CENTRAL TEXAS
Regional Mobility Authority

Regular Meeting of the Board of Directors

9:00 a.m.
Wednesday, March 29, 2017

Lowell H. Lebermann, Jr., Board Room
3300 N. IH-35, Suite 300
Austin, Texas 78705

A live video stream of this meeting may be viewed on the internet at www.mobilityauthority.com

AGENDA

No action on the following:

1. Welcome and opening remarks by the Chairman and members of the Board of Directors.
2. Opportunity for public comment – See ***Notes*** at the end of this agenda.
3. Welcome newly appointed Board Member and administer the oath of office.

Regular Items

Items to discuss, consider, and take appropriate action.

4. Discuss and consider the election of a Secretary.
5. Discuss and consider the appointment of a Chair to the Audit Committee.
6. Amend the minutes from the January 25, 2017 Regular Board meeting.
7. Approve the minutes for the February 22, 2017 Regular Board meeting.
8. Accept the financial statements for February 2017.
9. Discuss and take appropriate action regarding the initial payment to the Regional Infrastructure Fund.

10. Authorize a procurement of a firm to provide pay-by-mail, violations processing, collections and customer service.

11. Approve Work Authorization No. 14 with Kapsch Inc. for system integration services related to the SH 45 SW Project.

Briefings and Reports

Items for briefing and discussion. No action will be taken by the Board.

12. Monthly briefing on the MoPac Improvement Project.

13. Briefing on the HERO Program.

14. Executive Director Comments.

    A. SH 71 Express opening.
    B. Report on the Texas A&M Transportation Institute's high level assessment of the Wire One Austin Urban Gondola proposal led by CapMetro.
    C. New employee introduction.
    D. Report on the March 2017 investor meetings.

Executive Session

Under Chapter 551 of the Texas Government Code, the Board may recess into a closed meeting (an executive session) to deliberate any item on this agenda if the Chairman announces the item will be deliberated in executive session and identifies the section or sections of Chapter 551 that authorize meeting in executive session. A final action, decision, or vote on a matter deliberated in executive session will be made only after the Board reconvenes in an open meeting.

The Board may deliberate the following items in executive session if announced by the Chairman:

15. Discuss acquisition of one or more parcels or interests in real property needed for the Bergstrom Expressway (183 South) Project and related legal issues, including consideration of the use of eminent domain to condemn property, pursuant to §551.072 (Deliberation Regarding Real Property) and §551.071 (Consultation With Attorney).

16. Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).

17. Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects, as authorized by §551.071 (Consultation with Attorney).

18. Discuss personnel matters as authorized by §551.074 (Personnel Matters).

Reconvene in Open Session.

19. **Consideration of the use of eminent domain to condemn property**: Declare a public necessity to acquire the following described parcels of land, or interests therein, for the 183 South (Bergstrom Expressway) Project; and with respect to each such parcel or interest therein, authorize any of the following actions: (i) acquisition through negotiation or by the use of eminent domain to condemn the parcel or interest therein; (ii) execution of a contract to purchase, and (ii) execution of a possession and use agreement:

    A. Parcel E13B of the 183 South (Bergstrom Expressway) Project, a 0.044 acre parcel of real estate, owned by New Century Investment, LLC, a Texas limited liability company, located at 6000 FM 969, Austin TX 78724.

    B. Parcel 118 of the 183 South (Bergstrom Expressway) Project, a 0.688 acre parcel of land, owned by the City of Austin, located at the Southeast corner of Ed Bluestein Blvd (U.S. Highway 183) and Smith Road, Austin, TX 78721.

Regular Items

Items to discuss, consider, and take appropriate action.

20. Adjourn Meeting.

Notes

Opportunity for Public Comment. At the beginning and at the end of the meeting, the Board provides a period of up to one hour for public comment on any matter subject to the Mobility Authority's jurisdiction. Each speaker is allowed a maximum of three minutes. A person who wishes to address the Board should sign the speaker registration sheet before the beginning of the public comment period. If a speaker's topic is not listed on this agenda, the Board may not deliberate the speaker's topic or question the speaker during the open comment period, but may direct staff to investigate the matter or propose that an item be placed on a subsequent agenda for deliberation and possible action by the Board. The Board may not deliberate or act on an item that is not listed on this agenda.

Consent Agenda. The Consent Agenda includes routine or recurring items for Board action with a single vote. The Chairman or any Board Member may defer action on a Consent Agenda item for discussion and consideration by the Board with the other Regular Items.

Public Comment on Agenda Items. A member of the public may offer comments on a specific agenda item in open session if he or she signs the speaker registration sheet for that item before the Board takes up consideration of the item. The Chairman may limit the amount of time allowed for each speaker. Public comment unrelated to a specific agenda item must be offered during the open comment period.

Meeting Procedures. The order and numbering of agenda items is for ease of reference only. After the meeting is convened, the Chairman may rearrange the order in which agenda items are considered, and the Board may consider items on the agenda in any order or at any time during the meeting.

Persons with disabilities. If you plan to attend this meeting and may need auxiliary aids or services, such as an interpreter for those who are deaf or hearing impaired, or if you are a reader of large print or Braille, please contact Laura Bohl at (512) 996-9778 at least two days before the meeting so that appropriate arrangements can be made.
Español. Si desea recibir asistencia gratuita para traducir esta información, llame al (512) 996-9778.

Participation by Telephone Conference Call. One or more members of the Board of Directors may participate in this meeting through a telephone conference call, as authorized by Sec. 370.262, Texas Transportation Code (*see below*). Under that law, each part of the telephone conference call meeting law must be open to the public, shall be audible to the public at the meeting location, and will be tape-recorded. On conclusion of the meeting, the tape recording of the meeting will be made available to the public.

Sec. 370.262. MEETINGS BY TELEPHONE CONFERENCE CALL.
(a) Chapter 551, Government Code, does not prohibit any open or closed meeting of the board, a committee of the board, or the staff, or any combination of the board or staff, from being held by telephone conference call. The board may hold an open or closed meeting by telephone conference call subject to the requirements of Sections 551.125(c)-(f), Government Code, but is not subject to the requirements of Subsection (b) of that section.

(b) A telephone conference call meeting is subject to the notice requirements applicable to other meetings.

(c) Notice of a telephone conference call meeting that by law must be open to the public must specify the location of the meeting. The location must be a conference room of the authority or other facility in a county of the authority that is accessible to the public.

(d) Each part of the telephone conference call meeting that by law must be open to the public shall be audible to the public at the location specified in the notice and shall be tape-recorded or documented by written minutes. On conclusion of the meeting, the tape recording or the written minutes of the meeting shall be made available to the public.

Sec. 551.125. OTHER GOVERNMENTAL BODY. (a) Except as otherwise provided by this subchapter, this chapter does not prohibit a governmental body from holding an open or closed meeting by telephone conference call.

~~(b) A meeting held by telephone conference call may be held only if:~~
~~(1) an emergency or public necessity exists within the meaning of Section 551.045 of this chapter; and~~
~~(2) the convening at one location of a quorum of the governmental body is difficult or impossible; or~~
~~(3) the meeting is held by an advisory board.~~

(c) The telephone conference call meeting is subject to the notice requirements applicable to other meetings.

(d) The notice of the telephone conference call meeting must specify as the location of the meeting the location where meetings of the governmental body are usually held.

(e) Each part of the telephone conference call meeting that is required to be open to the public shall be audible to the public at the location specified in the notice of the meeting as the location of the meeting and shall be tape-recorded. The tape recording shall be made available to the public.

(f) The location designated in the notice as the location of the meeting shall provide two-way communication during the entire telephone conference call meeting and the identification of each party to the telephone conference shall be clearly stated prior to speaking.

Español. Si desea recibir asistencia gratuita para traducir esta información, llame al (512) 996-9778.

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #1

Welcome and opening remarks by the Chairman and members of the Board of Directors

Welcome, Opening Remarks and Board Member Comments

Board Action Required: No

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #2

Open Comment Period for Public Comment
& Public Comment on Agenda Items

Open Comment Period for Public Comment – At the beginning of the meeting, the Board provides a period of up to one hour for public comment on any matter subject to CTRMA's jurisdiction. Each speaker is allowed a maximum of three minutes. A person who wishes to address the Board should sign the speaker registration sheet before the beginning of the open comment period. If the speaker's topic is not listed on this agenda, the Board may not deliberate the topic or question the speaker during the open comment period, but may direct staff to investigate the subject further or propose that an item be placed on a subsequent agenda for deliberation and possible action by the Board. The Board may not act on an item that is not listed on this agenda.

Public Comment on Agenda Items – A member of the public may offer comments on a specific agenda item in open session if he or she signs the speaker registration sheet for that item before the Board's consideration of the item. The Chairman may limit the amount of time allowed for each speaker. Public comment unrelated to a specific agenda item must be offered during the open comment period.

Board Action: None.

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #3

Welcome newly appointed Board Member and administer the oath of office

If Williamson County appoints a new Board Member to the Central Texas Regional Mobility Authority prior to the March 29, 2017 Board Meeting, Chairman Ray A. Wilkerson will administer the oath of office to the new Board Member.

Board Action Required: No

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #4

Discuss and consider the election of a Secretary

Strategic Plan Relevance:	Regional Mobility
Department:	Legal
Contact:	Geoffrey Petrov, General Counsel
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on draft resolution

Summary:

Pursuant to Section 101.22, Mobility Authority Policy Code, officers of the Authority shall consist of a chairman, vice chairman, treasurer and secretary. The election of Nikelle Meade, former secretary, to serve as vice chair, replacing retiring vice chair, Jim Mills, has left the Board without a secretary. In accordance with Section 101.27, the Board shall hold a vote to elect a new secretary.

Backup provided: Draft Resolution

GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION NO. 17-0XX

ELECTION OF THE MOBILITY AUTHORITY BOARD SECRETARY

WHEREAS, pursuant to Section 101.22, Mobility Authority Policy Code, officers of the Authority shall consist of a chair, vice chair, treasurer, and secretary; and

WHEREAS, by Resolution No. 17-007 dated February 22, 2017, the Board of Directors elected Nikelle Meade, former secretary, to serve as vice chair, replacing retiring vice chair Jim Mills; and

WHEREAS, Nikelle Meade's election to serve as vice chair has left the secretary position vacant; and

WHEREAS, it is the desire of the Board of Directors to elect from among its members a Secretary who shall perform the duties described in Section 101.25 of the Mobility Authority Policy Code.

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors of the CTRMA elects _____ to serve as Secretary of the Board for a two-year term or until such time as their successor is elected by the Board.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of March 2017.

Submitted and reviewed by:

_____
Geoffrey Petrov, General Counsel

Approved:

_____
Ray A. Wilkerson
Chairman, Board of Directors

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #5

Discuss and consider the appointment of a Chair to the Audit Committee

Strategic Plan Relevance:	Regional Mobility
Department:	Legal
Contact:	Geoffrey Petrov, General Counsel
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Appointment of a new chair to the Audit Committee

Summary:

Audit Committee Chairman, Bob Bennet, retired from the Board in February 2017, leaving the audit committee without a chair. In accordance with Section 101.36 of the Mobility Authority Policy Code, the Chairman shall appoint a new chairman to chair the Audit Committee.

Backup provided: None

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #6

Amend the minutes from the January 25, 2017 Regular Board Meeting

Strategic Plan Relevance:	Regional Mobility
Department:	Legal
Contact:	Geoffrey Petrov, General Counsel
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on motion to amend the January 2017 Board Meeting minutes

Summary:

Approve the attached amended minutes from the January 25, 2017 Regular Board Meeting. The amended minutes include edits to the description provided for Item 7 and the addition of the conversation between Chairman Wilkerson and CH2M Project Manager Craig Martell to Item No. 8.

Backup provided: Amended Minutes, January 25, 2017 Regular Board Meeting.

MINUTES

Regular Meeting of the Board of

Directors of the

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Wednesday, January 25, 2017

The meeting was held in the Mobility Authority's Lowell H. Lebermann, Jr. Board Room at 3300 N. Interstate 35, #300, Austin, Texas 78705-1849. Notice of the meeting was posted January 19, 2017 at the respective County Courthouses of Williamson and Travis Counties; online on the website of the Mobility Authority; and in the Mobility Authority's office lobby at 3300 N. Interstate 35, #300, Austin, Texas 78705-1849.

An archived copy of the live-streamed video of this meeting is available at:

http://www.mobilityauthority.com/about/vod.php

1. **Welcome and Opening Remarks by Chairman Ray Wilkerson.**

   After noting that a quorum of the Board was present, Chairman Ray Wilkerson called the meeting to order at 9:07 a.m. with the following Board members present: Jim Mills, David Armbrust, Nikelle Meade and David Singleton.

2. **Opportunity for Public Comment.**

   No Public Comment given.

Regular Board Items

3. Approve the minutes for the December 21, 2016 Regular Board meeting.

   MOTION: Approval for the December 21, 2016, Regular Board Meeting minutes.

   RESULT: Approved (Unanimous); 5-0
   MOTION BY: David Singleton
   SECONDED BY: Nikelle Meade
   AYE: Wilkerson, Mills, Armbrust, Meade, and Singleton.
   NAY: None.

4. Accept the financial statements for December 2016.

Presentation by Mary Temple, Controller

MOTION: Accept the financial statements for December 2016.

RESULT: Approved (Unanimous); 5-0
MOTION BY: Nikelle Meade
SECONDED BY: David Singleton
AYE: Wilkerson, Mills, Armbrust, Meade, and Singleton.
NAY: None.

ADOPTED AS: Resolution No. 17-001

5. Presentation on the Capital Area Metropolitan Planning Organization Park and Ride Initiative.

Presentation by Jeff Dailey, Deputy Executive Director; Phillip Tindall, Associate Director, Capital Area Metropolitan Planning Organization.

NOTE: No action was taken regarding the Capital Area Metropolitan Planning Organization Park and Ride Initiative.

6. Consider and take appropriate action regarding development of the 183 North Project.

Presentation by Justin Word, Director of Engineering; Richard Ramirez, Managing Director, First Southwest.

MOTION: Authorize further development of the 183 North Project.

RESULT: Approved (Unanimous); 5-0
MOTION BY: David Armbrust
SECONDED BY: Nikelle Meade
AYE: Wilkerson, Mills, Armbrust, Meade, and Singleton
NAY: None.

ADOPTED AS: Resolution No. 17-002

7. Consider and take appropriate action regarding further development of the 290E Phase III Project.

Presentation by Justin Word, P.E., Director of Engineering; Terry McCoy, P.E., TxDOT Austin District Engineer.

Two options regarding 290E Phase III were presented. Option 1 would include building three direct connectors (SH 130 South to 290 Toll West, 290 Toll East to SH 130 South, and SH 130 North to 290 Toll West) and Option 2 would include building one direct connector (SH 130 South to 290 Toll West). Mr. Word informed the Board that staff intended to cease further development work as we worked through the options with TxDOT. Mr. McCoy offered to assist the Mobility Authority in preparing a proposal to present to the Texas Transportation Commission for the development of the 290E Phase III Project. Chairman Wilkerson expressed his appreciation for the partnership with TxDOT.

NOTE: No action was taken by the Board regarding further development of the 290E Phase III Project.

Briefing and Discussion on the following:

8. Quarterly update on transportation projects under construction.

A. MoPac Improvement Project.

Speaking on: Jeff Dailey, Deputy Executive Director
Steve Pustelnyk, Director of Community Relations
Craig Martell, Project Manager, CH2M

Craig Martell with CH2M is invited to speak regarding the MIP schedule

Ray Wilkerson: Good morning, thank you for joining us.

Craig Martel: Good morning, Mr. Chairman; Board Members. Yes, our current schedule shows middle of June as our completion date. As you can see, in segment 3 there are a lot of constrained workspaces, we have some temperature constraints for PFC. But, based upon current schedule, the durations, resources on the project, commitments from subs, were pretty confident hitting middle of June.

Ray Wilkerson: So, other than weather, which we can't control, I understand that, otherwise, and you feel, and I'm asking for the word "very" confident - that you can bring this project in June?

Craig Martell: We are "very" confident they will deliver the project in June.

Ray Wilkerson: Thank you, that's what I think this Board would like to hear.

B. 183 South Project.

Speaking on: Justin Word, Director of Engineering
Aaron Autry, Project Manager, Atkins

C. SH 45 SW Project.

Speaking on: Justin Word, Director of Engineering
Dee Anne Heath, Director of External Affairs

9. Executive Director's Report.

A. Oakhill Parkway

Speaking on: Justin Word, Director of Engineering
Dee Anne Heath, Director of External Affairs

B. Introduction of new employee.

Speaking on: Jeff Dailey, Deputy Executive Director

NOTE: Chairman Wilkerson and Mike Heiligenstein, Executive Director, honored Board Member Jim Mills for his years of service on the CTRMA Board and announced his retirement.

Executive Session Pursuant to Government Code, Chapter 551

Chairman Wilkerson announced in open session at 10:32 a.m. that the Board would recess the open meeting and reconvene in Executive Session to deliberate the following items:

10. Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).

11. Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects, as authorized by §551.071 (Consultation with Attorney).

12. Discuss personnel matters as authorized by §551.074 (Personnel Matters).

The Board then recessed into an executive session in the Travis Conference Room. After completing the executive session, the Board reconvened in open meeting at 11:24 a.m. in the Lebermann Board Room.

13. Consider and take appropriate action regarding CTRMA's application for Qualified Energy Conservation Bonds (QECBs).

Presentation by: Jeff Dailey, Deputy Executive Director.

NOTE: No action was taken regarding CTRMA's application for Qualified Energy Conservation Bonds (QECBs).

14. Adjourn Meeting.

After confirming that no member of the public wished to address the Board, Chairman Wilkerson declared the meeting adjourned at 11:40 a.m.

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #7

Approve the minutes for the February 22, 2017 Regular Board Meeting

Strategic Plan Relevance:	Regional Mobility
Department:	Legal
Contact:	Geoffrey Petrov, General Counsel
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on motion to approve minutes

Summary:

Approve the attached draft minutes for the February 22, 2017 Regular Board Meeting.

Backup provided: Draft Minutes, February 22, 2017 Regular Board Meeting.

MINUTES

Regular Meeting of the Board of

Directors of the

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Wednesday, February 22, 2017

The meeting was held in the Mobility Authority's Lowell H. Lebermann, Jr. Board Room at 3300 N. Interstate 35, #300, Austin, Texas 78705-1849. Notice of the meeting was posted February 17, 2017 at the respective County Courthouses of Williamson and Travis Counties; online on the website of the Mobility Authority; and in the Mobility Authority's office lobby at 3300 N. Interstate 35, #300, Austin, Texas 78705-1849.

An archived copy of the live-streamed video of this meeting is available at:

http://www.mobilityauthority.com/about/vod.php

NOTE: Chairman Wilkerson began the meeting with Item 2 and presented Mr. Bennett and Mr. Mills each with a resolution for their years of service on the Board, announcing their retirements.

2. Welcome and Opening Remarks by Chairman Ray Wilkerson.

After noting that a quorum of the Board was present, Chairman Ray Wilkerson called the meeting to order at 9:06 a.m. with the following Board members present: Jim Mills, Nikelle Meade, Bob Bennett, David Armbrust, and Charles Heimsath.

The board recessed at 9:23 a.m. to allow audience members to convey their thanks for many years of dedicated service to Mr. Bennett and Mr. Mills.

The board reconvened in open meeting at 9:36 a.m.

1. Welcome newly appointed Board Member and administer the oath of office.

Mr. Wilkerson introduced Amy Ellsworth, the new board member replacing Bob Bennett and administered the oath office.

NOTE: Following Mr. Bennett's retirement from the Board, he left the meeting and was replaced on the dais by Amy Ellsworth.

3. Opportunity for public comment.

No comments were offered.

Consent Board Items

Chairman Ray Wilkerson presented Items 4 thru 7 for Board consideration as the consent agenda.

4. Approve Work Authorization No. 6 with Parsons Brinkerhoff, Inc. for general engineering consultant services related to the MoKan Project.

Work Authorization No. 6 is in an amount not to exceed $612,890.13 including contingency, and is expected to be substantially complete by December 31, 2017.

ADOPTED AS: RESOLUTION NO. 17-003

5. Approve Supplement No. 1 to Work Authorization No. 2 with Parsons Brinkerhoff, Inc. for general engineering consultant services related to the 183 North Project.

Supplement No. 1 to Work Authorization No. 2 is in an amount not to exceed $4,317,054.95 including contingency, and is expected to be substantially complete by December 31, 2018.

ADOPTED AS: RESOLUTION NO. 17-004

6. Approve Supplement No. 2 to Work Authorization No. 7 with Atkins for general engineering consultant services related to the Oak Hill Parkway Project.

Supplement No. 2 to Work Authorization No. 7 is in an amount not to exceed $1,389,460, and is expected to be substantially complete by December 31, 2018.

ADOPTED AS: RESOLUTION NO. 17-005

7. Amend the Mobility Authority Policy Code regarding the publication of toll rates.

ADOPTED AS: RESOLUTION NO. 17-006

After confirming with the Board that no items on the Consent Agenda needed to be moved to the Regular Agenda for further discussion, Chairman Wilkerson put the Consent Agenda items up for a vote.

MOTION: Approval of consent agenda items 4 thru 7

RESULT: Approved (Unanimous); 6-0
MOTION BY: Jim Mills
SECONDED BY: David Armbrust
AYE: Wilkerson, Mills, Armbrust, Meade, Heimsath, and Ellsworth.
NAY: None.

Regular Board Items

8. Discuss and consider the election of a Vice Chairman.

David Armbrust nominated Nikelle Meade for the position of Vice Chair and the nomination was put to a vote.

MOTION: Appoint Nikelle Meade as Vice Chair of the CTRMA Board

RESULT: Approved (Unanimous); 6-0
MOTION BY: David Armbrust
SECONDED BY: Charles Heimsath
AYE: Wilkerson, Mills, Armbrust, Meade, Heimsath, and Ellsworth.
NAY: None.

ADOPTED AS: RESOLUTION NO. 17-007

9. Discuss and consider the election of a Treasurer.

David Armbrust nominated David Singleton for the position of Treasurer and the nomination was put to a vote.

MOTION: Appoint David Singleton as Treasurer of the CTRMA Board

RESULT: Approved (Unanimous); 6-0
MOTION BY: David Armbrust
SECONDED BY: Nikelle Meade
AYE: Wilkerson, Mills, Armbrust, Meade, Heimsath, and Ellsworth.
NAY: None.

ADOPTED AS: RESOLUTION NO. 17-008

10. Approve the minutes for the January 25, 2017 Regular Board meeting.

MOTION: Approve the minutes for the January 25, 2017 Regular Board meeting.

RESULT: Approved (Unanimous); 6-0
MOTION BY: Jim Mills
SECONDED BY: Nikelle Meade
AYE: Wilkerson, Mills, Armbrust, Meade, Heimsath, and Ellsworth.
NAY: None.

11. Accept the financial statements for January 2017.

Presentation by Mary Temple, Controller.

MOTION: Accept the financial statements for January 2017.

RESULT: Approved (Unanimous); 6-0
MOTION BY: Charles Heimsath
SECONDED BY: David Armbrust
AYE: Wilkerson, Mills, Armbrust, Meade, Heimsath, and Ellsworth.
NAY: None.

ADOPTED AS: **RESOLUTION NO. 17-009**

12. Add the SH 71 Express Project to the Mobility Authority Turnpike System

Presentation by Bill Chapman, Chief Financial Officer.

MOTION: Add the SH 71 Express Project to the Mobility Turnpike System.

RESULT: Approved (Unanimous); 6-0
MOTION BY: Charles Heimsath
SECONDED BY: Nikelle Meade
AYE: Wilkerson, Mills, Armbrust, Meade, Heimsath, and Ellsworth.
NAY: None.

ADOPTED AS: **RESOLUTION NO. 17-010**

13. Briefing on the Mobility Authority's cash flow.

Presentation by Bill Chapman, Chief Financial Officer.

14. Approve a Master Interlocal Agreement and Work Authorization No. 1 with the Texas A&M Transportation Institute.

Presentation by Tim Reilly, Director of Operations.

Mr. Reilly informed the Board that negotiations regarding a Master Interlocal Agreement remain ongoing and asked for approval of Work Authorization No. 1 as a separate Interlocal Agreement with the Texas A&M Transportation Institute. No action on the Master Interlocal Agreement was taken.

MOTION: Approve an Interlocal Agreement with the Texas A&M Transportation Institute to conduct a behavioral study to aid in developing initiatives to

improve customer service and enhance the road user experience.

RESULT: Approved (Unanimous); 6-0
MOTION BY: Nikelle Meade
SECONDED BY: Charles Heimsath
AYE: Wilkerson, Mills, Armbrust, Meade, Heimsath, and Ellsworth.
NAY: None.

ADOPTED AS: RESOLUTION NO. 17-011

Briefings and Reports

15. Monthly Briefing on the MoPac Improvement Project.

Presentation by: Steve Pustelnyk, Director of Community Relations
Rick Volk, Global Alternative Project Delivery Director, CH2M

Rick Volk is invited to speak.

Ray Wilkerson: Are our oversight and construction team members here today?

Steve Pustelnyk: I believe so

Ray Wilkerson: As I'd asked repeatedly in the past and will continue in the future, if they could just come up and just give me a little brief. Update to assure as that we are still on time on what we talked about week please.

Rick Volk: Good morning Mr. Chairman, Board members. My name is Rick Volk; I am the project executive for MoPac for CH2M, and yes, we are working with your folks on a daily basis to bring this project home as quickly as possible. To complete the work and deliver this project to you in a quality and timely fashion. We have made some recent changes with the executive leadership in order to more effective work with you to accomplish that.

Ray Wilkerson: I appreciate that. The time frame that was given to us last time and would like to hear again if we are still on track in the June period of completion. It is important to us to make sure the public is relying on what we are spinning out there or timing because my hour and fifteen minutes on mopac last night to get to downtown, I can assure you people are ready to be through with that and figure out what that time to be able to depend on.

Rick Volk: We are, we are on course for that except for two items that have come up since the commitment was made to you last month. One is a duct bank that is interfering throughout Segment 3, an existing TxDOT ITS duct bank.

Ray Wilkerson: Can you explain what a duct bank is?

Rick Volk: It's concreate in case conduits underneath the roadway. It's actually at a higher elevation than what they should have been and we are in the process of removing that currently. That is going to have

an impact on the schedule and then we have some re work to do on sound walls that we are working on. Both of them will have minor impacts. June will be difficult but it will be there or shortly thereafter.

Ray Wilkerson: Forgive me for doing this, but all of our Board members are asked, constantly, by elected officials and the public at large, when are we going to deliver this project? We want to try to narrow it down to certainty and the only way I can do that is to be the person who is actually in charge of the project. So we are asking you and we will ask at every meeting if you can at least, if there are going to be any changes or any surprises, no more gray areas for the public as far as we are concerned. We want to hear exactly what those are and why.

Rick Volk: Absolutely and I will be here to report to you on a monthly basis. Those two items that I just noted are, the duct bank and Steve noted within the next couple of weeks we will be completed with the excavation. We are going to be out of the ground in a couple of weeks in terms of hitting everything that can potentially could be a surprise. So we don't anticipate anything coming up that we haven't already encountered. Once we get through these two issues we will be able to give you, with confidence, where this project will be.

Ray Wilkerson: Alright, so next meeting you can tell us if June is still a valid date, is that correct?

Rick Volk: Yes, that is correct.

Ray Wilkerson: Thank you.

Mike Heiligenstein: Rick, I'm just going to ask a quick question, should take a second.

Rick Volk: Yes sir.

Mike Heiligenstein: On the paving, so obviously we got to have a metric for temperature. I think we've helped negotiate that down somewhat so 60 degrees now on the metric?

Rick Volk: That is correct.

Mike Heiligenstein: 60 degrees back sort of speak, when do you anticipate, we are good down to 183, right or is it all the way to 2222?

Rick Volk: Northbound we are good to 2222 not as far on southbound.

Mike Heiligenstein: But that can be going on, that duct bank and sound wall will not interfere with that paving, starting whenever, April or whatever?

Rick Volk: That could have an impact of Segment 3.

Mike Heiligenstein: Farther south?

Rick Volk: Yes, farther south.

Mike Heiligenstein: But you got a lot of paving.

Rick Volk: We do and related to the paving plan, we have, as a matter of fact, I just got an update this morning in our meeting this morning before coming down here. We have brought Lane and Austin Materials in to do a deep dive into the paving plan to be prepared for this spring when the temperature changes. Even looking into the number of trucks that will be required, the hours, the hours restrictions

on drivers, so that we can give you a good paving plan on how we are going to attack it. Have all the predecessor work done in time for the temperature, which will be at some point in April that we anticipate, we can really get into the PFC paving. Last year I think it was about April 23rd. So we will probably have something to you Mike and your folks next week. This week we will have it internally a very detailed paving plan.

Ray Wilkerson: Well thank you again, we appreciate your willingness to come and talk to us to keep us up to date. We look forward to seeing you again next month.

NOTE: Jim Mills left the dais at 10:30 a.m.

16. Executive Director's Report.

A. Texas 85th Legislature update.

Presentation by: Jerry Valdez, Legislative Affairs Consultant.

B. Update on Change Orders.

Presentation by: Justin Word, P.E., Director of Engineering.

C. Update on 290E Phase III Proposal.

Presentation by: Mike Heiligenstein, Executive Director.

Executive Session Pursuant to Government Code, Chapter 551

Chairman Wilkerson announced in open session at 10:39 a.m. that the Board would recess the open meeting and reconvene in Executive Session in the Travis conference room to deliberate the following items:

17. Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).

18. Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects, as authorized by §551.071 (Consultation with Attorney).

19. Discuss personnel matters as authorized by §551.074 (Personnel Matters).

After completing the executive session, the Board reconvened in open meeting at 11:28 a.m. in the Lebermann Board room.

After confirming that no member of the public wished to address the Board, Chairman Wilkerson declared the meeting adjourned at 11:29 a.m.

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #8

Accept the financial statements for February 2017

Strategic Plan Relevance:	Regional Mobility
Department:	Finance
Contact:	Bill Chapman, Chief Financial Officer
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on draft resolution

Summary:

Presentation and acceptance of the monthly financial statements for February 2017.

Backup Provided: Draft Resolution
Draft financial statements for February 2017.

GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION NO. 17-0XX

ACCEPT THE FINANCIAL STATEMENTS FOR FEBRUARY 2017

WHEREAS, the Central Texas Regional Mobility Authority ("Mobility Authority") is empowered to procure such goods and services as it deems necessary to assist with its operations and to study and develop potential transportation projects, and is responsible to insure accurate financial records are maintained using sound and acceptable financial practices; and

WHEREAS, close scrutiny of the Mobility Authority's expenditures for goods and services, including those related to project development, as well as close scrutiny of the Mobility Authority's financial condition and records is the responsibility of the Board and its designees through procedures the Board may implement from time to time; and

WHEREAS, the Board has adopted policies and procedures intended to provide strong fiscal oversight and which authorize the Executive Director, working with the Mobility Authority's Chief Financial Officer, to review invoices, approve disbursements, and prepare and maintain accurate financial records and reports; and

WHEREAS, the Executive Director, working with the Chief Financial Officer, has reviewed and authorized the disbursements necessary for the month of February 2017, and has caused Financial Statements to be prepared and attached to this resolution as Exhibit A.

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors accept the Financial Statements for February 2017, attached as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of March 2017.

Submitted and reviewed by:

_____
Geoffrey Petrov, General Counsel

Approved:

_____
Ray A. Wilkerson
Chairman, Board of Directors

Exhibit A

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending February 28, 2017

	Budget Amount FY 2017	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
REVENUE				
Operating Revenue				
Toll Revenue - Tags	46,555,037	34,633,844	74.39%	30,268,085
Video Tolls	16,030,043	9,315,572	58.11%	7,423,804
Fee Revenue	6,876,980	3,700,498	53.81%	3,111,075
Total Operating Revenue	**69,462,060**	**47,649,915**	**68.60%**	**40,802,965**
Other Revenue				
Interest Income	250,000	581,710	232.68%	316,130
Grant Revenue	700,000	14,693,679	2099.10%	38,847,524
Reimbursed Expenditures	1,555,396	207,873	13.36%	2,849
Misc Revenue	-	6,010	-	48,322
Total Other Revenue	**2,505,396**	**15,489,271**	**618.24%**	**39,214,826**
TOTAL REVENUE	**$71,967,456**	**$63,139,186**	**87.73%**	**80,017,791**
EXPENSES				
Salaries and Benefits				
Salary Expense-Regular	2,967,036	2,094,304	70.59%	1,876,406
Salary Reserve	80,000	-	-	-
TCDRS	415,385	288,497	69.45%	257,097
FICA	128,873	84,634	65.67%	79,082
FICA MED	45,627	30,842	67.60%	27,341
Health Insurance Expense	332,091	229,863	69.22%	170,410
Life Insurance Expense	14,167	6,191	43.70%	2,946
Auto Allowance Expense	10,200	6,800	66.67%	6,800
Other Benefits	269,785	155,293	57.56%	141,347
Unemployment Taxes	15,463	4,245	27.45%	276
Total Salaries and Benefits	**4,278,627**	**2,900,668**	**67.79%**	**2,561,705**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending February 28, 2017

	Budget Amount FY 2017	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Administrative				
Administrative and Office Expenses				
Accounting	20,000	5,431	27.15%	14,245
Auditing	74,000	53,880	72.81%	36,247
Human Resources	30,000	12,766	42.55%	3,288
IT Services	88,000	47,096	53.52%	32,280
Internet	1,700	1,396	82.10%	3,722
Software Licenses	55,725	61,601	110.54%	22,157
Cell Phones	14,542	9,785	67.29%	7,359
Local Telephone Service	12,000	10,216	85.13%	7,512
Overnight Delivery Services	850	63	7.39%	102
Local Delivery Services	1,050	-	-	250
Copy Machine	12,000	10,485	87.38%	9,612
Repair & Maintenance-General	1,000	2,030	203.00%	2,034
Meeting Facilities	1,000	-	-	-
CommunityMeeting/ Events	2,000	-	-	616
Meeting Expense	15,250	5,908	38.74%	4,887
Public Notices	2,000	25	1.25%	-
Toll Tag Expense	1,900	874	45.98%	594
Parking	3,600	954	26.51%	2,209
Mileage Reimbursement	11,200	2,984	26.64%	3,227
Insurance Expense	150,000	99,079	66.05%	84,566
Rent Expense	558,000	358,565	64.26%	251,124
Legal Services	525,000	41,872	7.98%	96,071
Total Administrative and Office Expenses	**1,580,817**	**725,009**	**45.86%**	**582,104**
Office Supplies				
Books & Publications	6,150	690	11.21%	297
Office Supplies	21,000	12,520	59.62%	14,649
Computer Supplies	17,000	11,152	65.60%	10,224
Copy Supplies	2,500	609	24.35%	1,294
Other Reports-Printing	10,000	584	5.84%	5,088
Office Supplies-Printed	2,700	635	23.50%	2,907
Misc Materials & Supplies	3,750	1,015	27.07%	387
Postage Expense	5,850	322	5.51%	382
Total Office Supplies	**68,950**	**27,527**	**39.92%**	**35,229**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending February 28, 2017

	Budget Amount FY 2017	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Communications and Public Relations				
Graphic Design Services	75,000	6,625	8.83%	18,008
Website Maintenance	140,000	99,436	71.03%	12,403
Research Services	105,000	79,059	75.29%	-
Communications and Marketing	469,900	221,608	47.16%	124,768
Advertising Expense	336,500	58,327	17.33%	105,193
Direct Mail	10,000	-	-	380
Video Production	35,000	8,820	25.20%	34,229
Photography	10,000	1,077	10.77%	8,950
Radio	10,000	-	-	-
Other Public Relations	125,000	5,000	4.00%	3,500
Promotional Items	10,000	972	9.72%	8,322
Displays	5,000	-	-	-
Annual Report printing	5,000	-	-	-
Direct Mail Printing	11,300	-	-	-
Other Communication Expenses	1,000	2,009	200.90%	660
Total Communications and Public Relations	**1,348,700**	**482,933**	**35.81%**	**316,411**
Employee Development				
Subscriptions	3,300	1,467	44.46%	2,840
Memberships	50,750	35,066	69.10%	36,451
Continuing Education	11,750	135	1.15%	3,000
Professional Development	6,700	-	-	(2,366)
Other Licenses	1,250	257	20.52%	430
Seminars and Conferences	44,000	18,259	41.50%	12,261
Travel	88,000	40,364	45.87%	44,987
Total Employee Development	**205,750**	**95,548**	**46.44%**	**97,603**
Financing and Banking Fees				
Trustee Fees	15,000	17,500	116.67%	3,225
Bank Fee Expense	8,000	3,790	47.37%	3,838
Continuing Disclosure	10,000	-	-	-
Arbitrage Rebate Calculation	8,000	6,455	80.69%	3,685
Rating Agency Expense	30,000	15,000	50.00%	14,000
Total Financing and Banking Fees	**71,000**	**42,745**	**60.20%**	**24,748**
Total Administrative	**3,275,217**	**1,373,761**	**41.94%**	**1,056,095**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending February 28, 2017

	Budget Amount FY 2017	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Operations and Maintenance				
Operations and Maintenance Consulting				
GEC-Trust Indenture Support	165,000	63,278	38.35%	75,625
GEC-Financial Planning Support	10,500	47	0.45%	-
GEC-Toll Ops Support	45,000	14,384	31.97%	3,180
GEC-Roadway Ops Support	331,667	223,614	67.42%	268,020
GEC-Technology Support	40,000	19,026	47.56%	36,131
GEC-Public Information Support	30,000	19,134	63.78%	13,334
GEC-General Support	1,176,000	426,250	36.25%	225,952
General System Consultant	70,000	22,218	31.74%	113,192
Traffic and Revenue Consultant	80,000	53,521	66.90%	66,553
Total Operations and Maintenance Consulting	**1,948,167**	**841,472**	**43.19%**	**801,988**
Roadway Operations and Maintenance				
Roadway Maintenance	4,871,600	1,964,776	40.33%	320,828
Landscape Maintenance	5,000	-	-	108,103
Signal & Illumination Maint	20,000	23,677	118.39%	113,316
Maintenance Supplies-Roadway	45,000	396	0.88%	68,470
Tools & Equipment Expense	750	22	2.95%	475
Gasoline	6,000	4,106	68.43%	1,541
Repair & Maintenance-Vehicles	1,500	1,521	101.37%	7,190
Roadway Operations	-	-	-	521
Electricity - Roadways	180,000	97,109	53.95%	96,723
Total Roadway Operations and Maintenance	**5,129,850**	**2,091,608**	**40.77%**	**717,168**
Toll Processing and Collection Expense				
Image Processing	2,300,000	919,901	40.00%	1,218,931
Tag Collection Fees	3,240,000	2,304,996	71.14%	1,991,728
Court Enforcement Costs	40,000	8,800	22.00%	7,575
DMV Lookup Fees	5,000	303	6.06%	1,424
Total Processing and Collection Expense	**5,585,000**	**3,234,000**	**57.91%**	**3,219,658**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending February 28, 2017

	Budget Amount FY 2017	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Toll Operations Expense				
Facility maintenance	-	30	-	787
Generator Maintenance	-	-	-	3,662
Generator Fuel	6,000	58	0.96%	1,291
Fire and Burglar Alarm	500	153	30.60%	247
Elevator Maintenance	3,000	-	-	-
Refuse	1,200	1,051	87.55%	512
Pest Control	1,600	-	-	3,074
Custodial	2,500	-	-	1,313
Telecommunications	90,000	43,971	48.86%	49,305
Water	10,500	10,867	103.49%	6,619
Electricity	1,200	1,541	128.38%	-
ETC spare parts expense	1,600	-	-	-
Repair & Maintenace Toll Equip	275,000	11,928	4.34%	299,375
Law Enforcement	273,182	137,142	50.20%	132,519
ETC Maintenance Contract	1,755,098	512,132	29.18%	910,200
ETC Toll Management Center System Operation	49,098	-	-	-
ETC Testing	10,000	-	-	-
Total Toll Operations Expense	**2,480,478**	**718,873**	**28.98%**	**1,408,903**
Total Operations and Maintenance	**15,143,495**	**6,885,952**	**45.47%**	**6,147,717**
Other Expenses				
Special Projects and Contingencies				
HERO	700,000	676,837	96.69%	796,572
Special Projects	125,000	151,088	120.87%	587,196
Other Contractual Svcs	105,000	39,319	37.45%	28,369
Contingency	300,000	578	0.19%	12,195
Total Special Projects and Contingencies	**1,230,000**	**867,822**	**70.55%**	**1,424,333**

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending February 28, 2017

	Budget Amount FY 2017	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
Non Cash Expenses				
Amortization Expense	383,230	255,828	66.76%	255,487
Amort Expense - Refund Savings	1,027,860	688,342	66.97%	685,240
Dep Exp- Furniture & Fixtures	2,207	1,607	72.81%	736
Dep Expense - Equipment	9,692	10,158	104.81%	6,172
Dep Expense - Autos & Trucks	6,406	5,982	93.39%	3,244
Dep Expense-Buildng & Toll Fac	177,115	118,077	66.67%	118,077
Dep Expense-Highways & Bridges	22,012,091	11,674,766	53.04%	11,255,742
Dep Expense-Communic Equip	196,115	130,743	66.67%	130,743
Dep Expense-Toll Equipment	2,756,238	1,837,492	66.67%	1,835,479
Dep Expense - Signs	325,893	217,262	66.67%	217,262
Dep Expense-Land Improvemts	884,934	589,956	66.67%	589,956
Depreciation Expense-Computers	16,203	9,304	57.42%	10,910
Total Non Cash Expenses	**27,797,984**	**15,539,516**	**55.90%**	**15,109,047**
Total Other Expenses	**29,027,984**	**16,407,338**	**56.52%**	**16,533,380**
Non Operating Expenses				
Bond issuance expense	200,000	1,090,977	545.49%	142,339
Interest Expense	42,813,675	20,961,444	48.96%	27,799,687
Community Initiatives	100,000	28,500	28.50%	35,000
Total Non Operating Expenses	**43,113,675**	**22,080,921**	**51.22%**	**27,977,026**
TOTAL EXPENSES	**$94,838,998**	**$49,648,641**	**52.35%**	**$54,275,922**
Net Income	**($22,871,542)**	**$13,490,545**		**25,741,868**

Central Texas Regional Mobility Authority
Balance Sheet
as of February 28, 2017

	as of 02/28/2017		as of 02/29/2016	
ASSETS				
Current Assets				
Cash				
Regions Operating Account	$ 284,186		$ 747,217	
Cash in TexStar	454,513		581,879	
Regions Payroll Account	183,918		135,853	
Restricted Cash				
Goldman Sachs FSGF 465	250,820,728		424,345,449	
Restricted Cash - TexSTAR	133,845,253		7,026,209	
Overpayments account	159,978		128,083	
Total Cash and Cash Equivalents		385,748,576		432,964,689
Accounts Receivable				
Accounts Receivable	14,485		14,485	
Due From TTA	570,013		591,871	
Due From NTTA	456,532		384,195	
Due From HCTRA	987,545		343,530	
Due From TxDOT	360,594		5,651,376	
Interest Receivable	540,387		142,518	
Total Receivables		2,929,556		7,127,974
Short Term Investments				
Agencies	173,681,288		114,958,510	
Total Short Term Investments		173,681,288		114,958,510
Total Current Assets		562,359,419		555,051,173
Total Construction in Progress		440,169,338		267,216,402
Fixed Assets (Net of Depreciation)				
Computer	30,968		45,672	
Computer Software	901,512		1,266,641	
Furniture and Fixtures	16,117		15,819	
Equipment	2,821		(2,800)	
Autos and Trucks	51,454		22,956	
Buildings and Toll Facilities	5,349,577		5,526,692	
Highways and Bridges	604,960,406		613,936,244	
Communication Equipment	87,678		283,793	
Toll Equipment	15,419,203		18,175,441	
Signs	11,039,093		11,364,987	
Land Improvements	10,918,917		11,803,851	
Right of way	87,960,004		86,849,829	
Leasehold Improvements	155,182		167,825	
Total Fixed Assets		736,892,933		749,456,950
Other Assets				
Security Deposits	-		0	
Intangible Assets-Net	102,663,730		12,215,183	
2005 Bond Insurance Costs	4,572,635		4,786,143	
Prepaid Insurance	86,245		82,868	
Deferred Outflows (pension related)	780,064		-	
Pension Asset	202,023		-	
Total Other Assets		108,304,696		17,084,194
Total Assets		**$ 1,847,726,388**		**$ 1,588,808,719**

