PUBLIC MEETING #1 SUMMARY

About the Study
The Houston-Galveston Area Council conducted an access management study for SH 105 to identify transportation improvements that will reduce crashes, improve traffic flow, reduce motorist delay and address multi-modal/land-use context. The study area extends from SH 105 between Loop 336 in Conroe to US 59 in Cleveland, and crosses Montgomery, San Jacinto and Liberty Counties.

Meeting Purpose and Activities
H-GAC hosted a public meeting regarding proposed safety and mobility improvements. The open house meeting was held to introduce the study, show initial recommendations and improvements, and receive public feedback. The meeting date, location and time:

Wednesday, August 10, 2011
Austin Elementary School
14796 Highway 105 East
Conroe, Texas 77306
6:00-8:00 p.m.

At the meeting, informative boards were staffed by project team members. Attendees were able to speak with team members and have questions answered. Two sets of large table maps of the study area were displayed and attendees were invited to review the short-, medium- and long-term recommendations. Smaller maps of proposed pedestrian improvements and livable center plans were also available for review. Questionnaires were provided to collect comments from attendees. Some attendees took extra copies of the questionnaires to distribute to people who were not able to attend the meeting.

The project boards, presentation, sign-in sheets and completed questionnaires are included as attachments to the Public Involvement Report, which is a separate document.

Attendance
A total of 72 people attended the public meetings. The following breakdown categorizes the attendees:

<table>
<thead>
<tr>
<th>Category</th>
<th>Attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Public</td>
<td>57</td>
</tr>
<tr>
<td>Elected Officials/Steering Committee</td>
<td>4</td>
</tr>
<tr>
<td>Project Team</td>
<td>11</td>
</tr>
</tbody>
</table>

PUBLICITY SUMMARY
A variety of methods were used to publicize the meetings. The following is a breakdown of the publicity summary. Copies of all publicity items are included in Attachment A.

Direct Mail
Letters were sent to local elected officials 30 days in advance. Two rounds of postcards were mailed to local community groups, the Steering Committee, the Stakeholder Committee, schools, churches, emergency services and property owners within the SH 105 study area. Extra postcards were distributed at Austin Elementary School, Security Community Center, Cut and Shoot Town Hall, and other local area businesses. The map on the following page shows the distribution area of the property owners who received the postcard. The complete mailing lists are included on the enclosed CD.

Newspapers
A public meeting notice was printed in the legal section of The Houston Chronicle, 30 days prior to the meeting. Display ads were printed in English and Spanish in the Conroe Courier and Cleveland Advocate and in Spanish in La Voz, The Houston Chronicle’s Spanish language publication. A media release was e-mailed approximately two weeks in advance. An article appeared in Your Houston News.
PUBLIC MEETING #2 SUMMARY
About the Study
The Houston-Galveston Area Council conducted an access management study for SH 105 to identify transportation improvements that will reduce crashes, improve traffic flow, reduce motorist delay and address multi-modal/land-use context. The study area extends from SH 105 between Loop 336 in Conroe to US 59 in Cleveland, and crosses Montgomery, San Jacinto and Liberty Counties.

Meeting Purpose and Activities
H-GAC hosted a public meeting regarding proposed safety and mobility improvements. The open house meeting was held to introduce the study, show final recommendations and improvements, and receive public feedback. The meeting date, location and time:
Thursday, October 27, 2011
Austin Elementary School
14796 Highway 105 East
Conroe, Texas 77306
6:00-8:00 p.m.

At the meeting, informative boards were staffed by project team members. Attendees were able to speak with team members and have questions answered. Two sets of large table maps of the study area were displayed and attendees were invited to review the short-, medium- and long-term recommendations. Smaller maps of proposed pedestrian improvements and livable center plans were also available for review. Two display monitors were set up to continuously play a short movie on access management. Questionnaires were provided to collect comments from attendees. Some attendees took extra copies of the questionnaires to distribute to people who were not able to attend the meeting.

The project boards, presentation, sign-in sheets and completed questionnaires are included as attachments to the Public Involvement Report, which is a separate document.

Attendance
A total of 61 people attended the public meeting. The following breakdown categorizes the attendees:

SH105 ACCESS MANAGEMENT STUDY
PUBLICITY SUMMARY

A variety of methods were used to publicize the meetings. The following is a breakdown of the publicity summary. Copies of all publicity items are included in Attachment A.

Direct Mail
Letters were sent to local elected officials 30 days in advance. Postcards were mailed to local community groups, the Steering Committee, the Stakeholder Committee, schools, churches, emergency services and property owners within the SH 105 study area. Extra postcards were distributed at Austin Elementary School, Security Community Center, Cut and Shoot Town Hall, and other local area businesses. The map on the following page shows the distribution area of the property owners who received the postcard. The complete mailing lists are included on the enclosed CD.

Newspapers
A public meeting notice was printed in the legal section of The Houston Chronicle, 30 days prior to the meeting. Display ads were printed in English and Spanish in the Conroe Courier, Cleveland Advocate, The Greensheet. The display ad was only printed in Spanish in La Voz, the Houston Chronicle's Spanish language publication. A media release was emailed approximately two weeks in advance. An article was published in both Guidry News and Your Houston News.

Newsletters
Notices appeared in H-GAC's Vision and Regional Focus electronic newsletters.

E-notices
An e-notice was emailed to elected officials, the Steering Committee, and individuals from a database of previous meetings.

General Public 45
Elected Officials/Steering Committee 8
Project Team 8

Social Media
A notice was posted on the H-GAC's website, www.h-gac.com, in the Transportation and Air Quality section and on H-GAC's facebook page.

Signs
TxDOT's portable orange construction signs displayed the meeting information on the day of the meetings at two separate locations, near either end of the study corridor.

QUESTIONNAIRE COMMENTS SUMMARY

Questionnaires were distributed to attendees at the meeting. Some attendees took extra questionnaires for distribution to others who were not at the meeting. A summary of the 19 completed questionnaires received is provided below:

Which category best describes your interest?

- Local resident..........................13
- Public official..........................5
- School official..........................1
- Retail business owner..................1

Of the access management tools presented, which would you like to see used along the corridor?

- Improve traffic signal timing/progression............10
- Left- and right-turn lanes.........................9
- Center two-way, left-turn lane.................8
- Four-lane roadway section...................8
- No raised median.........................7
- Six-lane roadway section.....................3
- New traffic signal installation..................3
- Locate parking to set back further.............2
- Four-lane with a center turn lane............2
- Center turn lane in Cut and Shoot..........1
- New raised median..........................1

What do you think about the set of medium-term recommendations?

- No raised median..........................8
- No bicycle/pedestrian enhancements...........6
- No raised median accept at churches, schools, and major turns .........................2
- Douget Road needs traffic-triggered signal........1

What do you think about the set of short-term recommendations?

- Widen lanes........................................1

What do you think about the set of medium-term recommendations?

- No raised median..........................7
- No bicycle/pedestrian enhancements...........5
- No driveway consolidation.....................1
- Some of the medium-term should be short-term........1
- No raised median, need center turn lane........1
- You will acquire land from property owners who do not desire to lose their property...........1

What do you think about the set of long-term recommendations?

- No bicycle/pedestrian enhancements...........2
- More concerned with traffic problems..............1
- Only sidewalks near schools.....................1
- It’s a consideration..............................1
- No sidewalks........................................1
- OK.....................................................1

Do you support these recommendations for pedestrian/bicycle traffic along SH 105?

- Yes..................................................11
- No.....................................................1

What modifications or additions would you like to see?

