14	0	7	0	0	4	0	0	0	0	0	0	48
11:45	0	29	20	0	7	0	0	0	0	0	0	0	0	0	56
	0	110	58	2	20	0	0	7	0	1	0	0	0	0	198
Total	0	1046	494	71	179	1	0	49	1	1	0	0	1	0	1843
Percent	0.0%	56.8%	26.8%	3.9%	9.7%	0.1%	0.0%	2.7%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Southbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
12 PM	0	26	19	0	7	0	0	1	0	0	0	0	0	0	53
12:15	0	32	12	1	1	0	0	2	0	0	0	0	0	0	48
12:30	0	29	16	1	2	0	0	2	0	0	0	0	0	0	50
12:45	0	23	21	1	4	0	0	2	0	0	0	0	0	0	51
	0	110	68	3	14	0	0	7	0	0	0	0	0	0	202
13:00	0	41	14	2	4	0	0	1	0	1	0	0	0	0	63
13:15	0	31	14	1	1	0	0	2	0	0	0	0	0	0	49
13:30	0	37	17	0	8	0	1	1	0	0	0	0	0	0	64
13:45	0	23	18	1	6	0	0	0	0	0	0	0	0	0	48
	0	132	63	4	19	0	1	4	0	1	0	0	0	0	224
14:00	0	28	23	0	7	0	0	0	0	1	0	0	0	0	59
14:15	0	22	18	4	10	0	0	4	0	0	1	0	0	0	59
14:30	0	29	23	0	13	0	0	2	0	0	0	0	0	0	67
14:45	0	35	24	4	8	0	0	1	0	0	0	0	1	0	73
	0	114	88	8	38	0	0	7	0	1	1	0	1	0	258
15:00	0	29	18	2	8	0	0	2	0	0	0	0	1	0	60
15:15	0	29	16	4	4	0	0	1	0	0	0	0	0	0	54
15:30	0	41	18	0	9	0	0	4	0	0	0	0	0	0	72
15:45	0	40	18	2	7	0	0	4	0	0	0	0	0	0	71
	0	139	70	8	28	0	0	11	0	0	0	0	1	0	257
16:00	0	41	22	0	3	0	0	2	0	0	0	0	0	0	68
16:15	0	36	21	1	6	0	0	3	0	0	0	0	0	0	67
16:30	0	43	18	0	7	0	0	3	0	0	0	0	0	0	71
16:45	0	55	22	1	4	0	0	1	0	0	0	0	0	0	83
	0	175	83	2	20	0	0	9	0	0	0	0	0	0	289
17:00	0	44	22	2	3	0	0	2	0	0	0	0	0	0	73
17:15	0	51	21	3	6	0	0	6	1	0	1	0	0	0	89
17:30	0	53	25	0	6	0	0	2	0	0	0	0	0	0	86
17:45	0	52	24	1	6	0	0	3	0	0	0	0	0	0	86
	0	200	92	6	21	0	0	13	1	0	1	0	0	0	334
18:00	0	45	27	0	2	0	0	3	0	0	0	0	0	0	77
18:15	0	44	22	1	5	0	0	1	0	0	0	0	0	0	73
18:30	0	36	23	2	3	0	0	3	0	0	0	0	0	0	67
18:45	0	41	21	2	4	0	0	1	0	0	0	0	0	0	69
	0	166	93	5	14	0	0	8	0	0	0	0	0	0	286
19:00	0	37	24	1	2	0	0	1	0	0	0	0	0	0	65
19:15	0	33	28	0	1	0	0	0	0	0	0	0	0	0	62
19:30	0	29	13	1	3	0	0	2	0	0	0	0	0	0	48
19:45	0	32	16	1	8	0	0	1	0	0	0	0	0	0	58
	0	131	81	3	14	0	0	4	0	0	0	0	0	0	233
20:00	0	29	11	2	10	0	0	1	0	0	0	0	0	0	53
20:15	0	28	10	1	4	0	0	0	0	0	0	0	0	0	43
20:30	0	25	9	0	3	0	0	0	0	0	0	0	0	0	37
20:45	0	23	10	0	8	0	0	2	0	0	0	0	0	0	43
	0	105	40	3	25	0	0	3	0	0	0	0	0	0	176
21:00	0	24	9	1	1	0	0	0	0	0	0	0	0	0	35
21:15	0	29	11	0	2	0	0	1	0	0	0	0	0	0	43
21:30	0	26	9	1	1	0	0	0	0	0	0	0	0	0	37
21:45	0	19	9	1	1	0	0	0	0	0	0	0	0	0	30
	0	98	38	3	5	0	0	1	0	0	0	0	0	0	145
22:00	0	12	8	0	1	0	0	1	0	0	0	0	0	0	22
22:15	0	15	4	1	1	0	0	0	0	0	0	0	0	0	21
22:30	0	12	4	0	1	0	0	0	0	0	0	0	0	0	17
22:45	0	10	5	0	0	0	0	0	0	0	0	0	0	0	15
	0	49	21	1	3	0	0	1	0	0	0	0	0	0	75
23:00	0	9	9	0	0	0	0	0	0	0	0	0	0	0	18
23:15	0	11	3	0	1	0	0	0	0	0	0	0	0	0	15
23:30	0	8	3	0	0	0	0	1	0	0	0	0	0	0	12
23:45	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
	0	32	17	0	1	0	0	1	0	0	0	0	0	0	51
Total	0	1451	754	46	202	0	1	69	1	2	2	0	2	0	2530
Percent	0.0%	57.4%	29.8%	1.8%	8.0%	0.0%	0.0%	2.7%	0.0%	0.1%	0.1%	0.0%	0.1%	0.0%	
Grand Total	0	2497	1248	117	381	1	1	118	2	3	2	0	3	0	4373
Percent	0.0%	57.1%	28.5%	2.7%	8.7%	0.0%	0.0%	2.7%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	

Charity Belford
3/28/2008

BENEFIT COST ANALYSIS WORKSHEET

SR 20 at Hightower Trail
Rockdale County
(Special Comments)

ACCIDENT DATA

Description	Symbol	Value
Property Damage Accidents (no fatality or injury)	P	5
Fatalities	F	0.25
Injuries	I	4.75

FIXED VALUES

Description	Symbol	Value
Fatality Cost	Fc	$5,800,000
Injury Cost	Ic	$333,500
Property Damage Cost	Pc	$4,400
Maintenance/Operating Cost	Cm	$50,000

TABLE VALUES

Description	Symbol	Value
Reduction Factor (fatalities and injuries) (Appendix E)	R	0.955
Reduction Factor (property damage) (Appendix E)	Rp	0.58
Capital Recovery Factor (Appendix E)	Ek	0.135
Initial Improvement Cost (Itemized Cost Estimate)	Ci	$1,401,507.00

Q = Weighted cost of fatal and injury collisions

$$Q = \frac{(Fc \times F) + (Ic \times I)}{F + I}$$

Q = 606825

B = Benefit

B = Q (F + I) (R) + Pc (P) (Rp)

B = 2910349.375

C = Cost

C = Ek (Ci) + Cm

C = 239203.445

B/C = Benefit/Cost Ratio

B/C = 12.16683721

BENEFIT/COST RATIO: 12.17

Charity Belford
3/28/2008

BENEFIT COST ANALYSIS FACTOR DEFINITIONS

F: annual number of collisions involving fatatlities during study period

I: average annual number of collisions involving injured people for the period of the study

P: average annual number of collisions involoving only property damage for the period of the study

R: reduction of fatal and injury collisions by type (from Table A - Appendix E)

R_P: reduction of property damage only collisions by type (from Table A - Appendix E)

P_C: average cost, in thousands of $, per property damage only collision

Q: weighted cost, in thousands of $, of fatal and injury collisions

I_C: average cost per injury in thousands of $

F_C: average cost per fatality in thousands of $

E_K: capital recovery factor based on countermeasure life (from Table B - Appendix E)

C_I: estimated intial cost of the countermeasure (cost of the improvement including r/w) in thousands of $

C_M: estimated annual maintenance and operating cost of the countermeasure in thousands of $

TRAFFIC ENGINEERING REPORT
FOR
PROPOSED ROADWAY IMPROVEMENTS

SR 20 @ W. Hightower Trail

ROCKDALE COUNTY, GA
GDOT Project No. STP-0006-00(935)
RCDOT Project No. O-40

Prepared for the
Georgia Department of Transportation

W&A Project No. 07-912
October 19, 2007

WOLVERTON & ASSOCIATES, INC.
6745 SUGARLOAF PARKWAY
SUITE 100
DULUTH, GA 30097
(770) 447-8999 PHONE
(770) 447-9070 FAX
www.wolverton-assoc.com

TABLE OF CONTENTS

TABLE OF CONTENTS i

LIST OF FIGURES ii

LIST OF TABLES ii

1. INTRODUCTION 1

Methodology 1

2. EXISTING CONDITIONS 4

3. TRAFFIC DATA 6

Projected Average Daily Traffic Volumes, ADT 6

Projected Peak Hour Volumes 6

4. CAPACITY ANALYSIS 10

Capacity 10

Capacity Analysis Results 11

5. TRAFFIC SIGNAL WARRANT ANALYSIS 14

8th Highest Hour Volume 14

Warrant 1, Eight-Hour Vehicular Volume 15

Warrant 2, Four-Hour Vehicular Volume 17

Warrant 3, Peak Hour 18

Warrant 4 – Pedestrian Volume 19

Warrant 5 – School Crossing 19

Warrant 6 – Coordinated Signal System 19

Warrant 7 – Crash Experience 19

Warrant 8 – Roadway Network 19

Summary of Warrant Analysis 19

5. RECOMMENDATIONS 20

REFERENCES 22

APPENDIX A – TMC Counts

APPENDIX B – ATR Counts

APPENDIX C – Site Photographs

APPENDIX D – Hisotrical Traffic Data

APPENDIX E – Synchro Printouts – Existing Condition

APPENDIX F – Synchro Printouts – No Build Option

APPENDIX G – Synchro Printouts – Build Option Build Volumes

APPENDIX H – Synchro Printouts – Build Options Design Volumes

APPENDIX I – Accident Data

LIST OF FIGURES

Figure 1 – Project Vicinity 2
Figure 2 – Aerial Photograph 3
Figure 3 – Existing Lane Geometry 5
Figure 4 – Existing Traffic Volumes 7
Figure 5 – Build Year (2010) Traffic Volumes 8
Figure 6 – Design Year (2030) Traffic Volumes 9
Figure 7– Warrant 2, Four-Hour Vehicular Volume 17
Figure 8– Warrant 3, Peak-Hour Vehicular Volume 18
Figure 9 – Proposed Geometry 20

LIST OF TABLES

Table 1 – Level of Service Criteria 10
Table 2 – Capacity Analysis Results: Roundabout (V/C Ratio) 11
Table 3 – Capacity Analysis Results: Alternatives 12
Table 4 – Queue Comparison 13
Table 5 – Year 2013 8th Highest Hour Volume 15
Table 6 – Year 2033 8th Highest Hour Volume 15
Table 7 – Warrant 1, Eight-Hour Vehicular Volume 16
Table 8 – Summary of Warrant Analysis 19
Table 9 – Turn Bay Length Summary 21

1. INTRODUCTION

SR 20 @ W. Hightower Trail Traffic Engineering Report

The purpose of this report is to analyze current intersection capacity and identify alternatives for improvements to the intersection of SR 20 and W. Hightower Trail. The project also includes the intersection of W. Hightower Trail and Chandler Road, which is directly east of and adjacent to the intersection of SR 20 and W. Hightower Trail. The driveway on the northwest corner provides access to a cycle shop. Figure 1 shows the project vicinity and Figure 2 shows an aerial photograph of the project location.

Methodology

Initial evaluations were made to asses the current conditions in the vicinity of the project. Peak hour turning movement counts (TMC) were conducted on Tuesday, August 21, 2007 during the AM and PM peak hour at the intersection of SR 20 and W. Hightower Trail and Chandler Road. In addition to the TMC, automatic traffic recorder (ATR) tube, speed, and class counts were taken on Wednesday August 22, 2007 for a 24 hour period at each approach to the SR 20 @ W. Hightower Trail/Chandler Road intersections. The TMC and ATR counts are contained in Appendices A and B, respectively. Growth rates were developed for the project vicinity and were applied to the existing counts to get Build year 2010 and Design year 2030 volumes.

Figure 1 – Project Vicinity

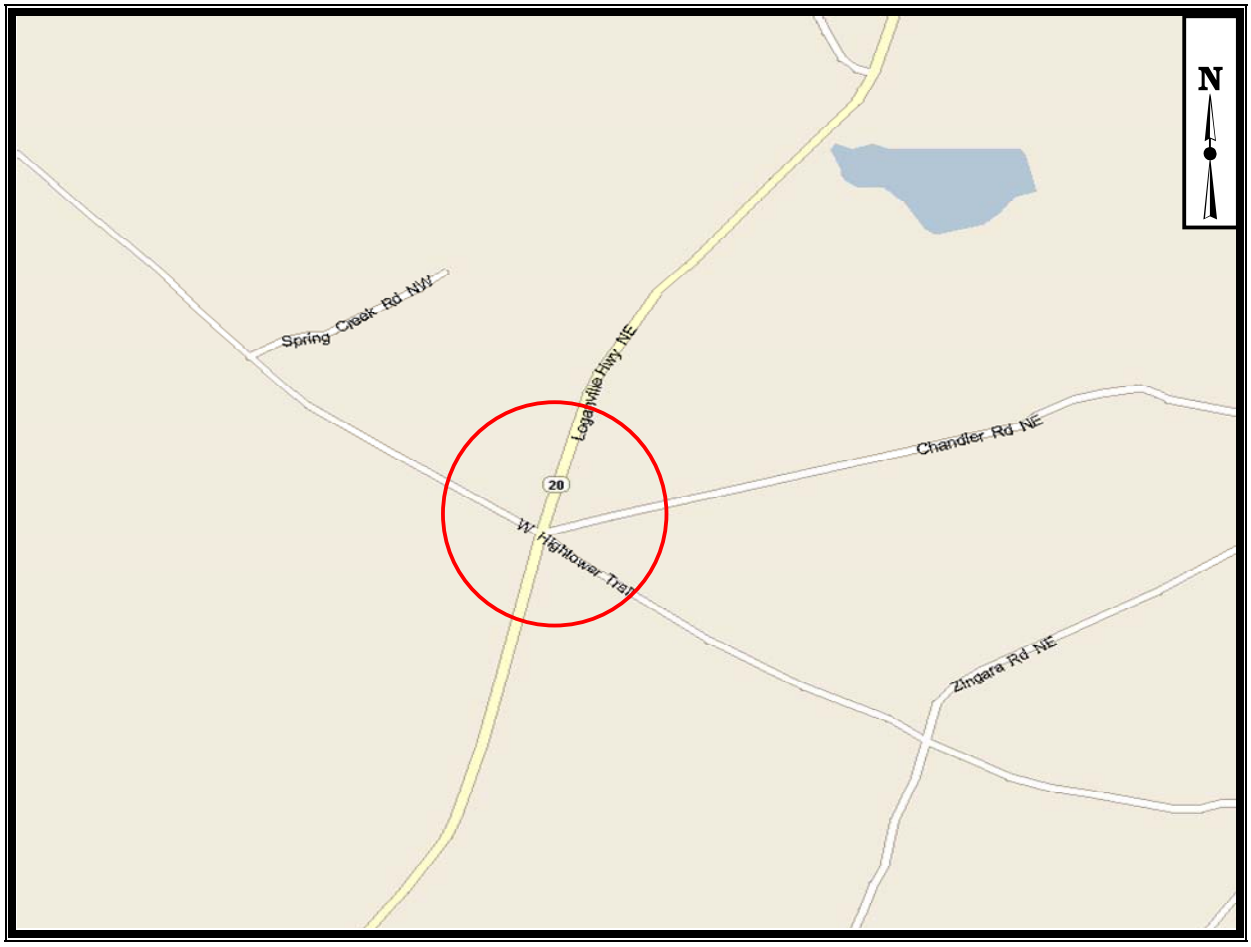
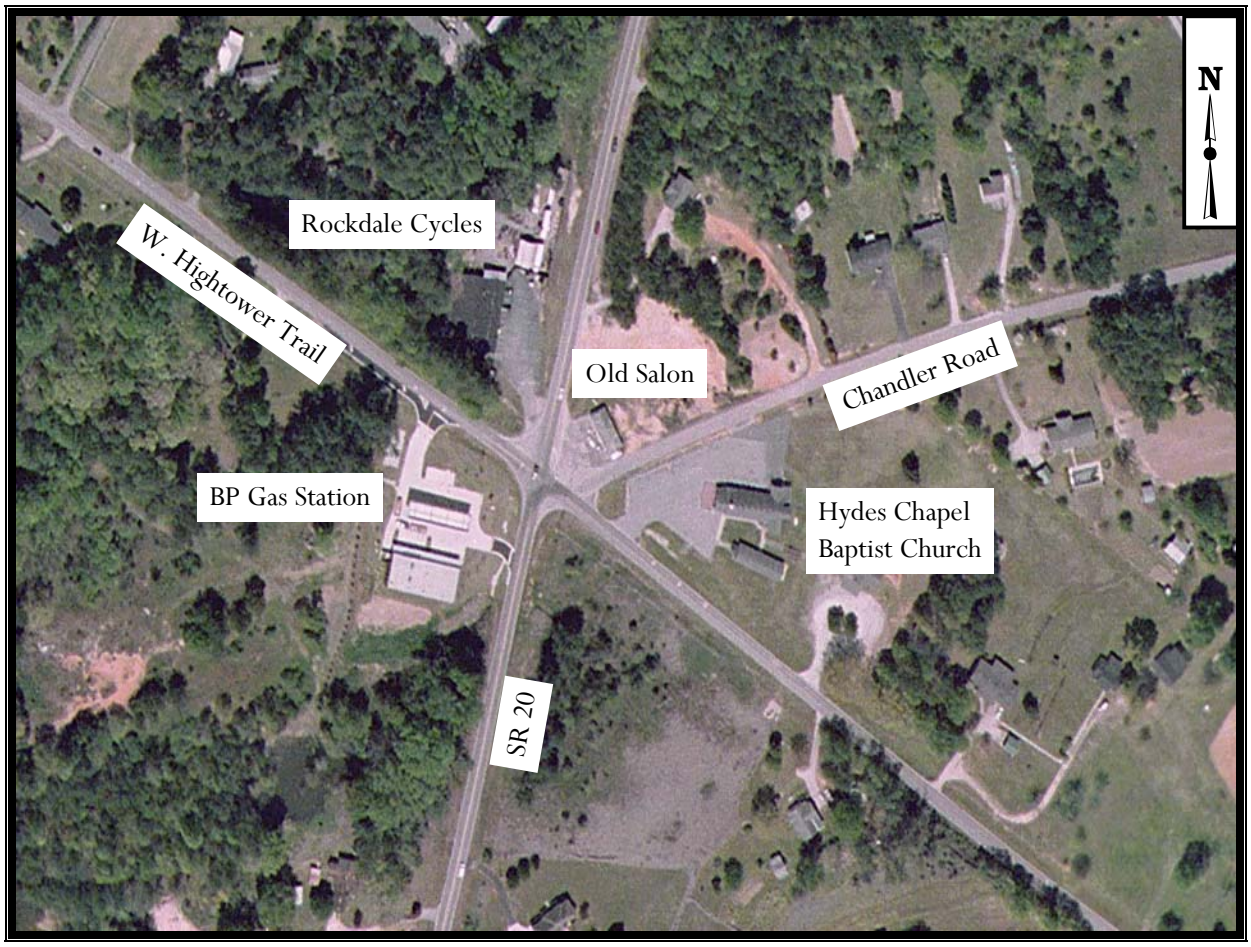


Figure 2 – Aerial Photograph



2. EXISTING CONDITIONS

SR 20 @ W. Hightower Trail Traffic Engineering Report

SR 20 is a two-lane road that runs from Pleasant Hill Road south to Sigman Road and has a posted speed limit of 45 mph. In the project vicinity, development along SR 20 is limited with only a few houses and a gas station. The functional class of SR 20 is an Urban Minor Arterial.