Central Texas Regional Mobility Authority
Balance Sheet
as of February 28, 2017

	as of 02/28/2017		as of 02/29/2016	
LIABILITIES				
Current Liabilities				
Accounts Payable	$ 115,137		$ 816,494	
Construction Payable	315,577		3,020,315	
Overpayments	162,446		130,247	
Interest Payable	8,688,496		9,509,577	
Due to other Funds	-		113,194	
Deferred Compensation Payable	(13,169)		-	
TCDRS Payable	54,416		50,186	
Medical Reimbursement Payable	(2,002)		2,160	
Due to other Agencies	-		(669,167)	
Due to Other Entities	6,696,717		1,329,333	
Other	-		650,000	
Total Current Liabilities		16,017,618		14,952,338
Long Term Liabilities				
Compensated Absences	138,927		189,089	
Deferred Inflows (pension related)	172,017		-	
Long Term Payables		310,944		189,089
Bonds Payable				
Senior Lien Revenue Bonds:				
Senior Lien Revenue Bonds 2010	67,417,712		114,378,536	
Senior Lien Revenue Bonds 2011	14,140,764		309,227,006	
Senior Refunding Bonds 2013	144,183,000		147,880,000	
Senior Lien Revenue Bonds 2015	298,790,000		298,790,000	
Senior Lien Put Bnd 2015	68,785,000		68,785,000	
Senior Lien Refunding Revenue Bonds 2016	358,030,000		-	
Sn Lien Rev Bnd Prem/Disc 2010	-		25,908	
Sn Lien Rev Bnd Prem/Disc 2011	-		(3,301,620)	
Sn Lien Rev Bnd Prem/Disc 2013	10,683,284		12,738,041	
Sn Lien Revenue Bnd Prem 2015	22,372,688		23,569,193	
Sn Lien Put Bnd Prem 2015	6,210,562		8,074,316	
Senior lien premium 2016 revenue bonds	57,457,966		-	
Total Senior Lien Revenue Bonds		1,048,070,977		980,166,380
Sub Lien Revenue Bonds:				
Subordinated Lien Bond 2011	-		70,000,000	
Sub Refunding Bnds 2013	101,530,000		102,030,000	
Sub Debt Refunding Bonds 2016	74,690,000		-	
Sub Lien Bond 2011 Prem/Disc	-		(1,723,720)	
Sub Refunding 2013 Prem/Disc	2,487,391		2,975,868	
Sub Refunding 2016 Prem/Disc	10,316,340		-	
Total Sub Lien Revenue Bonds		189,023,731		173,282,148
Other Obligations				
TIFIA note 2015	52,185		50,618	
SIB loan 2015	30,205,206		31,572	
State Highway Fund Loan 2015	30,205,206		31,572	
2013 American Bank Loan	3,570,000		5,300,000	
Total Other Obligations		64,032,596		5,413,763
Total Long Term Liabilities		1,301,438,249		1,159,051,380
Total Liabilities		**1,317,455,867**		**1,174,003,718**
NET ASSETS				
Contributed Capital		40,347,060		35,847,060
Net Assets Beginning		476,432,916		353,216,073
Current Year Operations		13,490,545		25,741,868
Total Net Assets		**530,270,521**		**414,805,001**
Total Liabilities and Net Assets		**$ 1,847,726,388**		**$ 1,588,808,719**

Central Texas Regional Mobility Authority
Statement of Cash Flows
as of February 28, 2017

Cash flows from operating activities:		
Receipts from toll fees	$	46,794,984
Receipts from other fees		213,883
Payments to vendors		(4,440,934)
Payments to employees		(2,899,094)
Net cash flows provided by (used in) operating activities		39,668,839
Cash flows from capital and related financing activities:		
Proceeds from notes payable		49,008,509
Refunding of bonds		(11,916,240)
Receipts from Department of Transportation		96,923,100
Receipt from Hays County		4,500,000
Payments on interest		(32,265,305)
Acquisition of capital assets		(132,607)
Acquisitions of construction in progress		(132,575,631)
Net cash flows provided by (used in) capital and related financing activities		(28,688,173)
Cash flows from investing activities:		
Interest income		1,866,941
Purchase of investments		(180,054,286)
Proceeds from sale or maturity of investments		95,504,938
Net cash flows provided by (used in) investing activities		(82,682,407)
Net increase (decrease) in cash and cash equivalents		(71,701,742)
Cash and cash equivalents at beginning of period		323,150,553
Cash and cash equivalents at end of February	$	251,448,811

Reconciliation of change in net assets to net cash provided by operating activities:

Operating income	$	20,898,582
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Depreciation and amortization		14,851,174
Changes in assets and liabilities:		
Decrease in accounts receivable		(854,930)
(Increase) decrease in prepaid expenses and other assets		21,357
(Decrease) increase in accounts payable		(1,263,363)
Increase (decrease) in accrued expenses		6,016,018
Total adjustments		18,770,256
Net cash flows provided by (used in) operating activities	$	39,668,838

Reconciliation of cash and cash equivalents:

Unrestricted cash and cash equivalents	$	628,082
Restricted cash and cash equivalents		250,820,728
Total	$	251,448,811

INVESTMENTS by FUND

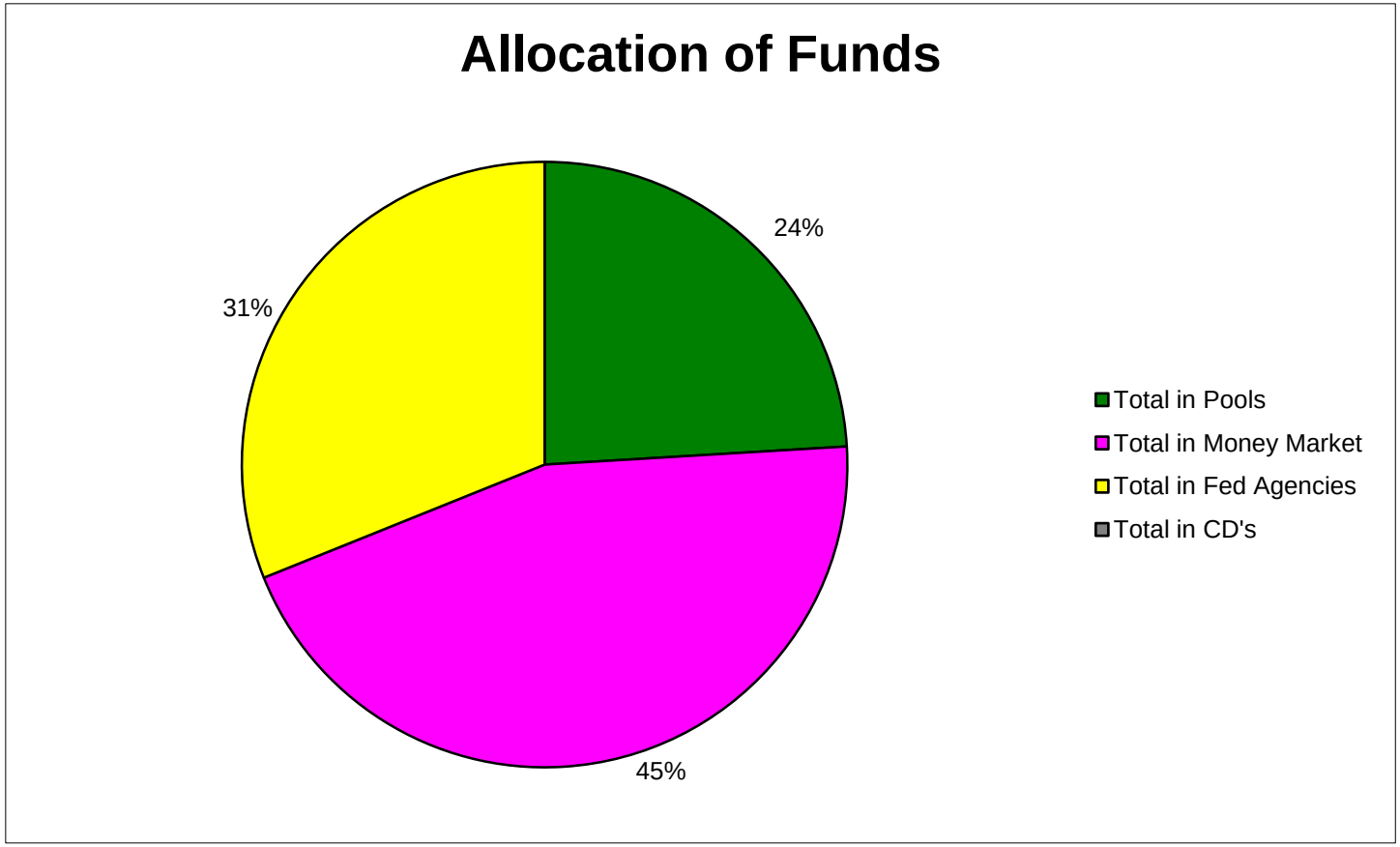
		Balance February 28, 2017		
Renewal & Replacement Fund		3.00	TexSTAR	134,299,765.83
TexSTAR	504,918.70		Goldman Sachs	250,548,347.51
Goldman Sachs	188,563.46		Agencies & Treasury Notes	173,670,885.51
Agencies		693,482.16		
TxDOT Grant Fund				$ 558,518,998.85
TexSTAR	4,093,017.56			
Goldman Sachs	5,467,654.85			
Agencies		9,560,672.41		
Senior Debt Service Reserve Fund				
TexSTAR	10,619,292.53			
Goldman Sachs	29,327,957.22			
Agencies	39,985,710.39	79,932,960.14		
2010 Senior Lien DSF				
Goldman Sachs	389,725.96			
TexSTAR	-	389,725.96		
2011 Debt Service Acct				
Goldman Sachs	751,056.08	751,056.08		
2013 Sr Debt Service Acct				
Goldman Sachs	1,836,899.98	1,836,899.98		
2013 Sub Debt Service Account				
Goldman Sachs	1,013,509.29	6,026,449.57		
TexSTAR	5,012,940.28			
2015 Sr Capitalized Interest				
Goldman Sachs	10,590,963.43	60,699,986.18		
TexSTAR	50,109,022.75			
2015A Debt Service Account				
Goldman Sachs	3.30	3.30		
2015B Debt Service Account				
Goldman Sachs	574,161.98	574,161.98		
2016 Sr Lien Rev Refunding Cost of Issuance				
Goldman Sachs	-	-		
2016 Sr Lien Rev Refunding Debt Service Account				
Goldman Sachs	8,530,003.11	8,530,003.11		
2016 Sub Lien Rev Refunding Cost of Issuance				
Goldman Sachs	-	-		
2016 Sub Lien Rev Refunding Bond Proceeds Clearing Fund				
Goldman Sachs	-	-		
2016 Sub Lien Rev Refunding Debt Service Account				
Goldman Sachs	628,948.38	628,948.38		
2016 Sub Lein Rev Refunding DSR				
Goldman Sachs	6,635,981.64	6,635,981.64		
Operating Fund				
TexSTAR	454,513.13			
TexSTAR-Trustee	3,075,098.17			
Goldman Sachs	-	3,529,611.30		
Revenue Fund				
Goldman Sachs	2,818,815.83	2,818,815.83		
General Fund				
TexSTAR	25,065,623.08			
Goldman Sachs	17,843,015.05			
Agencies	4,408,662.50	47,317,300.63		
2013 Sub Debt Service Reserve Fund				
Goldman Sachs	3,472,717.02			
Agencies		3,472,717.02		
MoPac Revenue Fund				
Goldman Sachs	56,744.63	56,744.63		
MoPac Construction Fund				
Goldman Sachs	46,543,226.39	46,543,226.39		
2011 Sub Debt Project fund				
TexSTAR	-			
Agencies				
Goldman Sachs	0.00	0.00		
2015B Project Account				
Goldman Sachs	4,891,763.16			
Agencies	20,201,168.68	40,125,638.76		
TexSTAR	15,032,706.92			
2015A Project Account				
TexSTAR	5,293,811.76			
Goldman Sachs	38,936,957.07			
Agencies	79,192,898.11			
Treasury Notes	29,882,445.83	153,306,112.77		
2015 TIFIA Project Account				
Goldman Sachs	50,272.15	50,272.15		
2015 State Highway Fund Project Account				
Goldman Sachs	29,582,224.68	29,582,224.68		
2015 SIB Project Account				
Goldman Sachs	19,722,925.91	19,722,925.91		
2011 Sr Financial Assistance Fund				
Goldman Sachs	11,448,313.45	26,487,134.40		
TexSTAR	15,038,820.95			
Develper Deposits				
Goldman Sachs	351.24	351.24		
183S Utility Custody Deposit				
Goldman Sachs	5,976,536.10	5,976,536.10		
45SW Trust Account Hays County				
Goldman Sachs	300,571.09	300,571.09		
45SW Trust Account Travis County				
Goldman Sachs	2,968,485.06	2,968,485.06	$	-
		$ 558,518,998.85		

CTRMA INVESTMENT REPORT

	Month Ending 2/28/17						
	Balance 2/1/2017	Additions	Discount Amortization	Accrued Interest	Withdrawals	Balance 2/28/2017	Rate February
Amount in Trustee TexStar							
2011 Sr Lien Financial Assist Fund	15,032,440.18			6,380.77		15,038,820.95	0.553%
2013 Sub Lien Debt Service Reserve	5,010,813.37			2,126.91		5,012,940.28	0.553%
General Fund	25,054,988.08			10,635.00		25,065,623.08	0.553%
Trustee Operating Fund	2,447,755.79	1,626,192.63		1,149.75	1,000,000.00	3,075,098.17	0.553%
Renewal and Replacement	504,704.46			214.24		504,918.70	0.553%
TxDOT Grant Fund	4,091,280.95			1,736.61		4,093,017.56	0.553%
Senior Lien Debt Service Reserve Fund	10,614,786.89			4,505.64		10,619,292.53	0.553%
2015A Sr Ln Project account	5,291,565.67			2,246.09		5,293,811.76	0.553%
2015A Sr Ln Project Cap Interest	50,087,762.13			21,260.62		50,109,022.75	0.553%
2015B Sr Ln Project	15,026,328.75			6,378.17		15,032,706.92	0.553%
	133,162,426.27	1,626,192.63		56,633.80	1,000,000.00	133,845,252.70	
Amount in TexStar Operating Fund	454,305.25	1,000,000.00		207.88	1,000,000.00	454,513.13	0.553%
Goldman Sachs							
Operating Fund	0.00	1,626,190.00		2.63	1,626,192.63	0.00	0.280%
45SW Trust Account Travis County	3,011,708.66			1,263.05	44,486.65	2,968,485.06	0.280%
45SW Trust Account Hays County	1,441,847.51			654.72	1,141,931.14	300,571.09	0.280%
2015A Project Account	50,495,238.16	8,000,000.00		71,073.76	19,629,354.85	38,936,957.07	0.280%
2015B Project Account	4,889,798.17			1,964.99		4,891,763.16	0.280%
2015D State Highway Fund Project Acct	29,570,554.92			11,669.76		29,582,224.68	0.280%
2015C TIFIA Project Account	50,251.96			20.19		50,272.15	0.280%
2015E SIB Project Account	19,715,865.90			7,060.01		19,722,925.91	0.280%
2011 Sub Lien Project Acct	0.00			22.17	22.17	0.00	0.280%
Developer Deposits	100,310.93			40.31	100,000.00	351.24	0.280%
183S Utility Custody Deposit	6,337,132.18			2,585.83	363,181.91	5,976,536.10	0.280%
2011 Sr Financial Assistance Fund	11,443,627.43			4,686.02		11,448,313.45	0.280%
2010 Senior DSF	389,563.28			162.68		389,725.96	0.280%
2011 Senior Lien Debt Service Acct	750,754.39			301.69		751,056.08	0.280%
2013 Senior Lien Debt Service Acct	922,619.61	913,901.08		379.29		1,836,899.98	0.280%
2013 Subordinate Debt Service Acct	507,112.41	506,227.52		169.36		1,013,509.29	0.280%
2015 Sr Capitalized Interest	10,586,522.83			4,440.60		10,590,963.43	0.280%
2015A Debt Service Acct	3.30					3.30	0.280%
2015B Debt Service Acct	287,671.88	286,390.62		99.48		574,161.98	0.280%
2016 Sr Lien Rev Refunding Debt Service Account	8,479,844.10	48,128.90		2,030.11		8,530,003.11	0.280%
2016 Sub Lien Rev Refunding Debt Service Account	316,170.40	312,682.17		95.81		628,948.38	0.280%
2016 Sub Lein Rev Refunding DSR	6,633,316.01			2,665.63		6,635,981.64	0.280%
TxDOT Grant Fund	5,465,458.53			2,196.32		5,467,654.85	0.280%
Renewal and Replacement	188,487.72			75.74		188,563.46	0.280%
Revenue Fund	2,887,296.72	6,506,858.64		1,203.49	6,576,543.02	2,818,815.83	0.280%
General Fund	16,942,367.08	2,231,080.74		6,705.89	1,337,138.66	17,843,015.05	0.280%
Senior Lien Debt Service Reserve Fund	26,809,193.43	2,500,000.00		18,763.79		29,327,957.22	0.280%
MoPac Revenue Fund	31,459.03	25,274.19		11.41		56,744.63	0.280%
2013 Sub Debt Service Reserve Fund	3,471,322.05			1,394.97		3,472,717.02	0.280%
MoPac Managed Lane Construction Fund	40,165,114.18	6,432,564.29		16,350.41	70,802.49	46,543,226.39	0.280%
	251,890,612.77	29,389,298.15	0.00	158,090.11	30,889,653.52	250,548,347.51	
Amount in Fed Agencies and Treasuries							
Amortized Principal	184,211,577.26		(40,691.75)		10,500,000.00	173,670,885.51	
	184,211,577.26	0.00	(40,691.75)	0.00	10,500,000.00	173,670,885.51	
Certificates of Deposit						0.00	
Total in Pools	133,616,731.52	2,626,192.63		56,841.68	2,000,000.00	134,299,765.83	
Total in GS FSGF	251,890,612.77	29,389,298.15		158,090.11	30,889,653.52	250,548,347.51	
Total in Fed Agencies and Treasuries	184,211,577.26	0.00	(40,691.75)		10,500,000.00	173,670,885.51	
Total Invested	569,718,921.55	32,015,490.78	(40,691.75)	214,931.79	43,389,653.52	558,518,998.85	

All Investments in the portfollio are in compliance with the CTRMA's Investment policy.

William Chapman, CFO


Allocation of Funds
24%
31%
45%
Total in Pools
Total in Money Market
Total in Fed Agencies
Total in CD's

Amount of investments As of February 28, 2017

Agency	CUSIP #	COST	Book Value	Market Value	Yield to Maturity	Purchased	Matures	FUND
Farmer Mac	31315PV55	Matured	Matured	Matured	0.7751%	3/11/2015	2/23/2017	Senior DSRF
Federal Farm Credit	3133ECA79	4,959,250.00	4,985,284.72	4,989,250.00	1.2155%	3/11/2015	3/19/2018	Senior DSRF
Federal Farm Credit	3133EE4K3	24,928,346.00	24,980,738.17	25,001,500.00	0.7200%	1/13/2016	7/21/2017	Senior DSRF
Federal Farm Credit	3133EFSG3	10,057,749.23	10,029,634.37	10,106,600.00	0.8421%	2/8/2016	3/14/2018	2015B Sr Project
Federal Home loan Bank	313378QK0	10,253,642.07	10,171,534.31	10,010,800.00	1.0369%	2/8/2016	3/8/2019	2015B Sr Project
Freddie Mac	3137EADF3	16,124,658.17	16,022,757.07	16,020,800.00	0.6259%	2/9/2016	5/12/2017	2015A Sr Project
Freddie Mac	3134G4Z84	9,850,343.91	9,819,425.32	9,825,480.00	0.8097%	2/18/2016	10/10/2017	2015A Sr Project
Federal Farm Credit	3133ECKC7	8,000,866.72	8,000,065.66	8,001,040.00	0.6400%	2/23/2016	3/28/2017	2015A Sr Project
Federal Home loan Bank	3030A62S5	6,984,310.89	6,994,610.60	7,001,050.00	0.9053%	3/14/2016	8/28/2017	2015A Sr Project
Fannie MAE	3135G0JA2	8,031,624.00	8,004,708.29	8,008,000.00	0.9023%	3/14/2016	4/27/2017	2015A Sr Project
Federal Home loan Bank	303370SZ2	14,536,023.18	14,345,341.06	14,361,577.50	0.9023%	3/7/2016	9/8/2017	2015A Sr Project
Federal Home loan Bank	3030A5QL6	8,000,900.56	8,000,225.14	8,002,000.00	0.7913%	3/4/2016	6/30/2017	2015A Sr Project
Freddie Mac	3137EADT3	Matured	Matured	Matured	0.6999%	3/4/2016	2/22/2017	2015A Sr Project
Federal Home loan Bank	313379FW4	8,027,415.64	8,005,764.97	8,008,320.00	0.7098%	3/30/2016	6/9/2017	2015A Sr Project
Federal Home loan Bank	3030A6SW8	10,039,900.00	10,019,687.50	10,010,000.00	0.7616%	4/11/2016	12/19/2017	Senior DSRF
Federal Home loan Bank	3030A6SW8	4,417,556.00	4,408,662.50	4,404,400.00	0.7616%	4/11/2016	12/19/2017	General
US Treasury Note	912828TB6	29,888,668.75	29,882,445.83	29,888,519.40	0.6266%	12/28/2016	6/30/2017	2015A Sr Project
		174,101,255.12	173,670,885.51	173,639,336.90				

Agency	CUSIP #	COST	Cummulative Amortization	2/28/2017 Book Value	Maturity Value	Interest Income Accrued Interest	Amortization	February 28, 2017 Interest Earned
Farmer Mac	31315PV55	Matured	Matured	Matured	Matured	1,666.67	(50.00)	1,616.67
Federal Farm Credit	3133ECA79	4,959,250.00	(26,034.72)	4,985,284.72	5,000,000.00	3,916.67	1,131.94	5,048.61
Federal Farm Credit	3133EE4K3	24,928,346.00	(52,392.17)	24,980,738.17	25,000,000.00	15,000.00	3,852.37	18,852.37
Federal Farm Credit	3133EFSG3	10,057,749.23	28,114.86	10,029,634.37	10,000,000.00	9,166.67	(2,279.58)	6,887.09
Federal Home loan Bank	313378QK0	10,253,642.07	82,107.76	10,171,534.31	10,000,000.00	15,625.00	(6,861.37)	8,763.63
Freddie Mac	3137EADF3	16,124,658.17	101,901.10	16,022,757.07	16,000,000.00	16,666.67	(7,585.69)	9,080.98
Freddie Mac	3134G4Z84	9,850,343.91	30,918.59	9,819,425.32	9,800,000.00	9,187.50	(2,428.16)	6,759.34
Federal Farm Credit	3133ECKC7	8,000,866.72	801.06	8,000,065.66	8,000,000.00	4,333.33	(65.66)	4,267.67
Federal Home loan Bank	3030A62S5	6,984,310.89	(10,299.71)	6,994,610.60	7,000,000.00	4,375.00	898.23	5,273.23
Fannie MAE	3135G0JA2	8,031,624.00	26,915.71	8,004,708.29	8,000,000.00	7,500.00	(2,354.14)	5,145.86
Federal Home loan Bank	303370SZ2	14,536,023.18	190,682.12	14,345,341.06	14,250,000.00	26,718.75	(15,890.18)	10,828.57
Federal Home loan Bank	3030A5QL6	8,000,900.56	675.42	8,000,225.14	8,000,000.00	5,333.33	(56.28)	5,277.05
Freddie Mac	3137EADT3	Matured	Matured	Matured	Matured	5,833.33	(1,135.10)	4,698.23
Federal Home loan Bank	313379FW4	8,027,415.64	21,650.67	8,005,764.97	8,000,000.00	6,666.67	(1,921.66)	4,745.01
Federal Home loan Bank	3030A6SW8	10,039,900.00	20,212.50	10,019,687.50	10,000,000.00	8,333.33	(1,968.75)	6,364.58
Federal Home loan Bank	3030A6SW8	4,417,556.00	8,893.50	4,408,662.50	4,400,000.00	3,666.67	(866.25)	2,800.42
US Treasury Note	912828TB6	29,888,668.75	6,222.92	29,882,445.83	29,870,000.00	18,688.75	(3,111.46)	15,577.29
		174,101,255.12	430,369.61	173,670,885.51	173,320,000.00	162,678.34	(40,691.75)	121,986.60

February 28, 2017 Certificates of Deposit Outstanding

Bank	CUSIP #	COST	Yield to Maturity	Purchased	Matures	February 28, 2017 Interest	FUND
		-				$ -	

Travis County Escrow account

Balance 2/1/2017	Additions	Accrued Interest	Withdrawls	Balance 2/28/2017
$ 272,271.30		$ 109.41		$ 272,380.71

CENTRAL TEXAS
Regional Mobility Authority

183 South Design-Build Project

Change Order Status 3/14/17

EXECUTED CONTRACT VALUE			**$581,545,700**
EXECUTED CHANGE ORDERS	CO#1	City of Austin ILA Adjustment	($2,779,934)
	CO#2	Addition of Coping to Soil Nail Walls	$742,385
	CO#4	Greenroads Implementation	$362,280
	CO#6	51st Street Parking Trailhead	$477,583
		Others Less than $300,000 (2)	$13,403
		Subtotal	**($1,184,283)**
CURRENT CONTRACT VALUE			**$580,361,417**
CHANGE ORDERS IN NEGOTIATIONS & POTENTIAL CONTRACTUAL OBLIGATIONS			**$16,390,000**
TOTAL POTENTIAL OBLIGATIONS			**$15,210,000**
TOTAL PROJECT CONTINGENCY			**$47,860,000**
REMAINING PROJECT CONTINGENCY			**$32,650,000**

CENTRAL TEXAS
Regional Mobility Authority

SH 45SW Construction

Change Order Status 3/14/17

EXECUTED CONTRACT VALUE		**$75,103,623**
EXECUTED CHANGE ORDERS	**None To Date**	**$0**
CURRENT CONTRACT VALUE		**$75,103,623**
CHANGE ORDERS IN NEGOTIATIONS & POTENTIAL CONTRACTUAL OBLIGATIONS		**$5,380,000**
TOTAL POTENTIAL OBLIGATIONS		**$5,380,000**
TOTAL PROJECT CONTINGENCY		**$7,520,000**
REMAINING PROJECT CONTINGENCY		**$2,140,000**

CENTRAL TEXAS
Regional Mobility Authority

MOPAC Construction

Change Order Status 3/14/17

EXECUTED CONTRACT VALUE		**$136,632,100**
EXECUTED CHANGE ORDERS		
CO#001B	5th & Cesar Chavez SB Reconfig (Construction)	$593,031
CO#05B	FM 2222 Bridge NB Ret Wall Abutment Repair (Construction)	$850,000
CO#07	FM 2222 Exit Storage Lane	$426,000
CO#08C	Refuge Area: Added Shoulder Adjustment Soundwall #1	$2,508,548
CO#09	Westover SB Entrance Ramp Repairs	$450,000
CO#12	Barrier Rail Opaque Seal	$542,419
CO#17	Bike and Ped Improvements at Far West Blvd Bridge/FM 2222	$971,889
	Total of Others Less than $300,000 (20)	$623,504
	Subtotal	**$6,965,390**
CURRENT CONTRACT VALUE		**$143,597,490**
CHANGE ORDERS IN NEGOTIATIONS & POTENTIAL CONTRACTUAL OBLIGATIONS		**$ 43,080,000**
TOTAL POTENTIAL OBLIGATIONS		**$50,050,000**
TOTAL PROJECT CONTINGENCY		**$32,300,000**
ASSESSED LIQUIDATED DAMAGES		**$20,000,000**
REMAINING PROJECT CONTINGENCY		**$2,250,000**

TexSTAR

Monthly Newsletter – February 2017

Performance

As of February 28, 2017

Current Invested Balance	$7,267,565,993.07
Weighted Average Maturity (1)	43 Days
Weighted Average Maturity (2)	111 Days
Net Asset Value	1.000226
Total Number of Participants	827
Management Fee on Invested Balance	0.06%*
Interest Distributed	$3,506,877.98
Management Fee Collected	$343,060.18
% of Portfolio Invested Beyond 1 Year	8.33%
Standard & Poor's Current Rating	AAAm

Rates reflect historical information and are not an indication of future performance.

February Averages

Average Invested Balance	$7,453,099,075.99
Average Monthly Yield, on a simple basis	0.5533%
Average Weighted Average Maturity (1)*	48 Days
Average Weighted Average Maturity (2)*	105 Days

Definition of Weighted Average Maturity (1) & (2)

(1) This weighted average maturity calculation uses the SEC Rule 2a-7 definition for stated maturity for any floating rate instrument held in the portfolio to determine the weighted average maturity for the pool. This Rule specifies that a variable rate instrument to be paid in 397 calendar days or less shall be deemed to have a maturity equal to the period remaining until the next readjustment of the interest rate.

(2) This weighted average maturity calculation uses the final maturity of any floating rate instruments held in the portfolio to calculate the weighted average maturity for the pool.

* The maximum management fee authorized for the TexSTAR Cash Reserve Fund is 12 basis points. This fee may be waived in full or in part in the discretion of the TexSTAR co-administrators at any time as provided for in the TexSTAR Information Statement.

New Participants

We would like to welcome the following entities who joined the TexSTAR program in February:

- ★ Aransas Pass ISD
- ★ Montgomery County MUD 112
- ★ East Harris County Emergency Services JPB
- ★ San Antonio Water System

Economic Commentary

The month opened on a dovish tone as the labor report showed a decent headline number but underwhelming wage growth and the Federal Reserve (Fed) released meeting minutes which were viewed as neutral. Skepticism on the timing and magnitude of the Trump agenda along with political uncertainty in Europe led to a slight sell off. As the month progressed, U.S. economic data continued to come in strong and a slew of hawkish Fed statements starting mid-month led rates to reverse trend as the market began to expect an expedited hiking schedule with March as a possibility for the next rate hike. The Fed Fund's probability of a March rate rise increased from 30% in the beginning of the month to 80% by month end. The pace of growth in the second half of 2016 accelerated to 2.7% bringing year over year GDP growth in 2016 to 1.9%. It is expected that the strong momentum exiting 2016 should provide a positive backdrop for growth in 2017. The first half of 2017 growth may moderate somewhat as residual seasonality often negatively impacts the first quarter but the second half of 2017 should be stronger as fiscal policy initiatives become clearer. Consumption should continue to be the principal driver of the U.S. economy. Tighter labor markets, rising income, modest employment growth and rising net worth should all continue to be supportive of consumption. Despite the general hawkish tone from central banks, government bonds fared well, posting positive returns for February. Equity indices reached all time high levels supported by Trump's Congressional address. Investment grade credit spreads continued to trade tighter as demand remained strong given an average month of supply after an unexpectedly heavy January. Although the month started slow, new issuance picked up in the last few weeks of February - a possible sign that corporations are shoring up funding prior to a potential hike in March. Credit has also benefited from a solid earnings season as a majority of companies beat earnings estimates.

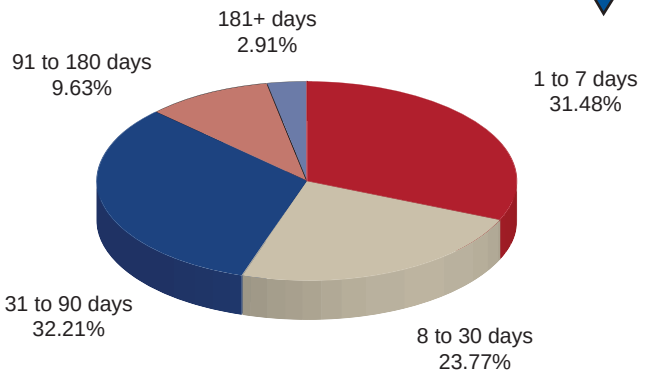
In terms of the timing for the next federal funds rate increase, the committee has indicated that their objective is to continue to keep the pace of rate hikes "gradual" however the median of the committee shifted their expectations upward from 2 to 3 rate hikes next year. This suggests that if better growth prospects come to fruition along with fiscal stimulus in the second half of 2017, the committee may become more anxious to move quickly. There are 3 - 4 rates hikes expected in 2017 with the first coming in June. However, the risks of a March rate hike have risen based on better inflation data and more hawkish rhetoric from some Fed members. President-Elect Trump will also be able to appointment three new Board of Governors, as well as a Vice Chair of Supervision this year. These appointments are unlikely to make a major impact on monetary policy in 2017. However, when Chair Yellen's term is complete in 2018, the potential for a new Chair poses large risks for a major change in the Fed's approach to monetary policy going forward.

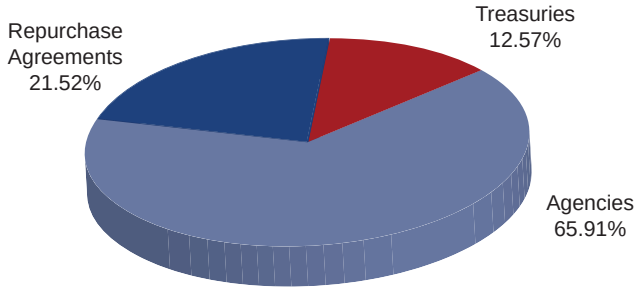
This information is an excerpt from an economic report dated February 2017 provided to TexSTAR by JP Morgan Asset Management, Inc., the investment manager of the TexSTAR pool.

For more information about TexSTAR, please visit our web site at www.texstar.org.

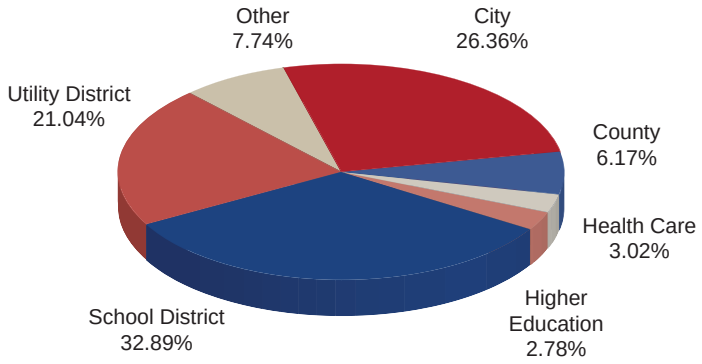
Information at a Glance

Portfolio by Type of Investment As of February 28, 2017





Portfolio by Maturity As of February 28, 2017



Distribution of Participants by Type As of February 28, 2017

Historical Program Information

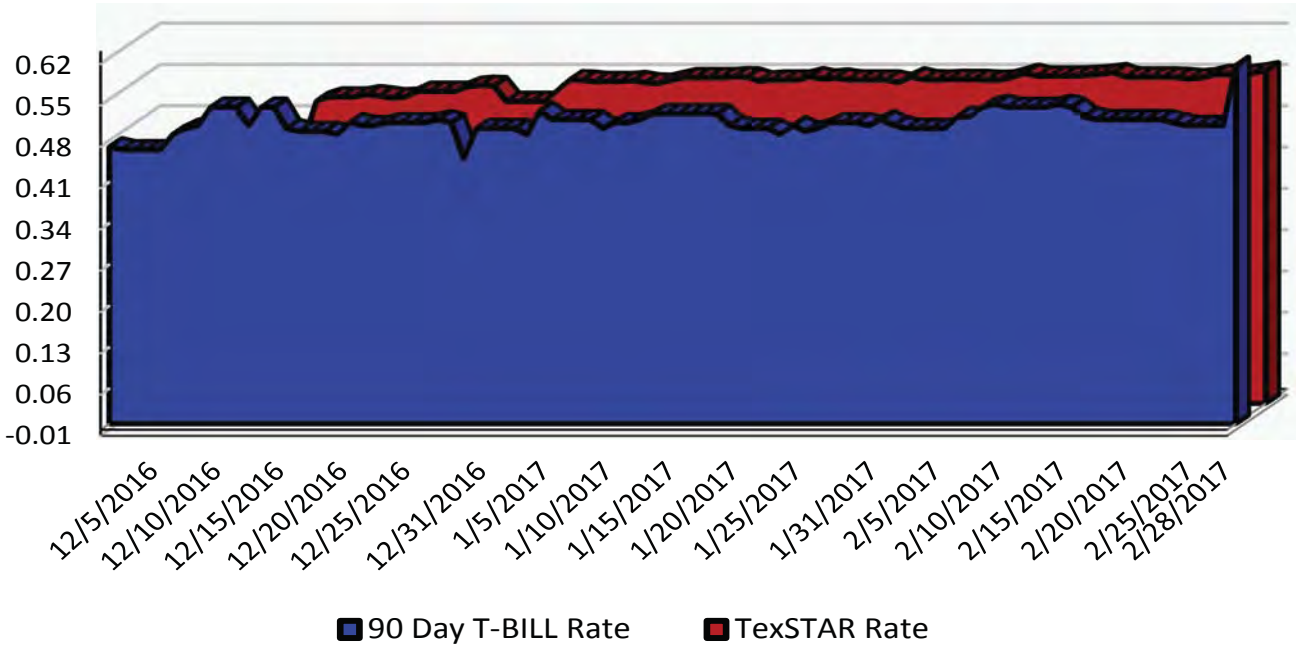
Month	Average Rate	Book Value	Market Value	Net Asset Value	WAM (1)*	WAM (2)*	Number of Participants
Feb 17	0.5533%	$7,267,565,993.07	$7,269,212,259.58	1.000226	43	111	827
Jan 17	0.5452%	7,011,113,225.83	7,012,695,761.41	1.000225	44	96	823
Dec 16	0.4815%	6,128,094,216.46	6,129,417,408.96	1.000215	49	100	822
Nov 16	0.4144%	5,250,402,124.93	5,251,596,034.74	1.000227	47	109	821
Oct 16	0.4202%	5,155,508,603.07	5,157,927,996.01	1.000469	39	105	820
Sep 16	0.4123%	5,253,367,191.87	5,255,503,092.88	1.000412	43	115	818
Aug 16	0.3990%	5,436,604,745.94	5,438,039,955.56	1.000263	39	114	817
Jul 16	0.3861%	5,602,432,939.56	5,603,475,110.87	1.000186	46	113	813
Jun 16	0.3927%	5,286,667,625.92	5,287,554,140.45	1.000167	47	111	810
May 16	0.3664%	5,716,887,504.32	5,717,379,585.85	1.000086	48	111	807
Apr 16	0.3696%	5,540,251,067.80	5,541,072,494.98	1.000144	46	106	805
Mar 16	0.3450%	5,594,793,523.15	5,595,290,113.49	1.000088	45	86	803

Portfolio Asset Summary as of February 28, 2017

	Book Value	Market Value
Uninvested Balance	$ 43,049.43	$ 43,049.43
Accrual of Interest Income	4,401,625.25	4,401,625.25
Interest and Management Fees Payable	(3,597,264.01)	(3,597,264.01)
Payable for Investment Purchased	0.00	0.00
Repurchase Agreement	1,563,447,999.72	1,563,447,999.72
Government Securities	5,703,270,582.68	5,704,916,849.19
Total	**$ 7,267,565,993.07**	**$ 7,269,212,259.58**

Market value of collateral supporting the Repurchase Agreements is at least 102% of the Book Value. The portfolio is managed by J.P. Morgan Chase & Co. and the assets are safekept in a separate custodial account at the Federal Reserve Bank in the name of TexSTAR. The only source of payment to the Participants are the assets of TexSTAR. There is no secondary source of payment for the pool such as insurance or guarantee. Should you require a copy of the portfolio, please contact TexSTAR Participant Services.

TexSTAR versus 90-Day Treasury Bill



This material is for information purposes only. This information does not represent an offer to buy or sell a security. The above rate information is obtained from sources that are believed to be reliable; however, its accuracy or completeness may be subject to change. The TexSTAR management fee may be waived in full or in part at the discretion of the TexSTAR co-administrators and the TexSTAR rate for the period shown reflects waiver of fees. This table represents historical investment performance/return to the customer, net of fees, and is not an indication of future performance. An investment in the security is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although the issuer seeks to preserve the value of an investment at $1.00 per share, it is possible to lose money by investing in the security. Information about these and other program details are in the fund's Information Statement which should be read carefully before investing. The yield on the 90-Day Treasury Bill ("T-Bill Yield") is shown for comparative purposes only. When comparing the investment returns of the TexSTAR pool to the T-Bill Yield, you should know that the TexSTAR pool consist of allocations of specific diversified securities as detailed in the respective Information Statements. The T-Bill Yield is taken from Bloomberg Finance L.P. and represents the daily closing yield on the then current 90-day T-Bill.

Daily Summary for February 2017

Date	Mny Mkt Fund Equiv. [SEC Std.]	Daily Allocation Factor	TexSTAR Invested Balance	Market Value Per Share	WAM Days (1)*	WAM Days (2)*
2/1/2017	0.5482%	0.000015019	$7,057,842,102.22	1.000284	48	100
2/2/2017	0.5475%	0.000015001	$7,192,592,329.20	1.000297	50	99
2/3/2017	0.5485%	0.000015027	$7,180,351,364.08	1.000298	48	98
2/4/2017	0.5485%	0.000015027	$7,180,351,364.08	1.000298	48	98
2/5/2017	0.5485%	0.000015027	$7,180,351,364.08	1.000298	48	98
2/6/2017	0.5471%	0.000014990	$7,329,851,392.83	1.000291	47	95
2/7/2017	0.5473%	0.000014994	$7,400,841,729.90	1.000281	49	102
2/8/2017	0.5524%	0.000015133	$7,540,263,632.44	1.000276	51	103
2/9/2017	0.5590%	0.000015315	$7,529,165,615.29	1.000283	52	105
2/10/2017	0.5542%	0.000015183	$7,884,302,216.71	1.000247	48	100
2/11/2017	0.5542%	0.000015183	$7,884,302,216.71	1.000247	48	100
2/12/2017	0.5542%	0.000015183	$7,884,302,216.71	1.000247	48	100
2/13/2017	0.5545%	0.000015191	$7,873,978,766.35	1.000244	51	102
2/14/2017	0.5557%	0.000015226	$7,748,417,223.48	1.000241	51	102
2/15/2017	0.5575%	0.000015275	$7,585,839,872.45	1.000240	51	104
2/16/2017	0.5602%	0.000015349	$7,495,662,930.50	1.000242	50	110
2/17/2017	0.5525%	0.000015136	$7,435,639,454.60	1.000254	47	107
2/18/2017	0.5525%	0.000015136	$7,435,639,454.60	1.000254	47	107
2/19/2017	0.5525%	0.000015136	$7,435,639,454.60	1.000254	47	107
2/20/2017	0.5525%	0.000015136	$7,435,639,454.60	1.000254	47	107
2/21/2017	0.5517%	0.000015114	$7,430,939,248.15	1.000237	47	112
2/22/2017	0.5497%	0.000015061	$7,461,659,666.55	1.000231	48	112
2/23/2017	0.5513%	0.000015104	$7,434,739,570.11	1.000247	47	112
2/24/2017	0.5568%	0.000015255	$7,370,498,900.47	1.000217	43	110
2/25/2017	0.5568%	0.000015255	$7,370,498,900.47	1.000217	43	110
2/26/2017	0.5568%	0.000015255	$7,370,498,900.47	1.000217	43	110
2/27/2017	0.5594%	0.000015325	$7,289,398,793.05	1.000227	43	112
2/28/2017	0.5633%	0.000015432	$7,267,565,993.07	1.000226	43	111
Average	0.5533%	0.000015160	$7,453,099,075.99		48	105

TexSTAR Participant Services
FirstSouthwest, A Division of Hilltop Securities
1201 Elm Street, Suite 3500
Dallas, Texas 75270

TexSTAR

TexSTAR Board Members

William Chapman	*Central Texas Regional Mobility Authority*	*Governing Board President*
Nell Lange	*City of Frisco*	*Governing Board Vice President*
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Monte Mercer	*North Central TX Council of Government*	*Advisory Board*
Stephen Fortenberry	*Plano ISD*	*Advisory Board*
Becky Brooks	*Government Resource Associates, LLC*	*Advisory Board*

For more information contact TexSTAR Participant Services ★ 1-800-TEX-STAR ★ www.texstar.org

FirstSouthwest
A Division of Hilltop Securities

J.P.Morgan
Asset Management

CENTRAL TEXAS
Regional Mobility Authority

March 29 2017
AGENDA ITEM #9

Discuss and take appropriate action regarding the initial payment to the Regional Infrastructure Fund

Strategic Plan Relevance:	Regional Mobility
Department:	Executive
Contact:	Bill Chapman, Chief Financial Office Jeff Dailey, Deputy Executive Director
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Discuss and take appropriate action

Summary:

A Regional Infrastructure Fund (RIF) was established through an Interlocal Agreement between Capital Area Metropolitan Organization (CAMPO) and CTRMA related to the MoPac Improvement Project. The terms of the agreement require escalating annual payments by CTRMA starting with $2,000,000 on September 1, 2017. Staff recommends that general fund be the source of the initial payment. Revenues from the Mopac Express Lanes will reimburse the general funds after they are open to traffic and sufficient revenues are realized.

Backup provided:	Interlocal Agreement between CAMPO and CTRMA for the MoPac Improvement Project and Establishment of Regional Infrastructure Fund (RIF)

June 29, 2012

Mr. Mike Heiligenstein
Executive Director
Central Texas Regional Mobility Authority
301 Congress Avenue, Suite 650
Austin, Texas 78701

Dear Mr. Heiligenstein:

Please find attached a copy of the executed Interlocal Agreement between CAMPO and CTRMA for the MoPac Improvement Project. We appreciate everyone's efforts to bring this to fruition.

Sincerely,

Enoch N Needham

Enoch N Needham, P.E.

Assistant Director, CAMPO

Attachment

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION

www.CAMPOTexas.org
505 Barton Springs Rd., Ste. 700, Austin, TX 78704
MAILING ADDRESS P.O. Box 1088, Austin, TX 78767
512 974 2275 512 974 6385

INTERLOCAL AGREEMENT

THIS INTERLOCAL AGREEMENT (the "Agreement") is made and entered into effective as of the 27th day of June, 2012, by and between the CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION ("CAMPO"), the designated metropolitan planning organization for the Austin metropolitan area, and the CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY (the "Mobility Authority"), a political subdivision of the State of Texas (each a "Party", and collectively, the "Parties").