- Widen SH 105
- Wait for the bicycle/pedestrian enhancements when more businesses are along SH 105
- Place sidewalks only near schools
- Four lanes with center-turn lane only

Do you have any other general comments on the information presented tonight?

- Rethink raised medians with a center-turn only
- Why can’t East of Conroe (Hwy 105) be done as West of Conroe?
- No raised medians
- The zero crashes at Walker Road is not true, please recheck sources
- Lower the speed limits
- Add more police patrol
## APPENDIX B
### SUMMARY OF SH 105 CORRIDOR SUBDIVISION REGULATIONS

Subdivision regulations for Montgomery, San Jacinto, and Liberty counties are applicable to SH 105 and were reviewed as part of this study. In the absence of zoning controls, these subdivision regulations most directly influence development pattern along the corridor. A summary and comparison of these regulations is provided in the table.

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>San Jacinto</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extra Territorial Jurisdiction (ETJ)</strong></td>
<td></td>
<td>Part I, Sec. 2.8</td>
</tr>
<tr>
<td><strong>Exemptions from Subdivision Regulations</strong></td>
<td></td>
<td>Part I, Sec. 3.1</td>
</tr>
<tr>
<td>Lots</td>
<td></td>
<td>Appendix 6, Sec. 8</td>
</tr>
<tr>
<td>Flag lots</td>
<td>Generally not permitted, unless Commissioners Court approves the lot after review</td>
<td>Part I, Sec. 6.4</td>
</tr>
<tr>
<td>Min. 1st width</td>
<td>NONE NOTED</td>
<td></td>
</tr>
<tr>
<td>Min. 1st depth</td>
<td>NONE NOTED</td>
<td></td>
</tr>
<tr>
<td>Min. setback</td>
<td>NONE NOTED</td>
<td></td>
</tr>
<tr>
<td>Min. 1st area</td>
<td>Exemptions earned by a public water supply and all OSSF, 1/2 acre</td>
<td>Appendix 6, Sec. 9</td>
</tr>
<tr>
<td>Water/Wastewater/Sewage</td>
<td>Subdivisions served by a public water supply and all OSSF, 1/2 acre</td>
<td>Appendix 5, Site Design and Development Standards</td>
</tr>
<tr>
<td>Roads</td>
<td></td>
<td>Appendix 5, Article 3B</td>
</tr>
<tr>
<td>General provisions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of lanes</td>
<td></td>
<td>Part I, Sec. 6.1</td>
</tr>
<tr>
<td>Min. 1st fromage</td>
<td></td>
<td>Part I, Sec. 6.5</td>
</tr>
<tr>
<td>Min. driveway spacing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement width</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Streets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.O.W. width</td>
<td></td>
<td>Part I, Sec. 6.1</td>
</tr>
<tr>
<td>Collector 70'</td>
<td></td>
<td>Part I, Sec. 6.5</td>
</tr>
<tr>
<td>Local 60'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Township Road 60'</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exemptions to bulk regulations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exterior Roads - Industrial Property</td>
<td></td>
<td>Appendix 6, Sec. 8.8</td>
</tr>
<tr>
<td>Other Applicable Development Regulations</td>
<td></td>
<td>Appendix 6, Article 3B</td>
</tr>
</tbody>
</table>
## Regulatory Element: Extra Territorial Jurisdiction (ETJ)

1. A parcel is within the ETJ of an incorporated city, then it is subject to the regulations of both the city and County.

## Exemptions from Subdivision Regulations

- **1.** Not a subdivision (for any type, color, status or additive amendments)
- **2.** All lots are more than 10 acres and to new streets or public dedications.
- **3.** All lots are being sold to Veterans through the Veterans Land Buyout Program. Lots are subject to the requirements of the Texas Veterans Land Board.
- **4.** All lots are being sold to the State of Texas for use as state parks.
- **5.** The land is owned by a political jurisdiction of the state, subject to the requirements of the State Parks and recreation areas.
- **6.** The land is being divided among family for family and results in no more than 4 lots.
- **7.** All lots are more than 10 acres and no new streets or public dedications.
- **8.** The land is subject to the requirements of the City of Liberty for plating requirements.

## Water/Wastewater/Sewage

- **Sec. 2.9**
  - **1.** The land is used primarily for agriculture, farm, ranch, timber management.
  - **2.** The land is being divided among family for family and results in no more than 4 lots.
  - **3.** All lots are more than 10 acres and no new streets or public dedications.
  - **4.** All lots are being sold to Veterans through the Veterans Land Buyout Program. Lots are subject to the requirements of the Texas Veterans Land Board.
  - **5.** The land is owned by the State of Texas for use as state parks.
  - **6.** The land is owned by a political jurisdiction of the state, subject to the requirements of the State Parks and recreation areas.
  - **7.** Two tracts are created - one for the owner and to be sold for development that would be subject to plat requirements.
  - **8.** No public dedications are being made and the lot is being transferred to a previous owner with a plat being required before further development.

## Streets

- **Sec. 3.1**
  - **1.** The land is used primarily for agriculture, farm, ranch, timber management.
  - **2.** The land is being divided among family for family and results in no more than 4 lots.
  - **3.** All lots are more than 10 acres and no new streets or public dedications.
  - **4.** All lots are being sold to Veterans through the Veterans Land Buyout Program. Lots are subject to the requirements of the Texas Veterans Land Board.
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  - **7.** Two tracts are created - one for the owner and to be sold for development that would be subject to plat requirements.
  - **8.** No public dedications are being made and the lot is being transferred to a previous owner with a plat being required before further development.

## Floodplain development

- **Sec. 4.1.1**
  - **3.** The land is used primarily for agriculture, farm, ranch, timber management.
  - **4.** The land is being divided among family for family and results in no more than 4 lots.
  - **5.** All lots are more than 10 acres and no new streets or public dedications.
  - **6.** All lots are being sold to Veterans through the Veterans Land Buyout Program. Lots are subject to the requirements of the Texas Veterans Land Board.
  - **7.** The land is owned by the State of Texas for use as state parks.
  - **8.** The land is owned by a political jurisdiction of the state, subject to the requirements of the State Parks and recreation areas.
  - **9.** Two tracts are created - one for the owner and to be sold for development that would be subject to plat requirements.
  - **10.** No public dedications are being made and the lot is being transferred to a previous owner with a plat being required before further development.

## Pavement width

- **Sec. 6.1**
  - **3.** The land is used primarily for agriculture, farm, ranch, timber management.
  - **4.** The land is being divided among family for family and results in no more than 4 lots.
  - **5.** All lots are more than 10 acres and no new streets or public dedications.
  - **6.** All lots are being sold to Veterans through the Veterans Land Buyout Program. Lots are subject to the requirements of the Texas Veterans Land Board.
  - **7.** The land is owned by the State of Texas for use as state parks.
  - **8.** The land is owned by a political jurisdiction of the state, subject to the requirements of the State Parks and recreation areas.
  - **9.** Two tracts are created - one for the owner and to be sold for development that would be subject to plat requirements.
  - **10.** No public dedications are being made and the lot is being transferred to a previous owner with a plat being required before further development.

## Other Applicable Development Regulations

- **Sec. 6.1**
  - **3.** The land is used primarily for agriculture, farm, ranch, timber management.
  - **4.** The land is being divided among family for family and results in no more than 4 lots.
  - **5.** All lots are more than 10 acres and no new streets or public dedications.
  - **6.** All lots are being sold to Veterans through the Veterans Land Buyout Program. Lots are subject to the requirements of the Texas Veterans Land Board.
  - **7.** The land is owned by the State of Texas for use as state parks.
  - **8.** The land is owned by a political jurisdiction of the state, subject to the requirements of the State Parks and recreation areas.
  - **9.** Two tracts are created - one for the owner and to be sold for development that would be subject to plat requirements.
  - **10.** No public dedications are being made and the lot is being transferred to a previous owner with a plat being required before further development.