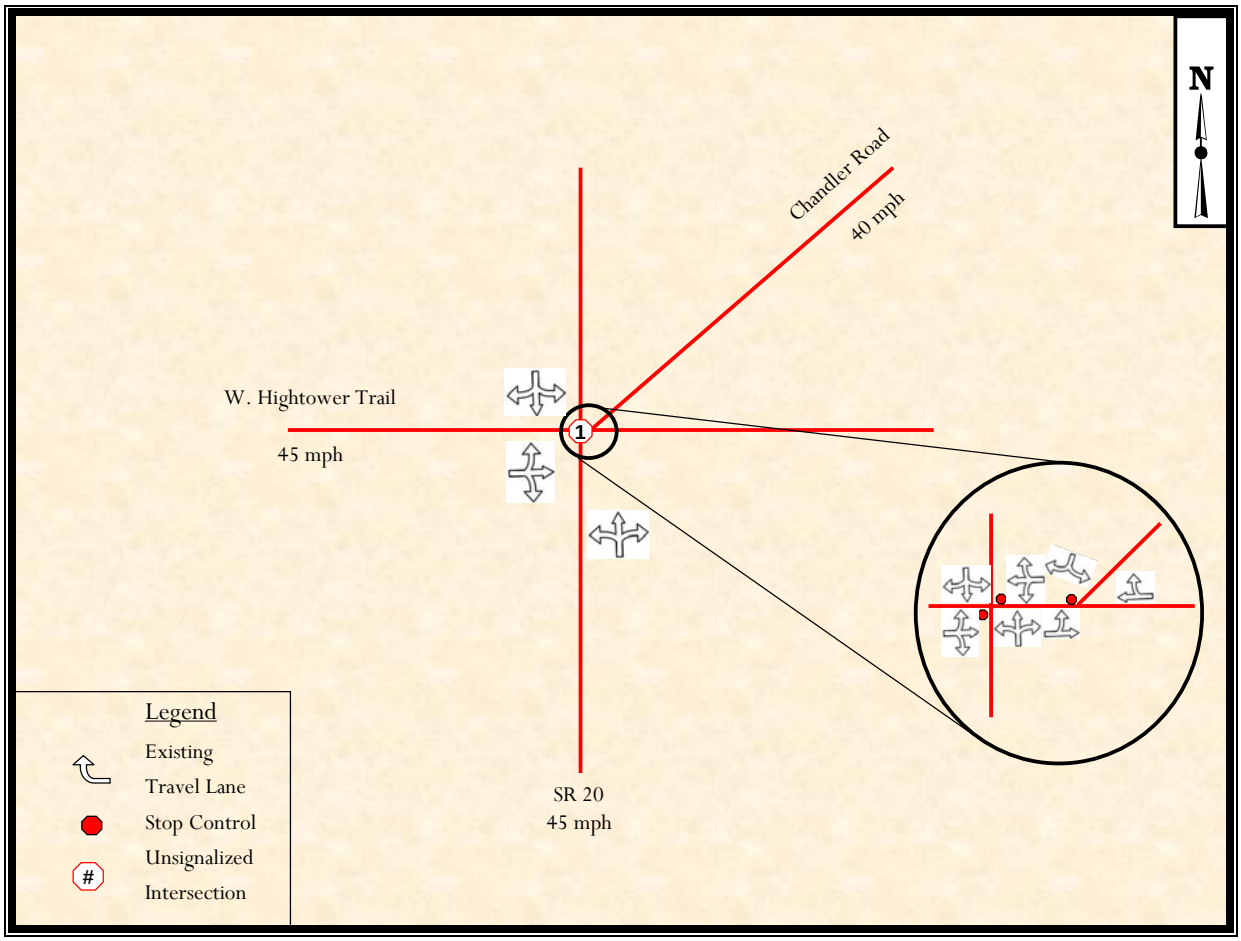
W. Hightower Trail is a two-lane road that runs in an east-west direction from Bethel Road to Norris Lake Road and has a posted speed limit of 45 mph. In the project vicinity, development along W. Hightower Trail is minimal with a few houses, a church, and a fire station 1.5 miles east of the intersection of SR 20. The functional class of W. Hightower Trail is an Urban Minor Arterial.

Chandler Road is a two-lane road that runs northeast from the intersection of W. Hightower Trail @ SR 20 and ends at Zingara Road. The posted speed limit on Chandler Road is 40 mph. In the project vicinity, development along Chandler Road is minimal with a few houses and the same church. The functional class of Chandler Road is and Urban Local Street.

The study intersection is the intersection of SR 20 and W. Hightower Trail/Chandler Road. This intersection had a gas station on the southwest corner, a church on the east-northeast corner, a closed building on the north-northeast corner, and a bike shop on the northwest corner.

Figure 3 shows the existing intersection geometry. Pictures of the project vicinity were taken and are contained in Appendix C.

Figure 3 – Existing Lane Geometry



3. TRAFFIC DATA

Turning movement counts (TMCs) were collected at the study intersection. Twenty-four hour automatic traffic recorder (ATR) counts were collected on each approach of the intersection. Additionally, 24-hr bi-directional count data complete with class and speed profiles were collected on SR 20 just north of the intersection. Based on this data, the truck percentage in the project vicinity is 14.8% and the 85th percentile speed is 61 mph. The existing peak turning movement volumes are illustrated in Figure 4.

Projected Average Daily Traffic Volumes, ADT

The growth rate was obtained using historical traffic data in the project vicinity from GDOT count stations number 243, 245, and 247. The annual growth rate for the surrounding area is 0.82%. A growth rate of 2% will be used instead for a conservative estimate. The historical traffic data is contained in Appendix D. The growth rate was applied to the ADT to project 24-hr traffic for the build year (2010) and design year (2030).

Projected Peak Hour Volumes

The growth rate was applied to the existing TMC to get the projected peak hour volumes. A growth factor of 1.061208 was used to project the 2010 build year volumes and a growth factor of 1.57689 was used to project the 2030 design year volumes. The projected build and design year volumes are shown in Figures 5 and 6, respectively.

Figure 4 – Existing Traffic Volumes

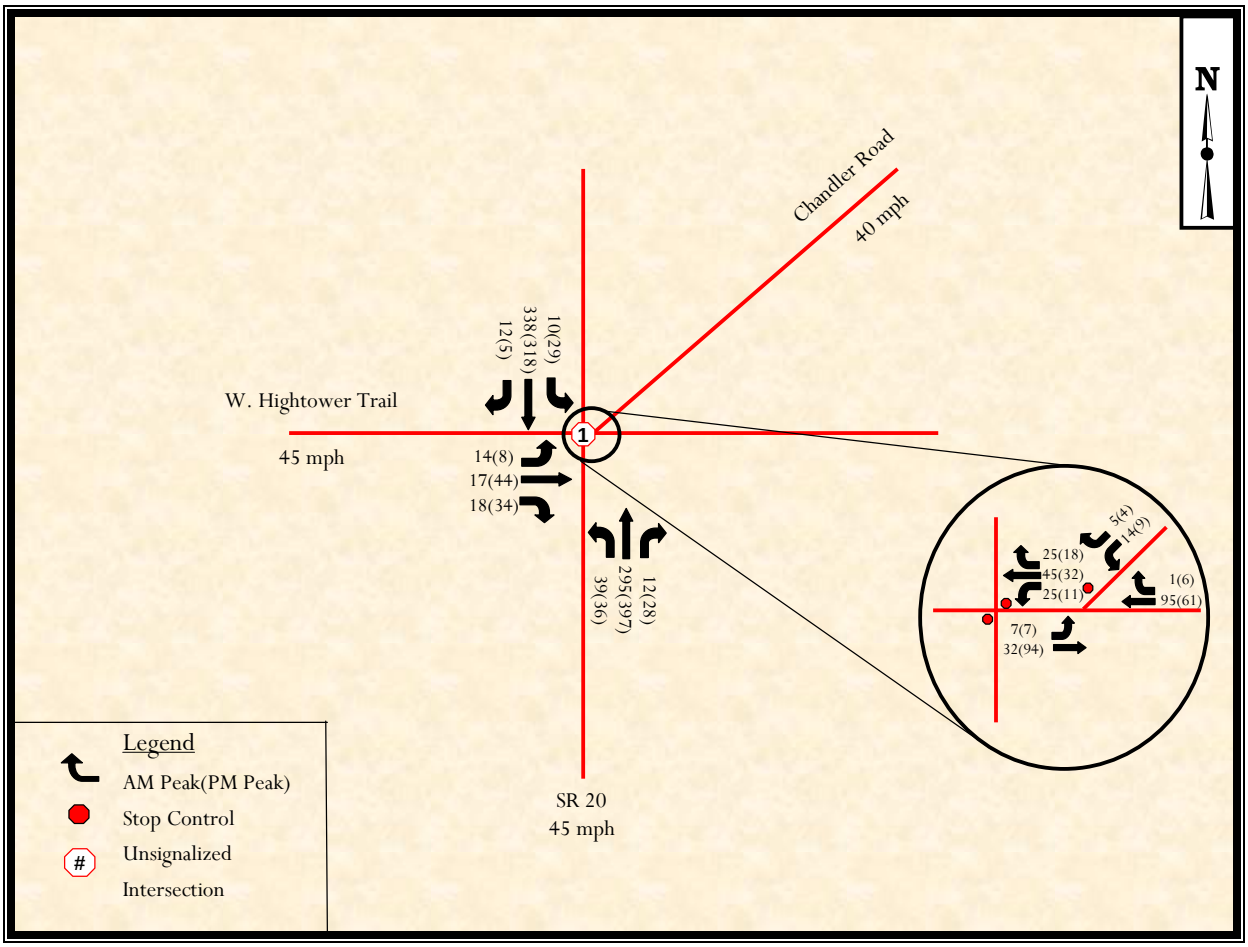


Figure 5 – Build Year (2010) Traffic Volumes

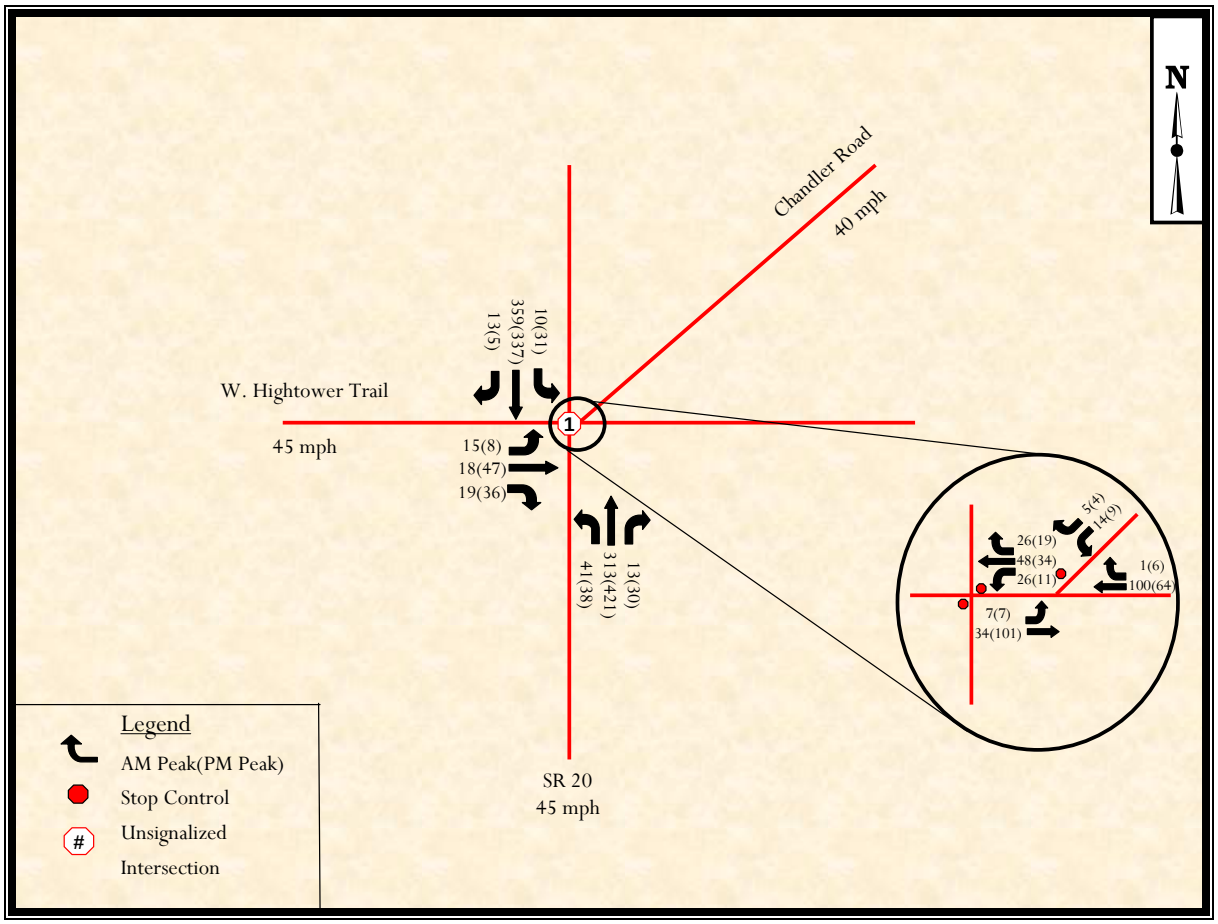
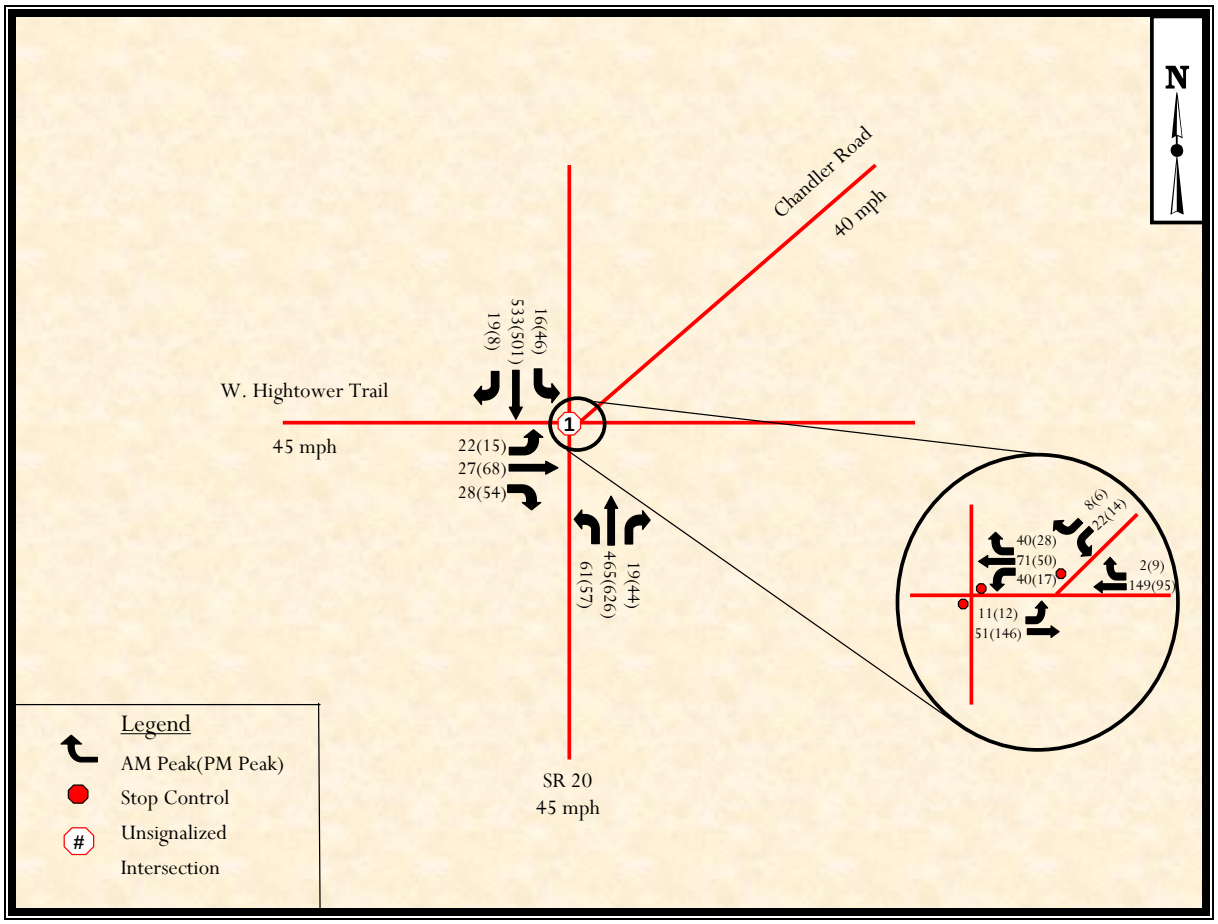


Figure 6 – Design Year (2030) Traffic Volumes



4. CAPACITY ANALYSIS

Capacity

Capacity analysis was used to evaluate the projected volumes at the study intersection along the corridor. This process was used to define geometry and traffic control needed to result in acceptable levels of service for the projected conditions.

The *Synchro Program* was used to conduct capacity analysis. *Synchro* implements the capacity methods of the *Highway Capacity Manual* (HCM) [1] for performing the industry standard evaluation of intersection performance. The delays used in the reports follow the procedure as recommended by the HCM.

The Highway Capacity Manual defines level of service (LOS) in terms of the amount of control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay.

The levels of service definitions for both stop controlled and signal controlled intersections are provided in Table 1.

Table 1 – Level of Service Criteria

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)	
	WITH STOP-SIGN CONTROL	WITH SIGNAL CONTROL
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Source: Highway Capacity Manual

The GDOT has ranges of acceptable Levels of Service based on the area. Rural, sparsely developed areas have a minimum LOS requirement of C. This is due to the expectancy of rural residents for relatively un-congested conditions and design flexibility related to lower right of way costs of impacts. The minimum LOS for urban areas is D. This reflects the greater acceptance of delay and congestion by urban residents. Additionally, the increased density of developments makes right of way costs much higher in urban areas. The project corridor is urban in nature; therefore, a minimum LOS D threshold will be the target operational condition.

Capacity Analysis Results

No Build

The study intersection was initially evaluated with a no build option. This analysis shows what level of service the intersection would function at in the build and design years if the existing facility were to remain unchanged. This establishes a baseline for comparing improvement alternatives.

Table 2 contains the results of capacity analysis of projected volumes for the intersection in the Build and Design Years. The values shown in parenthesis indicate the estimated delay in seconds per vehicle. Synchro printouts for the existing condition are located in Appendix E. Synchro printouts for the Build and Design Year no-build options are provided in Appendix F.

Build

Four alternatives were analyzed for the build option.

- Alternative 1 is to install a signal at the intersection.
- Alternative 2 is to construct left and right turn lanes on all approaches of the intersection.
- Alternative 3 is a combination of Alternatives 1 and 2, with a signal and turn lanes.
- Alternative 4 is to construct a roundabout at the intersection.

All alternatives involved closing access to Chandler Road and constructing a cul-de-sac. Synchro printouts for the Build and Design Years for each of the alternatives are in Appendices G and H, respectively.

Neither Synchro nor HCS+ can give an accurate LOS while modeling a roundabout. However, based on research from the USDOT study; Roundabouts: An Informational Guide (FHA Publication No.FHWA-RD-00-067)[2], a one lane roundabout can be analyzed using its volume to capacity ratio. According to this study, roundabouts should not be designed to handle any more than 85% of its capacity. Table 2 shows the volume to capacity ratio for each approach of the intersection if a roundabout was to be constructed. Table 3 shows the level of service for each alternative in the build and design year.

Table 2 – Capacity Analysis Results: Roundabout (V/C Ratio)

Intersection	Approach	2010		2030	
		AM Peak	PM Peak	AM Peak	PM Peak
SR 20 @ W. Hightower Trail Roundabout	NB	0.461	0.681	0.819	1.260
	SB	0.503	0.484	0.904	0.863
	EB	0.048	0.089	0.072	0.141
	WB	0.086	0.058	0.135	0.089

* red denotes single lane roundabout will be over the recommended capacity

The table shows that in the design year, a roundabout will fail with the projected traffic.

Table 3 – Capacity Analysis Results: Alternatives

		No Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4
2010	AM Peak	D (28.0)	A (7.2)	D (27.4)	A (5.6)	N/A
	PM Peak	D (26.0)	A (6.2)	D (29.3)	A (5.5)	N/A
2030	AM Peak	F (332.8)	B (11.9)	F (209.0)	A (7.3)	N/A
	PM Peak	F (291.5)	B (10.6)	F (179.5)	A (7.2)	N/A

In Table 3, Alternatives 1 and 3 have the best LOS in the build and design years. Alternative 1, installing a traffic signal only, is acceptable; however, significant queuing because of the turning traffic is not desirable. Table 4 shows the queuing on each of the approaches for all of the alternatives. Roundabout queuing can not be calculated in Synchro or HCS+ due to the same constraints as before.

Table 4 – Queue Comparison

SR 20 @ W. Hightower Trail			No Build		Alternative 1		Alternative 2		Alternative 3	
			Synchro	SimTraffic	Synchro	SimTraffic	Synchro	SimTraffic	Synchro	SimTraffic
2010	AM	NBL	3	130	105	166	3	54	14	73
		NB					0	0	70	110
		NBR					0	27	5	0
		SBL	1	0	99	202	1	0	5	38
		SB					0	0	78	145
		SBR					0	0	4	0
		EBL	20	69	27	42	7	42	13	42
		EB					0	0	15	23
		EBR					6	27	11	0
		WBL	51	105	48	99	12	57	19	67
		WB					0	0	29	72
		WBR					21	72	13	0
	PM	NBL	3	120	137	269	3	38	13	38
		NB					0	0	99	266
		NBR					0	27	7	0
		SBL	2	54	91	170	2	0	11	44
		SB					0	0	72	191
		SBR					0	0	3	0
		EBL	38	33	44	73	4	78	9	73
		EB					0	0	29	0
		EBR					22	0	16	0
		WBL	31	32	35	113	6	51	11	51
		WB					0	0	23	79
		WBR					15	79	11	0
2030	AM	NBL	6	51	239	280	6	44	23	68
		NB					0	0	121	258
		NBR					0	54	5	0
		SBL	5	91	225	222	5	0	15	57
		SB					0	0	128	240
		SBR					0	0	3	0
		EBL	147	74	56	128	56	89	21	93
		EB					0	0	25	56
		EBR					24	44	17	0
		WBL	315	120	117	116	70	58	34	74
		WB					0	0	51	88
		WBR					111	74	19	0
	PM	NBL	5	277	337	329	5	44	19	44
		NB					0	0	183	341
		NBR					0	0	8	0
		SBL	5	223	195	327	4	54	16	53
		SB					0	0	122	226
		SBR					0	0	3	0
		EBL	238	105	103	60	29	27	19	27
		EB					0	0	53	51
		EBR					103	64	25	0
		WBL	209	115	76	62	46	37	20	37
		WB					0	0	41	48
		WBR					65	69	17	0

5. TRAFFIC SIGNAL WARRANT ANALYSIS

SR 20 @ W. Hightower Trail Traffic Engineering Report

As per project alternatives, SR 20 @ W. Hightower Trail will be evaluated for the installation of a traffic signal. The projected volumes of the intersections were evaluated using the guidelines given in the 2003 Edition of the *Manual on Uniform Traffic Control Devices (MUTCD)*[3]. The MUTCD establishes the following Warrants:

- Warrant 1, Eight-Hour Vehicular Volume,
- Warrant 2, Four-Hour Vehicular Volume,
- Warrant 3, Peak Hour,
- Warrant 4, Pedestrian Volume,
- Warrant 5, School Crossing,
- Warrant 6, Coordinated Signal System,
- Warrant 7, Crash Experience,
- Warrant 8, Roadway Network.