WITNESSETH:

WHEREAS, 23 U.S.C. §134 requires the Governor, by agreement with units of general purpose local government in the affected area, to designate a metropolitan planning organization ("MPO") for each metropolitan planning area in the state; and

WHEREAS, 23 U.S.C. §134 requires each MPO so designated, in cooperation with the state, to develop long-range transportation plans and transportation improvement programs for the metropolitan planning area; and

WHEREAS, the Governor of Texas has designated CAMPO as the MPO for Bastrop, Caldwell, Hays, Travis, and Williamson Counties in accordance with the requirements of 23 U.S.C. §134; and

WHEREAS, the Mobility Authority is a regional mobility authority created pursuant to the request of Travis and Williamson Counties and operating pursuant to Chapter 370 of the Texas Transportation Code (the "RMA Act") and 43 TEX. ADMIN. CODE §§26.1 *et seq.*; and

WHEREAS, Chapter 791 of the Texas Government Code provides that any one or more public agencies may contract with each other for the performance of governmental functions or services in which the contracting parties are mutually interested; and

WHEREAS, Section 370.033 of the RMA Act provides that a regional mobility authority may enter into contracts or agreements with another governmental entity; and

WHEREAS, the Mobility Authority's goals include improving mobility within Travis and Williamson counties, and to further that goal, the Mobility Authority has exercised its option, pursuant to state law, to develop, construct, and operate a proposed managed lane project in the City of Austin, Travis County, along an 11-mile portion of Loop 1 (MoPac) south of Parmer Lane to Cesar Chavez Street (the "MoPac Improvement Project" or "Project"); and

WHEREAS, the Texas Department of Transportation ("TxDOT") recently identified approximately $2 billion in unanticipated funding for highway projects, resulting primarily from additional federal funding and lower than expected borrowing and construction costs for current projects; and

WHEREAS, TxDOT has notified CAMPO that $136,583,000.00 of the unanticipated funding (the "New Funds") will be made available for transportation projects in the Austin metropolitan area and has asked CAMPO to allocate the New Funds for appropriate projects; and

WHEREAS, the New Funds must be primarily allocated to projects which have progressed through the planning and development process to a point where Federal funds may be obligated to the project by September 30, 2012; and

WHEREAS, the MoPac Improvement Project is expected to receive environmental clearance on or before August 31, 2012, and has otherwise advanced through the planning and development process such that it is anticipated to be eligible for the obligation of funds prior to September 30, 2012; and

WHEREAS, CAMPO has determined that it is in the best interest of the region to allocate $130 million in New Funds to the development and construction of the MoPac Improvement Project by the Mobility Authority; and

WHEREAS, the allocation of $130 million in New Funds to the MoPac Improvement Project makes it possible for the Mobility Authority to fund construction of the Project without issuing toll revenue bonds, and thus reduces the total cost of constructing and operating the Project by the projected cost of issuing and repaying toll revenue bonds; and

WHEREAS, because the Mobility Authority will not have debt service requirements for the MoPac Improvement Project, the Project will generate "Surplus Revenue" (as defined below) sooner than if debt were issued; and

WHEREAS, to assure that the region shares in the benefits resulting from the use of New Funds for the MoPac Improvement Project, and in accordance with the requirements of Section 370.174 of the RMA Act, the Mobility Authority has agreed to establish a Regional Infrastructure Fund ("RIF") created from a portion of the Surplus Revenue from the MoPac Improvement Project to be used to fund other transportation projects in the region; and

WHEREAS, in accordance with the terms of this Agreement and provisions of the RMA Act, the RIF will be available for use on transportation projects identified by CAMPO; and

WHEREAS, the Mobility Authority has agreed to deposit and hold the RIF in a dedicated interest-bearing account for the benefit of CAMPO;

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained, the undersigned Parties agree as follows:

I.
FINDINGS

Recitals. The recitals set forth above are incorporated herein for all purposes and are found by the Parties to be true and correct. It is further found and determined that the Parties

have authorized and approved the Agreement by resolution and that this Agreement will be in full force and effect when approved by each party.

II.
ACTION

A. **Allocation of New Funds to the MoPac Improvement Project**. CAMPO shall amend its Transportation Improvement Program ("TIP") to allocate to the Mobility Authority $130 million in New Funds, to be used to pay or provide reimbursement for the costs of (1) constructing the MoPac Improvement Project, including without limitation costs of right-of-way acquisition and utility relocation; and (2) other costs associated with project financing and implementation. This funding allocation is committed by CAMPO and is not subject to future discretionary actions of CAMPO. The Parties recognize and acknowledge that, subject to applicable law, a portion of the New Funds committed by this paragraph may be applied to reimburse costs incurred prior to, and in anticipation of, receipt of New Funds. The Parties further recognize and acknowledge that the New Funds shall be made available to the Mobility Authority by TxDOT pursuant to the terms of a separate financial assistance agreement. A copy of the financial assistance agreement will be provided to CAMPO upon execution by the Mobility Authority and TxDOT.

B. **Maintenance of Regional Infrastructure Fund**. In order to share the financial benefits derived from using New Funds for the MoPac Improvement Project, the Mobility Authority will establish and maintain a RIF. The RIF will be held in a dedicated interest-bearing account into which the Mobility Authority will deposit a portion of the Surplus Revenue generated by the Project (the "RIF Account"). The amounts of, and projected schedule for, contributions to the RIF Account are set forth on Exhibit "A", attached hereto and incorporated herein.

C. **Use of Funds Held in the RIF Account**. The proceeds deposited to the RIF Account (and interest earned thereon) shall be used to assist governmental entities (which may include the Mobility Authority) in funding eligible toll or toll-free transportation projects. CAMPO shall have the sole responsibility for designating the transportation projects to which funds in the RIF Account will be allocated and determining the amount of available RIF proceeds to be allocated to each project. The Mobility Authority shall distribute funds in the RIF Account to governmental entities as designated by CAMPO for transportation projects included in the approved TIP (and any other required planning document). Notwithstanding the foregoing, unless otherwise permitted by federal law, funds in the RIF Account may only be used for a transportation project as defined in Title 23 of the United States Code (23 U.S.C.).

   If, in the future, state and federal law permits CAMPO to directly fund projects through loans and grants, and state law permits a regional mobility authority to transfer Surplus Revenue directly to a metropolitan planning organization, the Parties agree that the RIF contributions and account shall, upon receipt of a written request from CAMPO, be transferred from the Mobility Authority to CAMPO.

D. **Mobility Authority Commitment Contingent on Surplus Revenue**. The Mobility Authority shall deposit Surplus Revenue to the RIF Account only to the extent Surplus Revenue exists and in accordance with the general schedule set forth in Exhibit "A", which was derived based on projected revenues, operations and maintenance expenses, necessary reserves, and other project expenditures developed by the Mobility Authority and its consultants. For purposes of this Agreement, the phrase "Surplus Revenue" shall have the meaning set forth in Section 370.003(12) of the RMA Act, provided that neither (1) feasibility fund expenditures; nor (2) debt service and other expenses associated with any borrowing as described in Section II.E(2) shall be deducted from Project revenues in computing Surplus Revenue. If the Project does not generate Surplus Revenue at the time or in the amounts projected on Exhibit "A", the parties will confer and will work in good faith to revise the terms hereof to accommodate the changed circumstances while preserving the benefits for the region of the RIF and recognizing the value of the designated contribution schedule.

E. **Encumbrance of Project Revenues.** The Mobility Authority agrees not to encumber Project revenues to secure borrowing from third parties except in either of the following circumstances:

(1) The Mobility Authority determines that funds are needed to support Project construction or operations or to reimburse previously-incurred Project expenditures. If the funds needed are less than $25 million, the Mobility Authority may take such actions as are necessary to secure the funding, including entering into a loan agreement with a third party to provide the funding on commercially reasonable terms (which may include a pledge of Project revenues).

(2) If the Mobility Authority has made contributions to the RIF in accordance with the schedule reflected on Exhibit "A", it may pledge that portion of Surplus Revenue which exceeds scheduled RIF contributions ("Additional Surplus Revenue") to secure third party borrowing. In accordance with Section II.D, all debt service and other expenses associated with such borrowing shall be excluded from the definition of Surplus Revenue available for contribution to the RIF (i.e., debt service and expenses related to such borrowing will not be deducted from Project revenues for purposes of calculating Surplus Revenue available for contribution to the RIF). In the event the Mobility Authority intends to borrow money and pledge the Additional Surplus Revenue to secure such borrowing, the Mobility Authority shall: (1) provide notice of its intent to engage in such borrowing at least thirty (30) calendar days prior to consummating such loan; (2) assure that any documents evidencing the loan recognize the obligations to make the RIF contributions prior to satisfying any loan obligations; and (3) provide documents evidencing the loan to CAMPO at least ten (10) business days prior to funding.

F. **Advance Funding of RIF.** At its option and depending on Project performance, the Mobility Authority may fund the entire contribution to the RIF earlier than is otherwise projected on Exhibit "A".

G. **Audit of Project.** The Mobility Authority will provide a copy of its annual audit to CAMPO until such time that the RIF contributions have been fully funded in accordance with Exhibit "A". In addition, CAMPO may, at its expense, secure an independent audit of the Project to verify the computation and availability of Surplus Revenue for contribution to the RIF in accordance with the projected schedule reflected on Exhibit "A".

III.
GENERAL AND MISCELLANEOUS

A. **Prior Written Agreements**. This Agreement is the complete agreement by and between the Parties on the subject matter of the Agreement. This Agreement is without regard to any and all prior written contracts or agreements between the Parties regarding any other subject matter and does not modify, amend, ratify, confirm, or renew any such other prior contract or agreement between the Parties.

B. **Other Services**. Nothing in this Agreement shall be deemed to create, by implication or otherwise, any duty or responsibility of either of the Parties to undertake or not to undertake any other service, or to provide or not to provide any service, except as specifically set forth in this Agreement or in a separate written instrument executed by both Parties.

C. **Governmental Immunity**. Nothing in this Agreement shall be deemed to waive, modify, or amend any legal defense available at law or in equity to either of the Parties nor to create any legal rights or claims on behalf of any third party. Neither of the Parties waives, modifies, or alters to any extent whatsoever the availability of the defense of governmental immunity under the laws of the State of Texas and of the United States.

D. **Amendments and Modifications**. This Agreement may not be amended or modified except in writing and executed by both Parties to this Agreement and authorized by their respective governing bodies.

E. **Severability**. If any provision of this Agreement shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision hereof, but rather this entire Agreement will be construed as if not containing the particular invalid or unenforceable provision(s), and the rights and obligations of the Parties shall be construed and enforced in accordance therewith. The Parties acknowledge that if any provision of this Agreement is determined to be invalid or unenforceable, it is their desire and intention that such provision be reformed and construed in such a manner that it will, to the maximum extent practicable, give effect to the intent of this Agreement and be deemed to be validated and enforceable.

F. **Execution in Counterparts**. This Agreement may be simultaneously executed in several counterparts, each of which shall be an original and all of which shall be considered fully executed as of the date first written above, when both Parties have executed an identical counterpart, notwithstanding that all signatures may not appear on the same counterpart.

IN WITNESS WHEREOF, the Parties have executed and attested this Agreement by their officers thereunto duly authorized.

Capital Area Metropolitan Planning Organization Transportation Policy Board

By: Will Conley, Chair

Date: 6-28-12

Central Texas Regional Mobility Authority

By: Ray Wilkerson, Chair

Date: 10-17-12

EXHIBIT "A"

PROJECTED
REGIONAL INFRASTRUCTURE FUND
CONTRIBUTION SCHEDULE
(Contributions to be made on or before September 1 of the year indicated)

Year	Annual Amount
2017	$2,000,000
2018	$2,000,000
2019	$3,000,000
2020	$4,000,000
2021	$5,000,000
2022	$5,000,000
2023	$6,000,000
2024	$10,000,000
2025	$10,000,000
2026	$10,000,000
2027	$10,000,000
2028	$10,000,000
2029	$11,000,000
2030	$11,000,000
2031	$11,000,000
2032	$11,000,000
2033	$11,000,000
2034	$11,000,000
2035	$11,000,000
2036	$12,000,000
2037	$12,000,000
2038	$12,000,000
2039	$12,000,000
2040	$12,000,000
2041	$16,000,000
TOTAL	$230,000,000

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #10

Authorize a procurement of a firm to provide pay-by-mail, violations processing, collections and customer service

Strategic Plan Relevance:	Regional Mobility
Department:	N/A
Contact:	Tracie Brown, Toll Collection Manager
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on draft resolution

Summary:

This item authorizes the executive Director to go forward with the procurement of a firm to provide pay-by-mail, violations processing, collections and customer service by issuance of a request for proposals to firms who have been shortlisted based on a review of their qualifications. The current contract with MSB expires in January 2018.

This is the second phase of a 2-step procurement. During the first phase a Request for Qualifications was issued in December 2016, responses from interested firms were evaluated, and a shortlist of the most highly qualified firms was established. The shortlist of firms eligible to submit proposals will be presented at the Board Meeting.

At a high level, the scope of services shall include program startup; systems to support operations; staffing; pay by mail & violations processing; plate-based account management; customer relationship management; revenue recovery; legal action support; reporting; compliance & quality; and project management. The initial term of the procured contract will be for a period of five (5) years and will include two (2) options to extend the contract. Each option will be for a period of up to two (2) additional years for a total contract term potentially up to a maximum of nine (9) years.

Backup Provided: Draft Resolution

GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION NO. 17-0XX

AUTHORIZE A PROCUREMENT OF A FIRM TO PROVIDE PAY-BY-MAIL, VIOLATIONS PROCESSING, COLLECTIONS AND CUSTOMER SERVICE

WHEREAS, by Resolution No. 07-71, dated December 7, 2007, the Board of Directors authorized the Executive Director to negotiate and execute on behalf of the Mobility Authority an Agreement for Violation Processing and Debt Collection Services effective January 15, 2008, (the "Agreement") with Gila Corporation, a Texas corporation subsequently converted to Gila LLC, a Texas limited liability company, d/b/a Municipal Services Bureau ("MSB"); and

WHEREAS, the agreement with MSB expires in January 2018; and

WHEREAS, the Mobility Authority has an ongoing need for a contractor to provide pay-by-mail, violations processing, collections and customer services for Mobility Authority toll facilities; and

WHEREAS, the Mobility Authority staff issued a request for qualifications in December 2016 to firms interested in providing pay-by-mail, violations processing, collections and customer services for Mobility Authority toll facilities; and

WHEREAS, an evaluation committee reviewed the qualifications submitted by firms in response to the request for qualifications and established a shortlist of the most highly qualified responsive firms; and

WHEREAS, the Executive Director recommends that the Mobility Authority proceed with the solicitation of proposals from the shortlisted firms and, ultimately, recommend a firm for award of a contract to provide pay-by-mail, violations processing, collections and customer care services.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors authorizes and directs the Executive Director to develop and issue a request for proposals to the shortlisted firms; and

BE IT FURTHER RESOLVED that the Executive Director establish a process to review the responses to the request for proposals and make a recommendation to the Board for award of a contract to the "best value" proposal based on the criteria set forth in the request for proposals.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of March 2017.

Submitted and reviewed by:

_____
Geoffrey Petrov, General Counsel

Approved:

_____
Ray A. Wilkerson
Chairman, Board of Directors

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #11

Approve Work Authorization No. 14 with Kapsch Inc. for system integration services related to the SH 45SW Project

Strategic Plan Relevance:	Regional Mobility
Department:	Toll Operations
Contact:	Tim Reilly, Director of Toll Operations
Associated Costs:	$2,364,252.06 (not to exceed)
Funding Source:	Reimbursed with Project Funds
Action Requested:	Consider and act on draft resolution

Summary:

Under this proposed work authorization, Kapsch TrafficCom USA (formerly Schneider Electric) will provide toll system integration services related to project activities required to assist the Mobility Authority in the development of the SH 45SW project.

These efforts will include, but not be limited to the design, acquisition, installation, testing, and integration of a complete and fully operational toll collection system and intelligent transportation system.

Backup provided: Draft Work Authorization No. 14
Draft Resolution

GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION NO. 17-0XX

APPROVING A WORK AUTHORIZATION NO. 14 WITH KAPSCH TRAFFICCOM USA FOR TOLL SYSTEMS INTEGRATION SERVICES FOR THE SH 45 SW PROJECT

WHEREAS, the Central Texas Regional Mobility Authority ("Mobility Authority") entered into a contract with Caseta Technologies, Inc. dated April 27, 2005, for the design, procurement, and installation of a toll collection system on the Authority's turnpike system (the "Contract"); and

WHEREAS, Kapsch TrafficCom USA (formerly Schneider Electric Mobility NA) is the successor in interest to the Contract with Caseta Technologies, Inc., and all rights and obligations of Caseta Technologies, Inc. under the Contract are now the rights and obligations of Kapsch TrafficCom USA ("Kapsch"); and

WHEREAS, the Executive Director and Kapsch have discussed and agreed to a proposed work authorization for Kapsch to provide toll system integration services and intelligent transportation system services for development of the SH 45 SW project (the "Project"); and

WHEREAS, the Executive Director recommends that the Board approve proposed Work Authorization No. 14, a copy of which is attached to this resolution as Exhibit A.

NOW THEREFORE, BE IT RESOLVED that the proposed work authorization with Schneider for toll system integration services and intelligent transportation system services for the Project is hereby approved; and

BE IT FURTHER RESOLVED that the Executive Director may finalize and execute on behalf of the Mobility Authority the proposed work authorization in the form or substantially the same form provided to the Board as agenda backup information.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of March, 2017.

Submitted and reviewed by:

_____
Geoff Petrov, General Counsel

Approved:

_____
Ray A. Wilkerson
Chairman, Board of Directors

Exhibit A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

****

WORK AUTHORIZATION

WORK AUTHORIZATION NO.14

TOLL SYSTEM IMPLEMENTATION

STATE HIGHWAY 45 SOUTHWEST PROJECT

THIS WORK AUTHORIZATION ("WA No. 14") is made pursuant to the terms and conditions of Article 1 of the GENERAL PROVISIONS, Attachment A, to the original Contract for Toll System Implementation, dated April 27, 2005 (the Contract) entered into by and between the Central Texas Regional Mobility Authority (the "Authority" or "CTRMA"), and Kapsch TrafficCom Transportation NA, Inc. (the "Contractor," also referred to in attachments to this WA N0. 14 as the "System Integrator" or "SI").

PART I. The Contractor will perform toll implementation services generally described in the Scope of Work attached hereto as **Attachment A**. The Contractor's duties and responsibilities are further detailed in: (1) the SH 45 SW Project Layout included as **Attachment B**, (2) the Toll Facility Responsibility Matrix included as **Attachment C**, and (3) the Fixed Price Tolling Standards included as **Attachment D**.

PART II. The maximum amount payable under this WA No. 14 is $2,364,252.06. This amount is based upon the pricing obtained, and is documented by the fee schedule set forth in **Attachment E**.

PART III. Payment to the Contractor for the services established under this WA No. 14 shall be made in accordance with the Contract.

PART IV. This WA No. 14 shall become effective on the date both parties have signed this WA No. 14. This WA No. 14 will terminate on the SH 45 SW Toll Lanes substantial completion date or upon payment of the maximum amount payable in **Part II**, whichever date is first, unless extended as provided by the Contract. The work shall be performed in accordance with the project Schedule and Milestones as set forth in **Attachment F**.

PART V. This WA No. 14 does not waive any of the parties' responsibilities and obligations provided under the Contract, and except as specifically modified by this WA No. 14, as such responsibilities and obligations under the Contract remain in full force and effect.

IN WITNESS WHEREOF, this Work Authorization No. 14 is executed in duplicate counterparts and hereby accepted and acknowledged below.

THE CONTRACTOR: Kapsch TrafficCom Transportation NA, Inc.

_____

Signature Date

_____

Typed/Printed Name and Title

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Executed for and approved by the Central Texas Regional Mobility Authority for the purpose and effect of activating and/or carrying out the orders, established policies or work programs heretofore approved and authorized by the Texas Transportation Commission.

_____

Signature Date

Mike Heiligenstein, Executive Director

Typed/Printed Name and Title

LIST OF ATTACHMENTS

Attachment A	Scope of Work
Attachment B	SH 45 SW Toll System Layout
Attachment C	Toll Facilities and ITS Responsibility Matrix
Attachment D	Fixed Price Tolling Standards
Attachment E	Fee Schedule/Budget
Attachment F	Preliminary Project Schedule and Milestones

ATTACHMENT A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
TOLL SYSTEM IMPLEMENTATION
State Highway 45 Southwest Project

SCOPE OF WORK for SYSTEMS INTEGRATOR

A1.0 General

A1.01. Background

The Central Texas Regional Mobility Authority (CTRMA) is developing the State Highway (SH) 45 Southwest (SW) Project ("Project"), which will construct a new 4-lane toll facility, approximately 3.6 miles in length, between FM 1626 and Loop 1 (MoPac), extending onto the existing the SH 45 roadway south of Escarpment Boulevard. Once complete, the project will offer drivers and residents in Northern Hays and Southern Travis counties less congested local roads and improved travel times.

The Texas Department of Transportation (TxDOT), along with Hays and Travis Counties, provided funding and right-of-way for the project, and TxDOT lead environmental impact studies, including related environmental documentation and coordination of public outreach. CTRMA is responsible for the project design, permitting, and infrastructure construction, in addition to the procurement, design, installation, testing and commissioning of the Toll Collection System (TCS). Additionally, SH 45SW will require the implementation of a Traffic Management System (TMS).

Upon substantial completion, CTRMA shall operate and maintain toll lanes on the Project, which will include the collection of tolls, setting toll rates, servicing customers, toll enforcement, facilities and toll collection system maintenance, repairs and capital improvements to the toll lanes, toll facilities, and related equipment.

A1.02. Summary Scope of Work

The Scope of Work for Work Authorization No. 14 consists of two (2) components: (1) Toll Collection System Implementation and (2) Traffic Management System Implementation. A description of the scope of work for each component is described below.

A1.02.A. Toll Collection System Implementation

Part A of the Scope of Work for Authorization No. 14 provides for the procurement, installation, testing, and implementation of a complete and fully operational TCS for the Project by the Systems Integrator (SI). This includes, but is not limited to, all of the required communications and systems interfaces, as well as design, coordination, and project interface activities to facilitate the design and construction of the toll system infrastructure facilities by others on the SH 45 SW Project.

This Work Authorization also authorizes the SI to establish and maintain relationships with a wide variety of third parties, and to coordinate the designs for the proposed TCS with the entire SH 45SW Project to ensure that the construction of the toll system infrastructure facilities will be fully compatible and meet the requirements for the CTRMA's TCS. In this role, the SI will work closely with CTRMA, and various designers and roadway contractors in developing the required complete TCS and network infrastructure.

A1.02.B Traffic Management System

Part B of the Scope of Work for Work Authorization 14 provides for the procurement, installation, testing, and implementation of a complete and fully operational TMS for the Project by the Systems Integrator (SI). Scope shall include, but not be limited to, coordination and project interface activities to facilitate the design and construction of the TMS infrastructure facilities by others.

This Work Authorization also authorizes the SI to establish and maintain relationships with a wide variety of third parties, and to coordinate the designs for the proposed TMS with the entire SH 45SW Project. This coordination will help to ensure that the construction of the TMS infrastructure facilities will be fully compatible and meet the requirements for the CTRMA's Traffic Management System. In this role, the SI will work closely with CTRMA, various designers and roadway contractors in developing the required complete Intelligent Transportation System (ITS), and network infrastructure.

A2.0 General Description – Toll Road Infrastructure and Site

The SH 45 SW Project limits in Southern Travis County and Northern Hays County will extend from FM 1626 to Loop 1 (MoPac), utilizing the existing the SH 45 roadway south of Escarpment Boulevard. The project length is approximately 3.6 miles.

Proposed Facility:

The SH 45 SW Project will be a new four-lane, divided tollway consisting of: two (2) twelve-foot lanes in each direction, a ten-foot outside shoulder and a four- or five-foot inside shoulder with varying median widths. The project includes a ten-foot-wide, ADA-compliant shared use path, separated from the roadway for the entire length of the project, except over the Bear Creek Bridge. The shared use path will serve as part of the future Violet Crown Trail, and will have a trailhead under the bridge structure at SH 45SW and MoPac.

The following bridges are included in the design of the project:

- Overpass of Bliss Spillar Road and water quality pond
- Overpass of Bear Creek and water quality pond
- Overpass of Danz Creek, water quality ponds, and MoPac
- Direct connector for westbound SH 45SW to northbound MoPac over Danz Creek
- Widening of the existing SH 45 and MoPac bridges over Danz Creek

The Toll Collection System for the Project will be all Electronic Toll Collection (ETC). The project will consist of one Toll Site that provides Open Road Tolling for both the NB and SB lanes and shoulders. A two Gantry solution will be provided for this site at the locations listed in Table 1 below.

Note: The location of the gantries are approximate and may be subject to change.

The SH 45 SW Project will be a limited-access tollway with entrances and exits to the facility provided at the following locations:

- FM 1626
- Bliss Spillar Road
- Loop 1 (MoPac)
- SH 45, west of Loop 1

Table 1: Gantry Locations and Lane Counts

Approximate Station Location	Direction of Travel	No. of Lanes	No. of Shoulders (8' or greater)	Comments
256+00	Northbound	2	1	The design plan typical section includes one (1) 10 foot shoulder in each direction of travel. However, the typical section may be different if the location of the gantry is revised.
256+00	Southbound	2	1	The design plan typical section includes one (1) 10 foot shoulder in each direction of travel. However, the typical section may be different if the location of the gantry is revised.
	Total Gantry	4	2	

Refer to the SH 45SW Project Layout included as ***ATTACHMENT B*** for the general project layout.

A3.0 General Requirements - Toll Collection System and Traffic Management System

A3.01 General Requirements - Toll Collection System

The Central Texas Roadway System, which is being designed and implemented through a series of separate work authorizations for the various segments of the proposed Toll Road System, generally will be fully compatible with the TCS that has been designed and implemented on the 183A Toll Road, US 290, SH 71 and the Manor Projects. The TCS installed on SH 45 SW shall utilize automatic vehicle identification and classification technology, a Violation Enforcement System (VES) with an integrated camera and triggering systems to capture referenced digital images of license plates, and a Remote Online Management System (ROMS). It is required that the TCS be interoperable with the other Texas ETC systems.

The Customer Service Center (CSC) is located in a facility at 12719 Burnet Road, Austin, Texas, developed and administrated by the Toll Operations Division (TOD) of TxDOT. The CTRMA contracts with the members of the Texas Statewide Interoperability Task force for CSC services for its customers. Expansion of CTRMA's TCS to serve the SH 45 SW Project includes coordination and design of appropriate interfaces with the TxDOT CSC. Appropriate communications links between, and interfaces to (where necessary), CTRMA's various toll facilities, including: the Central Texas Roadway System, Administrative Offices, Traffic Management Center (TMC) at the Field Operations Building(s), and the Violation Processing Center (VPC) are part of the requirements of the TCS design/implementation work.

Note: The VPC is located in a separate facility, and is currently being administrated by the Municipal Services Bureau, Inc. under contract to the CTRMA. Development of CTRMA's TCS will included coordination and design of the appropriate interfaces with the VPC.

The general locations, layouts, and implementation schedule for the toll facilities for the SH 45 SW Project, as currently proposed, are indicated in the attached Exhibits. The Exhibits are based upon the latest information currently available, and they are intended for informational purposes only. The locations are subject to change, and it should be anticipated that refinements and adjustment to the locations and layouts indicated will be required as designs for the TCS are developed further.

A3.02 General Requirements – Traffic Management System

The Intelligent Transportation System for SH 45 SW Project includes a concrete encased duct bank consisting of twelve, 2-inch conduits along the length of the project, closed-circuit television (CCTV) surveillance cameras, dynamic message signs (DMS), vehicle detectors, and communication hub enclosures. The ITS duct bank shall be in accordance with the guidelines included in the *Austin District Guidelines for Developing Freeway Corridor Traffic Management System.*

The Project design shall include ITS components, consistent with the overall location and quantity of ITS components in the *"ITS Schematic."* The general locations, layouts, and implementation schedule for the TMS for the SH 45 SW Project, as currently proposed, are based on the latest information currently available, and they are intended for informational purposes only. The locations are subject to change, and it should be anticipated that refinements and adjustment to the locations and layouts indicated will be required as designs for the TMS are developed further.

The SI shall design and install a Traffic Management System that is compatible with the Austin Regional ITS Architecture for both control of devices and reception of images and data. The proposed system shall be seamlessly integrated into the exiting CTRMA TMC, all devices shall be compatible with the current TMC Video Management Software (VMS), DMS software and Traffic Detector Database. Access to any cameras, DMS or RVSD by a third party will be facilitated by a Memorandum of Understanding and Agreement (MUA) between CTRMA and third party. The database administrator at the TMC will add the new device addresses to the already functioning tables. Note that the fiber trunk line will eventually tie into the fiber system along MoPac once constructed and installed. The SI shall furnish and install appropriate communications links between, and interfaces to, CTRMA's various toll facilities, including: the Central Texas Roadway System, Administrative Offices, TMC at the Field Operations Building(s), and the VPC as part of the requirements of the TMS design/implementation work.

A4.0 Equipment and Installation

A4.01. Gantries and Roadside Equipment for ETC Systems

For a complete, tested, and operating TCS under this Work Authorization, the SI will be required to provide and install the toll equipment, hardware and software systems at all TCS field installations on the SH 45 SW Project. The SI's principle items of work and primary components of the TCS at each toll location will include, but are not limited to:

- Furnishing and installing lane controllers and ancillary devices
- Furnishing and installing ETC lane components, including: Automatic Vehicle Detection System (AVDS), Automatic Vehicle Classification (AVC), Violation Enforcement System (VES), and Automatic Vehicle Identification (AVI) systems and hardware
- Furnishing and installing all ETC lane equipment wiring and cable, hardware, brackets, and fasteners required to attach the ETC equipment to the gantries and toll hangers provided by others
- Furnishing, installing and configuring ROMS for all ETC and ITS site equipment (e.g. ETC Equipment, ITS Equipment AVDS, AVC, AVI, VES, HVAC, generators, power, communications equipment, etc.)
- Furnishing and installing communication system communication system and network components (e.g. fiber optic cable, terminations, splices, network switches, routers and other network devices as required by CTRMA)
- Furnishing and installing master ground system connected to the master ground bus bar

provided by others

- Furnishing and installing lightning surge suppression system and components for AVI, communication network, VES, Uninterruptible Power Supply (UPS), and service/feeder power
- Furnishing and installing backup electrical power, including emergency generators, fuel tanks, and automatic transfer switches
- Furnishing and installing wiring, cable, hardware, and ROMS interface
- Furnishing and installing In-Lane Processor (ILP) enclosure, with HVAC for appropriate environmental protection and climate controls for electronic equipment.
- Furnishing and installing site surveillance cameras and security systems to monitor each ILP and gantries
- Providing power from the electrical service to the toll and ITS locations
- Preparing and submitting Federal Communication Commission (FCC) license(s)
- Providing complete testing, certification and acceptance of all systems for the complete, fully integrated and operational TCS, furnished and installed

The procurement, fabrication and installation of gantries and other civil infrastructure for the TCS to be located on the Project shall be completed by others contracted by CTRMA. It is the responsibility of the SI, nevertheless, to work closely with CTRMA, their various designers and roadway contractors to establish the precise location for the gantry structure and to provide the roadway contractor(s) with detailed information regarding the installation for the TCS equipment at each location.

A4.02 ITS System Design

For all TMS field installations on the SH 45 SW Project, the SI will be responsible for the final ITS systems design, as well as the purchase and installation of the ITS equipment. The principle items of work and primary components of the TMS at each location will include, but not limited to:

- Duct Banks: Furnish and install the fiber optic cabling required for the ITS and Tolling systems. The duct bank and its laterals shall be constructed by others.
- CCTV Cameras: Furnish and install the cameras, communications, and equipment enclosures. Installation of foundations, conduits and conduit laterals, grounding, lightning protection, camera poles, and electrical services shall be provided by others.
- DMS: Furnish and install the DMS, communications and equipment enclosures. Installation of foundations, conduits and conduit laterals, grounding, DMS support structures, and electrical services for DMS (at the location specified by the SI) shall be completed by others.
- Vehicle Detectors: Furnish and install radar vehicle detectors, communications and equipment enclosures. Installation of foundations, conduits and conduit laterals, grounding, vehicle detectors support structures, and electrical services for vehicle detectors (at the location specified by the SI) shall be completed by others.
- Communications enclosure: Design, furnish, and install the enclosures. Design and construction of the enclosure support slab shall be constructed by others.

As indicated above, elements of the ITS infrastructure will be the responsibility of others. Nevertheless, it is the responsibility of the SI to work closely with CTRMA, various designers and roadway contractors to establish the precise locations for the elements above and to provide the Roadway Contractor(s) with detailed information as needed.

A5.0 Coordination and Project Interface

All TCS/ITS infrastructure facilities along the SH 45 SW Project will be provided by others as indicated in ***Section A6.0 and Section A7.0*** below. The SI is required to participate and coordinate with contractors and designers of the SH 45 SW Project, enabling them to obtain specific, detailed information regarding the proposed design of the TCS and TMS, location of the TCS and TMS components, technical requirements of the system, as well as all documents necessary in order for them to complete the design/construction of the appropriate toll infrastructure.

The SI is responsible for ensuring that the toll gantry is located and configured properly to accommodate the SI's own particular system components as required to meet the CTRMA TCS and TMS performance and accuracy requirements. It is also the responsibility of the SI to ensure the construction of the toll system infrastructure facilities will be fully compatible with, and meet the requirements for, the CTRMA's TCS and TMS.

The SI will be responsible for maintaining relationships with a wide variety of third parties, including designers, roadway contractors, and various suppliers. In this role, the SI will work closely with CTRMA in developing the required network. The work related to this Work Authorization No. 14 generally will include, but not be limited to:

- Providing design input and detailed information, including: TCS and TMS component details, dimensions and layout configurations, and specific technical requirements for elements of the proposed TCS and TMS
- Preparing construction/installation guidelines for various components of CTRMA's TCS and TMS
- Reviewing construction documents prepared by others, including conducting "over-the-shoulder" reviews, as necessary or requested by CTRMA
- Attending and participating in coordination meetings as determined by the project schedule and/or as requested by CTRMA

  Note: This includes attending design coordination meetings, construction meetings, and issue resolution meetings as necessary to resolve outstanding comments.
- Submitting installation plans and installation drawings to the CTRMA for review and approval
- Providing input into the development and maintenance of the project schedule as it relates to coordination with civil infrastructure contractors, the coordination of civil site turnovers, and the installation and testing of the toll system

  Note: The SI will be expected to review the project baseline schedule prepared by the contractor for review and acceptance.

Prior to deploying any toll collection equipment or technology on the SH 45 SW Project, the SI shall certify to CTRMA that the technology complies with the interoperability rules that are in effect on the date of the issuance of the NTP for this WA.

All TCS infrastructure facilities will be provided by others as indicated in Section A6.0 and Section A7.0 hereof.

A6.0. Work by Others

A6.01 Civil/Roadway Construction – Toll Collection System

The CTRMA, through its roadway construction contracts, will provide a minimum of 60 linear feet of jointed concrete pavement in each of the areas designated for toll collection facilities. The pavement will be reinforced with Glass Fiber Reinforced Polymer (GFRP) bars. Transverse joints and longitudinal joints will be placed at positions equal to lane width and as shown on the CTRMA details. Power and communication lines to support the Wide Area Network (WAN) will be provided by others and terminated at an ILP enclosure in an area within 500 feet of ILP. The SI is responsible for the communication links between the TCS Host, the TxDOT CSC, the VPC, the TMC, and all express toll location facilities. It is the responsibility of the SI to coordinate with 3rd parties for leased communication services along the corridor.

Except as may be expressly indicated elsewhere, all toll system infrastructure required for the TCS at the designated TCS Location(s) will be provided and installed by others contracted by CTRMA. The principle items of work and primary components of the TCS infrastructure shall include, but are not limited to:

- GFRP Bar Reinforced Pavement Section
- Retaining Walls and Coping Details
- Drainage Features
- Civil Site Work, including Grading, Access Driveways, and Fencing
- All toll gantry procurement and installations, including foundations and gantry structures
- All conduit and ground boxes are to be provided by the civil contractor
- ILP concrete foundation slab with a perimeter security fence

  Note: The ILP's are to be provided with appropriate environmental protection and climate controls for housing the electronic equipment by the SI.
- Toll Equipment concrete foundation slab
- Conduit and ground boxes providing connections between the ILP's and the ETC lane equipment installations

  Note: It is the responsibility of the SI to coordinate with the roadway contractor(s) for the placement and installation of these elements to ensure that the construction is acceptable for the TCS as designed.
- Gantry and ILP enclosure lightning protection, air terminal, down conductors, and ground electrodes
- Power up to the location of the proposed ILP enclosures
- Concrete foundations for emergency generators and associated fuel tanks
- Installation of natural gas lines, if necessary

  Note: The SI is to coordinate and provide generator requirements, including locations for gas feeds for the emergency generators.
- All signing, pavement markings, traffic barriers and other roadway appurtenances required at each remote express toll location

Refer to the Fixed Price Tolling Standards that were issued by the CTRMA on November 2013, which is

included as ***ATTACHMENT D***.

A6.02 Civil/Roadway Construction – Traffic Management System

Except as may be expressly indicated elsewhere, all required TMS infrastructure will be provided and installed by others. The principle items of work and primary components of the TMS infrastructure shall include, but limited to:

- ITS layouts
- Duct Bank
- Foundations
- Conduits
- Electrical Services
- Grounding circuits
- Support Structures

A7.0 Toll Facilities Responsibility Matrix

For this work authorization, the SI is responsible for design and coordination of the various aspects of the TCS, as identified in ***ATTACHMENT C - Toll Facilities and ITS Responsibility Matrix***, and shall work with the CTRMA, roadway designers and contractors, and others as described herein.

A8.0 Project Schedule

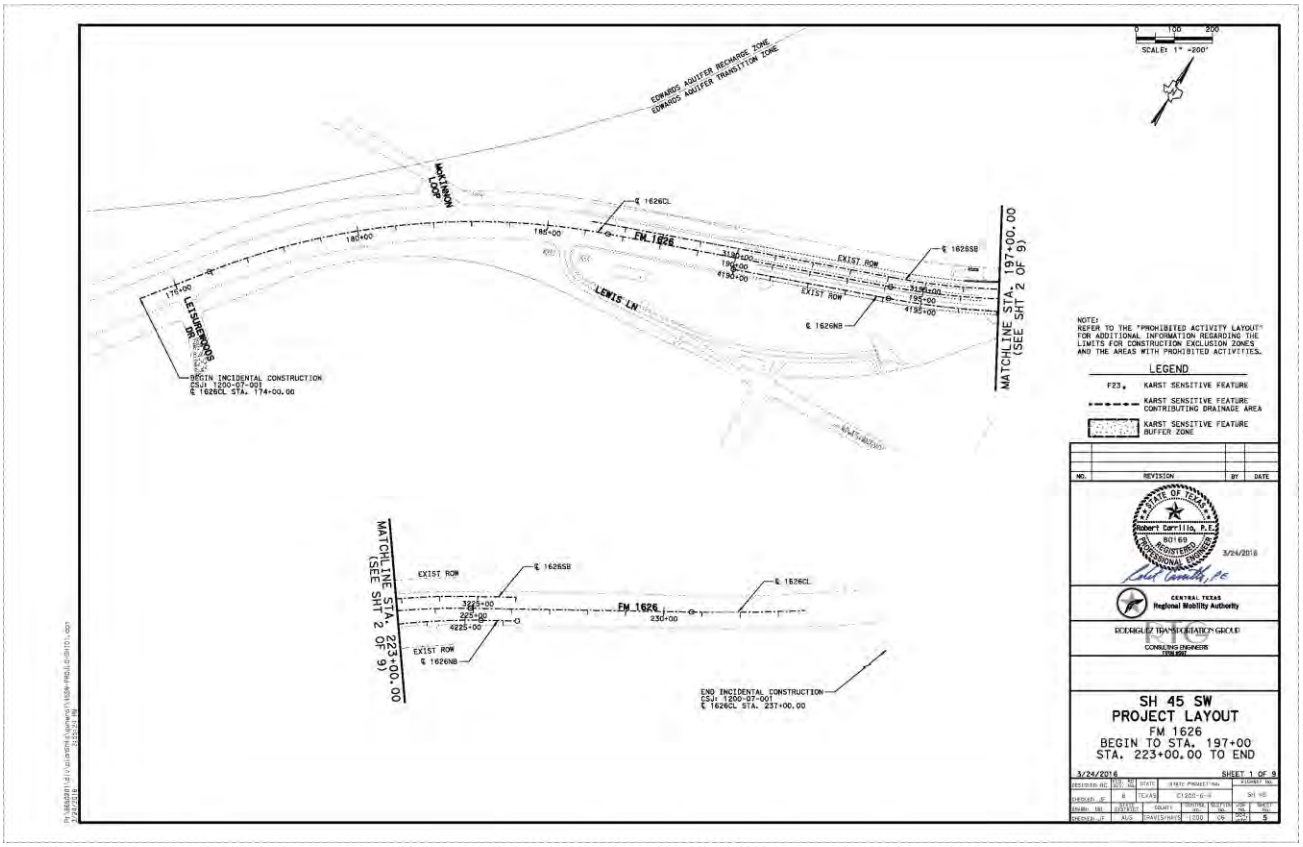
The Project Schedule shall be developed to incorporate the milestone dates established for this Work Authorization No. 14 as presented in ***ATTACHMENT F***.