## Exemptions to bulk regulations

- **Sec. 4.1.2**
  - **3.** The land is used primarily for agriculture, farm, ranch, timber management.
  - **4.** The land is being divided among family for family and results in no more than 4 lots.
  - **5.** All lots are more than 10 acres and no new streets or public dedications.
  - **6.** All lots are being sold to Veterans through the Veterans Land Buyout Program. Lots are subject to the requirements of the Texas Veterans Land Board.
  - **7.** The land is owned by the State of Texas for use as state parks.
  - **8.** The land is owned by a political jurisdiction of the state, subject to the requirements of the State Parks and recreation areas.
  - **9.** Two tracts are created - one for the owner and to be sold for development that would be subject to plat requirements.
  - **10.** No public dedications are being made and the lot is being transferred to a previous owner with a plat being required before further development.
### Regulatory Element: Exemptions from Subdivision Regulations

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Montgomery</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Territorial Jurisdiction (ETJ)</td>
<td>None noted</td>
<td>Sec. 2-2.4</td>
</tr>
</tbody>
</table>

### Regulatory Element: Water/Wastewater/Sewage

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Montgomery</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General provisions</td>
<td>None noted</td>
<td>Sec. 2.2.4</td>
</tr>
</tbody>
</table>

### Regulatory Element: Streets

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Montgomery</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General provisions</td>
<td>None noted</td>
<td>Sec. 2.2.4</td>
</tr>
</tbody>
</table>

### Regulatory Element: Regulatory element: Lots

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Montgomery</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flag lots</td>
<td>None noted</td>
<td>Sec. 2.2.4</td>
</tr>
</tbody>
</table>

### Regulatory Element: Floodplain development

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Montgomery</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lots that may be permitted in the Floodplain after all other viable options are exhausted</td>
<td>None noted</td>
<td>Sec. 2-6.1</td>
</tr>
</tbody>
</table>

### Regulatory Element: Other Applicable Development Regulations

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Montgomery</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster developments and townhouses, multifamily residential, multi-family residential, apartments and mobile home parks should be served by a community water supply</td>
<td>None noted</td>
<td>Sec. 2-5.4</td>
</tr>
</tbody>
</table>

### Regulatory Element: Water/Wastewater/Sewage

- Subdivisions served by a public water supply and an OSSF must have a minimum lot size of 1/2 acre. Subdivisions with individual water systems (not served by public water supply) must have a minimum lot size of 1 acre.

### Regulatory Element: Streets

- Residences, apartment buildings, multi-family residential, apartment and mobile home parks should be served by existing streets.
- While not referenced in Subdivision Regulations, Texas Administrative Code [Title 30, Part I, Ch. 285, Subchapter A, Rule §285.4 (a)] applies:
  - Subdivisions served by a public water supply and OSSF must have a minimum lot size of 1/2 acre. Subdivisions with individual water systems (not served by public water supply) must have a minimum lot size of 1 acre.

### Regulatory Element: Floodplain development

- Subdivisions served by a public water supply and OSSF must have a minimum lot size of 1/2 acre. Subdivisions with individual water systems (not served by public water supply) must have a minimum lot size of 1 acre.

### Regulatory Element: Other Applicable Development Regulations

- None noted; however, per the Texas Administrative Code [Title 30, Part I, Ch. 285, Subchapter A, Rule §285.4 (a)] regarding On-Site Sewage Facilities: a score for lots served by well and septic and 1/2 acre central water and septic.

### Regulatory Element: Lot setbacks

- None noted; however, per the Texas Administrative Code [Title 30, Part I, Ch. 285, Subchapter A, Rule §285.4 (a)] regarding On-Site Sewage Facilities: a score for lots served by well and septic and 1/2 acre central water and septic.

### Regulatory Element: Street R.O.W. width

- None noted; however, per the Texas Administrative Code [Title 30, Part I, Ch. 285, Subchapter A, Rule §285.4 (a)] regarding On-Site Sewage Facilities: a score for lots served by well and septic and 1/2 acre central water and septic.

### Regulatory Element: Minimum lot area

- None noted; however, per the Texas Administrative Code [Title 30, Part I, Ch. 285, Subchapter A, Rule §285.4 (a)] regarding On-Site Sewage Facilities: a score for lots served by well and septic and 1/2 acre central water and septic.

### Regulatory Element: Streets

- Montgomery Citation: None noted
- Single-family residential: 50', 30' for pie-shaped lots, 60' corner lots, 75' corner lots on major thoroughfare
- Apartments or multi-family developments: 20' from any street

### Regulatory Element: Driveway spacing

- None noted; however, per the Texas Administrative Code [Title 30, Part I, Ch. 285, Subchapter A, Rule §285.4 (a)] regarding On-Site Sewage Facilities: a score for lots served by well and septic and 1/2 acre central water and septic.

### Regulatory Element: Pavement width

- Montgomery Citation: None noted
- Commercial and heavy industrial streets: Minimum pavement width = 22'
- Residential streets, major thoroughfares: Minimum pavement width = 18'
- Secondary roads: Minimum pavement width = 16'
- Alleys: 20'
- Cul-de-sac bulbs: 50' single-family and 60' other uses
### Exemptions from Subdivision Regulations

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Cleveland</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Territorial Jurisdiction (ETJ)</td>
<td>NONE NOTED</td>
<td></td>
</tr>
</tbody>
</table>

### Water/Wastewater/Sewage

- Permits for septic systems will only be issued when a final plat for the lot has been approved and recorded or when an existing lot complies with the subdivision regulations.
- The city will not provide water or sewer service to any subdivision until a final plat has been approved and recorded or until the subdivision regulations have been fully complied with.
- While not referenced in Subdivision Regulations, Texas Administrative Code [Title 30, Part I, Ch. 285, Subchapter A, Rule §285.4 (a)] applies:
  - Subdivisions served by a public water supply and an OSSF must have a minimum lot size of 1/2 acre. Subdivisions with individual water systems (not served by public water systems) must have a minimum lot size of 1 acre.

### Streets

- General provisions:
  - Cul-de-sac bulbs: 100' in residential areas; 200' in commercial/industrial
  - Alleys: 20'

- R.O.W. width:
  - 120' if served by sewer
  - 200' if not served by sewer

### Lots

- Flag lots:
  - Min. lot width: 50' if served by sewer
  - Min. lot depth: 75' if not served by sewer
  - Min. setback: 50' if served by sewer
  - Min. lot area: 6,000 s.f. if served by sewer

- Exemptions to bulk regulations:
  - Front yard: 25'; corner lots: must have a 15' sideyard setback unless it is a “key” lot, in which case 25' is required; rear yard: 25% of lot depth or 40' maximum; sideyard: the greater of 10' or 10% of lot width.
  - Max. block length: 1,200' maximum; 200' minimum

- Floodplain development:
  - NONE NOTED

### Other Applicable Development Regulations

- NONE NOTED
APPENDIX C
EXISTING (2011) TRAFFIC COUNT DATA

SEVEN-DAY TRAFFIC COUNTS SUMMARY

**EB - Eastbound, WB - Westbound**

24-hour traffic counts were conducted for seven consecutive days at various locations along SH 105. This data is summarized in the following charts for each location by day of the week and time of day. For each location, traffic volumes are summarized by direction and then totaled for both directions.
SEVEN-DAY TRAFFIC COUNTS SUMMARY (CONTINUED)