Each of the applicable warrants will be addressed.

The MUTCD guidelines for warrant studies suggest that signals should not be installed unless one or more of the warrants are satisfied.

8th Highest Hour Volume

Signal warrant studies for existing intersections involves the collection of hourly traffic data using automated traffic recorders. However, this study is concerned with the analysis of projected conditions that will occur in the Design Year; therefore projections of the ADT Volumes were used. These volumes are contained in Appendix B.

Since the eight hour warrant is the most widely accepted of the signal warrants, it is necessary to estimate the eighth highest hour for use in the signal warrants analysis. If the eighth highest hour of the day meets the warrant then seven other hours will also meet the minimum volumes.

The *Manual of Traffic Signal Design*[4] published by the Institute of Transportation Engineers, 1982, provides a section that discusses warrant analysis of new intersections. This same analysis can be used for existing intersections if major geometric changes will be occurring, as is the case at this intersection. This publication provides the assumption that the eighth highest hour volume is about 6.25 percent of the ADT.

The eighth highest hour volume for the two intersections mentioned above was calculated using this assumption. These volumes for the Build Year and Design Year are shown in Table 5 and Table 6.

Table 5 – Year 2010 8th Highest Hour Volume

Major Street	Minor Street	2010 ADT		8th Highest Hour Volume	
		Major Street	Minor Street	Major Street	Minor Street
SR 20	W. Hightower Trail	9467	838	592	52

Table 6 – Year 2030 8th Highest Hour Volume

Major Street	Minor Street	2030 ADT		8th Highest Hour Volume	
		Major Street	Minor Street	Major Street	Minor Street
SR 20	W. Hightower Trail	14067	1246	879	78

Warrant 1, Eight-Hour Vehicular Volume

The MUTCD gives minimum volumes required to meet the warrant. The traffic volume requirements of Warrant 1, Conditions A and B are hourly volumes that must be met for 8 hours of an average day. The required volume for the major street is the total approach volume (both directions). The required minor street volume is the heavier approach volume (one direction). If either Condition A or Condition B is met, then Warrant 1 is satisfied. Since the posted speed limit of SR 20 is 45 mph the 70% values for Warrant 1 are used.

Table 7 provides a comparison of Build and Design Year projected volumes to the requirements of Warrant 1 for the intersection being analyzed for signal installation.

Table 7 – Warrant 1, Eight-Hour Vehicular Volume

2010	8th Highest Hour Volume		Condition A - Met?		Condition B - Met?	
SR 20	Major Street	Minor Street	Major Street (>350 vph)	Minor Street (>105 vph)	Major Street (>525 vph)	Minor Street (>53 vph)
W. Hightower Road	592	52	Yes	No	Yes	No

2030	8th Highest Hour Volume		Condition A - Met?		Condition B - Met?	
SR 20	Major Street	Minor Street	Major Street (>350 vph)	Minor Street (>105 vph)	Major Street (>525 vph)	Minor Street (>53 vph)
W. Hightower Road	879	78	Yes	No	Yes	Yes

W. Hightower Trail meets condition B in the Design year 2030. **Warrant 1 is met for SR 20 @ W. Hightower Trail.**

Using the same reasoning to analyze warrant 1 warrants 2 and 3 can be examined.

Warrant 2, Four-Hour Vehicular Volume

The MUTCD Section 4C.03 states:

> *"Support: The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.*
>
> *Standard: The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in Figure 4C-1 for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these 4 hours."*

Figure 7– Warrant 2, Four-Hour Vehicular Volume

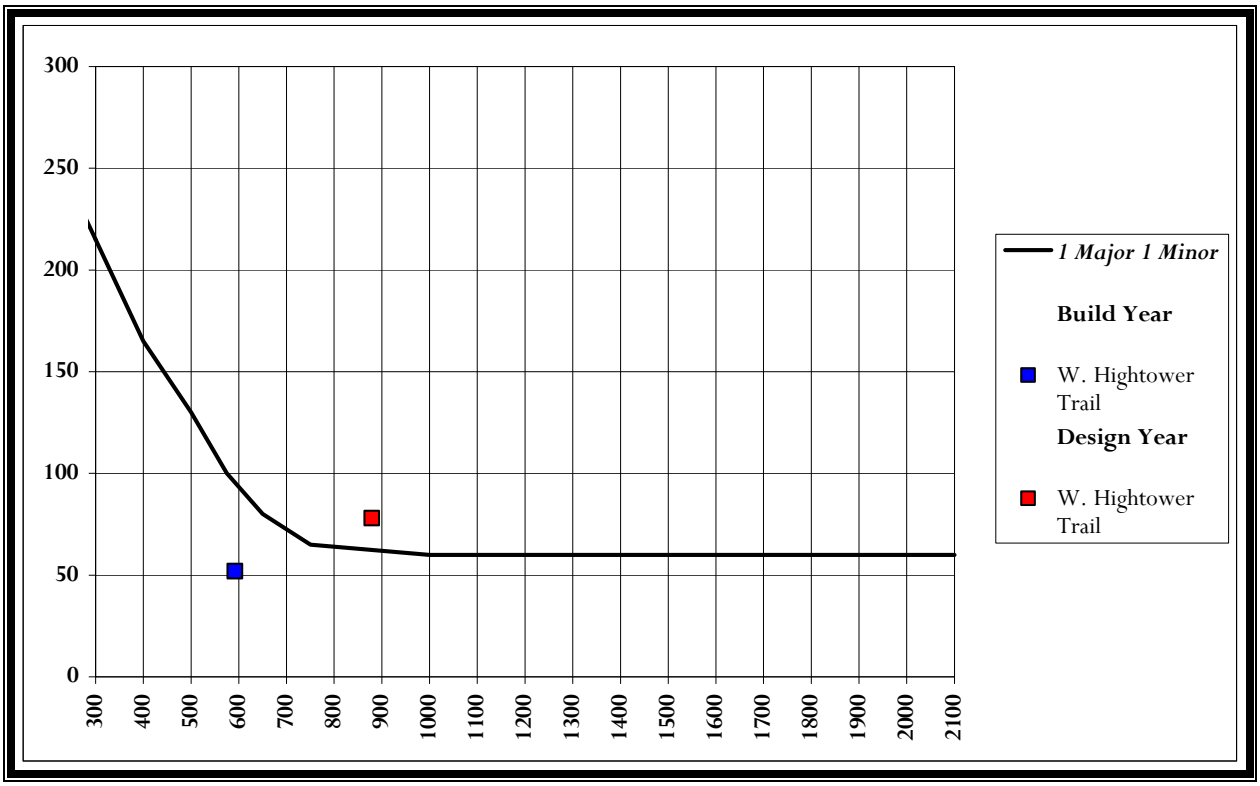


Figure 7 shows the eighth highest hour compared to Warrant 2. **Warrant 2 is met for SR 20 @ W. Hightower Trail in the Design year.**

Warrant 3, Peak Hour

The MUTCD Section 4C.04 states:

> *"Support: The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street."*

Figure 8– Warrant 3, Peak-Hour Vehicular Volume

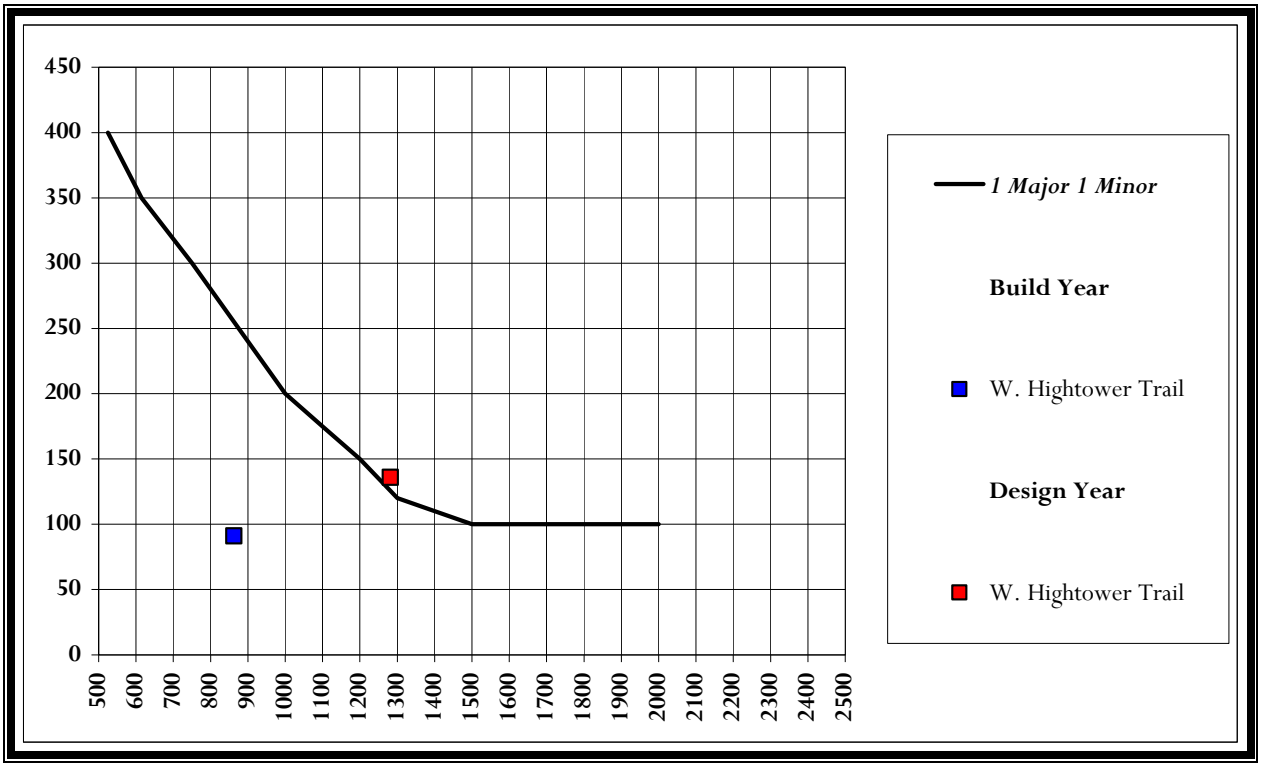


Figure 8 shows W. Hightower Trail meets the warrant in the Design year. **Warrant 3 is met for SR 20 @ W. Hightower Trail.**

Warrant 4 – Pedestrian Volume

There is not excessive pedestrian volume in the area of the site. Therefore, **Warrant 4 is not applicable.**

Warrant 5 – School Crossing

There is no school in close proximity to the intersection of SR 20 @ W. Hightower Trail. Therefore, **Warrant 5 is not applicable**.

Warrant 6 – Coordinated Signal System

There are no signals close enough to this intersection to maintain a coordinated signal system. Therefore, **Warrant 6 is not applicable.**

Warrant 7 – Crash Experience

The severity and frequency of crashes are one of the principal reasons to consider installing a traffic signal at these intersections. Accident data for the project area is contained in Appendix I of this report. There are more than five (5) crashes correctable with a signal in each year from 2003 to 2006. Therefore, **Warrant 7 is satisfied for the intersection of SR 20 @ W. Hightower Trail.**

Warrant 8 – Roadway Network

The intersection is not part of a principle roadway network. Therefore, **Warrant 8 is not applicable.**

Summary of Warrant Analysis

Table 8 summarizes the signal warrant analysis for the intersection of SR 20 @ W. Hightower Trail and indicates that a **traffic signal is warranted for the intersection.**

Table 8 – Summary of Warrant Analysis

WARRANT	SR 20 @ W. Hightower Road
1. Eight-Hour Vehicular Volume	**Satisfied**
2. Four-Hour Vehicular Volume	**Satisfied**
3. Peak Hour	**Satisfied**
4. Pedestrian Volume	Not Applicable
5. School Crossing	Not Applicable
6. Coordinated Signal System	Not Applicable
7. Crash Experience	**Satisfied**
8. Roadway Network	Not Applicable

5. RECOMMENDATIONS

SR 20 @ W. Hightower Trail Traffic Engineering Report

Based on the analysis documented in this report, Wolverton and Associates, Inc. make the following conclusions and recommendations:

1. Install a traffic signal at the intersection of SR 20 @ W. Hightower Trail
2. Close access to Chandler Road and construct a cul-de-sac at the end
3. Construct 250' left turn lanes on all approaches to the intersection
4. Construct 200' right turn lanes on all approaches to the intersection
5. Relocate access to the cycle shop on the northwest corner a minimum of 100' away from the intersection.

Figure 9 shows the proposed geometry for the recommended alternative.

Figure 9 – Proposed Geometry

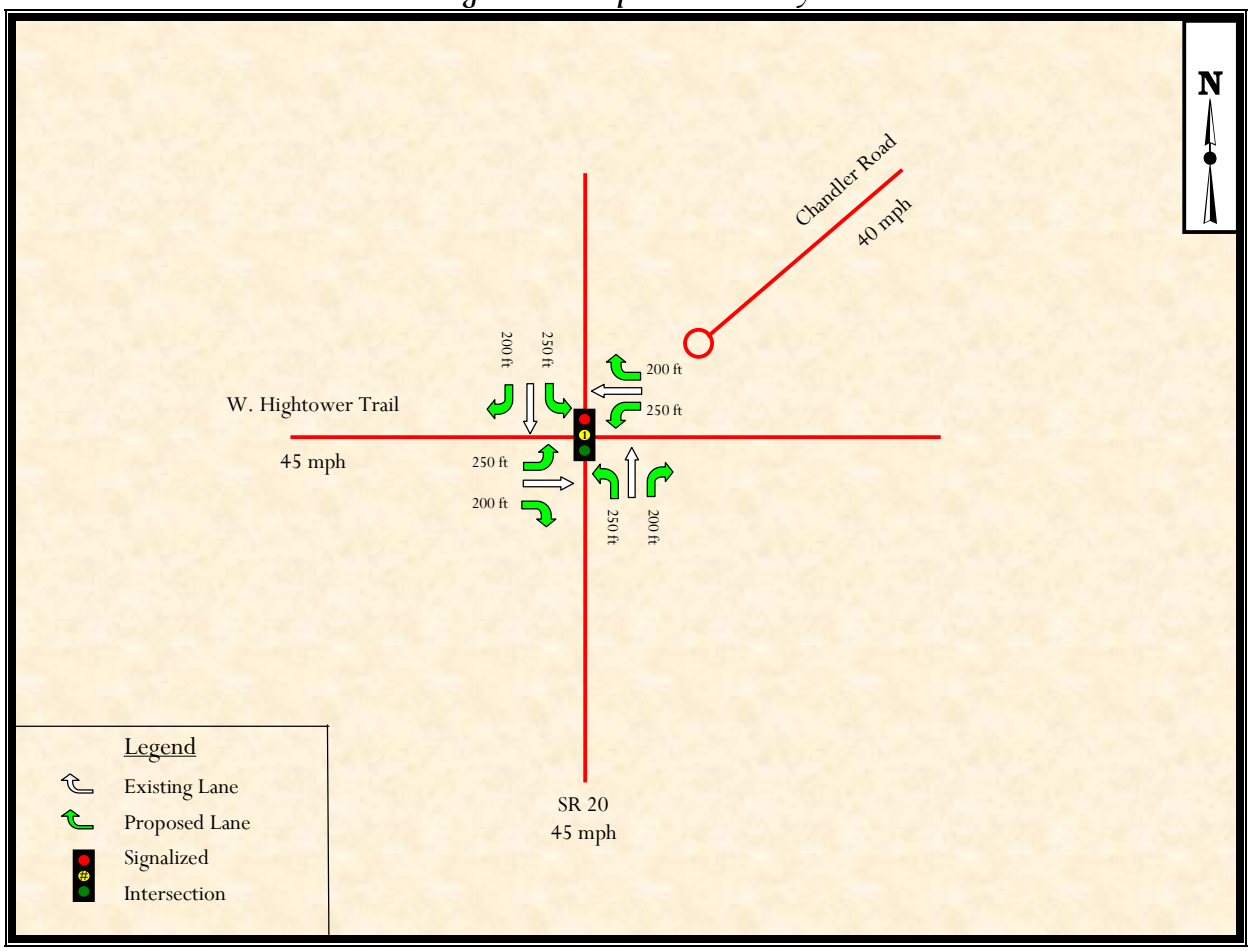


Table 9 summarizes the turn bay lengths for each alternative. Alternative 3 turn bay lengths are in bold to denote the recommendations.

Table 9 – Turn Bay Length Summary

	Existing	Alternative 1	Alternative 2	Alternative 3	Alternative 4
NBL	0	0	250	**250**	0
NBR	0	0	200	**200**	0
SBL	0	0	250	**250**	0
SBR	0	0	200	**200**	0
EBL	0	0	250	**250**	0
EBR	0	0	200	**200**	0
WBL	0	0	250	**250**	0
WBR	0	0	200	**200**	0

References

SR 20 @ W. Hightower Trail Traffic Engineering Report

1. Highway Capacity Manual, HCM 2000, Transportation Research Board, Washington, DC, 2000.

2. Roundabouts: An Informational Guide, Federal Highway Administration, Washington, DC, 2000.

3. Manual on Uniform Traffic Control Devices, 2003 Edition, Federal Highway Administration, Washington, DC, 2003.
4. Manual of Traffic Signal Design, Institute of Transportation Engineers, Washington, DC, 1982.

APPENDICES

APPENDIX A

TMC Counts

Reliable Traffic Data Services,LLC
Tel: (770) 578-8158 Fax: (770) 578-8159
email: reliabletraffic@msn.com

TMC Data

File Name : 23200001
Site Code : 23200001
Start Date : 8/21/2007
Page No : 1

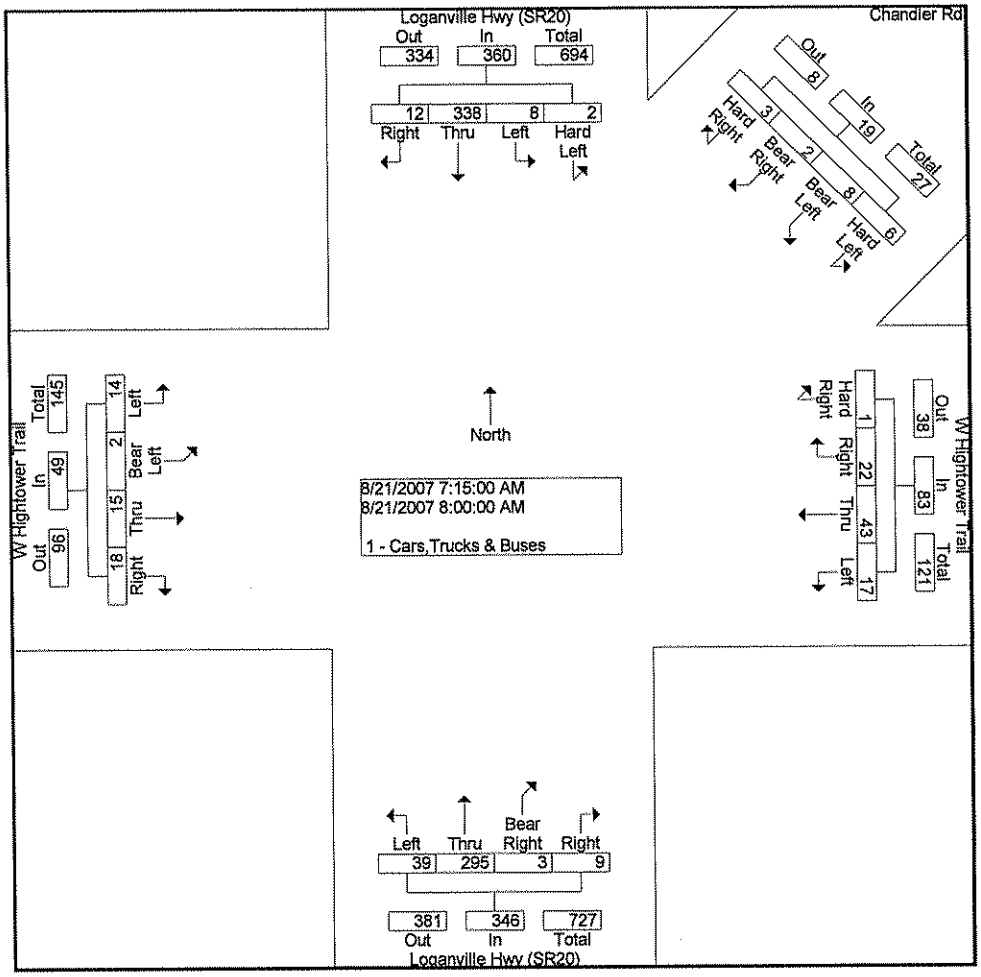
Groups Printed- 1 - Cars,Trucks & Buses

	Loganville Hwy (SR20) Northbound					Chandler Rd Southwestbound					Loganville Hwy (SR20) Southbound					W Hightower Trail Eastbound					W Hightower Trail Westbound					
Start Time	Left	Thru	Bear Right	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Left	Bear Left	Thru	Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	7	78	1	1	87	1	0	0	0	1	0	2	76	3	81	2	0	2	3	7	3	10	5	1	19	195
07:15 AM	9	84	2	2	97	1	1	0	1	3	0	2	81	2	85	4	1	3	3	11	4	13	7	0	24	220
07:30 AM	10	79	0	1	90	2	2	1	0	5	1	3	109	5	118	3	0	5	4	12	6	11	6	1	24	249
07:45 AM	11	65	1	3	80	1	3	1	1	6	0	1	72	3	76	4	0	4	5	13	4	9	4	0	17	192
Total	37	306	4	7	354	5	6	2	2	15	1	8	338	13	360	13	1	14	15	43	17	43	22	2	84	856
08:00 AM	9	67	0	3	79	2	2	0	1	5	1	2	76	2	81	3	1	3	6	13	3	10	5	0	18	196
08:15 AM	10	59	1	4	74	2	2	0	0	4	0	2	57	3	62	2	1	2	4	9	4	8	6	1	19	168
08:30 AM	9	55	3	3	70	1	0	1	0	2	1	4	52	2	59	2	0	4	5	11	3	10	5	0	18	160
08:45 AM	6	53	1	2	62	0	1	0	1	2	0	3	46	2	51	1	0	3	3	7	5	9	3	0	17	139
Total	34	234	5	12	285	5	5	1	2	13	2	11	231	9	253	8	2	12	18	40	15	37	19	1	72	663
*** BREAK ***																										
04:00 PM	7	58	2	4	71	1	0	1	0	2	0	4	47	1	52	1	0	6	7	14	4	4	3	1	12	151
04:15 PM	6	63	1	7	77	0	1	0	1	2	1	5	59	3	68	2	0	7	8	17	2	6	5	1	14	178
04:30 PM	7	80	0	4	91	1	2	1	0	4	0	8	67	2	77	1	1	9	7	18	3	7	3	0	13	203
04:45 PM	8	95	0	5	108	0	1	0	1	2	0	4	82	0	86	2	0	10	8	20	1	10	4	2	17	233
Total	28	296	3	20	347	2	4	2	2	10	1	21	255	6	283	6	1	32	30	69	10	27	15	4	56	765
05:00 PM	7	114	1	8	130	2	2	1	1	6	1	5	84	2	92	1	0	13	10	24	2	8	3	2	15	267
05:15 PM	10	97	0	7	114	1	2	0	0	3	1	6	79	1	87	3	1	11	7	22	2	5	4	1	12	238
05:30 PM	11	91	2	5	109	1	0	1	0	2	1	11	73	2	87	2	0	9	9	20	1	7	5	1	14	232
05:45 PM	8	77	1	3	89	0	1	0	1	2	0	7	67	1	75	2	1	10	7	20	2	5	3	0	10	196
Total	36	379	4	23	442	4	5	2	2	13	3	29	303	6	341	8	2	43	33	86	7	25	15	4	51	933
Grand Total	135	1215	16	62	1428	16	20	7	8	51	7	69	1127	34	1237	35	6	101	96	238	49	132	71	11	263	3217
Apprch %	9.5	85.1	1.1	4.3		31.4	39.2	13.7	15.7		0.6	5.6	91.1	2.7		14.7	2.5	42.4	40.3		18.6	50.2	27.0	4.2		
Total %	4.2	37.8	0.5	1.9	44.4	0.5	0.6	0.2	0.2	1.6	0.2	2.1	35.0	1.1	38.5	1.1	0.2	3.1	3.0	7.4	1.5	4.1	2.2	0.3	8.2	