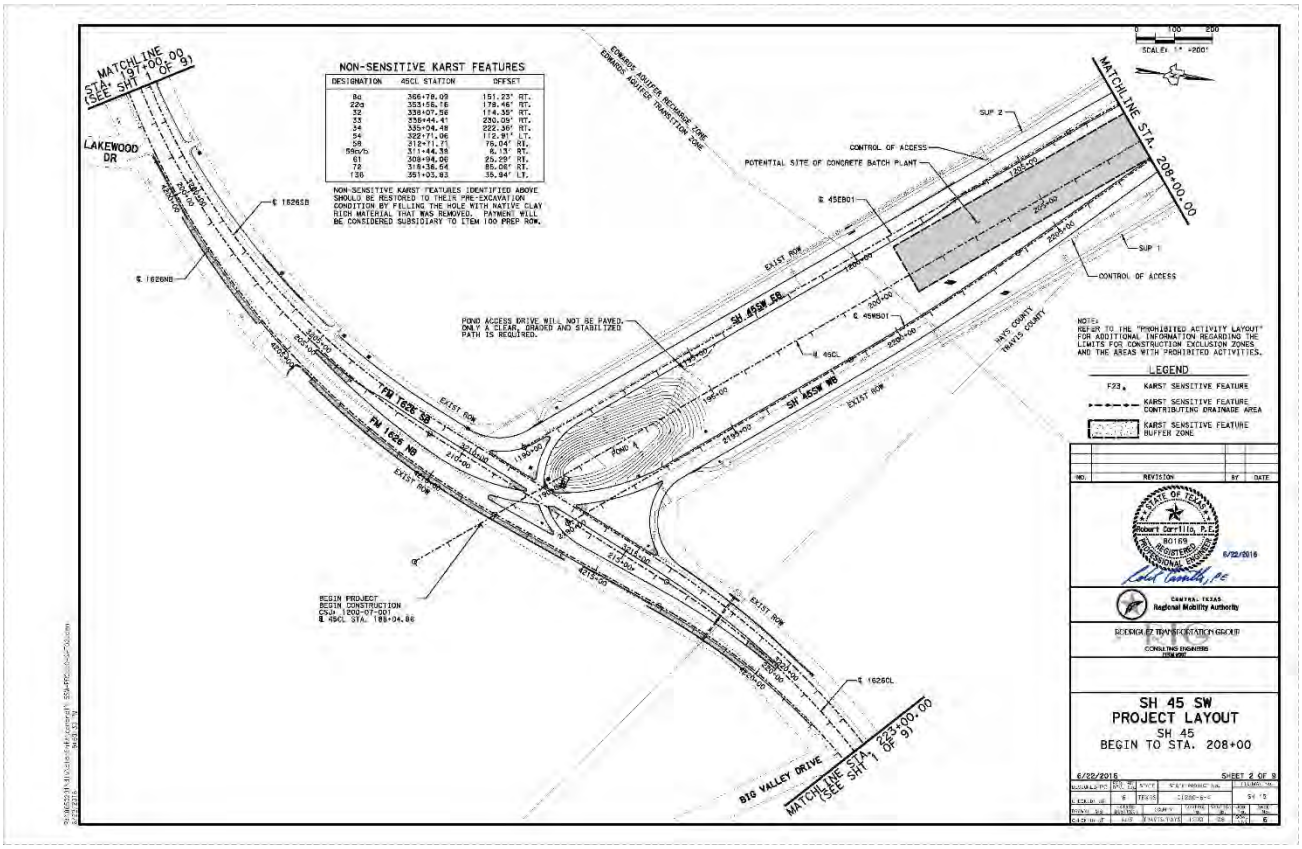
[END OF SECTION]

ATTACHMENT B

Toll System Layout

State Highway 45 SW Project

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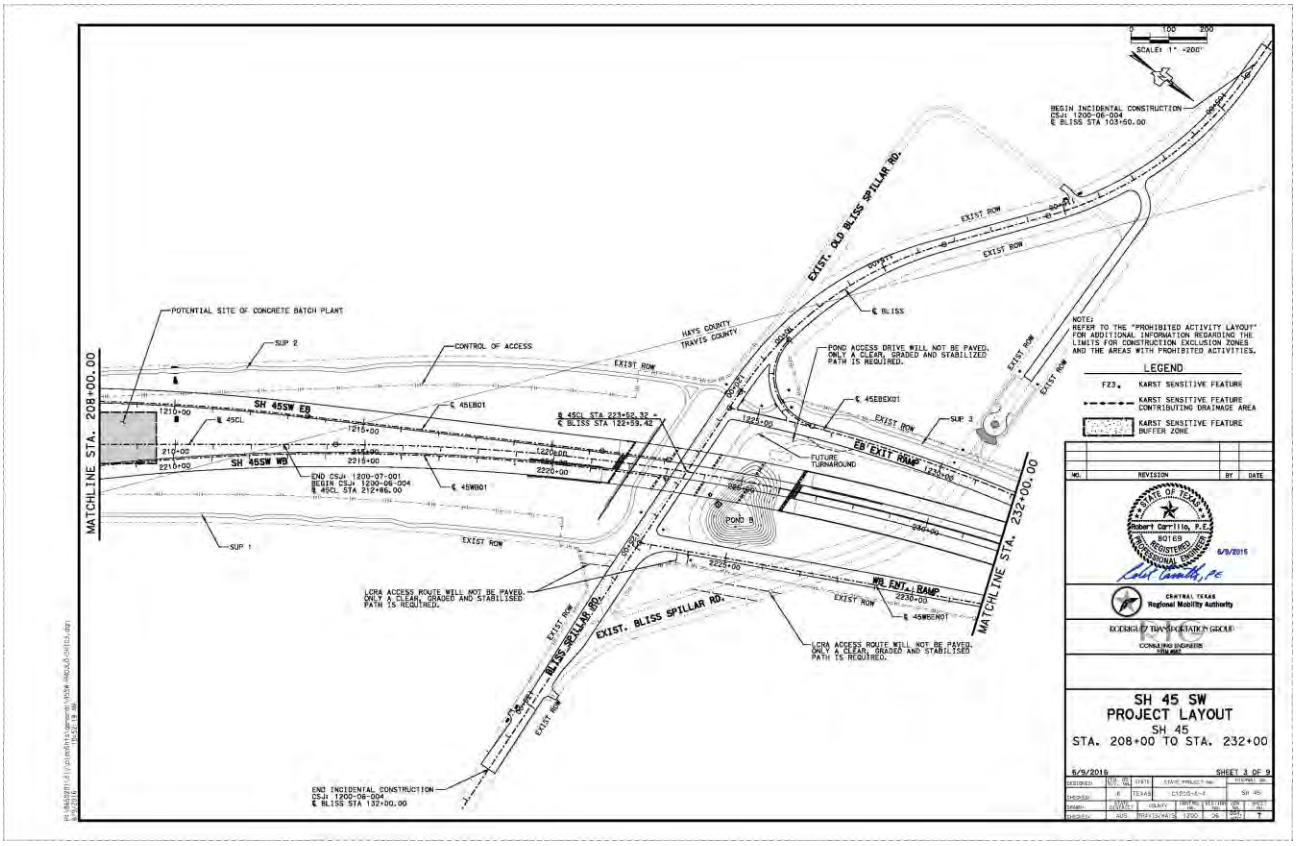
DESIGNATION
ASCL STATION
OFFSET
MATCHLINE STA. 197+00.00 (SEE SHT 1 OF 9)
LAKEWOOD DR
SH 45SW EB
SH 45SW WB
FM 1626 SB
FM 1626 NB
EXIST ROW
CONTROL OF ACCESS
POTENTIAL SITE OF CONCRETE BATCH PLANT
POND ACCESS DRIVE WILL NOT BE PAVED. ONLY A CLEAR, GRADED AND STABILIZED PATH IS REQUIRED.
HAYS COUNTY
TRAVIS COUNTY
BEGIN PROJECT
BEGIN CONSTRUCTION
CSJ: 1200-07-001
℄ 45CL STA. 189+04.86
MATCHLINE STA. 208+00.00
MATCHLINE STA. 223+00.00 (SEE SHT 1 OF 9)
BIG VALLEY DRIVE
NOTE: REFER TO THE "PROHIBITED ACTIVITY LAYOUT" FOR ADDITIONAL INFORMATION REGARDING THE LIMITS FOR CONSTRUCTION EXCLUSION ZONES AND THE AREAS WITH PROHIBITED ACTIVITIES.
LEGEND
KARST SENSITIVE FEATURE
KARST SENSITIVE FEATURE CONTRIBUTING DRAINAGE AREA
KARST SENSITIVE FEATURE BUFFER ZONE
REVISION
BY
DATE
Robert Carrillo, P.E.
80169
6/22/2016
CENTRAL TEXAS Regional Mobility Authority
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
SH 45 SW
PROJECT LAYOUT
SH 45
BEGIN TO STA. 208+00
6/22/2016
SHEET 2 OF 9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MATCHLINE STA. 232+00.00
POTENTIAL SITE OF CONCRETE BATCH PLANT
CONTROL OF ACCESS
SH 45SW EB
SH 45SW WB
EB EXIT RAMP
WB ENT. RAMP
FUTURE TURNAROUND
POND 8
POND ACCESS DRIVE WILL NOT BE PAVED. ONLY A CLEAR, GRADED AND STABILIZED PATH IS REQUIRED.
LCRA ACCESS ROUTE WILL NOT BE PAVED. ONLY A CLEAR, GRADED AND STABILISED PATH IS REQUIRED.
BLISS SPILLAR RD.
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BEGIN CSJ 1200-06-004
℄ 45CL STA 212+86.00
END INCIDENTAL CONSTRUCTION
CSJ 1200-06-004
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NOTE: REFER TO THE "PROHIBITED ACTIVITY LAYOUT" FOR ADDITIONAL INFORMATION REGARDING THE LIMITS FOR CONSTRUCTION EXCLUSION ZONES AND THE AREAS WITH PROHIBITED ACTIVITIES.
LEGEND
KARST SENSITIVE FEATURE
KARST SENSITIVE FEATURE CONTRIBUTING DRAINAGE AREA
KARST SENSITIVE FEATURE BUFFER ZONE
REVISION
BY
DATE
Robert Carrillo, P.E.
80169
6/9/2016
CENTRAL TEXAS Regional Mobility Authority
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
SH 45 SW
PROJECT LAYOUT
SH 45
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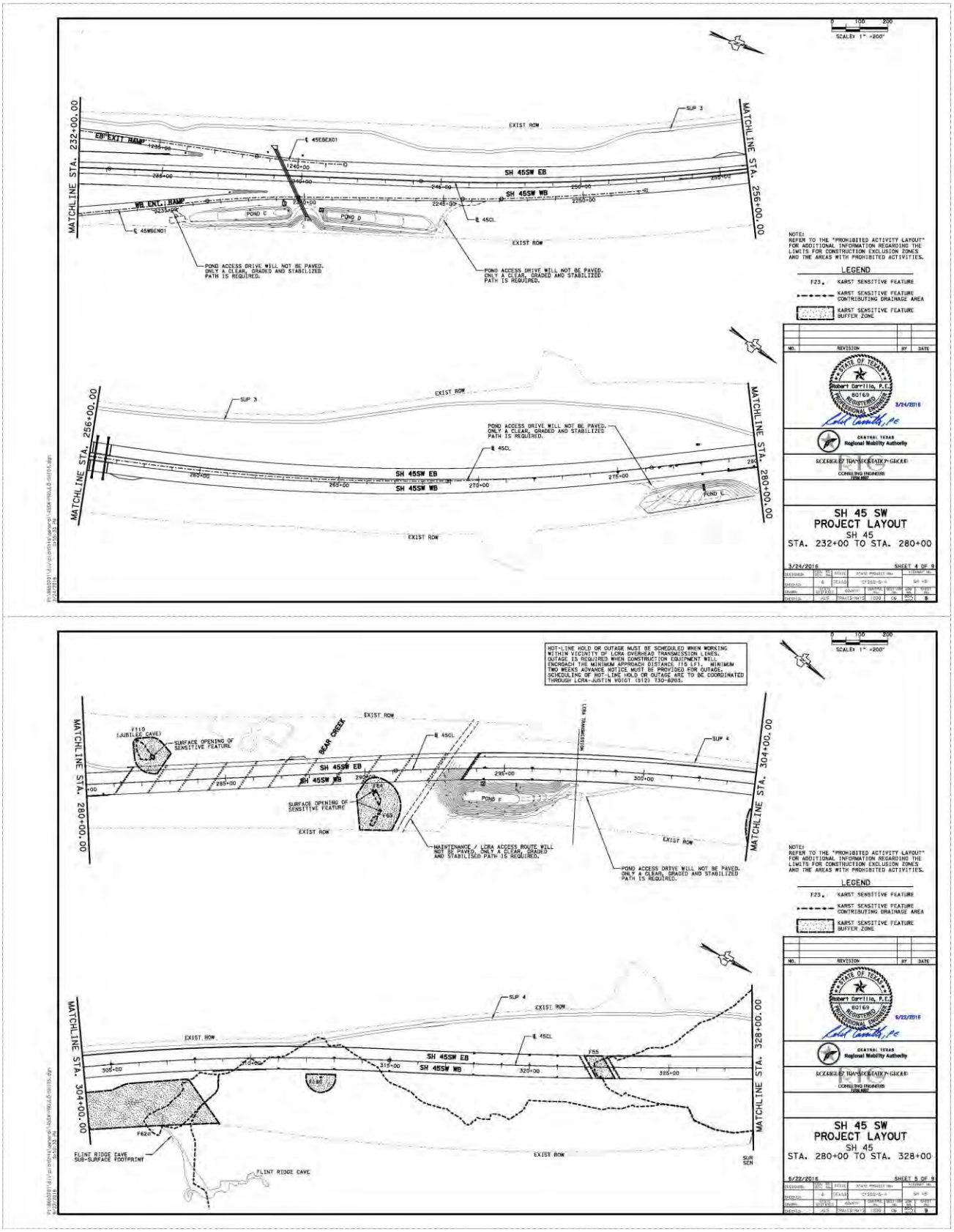
6/9/2016
SHEET 3 OF 9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MATCHLINE STA. 256+00.00
MATCHLINE STA. 280+00.00
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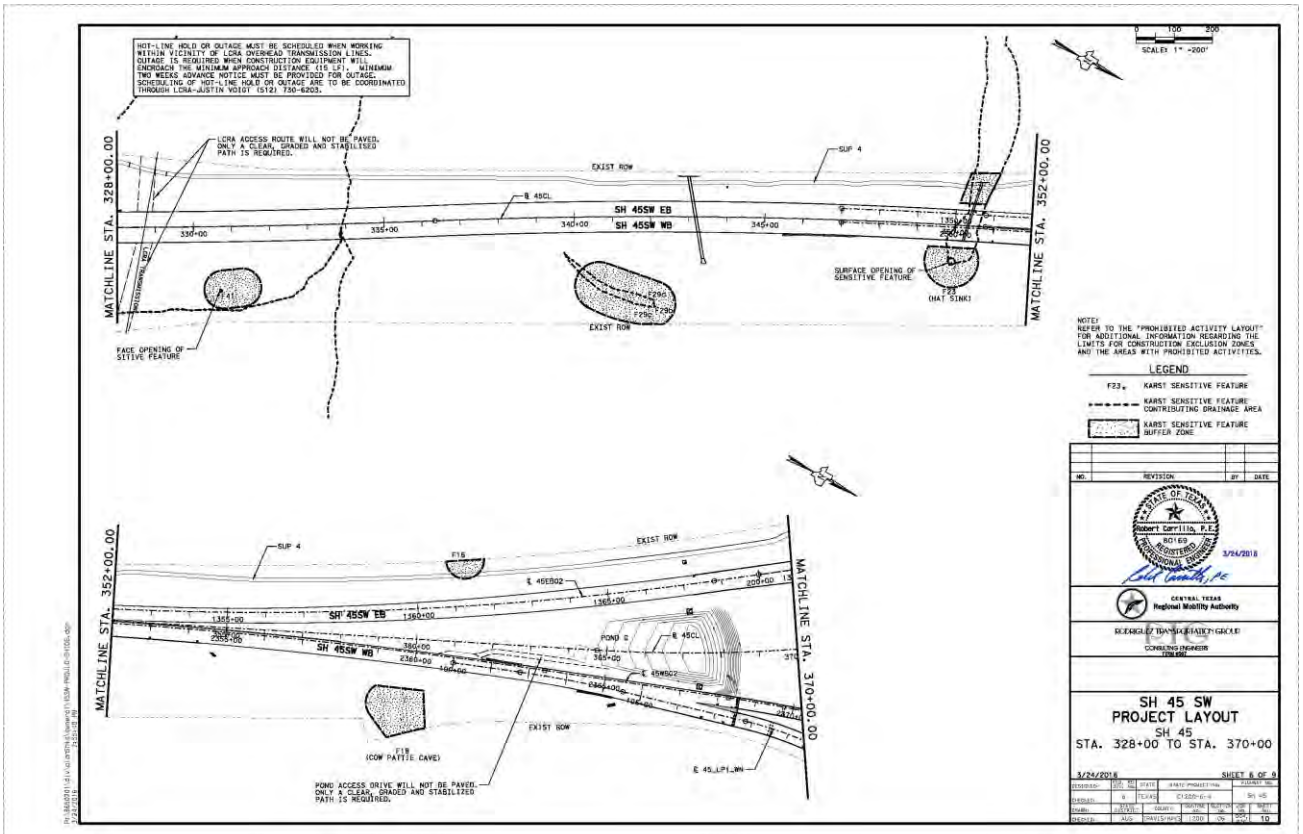
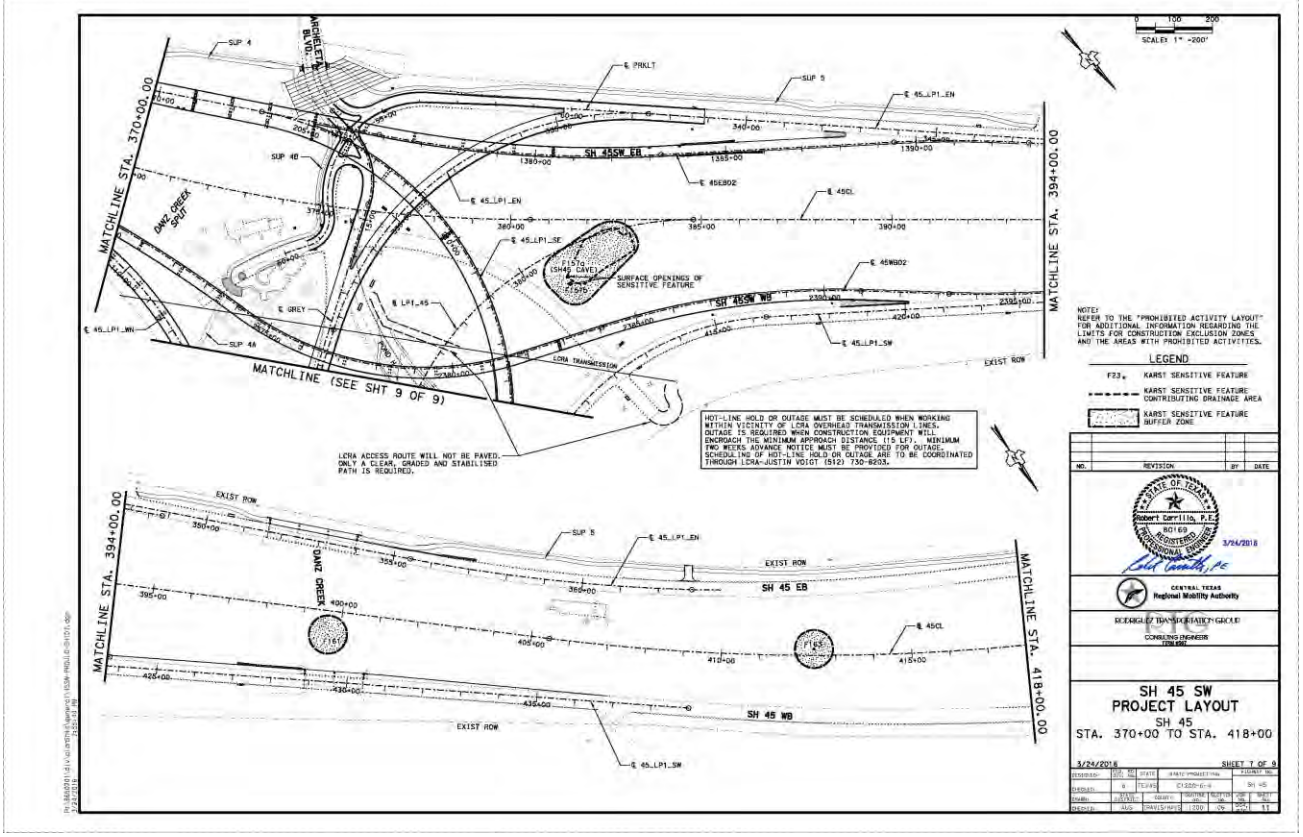
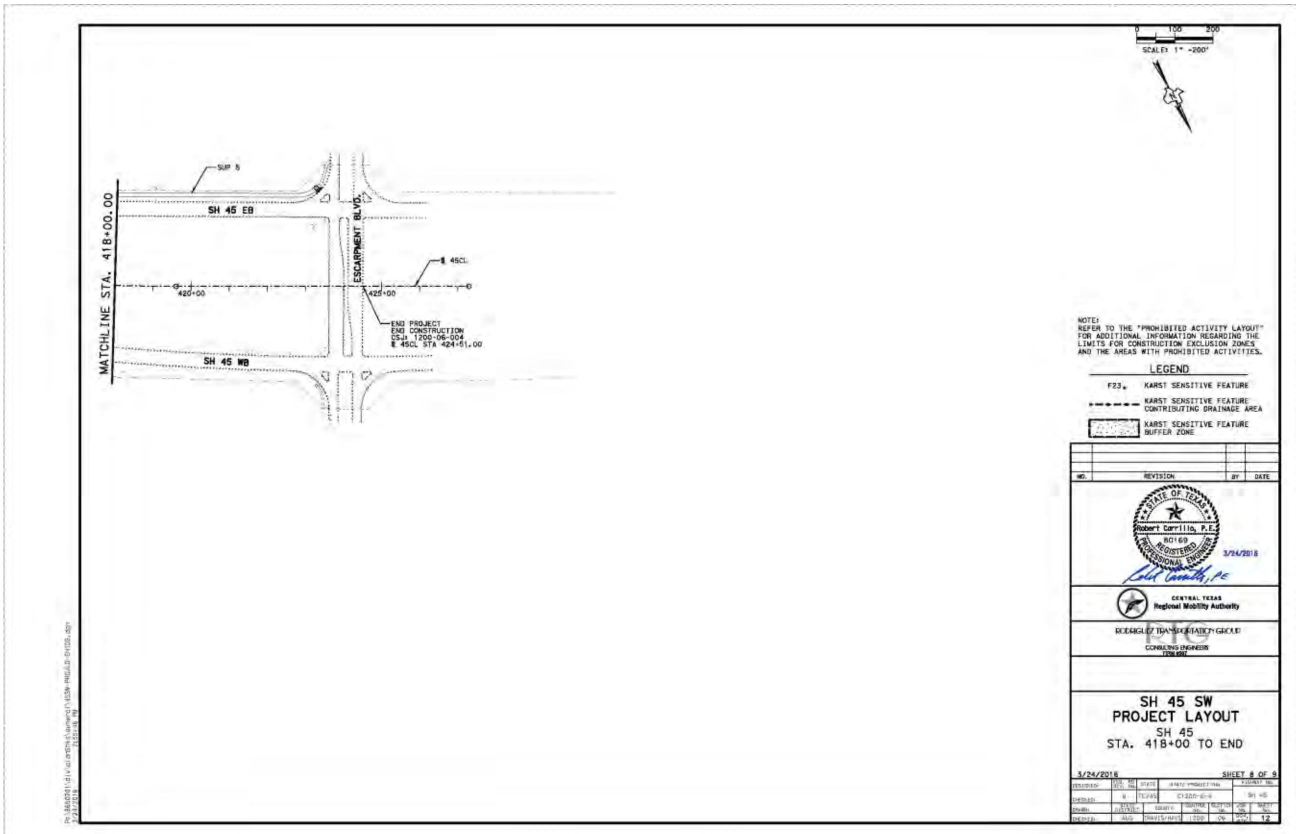
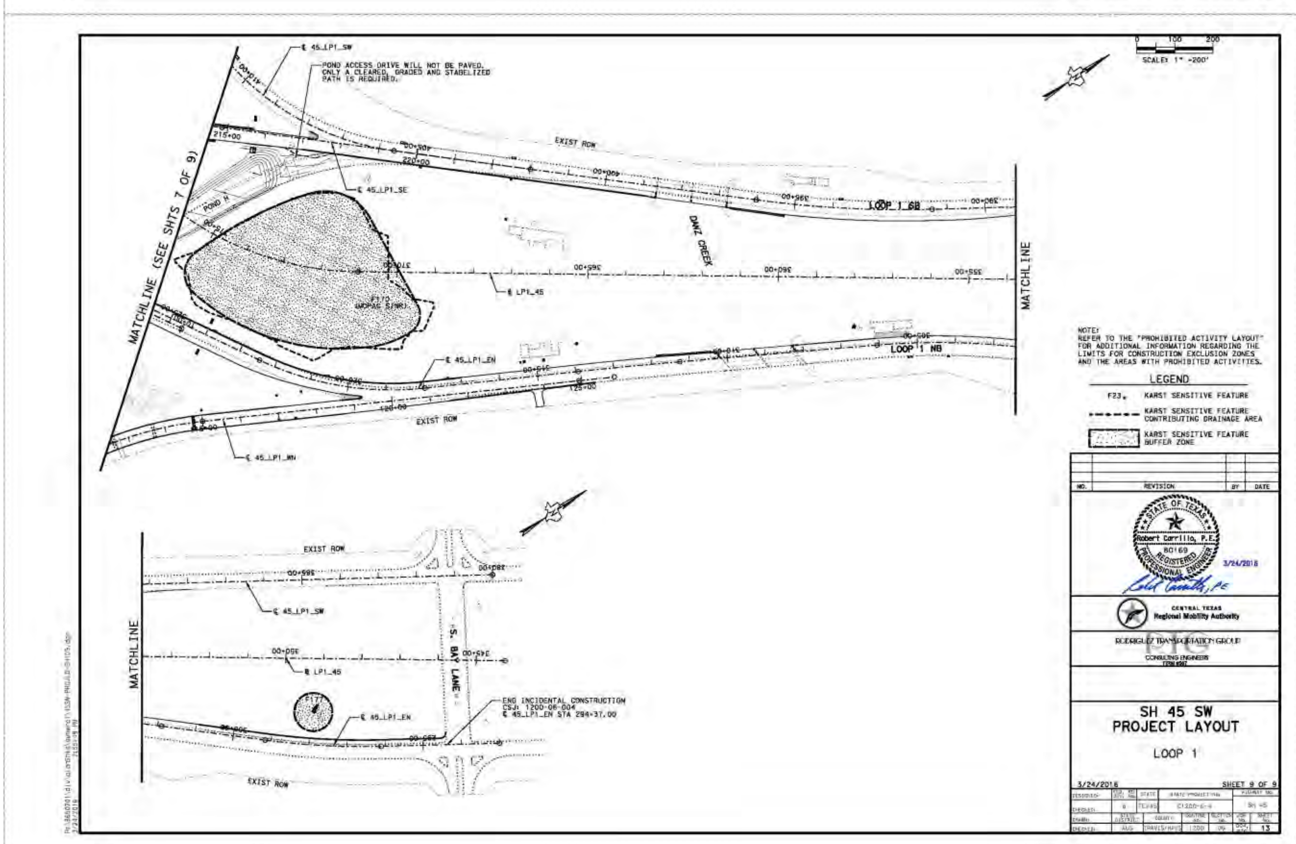
WB ENT. RAMP
SH 45SW EB
SH 45SW WB
EXIST ROW
SUP 3
POND C
POND D
POND E
POND ACCESS DRIVE WILL NOT BE PAVED. ONLY A CLEAR, GRADED AND STABILIZED PATH IS REQUIRED.
SCALE 1" =200'
LEGEND
KARST SENSITIVE FEATURE
KARST SENSITIVE FEATURE CONTRIBUTING DRAINAGE AREA
KARST SENSITIVE FEATURE BUFFER ZONE
SH 45 SW
PROJECT LAYOUT
SH 45
STA. 232+00 TO STA. 280+00
3/24/2016
SHEET 4 OF 9
MATCHLINE STA. 280+00.00
MATCHLINE STA. 304+00.00
MATCHLINE STA. 328+00.00
HOT-LINE HOLD OR OUTAGE MUST BE SCHEDULED WHEN WORKING WITHIN VICINITY OF LCRA OVERHEAD TRANSMISSION LINES. OUTAGE IS REQUIRED WHEN CONSTRUCTION EQUIPMENT WILL ENCROACH THE MINIMUM APPROACH DISTANCE (15 LF). MINIMUM TWO WEEKS ADVANCE NOTICE MUST BE PROVIDED FOR OUTAGE. SCHEDULING OF HOT-LINE HOLD OR OUTAGE ARE TO BE COORDINATED THROUGH LCRA-JUSTIN VOIGT (512) 730-8265.
F119 (JUBILEE CAVE)
SURFACE OPENING OF SENSITIVE FEATURE
BEAR CREEK
MAINTENANCE / LCRA ACCESS ROUTE WILL NOT BE PAVED, ONLY A CLEAR, GRADED AND STABILISED PATH IS REQUIRED.
F620
FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT
FLINT RIDGE CAVE
SH 45 SW
PROJECT LAYOUT
SH 45
STA. 280+00 TO STA. 328+00
6/22/2016
SHEET 5 OF 9


HOT-LINE HOLD OR OUTAGE MUST BE SCHEDULED WHEN WORKING WITHIN VICINITY OF LCRA OVERHEAD TRANSMISSION LINES. OUTAGE IS REQUIRED WHEN CONSTRUCTION EQUIPMENT WILL ENCROACH THE MINIMUM APPROACH DISTANCE (15 LF). MINIMUM TWO WEEKS ADVANCE NOTICE MUST BE PROVIDED FOR OUTAGE. SCHEDULING OF HOT-LINE HOLD OR OUTAGE ARE TO BE COORDINATED THROUGH LCRA-JUSTIN VOIGT (512) 730-6203.
LCRA ACCESS ROUTE WILL NOT BE PAVED. ONLY A CLEAR, GRADED AND STABILISED PATH IS REQUIRED.
MATCHLINE STA. 328+00.00
MATCHLINE STA. 352+00.00
SH 45SW EB
SH 45SW WB
EXIST ROW
SURFACE OPENING OF SENSITIVE FEATURE
(HAT SINK)
RACE OPENING OF SITIVE FEATURE
MATCHLINE STA. 370+00.00
POND 2
F18
(COW PATTIE CAVE)
POND ACCESS DRIVE WILL NOT BE PAVED. ONLY A CLEAR, GRADED AND STABILIZED PATH IS REQUIRED.
SCALE 1" =200'
NOTE: REFER TO THE "PROHIBITED ACTIVITY LAYOUT" FOR ADDITIONAL INFORMATION REGARDING THE LIMITS FOR CONSTRUCTION EXCLUSION ZONES AND THE AREAS WITH PROHIBITED ACTIVITIES.
LEGEND
KARST SENSITIVE FEATURE
KARST SENSITIVE FEATURE CONTRIBUTING DRAINAGE AREA
KARST SENSITIVE FEATURE BUFFER ZONE
NO. REVISION BY DATE
STATE OF TEXAS
Robert Carrillo, P.E.
80169
REGISTERED PROFESSIONAL ENGINEER
3/24/2018
CENTRAL TEXAS Regional Mobility Authority
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEER
SH 45 SW
PROJECT LAYOUT
SH 45
STA. 328+00 TO STA. 370+00
3/24/2018
SHEET 6 OF 9


MATCHLINE STA. 370+00.00
MATCHLINE STA. 394+00.00
MATCHLINE STA. 418+00.00
SH 45SW EB
SH 45SW WB
SH 45 EB
SH 45 WB
DANZ CREEK
DANZ CREEK SPUR
ARCHIE LEAL BLVD.
F157
(SH45 CAVE)
SURFACE OPENINGS OF SENSITIVE FEATURE
MATCHLINE (SEE SHT 9 OF 9)
LCRA TRANSMISSION
LCRA ACCESS ROUTE WILL NOT BE PAVED. ONLY A CLEAR, GRADED AND STABILISED PATH IS REQUIRED.
HOT-LINE HOLD OR OUTAGE MUST BE SCHEDULED WHEN WORKING WITHIN VICINITY OF LCRA OVERHEAD TRANSMISSION LINES. OUTAGE IS REQUIRED WHEN CONSTRUCTION EQUIPMENT WILL ENCROACH THE MINIMUM APPROACH DISTANCE (15 LF). MINIMUM TWO WEEKS ADVANCE NOTICE MUST BE PROVIDED FOR OUTAGE. SCHEDULING OF HOT-LINE HOLD OR OUTAGE ARE TO BE COORDINATED THROUGH LCRA-JUSTIN VOIGT (512) 730-6203.
SCALE 1" =200'
NOTE: REFER TO THE "PROHIBITED ACTIVITY LAYOUT" FOR ADDITIONAL INFORMATION REGARDING THE LIMITS FOR CONSTRUCTION EXCLUSION ZONES AND THE AREAS WITH PROHIBITED ACTIVITIES.
LEGEND
KARST SENSITIVE FEATURE
KARST SENSITIVE FEATURE CONTRIBUTING DRAINAGE AREA
KARST SENSITIVE FEATURE BUFFER ZONE
NO. REVISION BY DATE
STATE OF TEXAS
Robert Carrillo, P.E.
80169
REGISTERED PROFESSIONAL ENGINEER
3/24/2018
CENTRAL TEXAS Regional Mobility Authority
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEER
SH 45 SW
PROJECT LAYOUT
SH 45
STA. 370+00 TO STA. 418+00
3/24/2018
SHEET 7 OF 9


SCALE: 1" = 200'
SH 45 EB
SH 45 WB
MATCHLINE STA. 418+00.00
ESCARPMENT BLVD.
END PROJECT
END CONSTRUCTION
CSJ: 1200-06-004
℄ 45CL STA 424+51.00
NOTE:
REFER TO THE "PROHIBITED ACTIVITY LAYOUT" FOR ADDITIONAL INFORMATION REGARDING THE LIMITS FOR CONSTRUCTION EXCLUSION ZONES AND THE AREAS WITH PROHIBITED ACTIVITIES.
LEGEND
KARST SENSITIVE FEATURE
KARST SENSITIVE FEATURE CONTRIBUTING DRAINAGE AREA
KARST SENSITIVE FEATURE BUFFER ZONE
Robert Carrillo, P.E.
80169
3/24/2016
CENTRAL TEXAS Regional Mobility Authority
RODRIGUEZ TRANSPORTATION GROUP
SH 45 SW
PROJECT LAYOUT
SH 45
STA. 418+00 TO END
SHEET 8 OF 9


SCALE: 1" = 200'
POND ACCESS DRIVE WILL NOT BE PAVED. ONLY A CLEARED, GRADED AND STABILIZED PATH IS REQUIRED.
EXIST ROW
LOOP 1 SB
LOOP 1 NB
DANZ CREEK
MATCHLINE (SEE SHTS 7 OF 9)
MATCHLINE
S. BAY LANE
END INCIDENTAL CONSTRUCTION
CSJ: 1200-06-004
NOTE:
REFER TO THE "PROHIBITED ACTIVITY LAYOUT" FOR ADDITIONAL INFORMATION REGARDING THE LIMITS FOR CONSTRUCTION EXCLUSION ZONES AND THE AREAS WITH PROHIBITED ACTIVITIES.
LEGEND
KARST SENSITIVE FEATURE
KARST SENSITIVE FEATURE CONTRIBUTING DRAINAGE AREA
KARST SENSITIVE FEATURE BUFFER ZONE
Robert Carrillo, P.E.
80169
3/24/2016
CENTRAL TEXAS Regional Mobility Authority
RODRIGUEZ TRANSPORTATION GROUP
SH 45 SW
PROJECT LAYOUT
LOOP 1
SHEET 9 OF 9

ATTACHMENT C

Toll Facilities and ITS Responsibility Matrix

State Highway 45 SW Project

Responsibility Assignment Legend			
Primary Responsibility: P	**Support Responsibility: S**	**Coordination Responsibility Only: C**	**No Responsibility: N**

Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
GENERAL REQUIREMENTS							
Schedule	**N**	**P**	**P**	S	S	S	Contractor must accommodate and incorporate the SI scheduled activities into the project schedule. All schedule changes or updates which impact the SI tasks must be agreed to by the SI prior to submittal to CTRMA. A weekly schedule must be distributed and incorporate any SI updates or changes.
Request for Early Opening	**N**	**P**	**P**	S	S	S	The SI must be able to match schedule request for early opening. SI must be allowed early unencumbered access in order to meet early opening request.
Design Package – Installation and Electrical Design and Plans	**P**	**P**	**P**	C	N	C	Designer to incorporate all SI requirements and specifications into Structural and Electrical Design Packages. Contractor will coordinate installation activities with SI.
Grading	**N**	**P**	**P**	C	N	C	
Drainage		**S**	**P**	C	N	C	No culverts or pipes under tolling zones.
Utilities/Electrical Services	**P**	**P**	**P**	S	C	C	SI to provide specific power requirements for the Toll System to the Contactor. The contractor is to incorporate the toll facilities design and construct power utilities interface, and all power infrastructure. Contractor to provide power to the Toll System pad and ITS locations. SI to terminate power to their sites."
Traffic Control/Safe work zone	**N**	**P**	**P**	S	N	C	SI to provide contractor detailed lane closure requirements and schedule for installation and testing.
Signing	**N**	**P**	**P**	C	N	S	All toll signing must be coordinated with and approved by CTRMA.
Striping	**N**	**P**	**P**	S	N	C	SI to coordinate striping with pavement loop locations. Contractor to coordinate with SI for loops installation and striping sequencing.
Lighting		**P**	**P**	S	C	S	Roadway and toll location lighting provided by contractor. SI to provide lighting requirements in vicinity of toll locations and locations of other Toll System equipment. Contractor to confirm that lighting does not obstruct toll

Responsibility Assignment Legend							
Primary Responsibility: P	**Support Responsibility: S**		**Coordination Responsibility Only: C**			**No Responsibility: N**	
Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
							related signing or impede the Toll System.
Landscaping	**P**	**P**	**P**	C	N	N	
Fencing/Guardrail/Bollards /Concrete Barrier	**P**	**P**	**P**	S	C	C	SI to provide requirements for specific equipment clearances for Toll System. Designer to incorporate into roadway design. SI to confirm that design plans meet requirements.
TOLL SYSTEM: LOCATIONS, LAYOUTS, STRUCTURES, MOUNTS/BRACKETS							
Locations and Layouts	**P**	**P**	**P**	S	C	C	SI to provide specific locations for the Toll System. SI to provide requirements for specific lane and facility layouts. Designer to incorporate into Design Packages. The contractor will coordinate with SI during the installation activity.
Gantries/Foundation/Trusses/Junction boxes/Conduits/Grounding	**P**	**P**	**P**	S	C	S	SI to provide requirements for conduits (for SI installed power and communications cables, including specific requirement for below ground conduits for the loops), junction boxes, and power needs for the Toll System. The Designer to incorporate into structural design, including electrical grounding, bonding. Contractor to provide and install junction boxes and conduit pull strings and bell ends for all conduits up to one foot above pole and gantry foundation. The contractor will require SI to sign off on below ground conduits for the loops prior to installation of special pavement structure.
Gantries/Foundation/Trusses/Junction boxes/Conduits/Grounding	N	**P**	**P**	S	C	S	Contractor will provide conduits/wire ways on all the toll gantries for all the SI equipment.
Equipment Mounts on Brackets/Frames	S	N	**P**	**P**	**P**	**P**	SI to procure and install all Toll System equipment mounts, and related cable and wiring, including communications from roadside cabinets to the equipment mounted on the gantries. SI to provide requirements for all brackets and frames needed to attach SI procured equipment. Contractor to furnish and install necessary brackets (i.e. Trapeze) as per

Responsibility Assignment Legend							
Primary Responsibility: P	**Support Responsibility: S**		**Coordination Responsibility Only: C**			**No Responsibility: N**	
Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
							SI requirements
Equipment Brackets/Frames on Gantries	S	**P**	**P**	S	N	S	The contractor is to provide and install all brackets and frames needed to attach all SI procured equipment. SI to provide locations for installation to the contractor. SI to provided requirements for hanger and orientation of hanger mount to Gantries
Pavement structure, including special nonferrous zones and conduit stub-outs for in-pavement sensors/loops	**P**	**P**	**P**	S	N	C	SI to provide requirements for special pavement structure at toll gantry areas. SI shall coordinate joint spacing to avoid conflicts with loop placement and sign off on riser locations before concrete pour. Contractor to assure ferrous objects (i.e. rebar, grates, pipes, etc.) are not in toll revenue collection detection system(s) zone of influence. Contractor to located loop risers after pavement is poured.
EQUIPMENT CABINETS							
Toll Equipment Cabinets	C	C	S	S	**P**	**P**	SI to provide size and number of cabinets needed for Toll System. Contractor shall incorporate location into site grading and drainage. SI to procure and install environmentally controlled cabinets. The environmentally controlled enclosures provided by SI must comply with the America Society of Heating, Refrigeration, and Air Conditioning Engineers: Thermal Guidelines for Data Processing Environments. Contractor to provide traffic control devices and safe working conditions for SI during installation of all toll equipment.

Responsibility Assignment Legend			
Primary Responsibility: P	**Support Responsibility: S**	**Coordination Responsibility Only: C**	**No Responsibility: N**

Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
Toll Equipment Cabinets Site (TEC) and Roadside Equipment Cabinet Base Slabs	**P**	**P**	**P**	S	N	S	SI to provide requirements for specific equipment weight and anchorages for cabinets to the Contractor. Contractor to incorporate into Roadway Design. Contractor to install slabs with conduit plumbing.
Security Communications at Toll System locations	C	N	C	**P**	**P**	**P**	SI to provide security communications for all toll system equipment. Contractor to provided physical security fence as required by SI around TEC/Generators and Auxiliary fuel tanks
Facility Security	P	P	P	**S**	**C**	**C**	Designer to incorporate into the Roadway Design. Contractor to provided physical security fence as required by SI around TEC/Generators and Auxiliary fuel tanks
TOLL SUB-SYSTEMS							
Automatic Vehicle Identification (AVI) Antennas and Readers	N	N	S	**P**	**P**	**P**	SI to provide AVI System Mounts, Wiring and Cables. SI will perform all AVI system installation and terminations, and to make the connections to the electronics in the cabinets.
Automatic Vehicle Classification and Detection (AVC) and (AVD)	N	N	S	**P**	**P**	**P**	SI to install, connect and terminate AVC and/or AVD System mounted on the gantries and/or installed in the pavement to the electronics in the cabinets.
In-Pavement Sensors/Loops	N	N	S	**P**	**P**	**P**	SI to saw cut pavement, procure, install, and seal pavement sensors with approved sealant. Contractor to assure ferrous objects (i.e. rebar, grates, etc.) are not in toll collection detection system(s) zone of influence. Contractor to assure longitudinal and Transverse pavement joints in the non-ferrous pavement section in the Toll Zone do not conflict with SI conduit stub-up array in pavement section.
Video Capture Sub-System (VCS/VES) Cameras, Illumination, Sensors and Servers	N	N	S	P	P	P	SI to provide, install, terminate all Video Capture Sub-System (VCS/VES) equipment.
In-Lane Processing Servers and Electronics	N	N	N	**P**	**P**	**P**	SI to provide, installs, connects, and terminates all electronics in the cabinet and assures proper communications to the devices on the gantry and/or in the pavement.

Responsibility Assignment Legend			
Primary Responsibility: P	**Support Responsibility: S**	**Coordination Responsibility Only: C**	**No Responsibility: N**

Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
POWER DISTRIBUTION SUB-SYSTEM							
Metered power service at each location:	**N**	**P**	**P**	C	N	C	SI to provide power requirements and special requirements for construction of utilities near each Toll System. Contractor to provide and install necessary conductors, ducts and junction/pull boxes, bell ends/pull strings and disconnect switch/fuse at the meter. Contractor is responsible for wiring up to the ATS.
Metered power service at each toll location:	C	N	C	**P**	**P**	**P**	The SI shall provide and install all other wiring, switches, surge protection/suppression, etc. for power from the ATS at the toll pad for the Toll System equipment. SI will terminate all power wiring for all branch circuits off the Service Panel to the Toll Site.
Generators and Automatic Transfer Switches (ATS)	S	N	C	**P**	**P**	**P**	SI to provide generators, ATS, generator cabinets, wiring, connect and terminate all power at the Toll System sites.
Generator Power Source is propane	S	N	C	**P**	**P**	**P**	The SI shall provide, and install the propane tank for the generator. Contractor will provide pad and conduit feed for propane fuel tank (10' minimum from generator).
Uninterruptible Power Supplies (UPS)	S	N	C	**P**	**P**	**P**	SI to provide and install Uninterruptible Power Supply Systems (UPS) in the cabinets. UPS will be required for the Toll System.
Lightning Protection and Grounding	**N**	**P**	**P**	S	C	C	SI to provide specific requirements for equipment lightning protection and grounding. Contractor to furnish and install required lightning protection and grounding.
COMMUNICATIONS SUB-SYSTEMS							

Responsibility Assignment Legend							
Primary Responsibility: P	**Support Responsibility: S**		**Coordination Responsibility Only: C**			**No Responsibility: N**	
Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
Conduits/Ducts and Junction/Pull Boxes/Outlets	**C**	**P**	**P**	S	C	S	SI to provide specific Communications design requirements including location of long-radius sweep conduit bends. Contractor to incorporate into the roadway design. The contractor will install including conduits, junction boxes, bell ends with pull strings. The Contractor shall verify that all ducts bank and conduits are clear and have pull strings prior to the beginning of the Toll System installation.
Fiber Optic cabling in conduits for Toll System	S	S	S	**P**	**P**	**P**	SI to provide fiber requirements for Toll System. Contractor to incorporate into design of backbone and laterals. SI to furnish and install along the corridor from communication hub to cabinets.
Toll Hardware in Cabinets	C	N	C	**P**	**P**	**P**	SI to provide and install all toll hardware within the cabinets. Equipment must be installed in a clean and organized manner and must not be affected by the environmental controls. The SI must provide and install the redundant environmental controls.
Routers	C	N	C	**P**	**P**	**P**	SI to provide, install and configure the routers for connection from hub locations to the Mobility Authority's Traffic Management Center. (TMC)
Hubs	N	N	C	**P**	**P**	**P**	If applicable.
Switches	N	N	C	**P**	**P**	**P**	SI to provide, install and configure the switches for connection from tolling to hub locations.
Firewalls	N	N	C	**P**	**P**	**P**	SI to provide, install and configure the necessary firewall for the toll system
Patch/Distribution Panels	N	N	C	**P**	**P**	**P**	SI to provide and install all the necessary patch and distribution panels to provide Fault Tolerant Single Mode Fiber Optic IP-Based Communication System.
Corridor Communications System	S	N	C	**P**	**P**	**P**	SI to provide Fault Tolerant Single Mode Fiber Optic IP-Based Communication System for Toll Revenue Collection Systems.

Responsibility Assignment Legend							
Primary Responsibility: P	**Support Responsibility: S**		**Coordination Responsibility Only: C**			**No Responsibility: N**	
Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
Corridor to Traffic Management Center(TMC)	N	N	N	**P**	**P**	**P**	SI to provide Fault Tolerant IP-Based Communication System to the TMC for Toll Revenue Collection Systems.
Data/Communications Service to each Tolling Location	N	N	N	**P**	**P**	**P**	SI to install any power and communications cable required to interface between the Toll Cabinet and the Communications Service Provider's POI. Contractor is responsible for the conduit infrastructure to provide a raceway from the Toll Pad to the Service POI
SYSTEMS SERVERS AND SPACE							
Toll Collection Systems Computer(s)	N	N	N	**P**	**P**	**P**	
Support Equipment at CTRMA Offices	N	N	N	**P**	**P**	**P**	SI to provide data and power wiring schematics, equipment rack/cabinet requirement, and elevations, layouts, floor plans, air flow diagrams, and environmental controls load calculations, electrical power distribution, including grounding, bonding, lightning protection, panel boards, TVSS, circuit breakers conduit, conductors, j-boxes, receptacles.
Systems Servers and Workstations	N	N	C	**P**	**P**	**P**	SI to provide, install and configure all system servers and workstations required at the TMC to support the operations and management of the Project.
Federal Communication Commission License Preparation and Submission	C	N	N	**P**	**P**	**P**	SI to provide all information necessary to acquire FCC Licensing to the Mobility Authority.