EB - Eastbound, WB - Westbound

SH 105 - EB between Austin Elementary School Entrance and Exit Driveways

SH 105 - WB between Austin Elementary School Entrance and Exit Driveways

Total SH 105 between Austin Elementary School Entrance and Exit Driveways

SH 105 - EB East of FM 1484

SH 105 - WB East of FM 1484

Total SH 105 East of FM 1484
SEVEN-DAY TRAFFIC COUNTS SUMMARY (CONTINUED)

SH 105 - EB East of Walker Road

SH 105 - WB East of Walker Road

Total SH 105 East of Walker Road

SH 105 - EB East of Lee Turner Road

SH 105 - WB East of Lee Turner Road

Total SH 105 East of Lee Turner Road

Traffic Volume

Time of Day

0:00:00 4:00:00 8:00:00 12:00:00 16:00:00 20:00:00

Mon/Thu

Fri

Sat

Sun

0

500

1000

1500

2000

2500

C-3
SEVEN-DAY TRAFFIC COUNTS SUMMARY (CONTINUED)

EB - Eastbound, WB - Westbound

SH 105 - EB West of FM 1725

SH 105 - WB West of FM 1725

Total SH 105 West of FM 1725

SH 105 - EB West of US 59

SH 105 - WB West of US 59

Total SH 105 West of US 59

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day

Traffic Volume

Time of Day
The development of an access management plan for SH 105 involves the evaluation and analysis of the existing transportation system and the proposed recommendations. The analysis methodology and analytical tools used to evaluate the transportation system are described in this section.

**ANALYSIS METHODOLOGY**

The study area was modeled using Synchro/SimTraffic. Synchro is a macroscopic simulation software developed by Trafficware® for capacity analysis of intersections that are either isolated or part of a network, and includes an evaluation of delay and queues. Synchro also has the capability of optimizing traffic signals, thereby allowing the development of traffic signal timing to accommodate roadway and intersection reconfigurations evaluated as part of this traffic study. SimTraffic, the companion visualization software, enables microscopic simulation of the roadway network developed in SYNCHRO.

Capacity analyses were conducted for study area intersections to evaluate existing and projected traffic operating conditions. The Highway Capacity Manual defines... were peak hour intersection control delay (measured in units of seconds per vehicle) and level-of-service (LOS).

**DATA SOURCES**

Data for simulation model input were obtained as follows:

- Background aerials used in building the scaled network were obtained from Houston-Galveston Area Council's (H-GAC) digital aerial imagery files.
- Traffic signal timings for study area intersections were obtained from Texas Department of Transportation (TxDOT).
- Traffic counts in the study area were conducted by CJ Hensch and Wilbur Smith Associates.

**MODEL INPUTS**

To simulate real-life traffic conditions, the model requires very detailed data inputs. This section describes the various inputs that were utilized to develop the Synchro/SimTraffic model for the current project.

**LANE AND GEOMETRIC INFORMATION**

Several field trips were conducted to document the roadway geometric and operational details such as speed limits, number of lanes, left-turn and right-turn lanes. Aerial imagery obtained from H-GAC was scaled and used as a template to develop the existing study area roadway network. Lane and geometric information that was input in the software includes roadway speed limit, number of lanes, lane widths, turn bay storage lengths and number of storage lanes.

**Traffic Volumes and Composition**

Traffic volume information input in the simulation software includes peak hour intersection turning movement counts, and truck percentages. Peak hour intersection turning movement counts and 24-hour counts for the study area were used as the basis for developing traffic volumes that were coded in the simulation model. During the typical weekday, it was estimated that heavy vehicle percentage on SH 105 ranges between eight percent and 10 percent.

**Intersection Traffic Control**

All the signalized intersections along SH 105 in the study area along with critical minor un-signalized intersections and driveways were modeled in the simulation software. As mentioned previously, traffic signal timings for study area intersections were obtained from TxDOT.

**Model Calibration and Validation**

Calibration is a necessary process to ensure that traffic conditions in the real world are sufficiently replicated by the simulation model. Synchro/SimTraffic is a complex mathematical model with several parameters that can be adjusted to match behavior in the real world. Model parameters in Synchro/SimTraffic can be classified as following:

- Vehicle parameters
- Driver parameters

Driver parameters directly affect driving behavior for vehicles in the model. Vehicle parameters describe attributes associated with each vehicle type modeled such as vehicle dimensions, occupancy, acceleration and deceleration profiles. Some of the parameters affect the models’ performance on a global scale while others have a local effect.

Vehicle parameters that can be modified in Synchro/SimTraffic include length and width of vehicles, acceleration rate and maximum speed of vehicles. The default parameters provided in Synchro/SimTraffic are acceptable for the study area simulation and are not modified during the calibration process.

Driver parameters can be used to adjust the driving behavior of the vehicles in the simulation model from being most conservative to most aggressive. The driver parameters that can be modified in Synchro/SimTraffic include Yellow Deceleration Rate (maximum deceleration rate a driver is willing to use when faced with a yellow light), Speed Factor (maximum speed of a driver), Headways (amount of time between vehicles drivers try to maintain), etc. The driver parameters were modified from the default values provided in Synchro/SimTraffic till a realistic driver behavior was observed for the SH 105 study area.

After the calibration process was completed, the model was run multiple times and inspected visually to ensure expected operation of network elements. Analysis output from the Synchro/SimTraffic model was obtained after running the model for one hour representing the peak hour. Average travel time along SH 105 in the study area was calibrated to ensure real world travel behavior.

Travel time data were collected on SH 105 in the study area during the peak analysis periods. This data was used to assess the accuracy of the Synchro/SimTraffic model. Travel time output provided by the model was compared to real-world travel times and, if necessary, data input parameters were adjusted to reflect more real-world conditions. Finally, field observations were conducted and the model was calibrated based on field observations of queue lengths.

**Table 1** and Table 2 compare the travel time results from Synchro/SimTraffic model and the field observations for a typical weekday PM and weekend peak hour. The results show that the travel time along SH 105 in the study area is comparable to the output from the simulation model.
Table 1: Travel Time Results - Existing Weekday PM Peak Hour

<table>
<thead>
<tr>
<th>Direction</th>
<th>SH 105</th>
<th>Travel Time</th>
<th>Field Observation</th>
<th>Synchro/SimTraffic</th>
</tr>
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<tbody>
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<td></td>
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<tr>
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<tr>
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Table 2: Travel Time Results - Existing Weekend Peak Hour

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<th>Field Observation</th>
<th>Synchro/SimTraffic</th>
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<td>0:22:00</td>
<td>0:22:05</td>
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</table>
Widen to a four-lane divided with raised median from east of Douget to Whipporwill.

Construct WB dual left-turn lane.

Add pedestrian crosswalks.

Construct NB to EB NB right-turn lane.

Add signal interconnect.

Add pedestrian crosswalks.

Widen SH 105 to a six-lane divided curb and gutter (with raised median) from Loop 336 to Willis Waukegan.

Construct raised median from Loop 336 to FM 1485 with loons for u-turns.

Optimize traffic signal.

Optimize traffic signal.

Add pedestrian crosswalks.

Add signal interconnect.

Add signal interconnect.