Reliable Traffic Data Services,LLC
Tel: (770) 578-8158 Fax: (770) 578-8159
email: reliabletraffic@msn.com

File Name : 23200001
Site Code : 23200001
Start Date : 8/21/2007
Page No : 2

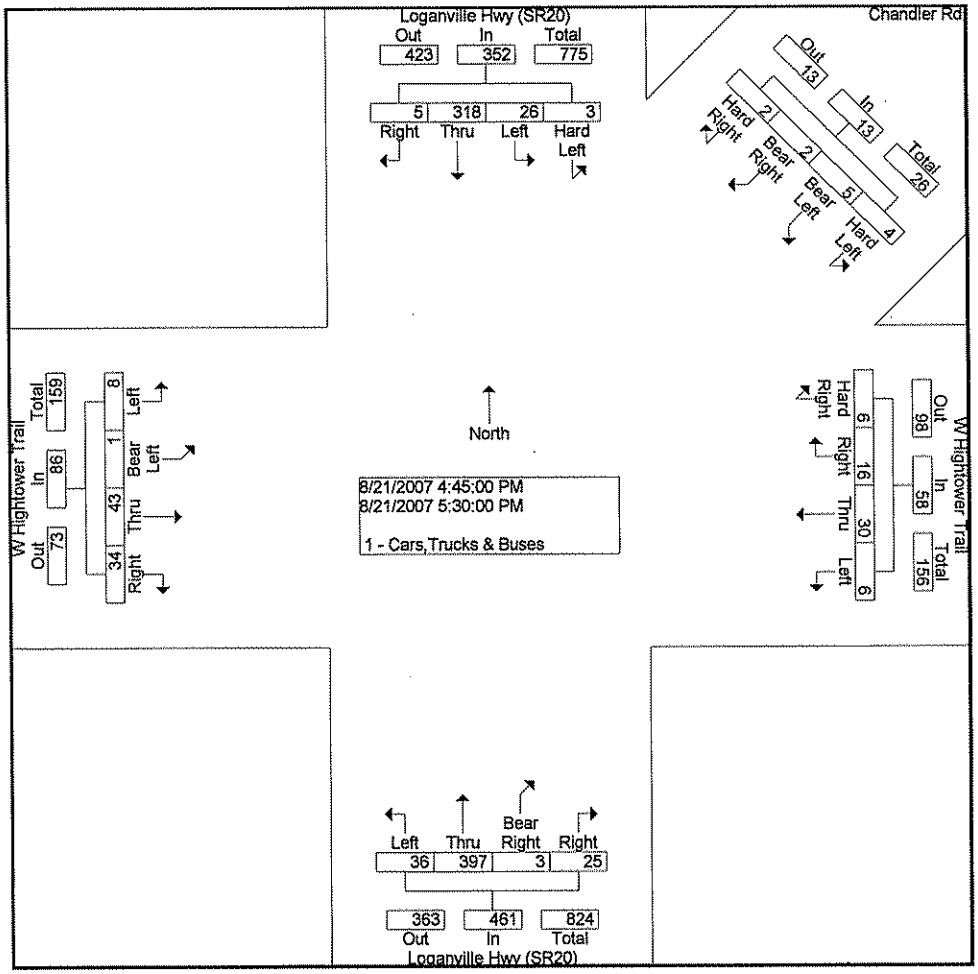
	Loganville Hwy (SR20) Northbound					Chandler Rd Southwestbound					Loganville Hwy (SR20) Southbound					W Hightower Trail Eastbound					W Hightower Trail Westbound					
Start Time	Left	Thru	Bear Right	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Left	Bear Left	Thru	Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Intersection	07:15 AM																									
Volume	39	295	3	9	346	6	8	2	3	19	2	8	338	12	360	14	2	15	18	49	17	43	22	1	83	857
Percent	11.3	85.3	0.9	2.6		31.6	42.1	10.5	15.8		0.6	2.2	93.9	3.3		28.6	4.1	30.6	36.7		20.5	51.8	26.5	1.2		
07:30 Volume	10	79	0	1	90	2	2	1	0	5	1	3	109	5	118	3	0	5	4	12	6	11	6	1	24	249
Peak Factor																										0.860
High Int.	07:15 AM					07:45 AM					07:30 AM					07:45 AM					07:15 AM					
Volume	9	84	2	2	97	1	3	1	1	6	1	3	109	5	118	4	0	4	5	13	4	13	7	0	24	
Peak Factor					0.892					0.792					0.763					0.942					0.865	



Reliable Traffic Data Services,LLC
Tel: (770) 578-8158 Fax: (770) 578-8159
email: reliabletraffic@msn.com

File Name : 23200001
Site Code : 23200001
Start Date : 8/21/2007
Page No : 3

	Loganville Hwy (SR20) Northbound					Chandler Rd Southwestbound					Loganville Hwy (SR20) Southbound					W Hightower Trail Eastbound					W Hightower Trail Westbound					
Start Time	Left	Thru	Bear Right	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Left	Bear Left	Thru	Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Intersection	04:45 PM																									
Volume	36	397	3	25	461	4	5	2	2	13	3	26	318	5	352	8	1	43	34	86	6	30	16	6	58	970
Percent	7.8	86.1	0.7	5.4		30.8	38.5	15.4	15.4		0.9	7.4	90.3	1.4		9.3	1.2	50.0	39.5		10.3	51.7	27.6	10.3		
05:00 Volume	7	114	1	8	130	2	2	1	1	6	1	5	84	2	92	1	0	13	10	24	2	8	3	2	15	267
Peak Factor																										0.908
High Int.	05:00 PM					05:00 PM					05:00 PM					05:00 PM					04:45 PM					
Volume	7	114	1	8	130	2	2	1	1	6	1	5	84	2	92	1	0	13	10	24	1	10	4	2	17	
Peak Factor					0.887					0.542					0.957					0.896					0.853	

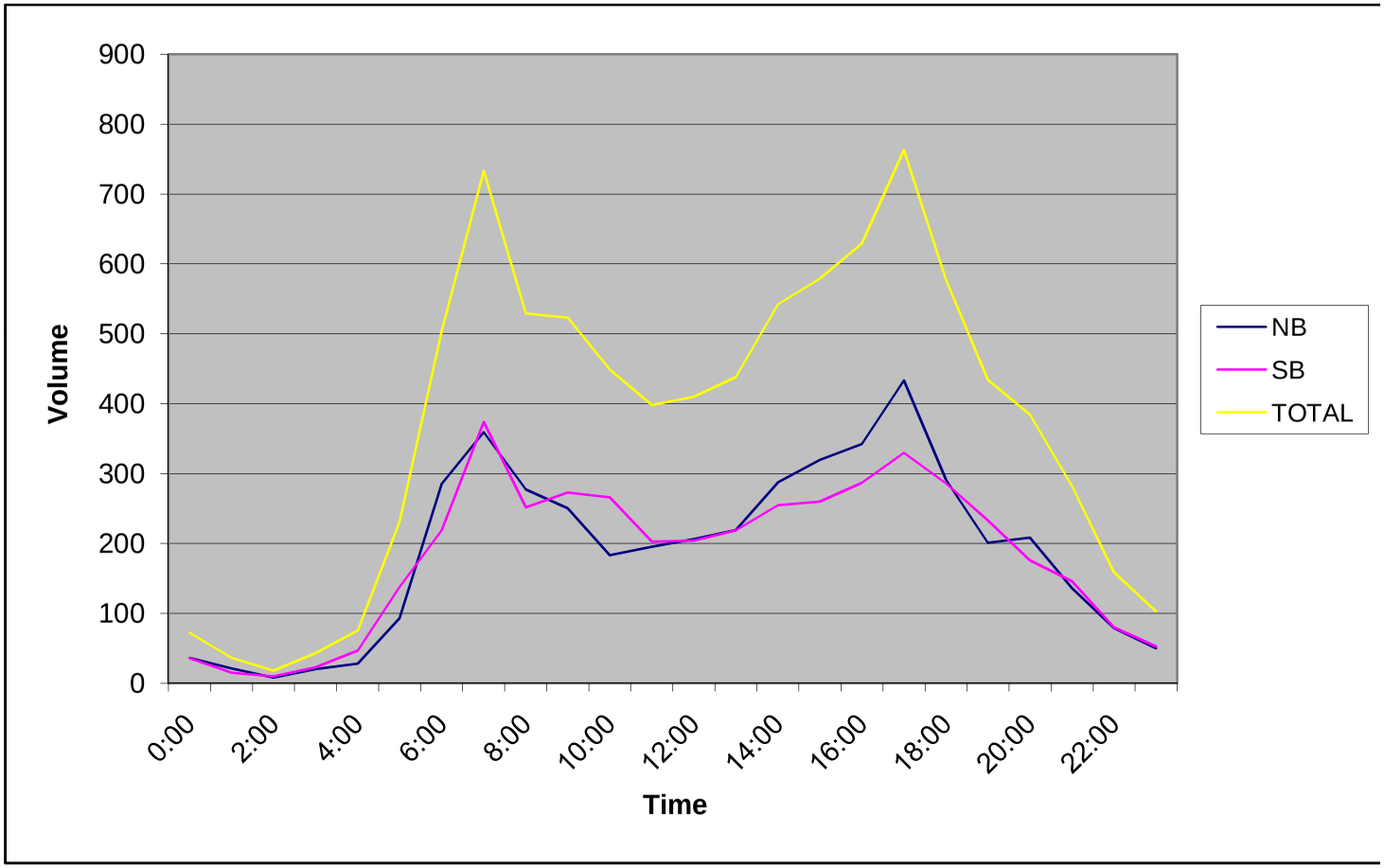


APPENDIX B

ATR Counts

SR 20

TIME	NB	SB	TOTAL
0:00	36	36	72
1:00	21	15	36
2:00	8	10	18
3:00	20	23	43
4:00	28	47	75
5:00	93	138	231
6:00	285	219	504
7:00	359	374	733
8:00	277	252	529
9:00	250	273	523
10:00	183	266	449
11:00	195	203	398
12:00	206	204	410
13:00	219	219	438
14:00	287	255	542
15:00	319	260	579
16:00	342	287	629
17:00	433	330	763
18:00	291	286	577
19:00	201	233	434
20:00	208	176	384
21:00	136	146	282
22:00	79	80	159
23:00	50	53	103
TOTAL	4526	4385	8911



Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200102
Station ID: 9412
Loganville Hwy (SR20) South of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Start Time	22-Aug-07 Wed	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		11	63		
12:15		10	56		
12:30		11	47		
12:45		4	40	36	206
01:00		6	59		
01:15		6	47		
01:30		6	48		
01:45		3	65	21	219
02:00		2	68		
02:15		2	69		
02:30		2	79		
02:45		2	71	8	287
03:00		5	68		
03:15		6	88		
03:30		7	86		
03:45		2	77	20	319
04:00		5	70		
04:15		9	79		
04:30		5	93		
04:45		9	100	28	342
05:00		17	105		
05:15		15	139		
05:30		26	99		
05:45		35	90	93	433
06:00		66	79		
06:15		61	67		
06:30		79	68		
06:45		79	77	285	291
07:00		89	63		
07:15		106	50		
07:30		96	48		
07:45		68	40	359	201
08:00		67	65		
08:15		75	48		
08:30		75	55		
08:45		60	40	277	208
09:00		70	33		
09:15		55	40		
09:30		63	37		
09:45		62	26	250	136
10:00		49	13		
10:15		51	33		
10:30		37	20		
10:45		46	13	183	79
11:00		48	18		
11:15		46	11		
11:30		48	12		
11:45		53	9	195	50
Total		1755	2771		
Percent		38.8%	61.2%		
Grand Total		1755	2771		
Percent		38.8%	61.2%		
ADT		Not Calculated			

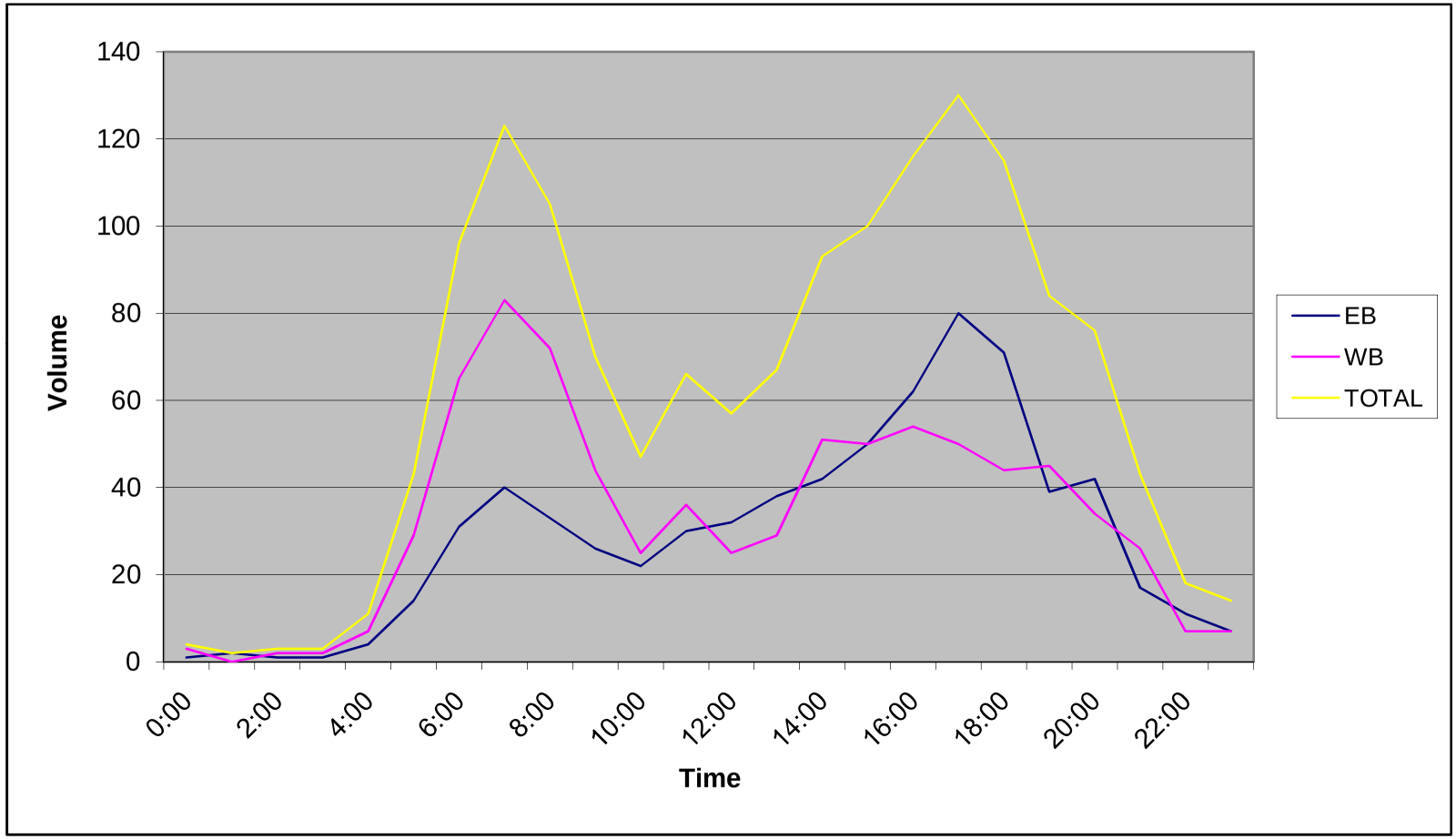
Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200101
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Start Time	22-Aug-07 Wed	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		14	53		
12:15		10	49		
12:30		9	50		
12:45		3	52	36	204
01:00		6	59		
01:15		4	49		
01:30		3	64		
01:45		2	47	15	219
02:00		2	59		
02:15		3	61		
02:30		1	64		
02:45		4	71	10	255
03:00		3	63		
03:15		6	54		
03:30		5	72		
03:45		9	71	23	260
04:00		8	68		
04:15		13	65		
04:30		11	71		
04:45		15	83	47	287
05:00		23	71		
05:15		41	89		
05:30		36	84		
05:45		38	86	138	330
06:00		42	77		
06:15		54	73		
06:30		59	67		
06:45		64	69	219	286
07:00		72	61		
07:15		93	62		
07:30		111	52		
07:45		98	58	374	233
08:00		71	53		
08:15		67	43		
08:30		61	37		
08:45		63	43	262	176
09:00		72	37		
09:15		76	43		
09:30		64	37		
09:45		61	29	273	146
10:00		67	25		
10:15		62	21		
10:30		76	19		
10:45		61	15	266	80
11:00		52	18		
11:15		42	15		
11:30		52	12		
11:45		57	8	203	53
Total		1866	2529		
Percent		42.5%	57.5%		
Grand Total		1866	2529		
Percent		42.5%	57.5%		
ADT		Not Calculated			

W. Hightower Trail

TIME	EB	WB	TOTAL
0:00	1	3	4
1:00	2	0	2
2:00	1	2	3
3:00	1	2	3
4:00	4	7	11
5:00	14	29	43
6:00	31	65	96
7:00	40	83	123
8:00	33	72	105
9:00	26	44	70
10:00	22	25	47
11:00	30	36	66
12:00	32	25	57
13:00	38	29	67
14:00	42	51	93
15:00	50	50	100
16:00	62	54	116
17:00	80	50	130
18:00	71	44	115
19:00	39	45	84
20:00	42	34	76
21:00	17	26	43
22:00	11	7	18
23:00	7	7	14
TOTAL	696	790	1486



Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200103
Station ID: 8133
W Hightower Trail West of SR20

Latitude: 0' 0.000 Undefined

Start Time	22-Aug-07 Wed	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		0	10		
12:15		0	8		
12:30		0	6		
12:45		1	8	1	32
01:00		0	11		
01:15		1	8		
01:30		1	9		
01:45		0	10	2	38
02:00		0	9		
02:15		0	12		
02:30		1	9		
02:45		0	12	1	42
03:00		0	7		
03:15		1	14		
03:30		0	14		
03:45		0	15	1	50
04:00		1	10		
04:15		1	12		
04:30		1	21		
04:45		1	19	4	62
05:00		1	15		
05:15		5	21		
05:30		2	26		
05:45		6	18	14	80
06:00		7	25		
06:15		7	19		
06:30		6	13		
06:45		11	14	31	71
07:00		9	8		
07:15		19	9		
07:30		7	14		
07:45		5	8	40	39
08:00		8	12		
08:15		9	12		
08:30		6	13		
08:45		10	5	33	42
09:00		6	4		
09:15		6	4		
09:30		3	4		
09:45		11	5	26	17
10:00		6	4		
10:15		5	3		
10:30		5	1		
10:45		6	3	22	11
11:00		12	2		
11:15		5	2		
11:30		7	3		
11:45		6	0	30	7
Total		205	491		
Percent		29.5%	70.5%		
Grand Total		205	491		
Percent		29.5%	70.5%		
ADT		Not Calculated			