Responsibility Assignment Legend			
Primary Responsibility: P	**Support Responsibility: S**	**Coordination Responsibility Only: C**	**No Responsibility: N**

Element/Task/Component/ **Sub-system**	Designer	**Contractor**		Systems Integrator **(SI)**			Comments **Other Responsibility/Information**
	Design	**Procure**	**Install/ Construct**	**Design**	**Procure**	**Install / Construct**	
DUCT BANK AND INTELLIGENT TRANSPORTATION SYSTEMS (ITS)							
New Duct bank	**P**	**P**	**P**	C	C	C	SI to provide requirements for new duct bank. Designer to incorporate into roadway design. SI to confirm that design plans meet requirements.
Fiber Installation	**N**	**C**	**C**	**P**	**P**	**P**	SI to provide, install and test the fiber.
Traffic Detection System (TDS) and CCTV Cameras: Pole/Post-Mounts, supports, wiring and cables	**N**	**C**	**S**	**P**	**P**	**P**	SI to provide requirements for traffic detection ground radar system mounts, conduits, power and data wiring, and cables. SI to procure, install and terminate TDS and CCTV Cameras including all communication and power wiring from the Contractor provided disconnect switch/fuse.
TDS and CCTV Cameras: Pole/Post-Mounts, cabinets, supports, wiring and cables	**N**	**P**	**P**	C	C	S	Contractor to provide and install poles , equipment cabinets, conduits, junction boxes, mounting supports, power wiring to a disconnect switch/fuse located in the base of the pole/post-mount. Contractor to provide pigtails at end of conduit runs.
DMS foundations, conduits, grounding, DMS support structure, and electrical services	**P**	**P**	**P**	S	C	C	
DMS, communications, and equipment enclosures	**S**	**N**	**S**	P	P	P	

ATTACHMENT D

Fixed Price Tolling Standards

State Highway 45 SW Project

ATTACHMENT D
FIXED PRICE TOLLING STANDARDS

CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE TOLLING STANDARDS
2 - 4 LANES

ISSUED: NOVEMBER 2013

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY - NOVEMBER 2013 ALL RIGHTS RESERVED

STANDARD PLANS & GUIDELINES

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4	ABB-1	ABBREVIATIONS
5	S-1	SYMBOLS USED
6	TC-1	TERMS AND CONDITIONS
7	ETC-1	EXAMPLE ETC CONFIGURATION
8	ETC-2	EXAMPLE ETC CONFIGURATION
9	ETC-3	EXAMPLE ETC CONFIGURATION
10	TES-1	TOLL EQUIPMENT SITE PLACEMENT DETAILS
11	P1-ML	MAIN LANE PAVEMENT JOINTING PLAN AND GROUND BOX LAYOUT
12	P1-RMP	RAMP PAVEMENT JOINTING PLAN AND GROUND BOX LAYOUT
13	P2-ML	GROUND BOX PLACEMENT AND CONDUIT RISER LOCATION (MAIN LANES)
14	P2-RMP	GROUND BOX PLACEMENT AND CONDUIT RISER LOCATION (RAMPS)
15	G1-ML	MAIN LANE GANTRY CROSS-LANE TANGENT ELEVATION VIEW
16	G2-RMP	RAMP GANTRY CROSS-LANE TANGENT ELEVATION VIEW
17	MG-1	TOLL GANTRY MISCELLANEOUS DETAILS
18	LP-1	LIGHTNING PROTECTION SYSTEM DETAILS
19	A1-A4	CONDUIT RISER DETAILS
20	DETAIL E1	TOLL GANTRY ELECTRICAL SINGLE-LINE DRAWING
21	DW-1	DRIVEWAY DETAIL
22	TAJ-1	TERMINAL ANCHOR JOINT - JOINTED
23	CATD-1	CONCRETE TO ASPHALT TRANSITION DETAIL
24	JC-1	JOINTED CONCRETE PAVEMENT

INTERIM REVIEW ONLY
Document Incomplete; not intended for permit, bidding or construction.
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420

CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS
INDEX OF
SHEETS

DESIGNED BY:	CSJ. NO./DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
	6		2
DRAWN BY:	STATE	DIST.	COUNTY
DW	TEXAS	AUS	
CHECKED BY:	CONT.	SECT.	JOB / HIGHWAY NO.
RK			

GENERAL NOTES

1 REFERENCE SHEET: THE SYSTEM INTEGRATOR SHALL PROVIDE A SUMMARY STATION AND OFFSET TABLE FOR ALL OF THE FOLLOWING FOR EACH GANTRY LOCATION:

AVDS & AVC ENTRY, MIDDLE, EXIT, AND AXLE CONDUIT RISERS (IF NECCESSARY)
AVDS & AVC ENTRY, MIDDLE, EXIT, AND AXLE LOOPS (IF NECCESSARY)

2 REFERENCE SHEET: THE DESIGN BUILDER SHALL PROVIDE A SUMMARY STATION AND OFFSET TABLE FOR ALL OF THE FOLLOWING FOR EACH GANTRY LOCATION:

GANTRY COLUMNS & TRUSSES
PAVEMENT SECTION JOINTS (JOINTS SHALL BE DESIGNED SO THAT NO LOOP CROSSES ANY JOINT)

3 TXDOT ELECTRICAL DETAIL SHEETS SHALL APPLY.

4 NATIONAL ELECTRIC CODE (NEC), NFPA 780, NESC REQUIREMENTS SHALL APPLY

5 TXDOT ITEM 618 SHALL GOVERN FOR ALL CONDUIT REQUIREMENTS

6 TXDOT ITEM 620 SHALL GOVERN FOR ALL ELECTRICAL CONDUCTOR REQUIREMENTS

7 TXDOT ITEM 624 SHALL GOVERN FOR ALL GROUND BOXES. HS-20 LOAD RATING REQUIREMENTS SHALL GOVERN IN ALL LOCATIONS SUBJECT TO TRAFFIC LOADING.

8 TXDOT ITEM 628 SHALL GOVERN FOR ALL ELECTRICAL SERVICES. THE DESIGN BUILDER SHALL CONTACT RESPECTIVE UTILITY FOR LOCATION OF ELECTRICAL SERVICE.

9 SITE CONDITIONS MAY REQUIRE MODIFICATION TO THE JCP TO EXISTING PAVEMENT TRANSITION.

10 DETAILS ARE SUBJECT TO REVISIONS PERIODICALLY AS REQUIRED BY SYSTEM INTEGRATOR TECHNOLOGIES.

INTERIM REVIEW ONLY
Document incomplete: not intended for permit, bidding or construction.
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420

CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS

GENERAL NOTES

GN-1

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			3
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				

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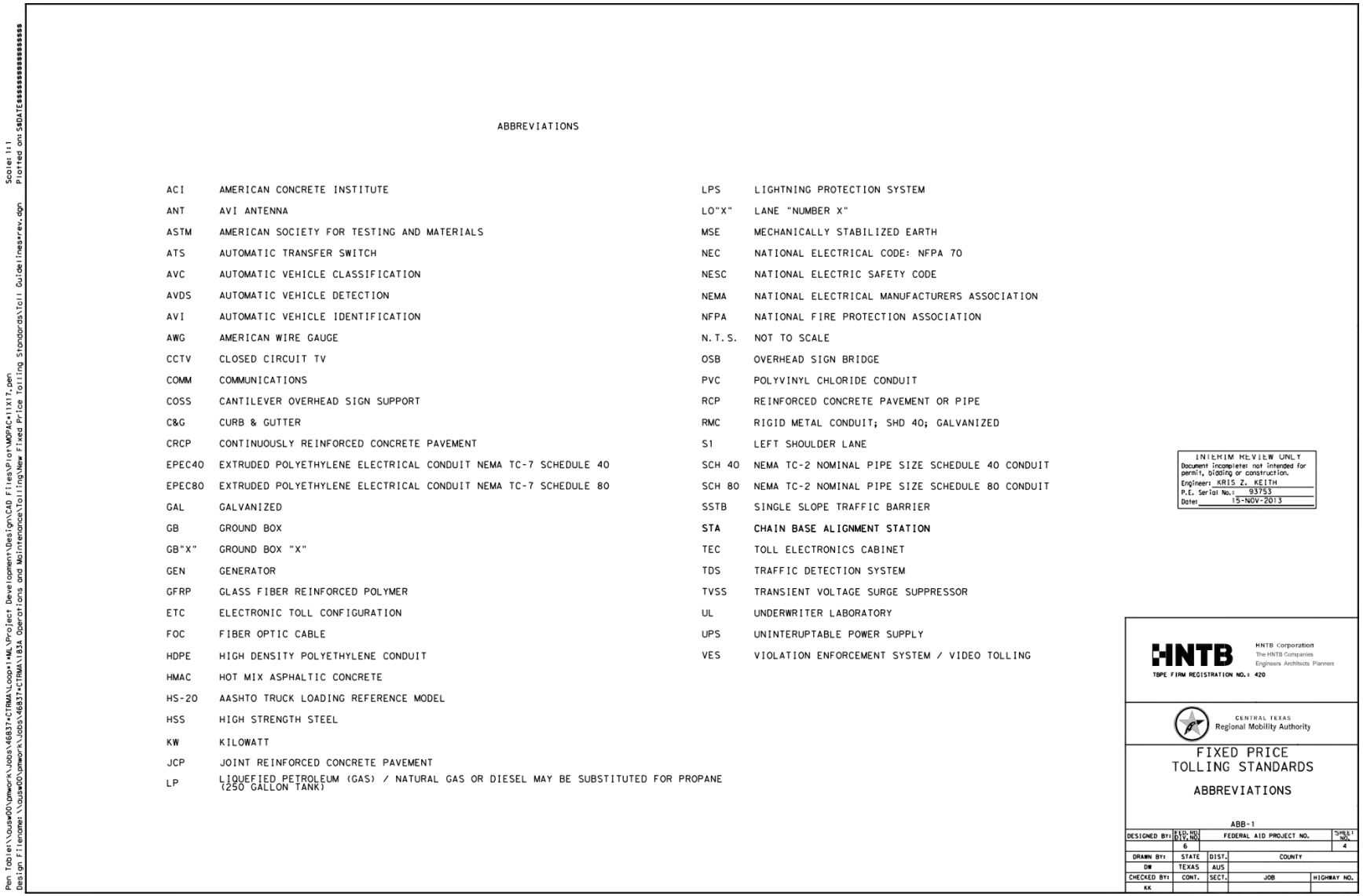

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ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE
ANT	AVI ANTENNA
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATS	AUTOMATIC TRANSFER SWITCH
AVC	AUTOMATIC VEHICLE CLASSIFICATION
AVDS	AUTOMATIC VEHICLE DETECTION
AVI	AUTOMATIC VEHICLE IDENTIFICATION
AWG	AMERICAN WIRE GAUGE
CCTV	CLOSED CIRCUIT TV
COMM	COMMUNICATIONS
COSS	CANTILEVER OVERHEAD SIGN SUPPORT
C&G	CURB & GUTTER
CRCP	CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
EPEC40	EXTRUDED POLYETHYLENE ELECTRICAL CONDUIT NEMA TC-7 SCHEDULE 40
EPEC80	EXTRUDED POLYETHYLENE ELECTRICAL CONDUIT NEMA TC-7 SCHEDULE 80
GAL	GALVANIZED
GB	GROUND BOX
GB"X"	GROUND BOX "X"
GEN	GENERATOR
GFRP	GLASS FIBER REINFORCED POLYMER
ETC	ELECTRONIC TOLL CONFIGURATION
FOC	FIBER OPTIC CABLE
HDPE	HIGH DENSITY POLYETHYLENE CONDUIT
HMAC	HOT MIX ASPHALTIC CONCRETE
HS-20	AASHTO TRUCK LOADING REFERENCE MODEL
HSS	HIGH STRENGTH STEEL
KW	KILOWATT
JCP	JOINT REINFORCED CONCRETE PAVEMENT
LP	LIQUEFIED PETROLEUM (GAS) / NATURAL GAS OR DIESEL MAY BE SUBSTITUTED FOR PROPANE (250 GALLON TANK)
LPS	LIGHTNING PROTECTION SYSTEM
LO"X"	LANE "NUMBER X"
MSE	MECHANICALLY STABILIZED EARTH
NEC	NATIONAL ELECTRICAL CODE: NFPA 70
NESC	NATIONAL ELECTRIC SAFETY CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
N.T.S.	NOT TO SCALE
OSB	OVERHEAD SIGN BRIDGE
PVC	POLYVINYL CHLORIDE CONDUIT
RCP	REINFORCED CONCRETE PAVEMENT OR PIPE
RMC	RIGID METAL CONDUIT; SHD 40; GALVANIZED
S1	LEFT SHOULDER LANE
SCH 40	NEMA TC-2 NOMINAL PIPE SIZE SCHEDULE 40 CONDUIT
SCH 80	NEMA TC-2 NOMINAL PIPE SIZE SCHEDULE 80 CONDUIT
SSTB	SINGLE SLOPE TRAFFIC BARRIER
STA	CHAIN BASE ALIGNMENT STATION
TEC	TOLL ELECTRONICS CABINET
TDS	TRAFFIC DETECTION SYSTEM
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UL	UNDERWRITER LABORATORY
UPS	UNINTERUPTABLE POWER SUPPLY
VES	VIOLATION ENFORCEMENT SYSTEM / VIDEO TOLLING

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TOLLING STANDARDS

ABBREVIATIONS

ABB-1

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	6			4
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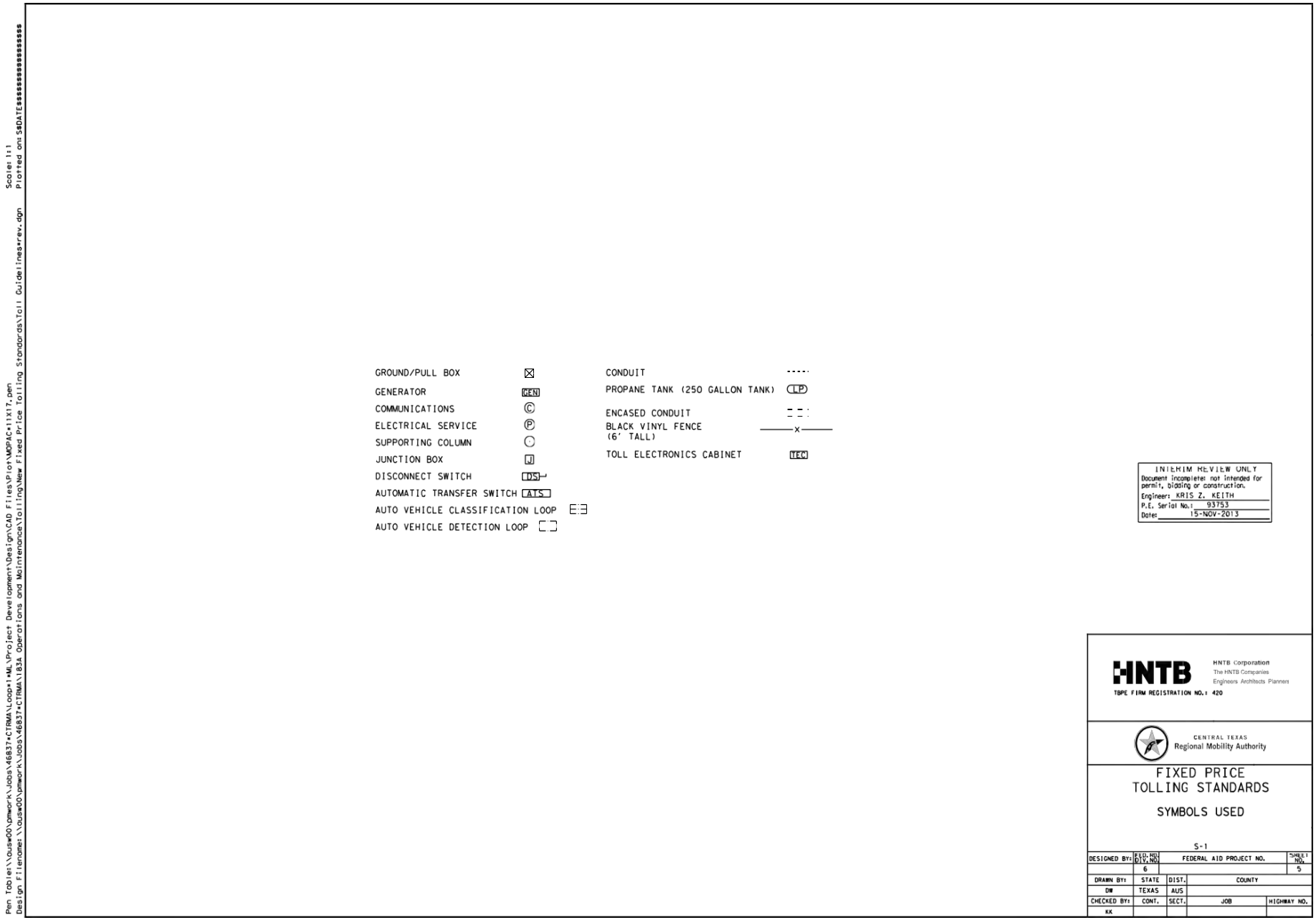
KK				


GROUND/PULL BOX
GENERATOR
GEN
COMMUNICATIONS
ELECTRICAL SERVICE
SUPPORTING COLUMN
JUNCTION BOX
DISCONNECT SWITCH
DS
AUTOMATIC TRANSFER SWITCH
ATS
AUTO VEHICLE CLASSIFICATION LOOP
AUTO VEHICLE DETECTION LOOP
CONDUIT
PROPANE TANK (250 GALLON TANK)
LP
ENCASED CONDUIT
BLACK VINYL FENCE
(6' TALL)
TOLL ELECTRONICS CABINET
TEC
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Regional Mobility Authority
FIXED PRICE
TOLLING STANDARDS
SYMBOLS USED
S-1
DESIGNED BY:
RED. NO./ DIV. NO.
6
FEDERAL AID PROJECT NO.
SHEET NO.
5
DRAWN BY:
DW
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DIST.
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COUNTY
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Scale: 1:1
Plotted on: $$DATE$$$$$$$$$$$$$$$$$$

TERMS & CONDITIONS

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1. MOBILITY AUTHORITY MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH RESPECT TO THE FILE(S) WHICH ARE THE SUBJECT OF THIS AGREEMENT, AND SPECIFICALLY MAKES NO WARRANTY THAT SAID FILE(S) SHALL BE MARKETABLE OR FIT FOR ANY PARTICULAR PURPOSE. FURTHERMORE, ANY DESCRIPTION OF SAID FILE(S) SHALL NOT BE DEEMED TO CREATE AN EXPRESS WARRANTY THAT SUCH FILES SHALL CONFORM TO SAID DESCRIPTION.

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5. MICROSTATION (*.DGN) FILENAMES THAT HAVE A COMPANION PDF ICON CAN BE VIEWED IN ADOBE ACROBAT READER BY CLICKING ON THE PDF ICON. THIS READER CAN BE USED TO PRINT THESE PDF FILES. RECEIVER AGREES THAT MOBILITY AUTHORITY ASSUMES NO RESPONSIBILITIES FOR PRINTING WITH ADOBE. ALSO, RECEIVER AGREES THAT MOBILITY AUTHORITY CANNOT BE HELD RESPONSIBLE FOR ANY PROBLEMS ARISING WITH THE PRINTING OF A PDF FILE.

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8. THE DESIGN FILES STANDARDS ARE COPYRIGHTED BY MOBILITY AUTHORITY AND MAY NOT BE RESOLD.

9. THESE TERMS AND CONDITIONS CONSTITUTE THE COMPLETE AND FINAL AGREEMENT OF THE PARTIES HERETO. RECEIVER ACCEPTS THE AFOREMENTIONED TERMS AND CONDITIONS.

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TERMS AND
CONDITIONS

TC-1

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	6			6
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
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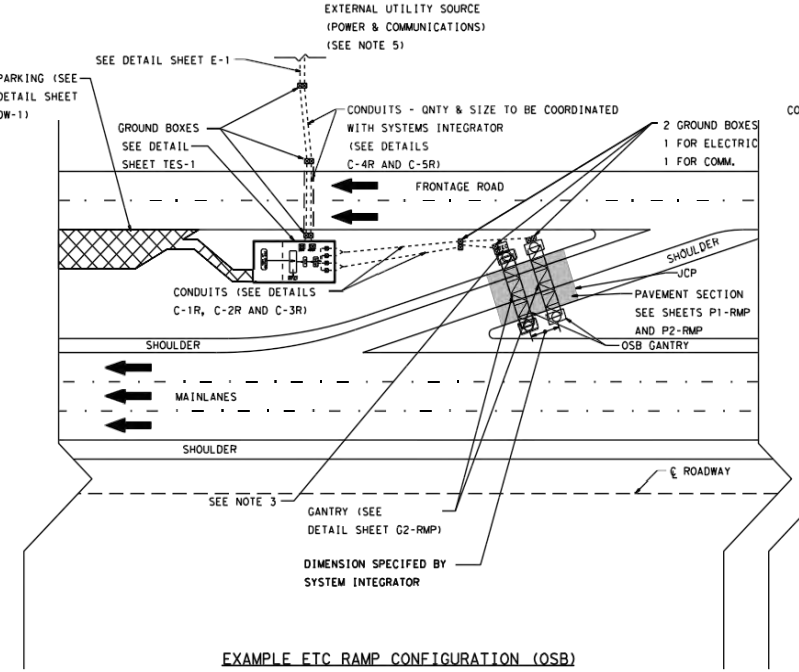
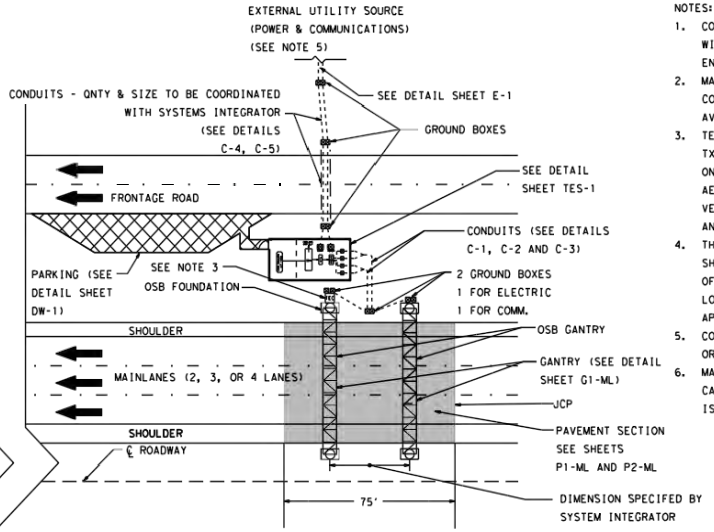
KK				



EXAMPLE ETC RAMP CONFIGURATION (OSB)



EXAMPLE ETC MAIN LANE CONFIGURATION (OSB)

NOTES:

1. CONDUIT BENDS SHALL NOT EXCEED 180° WITHOUT A PULL BOX UNLESS APPROVED BY ENGINEER.
2. MAXIMUM LENGTH OF RUN FROM COMMUNICATION CABINET TO FURTHEST AVI/AVDS IS 125'.
3. TEC TO BE MOUNTED ON COLUMN FOR STANDARD TXDOT STEEL COLUMNS. TEC TO BE MOUNTED ON CONCRETE PAD ADJACENT TO COLUMN FOR AESTHETIC COLUMNS. DESIGN BUILDER TO VERIFY LOCATION WITH MOBILITY AUTHORITY AND SYSTEM INTEGRATOR.
4. THE DESIGN BUILDER MUST PROVIDE DRAWINGS SHOWING THE LOCATION OF GANTRY, PROFILES OF ROADWAY, AND SUGGESTED GENERATOR LOCATIONS TO MOBILITY AUTHORITY FOR APPROVAL.
5. COMMUNICATIONS SHALL TIE INTO EXISTING OR PROPOSED DUCT BANK.
6. MAXIMUM LENGTH OF RUN FROM COMMUNICATION CABINET TO FURTHEST VES/TDS EQUIPMENT IS 300'.

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EXAMPLE ETC CONFIGURATIONS

ETC-1

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	6			7
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				

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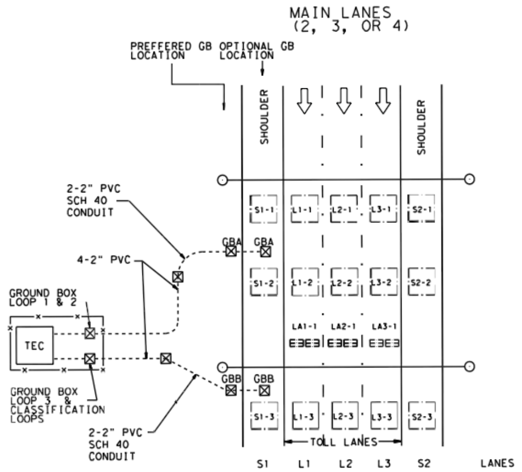
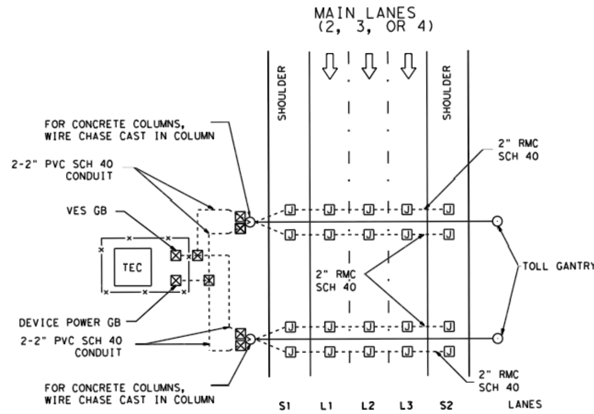


DETAIL C-1
MAINLANE VEHICLE DETECTION SCHEMATIC

NOTE: LOOP QUANTITY AND LOCATION TO BE SPECIFIED BY SYSTEM INTEGRATOR

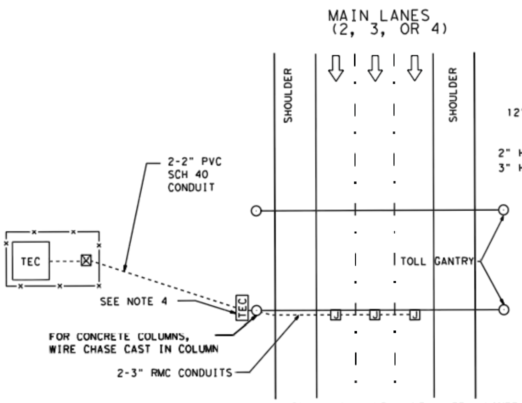


NOTE: LOCATE JUNCTION BOXES ON STRUCTURE OVER VES CAMERA

DETAIL C-2
VES CONFIGURATION

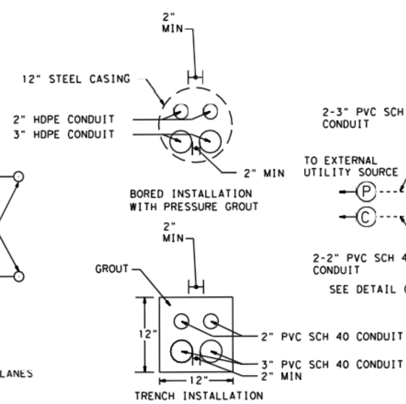
NOTES:

1) BORES SHALL BE PLACED AS SHOWN IN PLANS OR AS DIRECTED BY THE ENGINEER.
2) RETAINING WALL SECTIONS SHALL REQUIRE 4-4" SCH 80 PVC CONDUITS FROM ROADWAY SHOULDER PULL BOX TO A PULL BOX LOCATED ON THE GROUND AT FACE OF RETAINING WALL.
3) DETAIL C1: MAXIMUM CABLE LENGTH FROM S1-1 AND S1-3 TO TEC SHALL NOT EXCEED 300'
4) TEC TO BE MOUNTED ON COLUMN FOR STANDARD TXDOT STEEL COLUMNS. TEC TO BE MOUNTED ON CONCRETE PAD ADJACENT TO COLUMN FOR AESTHETIC COLUMNS. DESIGN BUILDER TO VERIFY LOCATION WITH MOBILITY AUTHORITY AND SYSTEM INTEGRATOR.
5) FOR DETAILS OF TOLL COLLECTION SYSTEMS CONFIGURATION, COORDINATE WITH SYSTEM INTEGRATOR.
6) GROUND BOXES LOCATED IN PAVEMENT SHALL BE PRECAST CONCRETE HS-20 LOAD RATED WITH REMOVABLE BOLTED COVER. NO FERROUS MATERIAL ALLOWED FOR GROUND BOXES.
7) PROVIDE A MINIMUM OF 2' CLEARANCE BETWEEN TOP OF GROUT AND/OR CASING, AND BOTTOM OF PAVEMENT AND/OR CONCRETE STRUCTURE.
8) SYSTEM INTEGRATOR OR MOBILITY AUTHORITY MUST APPROVE OF ALL DESIGN DRAWINGS.
9) WIRES RUNNING IN COLUMNS SHALL EITHER BE IN THE COLUMN IN RECESED CHASE OR IN CONDUIT FOR TRUSS COLUMNS.
10) ALL GROUND/PULL BOX SIZES AND MODELS MUST BE APPROVED BY THE MOBILITY AUTHORITY OR SYSTEMS INTEGRATOR.
11) FOR 2 MAIN LANES, REMOVE L3
FOR 4 MAIN LANES, ADD L4

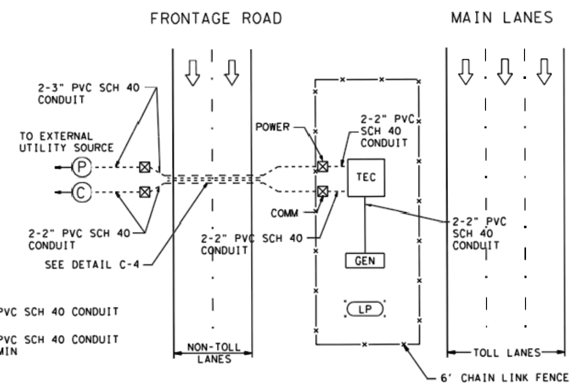


NOTE: LOCATE JUNCTION BOXES ON STRUCTURE NEAR AVI ANTENNA

DETAIL C-3
AVI READER CONFIGURATION
SEE NOTE 7



DETAIL C-4
CONDUIT ENCASEMENT
SEE NOTE 7



DETAIL C-5
UTILITY POWER, BACKUP POWER, & TELECOMMUNICATIONS SCHEMATIC

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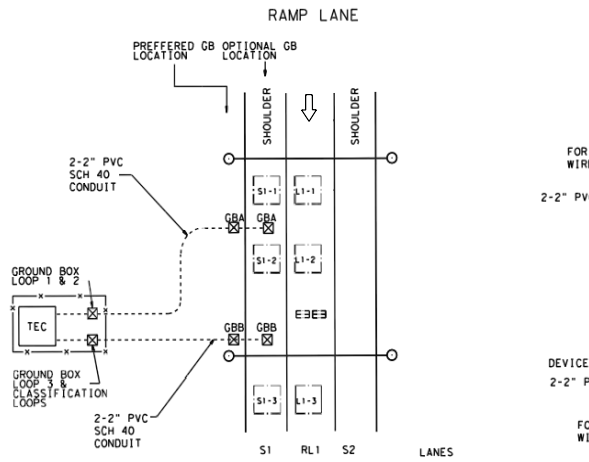
FIXED PRICE
TOLLING STANDARDS
EXAMPLE ETC CONFIGURATION
(MAIN LANES)

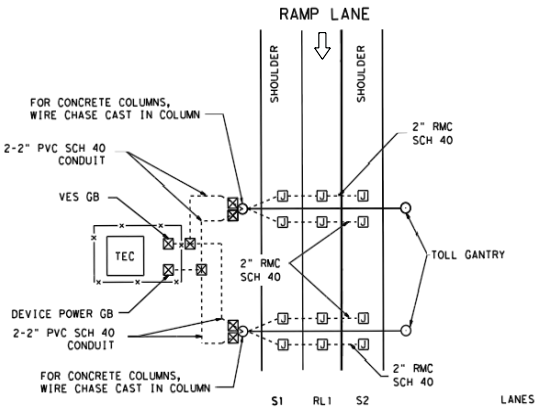
ETC-2

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			8
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				



DETAIL C-1R
RAMP VEHICLE DETECTION SCHEMATIC

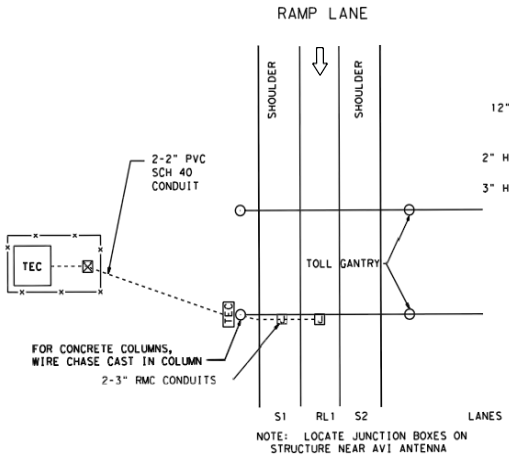
NOTE: LOOP QUANTITY AND LOCATION TO BE SPECIFIED BY SYSTEM INTEGRATOR



NOTE: LOCATE JUNCTION BOXES ON STRUCTURE OVER VES CAMERA

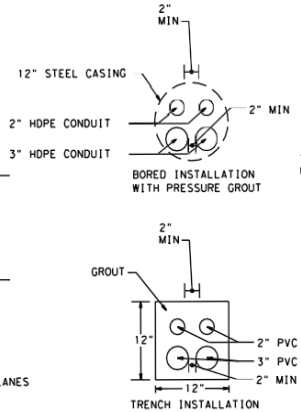
DETAIL C-2R
VES CONFIGURATION

NOTES:
1) BORES SHALL BE PLACED AS SHOWN IN PLANS OR AS DIRECTED BY THE ENGINEER.
2) RETAINING WALL SECTIONS SHALL REQUIRE 4-4" SCH 80 PVC CONDUITS FROM ROADWAY SHOULDER PULL BOX TO A PULL BOX LOCATED ON THE GROUND AT FACE OF RETAINING WALL.
3) DETAIL C1: MAXIMUM CABLE LENGTH FROM S1-1 AND S1-3 TO TEC SHALL NOT EXCEED 300'
4) TEC TO BE MOUNTED ON COLUMN FOR STANDARD TXDOT STEEL COLUMNS. TEC TO BE MOUNTED ON CONCRETE PAD ADJACENT TO COLUMN FOR AESTHETIC COLUMNS. DESIGN BUILDER TO VERIFY LOCATION WITH MOBILITY AUTHORITY AND SYSTEM INTEGRATOR.
5) FOR DETAILS OF TOLL COLLECTION SYSTEMS CONFIGURATION, COORDINATE WITH SYSTEM INTEGRATOR.
6) GROUND BOXES LOCATED IN PAVEMENT SHALL BE PRECAST CONCRETE HS-20 LOAD RATED WITH REMOVABLE BOLTED COVER. NO FERROUS MATERIAL ALLOWED FOR GROUND BOXES.
7) PROVIDE A MINIMUM OF 2' CLEARANCE BETWEEN TOP OF GROUT AND/OR CASING, AND BOTTOM OF PAVEMENT AND/OR CONCRETE STRUCTURE.
8) SYSTEM INTEGRATOR OR MOBILITY AUTHORITY MUST APPROVE OF ALL DESIGN DRAWINGS.
9) WIRES RUNNING IN COLUMNS SHALL EITHER BE IN THE COLUMN IN RECESED CHASE OR IN CONDUIT FOR TRUSS COLUMNS.
10) ALL GROUND/PULL BOX SIZES AND MODELS MUST BE APPROVED BY THE MOBILITY AUTHORITY OR SYSTEMS INTEGRATOR.

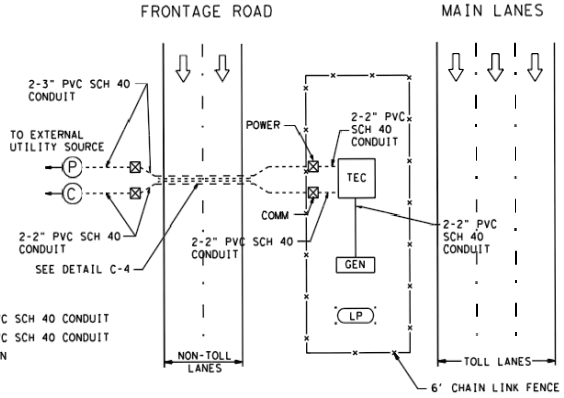


NOTE: LOCATE JUNCTION BOXES ON STRUCTURE NEAR AVI ANTENNA

DETAIL C-3R
AVI READER CONFIGURATION
SEE NOTE 7



DETAIL C-4R
CONDUIT ENCASEMENT
(SEE NOTE 7)



DETAIL C-5R
UTILITY POWER, BACKUP POWER, & TELECOMMUNICATIONS SCHEMATIC

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FIXED PRICE
TOLLING STANDARDS
EXAMPLE ETC CONFIGURATION
(RAMPS)

ETC-3

DESIGNED BY:	RED. NO./ DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			9
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
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KK				

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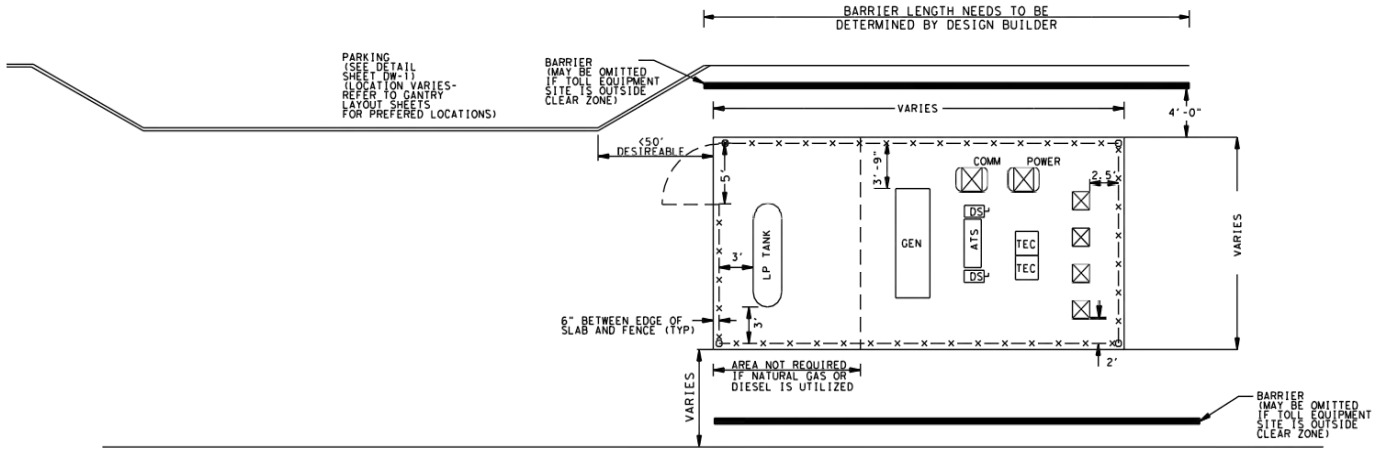
Scale: 1:10
Plotted on: 5@DATE$$$$$$$$$$$$$$$$



DETAIL 1
EQUIPMENT PLACEMENT
AND DIMENSIONS

NOTES:
1) PARKING MAY BE LOCATED ON EITHER SIDE OF SLAB FOUNDATION. LAYOUTS MUST BE MIRRORED IF PARKING IS RELOCATED.
2) DESIGN BUILDER SHALL DESIGN SLAB FOUNDATION AND SUBMIT TO MOBILITY AUTHORITY FOR APPROVAL.
3) DESIGN BUILDER SHALL PROVIDE ANCHOR DETAILS FOR ALL EQUIPMENT.
4) TEC, FUEL TANK, GENERATOR, AND ATS TO BE PROVIDED BY SYSTEM INTEGRATOR.
5) TEC SHALL HAVE FRONT AND REAR ACCESS LOCKABLE DOORS.
6) TEC SHALL BE INSULATED WITH R4 FOAM INSULATION.
7) TEC SHALL HAVE REDUNDANT ENVIRONMENTAL CONTROLS.
8) TEC SHALL HAVE INTRUSION DETECTION SYSTEM.
9) 18' ALUMINUM LIGHT POLE AND LIGHTNING ROD WITH MINIMUM 150 WATT METAL HALIDE 120V/240V OR EQUIVALENT LED OUTDOOR LIGHT FIXTURE WITH PHOTO CELL.
10) DESIGN BUILDER SHALL BE RESPONSIBLE FOR PROVIDING PROTECTION FOR ALL EQUIPMENT PLACEMENT LOCATIONS.
11) DESIGN BUILDER SHALL DETERMINE NUMBER OF WIRES, SIZE OF WIRES AND CONDUIT SIZE NEEDED TO MEET NEC AND ROAD REQUIREMENTS.
12) TEC CABINET TO BE DUAL 334 OR EQUIVALENT.
12) ALL GROUND/PULL BOX SIZES AND MODELS MUST BE APPROVED BY THE MOBILITY AUTHORITY OR SYSTEMS INTEGRATOR.

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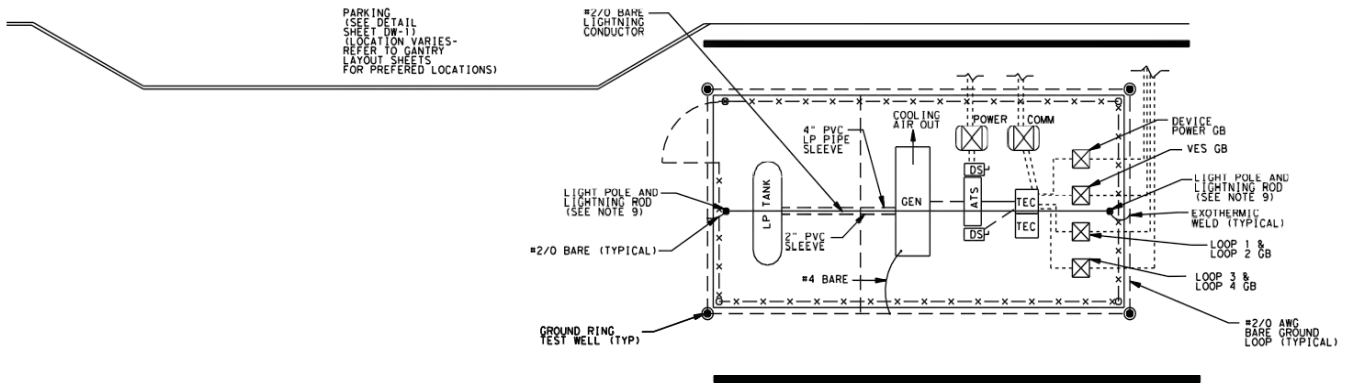
P.E. Serial No.: 93753
Date: 15-NOV-2013



DETAIL 2
EQUIPMENT PLACEMENT
AND ELECTRICAL RUNS

NOT TO SCALE

HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420

CENTRAL TEXAS
Regional Mobility Authority

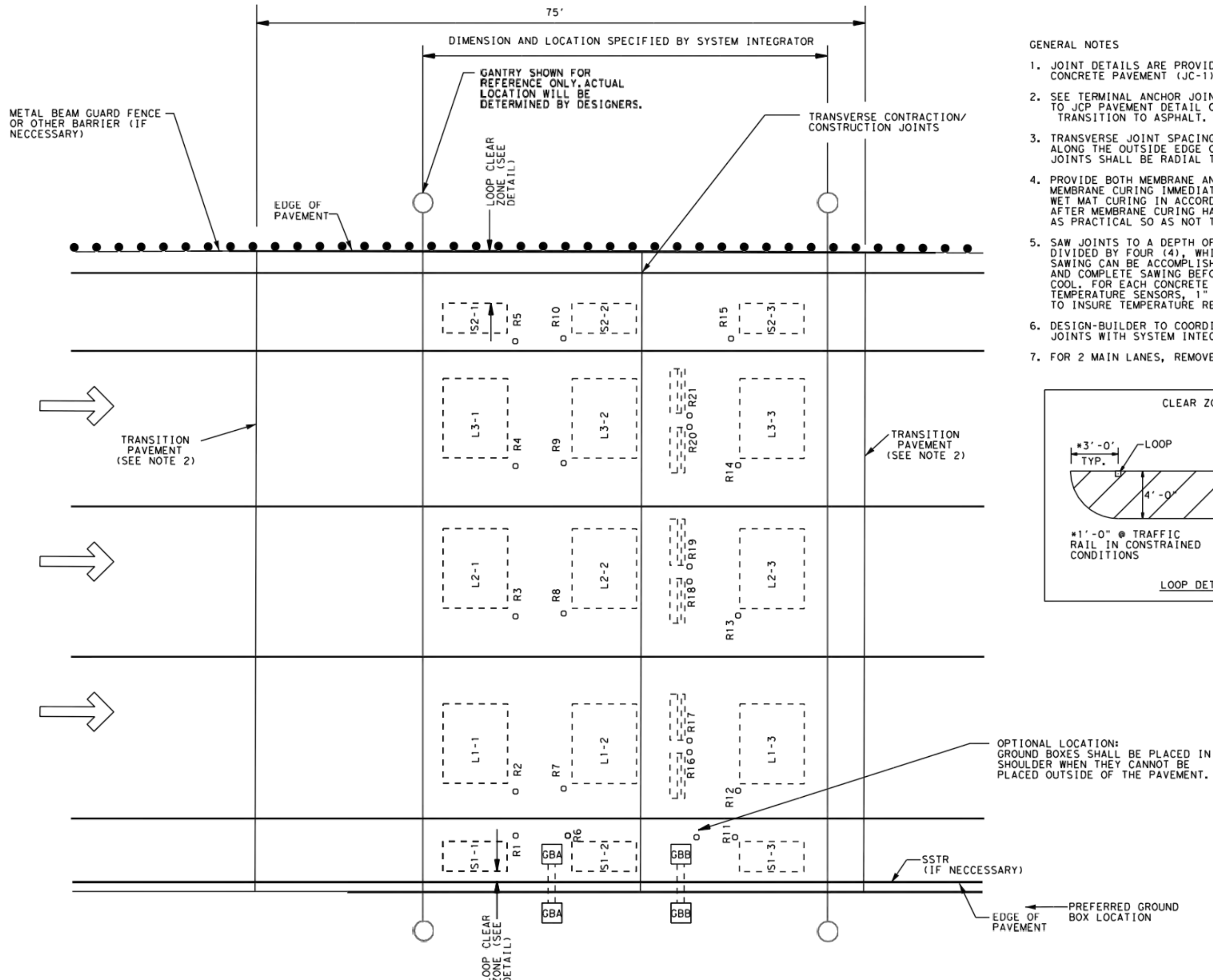
FIXED PRICE TOLLING STANDARDS

TOLL EQUIPMENT SITE PLACEMENT DETAILS

TES-1

DESIGNED BY:	RED. NO./ DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			10
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				

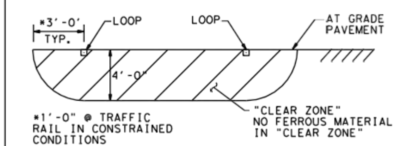
Pen Tables:\\ousw001\pmwork\Jobs\46837+CTRMA\Loop1+ML\Project Development\Design\CAD Files\PlotMOPAC+11X17.pen
Design Filenames:\\ousw001\pmwork\Jobs\46837+CTRMA\183A Operations and Maintenance\Tolling\New Fixed Price Tolling Standards\TEC.dgn
Scale: 1:10
Plotted on: 5/8/2014



GENERAL NOTES

1. JOINT DETAILS ARE PROVIDED ON THE JOINTED CONCRETE PAVEMENT (JC-1) STANDARD DETAIL SHEET.
2. SEE TERMINAL ANCHOR JOINT DETAIL FOR CRCP TO JCP PAVEMENT DETAIL ON SHT. 22. SEE CATD-1 FOR JCP TRANSITION TO ASPHALT.
3. TRANSVERSE JOINT SPACINGS SHOWN ARE MEASURED ALONG THE OUTSIDE EDGE OF PAVEMENT. TRANSVERSE JOINTS SHALL BE RADIAL TO THE BASELINE.
4. PROVIDE BOTH MEMBRANE AND WET MAT CURING. PLACE MEMBRANE CURING IMMEDIATELY AFTER TEXTURING. PROVIDE WET MAT CURING IN ACCORDANCE WITH TXDOT ITEM 420.20(A), AFTER MEMBRANE CURING HAS BEEN APPLIED AND AS SOON AS PRACTICAL SO AS NOT TO DAMAGE THE SURFACE FINISH.
5. SAW JOINTS TO A DEPTH OF 3" OR THE PAVEMENT THICKNESS DIVIDED BY FOUR (4), WHICHEVER IS GREATER, AS SOON AS SAWING CAN BE ACCOMPLISHED WITH ONLY MINOR RAVELING AND COMPLETE SAWING BEFORE THE PAVEMENT BEGINS TO COOL. FOR EACH CONCRETE PLACEMENT INSTALL ONE OR MORE TEMPERATURE SENSORS, 1" BELOW THE SURFACE AND MONITOR TO INSURE TEMPERATURE REQUIREMENTS ARE MET.
6. DESIGN-BUILDER TO COORDINATE LOCATION OF CONSTRUCTION JOINTS WITH SYSTEM INTEGRATOR.
7. FOR 2 MAIN LANES, REMOVE L3. FOR 4 MAIN LANES, ADD L4.