LONG TERM IMPROVEMENTS

LONG TERM IMPROVEMENTS

EXISTING

EXISTING

TRAVEL TIME IMPROVEMENTS

TRAVEL TIME IMPROVEMENTS

Typical Cross Sections

Existing Section

Proposed Short Term

Proposed Medium Term

Proposed Long Term

Existing Section

Proposed Short Term

Proposed Medium Term

Proposed Long Term

SHORT TERM IMPROVEMENTS

MEDIUM TERM IMPROVEMENTS

EXISTING

TRAVEL TIME IMPROVEMENTS
Typical Cross Sections

Existing Section
(FM 148S - Whipporwill)

Proposed Medium Term
(East of Douget - Whipporwill)

Proposed Long Term
(Loop 336 - Willis Waukegan)

Existing
(Whipporwill - US 59)

Funded TxDOT Improvement
(Whipporwill - FM 1484)

Proposed Medium Term
(Whipporwill - Crystal Forest)

Proposed Long Term
(Loop 336 - Willis Waukegan)
**SHORT TERM IMPROVEMENTS**
- Traffic Signal (Proposed)
- Raised Median/Curb

**MEDIUM TERM IMPROVEMENTS**
- Driveway Closure
- Reconfigure Driveway

**LEGEND**
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

**Typical Cross Sections**

**Existing Section**
(Whippoorwill - US 59)

**Fund ed TxDOT Improvement**
(Whippoorwill - FM 1484)

**Proposed Long Term**
(Loop 336 - Willis Waukegan)
**SHORT TERM IMPROVEMENTS**
- Traffic Signal (Proposed)
- Raised Median/Curb

**MEDIUM TERM IMPROVEMENTS**
- Driveway Closure
- Reconfigure Driveway

---

**LEGEND**
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

---

**Typical Cross Sections**

**Existing Section**
(Whipporwill - US 59)

**Funded TxDOT Improvement**
(Whipporwill - FM 1484)

**Proposed Short Term**
(Woodridge - Willis Waukegan)

**Proposed Long Term**
(Loop 336 - Willis Waukegan)
SHORT TERM IMPROVEMENTS
- Traffic Signal (Proposed)
- Raised Median/Curb
- Loop

MEDIUM TERM IMPROVEMENTS
- Driveway Closure
- Reconfigure Driveway

LEGEND
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

Typical Cross Sections

Existing Section
(Whipporwill - US 59)

Funded TxDOT Improvement
(Whipporwill - FM 1484)

Proposed Long Term
(Willis Waukegan - US 59)
SHORT TERM IMPROVEMENTS
- Traffic Signal (Proposed)
- Raised Median/Curb

MEDIUM TERM IMPROVEMENTS
- Driveway Closure
- Reconfigure Driveway

LEGEND
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

Typical Cross Sections

EXISTING SECTION
(Whippoorwill - US 59)

PROPOSED SHORT TERM
(Crockett Martin - Carmen)

PROPOSED LONG TERM
(Willis Waukegan - US 59)
**Short Term Improvements**

- Traffic Signal (Proposed)
- Raised Median/Curb

**Medium Term Improvements**

- Driveway Closure
- Reconfigure Driveway

**Legend**

- **Red**: Traffic Signal (Existing)
- **Orange**: Raised Median/Curb
- **Blue**: Existing Lane Marking
- **Gray**: Proposed Lane Marking
- **Yellow**: Existing Right-of-Way
- **Green**: Existing Lane Configuration
- **Purple**: Proposed Lane Configuration
- **Black**: New Pavement
- **Gray**: Funded TxDOT Improvement

**Existing Section**

(Whippoorwill - US 59)

**Funded TxDOT Improvement**

(West of Crockett Martin - West of Walker)

**Proposed Long Term**

(Willis Waukegan - US 59)
Typical Cross Sections

**SH 105**

**ACCESS MANAGEMENT STUDY**

- **SHORT TERM IMPROVEMENTS**
  - Traffic Signal (Proposed)
  - Raised Median/Curb

- **MEDIUM TERM IMPROVEMENTS**
  - Driveway Closure
  - Reconfigure Driveway

**LEGEND**

- **Civic**
  - Traffic Signal (Existing)
  - Existing Lane Marking

- **Commercial**
  - Proposed Lane Marking

- **Farm Ranch**
  - Existing Right of Way

- **Residential**
  - Existing Lane Configuration

- **Undetermined**
  - Proposed Lane Configuration

- **Vacant**
  - New Pavement

- **Funded TxDOT Improvement**

**EXISTING SECTION**

- (Whippoorwill - US 59)

**Funded TxDOT Improvement**

- (East of Walker - Duck Creek)

**PROPOSED LONG TERM**

- (Willis Waukegan - US 59)
**Typical Cross Sections**

**Short Term Improvements**
- Traffic Signal (Proposed)
- Raised Median/Curb
- Lion

**Medium Term Improvements**
- Driveway Closure
- Reconfigure Driveway

**Legend**
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

**Existing Section**
(Whippoorwill - US 59)

**Planned TxDOT Improvement**
(East of Walker - Duck Creek)

**Proposed Long Term**
(Willis Waukegan - US 59)
WIDEN SH 105 TO ACCOMMODATE A TWO-WAY LEFT-TURN LANE FROM WEST OF PIONEER TO EAST OF SECURITY FOREST

ADD SIDEWALK FROM PIONEER TO SECURITY FOREST

WIDEN SH 105 TO ACCOMMODATE A EB PASSING LANE FROM EAST OF WALKER TO DUCK CREEK

LONG TERM IMPROVEMENTS

Widen SH 105 to a four-lane divided with raised median and shoulders from Willis Waukegan to US 59

Typical Cross Sections

EXISTING SECTION

Funded TxDOT Improvement

(East of Walker - Duck Creek)

Funded TxDOT Improvement

(Willis Waukegan - US 59)

LEGEND

Civic Traffic Signal (Existing)
Commercial Existing Lane Marking
Farm Ranch Proposed Lane Marking
Residential Existing Right-of-Way
Undetermined Existing Lane Configuration
Vacant Proposed Lane Configuration
New Pavement
Funded TxDOT Improvement

Typical Cross Sections

EXISTING SECTION

(Whippoorwill - US 59)

Proposed Short Term

(Pioneer - Security Forest)

Proposed Long Term

(Willis Waukegan - US 59)
Typical Cross Sections

**Short Term Improvements**

- Traffic Signal (Proposed)
- Raised Median/Curb
- Drainage

**Medium Term Improvements**

- Traffic Signal (Proposed)
- Driveway Closure
- Reconfigure Driveway

**Long Term Improvements**

- Traffic Signal (Proposed)
- Driveway Closure
- Reconfigure Driveway

**Legend**

- Crossties
- Commercial
- Farm Ranch
- Residential
- Underserved
- Vacant
- Existing Lane Marking
- Proposed Lane Marking
- Existing Right-of-Way
- Existing Lane Configuration
- Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

**Existing Section**

- Whippoorwill - US 59

**Funded TxDOT Improvement**

- East of Walker to Duck Creek

**Proposed Long Term**

- Willis Waukegan - US 59
**SHORT TERM IMPROVEMENTS**
- Traffic Signal (Proposed)
- Raised Median/Curb