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

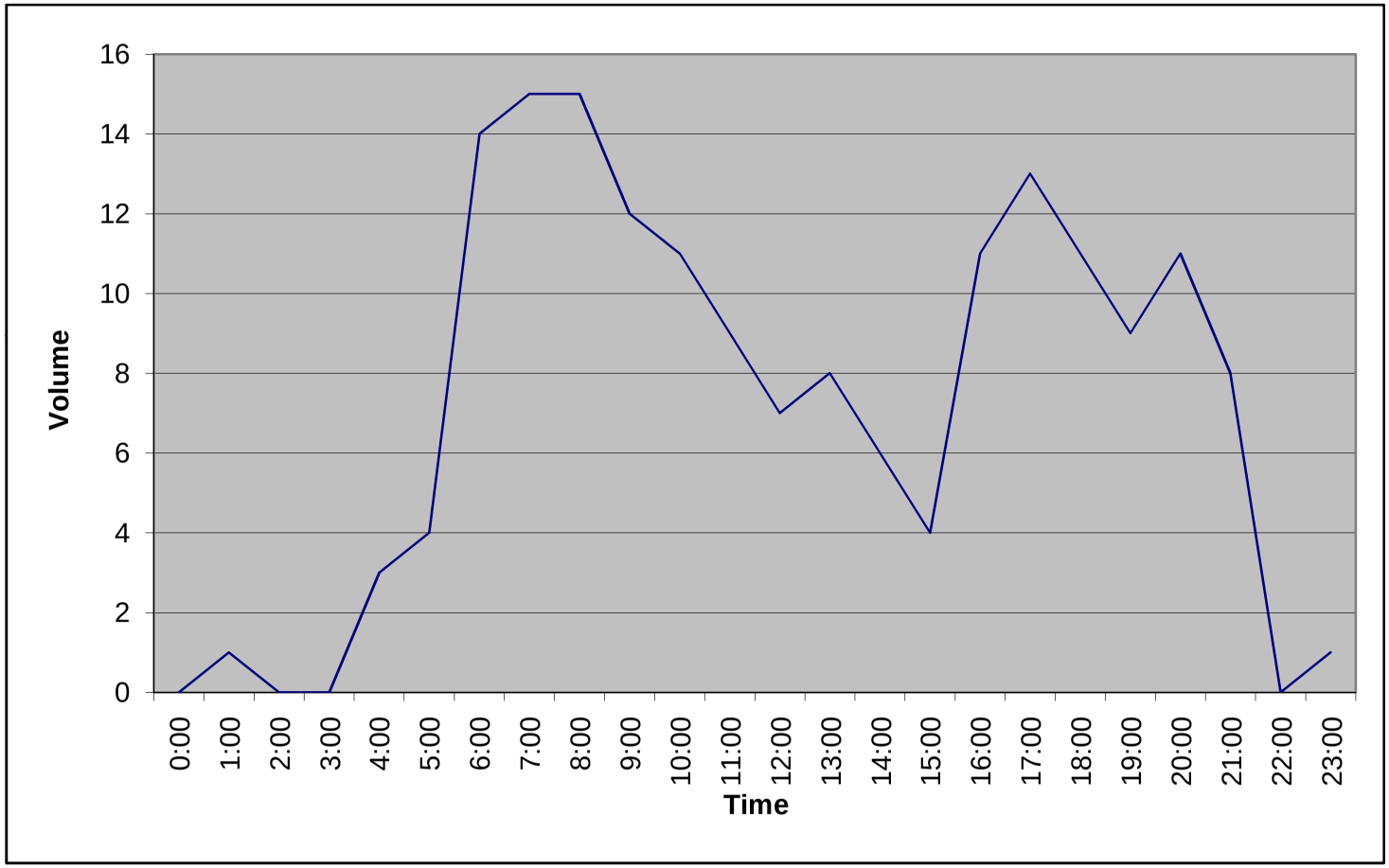
Site Code: 23200104
Station ID: 7655
W Hightower Trail East of SR20

Latitude: 0' 0.000 Undefined

Start Time	22-Aug-07 Wed	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		1	5		
12:15		0	7		
12:30		2	7		
12:45		0	6	3	25
01:00		0	12		
01:15		0	3		
01:30		0	2		
01:45		0	12	0	29
02:00		0	10		
02:15		1	11		
02:30		1	15		
02:45		0	15	2	51
03:00		1	11		
03:15		0	16		
03:30		1	12		
03:45		0	11	2	50
04:00		2	14		
04:15		2	12		
04:30		2	13		
04:45		1	15	7	54
05:00		5	14		
05:15		4	12		
05:30		8	13		
05:45		12	11	29	50
06:00		13	9		
06:15		10	11		
06:30		28	13		
06:45		14	11	65	44
07:00		27	14		
07:15		21	10		
07:30		21	9		
07:45		14	12	83	45
08:00		19	11		
08:15		19	10		
08:30		23	7		
08:45		11	6	72	34
09:00		10	5		
09:15		13	7		
09:30		6	6		
09:45		15	8	44	26
10:00		11	1		
10:15		7	1		
10:30		5	2		
10:45		2	3	25	7
11:00		8	3		
11:15		10	1		
11:30		7	1		
11:45		11	2	36	7
Total		368	422		
Percent		46.6%	53.4%		
Grand Total		368	422		
Percent		46.6%	53.4%		
ADT		Not Calculated			

Chandler Road

TIME	EB
0:00	0
1:00	1
2:00	0
3:00	0
4:00	3
5:00	4
6:00	14
7:00	15
8:00	15
9:00	12
10:00	11
11:00	9
12:00	7
13:00	8
14:00	6
15:00	4
16:00	11
17:00	13
18:00	11
19:00	9
20:00	11
21:00	8
22:00	0
23:00	1
TOTAL	173



Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200105
Station ID: 5556
Chandler Rd Northeast of W Hightower Tr

Latitude: 0' 0.000 Undefined

Start Time	22-Aug-07 Wed	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		0	1		
12:15		0	0		
12:30		0	2		
12:45		0	4	0	7
01:00		0	1		
01:15		1	0		
01:30		0	3		
01:45		0	4	1	8
02:00		0	1		
02:15		0	3		
02:30		0	1		
02:45		0	1	0	6
03:00		0	2		
03:15		0	1		
03:30		0	1		
03:45		0	0	0	4
04:00		0	4		
04:15		0	0		
04:30		0	3		
04:45		3	4	3	11
05:00		1	5		
05:15		0	3		
05:30		0	2		
05:45		3	3	4	13
06:00		1	1		
06:15		2	7		
06:30		7	2		
06:45		4	1	14	11
07:00		5	3		
07:15		5	2		
07:30		4	2		
07:45		1	2	15	9
08:00		2	2		
08:15		4	4		
08:30		3	3		
08:45		6	2	15	11
09:00		6	2		
09:15		0	1		
09:30		3	4		
09:45		3	1	12	8
10:00		2	0		
10:15		4	0		
10:30		4	0		
10:45		1	0	11	0
11:00		3	0		
11:15		2	1		
11:30		2	0		
11:45		2	0	9	1
Total		84	89		
Percent		48.6%	51.4%		
Grand Total		84	89		
Percent		48.6%	51.4%		
ADT		Not Calculated			

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Northbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
08/22/07	0	9	3	0	1	0	0	0	0	0	0	0	0	0	13
00:15	0	3	1	1	2	0	0	0	0	0	0	0	0	0	7
00:30	0	3	4	1	0	0	0	0	0	0	0	0	0	0	8
00:45	0	2	2	0	1	0	0	0	0	0	0	0	0	0	5
	0	17	10	2	4	0	0	0	0	0	0	0	0	0	33
01:00	0	3	2	1	0	0	0	0	0	0	0	0	0	0	6
01:15	0	3	2	1	2	0	0	0	0	0	0	0	0	0	8
01:30	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
01:45	0	2	1	0	1	0	0	0	0	0	0	0	0	0	4
	0	14	7	2	3	0	0	0	0	0	0	0	0	0	26
02:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:15	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
02:30	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:45	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
	0	7	7	0	1	0	0	0	0	0	0	0	0	0	15
03:00	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
03:15	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
03:30	0	6	2	1	1	0	0	0	0	0	0	0	0	0	10
03:45	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
	0	15	8	1	3	0	0	0	0	0	0	0	0	0	27
04:00	0	4	1	1	2	0	0	0	0	0	0	0	0	0	8
04:15	0	9	2	1	2	0	0	0	0	0	0	0	0	0	14
04:30	0	4	2	1	0	0	0	1	0	0	0	0	0	0	8
04:45	0	3	2	0	2	0	0	0	0	0	0	0	0	0	7
	0	20	7	3	6	0	0	1	0	0	0	0	0	0	37
05:00	0	3	8	0	2	0	0	0	0	0	0	0	0	0	13
05:15	0	16	8	2	4	0	0	2	0	0	0	0	0	0	32
05:30	0	20	11	3	4	0	0	1	0	0	0	0	0	0	39
05:45	0	21	9	1	3	0	0	1	0	0	0	0	0	0	35
	0	60	36	6	13	0	0	4	0	0	0	0	0	0	119
06:00	0	26	9	2	4	0	0	2	0	0	0	0	0	0	43
06:15	0	28	14	3	5	0	0	2	0	0	1	0	0	0	53
06:30	0	39	27	7	13	1	0	4	0	0	0	0	0	0	91
06:45	0	48	28	4	13	0	0	4	0	0	0	0	0	0	97
	0	141	78	16	35	1	0	12	0	0	1	0	0	0	284
07:00	0	58	21	3	9	0	0	4	0	0	0	0	0	0	95
07:15	0	52	18	5	6	1	0	5	0	1	1	0	0	0	89
07:30	0	44	25	6	13	0	0	3	0	0	0	0	0	0	91
07:45	1	40	20	5	7	0	0	3	0	0	1	0	0	0	77
	1	194	84	19	35	1	0	15	0	1	2	0	0	0	352
08:00	0	42	21	4	6	0	0	1	1	0	0	0	0	0	75
08:15	0	42	15	4	6	0	0	3	0	0	0	0	1	0	71
08:30	1	36	13	1	4	0	0	3	0	0	0	0	0	0	58
08:45	0	27	14	2	10	0	0	2	0	0	0	0	0	0	55
	1	147	63	11	26	0	0	9	1	0	0	0	1	0	259
09:00	0	28	13	3	7	0	0	2	0	0	0	0	0	0	53
09:15	0	27	11	4	9	0	0	2	0	0	0	0	0	0	53
09:30	0	27	15	3	6	0	0	4	0	0	0	0	0	0	55
09:45	0	21	10	2	5	0	0	2	0	0	0	0	0	0	40
	0	103	49	12	27	0	0	10	0	0	0	0	0	0	201
10:00	0	27	10	2	8	0	0	2	0	0	0	0	0	0	49
10:15	0	26	12	0	5	0	0	1	0	0	0	0	0	0	44
10:30	0	10	8	1	3	0	0	1	0	0	0	0	0	0	23
10:45	0	20	6	0	5	0	0	1	0	0	0	0	0	0	32
	0	83	36	3	21	0	0	5	0	0	0	0	0	0	148
11:00	0	27	12	1	4	0	0	1	0	0	0	0	0	0	45
11:15	0	12	16	0	4	0	0	2	0	0	0	0	0	0	34
11:30	0	24	15	0	4	0	0	0	0	0	0	0	0	0	43
11:45	0	20	13	0	2	0	0	1	0	0	0	0	0	0	36
	0	83	56	1	14	0	0	4	0	0	0	0	0	0	158
Total	2	884	441	76	188	2	0	60	1	1	3	0	1	0	1659
Percent	0.1%	53.3%	26.6%	4.6%	11.3%	0.1%	0.0%	3.6%	0.1%	0.1%	0.2%	0.0%	0.1%	0.0%	

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Northbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
12 PM	0	36	17	0	10	0	0	1	0	0	0	0	0	0	64
12:15	0	39	15	0	5	0	0	0	0	0	0	0	0	0	59
12:30	0	24	18	0	4	0	0	1	0	0	0	0	0	0	47
12:45	0	38	13	0	9	0	0	0	0	0	0	0	0	0	60
	0	137	63	0	28	0	0	2	0	0	0	0	0	0	230
13:00	0	18	19	0	7	0	0	3	0	0	0	0	0	0	47
13:15	0	32	15	0	3	0	0	0	0	0	0	0	0	0	50
13:30	0	16	13	0	5	0	0	0	0	0	0	0	0	0	34
13:45	0	16	17	0	4	0	0	2	0	0	0	0	1	0	40
	0	82	64	0	19	0	0	5	0	0	0	0	1	0	171
14:00	0	27	18	1	10	0	0	4	0	0	0	0	0	0	60
14:15	1	39	15	0	12	0	1	1	0	0	0	0	0	0	69
14:30	0	33	18	1	6	0	0	1	1	0	0	0	0	0	60
14:45	0	42	8	1	1	0	0	1	0	0	0	0	0	0	53
	1	141	59	3	29	0	1	7	1	0	0	0	0	0	242
15:00	0	50	22	0	4	0	0	2	0	0	0	0	0	0	78
15:15	0	28	22	1	6	0	0	0	0	1	0	0	0	0	58
15:30	0	39	12	0	7	0	0	1	0	0	0	0	0	0	59
15:45	0	44	28	1	6	0	0	3	0	0	0	0	0	0	82
	0	161	84	2	23	0	0	6	0	1	0	0	0	0	277
16:00	0	47	17	0	8	0	0	0	0	0	0	0	0	0	72
16:15	0	57	20	0	10	0	0	6	0	0	1	0	0	0	94
16:30	0	61	21	0	9	0	0	0	0	0	0	0	0	0	91
16:45	0	65	25	0	8	0	0	2	0	0	0	0	0	0	100
	0	230	83	0	35	0	0	8	0	0	1	0	0	0	357
17:00	0	76	19	0	9	0	0	2	0	0	0	0	0	0	106
17:15	0	79	23	1	7	0	1	1	0	0	0	0	0	0	112
17:30	1	76	21	1	4	0	0	2	0	0	0	0	0	0	105
17:45	1	72	24	2	4	0	0	1	0	1	0	0	0	0	105
	2	303	87	4	24	0	1	6	0	1	0	0	0	0	428
18:00	0	60	22	1	11	1	0	3	0	1	0	0	0	0	99
18:15	0	44	16	1	5	0	0	3	0	0	0	0	0	0	69
18:30	0	39	13	0	6	0	0	0	0	0	0	0	0	0	58
18:45	0	48	15	2	5	0	0	2	0	0	0	0	0	0	72
	0	191	66	4	27	1	0	8	0	1	0	0	0	0	298
19:00	0	42	14	3	7	0	0	0	0	0	0	0	0	0	66
19:15	0	39	16	1	4	0	0	2	0	0	0	0	0	0	62
19:30	0	30	16	3	4	0	0	0	1	0	0	0	1	0	55
19:45	0	30	14	1	3	1	0	0	0	0	0	0	0	0	49
	0	141	60	8	18	1	0	2	1	0	0	0	1	0	232
20:00	0	21	15	2	4	0	0	2	0	0	0	0	0	0	44
20:15	0	32	13	1	8	0	0	1	0	0	0	0	1	0	56
20:30	0	34	18	0	7	0	0	1	0	0	0	0	0	0	60
20:45	0	36	19	2	3	0	0	1	0	0	0	0	0	0	61
	0	123	65	5	22	0	0	5	0	0	0	0	1	0	221
21:00	0	24	9	1	2	0	0	0	0	0	0	0	0	0	36
21:15	0	34	11	0	3	0	0	1	0	0	0	0	0	0	49
21:30	0	32	8	0	4	1	0	2	0	0	0	0	0	0	47
21:45	0	26	8	1	4	0	0	1	0	0	0	0	0	0	40
	0	116	36	2	13	1	0	4	0	0	0	0	0	0	172
22:00	0	26	6	0	3	0	0	1	0	0	0	0	0	0	36
22:15	0	20	9	2	1	0	0	0	0	0	0	0	0	0	32
22:30	0	16	2	0	2	0	0	0	0	0	0	0	0	0	20
22:45	0	12	4	0	1	0	0	0	0	0	0	0	0	0	17
	0	74	21	2	7	0	0	1	0	0	0	0	0	0	105
23:00	0	6	4	1	1	0	0	0	0	0	0	0	0	0	12
23:15	0	12	4	1	4	0	0	1	0	0	0	0	0	0	22
23:30	0	6	2	1	0	0	0	0	0	0	0	0	0	0	9
23:45	0	12	3	0	1	0	0	0	0	0	0	0	0	0	16
	0	36	13	3	6	0	0	1	0	0	0	0	0	0	59
Total	3	1735	701	33	251	3	2	55	2	3	1	0	3	0	2792
Percent	0.1%	62.1%	25.1%	1.2%	9.0%	0.1%	0.1%	2.0%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	
Grand Total	5	2619	1142	109	439	5	2	115	3	4	4	0	4	0	4451
Percent	0.1%	58.8%	25.7%	2.4%	9.9%	0.1%	0.0%	2.6%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Northbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total
08/22/07	0	0	0	0	0	0	0	4	6	1	1	0	0	0	12
00:15	0	0	0	0	0	1	0	0	3	2	0	0	0	0	6
00:30	0	1	0	0	0	0	0	3	3	1	2	0	0	0	10
00:45	0	0	0	0	0	0	0	1	2	1	1	0	0	0	5
	0	1	0	0	0	1	0	8	14	5	4	0	0	0	33
01:00	0	0	0	0	0	0	0	1	4	1	1	0	0	0	7
01:15	0	0	0	0	0	0	1	1	3	3	1	0	1	0	10
01:30	0	0	0	0	0	0	0	0	3	1	1	0	0	0	5
01:45	0	1	0	0	0	0	0	0	3	0	0	0	0	0	4
	0	1	0	0	0	0	1	2	13	5	3	0	1	0	26
02:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
02:15	0	0	0	0	0	0	1	0	0	1	1	0	1	0	4
02:30	0	0	0	0	0	0	0	1	2	1	0	0	0	0	4
02:45	0	0	0	0	0	0	1	0	2	1	1	0	0	0	5
	0	0	0	0	0	0	2	2	5	3	2	0	1	0	15
03:00	0	0	0	0	0	0	0	2	1	1	0	0	0	0	4
03:15	0	0	0	0	0	0	1	1	3	0	0	0	0	0	5
03:30	0	0	0	0	0	1	2	2	4	3	0	0	0	0	12
03:45	0	0	0	0	0	0	1	2	2	1	0	0	0	0	6
	0	0	0	0	0	1	4	7	10	5	0	0	0	0	27
04:00	0	0	0	0	0	1	1	3	2	3	0	0	0	0	10
04:15	0	0	0	0	0	0	1	4	2	2	1	1	0	0	11
04:30	0	0	0	0	0	1	0	2	3	1	1	0	0	0	8
04:45	0	0	0	0	0	0	1	3	1	1	2	0	0	0	8
	0	0	0	0	0	2	3	12	8	7	4	1	0	0	37
05:00	0	0	0	0	0	2	1	2	2	9	2	0	0	0	18
05:15	2	0	0	1	0	0	1	4	4	7	6	0	1	0	26
05:30	2	0	0	1	2	0	4	4	8	7	7	1	3	0	39
05:45	1	0	0	1	0	0	4	6	9	9	5	1	0	0	36
	5	0	0	3	2	2	10	16	23	32	20	2	4	0	119
06:00	1	0	0	1	2	0	3	12	13	14	5	1	0	0	52
06:15	2	0	0	1	0	0	5	12	18	22	10	1	1	0	72
06:30	2	2	0	2	1	0	8	8	21	18	13	2	2	0	79
06:45	3	2	0	2	1	0	7	9	25	20	9	1	2	0	81
	8	4	0	6	4	0	23	41	77	74	37	5	5	0	284
07:00	3	3	0	1	0	0	5	7	31	20	10	1	1	0	82
07:15	2	0	0	2	0	2	8	13	23	23	10	2	4	0	89
07:30	4	0	1	2	3	1	9	15	35	19	14	2	4	0	109
07:45	4	3	0	3	1	1	7	15	14	11	10	2	2	0	73
	13	6	1	8	4	4	29	50	103	73	44	7	11	0	353
08:00	4	1	0	2	1	0	4	13	21	18	9	1	0	0	74
08:15	2	0	0	2	0	0	5	9	19	17	11	1	1	0	67
08:30	0	2	1	1	0	2	4	7	22	15	5	2	0	0	61
08:45	2	0	0	2	1	1	4	10	18	12	7	1	0	0	58
	8	3	1	7	2	3	17	39	80	62	32	5	1	0	260
09:00	2	0	0	1	1	0	3	7	14	13	6	1	0	0	48
09:15	2	2	0	1	0	0	3	10	18	12	6	0	0	0	54
09:30	1	1	2	3	5	3	1	5	13	17	7	1	0	0	59
09:45	1	2	0	1	1	0	1	4	13	13	4	0	0	0	40
	6	5	2	6	7	3	8	26	58	55	23	2	0	0	201
10:00	1	2	0	1	0	0	1	6	18	10	10	0	1	0	50
10:15	1	1	0	0	0	0	2	10	9	6	10	1	0	0	40
10:30	0	0	0	0	1	0	1	3	7	9	4	0	1	0	26
10:45	0	0	0	0	0	0	1	6	12	10	2	1	0	0	32
	2	3	0	1	1	0	5	25	46	35	26	2	2	0	148
11:00	0	0	0	0	0	0	4	14	3	12	9	2	2	0	46
11:15	0	0	0	0	0	0	4	6	8	10	9	1	2	0	40
11:30	0	0	0	0	0	0	2	3	9	14	4	1	0	0	33
11:45	0	0	0	0	0	0	0	8	12	11	6	2	0	0	39
	0	0	0	0	0	0	10	31	32	47	28	6	4	0	158
Total	42	23	4	31	20	16	112	259	469	403	223	30	29	0	1661