CLEAR ZONE - ALL LOOPS



LOOP DETECTOR CLEAR ZONE DETAIL

INTERIM REVIEW ONLY
Document incomplete: not intended for permit, bidding or construction.
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

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Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420

CENTRAL TEXAS Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS
MAINLANE PAVEMENT JOINTING PLAN AND GROUND BOX LAYOUT
P1-ML

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			11
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				

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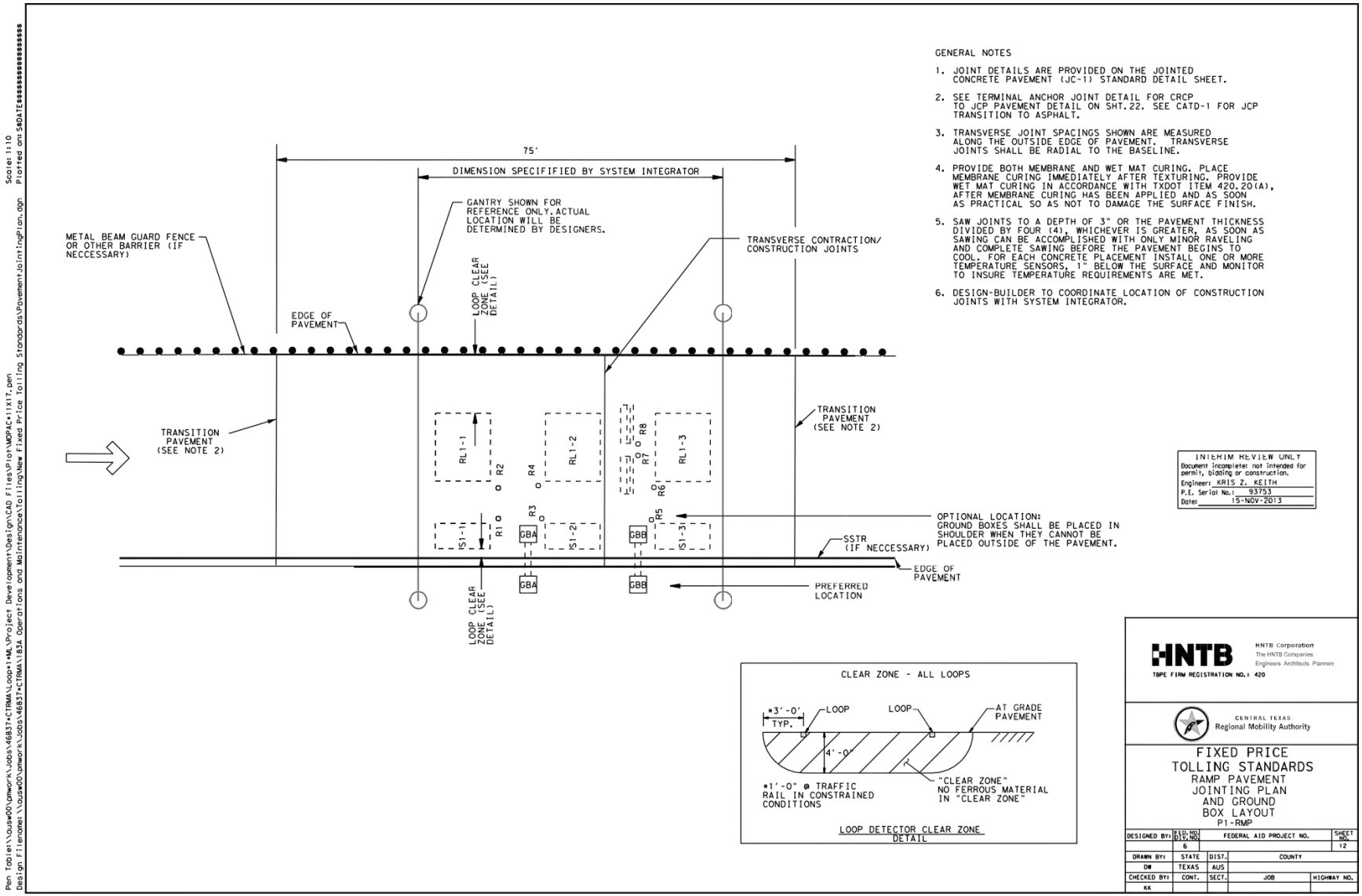
Design Filename: \\ausw00\pmwork\Jobs\46837*CTRMA\183A Operations and Maintenance\Tolling\New Fixed Price Tolling Standards\PavementJointingPlan.dgn
Scale: 1:10 Plotted on: $$DATE$$$$$$$$$$$$$$$$$$$$$$



GENERAL NOTES

1. JOINT DETAILS ARE PROVIDED ON THE JOINTED CONCRETE PAVEMENT (JC-1) STANDARD DETAIL SHEET.
2. SEE TERMINAL ANCHOR JOINT DETAIL FOR CRCP TO JCP PAVEMENT DETAIL ON SHT.22. SEE CATD-1 FOR JCP TRANSITION TO ASPHALT.
3. TRANSVERSE JOINT SPACINGS SHOWN ARE MEASURED ALONG THE OUTSIDE EDGE OF PAVEMENT. TRANSVERSE JOINTS SHALL BE RADIAL TO THE BASELINE.
4. PROVIDE BOTH MEMBRANE AND WET MAT CURING. PLACE MEMBRANE CURING IMMEDIATELY AFTER TEXTURING. PROVIDE WET MAT CURING IN ACCORDANCE WITH TXDOT ITEM 420.20(A), AFTER MEMBRANE CURING HAS BEEN APPLIED AND AS SOON AS PRACTICAL SO AS NOT TO DAMAGE THE SURFACE FINISH.
5. SAW JOINTS TO A DEPTH OF 3" OR THE PAVEMENT THICKNESS DIVIDED BY FOUR (4), WHICHEVER IS GREATER, AS SOON AS SAWING CAN BE ACCOMPLISHED WITH ONLY MINOR RAVELING AND COMPLETE SAWING BEFORE THE PAVEMENT BEGINS TO COOL. FOR EACH CONCRETE PLACEMENT INSTALL ONE OR MORE TEMPERATURE SENSORS, 1" BELOW THE SURFACE AND MONITOR TO INSURE TEMPERATURE REQUIREMENTS ARE MET.
6. DESIGN-BUILDER TO COORDINATE LOCATION OF CONSTRUCTION JOINTS WITH SYSTEM INTEGRATOR.

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Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

LOOP DETECTOR CLEAR ZONE DETAIL

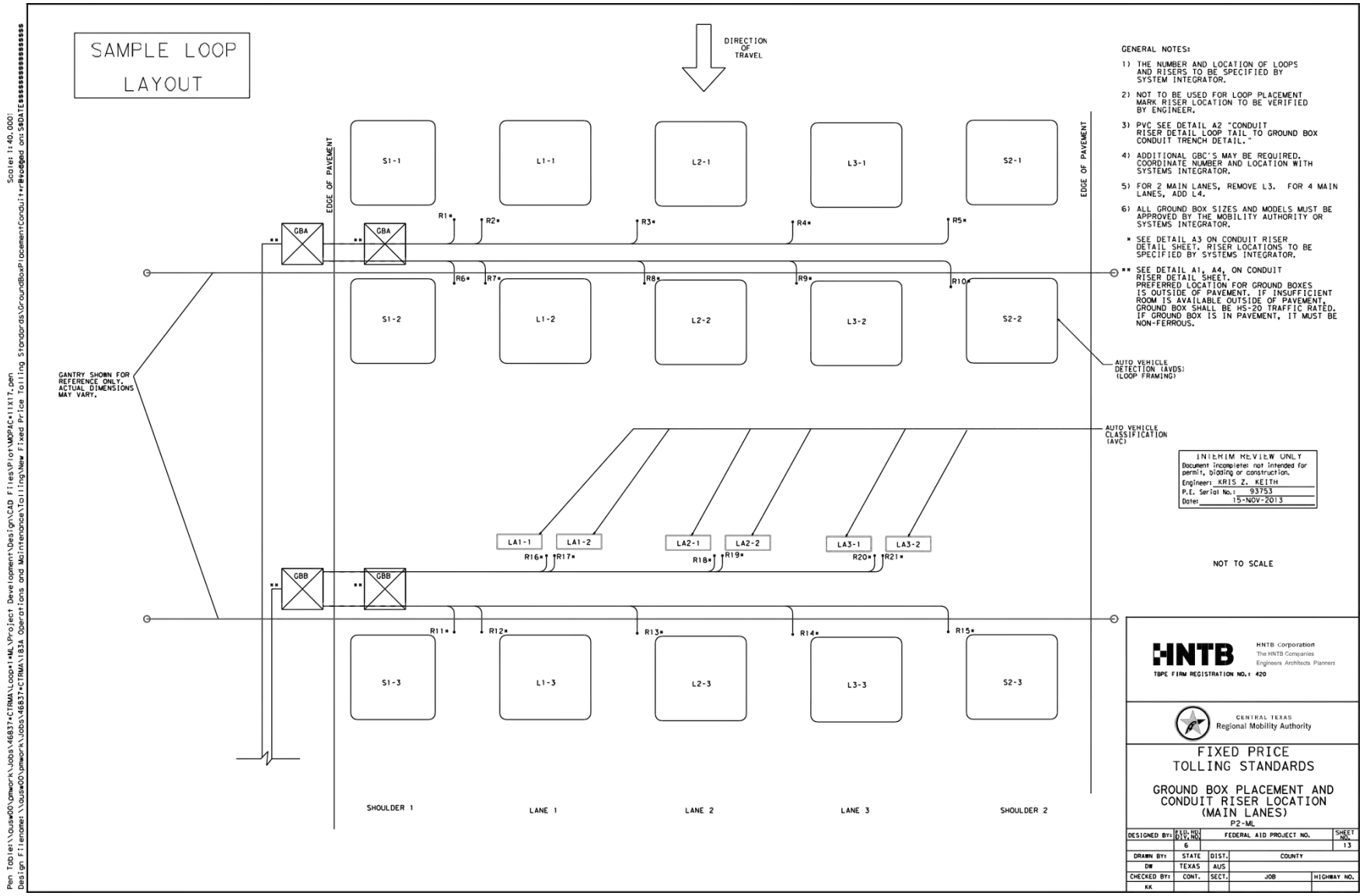
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420

CENTRAL TEXAS Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS
RAMP PAVEMENT
JOINTING PLAN
AND GROUND
BOX LAYOUT
P1-RMP

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			12
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				

Pen Tables:\\dus400\pmwork\Jobs\46837+CTRMA\Loop1+ML\Project Development\Design\CAD Files\PlotWDPAC+11X17.pen
Design Files:es:\\dus400\pmwork\Jobs\46837+CTRMA\1834 Operations and Maintenance\Tolling\New Fixed Price Tolling Standards\Pavement Jointing Plan.dgn Plotted on: 5@DATE$$$$$$$$$$$$$$$$$$$$ Scale: 1:10


SAMPLE LOOP LAYOUT
DIRECTION OF TRAVEL
EDGE OF PAVEMENT
EDGE OF PAVEMENT
S1-1
L1-1
L2-1
L3-1
S2-1
S1-2
L1-2
L2-2
L3-2
S2-2
S1-3
L1-3
L2-3
L3-3
S2-3
GBA
GBA
GBB
GBB
R1*
R2*
R3*
R4*
R5*
R6*
R7*
R8*
R9*
R10*
R11*
R12*
R13*
R14*
R15*
R16*
R17*
R18*
R19*
R20*
R21*
LA1-1
LA1-2
LA2-1
LA2-2
LA3-1
LA3-2
GANTRY SHOWN FOR REFERENCE ONLY. ACTUAL DIMENSIONS MAY VARY.
AUTO VEHICLE DETECTION (AVDS) (LOOP FRAMING)
AUTO VEHICLE CLASSIFICATION (AVC)
SHOULDER 1
LANE 1
LANE 2
LANE 3
SHOULDER 2
GENERAL NOTES:
1) THE NUMBER AND LOCATION OF LOOPS AND RISERS TO BE SPECIFIED BY SYSTEM INTEGRATOR.
2) NOT TO BE USED FOR LOOP PLACEMENT MARK RISER LOCATION TO BE VERIFIED BY ENGINEER.
3) PVC SEE DETAIL A2 "CONDUIT RISER DETAIL LOOP TAIL TO GROUND BOX CONDUIT TRENCH DETAIL."
4) ADDITIONAL GBC'S MAY BE REQUIRED. COORDINATE NUMBER AND LOCATION WITH SYSTEMS INTEGRATOR.
5) FOR 2 MAIN LANES, REMOVE L3. FOR 4 MAIN LANES, ADD L4.
6) ALL GROUND BOX SIZES AND MODELS MUST BE APPROVED BY THE MOBILITY AUTHORITY OR SYSTEMS INTEGRATOR.
* SEE DETAIL A3 ON CONDUIT RISER DETAIL SHEET. RISER LOCATIONS TO BE SPECIFIED BY SYSTEMS INTEGRATOR.
** SEE DETAIL A1, A4, ON CONDUIT RISER DETAIL SHEET. PREFERRED LOCATION FOR GROUND BOXES IS OUTSIDE OF PAVEMENT. IF INSUFFICIENT ROOM IS AVAILABLE OUTSIDE OF PAVEMENT, GROUND BOX SHALL BE HS-20 TRAFFIC RATED. IF GROUND BOX IS IN PAVEMENT, IT MUST BE NON-FERROUS.
INTERIM REVIEW ONLY
Document incomplete; not intended for permit, bidding or construction.
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013
NOT TO SCALE
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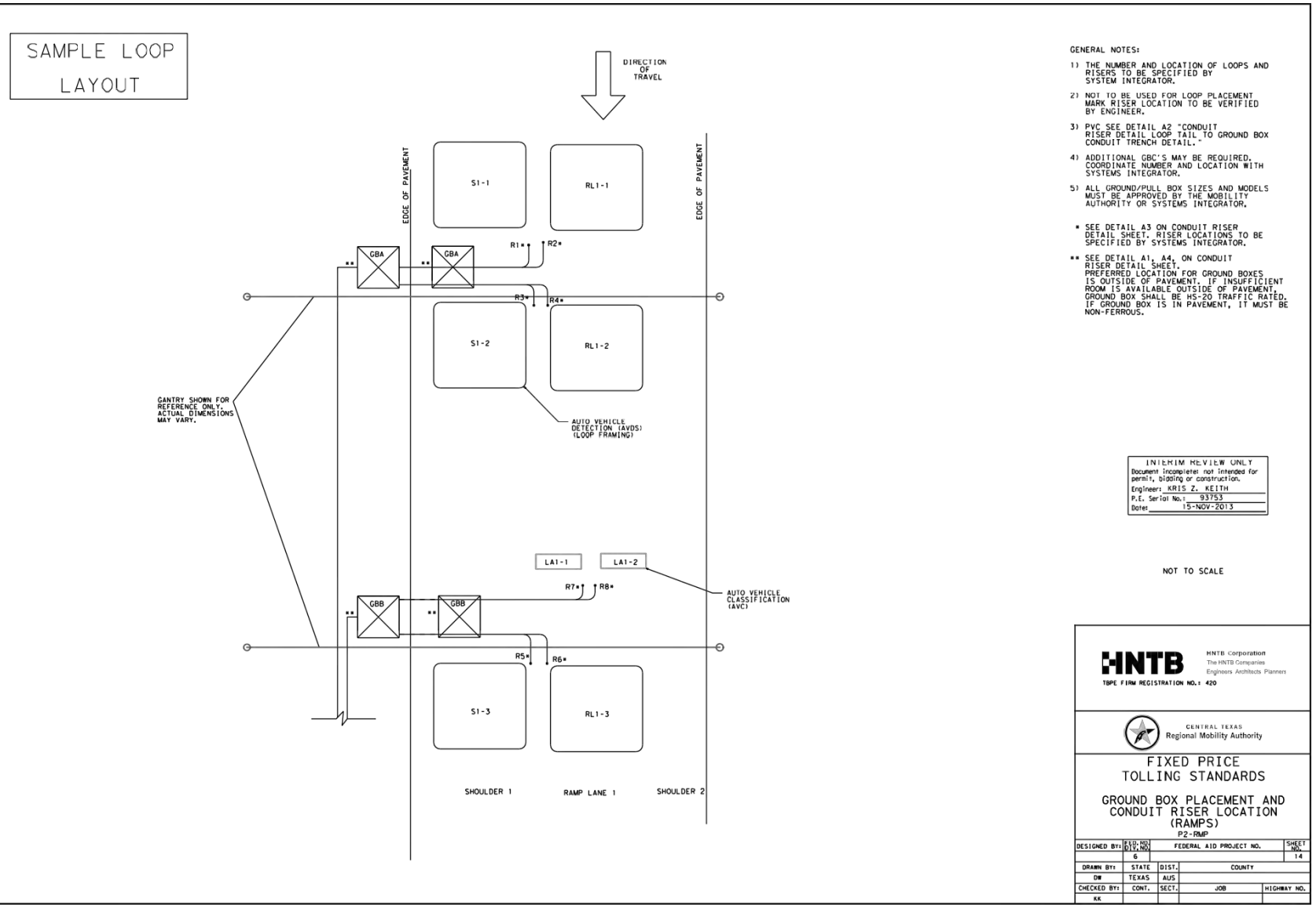
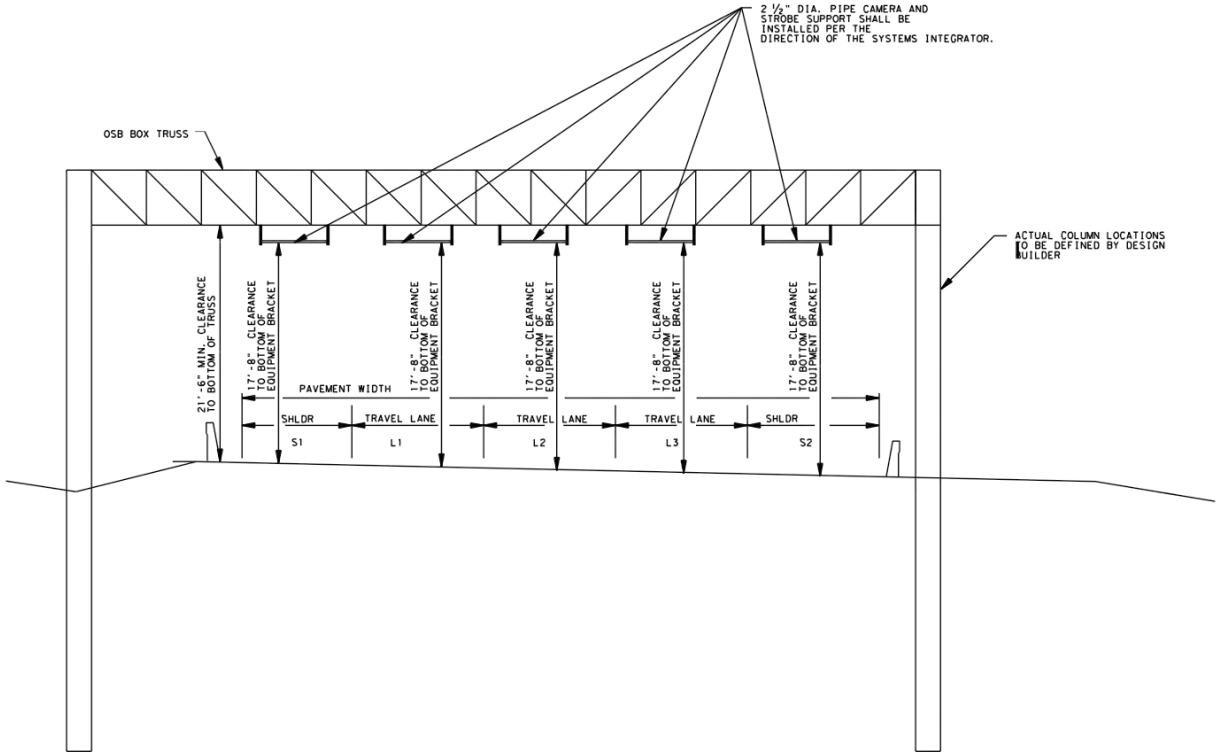
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420
CENTRAL TEXAS
Regional Mobility Authority
FIXED PRICE
TOLLING STANDARDS
GROUND BOX PLACEMENT AND CONDUIT RISER LOCATION (MAIN LANES)
P2-ML
DESIGNED BY: KK
DRAWN BY: DW
CHECKED BY: KK
STATE: TEXAS
DIST.: AUS
COUNTY
CONT.
SECT.
JOB
HIGHWAY NO.
FEDERAL AID PROJECT NO.
SHEET NO.: 13


SAMPLE LOOP LAYOUT
DIRECTION OF TRAVEL
EDGE OF PAVEMENT
EDGE OF PAVEMENT
S1-1
RL1-1
S1-2
RL1-2
S1-3
RL1-3
GBA
GBA
GBB
GBB
R1*
R2*
R3*
R4*
R5*
R6*
R7*
R8*
LA1-1
LA1-2
GANTRY SHOWN FOR REFERENCE ONLY. ACTUAL DIMENSIONS MAY VARY.
AUTO VEHICLE DETECTION (AVDS) (LOOP FRAMING)
AUTO VEHICLE CLASSIFICATION (AVC)
SHOULDER 1
RAMP LANE 1
SHOULDER 2
GENERAL NOTES:
1) THE NUMBER AND LOCATION OF LOOPS AND RISERS TO BE SPECIFIED BY SYSTEM INTEGRATOR.
2) NOT TO BE USED FOR LOOP PLACEMENT MARK RISER LOCATION TO BE VERIFIED BY ENGINEER.
3) PVC SEE DETAIL A2 "CONDUIT RISER DETAIL LOOP TAIL TO GROUND BOX CONDUIT TRENCH DETAIL."
4) ADDITIONAL GBC'S MAY BE REQUIRED. COORDINATE NUMBER AND LOCATION WITH SYSTEMS INTEGRATOR.
5) ALL GROUND/PULL BOX SIZES AND MODELS MUST BE APPROVED BY THE MOBILITY AUTHORITY OR SYSTEMS INTEGRATOR.
* SEE DETAIL A3 ON CONDUIT RISER DETAIL SHEET. RISER LOCATIONS TO BE SPECIFIED BY SYSTEMS INTEGRATOR.
** SEE DETAIL A1, A4, ON CONDUIT RISER DETAIL SHEET. PREFERRED LOCATION FOR GROUND BOXES IS OUTSIDE OF PAVEMENT. IF INSUFFICIENT ROOM IS AVAILABLE OUTSIDE OF PAVEMENT, GROUND BOX SHALL BE HS-20 TRAFFIC RATED. IF GROUND BOX IS IN PAVEMENT, IT MUST BE NON-FERROUS.
INTERIM REVIEW ONLY
Document incomplete not intended for permit, bidding or construction.
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Dates: 15-NOV-2013
NOT TO SCALE
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420
CENTRAL TEXAS
Regional Mobility Authority
FIXED PRICE
TOLLING STANDARDS
GROUND BOX PLACEMENT AND CONDUIT RISER LOCATION (RAMPS)
P2-RMP
DESIGNED BY: KK
CHECKED BY: KK
DRAWN BY: DW
STATE: TEXAS
DIST.: AUS
COUNTY
CONT.
SECT.
JOB
HIGHWAY NO.
SHEET NO.: 14



NOTES

1. TWO (2) BRACKETS ARE REQUIRED FOR EACH LOCATON SHOWN. BRACKETS SHALL BE ADJUSTABLE TO ALLOW FOR POSITIONING IN ACCORDANCE WITH THE SYSTEMS INTEGRATOR'S SPECICATIONS. DESIGN BUILDER MUST COORDINATE INITIAL PLACEMENT LOCATION WITH THE SYSTEMS INTEGRATOR.
2. WALKWAYS ARE REQUIRED TO BE INSTALLED ON ALL GANTRY TRUSSES. LADDERS ARE REQUIRED TO BE INSTALLED ON ALL GANTRY COLUMNS.
3. FOR 2 MAIN LANES, REMOVE L3. FOR 4 MAIN LANES, ADD L4.

QUANTITY OF BRACKETS:
2 LANES = 16 BRACKETS
3 LANES = 20 BRACKETS
4 LANES = 24 BRACKETS

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Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

NOT TO SCALE

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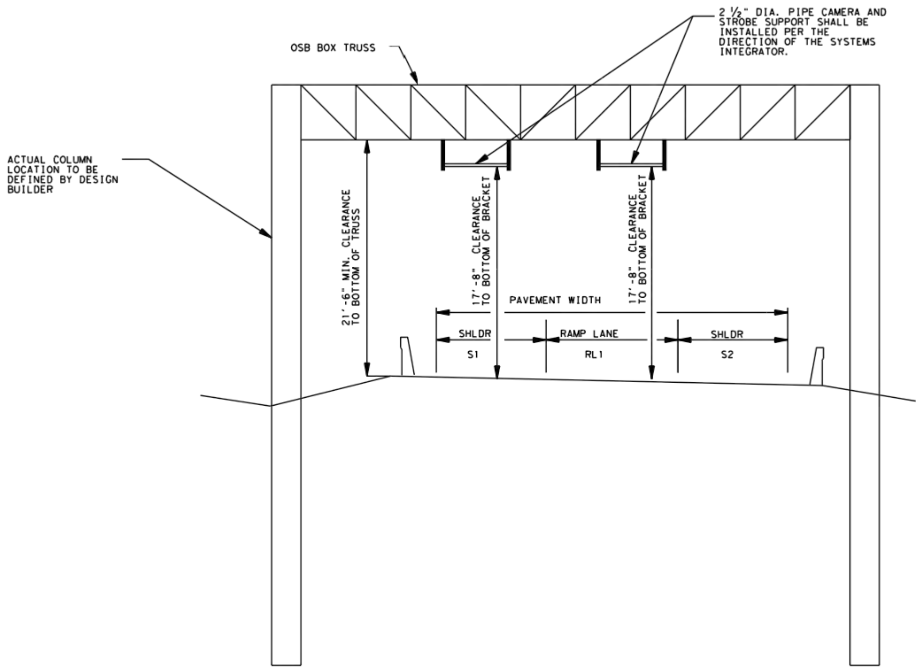
TBPE FIRM REGISTRATION NO.: 420

CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS
MAINLANE GANTRY CROSS-LANE TANGENT ELEVATION VIEW

G1-ML

DESIGNED BY:	RSD. NO/ DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			15
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				



NOTES

1. TWO (2) BRACKETS ARE REQUIRED FOR EACH LOCATION SHOWN. BRACKETS SHALL BE ADJUSTABLE TO ALLOW FOR POSITIONING IN ACCORDANCE WITH THE SYSTEMS INTEGRATOR'S SPECICATIONS. DESIGN BUILDER MUST COORDINATE INITIAL PLACEMENT LOCATION WITH THE SYSTEMS INTEGRATOR.
2. WALKWAYS ARE REQUIRED TO BE INSTALLED ON ALL GANTRY TRUSSES. LADDERS ARE REQUIRED TO BE INSTALLED ON ALL GANTRY COLUMNS.

QUANTITY OF BRACKETS:
1 RAMP LANE = 8 BRACKETS

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Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

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Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420

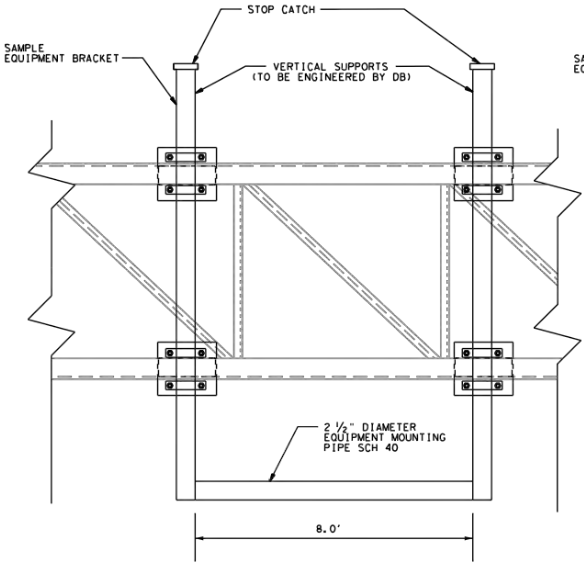
CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS

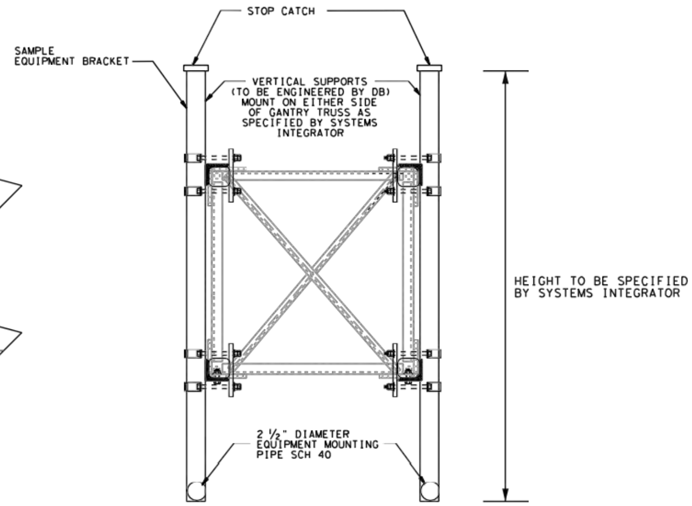
RAMP CROSS-LANE
TANGENT ELEVATION VIEW

G2-RMP

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			16
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				



ELEVATION TOLL GANTRY BRACKET



CROSS SECTION OF TOLL GANTRY BRACKET

GENERAL NOTES:

1) THESE DETAILS ARE FOR USE WITH TXDOT STANDARD OVERHEAD SIGN BRIDGE (OSB) OR CANTILEVER OVERHEAD SIGN SUPPORT (COSS).

2) FOR CONNECTION DETAILS NOT SHOWN SEE OVERHEAD SIGN BRIDGE TRUSS DETAILS (OSBC) OR CANTILEVER OVERHEAD SIGN SUPPORT DETAILS (COSSD).

3) AI-R AL SHALL BE COMPATIBLE WITH THE REQUIREMENTS OF THE ASSOCIATED REFERENCE SIGN BRIDGE STANDARDS.

4) QUANTITY OF EQUIPMENT BRACKETS AND LOCATION TO BE SPECIFIED BY SYSTEM INTEGRATOR.

5) DESIGN OF EQUIPMENT BRACKET AND CONNECTION TO OVERHEAD TRUSS TO BE PROVIDED BY DESIGN BUILDER. AVI ANTENNA AND CAMERA MOUNTING HARDWARE AND CONNECTION DETAILS TO BE PROVIDED BY SYSTEM INTEGRATOR.

6) SHOP DRAWINGS FOR AVI ANTENNA AND VES CAMERA SUPPORT SHALL BE PROVIDED FOR ENGINEER'S REVIEW.

7) DESIGNER BUILDER TO SPECIFY APPROPRIATE, SPAN, ICE LOADING, AND WIND ZONE. TRUSS DYNAMIC RESPONSE AND DEFLECTION SHALL BE COMPATIBLE WITH TOLL SYSTEM REQUIREMENTS.

8) DESIGN OF OSB AND COSS COLUMNS, DRILLED SHAFTS, AND TRUSS TO COLUMN CONNECTION TO BE PROVIDED BY DESIGN BUILDER.

9) EQUIPMENT BRACKET AND ALL MOUNTING HARDWARE SHALL BE HOT DIP GALVANIZED.

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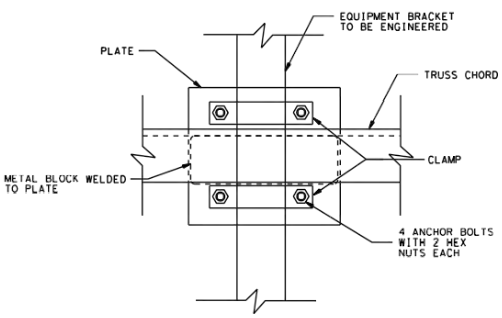
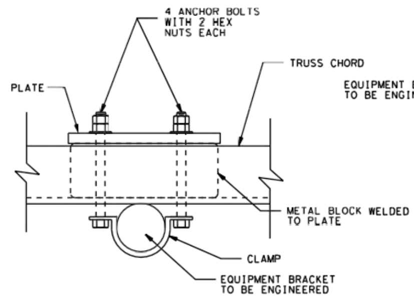
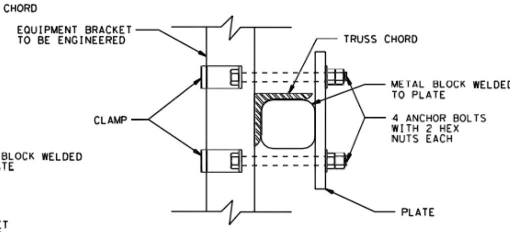
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013



FRONT VIEW
(TOP CHORD SHOWN, FLIP HORIZ. FOR BOTTOM CHORD)



TOP VIEW
(TOP CHORD SHOWN, BOTTOM VIEW FOR BOTTOM CHORD)



SIDE VIEW
(TOP CHORD SHOWN, FLIP HORIZ. FOR BOTTOM CHORD)

NOT TO SCALE

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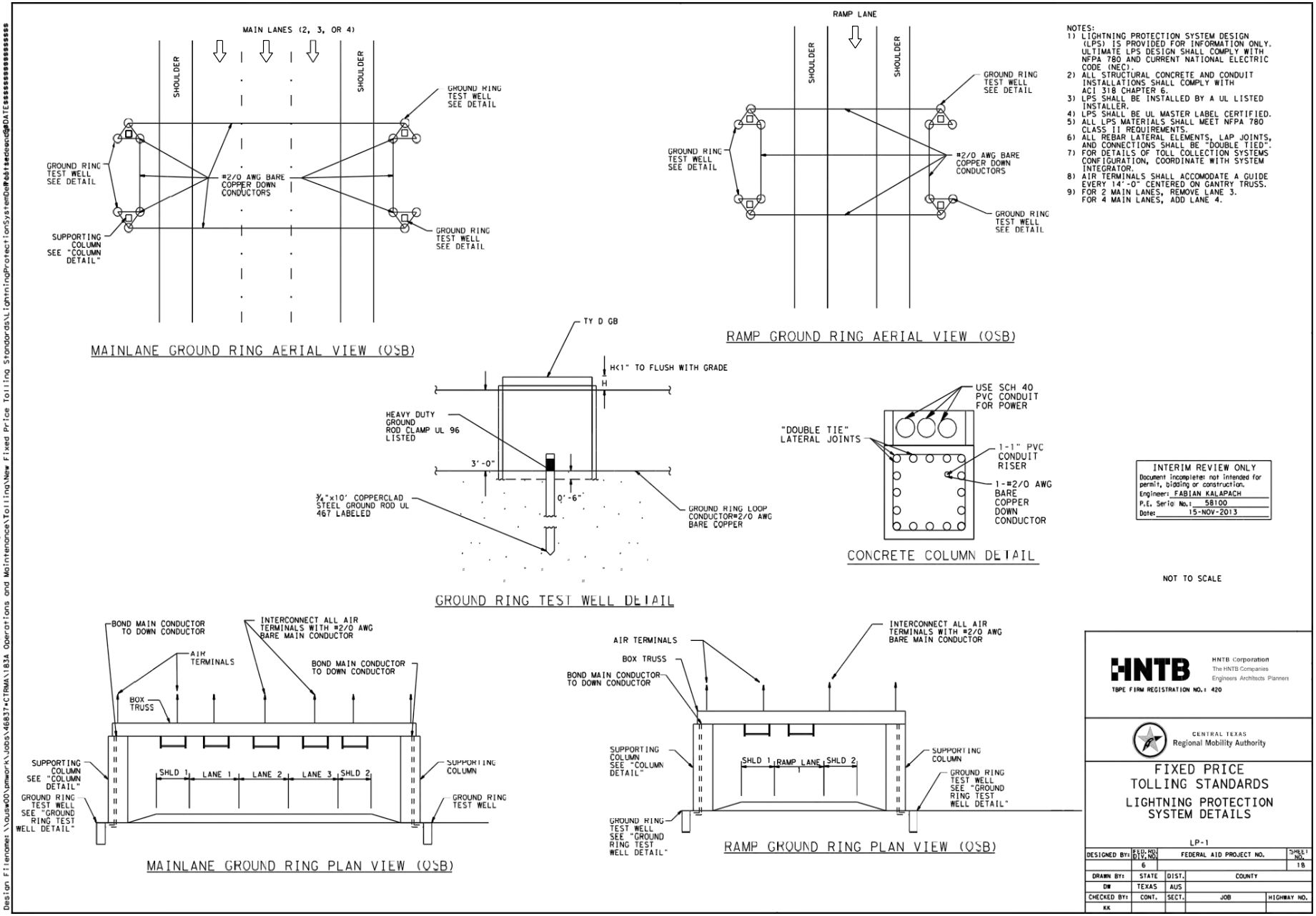
TBPE FIRM REGISTRATION NO.: 420

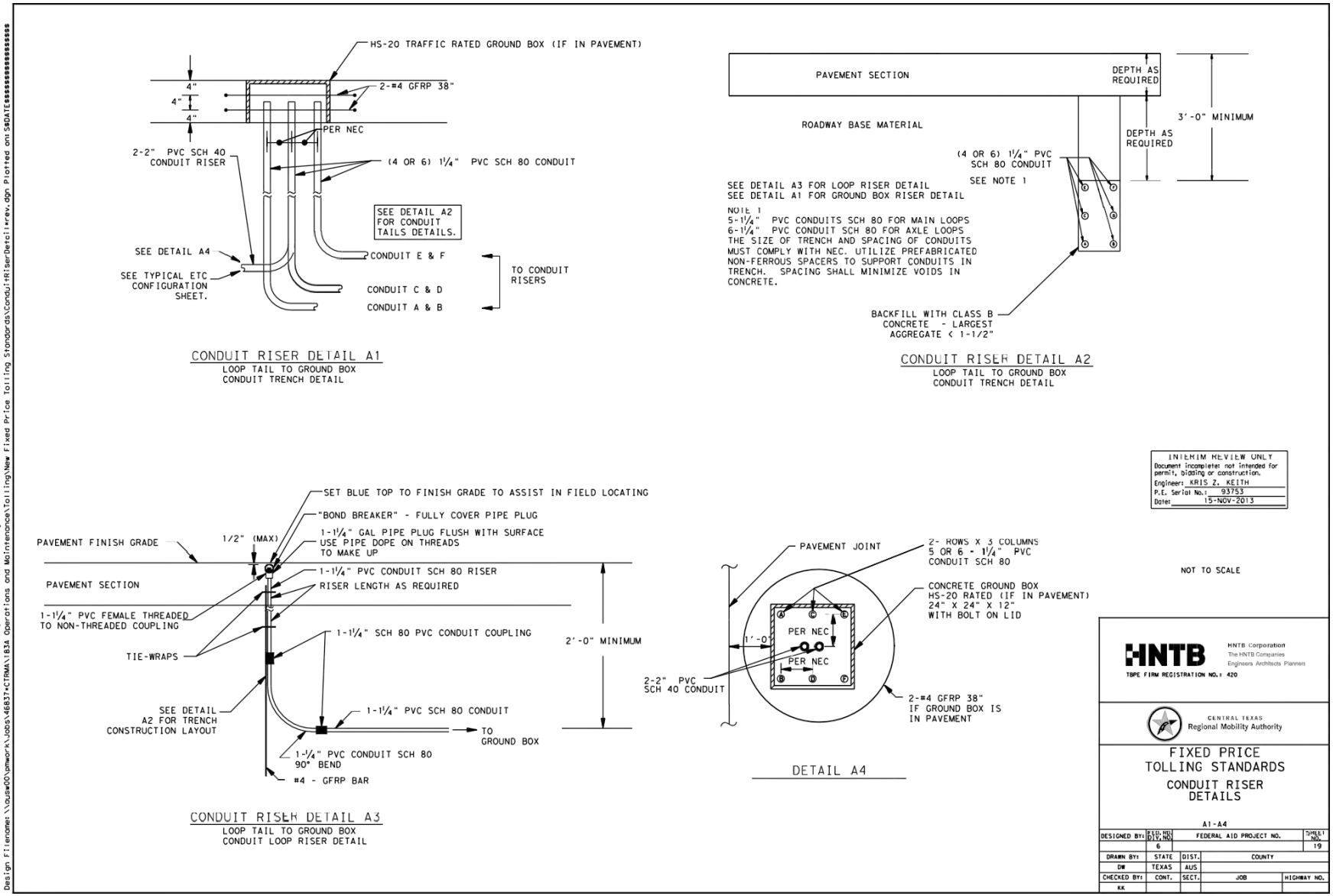
CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS
TOLL GANTRY
MISCELLANEOUS
DETAILS

MG-1

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	6			17
DRAWN BY:	STATE	DIST.	COUNTY	
DW	TEXAS	AUS		
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.
KK				


MAIN LANES (2, 3, OR 4)
SHOULDER
SHOULDER
GROUND RING TEST WELL SEE DETAIL
GROUND RING TEST WELL SEE DETAIL
#2/0 AWG BARE COPPER DOWN CONDUCTORS
SUPPORTING COLUMN SEE "COLUMN DETAIL"
GROUND RING TEST WELL SEE DETAIL
MAINLANE GROUND RING AERIAL VIEW (OSB)
RAMP LANE
SHOULDER
SHOULDER
GROUND RING TEST WELL SEE DETAIL
GROUND RING TEST WELL SEE DETAIL
#2/0 AWG BARE COPPER DOWN CONDUCTORS
GROUND RING TEST WELL SEE DETAIL
RAMP GROUND RING AERIAL VIEW (OSB)
NOTES:
1) LIGHTNING PROTECTION SYSTEM DESIGN (LPS) IS PROVIDED FOR INFORMATION ONLY. ULTIMATE LPS DESIGN SHALL COMPLY WITH NFPA 780 AND CURRENT NATIONAL ELECTRIC CODE (NEC).
2) ALL STRUCTURAL CONCRETE AND CONDUIT INSTALLATIONS SHALL COMPLY WITH ACI 318 CHAPTER 6.
3) LPS SHALL BE INSTALLED BY A UL LISTED INSTALLER.
4) LPS SHALL BE UL MASTER LABEL CERTIFIED.
5) ALL LPS MATERIALS SHALL MEET NFPA 780 CLASS II REQUIREMENTS.
6) ALL REBAR LATERAL ELEMENTS, LAP JOINTS, AND CONNECTIONS SHALL BE "DOUBLE TIED".
7) FOR DETAILS OF TOLL COLLECTION SYSTEMS CONFIGURATION, COORDINATE WITH SYSTEM INTEGRATOR.
8) AIR TERMINALS SHALL ACCOMODATE A GUIDE EVERY 14'-0" CENTERED ON GANTRY TRUSS.
9) FOR 2 MAIN LANES, REMOVE LANE 3. FOR 4 MAIN LANES, ADD LANE 4.
TY D GB
H<1" TO FLUSH WITH GRADE
H
HEAVY DUTY GROUND ROD CLAMP UL 96 LISTED
3'-0"
0'-6"
¾"x10' COPPERCLAD STEEL GROUND ROD UL 467 LABELED
GROUND RING LOOP CONDUCTOR=2/0 AWG BARE COPPER
GROUND RING TEST WELL DETAIL
USE SCH 40 PVC CONDUIT FOR POWER
"DOUBLE TIE" LATERAL JOINTS
1-1" PVC CONDUIT RISER
1-#2/0 AWG BARE COPPER DOWN CONDUCTOR
CONCRETE COLUMN DETAIL
INTERIM REVIEW ONLY
Document incomplete; not intended for permit, bidding or construction.
Engineer: FABIAN KALAPACH
P.E. Serial No.: 58100
Date: 15-NOV-2013
NOT TO SCALE
BOND MAIN CONDUCTOR TO DOWN CONDUCTOR
AIR TERMINALS
INTERCONNECT ALL AIR TERMINALS WITH #2/0 AWG BARE MAIN CONDUCTOR
BOND MAIN CONDUCTOR TO DOWN CONDUCTOR
BOX TRUSS
SUPPORTING COLUMN SEE "COLUMN DETAIL"
SHLD 1
LANE 1
LANE 2
LANE 3
SHLD 2
SUPPORTING COLUMN
GROUND RING TEST WELL SEE "GROUND RING TEST WELL DETAIL"
GROUND RING TEST WELL
MAINLANE GROUND RING PLAN VIEW (OSB)
AIR TERMINALS
INTERCONNECT ALL AIR TERMINALS WITH #2/0 AWG BARE MAIN CONDUCTOR
BOX TRUSS
BOND MAIN CONDUCTOR TO DOWN CONDUCTOR
SUPPORTING COLUMN SEE "COLUMN DETAIL"
SHLD 1
RAMP LANE
SHLD 2
SUPPORTING COLUMN
GROUND RING TEST WELL SEE "GROUND RING TEST WELL DETAIL"
GROUND RING TEST WELL SEE "GROUND RING TEST WELL DETAIL"
RAMP GROUND RING PLAN VIEW (OSB)
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420
CENTRAL TEXAS
Regional Mobility Authority
FIXED PRICE
TOLLING STANDARDS
LIGHTNING PROTECTION
SYSTEM DETAILS
LP-1
DESIGNED BY: KK
FED. RD. DIV. NO.: 6
FEDERAL AID PROJECT NO.
SHEET NO.: 18
DRAWN BY: DW
STATE: TEXAS
DIST.: AUS
COUNTY
CHECKED BY: KK
CONT.
SECT.
JOB
HIGHWAY NO.
Scale: 1:20
Pen Table: \\aus400\pmwork\Jobs\46837-CTRMA\Loop1-ML\Project Development\Design\CAD Files\Plot\MOPAC-11X17.pen
Design Filename: \\aus400\pmwork\Jobs\46837-CTRMA\183A Operations and Maintenance\Tolling\New Fixed Price Tolling Standards\LightningProtectionSystemDetails.dgn DATE