**MEDIUM TERM IMPROVEMENTS**
- Driveway Closure
- Reconfigure Driveway

**LEGEND**
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

**Typical Cross Sections**

**Existing Section**
(Whippoorwill - US 59)

**Planned TxDOT Improvement**
(Duck Creek - Lee Turner)

**Proposed Long Term**
(Willis Waukegan - US 59)
Typical Cross Sections

**SHORT TERM IMPROVEMENTS**
- Traffic Signal (Proposed)
- Raised Median/Curb

**MEDIUM TERM IMPROVEMENTS**
- Driveway Closure
- Reconfigure Driveway

**LEGEND**
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

**Existing Section**
(Whipporwill - US 59)

**Proposed Long Term**
(Willis Waukegan - US 59)
Tennessee Gas Pipeline

Short Term Improvements
Traffic Signal (Proposed)
Raised Median/Curb Loon

Medium Term Improvements
Driveway Closure
Reconfigure Driveway

Legend
Civic Traffic Signal (Existing)
Commercial Existing Lane Marking
Farm Ranch Proposed Lane Marking
Residential Existing Right-of-Way
Undetermined Existing Lane Configuration
Vacant Proposed Lane Configuration
New Pavement
Funded TxDOT Improvement

Typical Cross Sections

Existing Section
(Whippoorwill - US 59)

Proposed Long Term
(Willis Waukegan - US 59)
SHORT TERM IMPROVEMENTS
- Traffic Signal (Proposed)
- Raised Median/Curb

MEDIUM TERM IMPROVEMENTS
- Driveway Closure
- Reconfigure Driveway

LEGEND
- Civic Traffic Signal (Existing)
- Commercial Existing Lane Marking
- Farm Ranch Proposed Lane Marking
- Residential Existing Right-of-Way
- Undetermined Existing Lane Configuration
- Vacant Proposed Lane Configuration
- New Pavement
- Funded TxDOT Improvement

Typical Cross Sections

Existing Section
(Whippoorwill - US 59)

Proposed Long Term
(Willis Waukegan - US 59)
**Typical Cross Sections**

**Existing Section**
(Whipporwill - US 59)

**Proposed Short Term**
(Wells Avenue to Driveway 330' West)

**Proposed Long Term**
(Willis Waukegan - US 59)
# APPENDIX F
## COST ESTIMATE DETAILS

This appendix provides cost estimates for prioritized improvement projects. Included are a summary of estimated costs, and details of quantities and bid prices. Assumptions upon which the cost estimates were developed are also provided.

### New Projects

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<th>Improvement Description</th>
<th>Improvement Number</th>
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<th>Unit Cost (In Millions)</th>
<th>Cost (In Millions)</th>
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<td>15,000</td>
</tr>
<tr>
<td>Add Right Turn Lane - SH 105 (Average Length = 225')</td>
<td>4</td>
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</tr>
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<td>6</td>
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<td>Add SH 105 - From Loop 336 to East of Douget</td>
<td>7</td>
<td>MI</td>
<td>1,651,519.00</td>
<td>3,468,139</td>
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<td>Bridge Widening - Lawrence Creek</td>
<td>8</td>
<td>SF</td>
<td>75.00</td>
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<tr>
<td>Bridge Culvert Widening - West Fork Crystal Creek</td>
<td>9</td>
<td>SF</td>
<td>100.00</td>
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<tr>
<td>Add Raised Median / Channelization (Concrete)</td>
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<td>Add Pedestrian Crosswalks</td>
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<td>13,000</td>
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<tr>
<td>Standardize Driveway</td>
<td>12</td>
<td>EA</td>
<td>3,179.00</td>
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<td>Concrete Sidewalks (Loop 336 to east of Douget Rd)</td>
<td>13</td>
<td>SF</td>
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<td>Concrete Sidewalks (Woodridge Dr to Willis Waukegan Rd)</td>
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<td>SF</td>
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<td>Concrete Sidewalks (Crockett Martin Rd to Carmen Blvd)</td>
<td>15</td>
<td>SF</td>
<td>9.00</td>
<td>171,000</td>
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<td>Concrete Sidewalks (Pioneer Rd to Security Forest Blvd)</td>
<td>16</td>
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<tr>
<td>Add SB Right Turn Lane - FM 1484</td>
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<td>Add SB Left Turn Lane - Crockett Trace</td>
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<td>EA</td>
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<td>Add NB Right Turn Lane - Old Highway 105</td>
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<td>Add SB Left Turn Lane - Walker</td>
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<td>157,200.00</td>
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</tr>
<tr>
<td>Rounding (Douglas Road)</td>
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<td>EA</td>
<td>45,200.00</td>
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### FUNDED PROJECTS

<table>
<thead>
<tr>
<th>Improvement Description</th>
<th>Improvement Number</th>
<th>Unit</th>
<th>Unit Cost (In Millions)</th>
<th>Cost (In Millions)</th>
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</thead>
<tbody>
<tr>
<td>TxDOT Improvements (Montgomery County) – Super 2 Passing Lanes, Center Left Turn Lane and Asphalt Overlay</td>
<td>1</td>
<td>LS</td>
<td>5,130,000</td>
<td>5,130,000</td>
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<td>TxDOT Improvements (San Jacinto County) – Super 2 Passing Lanes and Asphalt Overlay</td>
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<td>TxDOT Improvements (Liberty County) – Super 2 Passing Lanes and Asphalt Overlay</td>
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<td>1,170,000</td>
<td>1,170,000</td>
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**TOTAL FOR SHORT TERM IMPROVEMENTS (less than 5 years)**

- **Short Term (less than 5 years)**
  - Total for short term improvements: $13,385,013

### Medium Term (5 – 15 years)

<table>
<thead>
<tr>
<th>Improvement Description</th>
<th>Improvement Number</th>
<th>Unit</th>
<th>Unit Cost (In Millions)</th>
<th>Cost (In Millions)</th>
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<tbody>
<tr>
<td>Upgrade Signal Equipment (Sweep to Crystal Forest)</td>
<td>4</td>
<td>INT</td>
<td>20,500.00</td>
<td>20,500</td>
</tr>
<tr>
<td>Add SH 105 - From East of Douget to Crystal Forest</td>
<td>5</td>
<td>MI</td>
<td>1,651,519.00</td>
<td>1,651,519</td>
</tr>
<tr>
<td>Bridge Culvert Widening - Unnamed Creek near Jefferson Chemical Rd</td>
<td>6</td>
<td>SF</td>
<td>80.00</td>
<td>80,960</td>
</tr>
<tr>
<td>Add Raised Median / Channelization (Concrete)</td>
<td>7</td>
<td>EA</td>
<td>243,850.00</td>
<td>243,850</td>
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<tr>
<td>Concrete Sidewalks (Loop 336 to Willis Waukegan Rd)</td>
<td>8</td>
<td>SF</td>
<td>9.00</td>
<td>1,897,830</td>
</tr>
<tr>
<td>Butler Street Extension (From Loop 336 to Jefferson Chemical Rd)</td>
<td>9</td>
<td>EA</td>
<td>1,044,400.00</td>
<td>1,044,400</td>
</tr>
</tbody>
</table>

**TOTAL FOR MEDIUM TERM IMPROVEMENTS (5 – 15 years)**

- **Medium Term (5 – 15 years)**
  - Total for medium term improvements: $2,019,830

### Long Term (15 years+)

<table>
<thead>
<tr>
<th>Improvement Description</th>
<th>Improvement Number</th>
<th>Unit</th>
<th>Unit Cost (In Millions)</th>
<th>Cost (In Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge Reconstruction - East Fork Crystal Creek, Hurricane Creek, Caney Creek, Eagle Branch Creek, Spring Branch Creek, Lawrence Creek, Pebble Creek, Jadehawk Creek and East Fork San Jacinto River</td>
<td>10</td>
<td>MI</td>
<td>60.00</td>
<td>14,582,400</td>
</tr>
<tr>
<td>Bridge Culvert Reconstruction - West Fork Crystal Creek, Unnamed Creek near Jefferson Chemical Rd and Bee Branch Creek</td>
<td>11</td>
<td>SF</td>
<td>75.00</td>
<td>592,500</td>
</tr>
<tr>
<td>Add Raised Median / Channelization (Concrete)</td>
<td>12</td>
<td>SF</td>
<td>10.00</td>
<td>14,499,520</td>
</tr>
<tr>
<td>Concrete Sidewalks (Loop 336 to Willis Waukegan Rd)</td>
<td>13</td>
<td>SF</td>
<td>9.00</td>
<td>1,857,830</td>
</tr>
<tr>
<td>Butler Street Extension (From Loop 336 to Jefferson Chemical Rd)</td>
<td>14</td>
<td>EA</td>
<td>1,044,400.00</td>
<td>1,044,400</td>
</tr>
</tbody>
</table>