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Northbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total
12 PM	0	0	0	0	0	0	2	10	15	21	10	0	0	0	58
12:15	0	0	0	0	0	0	0	12	18	20	9	2	2	0	63
12:30	0	0	0	0	0	0	3	14	14	19	9	2	1	0	62
12:45	0	0	0	0	0	0	8	9	12	17	3	0	0	0	49
	0	0	0	0	0	0	13	45	59	77	31	4	3	0	232
13:00	0	0	0	0	0	0	0	7	18	14	2	2	0	0	43
13:15	0	0	0	0	0	0	2	6	16	16	4	1	1	0	46
13:30	0	0	0	0	0	0	0	1	12	12	6	0	0	0	31
13:45	0	0	0	0	1	2	2	8	18	8	8	2	1	0	50
	0	0	0	0	1	2	4	22	64	50	20	5	2	0	170
14:00	0	0	0	0	0	0	2	5	18	24	9	2	0	0	60
14:15	0	0	0	0	0	2	3	8	22	20	7	2	0	0	64
14:30	0	0	2	3	2	1	4	6	16	21	8	1	0	0	64
14:45	0	0	0	0	0	0	6	8	13	15	9	2	1	0	54
	0	0	2	3	2	3	15	27	69	80	33	7	1	0	242
15:00	0	0	0	0	0	1	8	17	25	18	9	0	0	0	78
15:15	0	0	0	0	0	0	11	15	24	13	4	0	0	0	67
15:30	0	0	0	0	0	0	6	3	18	20	8	0	0	0	55
15:45	0	0	0	0	0	0	8	17	20	18	13	1	0	0	77
	0	0	0	0	0	1	33	52	87	69	34	1	0	0	277
16:00	0	0	0	0	0	2	6	13	23	18	6	2	3	0	73
16:15	0	0	0	0	0	0	8	17	33	33	11	2	0	0	104
16:30	0	0	0	0	0	0	9	21	35	23	15	2	2	0	107
16:45	0	0	0	0	0	0	2	11	31	17	10	2	0	0	73
	0	0	0	0	0	2	25	62	122	91	42	8	5	0	357
17:00	0	0	0	0	0	2	2	9	33	26	10	0	0	0	82
17:15	0	2	6	8	8	4	3	10	28	40	15	2	0	0	126
17:30	0	0	2	0	2	0	4	9	34	37	18	2	2	0	110
17:45	2	0	0	2	3	0	2	12	31	33	20	2	3	0	110
	2	2	8	10	13	6	11	40	126	136	63	6	5	0	428
18:00	1	3	0	1	0	0	3	9	36	21	12	2	0	0	88
18:15	2	2	0	2	2	0	5	12	21	28	12	0	2	0	88
18:30	1	0	0	1	0	3	3	6	18	21	8	0	2	0	63
18:45	2	2	0	2	2	4	3	8	21	13	9	0	0	0	66
	6	7	0	6	4	7	14	35	96	83	41	2	4	0	305
19:00	2	1	0	2	2	2	5	8	24	22	4	0	0	0	72
19:15	0	2	0	0	0	0	3	9	14	15	6	2	0	0	51
19:30	1	0	0	3	2	2	7	12	10	10	4	0	0	0	51
19:45	0	2	2	2	0	0	3	14	20	8	6	2	0	0	59
	3	5	2	7	4	4	18	43	68	55	20	4	0	0	233
20:00	1	0	0	0	2	0	0	12	14	9	8	2	0	0	48
20:15	0	0	0	0	3	0	4	9	20	16	2	0	0	0	54
20:30	0	1	0	1	0	3	2	15	15	12	8	0	2	0	59
20:45	2	0	0	0	2	2	4	14	13	14	8	2	0	0	61
	3	1	0	1	7	5	10	50	62	51	26	4	2	0	222
21:00	0	0	0	0	0	0	4	15	4	10	6	0	0	0	39
21:15	2	0	0	2	0	2	3	10	12	9	4	0	2	0	46
21:30	1	0	0	0	2	0	6	13	15	11	3	0	0	0	51
21:45	0	0	0	0	3	2	4	9	10	8	4	0	0	0	40
	3	0	0	2	5	4	17	47	41	38	17	0	2	0	176
22:00	1	1	0	0	4	0	3	10	6	3	3	2	0	0	33
22:15	0	0	0	0	2	0	4	14	9	5	2	0	0	0	36
22:30	0	0	0	0	0	0	2	9	7	8	2	0	0	0	28
22:45	0	0	0	0	0	0	0	0	6	3	1	0	0	0	10
	1	1	0	0	6	0	9	33	28	19	8	2	0	0	107
23:00	0	0	0	0	0	0	2	3	3	2	4	0	0	0	14
23:15	0	2	0	0	2	0	2	1	8	4	2	2	0	0	23
23:30	0	0	0	0	0	0	0	2	3	2	3	0	0	0	10
23:45	0	0	0	0	0	0	2	2	3	0	3	2	0	0	12
	0	2	0	0	2	0	6	8	17	8	12	4	0	0	59
Total	18	18	12	29	44	34	175	464	839	757	347	47	24	0	2808
Grand Total	60	41	16	60	64	50	287	723	1308	1160	570	77	53	0	4469

15th Percentile :	46 MPH
50th Percentile :	54 MPH
85th Percentile :	61 MPH
95th Percentile :	65 MPH

Stats

Mean Speed(Average) :	53 MPH
10 MPH Pace Speed :	51-60 MPH
Number in Pace :	2468
Percent in Pace :	55.2%
Number of Vehicles > 45 MPH :	3891
Percent of Vehicles > 45 MPH :	87.1%

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Southbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
08/22/07	0	10	3	2	0	0	0	0	0	0	0	0	0	0	15
00:15	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
00:30	0	4	6	0	3	0	0	0	0	0	0	0	0	0	13
00:45	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
	0	20	13	2	3	0	0	0	0	0	0	0	0	0	38
01:00	0	2	3	0	0	0	0	0	0	0	0	0	0	0	5
01:15	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
01:30	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
01:45	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
	0	6	8	0	0	0	0	0	0	0	0	0	0	0	14
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:15	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:30	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:45	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
	0	7	4	0	0	0	0	0	0	0	0	0	0	0	11
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:15	0	2	3	0	0	0	0	0	0	0	0	0	0	0	5
03:30	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
03:45	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
	0	13	9	0	0	0	0	0	0	0	0	0	0	0	22
04:00	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
04:15	0	10	3	0	2	0	0	0	0	0	0	0	0	0	15
04:30	0	8	3	0	0	0	0	0	0	0	0	0	0	0	11
04:45	0	11	3	0	0	0	0	0	0	0	0	0	0	0	14
	0	32	11	0	2	0	0	0	0	0	0	0	0	0	45
05:00	0	19	4	0	0	0	0	0	0	0	0	0	0	0	23
05:15	0	24	9	2	3	0	0	2	0	0	0	0	0	0	40
05:30	0	22	9	2	4	0	0	1	0	0	0	0	1	0	39
05:45	0	29	7	1	1	0	0	0	0	0	0	0	0	0	38
	0	94	29	5	8	0	0	3	0	0	0	0	1	0	140
06:00	0	25	7	1	3	0	0	1	0	0	0	0	0	0	37
06:15	0	31	11	2	5	0	0	1	0	0	0	0	0	0	50
06:30	0	35	13	4	5	0	0	1	0	0	0	0	0	0	58
06:45	0	33	15	5	7	0	0	3	0	0	0	0	0	0	63
	0	124	46	12	20	0	0	6	0	0	0	0	0	0	208
07:00	0	39	18	4	5	0	0	4	0	0	0	0	0	0	70
07:15	0	50	21	5	10	0	0	5	0	0	0	0	0	0	91
07:30	0	65	23	5	16	0	0	2	0	0	0	0	0	0	111
07:45	0	57	21	6	8	0	0	5	1	0	0	0	0	0	98
	0	211	83	20	39	0	0	16	1	0	0	0	0	0	370
08:00	0	37	24	3	5	0	0	2	0	0	0	0	0	0	71
08:15	0	37	17	3	7	1	0	2	0	0	0	0	0	0	67
08:30	0	34	14	4	6	0	0	1	0	0	0	0	0	0	59
08:45	0	35	16	2	5	0	0	1	0	0	0	0	0	0	59
	0	143	71	12	23	1	0	6	0	0	0	0	0	0	256
09:00	0	35	22	4	8	0	0	2	0	0	0	0	0	0	71
09:15	0	43	22	3	4	0	0	4	0	0	0	0	0	0	76
09:30	0	35	17	4	7	0	0	1	0	0	0	0	0	0	64
09:45	0	31	16	2	9	0	0	1	0	0	0	0	0	0	59
	0	144	77	13	28	0	0	8	0	0	0	0	0	0	270
10:00	0	29	25	4	8	0	0	1	0	0	0	0	0	0	67
10:15	0	34	19	1	7	0	0	0	0	0	0	0	0	0	61
10:30	0	43	24	0	14	0	0	1	0	0	0	0	0	0	82
10:45	0	36	17	0	7	0	0	1	0	0	0	0	0	0	61
	0	142	85	5	36	0	0	3	0	0	0	0	0	0	271
11:00	0	32	13	0	4	0	0	2	0	1	0	0	0	0	52
11:15	0	26	11	2	2	0	0	1	0	0	0	0	0	0	42
11:30	0	23	14	0	7	0	0	4	0	0	0	0	0	0	48
11:45	0	29	20	0	7	0	0	0	0	0	0	0	0	0	56
	0	110	58	2	20	0	0	7	0	1	0	0	0	0	198
Total	0	1046	494	71	179	1	0	49	1	1	0	0	1	0	1843
Percent	0.0%	56.8%	26.8%	3.9%	9.7%	0.1%	0.0%	2.7%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Southbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
12 PM	0	26	19	0	7	0	0	1	0	0	0	0	0	0	53
12:15	0	32	12	1	1	0	0	2	0	0	0	0	0	0	48
12:30	0	29	16	1	2	0	0	2	0	0	0	0	0	0	50
12:45	0	23	21	1	4	0	0	2	0	0	0	0	0	0	51
	0	110	68	3	14	0	0	7	0	0	0	0	0	0	202
13:00	0	41	14	2	4	0	0	1	0	1	0	0	0	0	63
13:15	0	31	14	1	1	0	0	2	0	0	0	0	0	0	49
13:30	0	37	17	0	8	0	1	1	0	0	0	0	0	0	64
13:45	0	23	18	1	6	0	0	0	0	0	0	0	0	0	48
	0	132	63	4	19	0	1	4	0	1	0	0	0	0	224
14:00	0	28	23	0	7	0	0	0	0	1	0	0	0	0	59
14:15	0	22	18	4	10	0	0	4	0	0	1	0	0	0	59
14:30	0	29	23	0	13	0	0	2	0	0	0	0	0	0	67
14:45	0	35	24	4	8	0	0	1	0	0	0	0	1	0	73
	0	114	88	8	38	0	0	7	0	1	1	0	1	0	258
15:00	0	29	18	2	8	0	0	2	0	0	0	0	1	0	60
15:15	0	29	16	4	4	0	0	1	0	0	0	0	0	0	54
15:30	0	41	18	0	9	0	0	4	0	0	0	0	0	0	72
15:45	0	40	18	2	7	0	0	4	0	0	0	0	0	0	71
	0	139	70	8	28	0	0	11	0	0	0	0	1	0	257
16:00	0	41	22	0	3	0	0	2	0	0	0	0	0	0	68
16:15	0	36	21	1	6	0	0	3	0	0	0	0	0	0	67
16:30	0	43	18	0	7	0	0	3	0	0	0	0	0	0	71
16:45	0	55	22	1	4	0	0	1	0	0	0	0	0	0	83
	0	175	83	2	20	0	0	9	0	0	0	0	0	0	289
17:00	0	44	22	2	3	0	0	2	0	0	0	0	0	0	73
17:15	0	51	21	3	6	0	0	6	1	0	1	0	0	0	89
17:30	0	53	25	0	6	0	0	2	0	0	0	0	0	0	86
17:45	0	52	24	1	6	0	0	3	0	0	0	0	0	0	86
	0	200	92	6	21	0	0	13	1	0	1	0	0	0	334
18:00	0	45	27	0	2	0	0	3	0	0	0	0	0	0	77
18:15	0	44	22	1	5	0	0	1	0	0	0	0	0	0	73
18:30	0	36	23	2	3	0	0	3	0	0	0	0	0	0	67
18:45	0	41	21	2	4	0	0	1	0	0	0	0	0	0	69
	0	166	93	5	14	0	0	8	0	0	0	0	0	0	286
19:00	0	37	24	1	2	0	0	1	0	0	0	0	0	0	65
19:15	0	33	28	0	1	0	0	0	0	0	0	0	0	0	62
19:30	0	29	13	1	3	0	0	2	0	0	0	0	0	0	48
19:45	0	32	16	1	8	0	0	1	0	0	0	0	0	0	58
	0	131	81	3	14	0	0	4	0	0	0	0	0	0	233
20:00	0	29	11	2	10	0	0	1	0	0	0	0	0	0	53
20:15	0	28	10	1	4	0	0	0	0	0	0	0	0	0	43
20:30	0	25	9	0	3	0	0	0	0	0	0	0	0	0	37
20:45	0	23	10	0	8	0	0	2	0	0	0	0	0	0	43
	0	105	40	3	25	0	0	3	0	0	0	0	0	0	176
21:00	0	24	9	1	1	0	0	0	0	0	0	0	0	0	35
21:15	0	29	11	0	2	0	0	1	0	0	0	0	0	0	43
21:30	0	26	9	1	1	0	0	0	0	0	0	0	0	0	37
21:45	0	19	9	1	1	0	0	0	0	0	0	0	0	0	30
	0	98	38	3	5	0	0	1	0	0	0	0	0	0	145
22:00	0	12	8	0	1	0	0	1	0	0	0	0	0	0	22
22:15	0	15	4	1	1	0	0	0	0	0	0	0	0	0	21
22:30	0	12	4	0	1	0	0	0	0	0	0	0	0	0	17
22:45	0	10	5	0	0	0	0	0	0	0	0	0	0	0	15
	0	49	21	1	3	0	0	1	0	0	0	0	0	0	75
23:00	0	9	9	0	0	0	0	0	0	0	0	0	0	0	18
23:15	0	11	3	0	1	0	0	0	0	0	0	0	0	0	15
23:30	0	8	3	0	0	0	0	1	0	0	0	0	0	0	12
23:45	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
	0	32	17	0	1	0	0	1	0	0	0	0	0	0	51
Total	0	1451	754	46	202	0	1	69	1	2	2	0	2	0	2530
Percent	0.0%	57.4%	29.8%	1.8%	8.0%	0.0%	0.0%	2.7%	0.0%	0.1%	0.1%	0.0%	0.1%	0.0%	
Grand Total	0	2497	1248	117	381	1	1	118	2	3	2	0	3	0	4373
Percent	0.0%	57.1%	28.5%	2.7%	8.7%	0.0%	0.0%	2.7%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Southbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total
08/22/07	0	0	0	0	0	0	2	0	7	4	0	0	0	0	13
00:15	0	0	0	0	0	0	0	0	5	4	0	0	0	0	9
00:30	0	0	0	2	2	0	0	2	4	0	0	0	0	0	10
00:45	0	0	0	0	0	0	0	1	3	0	0	2	0	0	6
	0	0	0	2	2	0	2	3	19	8	0	2	0	0	38
01:00	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3
01:15	0	0	0	0	0	0	0	2	1	2	0	0	0	0	5
01:30	0	0	0	0	0	0	0	1	2	1	0	0	0	0	4
01:45	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
	0	0	0	0	0	0	0	4	5	4	1	0	0	0	14
02:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
02:15	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
02:30	0	0	0	0	0	0	0	2	1	1	0	0	0	0	4
02:45	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3
	0	0	0	0	0	0	0	5	3	3	0	0	0	0	11
03:00	0	0	0	0	0	1	1	2	0	1	0	0	0	0	5
03:15	0	0	0	0	0	0	1	1	0	2	0	0	0	0	4
03:30	0	0	0	0	0	0	2	3	1	1	0	0	0	0	7
03:45	1	0	0	0	0	0	1	2	2	0	0	0	0	0	6
	1	0	0	0	0	1	5	8	3	4	0	0	0	0	22
04:00	0	0	0	0	0	0	3	4	4	3	0	0	0	0	14
04:15	0	0	0	1	0	0	2	5	2	2	1	0	0	0	13
04:30	1	0	0	0	0	0	1	3	3	1	0	0	0	0	9
04:45	0	0	0	0	0	0	0	4	2	2	1	0	0	0	9
	1	0	0	1	0	0	6	16	11	8	2	0	0	0	45
05:00	0	0	0	2	3	0	4	4	6	5	4	1	0	0	29
05:15	2	0	0	4	0	2	3	5	8	6	6	0	0	0	36
05:30	3	0	0	4	0	0	5	8	8	9	6	3	0	0	46
05:45	0	0	0	2	0	0	3	5	6	8	3	2	0	0	29
	5	0	0	12	3	2	15	22	28	28	19	6	0	0	140
06:00	0	0	0	3	2	0	0	6	6	7	3	0	2	0	29
06:15	2	0	0	8	0	0	6	12	15	9	2	0	0	0	54
06:30	3	0	0	6	2	3	8	8	11	13	4	2	0	0	60
06:45	2	0	0	8	2	2	9	16	12	10	3	0	1	0	65
	7	0	0	25	6	5	23	42	44	39	12	2	3	0	208
07:00	2	0	0	10	0	0	0	11	16	13	2	2	7	0	63
07:15	3	0	0	9	3	0	7	17	26	17	4	0	7	0	93
07:30	7	0	0	17	0	0	7	22	32	17	10	0	3	0	115
07:45	2	0	0	13	0	0	9	11	26	29	4	2	3	0	99
	14	0	0	49	3	0	23	61	100	76	20	4	20	0	370
08:00	3	0	2	10	0	0	0	12	15	16	2	0	3	0	63
08:15	3	0	0	8	0	0	0	3	22	14	3	0	0	0	53
08:30	4	0	0	9	2	0	6	15	15	14	4	0	3	0	72
08:45	2	0	0	8	2	0	2	6	12	28	8	0	0	0	68
	12	0	2	35	4	0	8	36	64	72	17	0	6	0	256
09:00	3	0	0	9	0	0	2	18	14	20	7	0	3	0	76
09:15	2	0	0	10	0	0	7	20	20	14	5	0	3	0	81
09:30	2	0	2	9	0	0	0	14	17	5	7	0	7	0	63
09:45	0	0	0	7	0	0	0	14	16	11	3	0	0	0	51
	7	0	2	35	0	0	9	66	67	50	22	0	13	0	271
10:00	2	0	0	3	0	2	2	10	22	9	0	0	2	0	52
10:15	2	0	0	3	2	3	3	9	16	16	4	0	3	0	61
10:30	0	0	0	2	0	0	9	34	21	20	4	0	2	0	92
10:45	0	0	0	0	0	0	6	3	14	15	4	2	0	0	44
	4	0	0	8	2	5	20	56	73	60	12	2	7	0	249
11:00	0	0	0	0	0	0	0	10	16	17	7	0	0	0	50
11:15	0	0	0	0	0	0	0	16	15	8	3	1	0	0	43
11:30	0	0	0	0	0	2	0	13	13	16	9	2	0	0	55
11:45	2	0	0	0	0	0	0	10	22	11	5	0	0	0	50
	2	0	0	0	0	2	0	49	66	52	24	3	0	0	198
Total	53	0	4	167	20	15	111	368	483	404	129	19	49	0	1822

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 Fax: (770)578-8159
email: reliabletraffic@msn.com

Site Code: 23200106
Station ID: 8422
Loganville Hwy (SR20) North of
W Hightower Trail
Latitude: 0' 0.000 Undefined

Southbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total
12 PM	0	2	6	0	2	0	0	2	18	18	3	0	0	0	51
12:15	2	0	0	0	0	0	2	9	21	12	2	2	0	0	50
12:30	0	0	0	0	0	0	2	13	14	18	4	0	0	0	51
12:45	0	0	0	0	0	0	2	2	24	16	5	2	0	0	51
	2	2	6	0	2	0	6	26	77	64	14	4	0	0	203
13:00	0	0	0	0	0	0	0	7	15	22	12	2	0	0	58
13:15	0	0	0	0	0	0	2	5	13	20	10	1	0	0	51
13:30	2	0	0	0	0	0	7	7	18	25	5	3	0	0	67
13:45	0	0	0	0	0	0	0	10	15	12	10	2	0	0	49
	2	0	0	0	0	0	9	29	61	79	37	8	0	0	225
14:00	0	0	0	0	1	1	1	16	11	22	10	0	0	0	62
14:15	0	0	0	0	0	0	1	16	19	16	5	0	0	0	57
14:30	0	0	0	0	0	0	0	16	16	27	9	3	0	0	71
14:45	3	0	6	1	6	1	1	12	22	13	7	0	0	0	72
	3	0	6	1	7	2	3	60	68	78	31	3	0	0	262
15:00	0	0	0	0	0	1	12	20	14	15	5	0	0	0	67
15:15	0	0	0	0	0	0	1	2	13	22	6	3	0	0	47
15:30	0	0	0	0	0	0	6	6	13	32	14	2	0	0	73
15:45	2	0	1	0	0	0	1	15	13	30	7	0	0	0	69
	2	0	1	0	0	1	20	43	53	99	32	5	0	0	256
16:00	0	0	1	0	0	0	5	6	18	26	15	0	0	0	71
16:15	0	0	0	0	0	1	1	7	21	25	11	1	0	0	67
16:30	0	0	0	0	0	1	0	8	11	24	26	1	0	0	71
16:45	0	0	0	0	0	0	1	13	14	28	19	6	0	0	81
	0	0	1	0	0	2	7	34	64	103	71	8	0	0	290
17:00	0	0	0	0	0	0	7	5	22	33	9	3	0	0	79
17:15	0	1	0	1	2	0	2	9	34	25	12	2	2	0	90
17:30	0	0	0	2	0	2	7	16	24	24	8	2	1	0	86
17:45	0	0	1	2	0	0	0	8	31	24	8	1	5	0	80
	0	1	1	5	2	2	16	38	111	106	37	8	8	0	335
18:00	0	0	0	4	0	0	1	16	23	26	6	1	2	0	79
18:15	0	0	0	4	0	1	6	22	25	12	5	0	1	0	76
18:30	0	0	0	4	1	1	5	15	17	16	2	0	2	0	63
18:45	1	0	0	2	0	1	6	11	23	19	6	0	2	0	71
	1	0	0	14	1	3	18	64	88	73	19	1	7	0	289
19:00	0	0	0	3	0	3	1	9	26	15	5	1	3	0	66
19:15	0	0	0	3	0	3	1	9	17	21	8	1	0	0	63
19:30	0	0	0	5	0	1	1	8	11	18	3	0	1	0	48
19:45	0	0	0	3	0	0	20	12	9	9	3	0	1	0	57
	0	0	0	14	0	7	23	38	63	63	19	2	5	0	234
20:00	0	0	0	3	0	0	0	18	16	12	5	0	0	0	54
20:15	0	0	0	1	1	0	6	12	12	5	8	3	0	0	48
20:30	0	0	0	1	0	3	1	10	13	8	3	0	0	0	39
20:45	1	0	0	3	0	0	1	13	9	5	3	0	1	0	36
	1	0	0	8	1	3	8	53	50	30	19	3	1	0	177
21:00	0	0	0	2	0	2	2	13	7	2	0	0	0	0	28
21:15	0	0	0	4	0	0	2	11	11	11	2	0	0	0	41
21:30	0	0	0	2	0	4	9	14	4	7	2	0	0	0	42
21:45	0	0	0	4	0	0	2	9	7	2	2	0	0	0	26
	0	0	0	12	0	6	15	47	29	22	6	0	0	0	137
22:00	0	0	0	3	0	0	2	6	5	9	0	0	0	0	25
22:15	0	0	0	1	0	0	2	9	7	4	2	0	0	0	25
22:30	0	0	0	2	0	0	4	2	5	3	2	0	0	0	18
22:45	0	0	0	0	0	0	2	2	2	2	0	0	0	0	8
	0	0	0	6	0	0	10	19	19	18	4	0	0	0	76
23:00	0	0	0	0	2	0	2	5	5	2	2	0	0	0	18
23:15	0	0	0	0	0	0	2	3	3	6	2	0	0	0	16
23:30	0	0	0	0	0	0	1	4	2	3	0	0	0	0	10
23:45	0	0	0	0	0	0	0	2	3	2	0	0	0	0	7
	0	0	0	0	2	0	5	14	13	13	4	0	0	0	51
Total	11	3	15	60	15	26	140	465	696	748	293	42	21	0	2535
Grand Total	64	3	19	227	35	41	251	833	1179	1152	422	61	70	0	4357

15th Percentile :	46 MPH
50th Percentile :	53 MPH
85th Percentile :	60 MPH
95th Percentile :	64 MPH

Stats

Mean Speed(Average) :	52 MPH
10 MPH Pace Speed :	51-60 MPH
Number in Pace :	2331
Percent in Pace :	53.5%
Number of Vehicles > 45 MPH :	3717
Percent of Vehicles > 45 MPH :	85.3%

APPENDIX C

Site Photographs

1. SR 20 @ W. Hightower Road

Looking north on SR 20 towards W. Hightower Road

Looking south on SR 20 away from W. Hightower Road

Looking west on W. Hightower Road towards SR 20

Looking east on W. Hightower Road away from SR 20

1. SR 20 @ W. Hightower Road

Looking northeast at the church

Looking southwest on Chandler towards SR 20 @W. Hightower

Looking northeast on Chandler away from SR 20

Showing speed limit on Chnadler Road

1. SR 20 @ W. Hightower Road

Looking south on SR 20 towards W. Hightower Road

Looking north on SR 20 away from W. Hightower Road

Looking south on SR 20 showing shop entrance

Looking west showing Bicycle shop

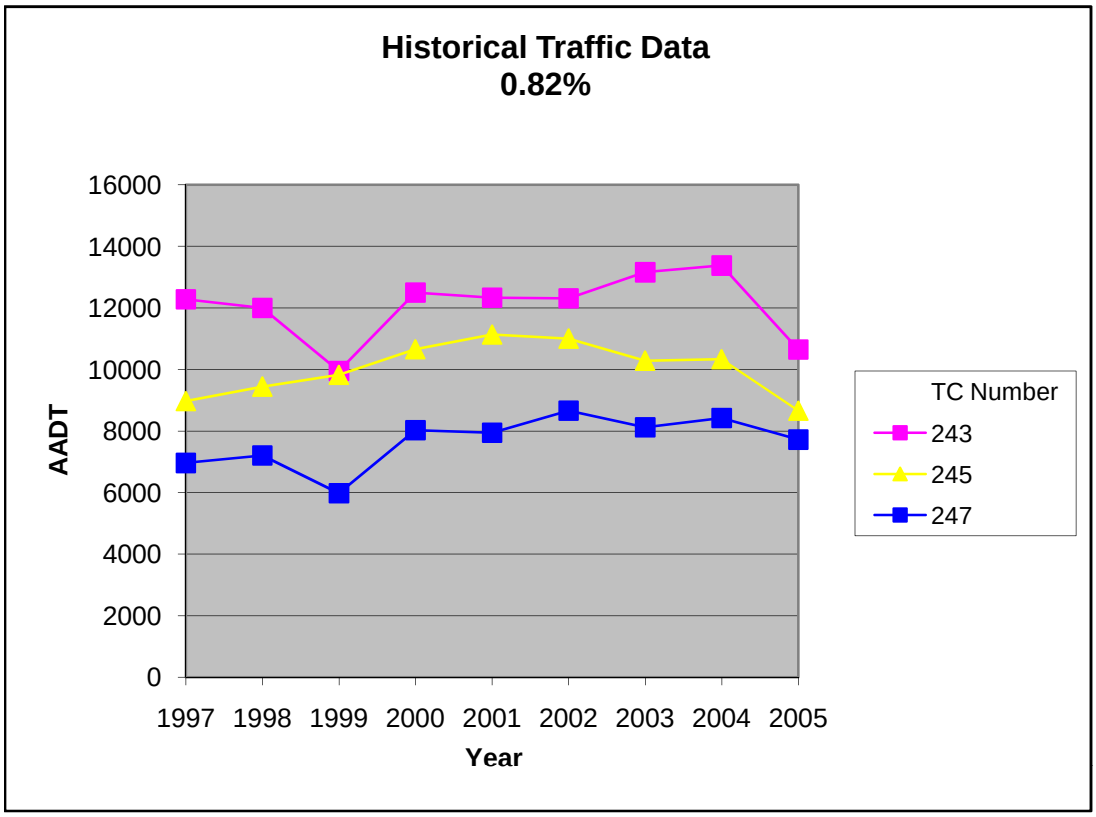
1. SR 20 @ W. Hightower Road

Looking east on W. Hightower Road towards SR 20

Looking west on W. Hightower Road away from SR 20

APPENDIX D

Historical Traffic Data


Historical Traffic Data
0.82%
16000
14000
12000
10000
8000
6000
4000
2000
0
AADT
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
TC Number
243
245
247

APPENDIX E

SYNCHRO PRINTOUTS – EXISTING CONDITION

AM Peak Hour

1: SR 20 @ W. Hightower Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	14	17	18	25	45	25	39	295	12	10	338	12
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Hourly flow rate (vph)	15	18	19	29	52	29	44	331	13	13	445	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	960	912	453	933	913	338	461			345		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	960	912	453	933	913	338	461			345		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	93	97	87	80	96	96			99		
cM capacity (veh/h)	184	260	607	217	260	704	1101			1214		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	52	110	389	474
Volume Left	15	29	44	13
Volume Right	19	29	13	16
cSH	287	293	1101	1214
Volume to Capacity	0.18	0.38	0.04	0.01
Queue Length 95th (ft)	16	42	3	1
Control Delay (s)	20.3	24.5	1.3	0.3
Lane LOS	C	C	A	A
Approach Delay (s)	20.3	24.5	1.3	0.3
Approach LOS	C	C		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	44	34	11	32	18	36	397	28	29	318	5
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Hourly flow rate (vph)	9	49	38	13	38	21	41	451	32	31	335	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	987	963	337	1010	950	467	340			483		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	987	963	337	1010	950	467	340			483		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	79	95	92	85	96	97			97		
cM capacity (veh/h)	184	240	705	166	244	596	1219			1080		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	97	72	524	371
Volume Left	9	13	41	31
Volume Right	38	21	32	5
cSH	313	268	1219	1080
Volume to Capacity	0.31	0.27	0.03	0.03
Queue Length 95th (ft)	32	26	3	2
Control Delay (s)	21.6	23.3	1.0	1.0
Lane LOS	C	C	A	A
Approach Delay (s)	21.6	23.3	1.0	1.0
Approach LOS	C	C		

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX F

Synchro Printouts – No Build Option

2010 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	18	19	26	48	26	41	313	13	10	359	13
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Hourly flow rate (vph)	16	19	20	30	56	30	46	352	15	13	472	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1016	966	481	988	967	359	489			366		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1016	966	481	988	967	359	489			366		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	92	97	85	77	96	96			99		
cM capacity (veh/h)	163	241	585	197	241	685	1074			1192		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	55	116	412	503
Volume Left	16	30	46	13
Volume Right	20	30	15	17
cSH	261	271	1074	1192
Volume to Capacity	0.21	0.43	0.04	0.01
Queue Length 95th (ft)	20	51	3	1
Control Delay (s)	22.5	28.0	1.4	0.3
Lane LOS	C	D	A	A
Approach Delay (s)	22.5	28.0	1.4	0.3
Approach LOS	C	D		

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

2010 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	47	36	11	34	19	38	421	30	31	337	5
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Hourly flow rate (vph)	9	53	40	13	40	22	43	478	34	33	355	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1047	1021	357	1071	1007	495	360			512		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1047	1021	357	1071	1007	495	360			512		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	76	94	91	82	96	96			97		
cM capacity (veh/h)	163	221	687	145	225	574	1199			1053		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	102	75	556	393
Volume Left	9	13	43	33
Volume Right	40	22	34	5
cSH	289	246	1199	1053
Volume to Capacity	0.35	0.31	0.04	0.03
Queue Length 95th (ft)	38	31	3	2
Control Delay (s)	24.1	26.0	1.0	1.0
Lane LOS	C	D	A	A
Approach Delay (s)	24.1	26.0	1.0	1.0
Approach LOS	C	D		

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

2030 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	27	28	40	71	40	61	465	19	46	501	8
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Hourly flow rate (vph)	23	29	30	47	83	47	69	522	21	61	659	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1544	1466	664	1500	1461	533	670			544		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1544	1466	664	1500	1461	533	670			544		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	25	74	94	32	26	91	93			94		
cM capacity (veh/h)	31	111	460	68	112	547	920			1025		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	82	176	612	730
Volume Left	23	47	69	61
Volume Right	30	47	21	11
cSH	77	117	920	1025
Volume to Capacity	1.07	1.50	0.07	0.06
Queue Length 95th (ft)	147	315	6	5
Control Delay (s)	218.5	332.8	1.9	1.5
Lane LOS	F	F	A	A
Approach Delay (s)	218.5	332.8	1.9	1.5
Approach LOS	F	F		

Intersection Summary			
Average Delay	49.1		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

2030 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	68	54	17	50	28	57	626	44	46	501	8
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Hourly flow rate (vph)	17	76	61	20	59	33	65	711	50	48	527	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1557	1519	532	1593	1499	736	536			761		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1557	1519	532	1593	1499	736	536			761		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	62	27	89	31	46	92	94			94		
cM capacity (veh/h)	44	105	548	29	108	419	1032			851		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	154	112	826	584
Volume Left	17	20	65	48
Volume Right	61	33	50	8
cSH	126	85	1032	851
Volume to Capacity	1.22	1.31	0.06	0.06
Queue Length 95th (ft)	238	209	5	5
Control Delay (s)	217.4	291.5	1.6	1.5
Lane LOS	F	F	A	A
Approach Delay (s)	217.4	291.5	1.6	1.5
Approach LOS	F	F		

Intersection Summary			
Average Delay	40.7		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

APPENDIX G

SYNCHRO PRINTOUTS – BUILD OPTION BUILD YEAR

2010 AM Peak Hour

ALTERNATIVE 1

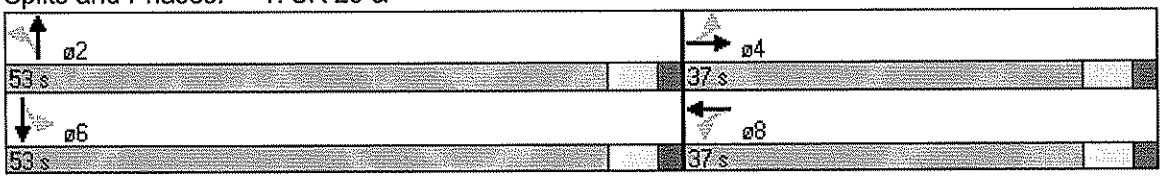
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.951			0.965			0.995			0.995	
Flt Protected		0.986			0.987			0.994			0.999	
Satd. Flow (prot)	0	1747	0	0	1774	0	0	1842	0	0	1852	0
Flt Permitted		0.925			0.930			0.910			0.987	
Satd. Flow (perm)	0	1639	0	0	1672	0	0	1687	0	0	1829	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			22			3			3	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			6023			7333			7284	
Travel Time (s)		161.3			136.9			166.7			165.5	
Volume (vph)	15	18	19	26	48	26	41	313	13	10	359	13
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Adj. Flow (vph)	16	19	20	30	56	30	46	352	15	13	472	17
Lane Group Flow (vph)	0	55	0	0	116	0	0	413	0	0	502	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phases	4	4		8	8		2	2		6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	37.0	37.0	0.0	37.0	37.0	0.0	53.0	53.0	0.0	53.0	53.0	0.0
Total Split (%)	41.1%	41.1%	0.0%	41.1%	41.1%	0.0%	58.9%	58.9%	0.0%	58.9%	58.9%	0.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		11.9			12.0			35.5			35.5	
Actuated g/C Ratio		0.21			0.21			0.65			0.65	
v/c Ratio		0.15			0.31			0.38			0.42	
Control Delay		9.7			12.0			6.3			6.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		9.7			12.0			6.3			6.6	
LOS		A			B			A			A	
Approach Delay		9.7			12.0			6.3			6.6	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)		5			15			43			55	
Queue Length 95th (ft)		27			48			105			99	
Internal Link Dist (ft)		7016			5943			7253			7204	
Turn Bay Length (ft)												
Base Capacity (vph)		755			771			1319			1430	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.07			0.15			0.31			0.35	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 54.5
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.42
Intersection Signal Delay: 7.2 Intersection LOS: A
Intersection Capacity Utilization 51.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: SR 20 &



ALTERNATIVE 2

1: SR 20 @ W. Hightower Trail

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	18	19	26	48	26	41	313	13	10	359	13
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Hourly flow rate (vph)	16	19	20	30	56	30	46	352	15	13	472	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8			8						
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	970	943	472	952	943	352	472			352		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	970	943	472	952	943	352	472			352		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	92	97	86	78	96	96			99		
cM capacity (veh/h)	177	249	592	209	249	692	1089			1207		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	16	39	30	86	46	352	15	13	472	17
Volume Left	16	0	30	0	46	0	0	13	0	0
Volume Right	0	20	0	30	0	0	15	0	0	17
cSH	177	512	209	384	1089	1700	1700	1207	1700	1700
Volume to Capacity	0.09	0.08	0.14	0.22	0.04	0.21	0.01	0.01	0.28	0.01
Queue Length 95th (ft)	7	6	12	21	3	0	0	1	0	0
Control Delay (s)	27.4	15.9	25.1	19.0	8.5	0.0	0.0	8.0	0.0	0.0
Lane LOS	D	C	D	C	A			A		
Approach Delay (s)	19.2		20.6		0.9			0.2		
Approach LOS	C		C							

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Alternative 3

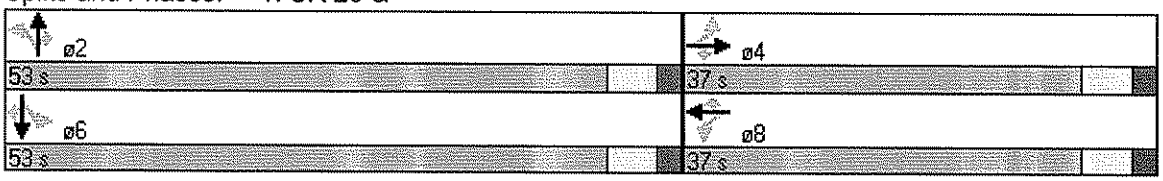
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		200	250		200	250		200	250		200
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.720			0.745			0.386			0.483		
Satd. Flow (perm)	1341	1863	1583	1388	1863	1583	719	1863	1583	900	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			20			30			15			17
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			6023			7333			7284	
Travel Time (s)		161.3			136.9			166.7			165.5	
Volume (vph)	15	18	19	26	48	26	41	313	13	10	359	13
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Adj. Flow (vph)	16	19	20	30	56	30	46	352	15	13	472	17
Lane Group Flow (vph)	16	19	20	30	56	30	46	352	15	13	472	17
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phases	4	4	4	8	8	8	2	2	2	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	53.0	53.0	53.0	53.0	53.0	53.0
Total Split (%)	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	58.9%	58.9%	58.9%	58.9%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	11.6	11.6	11.6	11.7	11.7	11.7	43.2	43.2	43.2	43.2	43.2	43.2
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.72	0.72	0.72	0.72	0.72	0.72
v/c Ratio	0.07	0.06	0.07	0.12	0.17	0.10	0.09	0.26	0.01	0.02	0.35	0.01
Control Delay	11.9	11.5	6.8	12.2	12.1	6.3	4.6	4.4	2.5	4.3	5.0	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	11.5	6.8	12.2	12.1	6.3	4.6	4.4	2.5	4.3	5.0	2.4
LOS	B	B	A	B	B	A	A	A	A	A	A	A
Approach Delay		9.9			10.7			4.4			4.9	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)	2	3	0	4	8	0	4	31	0	1	46	0
Queue Length 95th (ft)	13	15	11	19	29	13	14	70	5	5	78	4
Internal Link Dist (ft)		7016			5943			7253			7204	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		200	250		200	250		200	250		200
Base Capacity (vph)	576	801	692	597	801	698	606	1571	1337	759	1571	1338
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.02	0.03	0.05	0.07	0.04	0.08	0.22	0.01	0.02	0.30	0.01

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 59.8
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 5.6 Intersection LOS: A
Intersection Capacity Utilization 40.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: SR 20 &



2010 PM Peak Hour

Alternative 1

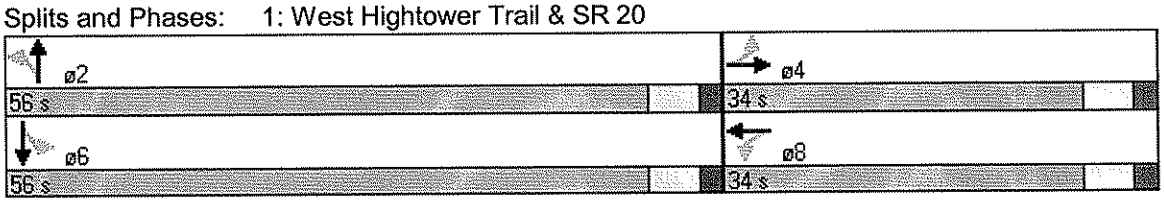
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.947			0.960			0.992			0.998	
Flt Protected		0.996			0.991			0.996			0.996	
Satd. Flow (prot)	0	1757	0	0	1772	0	0	1840	0	0	1852	0
Flt Permitted		0.981			0.956			0.948			0.933	
Satd. Flow (perm)	0	1731	0	0	1710	0	0	1752	0	0	1734	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			22			6			1	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			5903			7333			7284	
Travel Time (s)		161.3			134.2			166.7			165.5	
Volume (vph)	8	47	36	11	34	19	38	421	30	31	337	5
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	9	53	40	13	40	22	43	478	34	33	355	5
Lane Group Flow (vph)	0	102	0	0	75	0	0	555	0	0	393	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phases	4	4		8	8		2	2		6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.0	22.0		22.0	22.0		22.0	22.0		22.0	22.0	
Total Split (s)	34.0	34.0	0.0	34.0	34.0	0.0	56.0	56.0	0.0	56.0	56.0	0.0
Total Split (%)	37.8%	37.8%	0.0%	37.8%	37.8%	0.0%	62.2%	62.2%	0.0%	62.2%	62.2%	0.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		11.5			11.5			42.0			42.0	
Actuated g/C Ratio		0.19			0.19			0.74			0.74	
v/c Ratio		0.29			0.22			0.43			0.31	
Control Delay		10.9			11.4			5.7			4.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.9			11.4			5.7			4.7	
LOS		B			B			A			A	
Approach Delay		10.9			11.4			5.7			4.7	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		10			9			60			38	
Queue Length 95th (ft)		44			35			137			91	
Internal Link Dist (ft)		7016			5823			7253			7204	
Turn Bay Length (ft)												
Base Capacity (vph)		736			718			1480			1464	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.14			0.10			0.38			0.27	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 56.7
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 6.2 Intersection LOS: A
Intersection Capacity Utilization 46.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: West Hightower Trail & SR 20