HS-20 TRAFFIC RATED GROUND BOX (IF IN PAVEMENT)
2-#4 GFRP 38"
PER NEC
2-2" PVC SCH 40 CONDUIT RISER
(4 OR 6) 1¼" PVC SCH 80 CONDUIT
SEE DETAIL A2 FOR CONDUIT TAILS DETAILS.
SEE DETAIL A4
SEE TYPICAL ETC CONFIGURATION SHEET.
CONDUIT E & F
CONDUIT C & D
CONDUIT A & B
TO CONDUIT RISERS
CONDUIT RISER DETAIL A1
LOOP TAIL TO GROUND BOX
CONDUIT TRENCH DETAIL
PAVEMENT SECTION
DEPTH AS REQUIRED
ROADWAY BASE MATERIAL
3'-0" MINIMUM
(4 OR 6) 1¼" PVC SCH 80 CONDUIT
SEE NOTE 1
SEE DETAIL A3 FOR LOOP RISER DETAIL
SEE DETAIL A1 FOR GROUND BOX RISER DETAIL
NOTE 1
5-1¼" PVC CONDUITS SCH 80 FOR MAIN LOOPS
6-1¼" PVC CONDUIT SCH 80 FOR AXLE LOOPS
THE SIZE OF TRENCH AND SPACING OF CONDUITS MUST COMPLY WITH NEC. UTILIZE PREFABRICATED NON-FERROUS SPACERS TO SUPPORT CONDUITS IN TRENCH. SPACING SHALL MINIMIZE VOIDS IN CONCRETE.
BACKFILL WITH CLASS B CONCRETE - LARGEST AGGREGATE < 1-1/2"
CONDUIT RISER DETAIL A2
LOOP TAIL TO GROUND BOX
CONDUIT TRENCH DETAIL
SET BLUE TOP TO FINISH GRADE TO ASSIST IN FIELD LOCATING
"BOND BREAKER" - FULLY COVER PIPE PLUG
1-1¼" GAL PIPE PLUG FLUSH WITH SURFACE USE PIPE DOPE ON THREADS TO MAKE UP
PAVEMENT FINISH GRADE
1/2" (MAX)
1-1¼" PVC CONDUIT SCH 80 RISER
RISER LENGTH AS REQUIRED
PAVEMENT SECTION
1-1¼" PVC FEMALE THREADED TO NON-THREADED COUPLING
1-1¼" SCH 80 PVC CONDUIT COUPLING
2'-0" MINIMUM
TIE-WRAPS
SEE DETAIL A2 FOR TRENCH CONSTRUCTION LAYOUT
1-1¼" PVC SCH 80 CONDUIT
TO GROUND BOX
1-¼" PVC CONDUIT SCH 80 90° BEND
#4 - GFRP BAR
CONDUIT RISER DETAIL A3
LOOP TAIL TO GROUND BOX
CONDUIT LOOP RISER DETAIL
PAVEMENT JOINT
2- ROWS X 3 COLUMNS 5 OR 6 - 1¼" PVC CONDUIT SCH 80
CONCRETE GROUND BOX HS-20 RATED (IF IN PAVEMENT) 24" X 24" X 12" WITH BOLT ON LID
1'-0"
PER NEC
PER NEC
2-2" PVC SCH 40 CONDUIT
2-#4 GFRP 38" IF GROUND BOX IS IN PAVEMENT
DETAIL A4
INTERIM REVIEW ONLY
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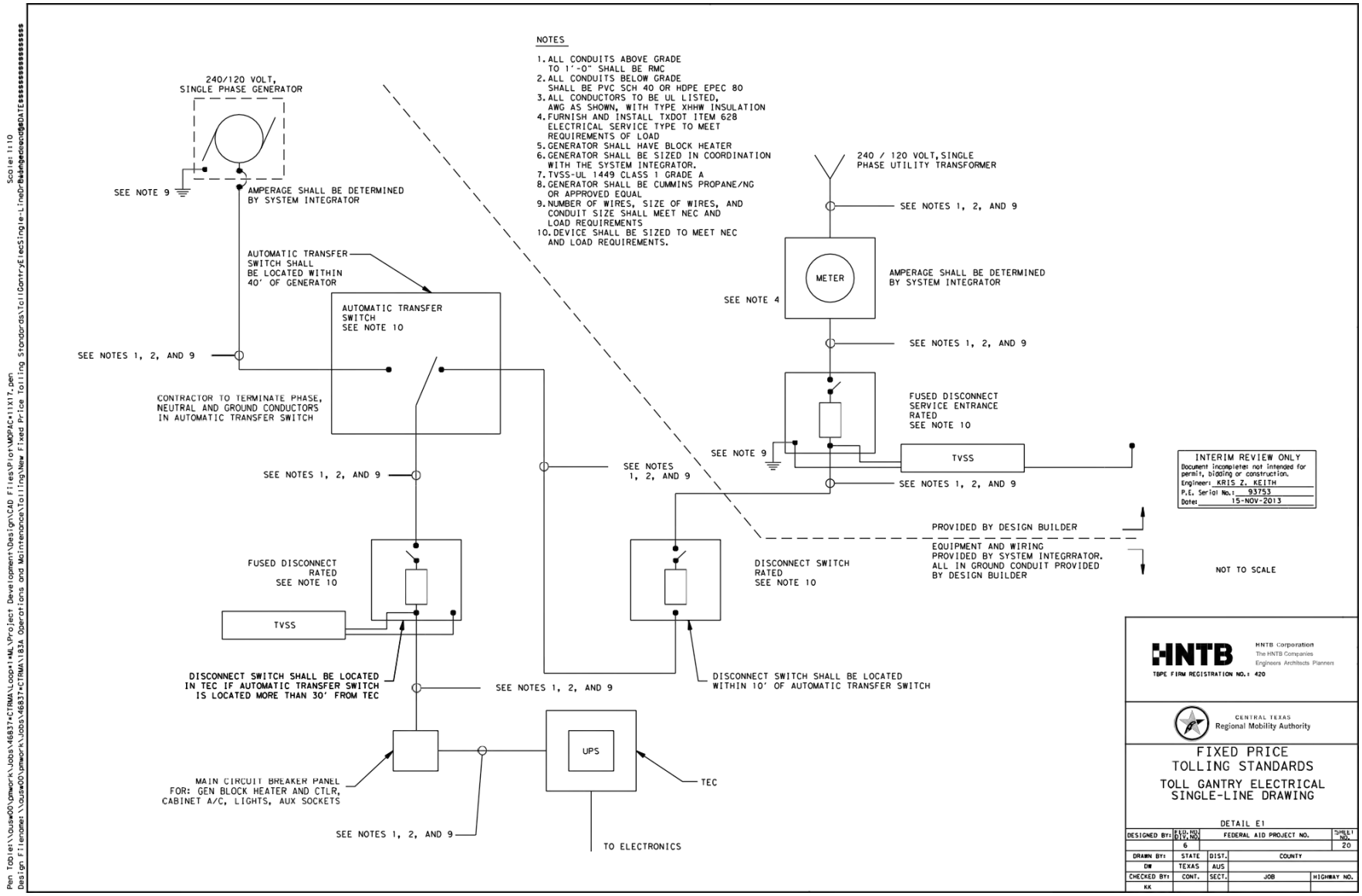
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013
NOT TO SCALE
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420
CENTRAL TEXAS
Regional Mobility Authority
FIXED PRICE
TOLLING STANDARDS
CONDUIT RISER
DETAILS
A1-A4
DESIGNED BY: KK
FED. RD. DIV. NO. 6
FEDERAL AID PROJECT NO.
SHEET NO. 19
DRAWN BY: DW
STATE TEXAS
DIST. AUS
COUNTY
CHECKED BY: KK
CONT.
SECT.
JOB
HIGHWAY NO.
Pen Tables\\dus#00\pmwork\Jobs\46837•CTRMA\Loop•1•ML\Project Development\Design\CAD Files\Prior\MOPAC•11X17.pen
Design Filename: \\dus#00\pmwork\Jobs\46837•CTRMA\183A Operations and Maintenance\Tolling\New Fixed Price Tolling Standards\Conduit•RiserDetail•rev.dgn Plotted on: %%DATE
Scale: 1:2


NOTES
1. ALL CONDUITS ABOVE GRADE TO 1'-0" SHALL BE RMC
2. ALL CONDUITS BELOW GRADE SHALL BE PVC SCH 40 OR HDPE EPEC 80
3. ALL CONDUCTORS TO BE UL LISTED, AWG AS SHOWN, WITH TYPE XHHW INSULATION
4. FURNISH AND INSTALL TXDOT ITEM 628 ELECTRICAL SERVICE TYPE TO MEET REQUIREMENTS OF LOAD
5. GENERATOR SHALL HAVE BLOCK HEATER
6. GENERATOR SHALL BE SIZED IN COORDINATION WITH THE SYSTEM INTEGRATOR.
7. TVSS-UL 1449 CLASS 1 GRADE A
8. GENERATOR SHALL BE CUMMINS PROPANE/NG OR APPROVED EQUAL
9. NUMBER OF WIRES, SIZE OF WIRES, AND CONDUIT SIZE SHALL MEET NEC AND LOAD REQUIREMENTS
10. DEVICE SHALL BE SIZED TO MEET NEC AND LOAD REQUIREMENTS.
240/120 VOLT, SINGLE PHASE GENERATOR
SEE NOTE 9
AMPERAGE SHALL BE DETERMINED BY SYSTEM INTEGRATOR
AUTOMATIC TRANSFER SWITCH SHALL BE LOCATED WITHIN 40' OF GENERATOR
AUTOMATIC TRANSFER SWITCH SEE NOTE 10
SEE NOTES 1, 2, AND 9
CONTRACTOR TO TERMINATE PHASE, NEUTRAL AND GROUND CONDUCTORS IN AUTOMATIC TRANSFER SWITCH
240 / 120 VOLT, SINGLE PHASE UTILITY TRANSFORMER
SEE NOTES 1, 2, AND 9
METER
AMPERAGE SHALL BE DETERMINED BY SYSTEM INTEGRATOR
SEE NOTE 4
SEE NOTES 1, 2, AND 9
FUSED DISCONNECT SERVICE ENTRANCE RATED SEE NOTE 10
SEE NOTE 9
TVSS
SEE NOTES 1, 2, AND 9
SEE NOTES 1, 2, AND 9
SEE NOTES 1, 2, AND 9
FUSED DISCONNECT RATED SEE NOTE 10
TVSS
DISCONNECT SWITCH RATED SEE NOTE 10
PROVIDED BY DESIGN BUILDER
EQUIPMENT AND WIRING PROVIDED BY SYSTEM INTEGRRATOR. ALL IN GROUND CONDUIT PROVIDED BY DESIGN BUILDER
NOT TO SCALE
INTERIM REVIEW ONLY
Document Incomplete not Intended for permit, bidding or construction.
Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Dates: 15-NOV-2013
DISCONNECT SWITCH SHALL BE LOCATED IN TEC IF AUTOMATIC TRANSFER SWITCH IS LOCATED MORE THAN 30' FROM TEC
SEE NOTES 1, 2, AND 9
DISCONNECT SWITCH SHALL BE LOCATED WITHIN 10' OF AUTOMATIC TRANSFER SWITCH
UPS
MAIN CIRCUIT BREAKER PANEL FOR: GEN BLOCK HEATER AND CTLR, CABINET A/C, LIGHTS, AUX SOCKETS
TEC
SEE NOTES 1, 2, AND 9
TO ELECTRONICS
HNTB
HNTB Corporation
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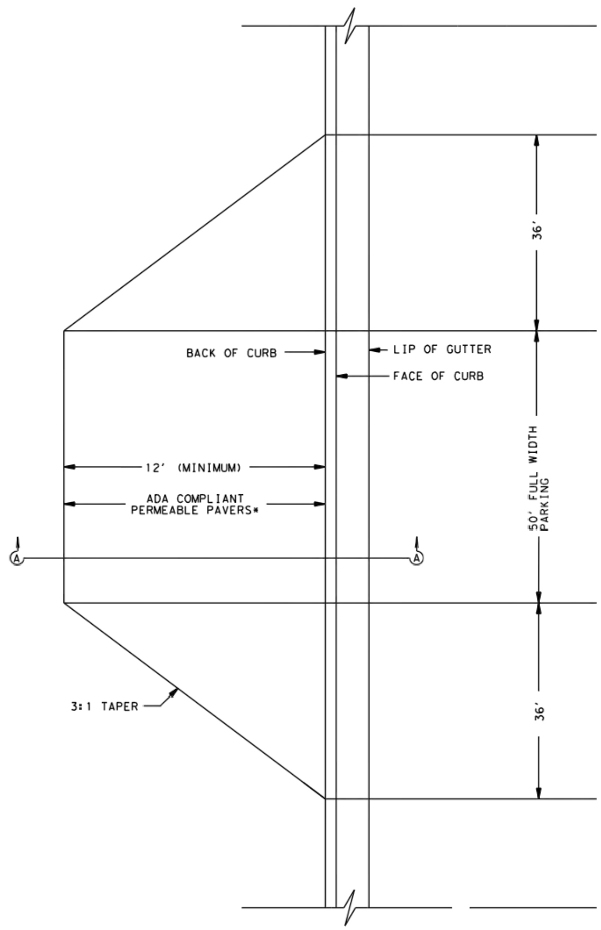
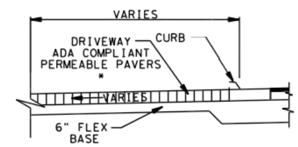
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420
CENTRAL TEXAS
Regional Mobility Authority
FIXED PRICE
TOLLING STANDARDS
TOLL GANTRY ELECTRICAL
SINGLE-LINE DRAWING
DETAIL E1
DESIGNED BY:
FED. RD. DIV. NO.: 6
FEDERAL AID PROJECT NO.
SHEET NO.: 20
DRAWN BY:
STATE: TEXAS
DIST.: AUS
COUNTY
CHECKED BY:
CONT.
SECT.
JOB
HIGHWAY NO.
KK





SECTION A-A
DRIVEWAY DETAILS
NTS

ENSURE GRADE BREAK DOES NOT EXCEED 8% UNLESS OTHERWISE DIRECTED.

DRIVEWAY CROSS SLOPE TO BE DESIGNED TO FACILITATE DRAINAGE AND SHALL NOT EXCEED +/- 5%. DRIVEWAY SECTIONS THAT CROSS EXISTING OR PROPOSED PEDESTRIAN FACILITIES SHALL NOT EXCEED +/- 2.0%

PORTIONS OF DRIVEWAYS THAT OVERLAP PEDESTRIAN FACILITIES SHALL MEET ALL REQUIREMENTS OF PEDESTRIAN FACILITIES, INCLUDING TEXAS ACCESSIBILITY STANDARDS.

*THE PERMEABLE PAVER SURFACE MAY BE CONCRETE IF SPECIFIED BY MOBILITY AUTHORITY. DESIGN-BUILDER TO CONFIRM SURFACE TYPE WITH MOBILITY AUTHORITY.

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Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

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TBPE FIRM REGISTRATION NO.: 420

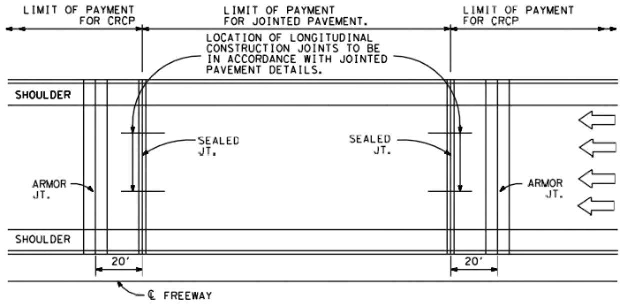
CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS

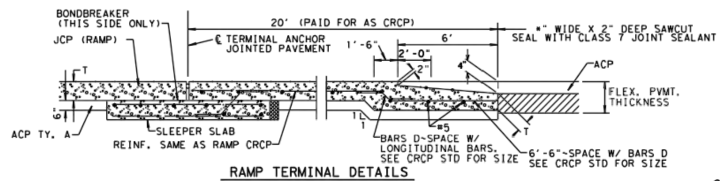
DRIVEWAY DETAIL

DW-1

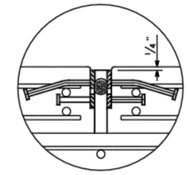
DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
	6				21
DRAWN BY:	STATE	DIST.	COUNTY		
DW	TEXAS	AUS			
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.	
KK					



TYPICAL FREEWAY LAYOUT
CONCRETE MEDIAN AND SHOULDERS
(SHOWING 2 TERMINAL ANCHORS)

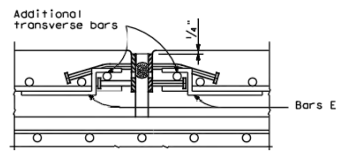


RAMP TERMINAL DETAILS



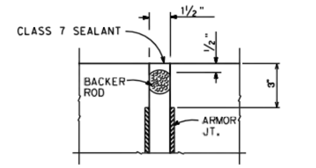
OPTIONAL ARMOR JT DESIGN

Note: Armor Joint may be depressed by ¼" across roadway for construction concerns. ¼" to ⅜" radius tool to be used at concrete edge. Optional Armor Joint design shall not be used at abutment.



SINGLE LAYER REINFORCEMENT

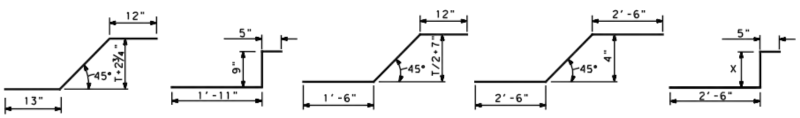
Two additional transverse bars shall be placed to engage Nelson Studs when single layer of continuous steel is present. Bars E shall be placed along longitudinal bars to engage additional transverse bars



PLAN VIEW

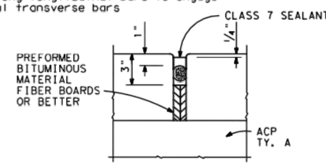
TREATMENT OF VERTICAL EDGE

Vertical edge shall be sealed with backer rod and class 7 sealant flush with pavement edge. Horizontal limits of backer rod along the length of the armor joint shall be extended to the outside of pavement. Joint shall be cleaned prior to sealing.



BARS A (#4) — BARS B (#4) — BARS C (#5) — BARS D (See CRCP Std. for size) — BARS E (#4)

T	X
8"	2¼"
9"	2¾"
10"	3¼"
11"	3¾"
12"	4¼"
13"	4¾"

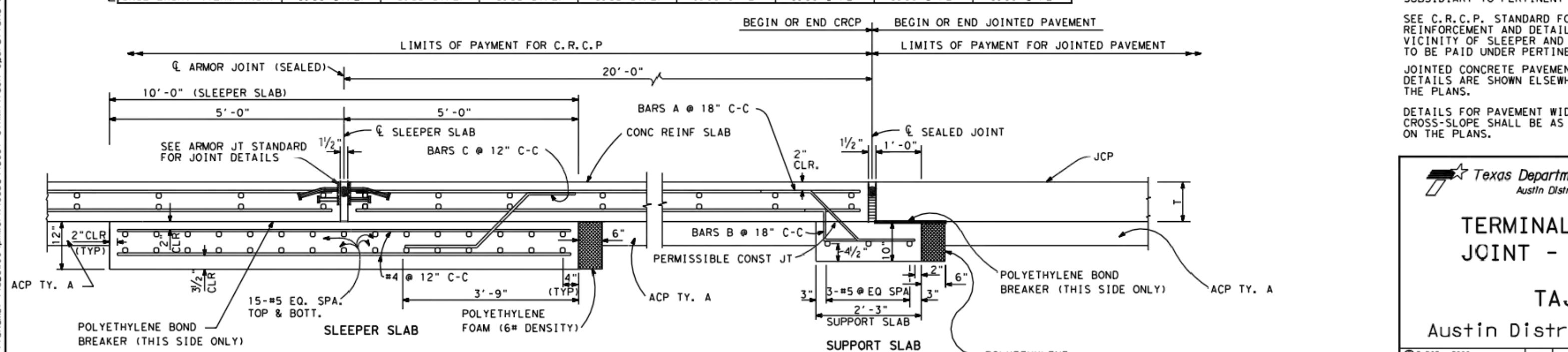


SEALED JOINT

¼" to ⅜" radius tool to be used at concrete edge. Joint shall be cleaned prior to sealing

ESTIMATED QUANTITIES (FOR ONE TERMINAL ANCHOR)

	ITEM	PAVEMENT THICKNESS (INCHES)							
		8	9	10	11	12	13	14	15
SLEEPER SLAB	CONC (TERM ANCH)	0.37 CY/LF	0.37 CY/LF	0.37 CY/LF	0.37 CY/LF	0.37 CY/LF	0.37 CY/LF	0.37 CY/LF	0.37 CY/LF
	REINF STL (TERM ANCH)	49.0 LBS/LF	49.1 LBS/LF	49.2 LBS/LF	49.3 LBS/LF	49.5 LBS/LF	49.6 LBS/LF	49.7 LBS/LF	49.8 LBS/LF
	UNCL EXCAV (TERM ANCH)	0.19 CY/LF	0.19 CY/LF	0.19 CY/LF	0.19 CY/LF	0.19 CY/LF	0.19 CY/LF	0.19 CY/LF	0.19 CY/LF
SUPPORT SLAB	CONC (TERM ANCH)	0.07 CY/LF	0.07 CY/LF	0.07 CY/LF	0.07 CY/LF	0.07 CY/LF	0.07 CY/LF	0.07 CY/LF	0.07 CY/LF
	REINF STL (TERM ANCH)	7.3 LBS/LF	7.4 LBS/LF	7.5 LBS/LF	7.5 LBS/LF	7.6 LBS/LF	7.7 LBS/LF	7.8 LBS/LF	7.9 LBS/LF
	UNCL EXCAV (TERM ANCH)	0.03 CY/LF	0.03 CY/LF	0.03 CY/LF	0.03 CY/LF	0.03 CY/LF	0.03 CY/LF	0.03 CY/LF	0.03 CY/LF



SECTION THRU TERMINAL ANCHORAGE
(SHOWING ONE TERMINAL ANCHOR)

NOTES:

POLYETHYLENE FOAM (6# DENSITY), SAW CUTS, EXPANSION JOINTS, AND EXPANSION JOINT MATERIALS SUBSIDIARY TO PERTINENT ITEM.

SUPPORT SLAB AND SLEEPER SLAB SHALL BE PAID FOR IN ACCORDANCE WITH SPECIAL SPECIFICATION ITEM "TERMINAL ANCHORAGE SYSTEM".

EXCAVATION OF A.C.P. IN VICINITY OF SLEEPER AND SUPPORT SLABS SUBSIDIARY TO PERTINENT ITEM.

SEE C.R.C.P. STANDARD FOR LOCATION OF REINFORCEMENT AND DETAILS. C.R.C.P. IN VICINITY OF SLEEPER AND SUPPORT SLAB TO BE PAID UNDER PERTINENT ITEM

JOINTED CONCRETE PAVEMENT (JCP) DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

DETAILS FOR PAVEMENT WIDTH, AND CROWN CROSS-SLOPE SHALL BE AS SHOWN ELSEWHERE ON THE PLANS.

Texas Department of Transportation
Austin District Design

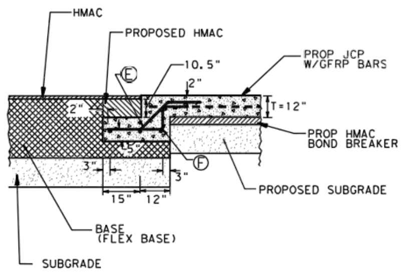
TERMINAL ANCHOR
JOINT - JOINTED

TAJ-1

Austin District Standard

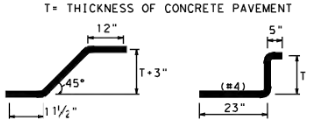
DIST	FED REG	FEDERAL AID PROJECT #	SHEET
AUS	6		22

FILE: TAJ-JCP.dgn



TRANSITION DETAIL
JCP TO ASPHALT
NTS

T= THICKNESS OF CONCRETE PAVEMENT



BAR DETAIL (E)
(#4)

BAR DETAIL (F)
(#4)

NOTE: STEEL REINFORCING ALLOWED FOR BARS E AND F, AND SPACED AT 18" C-C

GENERAL NOTES

1. DESIGN-BUILDER TO COORDINATE WITH SYSTEM INTEGRATOR FOR ACTUAL JOINT LOCATIONS.
2. TRANSVERSE JOINT SPACINGS SHOWN ARE MEASURED ALONG THE OUTSIDE EDGE OF PAVEMENT. TRANSVERSE JOINTS SHALL BE RADIAL TO THE BASELINE.
3. PROVIDE BOTH MEMBRANE AND WET MAT CURING. PLACE MEMBRANE CURING IMMEDIATELY AFTER TEXTURING. PROVIDE WET MAT CURING IN ACCORDANCE WITH TXDOT ITEM 420, AFTER MEMBRANE CURING HAS BEEN APPLIED AND AS SOON AS PRACTICAL SO AS NOT TO DAMAGE THE SURFACE FINISH.
4. SAW JOINTS TO A DEPTH OF 3" OR THE PAVEMENT THICKNESS DIVIDED BY FOUR (4), WHICHEVER IS GREATER, AS SOON AS SAWING CAN BE ACCOMPLISHED WITH ONLY MINOR RAVELING AND COMPLETE SAWING BEFORE THE PAVEMENT BEGINS TO COOL. FOR EACH CONCRETE PLACEMENT INSTALL ONE OR MORE TEMPERATURE SENSORS, 1" BELOW THE SURFACE AND MONITOR TO INSURE TEMPERATURE REQUIREMENTS ARE MET.

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Engineer: KRIS Z. KEITH
P.E. Serial No.: 93753
Date: 15-NOV-2013

NOT TO SCALE

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CENTRAL TEXAS
Regional Mobility Authority

FIXED PRICE
TOLLING STANDARDS
CONCRETE TO ASPHALT
TRANSITION DETAIL

CATD-1

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
	6				23
DRAWN BY:	STATE	DIST.	COUNTY		
DW	TEXAS	AUS			
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO.	
KK					

Scale: 1:5
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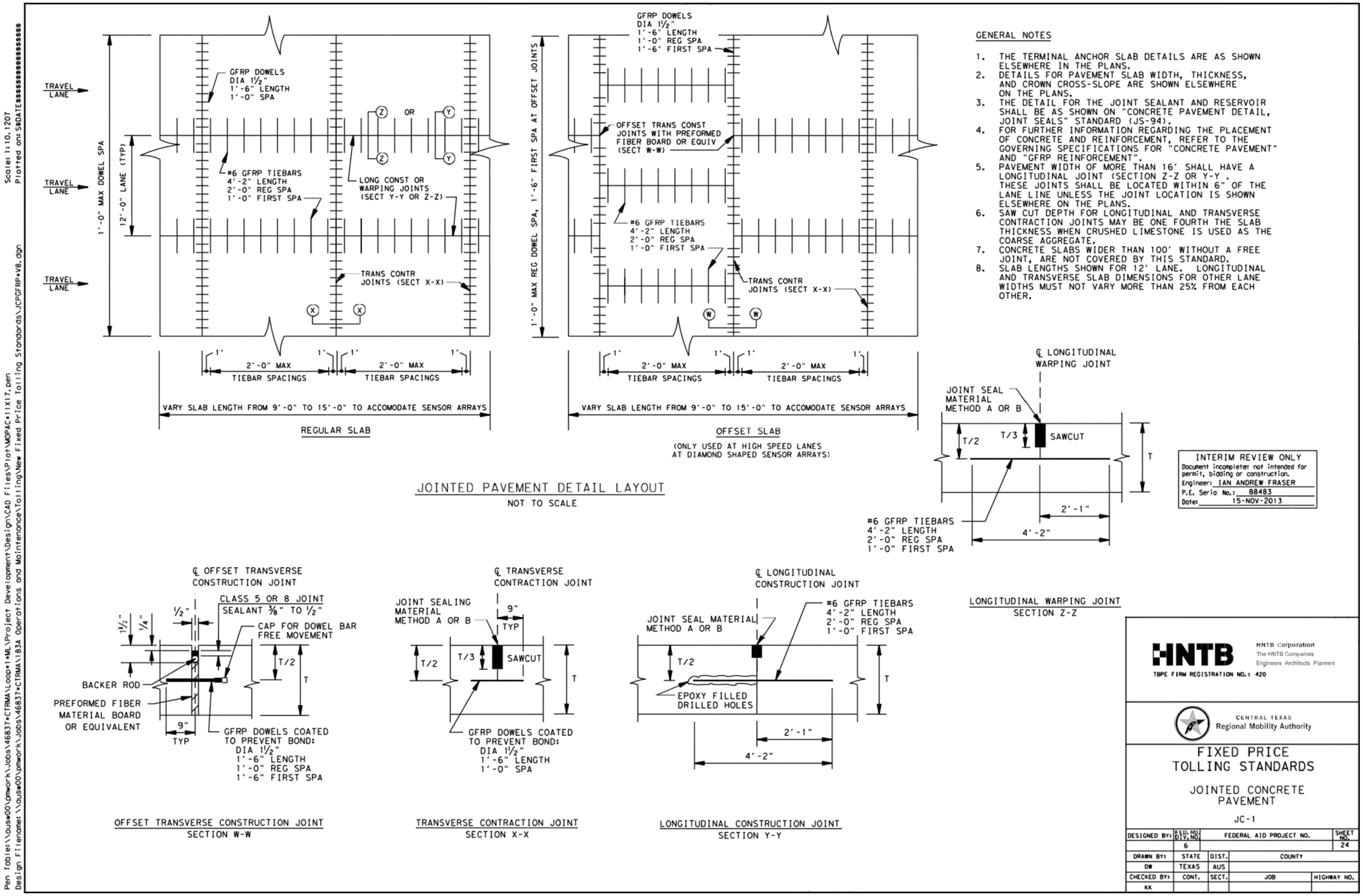
Design Filename: \\ousw00\pmwork\Jobs\46837*CTRMA\183A Operations and Maintenance\Tolling\New Fixed Price Tolling Standards\PavmtJointingPlanDetail.dgnPlotted on: $DATE$$$$$$$$$$$$$$$$$$$$$


JOINTED PAVEMENT DETAIL LAYOUT
NOT TO SCALE
REGULAR SLAB
OFFSET SLAB
(ONLY USED AT HIGH SPEED LANES AT DIAMOND SHAPED SENSOR ARRAYS)
TRAVEL LANE
1'-0" MAX DOWEL SPA
12'-0" LANE (TYP)
1'-0" MAX REG DOWEL SPA, 1'-6" FIRST SPA AT OFFSET JOINTS
GFRP DOWELS DIA 1½" 1'-6" LENGTH 1'-0" SPA
GFRP DOWELS DIA 1½" 1'-6" LENGTH 1'-0" REG SPA 1'-6" FIRST SPA
#6 GFRP TIEBARS 4'-2" LENGTH 2'-0" REG SPA 1'-0" FIRST SPA
LONG CONST OR WARPING JOINTS (SECT Y-Y OR Z-Z)
OFFSET TRANS CONST JOINTS WITH PREFORMED FIBER BOARD OR EQUIV (SECT W-W)
TRANS CONTR JOINTS (SECT X-X)
2'-0" MAX TIEBAR SPACINGS
VARY SLAB LENGTH FROM 9'-0" TO 15'-0" TO ACCOMODATE SENSOR ARRAYS
GENERAL NOTES
1. THE TERMINAL ANCHOR SLAB DETAILS ARE AS SHOWN ELSEWHERE IN THE PLANS.
2. DETAILS FOR PAVEMENT SLAB WIDTH, THICKNESS, AND CROWN CROSS-SLOPE ARE SHOWN ELSEWHERE ON THE PLANS.
3. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR SHALL BE AS SHOWN ON "CONCRETE PAVEMENT DETAIL, JOINT SEALS" STANDARD (JS-94).
4. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND REINFORCEMENT, REFER TO THE GOVERNING SPECIFICATIONS FOR "CONCRETE PAVEMENT" AND "GFRP REINFORCEMENT".
5. PAVEMENT WIDTH OF MORE THAN 16' SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR Y-Y . THESE JOINTS SHALL BE LOCATED WITHIN 6" OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
6. SAW CUT DEPTH FOR LONGITUDINAL AND TRANSVERSE CONTRACTION JOINTS MAY BE ONE FOURTH THE SLAB THICKNESS WHEN CRUSHED LIMESTONE IS USED AS THE COARSE AGGREGATE.
7. CONCRETE SLABS WIDER THAN 100' WITHOUT A FREE JOINT, ARE NOT COVERED BY THIS STANDARD.
8. SLAB LENGTHS SHOWN FOR 12' LANE. LONGITUDINAL AND TRANSVERSE SLAB DIMENSIONS FOR OTHER LANE WIDTHS MUST NOT VARY MORE THAN 25% FROM EACH OTHER.
℄ LONGITUDINAL WARPING JOINT
JOINT SEAL MATERIAL METHOD A OR B
SAWCUT
LONGITUDINAL WARPING JOINT
SECTION Z-Z
INTERIM REVIEW ONLY
Document incomplete: not intended for permit, bidding or construction.
Engineer: IAN ANDREW FRASER
P.E. Serial No.: 88483
Date: 15-NOV-2013
℄ OFFSET TRANSVERSE CONSTRUCTION JOINT
CLASS 5 OR 8 JOINT SEALANT ⅜" TO ½"
CAP FOR DOWEL BAR FREE MOVEMENT
BACKER ROD
PREFORMED FIBER MATERIAL BOARD OR EQUIVALENT
GFRP DOWELS COATED TO PREVENT BOND: DIA 1½" 1'-6" LENGTH 1'-0" REG SPA 1'-6" FIRST SPA
OFFSET TRANSVERSE CONSTRUCTION JOINT
SECTION W-W
℄ TRANSVERSE CONTRACTION JOINT
JOINT SEALING MATERIAL METHOD A OR B
GFRP DOWELS COATED TO PREVENT BOND: DIA 1½" 1'-6" LENGTH 1'-0" SPA
TRANSVERSE CONTRACTION JOINT
SECTION X-X
℄ LONGITUDINAL CONSTRUCTION JOINT
JOINT SEAL MATERIAL METHOD A OR B
EPOXY FILLED DRILLED HOLES
LONGITUDINAL CONSTRUCTION JOINT
SECTION Y-Y
HNTB
HNTB Corporation
The HNTB Companies
Engineers Architects Planners
TBPE FIRM REGISTRATION NO.: 420
CENTRAL TEXAS Regional Mobility Authority
FIXED PRICE TOLLING STANDARDS
JOINTED CONCRETE PAVEMENT
JC-1
DESIGNED BY: FED. RD. DIV. NO. 6 FEDERAL AID PROJECT NO. SHEET NO. 24
DRAWN BY: DW STATE TEXAS DIST. AUS COUNTY
CHECKED BY: KK CONT. SECT. JOB HIGHWAY NO.

ATTACHMENT E

Price Sheet

State Highway 45 SW Project

Price Sheet

Toll System Installation/Integration

State Highway 45 SW Project

Task No.	Description	Qty	Unit	Unit Price (US $'s)	Extended Price (US $'s)	Equipment / Subcontractors	Labor	Markup on Sub's & Equipment	%	Total	Total Hours
	System Integration										
1	Toll Zone - Materials / Equipment	1	Lot	617,840.96	617,840.96	514,867		102,973	20.0%	617,841	
2	Cooridor Devices - Equipment	1	Lot	408,445.76	408,445.76	340,371		68,074	20.0%	408,446	
3	Program Management	1	Lot	235,329.97	235,329.97		235,330			235,330	1,311
4	Systen Design & Documentation	1	Lot	183,990.19	183,990.19		183,990			183,990	1,242
5	SW Development	1	Lot	77,985.96	77,985.96		77,986			77,986	552
6	System Integration/Testing	1	Lot	191,187.54	191,187.54		191,188			191,188	1,224
7	Installation	1	Lot	376,701.30	376,701.30	134,054	215,837	26,811	20.0%	376,701	1,769
8	Fiber	1	Lot	255,683.01	255,683.01	198,361	17,650	39,672	20.0%	255,683	55
B	Bonding	1	LS	17,087.36	17,087.36	17,087				17,087	
	TOTAL				**2,364,252.06**	**1,204,741**	**921,981**	**237,531**		**2,364,252**	**6,153**

The Pricing shown above Excludes:

-- All Recurring Data Communication Costs

-- Lane Closures & MOT (if needed)

-- Recurring 3rd-Party SW/HW Support Agreements & SW Licenses

-- Spares Replenishment Costs

-- System HW/SW Warranty/Maintenance Services & Support

Milestone-Based Payments for SH-45 Southwest System Implementation					
Payment Number	Payment Milestone	% Paid	Cum. % Paid	$ Amount	Cum. $'s
A. Non-Equipment Cost					
A-1	Notice to Proceed	7.5%	7.5%	111,805	111,805
A-2	Project Management Documents Approved (Baseline Project Management Plan, Project Schedule and Update Quality Assurance Plan)	7.5%	15.0%	111,805	223,609
A-3	System Design Documents Approved (System Requirements Document (SRD), Updated Business Rules Document (BRD) and System Detailed Design Document (SDDD)	10.0%	25.0%	149,073	372,682
A-4	Approval of Remaining Documents (Installation and Master Test Plans)	10.0%	35.0%	149,073	521,755
A-5	Approved Installation Drawing Packages	15.0%	50.0%	223,609	745,364
A-6	Approved Interface Test, Formal Full On-site First Installation Testing (OFIT) Completed	7.5%	57.5%	111,805	857,169
A-7	Approved and Approval of All Maintenance Manuals, Training Materials and User Manuals	7.5%	65.0%	111,805	968,973
A-8	All Sites Commissioned	7.5%	72.5%	111,805	1,080,778
A-9	Training Completed and Go-Live	7.5%	80.0%	111,805	1,192,582
A-10	Formal System Operational Testing Approved	10.0%	90.0%	149,073	1,341,655
A-11	SH-45 SW System Acceptance	10.0%	100.0%	149,073	1,490,728
B. Hardware, Equipment and Off-the-Shelf Software					
B-1	Ordering Verified	10.0%	10.0%	61,784	61,784
B-2	Purchased, Received and Verified	90.0%	100.0%	556,057	617,841
C. Fiber					
C-1	Start of Fiber Installation Activities	40.0%	40.0%	102,273	102,273
C-2	Fiber Installation Substantially Completed	52.5%	92.5%	134,234	236,507
C-3	Formal System Operational Testing Approved	7.5%	100.0%	19,176	255,683
TOTAL				**$**	**2,364,252**

ATTACHMENT F

Preliminary Project Schedule and Milestones

State Highway 45 SW Project

(Dates and durations subject to change.)

Task	Duration and/or Milestone Date
Contractor Contract Executed	November 2016
Construction Duration (Approximate)	2.25 Years
Open to Traffic	February 2019

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #12

Monthly briefing on the MoPac Improvement Project

Strategic Plan Relevance:	Regional Mobility
Department:	Engineering
Contact:	Steve Pustelnyk, Director of Community Relations
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Briefing and Board Discussion Only

Summary:

The report is a construction status update for the MoPac Improvement Project.

Backup provided: none

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #13

Briefing on the HERO Program

Strategic Plan Relevance:	Regional Mobility
Department:	Operations
Contact:	Tim Reilly, Director of Operations
Associated Costs:	N/A
Funding Source:	N/As
Action Requested:	Briefing and Board Discussion Only

Summary:

Report on the status of the Highway Emergency Response Operations (HERO) program and transfer of the program to TxDOT.

Backup provided: None

CENTRAL TEXAS
Regional Mobility Autho

March 29 2017
AGENDA ITEM #14

Executive Director Comments

Strategic Plan Relevance:	Regional Mobility
Department:	Executive
Contact:	Mike Heiligenstein, Executive Director
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Briefing and Board Discussion Only

Summary:

Executive Director Comments.

A. SH 71 Express opening.

B. Report on the Texas A&M Transportation Institute's high level assessment of the Wire One Austin Urban Gondola proposal led by CapMetro.

C. New employee introduction.

D. Report on the March 2017 investor meetings.

Backup provided: High Level Considerations for the Wire One Austin Urban Gondola Proposal; Wire One Austin Proposal; Joint Agency Letter

High-Level Considerations

for the

Wire One Austin Urban Gondola Proposal

Prepared by

TEXAS A&M TRANSPORTATION INSTITUTE

THE TEXAS A&M UNIVERSITY SYSTEM

for

CAPITAL METROPOLITAN TRANSPORTATION AUTHORITY

February 24, 2016

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EXECUTIVE SUMMARY

Wire One Austin is a proposed urban gondola system for implementation within the city of Austin. The Board of Directors for the Central Texas Regional Mobility Authority (CTRMA) saw a concept-level presentation during a meeting on September 7, 2016.

The purpose of this technical memorandum is to present a high-level perspective of the project development considerations for the Wire One Austin proposal. Given the preliminary and high-level nature of the work, this memorandum does not make any recommendations regarding the overall suitability of the gondola. The objective of the memorandum is to provide information for additional consideration in further feasibility studies. At this time, many unknowns exist about specific ridership estimates, design characteristics, and financial considerations. This knowledge is critical for determining the overall suitability of the project.

Wire One Austin would extend north to south on a corridor from the UT-Austin campus to West Slaughter Lane, mostly following Lavaca and South First Streets. Wire One would be a monocable gondola with multiple cabins that move using a single pulled rope, continuously operating for 19 hours per day. The system consists of two 4.2-mi main lines and a third 0.25-mi line that connects the South Congress Transit Center to South First Street. Passengers would access the service at one of 19 stations located along the route. The proposer estimates the total implementation cost to be $287-$555 million, based on a low-cost design alternative for stations ($13 million per station).

The United States has limited experience with gondolas operating in an urban environment. Specific agencies operate trams, but those systems are different compared to gondolas. Trams generally have two large cabins that move back and forth as opposed to gondolas with multiple cabins that move along a cable. The Roosevelt Island Tramway and Portland Aerial Tram are two domestic tram systems. The City of Telluride operates a gondola that provides passenger service between the city center and a ski resort. Recently, other cities and region in the U.S. have expressed interest and started to investigate urban gondolas as a potential mode for transportation. As of the date of this report, three cities—San Diego, California; Washington, D.C.; and Albany, New York—had completed urban gondola feasibility assessments that are publicly available. International experience and interest is more extensive, as seen by systems currently operating in South America, Europe, and Asia. The most extensive development has occurred in Medellin, Colombia with the Metrocable system and La Paz, Bolivia with the Mi Teleférico system.

Wire One Austin is a unique proposal compared to other urban gondolas. As proposed, Wire One is longer than systems currently in operation internationally or any proposed system in the United States. Overall, most gondolas worldwide extend for 0.5 to 3.0 mi and have up to five intermediate stations in addition to 2 terminals. Almost all other systems either cross a river, traverse a steep slope, or connect neighborhoods with a poorly connected street grid. Wire One is longer, consists of more stations, and generally follows a flat slope through a well-connected street grid.

Central Texas transportation agencies would have to address a number of project development considerations before evaluating future funding opportunities. These considerations include topics related to regional and corridor-level planning, travel demand forecasting, and funding and financial options. The Wire One proposal is not included in the CAMPO 2040 Regional Transportation Plan or any transportation plans for the region. For the urban gondola to be eligible for federal funds, the regional transportation plan would require modification and the travel demand model would likely need to adapt

to include a new mode. Most sources of funding for local, state, and federal funding programs are competitive. Given a limited source of revenue, an investment in an urban gondola will likely require reprioritizing other projects.

Other key considerations relate to environmental impacts, design, and constructability. Studies that pursue funding need to clearly define a purpose and need to comply with the National Environmental Policy Act and the Texas Administrative Code, which require the assessment of potential environmental impacts for transportation projects. Specific items that may have a high risk of significant environmental impact include visual aesthetics, public parks and recreational lands, and utility relocation. A few overhead utilities currently exist above Lavaca and South First Streets and would have to move to support construction and operation. Subsurface utilities necessitate additional research and investigation.

Much of the success of a new transit mode is how the public would react and use the service. Wire One Austin would be would be a unique project in the U.S. for use of the urban gondola mode for a transit commuter corridor.