**TOTAL FOR LONG TERM IMPROVEMENTS (15 years +)**

- **Long Term (15 years +)**
  - Total for long term improvements: $105,700

**GRAND TOTAL**

- Total for all improvements: $122,120
### Cost Estimate Assumptions

<table>
<thead>
<tr>
<th>Improvement</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Traffic Signal (Crystal Forest Intersection)</td>
<td>Costs include vehicle detection, signal heads, street lighting, cabling and conduit. The costs also include pedestrian pads, curb ramps, proposed pavement markings and roadside signs. Traffic signal interconnection, as per TxDOT standards, will also be a part of the new traffic signal.</td>
</tr>
<tr>
<td>Upgrade Signal Equipment (Loop 336 to FM 1485)</td>
<td>Costs for upgrading existing traffic signal controller and cabinet, and installing wireless traffic signal interconnect.</td>
</tr>
<tr>
<td>Optimize Traffic Signal Timing</td>
<td>Cost to obtain traffic count data, develop signal timing inputs, field implement/fine tune and provide documentation.</td>
</tr>
<tr>
<td>Add Right Turn Lane - SH 105 (Average Length = 225')</td>
<td>Costs for adding right turn lanes (RTLs) are based on an average length of 225 LF construction area per RTL. Costs include all the materials required for the widening of existing SH 105 to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Add Right Turn Lane - SH 105 (Average Length = 400')</td>
<td>Costs for adding right turn lanes (RTLs) are based on an average length of 400 LF construction area per RTL. Costs include all the materials required for the widening of existing SH 105 to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Add Right Turn Lane - SH 105 (Average Length = 640')</td>
<td>Costs for adding right turn lanes (RTLs) are based on an average length of 640 LF construction area per RTL. Costs include all the materials required for the widening of existing SH 105 to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Widen SH 105 - From Loop 336 to East of Douget</td>
<td>Costs for widening SH 105 were calculated on a per mile basis. Costs include all the materials required for the widening of existing SH 105 to accommodate the addition of a raised median with left turn bays for access to businesses. Drainage improvements were also included in the costs since existing ditches would have to be relocated due to the roadway widening.</td>
</tr>
<tr>
<td>Add Raised Median / Channelization (Concrete)</td>
<td>Costs for adding raised medians/channelizations include all materials such as curb, conc riprap and striping. The cost was calculated on a square foot basis.</td>
</tr>
<tr>
<td>Widen SH 105 - From Loop 336 to East of Douget</td>
<td>Costs for adding right turn lanes at the Crystal Forest intersection. Costs include all the materials required for the widening cross street to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Add Right Turn Lane - Crockett Martin</td>
<td>Costs for adding left turn lane at the Crockett Martin intersection. Costs include all the materials required for the widening cross street to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Add Right Turn Lane - Crockett Trace</td>
<td>Costs for adding left turn lane at the Crockett Trace intersection. Costs include all the materials required for the widening cross street to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Add NB Right Turn Lane - Old Highway 105</td>
<td>Costs for adding right turn lane at the Old Hwy 105 intersection. Costs include all the materials required for the widening cross street to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Add NB &amp; SB Left Turn Lanes - Walker</td>
<td>Costs for adding left turn lanes at the Walker intersection. Costs include all the materials required for the widening cross street to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Add SB Right Turn Lane - Lee Turner</td>
<td>Costs for adding right turn lane at the Lee Turner intersection. Costs include all the materials required for the widening cross street to accommodate the RTL at the intersection.</td>
</tr>
<tr>
<td>Widen SH 105 - From East of Douget to Crystal Forest</td>
<td>Costs for widening SH 105 were calculated on a per mile basis. Costs include all the materials required for the widening of existing SH 105 to accommodate the addition of a raised median with left turn bays for access to businesses. Drainage improvements were also included in the costs since existing ditches would have to be relocated due to the roadway widening.</td>
</tr>
<tr>
<td>Add Raised Median / Channelization (Concrete)</td>
<td>Costs for adding raised medians/channelizations include all materials such as curb, conc riprap and striping. The cost was calculated on a square foot basis.</td>
</tr>
<tr>
<td>Realign Old SH 105</td>
<td>Costs for realigning of cross street are based on a 250 LF construction area. Costs include demolition of existing cross street and all the materials required for the relocation of the new cross street. Drainage improvements were also included in the costs since existing ditches would have to be relocated due to the roadway widening. Costs for acquiring ROW required for the realignment are not included in the estimate.</td>
</tr>
</tbody>
</table>
### Long Term (10 years+)

<table>
<thead>
<tr>
<th>Improvement</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widen SH 105 from 4-Lane to 6-Lane (Widen Only)</td>
<td>Costs for widening SH 105 from 4-lanes to 6-lanes were calculated on a per mile basis. Costs include all the materials required for the widening of existing SH 105 to accommodate the additional 2 lanes and a center raised median. Drainage improvements were also included in the costs since existing ditches would have to be relocated due to the roadway widening.</td>
</tr>
<tr>
<td>Widen SH 105 from 4-Lane to 6-Lane (Full Reconstruction)</td>
<td>Costs for widening and reconstructing SH 105 from 4-lanes to 6-lanes were calculated on a per mile basis. Costs include all the materials required for the full reconstruction of SH 105 and addition of 2 lanes and a center raised median. Drainage improvements were also included in the costs since existing ditches would have to be relocated due to the roadway widening.</td>
</tr>
<tr>
<td>Widen SH 105 from 2-Lane to 4-Lane (Widen Only)</td>
<td>Costs for widening SH 105 from 2-lanes to 4-lanes were calculated on a per mile basis. Costs include all the materials required for the widening of existing SH 105 to accommodate the additional 2 lanes and a center raised median. Drainage improvements were also included in the costs since existing ditches would have to be relocated due to the roadway widening.</td>
</tr>
<tr>
<td>Widen SH 105 from 2-Lane to 4-Lane (Full Reconstruction)</td>
<td>Costs for widening and reconstructing SH 105 from 2-lanes to 4-lanes were calculated on a per mile basis. Costs include all the materials required for the full reconstruction of SH 105 and addition of 2 lanes and a center raised median. Drainage improvements were also included in the costs since existing ditches would have to be relocated due to the roadway widening.</td>
</tr>
<tr>
<td>Add Raised Median / Channelization (Concrete)</td>
<td>Costs for adding raised medians/channelizations include all materials such as curb, conc riprap and striping. The cost was calculated on a square foot basis.</td>
</tr>
<tr>
<td>Concrete Sidewalks</td>
<td>Costs for concrete sidewalks include installation of a sidewalk with new curb ramps located at each cross street intersection. The costs was calculated on a square foot basis.</td>
</tr>
</tbody>
</table>
### Summary of Quantities for Short Term Improvements