ALTERNATIVE 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	47	36	11	34	19	38	421	30	31	337	5
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Hourly flow rate (vph)	9	53	40	13	40	22	43	478	34	33	355	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8			8						
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1005	985	355	1011	985	478	355			478		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1005	985	355	1011	985	478	355			478		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	77	94	92	83	96	96			97		
cM capacity (veh/h)	175	232	689	161	232	587	1204			1084		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	93	13	62	43	478	34	33	355	5
Volume Left	9	0	13	0	43	0	0	33	0	0
Volume Right	0	40	0	22	0	0	34	0	0	5
cSH	175	410	161	362	1204	1700	1700	1084	1700	1700
Volume to Capacity	0.05	0.23	0.08	0.17	0.04	0.28	0.02	0.03	0.21	0.00
Queue Length 95th (ft)	4	22	6	15	3	0	0	2	0	0
Control Delay (s)	26.7	18.7	29.3	19.3	8.1	0.0	0.0	8.4	0.0	0.0
Lane LOS	D	C	D	C	A			A		
Approach Delay (s)	19.4		21.0		0.6			0.7		
Approach LOS	C		C							

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

Alternative 3

1: SR 20 @ W. Hightower Trail

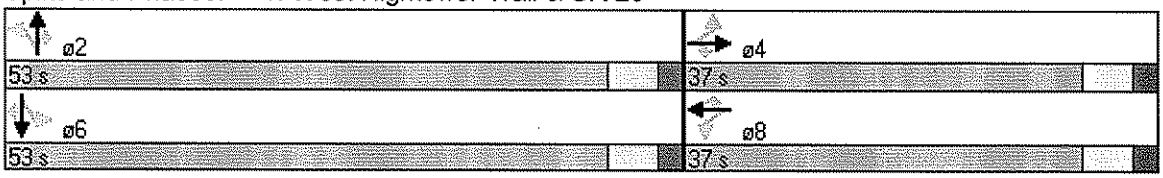
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		200	250		200	250		200	250		200
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.731			0.722			0.481			0.382		
Satd. Flow (perm)	1362	1863	1583	1345	1863	1583	896	1863	1583	712	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			40			22			34			5
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			5903			7333			7284	
Travel Time (s)		161.3			134.2			166.7			165.5	
Volume (vph)	8	47	36	11	34	19	38	421	30	31	337	5
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	9	53	40	13	40	22	43	478	34	33	355	5
Lane Group Flow (vph)	9	53	40	13	40	22	43	478	34	33	355	5
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phases	4	4	4	8	8	8	2	2	2	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	53.0	53.0	53.0	53.0	53.0	53.0
Total Split (%)	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	58.9%	58.9%	58.9%	58.9%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	11.5	11.5	11.5	11.4	11.4	11.4	42.1	42.1	42.1	42.1	42.1	42.1
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.72	0.72	0.72	0.72	0.72	0.72
v/c Ratio	0.04	0.16	0.12	0.05	0.12	0.07	0.07	0.36	0.03	0.06	0.26	0.00
Control Delay	11.8	12.0	6.1	11.8	11.8	6.8	4.3	5.0	2.0	4.5	4.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	12.0	6.1	11.8	11.8	6.8	4.3	5.0	2.0	4.5	4.4	2.8
LOS	B	B	A	B	B	A	A	A	A	A	A	A
Approach Delay		9.7			10.3			4.8			4.4	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)	1	7	0	2	6	0	3	46	0	2	31	0
Queue Length 95th (ft)	9	29	16	11	23	11	13	99	7	11	72	3
Internal Link Dist (ft)		7016			5823			7253			7204	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		200	250		200	250		200	250		200
Base Capacity (vph)	593	811	712	585	811	701	756	1572	1341	601	1572	1337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.07	0.06	0.02	0.05	0.03	0.06	0.30	0.03	0.05	0.23	0.00

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 58.2
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 5.5 Intersection LOS: A
Intersection Capacity Utilization 42.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: West Hightower Trail & SR 20



APPENDIX H

Synchro Printouts – Build Option Design Year

2030 AM Peak Hour

ALTERNATIVE 1

Wolverton & Associates 9/27/2007

1: SR 20 @ W. Hightower Trail

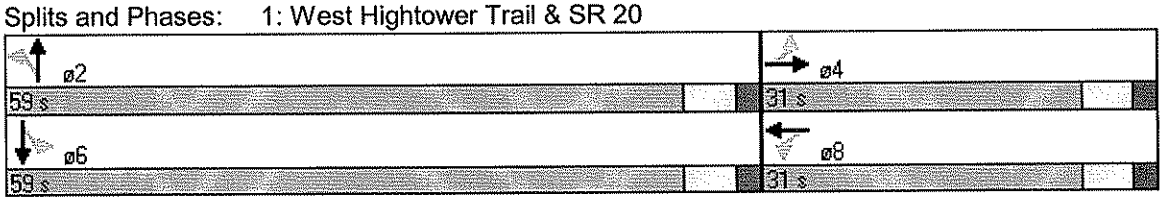
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.951			0.964			0.995			0.998	
Flt Protected		0.986			0.987			0.994			0.996	
Satd. Flow (prot)	0	1747	0	0	1772	0	0	1842	0	0	1852	0
Flt Permitted		0.900			0.907			0.866			0.912	
Satd. Flow (perm)	0	1594	0	0	1629	0	0	1605	0	0	1695	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			21			4			2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			6133			7333			7284	
Travel Time (s)		161.3			139.4			166.7			165.5	
Volume (vph)	22	27	28	40	71	40	61	465	19	46	501	8
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Adj. Flow (vph)	23	29	30	47	83	47	69	522	21	61	659	11
Lane Group Flow (vph)	0	82	0	0	177	0	0	612	0	0	731	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phases	4	4		8	8		2	2		6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	31.0	31.0	0.0	31.0	31.0	0.0	59.0	59.0	0.0	59.0	59.0	0.0
Total Split (%)	34.4%	34.4%	0.0%	34.4%	34.4%	0.0%	65.6%	65.6%	0.0%	65.6%	65.6%	0.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		13.3			13.3			38.8			38.8	
Actuated g/C Ratio		0.22			0.22			0.64			0.64	
v/c Ratio		0.22			0.47			0.59			0.67	
Control Delay		15.4			21.5			9.7			11.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.4			21.5			9.7			11.2	
LOS		B			C			A			B	
Approach Delay		15.4			21.5			9.7			11.2	
Approach LOS		B			C			A			B	
Queue Length 50th (ft)		11			35			94			123	
Queue Length 95th (ft)		56			117			239			225	
Internal Link Dist (ft)		7016			6053			7253			7204	
Turn Bay Length (ft)												
Base Capacity (vph)		614			621			1167			1232	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.13			0.29			0.52			0.59	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 60.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 11.9 Intersection LOS: B
Intersection Capacity Utilization 59.1% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: West Hightower Trail & SR 20



ALTERNATIVE 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	27	28	40	71	40	61	465	19	46	501	8
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Hourly flow rate (vph)	23	29	30	47	83	47	69	522	21	61	659	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8			8						
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1481	1440	659	1454	1440	522	659			522		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1481	1440	659	1454	1440	522	659			522		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	36	75	94	37	29	92	93			94		
cM capacity (veh/h)	37	116	464	74	116	554	929			1044		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	23	59	47	129	69	522	21	61	659	11
Volume Left	23	0	47	0	69	0	0	61	0	0
Volume Right	0	30	0	47	0	0	21	0	0	11
cSH	37	236	74	181	929	1700	1700	1044	1700	1700
Volume to Capacity	0.64	0.25	0.63	0.71	0.07	0.31	0.01	0.06	0.39	0.01
Queue Length 95th (ft)	56	24	70	111	6	0	0	5	0	0
Control Delay (s)	209.0	29.4	113.8	62.2	9.2	0.0	0.0	8.7	0.0	0.0
Lane LOS	F	D	F	F	A			A		
Approach Delay (s)	80.7		75.9		1.0			0.7		
Approach LOS	F		F							

Intersection Summary			
Average Delay	13.2		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

Alternative 3

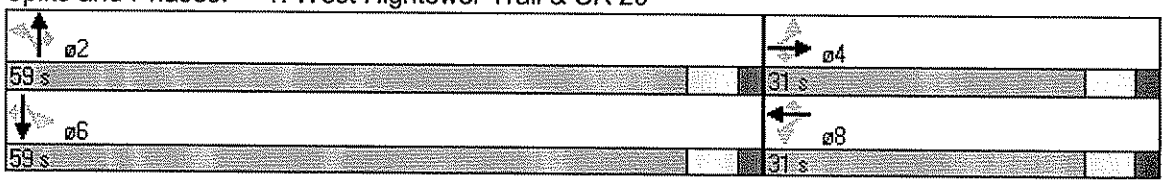
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		200	250		200	250		200	250		200
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.703			0.738			0.292			0.382		
Satd. Flow (perm)	1310	1863	1583	1375	1863	1583	544	1863	1583	712	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			47			21			11
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			6133			7333			7284	
Travel Time (s)		161.3			139.4			166.7			165.5	
Volume (vph)	22	27	28	40	71	40	61	465	19	46	501	8
Peak Hour Factor	0.94	0.94	0.94	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76
Adj. Flow (vph)	23	29	30	47	83	47	69	522	21	61	659	11
Lane Group Flow (vph)	23	29	30	47	83	47	69	522	21	61	659	11
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phases	4	4	4	8	8	8	2	2	2	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	31.0	31.0	31.0	31.0	31.0	31.0	59.0	59.0	59.0	59.0	59.0	59.0
Total Split (%)	34.4%	34.4%	34.4%	34.4%	34.4%	34.4%	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	11.8	11.8	11.8	11.8	11.8	11.8	42.4	42.4	42.4	42.4	42.4	42.4
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.69	0.69	0.69	0.69	0.69	0.69
v/c Ratio	0.10	0.08	0.09	0.19	0.24	0.14	0.18	0.41	0.02	0.12	0.51	0.01
Control Delay	16.1	15.5	8.1	16.8	16.4	7.3	5.6	5.6	2.0	4.8	6.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	15.5	8.1	16.8	16.4	7.3	5.6	5.6	2.0	4.8	6.8	2.2
LOS	B	B	A	B	B	A	A	A	A	A	A	A
Approach Delay		12.9			14.1			5.5			6.5	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	4	5	0	8	13	0	6	56	0	5	79	0
Queue Length 95th (ft)	21	25	17	34	51	19	23	121	5	15	128	3
Internal Link Dist (ft)		7016			6053			7253			7204	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		200	250		200	250		200	250		200
Base Capacity (vph)	494	702	615	518	702	626	437	1495	1275	571	1495	1273
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.04	0.05	0.09	0.12	0.08	0.16	0.35	0.02	0.11	0.44	0.01

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 61.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 7.3 Intersection LOS: A
Intersection Capacity Utilization 48.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: West Hightower Trail & SR 20



2030 PM Peak Hour

ALTERNATIVE 1

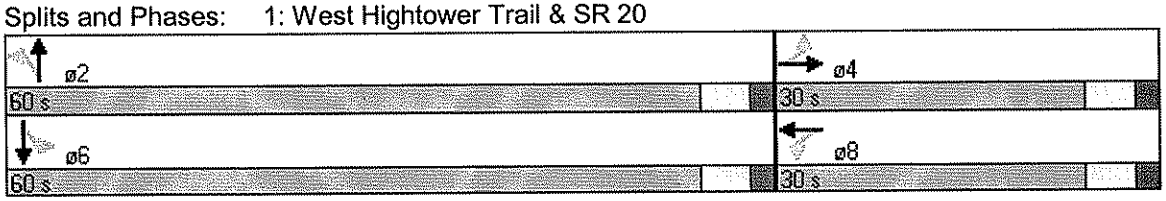
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.947			0.960			0.992			0.998	
Flt Protected		0.995			0.991			0.996			0.996	
Satd. Flow (prot)	0	1755	0	0	1772	0	0	1840	0	0	1852	0
Flt Permitted		0.966			0.938			0.919			0.894	
Satd. Flow (perm)	0	1704	0	0	1677	0	0	1698	0	0	1662	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			23			7			1	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			5563			7333			7284	
Travel Time (s)		161.3			126.4			166.7			165.5	
Volume (vph)	15	68	54	17	50	28	57	626	44	46	501	8
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	17	76	61	20	59	33	65	711	50	48	527	8
Lane Group Flow (vph)	0	154	0	0	112	0	0	826	0	0	583	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phases	4	4		8	8		2	2		6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	60.0	60.0	0.0	60.0	60.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%	66.7%	66.7%	0.0%	66.7%	66.7%	0.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		12.1			12.1			44.7			44.7	
Actuated g/C Ratio		0.19			0.19			0.72			0.72	
v/c Ratio		0.44			0.34			0.68			0.49	
Control Delay		20.8			20.3			10.0			6.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		20.8			20.3			10.0			6.8	
LOS		C			C			B			A	
Approach Delay		20.8			20.3			10.0			6.8	
Approach LOS		C			C			B			A	
Queue Length 50th (ft)		28			21			142			80	
Queue Length 95th (ft)		103			76			337			195	
Internal Link Dist (ft)		7016			5483			7253			7204	
Turn Bay Length (ft)												
Base Capacity (vph)		607			588			1334			1304	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.25			0.19			0.62			0.45	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 62.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 10.6 Intersection LOS: B
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: West Hightower Trail & SR 20



ALTERNATIVE 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	68	54	17	50	28	57	626	44	46	501	8
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Hourly flow rate (vph)	17	76	61	20	59	33	65	711	50	48	527	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			8			8						
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1495	1465	527	1503	1465	711	527			711		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1495	1465	527	1503	1465	711	527			711		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	67	33	89	47	48	92	94			95		
cM capacity (veh/h)	51	114	551	38	114	433	1040			888		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	17	137	20	92	65	711	50	48	527	8
Volume Left	17	0	20	0	65	0	0	48	0	0
Volume Right	0	61	0	33	0	0	50	0	0	8
cSH	51	204	38	177	1040	1700	1700	888	1700	1700
Volume to Capacity	0.33	0.67	0.53	0.52	0.06	0.42	0.03	0.05	0.31	0.00
Queue Length 95th (ft)	29	103	46	65	5	0	0	4	0	0
Control Delay (s)	107.0	53.2	179.5	47.7	8.7	0.0	0.0	9.3	0.0	0.0
Lane LOS	F	F	F	E	A			A		
Approach Delay (s)	59.1		71.3		0.7			0.8		
Approach LOS	F		F							

Intersection Summary			
Average Delay	10.8		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

ALTERNATIVE 3

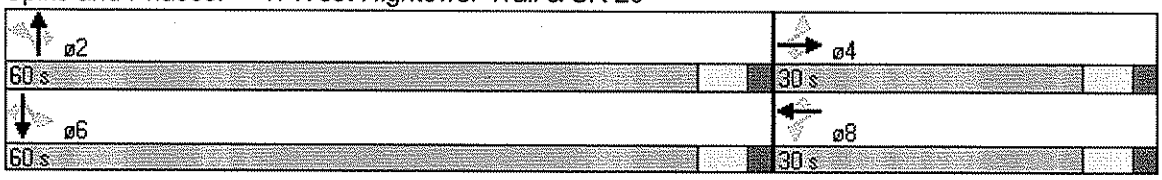
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		200	250		200	250		200	250		200
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.719			0.708			0.384			0.267		
Satd. Flow (perm)	1339	1863	1583	1319	1863	1583	715	1863	1583	497	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61			33			50			8
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		7096			5563			7333			7284	
Travel Time (s)		161.3			126.4			166.7			165.5	
Volume (vph)	15	68	54	17	50	28	57	626	44	46	501	8
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	17	76	61	20	59	33	65	711	50	48	527	8
Lane Group Flow (vph)	17	76	61	20	59	33	65	711	50	48	527	8
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phases	4	4	4	8	8	8	2	2	2	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	11.5	11.5	11.5	11.5	11.5	11.5	44.0	44.0	44.0	44.0	44.0	44.0
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	0.07	0.23	0.18	0.09	0.18	0.11	0.13	0.55	0.04	0.14	0.40	0.01
Control Delay	17.4	17.8	7.5	17.5	17.4	8.6	4.5	6.9	1.5	5.0	5.4	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	17.8	7.5	17.5	17.4	8.6	4.5	6.9	1.5	5.0	5.4	2.2
LOS	B	B	A	B	B	A	A	A	A	A	A	A
Approach Delay		13.6			14.8			6.4			5.3	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	3	13	0	3	10	0	5	88	0	4	56	0
Queue Length 95th (ft)	19	53	25	20	41	17	19	183	8	16	122	3
Internal Link Dist (ft)		7016			5483			7253			7204	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	250		200	250		200	250		200	250		200
Base Capacity (vph)	482	670	608	474	670	591	576	1502	1286	401	1502	1278
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.11	0.10	0.04	0.09	0.06	0.11	0.47	0.04	0.12	0.35	0.01

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 62.9
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 7.2 Intersection LOS: A
Intersection Capacity Utilization 53.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: West Hightower Trail & SR 20



APPENDIX I

Accident Data

ROCKDALE COUNTY, SR 20 @ W. Hightower Trail (CR 98)								
Accident No	Month	Day	Year	Time	Milelog	Intersecting Rt	Injuries	Fatalities
'30600378	2	23	2003	5:43 PM	3.68	'009800	0	0
'33500011	9	2	2003	7:47 AM	3.68	'009800	1	0
'34600496	12	10	2003	5:01 PM	3.68	'009800	0	0
'33500045	9	6	2003	9:37 AM	3.68	'009800	1	0
'32390539	6	21	2003	9:27 AM	3.68	'009800	2	0
'40670105	2	5	2004	2:31 PM	3.68	'009800	0	0
'42990081	8	6	2004	4:55 PM	3.68	'009800	0	0
'44860495	12	14	2004	3:30 PM	3.68	'009800	4	0
'43850153	10	14	2004	8:04 AM	3.68	'009800	1	0
'42500116	7	15	2004	6:09 PM	3.68	'009800	7	0
'42150048	6	23	2004	4:09 PM	3.68	'009800	1	0
'42130653	6	12	2004	9:06 AM	3.68	'009800	0	0
'50570168	2	15	2005	9:09 PM	3.68	'009800	2	0
'50570183	2	18	2005	11:39 AM	3.68	'009800	0	0
'50570213	2	23	2005	11:10 AM	3.68	'009800	1	0
'50240568	1	11	2005	11:55 AM	3.68	'009800	0	0
'50980665	3	7	2005	4:22 PM	3.68	'009800	0	0
'52730577	7	12	2005	2:02 PM	3.68	'009800	0	0
'50970229	3	22	2005	4:30 PM	3.68	'009800	0	0
'53550520	9	25	2005	4:10 PM	3.68	'009800	0	0
'53200341	8	5	2005	7:09 PM	3.68	'009800	0	0
'53200233	8	19	2005	8:06 AM	3.68	'009800	2	0
'53200228	8	17	2005	6:43 PM	3.68	'009800	0	0
'50980688	3	9	2005	1:44 PM	3.68	'009800	0	0
'50970243	3	23	2005	8:24 PM	3.68	'009800	0	0
'50970277	3	30	2005	10:15 AM	3.68	'009800	2	0
'54520031	11	18	2005	12:56 PM	3.73	'009800	1	0
'61080063	3	3	2006	10:48 PM	3.73	'009800	0	0
'65320065	10	23	2006	6:11 PM	3.73	'009800	2	0
'65100047	12	11	2006	7:28 AM	3.73	'009800	2	1
'64640110	11	22	2006	6:30 AM	3.73	'009800	1	0
'64640062	11	20	2006	10:06 AM	3.73	'009800	0	0
'64640018	11	12	2006	2:52 PM	3.73	'009800	1	0
'62860090	7	4	2006	4:10 PM	3.73	'009800	0	0
'63430083	8	30	2006	8:46 AM	3.73	'009800	0	0
'63440043	8	19	2006	3:00 PM	3.73	'009800	2	0
'63440098	8	16	2006	2:06 PM	3.73	'009800	5	0
'63490174	6	8	2006	3:43 PM	3.73	'009800	6	0
'63880016	9	23	2006	2:35 PM	3.73	'009800	0	0
'64210638	10	23	2006	6:11 PM	3.73	'009800	2	0

ROCKDALE COUNTY, SR 20 @ W. Hightower Trail (CR 98)					
Harmful Event	Collision	Location of Impact	Light	Surface	DirVeh1
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Other Non-Collision	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Wet	S
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	N
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Dark	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Wet	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Dark	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Dark	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Dawn	Dry	W
Motor Vehicle in Motion	Angle	On Shoulder	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	S
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E
Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W

DirVeh2	MnvrVeh1	MnvrVeh2
N	Straight	Straight
S	Straight	Straight
S	Straight	Straight
S	Turning Right	Straight
S	Straight	Straight
S	Turning Left	Straight
S	Turning Left	Straight
S	Straight	Straight
N	Straight	Straight
S	Straight	Straight
S	Turning Left	Straight
N	Straight	Straight
N	Straight	Straight
N	Straight	Straight
S	Straight	Straight
N	Straight	Straight
N	Turning Left	Straight
N	Straight	Straight
N	Straight	Straight
N	Straight	Straight
S	Straight	Straight
S	Straight	Straight
S	Straight	Straight
S	Straight	Straight
S	Straight	Straight
S	Straight	Straight
S	Straight	Straight
N	Straight	Straight
N	Straight	Straight
S	Straight	Straight
N	Straight	Straight
S	Straight	Straight
S	Straight	Straight
W	Making U-Turn	Straight
S	Straight	Straight
N	Straight	Straight
S	Straight	Straight
N	Straight	Straight
N	Straight	Straight
N	Straight	Straight