<table>
<thead>
<tr>
<th>Segment</th>
<th>New Traffic Signal</th>
<th>Upgrade Signal</th>
<th>Optimize Traffic Signal Timing</th>
<th>Add Right Turn Lane - SH 105 (Average Length = 225')</th>
<th>Add Right Turn Lane - SH 105 (Average Length = 400')</th>
<th>Add Right Turn Lane - SH 105 (Average Length = 640')</th>
<th>Add Right Turn Lane - SH 105 (Average Length = 800')</th>
<th>Widen SH 105</th>
<th>Bridge Widening</th>
<th>Bridge Widening (Concrete)</th>
<th>Add Raised Median / Chan. (Concrete)</th>
<th>Driveway Closure</th>
<th>Add Pedestrian Crosswalks</th>
<th>Standardize Driveway Width</th>
<th>Concrete Sidewalks</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>From Loop 336 to East of Douget</td>
<td>EA</td>
<td>INT</td>
<td>INT</td>
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<tr>
<td>2</td>
<td>Douget Intersection Improvements</td>
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<td></td>
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</tr>
<tr>
<td>3</td>
<td>From East of Douget to Whipporwill</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>From Whipporwill to Crystal Forest</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>5</td>
<td>From Crystal Forest to Willis Waukegan</td>
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<td></td>
<td></td>
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<tr>
<td>6</td>
<td>From Willis Waukegan to Walker</td>
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</tr>
<tr>
<td>7</td>
<td>From Walker to US 59</td>
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<td>4</td>
<td>3</td>
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</table>

### Summary of Quantities for Short Term Improvements (Continued)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Add NB Right Turn Lane - Crystal Forest</th>
<th>Add SB Right Turn Lane - FM 1484</th>
<th>Add NB Left Turn Lane - Crockett Martin</th>
<th>Add NB Left Turn Lane - Crockett Trace</th>
<th>Add NB Right Turn Lane - Old Highway 105</th>
<th>Add NB &amp; SB Left Turn Lanes - Walker</th>
<th>Add SB Right Turn Lane - Lee Turner</th>
<th>Widening (Douget Road)</th>
<th>Add Raised Median / Channelization (Concrete)</th>
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</thead>
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<tr>
<td>1</td>
<td>From Loop 336 to East of Douget</td>
<td>EA</td>
<td>EA</td>
<td>EA</td>
<td>EA</td>
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<td>2</td>
<td>Douget Intersection Improvements</td>
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</tr>
<tr>
<td>3</td>
<td>From East of Douget to Whipporwill</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>From Whipporwill to Crystal Forest</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>From Crystal Forest to Willis Waukegan</td>
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<td>1</td>
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<td>From Willis Waukegan to Walker</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1,350</td>
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<tr>
<td>7</td>
<td>From Walker to US 59</td>
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</tr>
<tr>
<td>Total</td>
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### Medium Term Improvements Along SH 105 by TxDOT

<table>
<thead>
<tr>
<th>Segment</th>
<th>Upgrade Signal Equipment</th>
<th>Widen SH 105</th>
<th>Bridge Widening (Culvert)</th>
<th>Add Raised Median / Channelization (Concrete)</th>
<th>Driveway Closure</th>
<th>Add NB Left Turn Lane - Jefferson</th>
<th>Realign Old SH 105</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT MI SF EA EA</td>
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<td></td>
</tr>
<tr>
<td>1 From Loop 336 to East of Douget</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2 Douget Intersection Improvements</td>
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<td></td>
</tr>
<tr>
<td>3 From East of Douget to Whippoorwill</td>
<td></td>
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<td>1,012</td>
<td>24,385</td>
<td>4</td>
<td>1</td>
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</tr>
<tr>
<td>4 From Whippoorwill to Crystal Forest</td>
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<td>0.4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5 From Crystal Forest to Willis Waukegan</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 From Willis Waukegan to Walker</td>
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<td>7 From Walker to US 59</td>
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### Long Term Improvements Along SH 105 by TxDOT

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<tr>
<th>Segment</th>
<th>Widen SH 105 from 4-lane to 6-lane (Full Reconstruction)</th>
<th>Widen SH 105 from 2-lane to 4-lane (Full Reconstruction)</th>
<th>Bridge Reconstruction</th>
<th>Bridge Reconstruction (Culvert)</th>
<th>Butler Street Extension</th>
<th>Add Raised Median / Channelization (Concrete)</th>
<th>Concrete Sidewalks</th>
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<tr>
<td>INT MI SF EA EA</td>
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Units: EA = Each, INT = Intersection, MI = Miles, SF = Square Feet, LS = Lump Sum
### Cost Estimate Details for Short Term Improvements (Continued)

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<th>COST</th>
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#### Additional Notes
- **Units:** EA = Each, INT = Intersection, MI = Miles, SF = Square Feet, LS = Lump Sum, STA = Station, SY = Square Yards, CY = Cubic Yards, LF = Linear Feet.
## Cost Estimate Details for Medium Term Improvements

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<td>REMOVING CONC (SIDEWALK OR RAMP) SY</td>
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<td>REFL PAV MRK TY I (Y) 24&quot;(SLD)(100MIL) LF</td>
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<td>REFL PAV MRK TY II-A-A EA</td>
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<td>ELIM EXT PAV MRK &amp; MRKS (WORD) EA</td>
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<td>PAV SURF PREP FOR MRK (ARROW) EA</td>
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<td>PAV SURF PREP FOR MRK (WORD) EA</td>
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<td>6055</td>
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<td>TRAFFIC SIGNAL IMPROVEMENTS (REMOVE SIGNAL) EA</td>
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<td>SIGNAL SYNCHRONIZATION LS</td>
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### Units
- EA = Each
- INT = Intersection
- Ml = Miles
- SF = Square Feet
- LS = Lump Sum
- STA = Station
- SY = Square Yards
- CY = Cubic Yards
- LF = Linear Feet

### Grand Total
- Costs: $157,000.00
- Total Cost: $4,757,500.00
- BONDS: $20,929.78
- MOBILIZATION LS 20%: $130,811.13

### Subtotals
- SUB TOTAL 1: $104,648.90
- SUB TOTAL 2: $26,162.23

### Calculations
- 20% MOBILIZATION: $26,162.23
- 5% BONDS: $20,929.78
## Cost Estimate Details for Long Term Improvements

### General Information

- **Date:** [Current Date]
- **Project:** SH 105 Access Management Study

### Table of Contents

- Cost Estimation
- Material Costs
- Labor Costs
- Equipment Costs

### Material Costs

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
<th>Unit</th>
<th>Price</th>
</tr>
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<tbody>
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### Total Costs

- **Total:** $9,953,000.00

### Units

- **Units:** EA = Each, INT = Intersection, MI = Miles, SF = Square Feet, LS = Lump Sum, STA = Station, SY = Square Yards, CY = Cubic Yards, LF = Linear Feet
## SH 105 Cost Bridge Widening/Reconstruction

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<tr>
<th>Structure Number</th>
<th>Water/Roadway Crossing</th>
<th>Type</th>
<th>Existing Bridge Length LF</th>
<th>Existing Bridge Width LF</th>
<th>Short Term Widening SF</th>
<th>Medium Term Widening SF</th>
<th>Long Term New Bridge SF</th>
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<td>4</td>
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<td>22</td>
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<td>0</td>
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<td>5</td>
<td>East Fork Crystal Creek</td>
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<td>6</td>
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### Calculations for Bridge Culvert Costs

#### Short Term

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<th>Box Culvert</th>
<th>Head Wall</th>
<th>Total</th>
<th>Calc Price per SF</th>
<th>Price per SF Used</th>
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