INTRODUCTION

Wire One Austin is a proposed urban gondola system for implementation within the city of Austin. A concept-level plan for Wire One Austin was presented before a meeting of the Central Texas Regional Mobility Authority (CTRMA) Board of Directors on September 7, 2016. The presentation included mock-up graphics of Wire One Austin as an operational system. The visuals depicted stations where passengers could board and alight and scenes with the gondola operating above existing streets. Included in the presentation was a map of the route location, estimates for travel time (to travel to stations and along the gondola line), ridership assumptions, and construction estimates. The premise for a gondola as a high-capacity transit alternative was to provide continuous service, significantly curtail right-of-way acquisitions, and provide a service that could operate independently of roadway congestion. Additionally, Wire One Austin is a mode that might encourage more users to take transit due to having an aesthetic design and providing a scenic view for travelers.

The purpose of this technical memorandum is to present a high-level perspective of the project development considerations for the Wire One Austin proposal. Given the preliminary and high-level nature of the work, this memorandum does not make any recommendations regarding the overall suitability of the gondola. The objective of the memorandum is to provide information for additional consideration in further feasibility studies.

This memorandum organizes information into different sections to provide a clear description of the proposed urban gondola system, background about similar systems worldwide, and discussion of items that need further consideration if the Wire One Austin proposal continues into project development. The presentation from the meeting with CTRMA was distilled into key topics that pertained to system design, basic operating concepts, alignment, and costs. A background on U.S. experience presents information regarding the two aerial trams in operation and proposals for urban gondola systems. Included tables list key attributes for international gondola applications, summarizing features including length, number of stops, hours of operation, and daily ridership. Some of the items that will need further feasibility analysis include estimates of costs, possible funding sources, operations planning and ridership forecasts, design and constructability, and environmental considerations.

TERMINOLOGY

Aerial **ropeways** transport passengers suspended in the air and generally consist of terminals, towers, ropes, and evacuation components. Enclosed cabins carry passengers between destinations, and can hold between 4 and 200 people. Terminals exist at the ends of the ropeway and house the equipment used to power the movement of the ropeway. Terminals exist as either drive or return terminals. The drive terminal houses the drive wheel that powers the movement of the ropeway. The return terminal houses the bull wheel that acts as a return mechanism for the ropeway. Intermediate stations allow passengers to board or leave the ropeway in the middle of the route. Towers between the terminals support the ropeway, often with steel-framed structures and guiding wheels. A series of ropes and cables controls movement. Ropeways can support cabins by using a single cable or multiple cables.

Evacuation systems provide an element of safety and redundancy to protect passengers in the event of an incident. Most aerial systems have a rope and harness inside individual cabins to provide a means for escape. Ancillary power units located at the terminals can engage when the primary power source fails. Standards for aerial ropeways help to ensure safety and consistency with smooth operation. The American National Standards Institute (ANSI) Standard B77.1-2011 details the technical specifications for operating components of an aerial ropeway system. The ANSI standard specifically uses the phrase

passenger ropeways to describe this transportation mode. The standard also contains language that applies to the Americans with Disabilities Act (ADA).

Aerial ropeways are a class of mass transit that entails different variations, including tramways and gondolas. **Tramways** are aerial lifts that consist of two multi-passenger cabins fixed to a suspended cable. Track cables provide physical support for the cabins, and haulage cables pull the cabin along the route. Tramways operate by pulling one cabin toward the powered engine and allowing gravity to push the second cabin away—similar to a back-and-forth seesaw. Some tramways can have dual-haul systems that allow different sides of the cable to operate independently of the other cabin. Cabins for tramways can hold up to 200 people. Operators usually have large cabins because the ropeway can serve only two cabins.

Gondolas consist of a ropeway that moves multiple enclosed cabins along a unidirectional loop. Cabins for gondolas are smaller compared to tramways. The speed of the main cable can be up to 19 mph. Gondolas are designed with cabins that can detach from the main line at terminals and intermediate stations. This capability allows cabins to move slower or stop at specific points along the route. Slower speeds allow passengers to move easily into or out of cabins.

Detachable gondolas exist in one of three different types, as characterized by the number of overhead cables supporting and pulling the cabins. A monocable gondola uses a single cable to support and pull the cabin. Bicable and tricable gondolas are supported by one and two fixed cables, respectively, and an additional cable pulls the gondolas. The number of cables influences the cabin capacity, speed, and maximum acceptable distance between supporting towers. Generally, systems with more cables tend to have larger cabins, move faster, and have a greater distance between towers. Tricable systems are the most resistant to wind but require more infrastructure when navigating horizontal curves. Overall, systems with more ropes (bicable, tricable) tend to be more expensive compared to a monocable (*1*). Specific cost comparisons between the different gondola types are not reliable because other characteristics have a greater influence on overall cost, namely the number of cabins and the design of individual stations. Table 1 provides a summary of the service characteristics for the three types of gondola systems.

Table 1. Service Characteristics of Gondola System Types (*1*)

Type of System	Monocable	Bicable	Tricable
Cabin Capacity	15 passengers	16 passengers	35 passengers
Transport Capacity	3,600 passengers/hour	3,600 passengers/hour	6,000 passengers/hour
Maximum Travel Speed	13 mph	13 mph	19 mph
Maximum Distance Between Towers	1,150 ft	2,300 ft	9,800 ft

Gondolas are most often associated with ferrying tourist traffic within ski resorts, historical sites, and other attractions. However, cities and governments have started to implement gondolas within urbanized settings as an alternative means for transit. Urban gondolas operate above the existing street network and function similarly to rail transit. Passengers access stations at ground level and walk or use escalators and elevators to an elevated platform where they can board cabins. Urban gondolas operate within cities worldwide.

WIRE ONE AUSTIN

The concept for Wire One Austin is a monocable urban gondola system to operate within the city of Austin. The system consists of multiple cabins that move along a route using a single pulled rope, providing passenger access at stations. The hours of operation suggest continuous movement for 19 hours per day, with a few hours set aside for recurring maintenance. Personnel would be assigned at stations to assist passengers with boarding and alighting. The proposer selected a monocable urban gondola system because that type of system was less expensive compared to other systems.

The proposed alignment is on a corridor that extends north to south from the University of Texas (UT-Austin) campus to West Slaughter Lane, mostly following Lavaca and South First Streets. Wire One Austin crosses a water boundary at Lady Bird Lake, which is a natural barrier that leads to congestion for major regional corridors. These corridors include highway segments identified by the Texas Department of Transportation (TxDOT) as the most congested in Texas: I-35, MoPac (Loop 1), South Lamar Blvd, and SH 360 (*2*). The real estate necessary for the gondola is anticipated to be in a public right of way controlled by the City of Austin, as well as private building owners if modifications of existing buildings are required. The system consists of two 4.2-mile main lines and a third 0.25-mi line that connects the South Congress Transit Center to South First Street. Passengers can transfer between the three lines through a midpoint transfer station at Ben White Blvd (US 290).

The proposer primarily chose the route location based on the number of homes close to the line. The hypothesis suggests that commuters would be inclined to take a 1- to 2-mi trip to a station and ride the urban gondola. The geographic area of the catchment area would include residents in the south Austin, as shown in Figure 1. Additionally, the route alignment includes key activity destinations such as City Hall, Parmer Events Center, Capital Complex, and UT Austin. Proposed stations will exist near a number of public schools.

In total, the system proposes 19 stations for passenger access to the gondola. Passengers enter and leave slow-moving gondola cabins at each station. The passenger stations would be placed every half-mile at major arterial crossings, such as William Cannon Drive, Stassney Lane, and Oltorf Street. The locations where the route would turn (to follow street curves) is a major factor for determining the number of stations and station locations. Turns need to be navigated slowly because a gondola can deflect and cause passenger discomfort. At stations, the gondola can detach from the main drive cable and move at a slower speed to provide passengers the time for boarding and alighting.

According to the Wire One proposal, built infrastructure would support the urban gondola along the route. Elevated platforms are proposed to be built into existing structures where feasible. Existing parking garages could link to constructed platform structures to accommodate the gondola, serving as an enhanced park-and-ride service. A series of steel towers and concrete structures above the street would connect the cable along the route. Individual ADA-compliant cabin cars expect to have climate control equipment, for both heating and cooling.

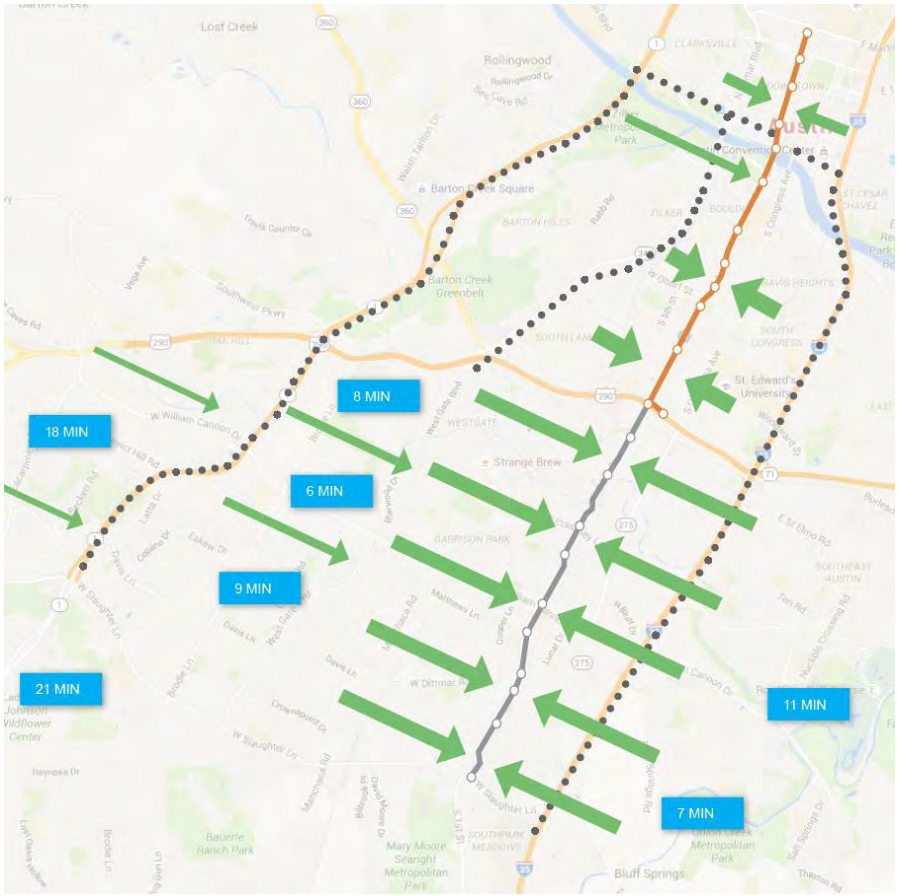

Figure 1. Map of Route and Catchment Area (*3*)

Specifically, the cited attributes of the Wire One Austin proposal include the following:

- Line Length: Two separate, 4.2-mi lines that interconnect (total length of 8.4 miles), plus a short 0.3-mi third line that connects the South Congress Transit Center to South First Street for a total of 8.7 mi.
- Number of Stops:
    - 11 stops, from UT-Austin to Ben White
    - 9 stops, from Ben White to Slaughter Lane
    - Total of 19 stops along the length of the corridor
- Travel Time:
    - 40 minutes from Slaughter Lane to Caser Chavez Street.
    - 6 minutes from Caser Chavez Street to UT-Austin.
- Average Travel Speed: 11.3 mph.
- Boarding Time: 12 seconds.
- Cabin Capacity: 10 people per cabin.
- Peak Frequency: 30 seconds between cars.
- Operational Capacity: 1,200 (base) to 3,000 (peak) persons per hour per direction (pphpd).
- Hours of Operation: Daily 19 hours per day.
- Ridership: 5.9 million per year, or daily average of 16,000 riders.
- Capital Cost for Implementation: $287–$555 million.
- Annual Operating Cost: $3–$6 million.

The proposer made many assumptions to derive estimates of ridership, costs, and financing arrangements for Wire One Austin. Supply-side assumptions for line speed, headway, and cabin capacity formed the basis for estimating a daily average ridership of 16,000 people per day. The proposer suggested a targeted ridership of 1,200 people in each direction during peak periods, with lower demand during off-peak times. The research team did not have access to detailed, written values that represented ridership predictions from the proposer. That estimate did not include a thorough consideration of demand, or an analysis of the market forces and behaviors governing trip-making decisions.

Pursuit of a low-cost design alternative formed the basis for estimating the capital cost of implementation. The proposer based most of their cost estimate on the number of 19 expected stations along the route at roughly $13M per station. Additional costs would be required to purchase individual cabins (including spares), aerial cables, towers, and a cable car storage facility. Those basic assumptions formed the proposer's low estimate of $287M. The proposer factored their estimate of unforeseen challenges to derive a high cost estimate of $555M. Projected maintenance costs estimates ranged from $3 to $6 million per year. The proposer based their estimates using information from North American manufacturers for a theoretical system without a detailed operating plan.

Additionally, the proposer believed they could construct stations at a lower cost compared to other recently implemented urban gondola systems. Public-private partnerships could be pursued by seeking arrangements for stations at parking garages and other locations along the route. The proposer suggested CTRMA-issued bonds might support a possible funding source for construction. The completed project could be turned over to Capital Metro for operations. Revenues from fares would serve as a long-term funding source. The research team sought additional detail regarding the cost estimates, financing, and maintenance implications for Wire One Austin, but the proposer had not made that information, or their calculation methodology, available at the time of this report.

Additionally, the following financial-related items may need further clarification or consideration:

- Specific detail for constructing stations in Austin, as opposed to generic estimates.
- Specific detail for operating costs, including a staffing plan and assumptions for personnel costs.
- Specific detail for capital maintenance costs for annual investment in a state of good repair.
- Fare schedule and fare-setting processes (e.g. compliance with federal regulations).
- Utility and tower relocation costs.
- Necessary right-of-way costs.
- Environmental mitigation.
- Financial plan for source of funding for construction and operations.

Figure 2 shows a map with the proposed route and station locations. Figure 3 illustrates a gondola operating above South First Street, and Figure 4 illustrates an overhead station at the intersection of Riverside Drive and South First Street.

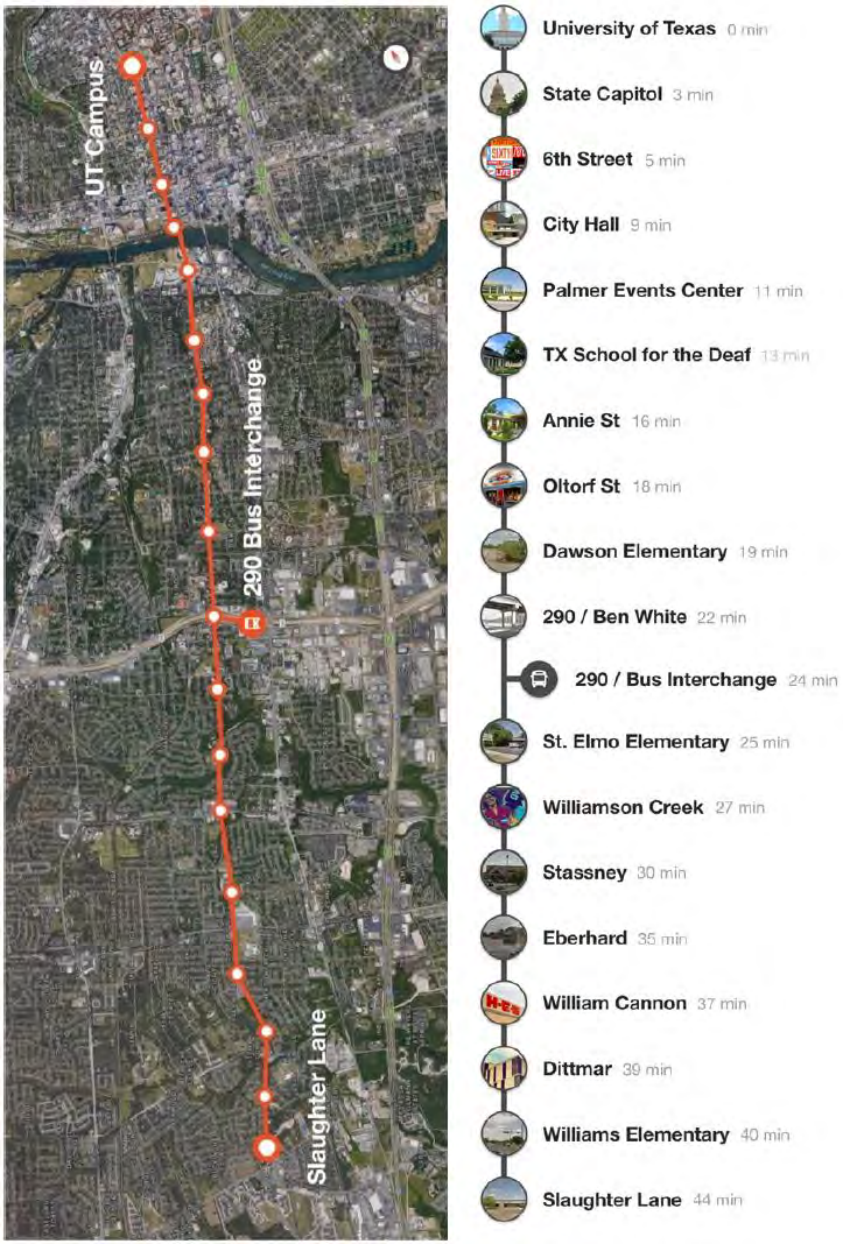

Figure 2. Map of Route and Stop Locations (*3*)

Figure 3. Illustration of a Gondola Operating Above South First Street (*3*)

Figure 4. Illustration of Overhead Station at Riverside Drive and South First Street (*3*)

U.S. EXPERIENCE

Nationally, the United States has limited practical experience with ropeways. The Roosevelt Island Tramway, implemented in 1976, is one of the oldest ropeways that currently operates. Within the past decade, a tram was implemented in Portland, Oregon and an urban gondola started carrying passengers in Colorado. As noted earlier, aerial trams and gondolas are two different types of ropeway systems. Aerial trams typically consist of two large passenger cabins that alternate positions between the two terminals on the line. Urban gondolas have multiple passenger cabins that move along a rope or multiple ropes. The City of Telluride operates a gondola that provides passenger service between the city center and the ski resort. The Telluride system was an alternative to an existing bus service. As of the date of this report, three cities—San Diego, California; Washington, D.C.; and Albany, New York—had completed urban gondola feasibility assessments that are publicly available.

Aerial Trams in Operation

Aerial trams currently operate in Portland, Oregon and Roosevelt Island in New York City. These trams carry more passengers per cabin compared to gondolas, but only two cabins move when the system operates. Table 1 lists the key features and operating characteristics of those two trams.

Portland Aerial Tram

Planning for the Portland Aerial Tram began in 1999 after the Oregon Health and Science University (OHSU) created a new campus in a different neighborhood to accommodate future growth. Existing roads and transportation services did not provide for easy transit between the two campuses, so OHSU officials studied ways to solve the problem. A study found that an aerial tram was the most cost-effective alternative given the steep incline and the anticipated ridership for the service. The tram crosses a state highway, an interstate highway with frontage and service roads, and local streets. Construction began in August 2005, and the service opened to the public in January 2007 (*4*).OHSU provided $40 million as a contribution toward the $57 million needed for construction costs since most of the passengers were either employees, patients, or visitors to the OHSU campuses. A significant share of the construction cost was to build the large station platforms and to buy two large cabins (*5*). The City of Portland operates the tram. In 2014, the latest year with available information, the total cost to operate the system was less than $2.3 million. The tram collected $495,000 from fare revenues, or 21.9 percent of the total operating cost (*6*).

Roosevelt Island Tramway

The development of the Roosevelt Island Tramway had a longer, incremental history. The system began in 1976 as a temporary means of transporting people between Manhattan and Roosevelt Island. However, the tram was very popular and became a permanent facility in 1989. The Roosevelt Island Operating Corporation, a public benefit corporation created by New York State, operates the tram. The payment systems for the tram integrate with the MetroCard fare card, managed by the New York Metropolitan Transit Authority. Additional fare to transfer to a connecting subway or bus route is not required. A modernization project started in March 2010 that converted the tram to a dual-haul system, allowing for schedule flexibility and enhanced maintenance scheduling (one side can close while the other side is open) (*4*). The total cost of the 2010 capital project was $25 million, of which $15 million came from a New York State grant (*7*). The tram generated $5.5 million in revenue for the fiscal year that ended in March 2016 (*6, 8*).

Proposed Urban Gondolas

Recently, some cities and regions have expressed interest toward investigating urban gondolas as a potential mode for transportation. Table 2 summarizes key attributes of the proposed urban gondola systems in the United States that had initial assessments and reports.

San Diego

In 2015, the San Diego Association of Governments and Metropolitan Transportation System completed an initial proof-of-concept feasibility study for a proposed urban gondola line between San Diego Bay and Balboa Park. The proposed urban gondola will travel roughly 2 mi and have four stations (including the terminals at each end). The report evaluated the existing conditions, assessed market demand, and provided estimates for implementation costs and farebox revenue. Further steps outline requirements to assess engineering design, environmental considerations, and regulatory issues (*9*).

Washington, D.C.

In the Washington, D.C., metro region, a collective group of businesses and government agencies completed a feasibility study in November 2016 for a proposed gondola system. The District of Columbia Department of Transportation and Arlington County were included as members of the study executive committee. The proposed line would provide service over the Potomac River between the Georgetown neighborhood in the District of Columbia and Rosslyn in Virginia. A major reason for pursuing the study was to consider a low-cost alternative for crossing the river. Preliminary cost estimates for a second Metrorail tunnel under the river were $2.5 billion, with a construction timeline of 12–16 years. The study focused on planning elements related to delivering transportation projects, including stakeholder engagement, travel demand forecasting, and environmental compliance. A detailed technical analysis primarily focused on route alignment and placement of the terminals and towers (*10*).

The travel demand forecasting assessment for the Washington, D.C., gondola utilized the travel demand model from the regional planning organization to estimate potential ridership and the impacts and changes in transit shed accessibility (defined as the geographic area served by transit). Within the model, the gondola route was either a similar light rail or bus rapid transit service for five specific alternatives. The highest ridership estimate derived was 15,600 people per day for a similar rail service, and the lowest estimate was 6,100 people per day for a similar bus rapid transit service. Overall, the study concluded that building and operating a gondola system would be feasible and increase transit options. No fatal flaws were identified. The estimated cost for design and construction was $80–90 million, based on similarities to the currently operating Emirates Line in London, England (*10*). In February 2017, The Arlington County Board of Supervisors declined to approve any additional funding to study and assess the urban gondola, citing concerns about the long-term value of the project and other transportation needs (*11*).

Albany, NY

In Albany, New York, an engineering firm completed a technical feasibility study in October 2016 to implement an urban gondola. The study focused more on engineering design practicality compared to the planning-based analysis for the Washington, D.C., study. The professionally licensed engineering firm and various gondola equipment manufacturers provided financial support for the study. The engineers have prior experience designing and constructing similar systems for clients in the entertainment business, including theme parks and casinos worldwide. The proposed gondola would extend for a distance of 1 mi across the Hudson River, connecting the Empire State Plaza to the Rensselaer Train Station. Three stations would operate along the route. The full build option had an estimated cost of $30

million to plan, design, fabricate, construct, and inspect—a very low amount compared to other operating systems. However, the report authors identified a number of considerations not easily found in other literature and research. These considerations include:

- Equipping cabins with air conditioning reduces cabin capacity from eight to six people. The increase in total cabin weight reduces the person-carrying capacity.
- Personnel required for recurring operations and maintenance is considerable. Job descriptions include roles for a general manager, duty/shift manager, mechanical/electrical technician, operator, and administrative assistant (*12*).

INTERNATIONAL EXPERIENCE

The number of installations of urban gondolas has increased internationally within the past decade. These ropeways can be found across multiple continents, including South America, Europe, and Asia. Most gondolas either cross a body of water, traverse a steep incline, or ferry travelers over a poorly connected street network. Existing literature and reports find the appeal for gondolas to stem from having a limited footprint, flexible network design, lower construction cost, and appealing aesthetics (*4*). Overall, urban systems tend to have similar design and operating characteristics: traveling short distances of less than 4 mi and average speed of 9 to 17 mph. The median operational capacity for gondola systems is 3,000 pphpd. Table 2 and Table 3 summarize key attributes for a sample of urban gondola systems throughout the world. Features for listed systems include cabin capacity, daily ridership, construction cost, and average passenger fare per trip. Most of the listed gondolas are monocable systems.

Medellin, Colombia

The most extensive development has occurred in South America, particularly the Metrocable system in Medellin, Colombia, and the Mi Teleférico system in La Paz, Bolivia. The Metrocable currently has three operating lines (Lines J, K, and L), and two additional lines are under construction (Lines H and M). Two gondola lines (Lines J and K) functions as a commuter service that connects travelers directly to the existing rail system. Line L serves as an extended tourist route of Line K by connecting residents to a large park located in the periphery of the urban area. The first line of the Metrocable stated operating in 2006 (Line K), with Lines J and K starting in 2008 and 2010, respectively. The city, regional transportation agency, and provincial government supported construction costs (*13*).

The goal of the Metrocable was to improve connectivity across distinct neighborhoods within the city (*14*). A private bus company that infrequently traveled in the area only served one of the neighborhoods connected by the gondola. Prior to the gondola, other neighborhoods could expect a 2 to 2.5-hour commute time to travel to the center of the city. After construction, the city center commute reduced from 1–1.5 hours (4). After opening, demand for the Metrocable caused long lines to form at stations during peak times. Line K serviced roughly 43,000 passengers per day during 2013 (*15*).

La Paz, Bolivia

In 2014, the Mi Teleférico began operations in La Paz, Bolivia—advertised as the largest and most extensive urban gondola system in the world. The system currently functions as three separate lines (Red, Yellow, and Green) that individually range in distance from 1.5 to 2.4 miles. The total length of all three lines is 6.2 mi. Two of the lines (Yellow and Green) connect through a transfer point. The cost to construct the first phase of the Red, Yellow, and Green lines was $234 million, which included construction of 11 stations serviced by lines with 427 individual cabins. After a couple years of operation, reliability was within a range of 98–99 percent for all three lines. Cabins arrive at stations in intervals of 12 seconds, and the system operates 17 hours per day (*16*).

Table 2. Representative Worldwide Urban Gondola Systems and U.S. Trams

System Name		City	Country	Opening Year	Line Length (miles)	Average Speed (mph)	Number of Stations	Number of Cabins in Service	Cabin Capacity	Peak Frequency (seconds)	Operational Capacity (PPHPD)
Proposed											
Wire One Austin		Austin, TX	USA	*Proposed*	8.7[1]	TBD	19	TBD	10	12	1,200
Capital District Gondola		Albany, NY	USA	*Proposed*	1.0	14	3	TBD	8	24	2,400
Bay to Balboa Park Skyway		San Diego, CA	USA	*Proposed*	2.0	14	4	141	8	12	2,400
Georgetown—Rosslyn		Washington, DC	USA	*Proposed*	0.7	10	2	TBD	10	60	TBD
Currently Operating Gondolas											
Cable Constantine		Constantine	Algeria	2008	0.9	13	3	35	15	22.5	2,400
Mi Teleferico	Red Line	La Paz	Bolivia	2014	1.5	11	3	427 (3 lines)	10	12	3,000
	Green Line	La Paz	Bolivia	2014	2.4	11	4		10	12	3,000
	Yellow Line	La Paz	Bolivia	2014	2.3	11	4		10	12	3,000
Complexo Do Alemao		Rio De Janeiro	Brazil	2011	2.1	13	6	152	10	12	3,000
Metrocable	Line K	Medellin	Colombia	2006	1.2	11	3	93	10	12	3,000
	Line J	Medellin	Colombia	2008	1.7	11	4	119	10	12	3,000
	Line L	Medellin	Colombia	2010	2.8	14	2	27	10	65	1,200
Emirates Air Line		London	England	2012	0.7	13	2	34	10	30	2,500
Koblenz Cable Car		Koblenz	Germany	2010	0.6	12	2	18	35	34	3,700
Ngong Ping Cable Car		Hong Kong		2006	3.5	17	2	112	17	18	3,500
Mexicable		Mexico City	Mexico	2016	3.0	11	7	190	10	12	3,000
Singapore Cable Car		Singapore	Singapore	1974; 2010[2]	1.0	9	3	81	6	15	1,400
Telluride Gondola		Telluride, CO	USA	1996	2.5	11	3	32	8	30	480
Metrocable—San Agustin Line		Caracas	Venezuela	2010	1.1	11	5	70	10	12	3,000
Currently Operating Aerial Trams											
Portland Aerial Tram		Portland, OR	USA	2007	0.6	22	2	2	79	300	936
Roosevelt Island Tramway		New York, NY	USA	1976; 2011[2]	0.6	18	2	2	110	450	1,500

Note: TBD = to be determined. PPHPD = Persons Per Hour Per Direction.

[1]Wire One Austin includes two separate 4.2-mile lines and a 0.3-mile third line for a total distance of 8.7 miles.

[2]Roosevelt Island Tram and Singapore Cable Car underwent major renovations in 2011 and 2010, respectively.

Table 3. Additional Characteristics of Representative Urban Gondola and Tram Systems

System Name		Clock Hours in Operation Daily	Daily Ridership	Main Topographic Feature	Construction Cost ($USD, in millions)	Fare (one-way ride unless noted)	Type of Gondola
Currently Operating Gondolas							
Cable Constantine		17	7,000	Deep valleys	NA	NA	Monocable
Mi Teleferico	Red Line	17	60,000 (all three lines)	Steep terrain/ Poor connectivity	$234 million (all three lines)	$0.43	Monocable
	Green Line						
	Yellow Line						
Complexo Do Alemao		12–15	NA	Deep valleys	$74 million	$1.50[1]	Monocable
Metrocable	Line K	13–18.5	43,000	Steep terrain/ Poor connectivity	$24 million ($2003)	$0.50	Monocable
	Line J	13–18.5	22,000	Steep terrain/ Poor connectivity	$47 million ($2007)	$0.50	
	Line L	13–18.5	NA	Steep terrain	$21 million ($2009)	$2.00	
Emirates Air Line		13–15	4,000–6,000	Body of water	NA	$4.25	Monocable
Koblenz Cable Car		8–10.5	NA	Body of water	$20 million ($2010)	$6.85	Tricable
Ngong Ping Cable Car		8–9.5	4,200	Body of water	NA	$24[1]	Bicable
Mexicable		15–19	NA	Poor connectivity	$87 million ($2016)	$0.30	Monocable
Singapore Cable Car		13.25	2,000–4,000	Deep valleys	NA	$24	Monocable
Telluride Gondola		16	NA	Steep terrain	$16 million ($1996)	$0	Monocable
Metrocable—San Agustin Line		NA	2,000–3,000	Steep terrain/ Poor connectivity	$18 million	NA	Monocable
Currently Operating Aerial Trams							
Portland Aerial Tram		8-16	3,800	Steep terrain	$57 million	$4.55[1]	
Roosevelt Island Tramway		18-19.5	4,000	Body of water	$6.25 million (1968; $22.6 million in $2006)	$2.50	

Note: NA = not available.

[1]Round trip fare.

PROJECT DEVELOPMENT CONSIDERATIONS

This section provides a summary of the items that need further consideration if Wire One Austin continues into project development. These items could be addressed in a detailed feasibility assessment that provides a more rigorous review of the urban gondola system. Specifically, topics addressed in this section are regional planning, travel demand forecasting for ridership estimates, corridor-level planning, design and constructability, environmental assessment, estimates of costs, and project funding options. The order of the topics does not represent relative importance.

Regional Planning

The Capital Area Metropolitan Planning Organization (CAMPO) produced the *CAMPO 2040 Regional Transportation Plan* that identifies how the region intends to invest in the transportation system. Updates to the regional plan occur every 5 years. For projects included in the regional transportation plan to be eligible for federal funding, federal law requires that the plan "include both long-range and short-range program strategies/actions that lead to the development of an integrated intermodal transportation system that facilitates the efficient movement of people and goods." The regional transportation plan is prepared through an approach that considers how roadways, transit, non-motorized transportation, and intermodal connections are able to improve the operational performance of the multimodal transportation system.

The Wire One proposal is not included in the CAMPO 2040 Regional Transportation Plan or any current modal transportation plans or transportation planning scenarios for the region.[1] The urban gondola mode has not been evaluated as a transit technology compared to bus rapid transit or urban rail. The proposed alignment along South First Street/Lavaca Street from West Slaughter Lane to UT-Austin has not been previously identified for a fixed guideway transit investment.

The presentation for Wire One Austin emphasized the strengths of the gondola system:

- Continuous operation.
- Capacity at 1,200 PPHPD (with the ability to increase to 3,000 PPHPD with additional cabins in operation).
- Opportunity for multi-modal connections.
- Limited footprint for towers between the terminals to support the guideway.
- Ability to incorporate design (towers, stations) into the urban built environment.
- Lower capital cost for infrastructure (towers, terminals) compared to other modes of fixed guideway.

This high-level review does not address specifics about how an urban gondola in the proposed corridor might affect the regional transportation system. Principally, this review does not entail an evaluation of baseline regional planning data and scenario analyses. A more-detailed corridor-level planning study can address these topics:

- How an urban gondola would compare to other modes of transit in a similar corridor (i.e., capital development costs, operating and capital maintenance costs, ridership, environmental assessments).
- How an urban gondola might affect the corridor (traffic and land use).

[1] City of Austin 2025 Austin Metropolitan Area Transportation Plan and 2016 Mobility Bond Program; Travis County Master Transportation Plan; Capital Metro Connects 2025.

- How an urban gondola would address mobility challenges (traffic congestion).
- How an urban gondola system would integrate into the transportation network and influence regional mobility—specifically, how an urban gondola or any fixed guideway investment in this corridor, would affect ridership on existing transit services.

Travel Demand Forecasting for Ridership Estimates

A travel demand model is a mathematical process used to forecast travel behavior and demand for a specific period based on a number of assumptions. A model relies on population and employment data, land use, and transportation network characteristics to simulate trip-making patterns throughout the region. As in most large urban areas, the travel demand model for the Austin region follows the four steps of trip generation, trip distribution, mode choice, and traffic assignment. In general, travel demand forecasting assists decision makers in making informed transportation planning decisions. The strength of modern travel demand forecasting is the ability to ask critical what-if questions about proposed plans and policies. CAMPO and TxDOT maintain a state of the practice regional travel demand model for the 6-county CAMPO planning area.

The CAMPO model was not used to forecast ridership for the Wire One proposal. Based on the proposal, 1,200 to 3,000 pphpd was the estimated range for ridership. The primary factor for that range was potential carrying capacity, dependent on cabin size and operating frequency—not forecasted ridership. Travel demand forecasting can predict ridership based on an analysis of demand in a corridor. For the proposal, the base assumption of potential ridership was the number of persons per hour that could be carried by a specific type of system (one cable), cabin size (10 passengers), and operating frequency (12 second headway).

Adding the urban gondola would require modification of the travel demand model to include a new mode. Adding any new mode—even a traditional light rail service—into a regional model can be a significant investment in time and money. The travel forecasting community has little experience with the type of urban gondola and associated context as proposed. Lack of knowledge limits the ability of analysts to develop modeling parameters based on existing operational systems. For scenarios with limited knowledge, modelers have to input assumptions about characteristics of potential users (market), physical operating conditions, modal competitiveness, and network interaction at origin and destination locations (e.g. parking, access). Transportation analysts could represent the new service as a fixed guideway by making assumptions about model parameters representing operating attributes, typical wait times, and specific subjective elements (e.g. reliability and comfort). However, if the new service intends to serve a tourist market, travel demand models typically are not capable of useful forecasts without extensive special studies and data collection.

Key considerations within the CAMPO regional travel demand model include:

- Addition of a new mode to the mode choice component would require recalibration of the model.
- User data to calibrate the model is not available in the local context. Assumptions based on reasonable comparison with other modes would be required.
- The regional travel demand model could help to predict typical daily travel activity by Austin residents, such as commuter (or worker) ridership. Special studies and data collection would be required to forecast tourist ridership.
- Use of the regional model requires an understanding of competing modes, residential and employment growth, network connectivity, and operating characteristics.

Corridor-Level Planning

Corridor studies offer the focus needed to develop service strategies and to examine alternative modes, alignments, station locations, termini, and so forth at an appropriate scale for decision-making. Although the Moving Ahead for Progress in the 21st Century Act (MAP-21) removed the federal requirement for stand-alone corridor level alternatives analysis studies, the Federal Transit Administrative (FTA) alternatives analysis framework still offers one model for conducting corridor-level planning studies to reach decisions on the mode for a transit project. Corridor-level transit planning following similar approaches is widely practiced around the world. The alternatives analysis framework for corridor-level planning studies includes the steps shown in Figure 5 (*17*).

Figure 5. Technical Framework for Corridor-Level Planning Study (*17*)

Appropriate station area planning should assess station loading (the number of transit users who will access the station by any mode at peak periods), staffing by day of week and time of day, transit bus feeder services, and parking requirements. Station area planning includes evaluation of the impact of the new construction on adjacent land use. Station area planning will include an assessment for each of the categories of environmental impacts (discussed below) for each station.

Key considerations associated with corridor planning are:

- FTA's approval of a project into the subsequent engineering phase hinges on how well the project meets statutory criteria for project justification.

- Corridor and station area planning link directly to the National Environmental Policy Act (NEPA) process for environmental review.

Design and Constructability

The topic of design and constructability refers to the ability to build the proposed system within the recommended corridor. For Wire One Austin, considerations relate to whether the construction of station platforms and towers and the placement of cables will cause any expected or unforeseen challenges. A high-level review of design and constructability for Wire One Austin focused on probable need to relocate existing utilities in the corridor.

Wire One Austin would operate immediately above two existing street corridors with clearly defined dimensions and a number of existing utilities and services. The primary north-south 8.4-mi corridor consists of a section of Lavaca Street and South First Street. The Lavaca Street section is mostly a three-lane, one-way roadway with 11-ft travel lanes, a bus-only lane, and parallel parking lanes on both sides. The total right of way for the Lavaca section is roughly 70 ft wide. The bridge across the Colorado River is a six-lane facility with three 10-ft lanes traveling in both directions. The South First section consists of an urban two-way, four-lane facility with travel lanes that are 10 to 11 ft wide. The total right-of-way for the Lavaca section is about 60 ft wide for most of the corridor.

Electrical and telecommunication lines are visually apparent south of Riverside Drive on the eastern side of the corridor. Both sides of the corridor have aboveground utilities roughly 1 mi south of Riverside Drive. Figure 6 shows Wire One Austin operating above South First Street, near Powell Circle, before and after implementation. The pre-implementation image shows a number of aboveground utilities, in addition to overhead traffic control signals, that are not present in the image depicting Wire One Austin after implementation. Some consideration of the aboveground utility lines may need to include significant long distance electric transmission lines, not just distribution lines (i.e., lower voltage lines that connect to homes). Crossings with transmission lines may exist at Cesar Chavez Blvd, Ben White Blvd, Eberhart Lane, and West Slaughter Lane.

Figure 6. Illustration of Wire One Austin at the Intersection of South First Street and Powell Circle Before (Left) and After (Right) Implementation (*3*)

Additional considerations associated with design and constructability are:

- Most of the plainly visible utility installations are overhead electric and telecommunication lines installed on poles. Additional research is required to investigate subsurface utilities.
- A moonlight tower is located at South First Street and Monroe Street.
- A railroad crossing exists on South First Street just south of Radam Lane. Railroad crossings have the potential to be problematic during the environmental review process and for acquiring right of way.
- In downtown Austin, tall buildings are immediately near the right of way. For that section, it might be necessary to purchase additional right of way for towers and stations.

Environmental Impacts

Environmental considerations include a number of factors about the direct and indirect impacts of implementing a transportation project. These factors include impacts to existing transportation services, socioeconomic populations, biological resources, and air quality. Addressing environmental concerns mostly consists of regulatory compliance with federal and state statutes. NEPA, along with federal regulations and the Texas Administrative Code, requires the assessment of potential environmental impacts for transportation projects. A purpose and needs statement is one of the first items required to clearly define the objectives for the proposed project. The project must also be consistent with the CAMPO long-range regional transportation plan and transportation planning goals for the region.

Environmental Review Categories

Any project that may request federal funding has to undergo a NEPA analysis. Many state and federal transportation agencies provide resources and guides to help navigate the environmental review process. Table 4 lists the different NEPA environmental assessment categories for detailed review. Based on the anticipated impacts, each environmental assessment category links to a likely class of action. A class of action indicates the significance of the impacts and the resulting level of documentation that is required in the NEPA process.

- **Low** indicates the environmental category likely does not involve significant impacts and therefore the NEPA finding may be a categorical exclusion (CE).
- **Medium** indicates the environmental category likely will require an environmental assessment (EA) to determine the impacts and could result in a finding of no significant impact (FONSI) or require further environmental reviews if the EA finds significant impacts.
- **High** indicates the environmental category will likely require an environmental impact statement (EIS) for actions with significant impact(s).

For each category, the notation (low, medium, or high) represents the perceived risk of an environmental impact based on the Wire One Austin proposal. The perceived risk is a preliminary assessment based on the limited information provided in the presentation materials. Detailed site research was not performed.

Table 4. NEPA Environmental Assessment Categories

NEPA Environmental Assessment Categories	Perceived Risk of Environmental Impact
Right of Way/Displacements (Uniform Act) Is new right of way needed? Will businesses or people be displaced?	Medium
Land Use Impacts What is the land use and will it change near stations?	Low
Farmlands, Soils, Geology What are the soils/geology and how will it be affected, or affect the project?	Low
Utilities/Emergency Services Is utility relocation needed? Are emergency services impacted?	High
Bicycle and Pedestrian Facilities How will bicycle/pedestrian accommodation occur?	Low
Community Impacts, Social/Economic Impacts, Environmental Justice (EJ) Identify impacts on communities, neighborhood connectivity, EJ populations.	Medium
Visual/Aesthetics Impacts Identify impacts for line of sight, visual receptors, etc.	High
Cultural Resources (Archeology, Historic Properties) Identify impacts on historic structures and archeologic sites.	Medium
DOT Act Section 4(f) (Parkland), Land and Water Conservation Section 6(f) Identify impacts on public parks/parklands.	High
Water Resources (Clean Water Act, Wetlands, Floodplains, Wild and Scenic Rivers, Edwards Aquifer, Drinking Water Systems) Identify impacts on water resources, agency coordination, permitting, etc.	Low
Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species) Identify influences on resources and habitats.	Low
Air Quality Demonstrate conformity and compliance.	Low
Hazardous Materials Identify sites and risks.	Low
Noise and Vibration Identify sources and receptors and assess impacts.	Medium
Greenhouse Gas Emissions and Climate Change Ensure compliance with requirements of the Council on Environmental Quality.	Low
Induced Growth/Indirect Impacts Follow TxDOT guidance on assessing induced growth and indirect impacts.	Medium
Cumulative Impacts Follow TxDOT guidance on assessing cumulative impacts.	Medium
Construction Phase Impacts Identify closures, disruptions, and traffic impacts during construction.	Medium

Visual Aesthetics

Based on an initial review, visual aesthetics is a high risk for adverse environmental impacts. A detailed assessment needs to determine if the gondola cables, towers, or stations might cause any adverse visual impacts. While some may find the aerial system visually appealing, others may perceive adverse impacts.

Specific assessments may be required for different views, potentially including the following examples:

- View of/from the State Capitol, including possible conflict with the City of Austin Capitol View Corridor ordinances.
- View across Lady Bird Lake.
- View from different land uses along South First Street.
- View of stations from adjacent neighborhoods.
- View from inside downtown high-rise buildings.

Assessments will be required for daytime and nighttime hours to assess the impact of lights and the ability of passengers in gondola cabins to see into taller buildings along the corridor. A significant privacy concern may arise if traveling passengers have the ability to see into personal residences. The overhead structures might also affect the visibility of existing traffic signals, requiring mitigation to avoid potential safety concerns in operation.

Public Parks and Recreational Lands

The category for public parks and recreational lands is potentially a high risk for adverse environmental impacts. The Department of Transportation Act of 1966 (DOT Act) Section 4(f) is the federal provision commonly cited for addressing publicly owned park and recreational areas. Generally, the provision requires federally funded projects to preserve the natural beauty of public parks, recreational lands, wildlife refuges, and historical sites. Any project that affects those types of lands must include a Section (4f) assessment prior to approval for implementation. Areas that may fall under Section 4(f) include the Colorado River (Lady Bird Lake) and the surrounding parkland. Any public land or park in the area that is touched or affected by the project may call for Section (4f) assessment.

Utilities and Right of Way

A previous section on design and constructability address the potential requirements for significant utility relocation and the possible need for right of way.

Medium-Level Risk of Environmental Impacts

The medium-level risks of environmental impacts include the impacts on existing communities, various socioeconomic populations, and historic properties. The impacts during construction may also create adverse impacts. Building a new high-capacity transit service through existing communities will likely have a significant impact on existing land uses around stations. New construction tends to develop incrementally within neighborhoods, with some land parcels redeveloping while others do not, creating impacts on existing communities. Another concern may be the noise generated by moving cables inside stations and along the route at towers.

Project Review Process

Each category and resource presents a different risk based on the project's setting, surrounding conditions, and receptors. Although an environmental assessment will eventually be required for each

category, it is important to identify environmental risks as early as possible in the project development process. It is also necessary to document what risks or resources may not be present, referred to as negative declarations. For example, if there no known endangered species exist, or no farmlands present, the absence in the project corridor is important and requires documentation.

Estimates of Costs

The source for the estimate of capital costs to construct the Wire One Austin project is the proposer's *Wire One Austin Vision* document and the estimate of operating and maintenance costs in the presentation to the CTRMA Board in September 2016. The estimates present a range of costs based on the conceptual level of the proposal. More-detailed cost estimates will require additional project definition and a detailed operations plan. The Wire One proposer suggested that a possible funding source for capital construction is CTRMA-issued bonds. The completed project would then be turned over to Capital Metro for operations. The revenues from fares would serve as a long-term funding source.

Capital Costs

The estimated capital costs for implementation of the proposed Wire One Austin include cables, towers, 19 stations, and cabins to provide capacity for 1,200 (base) to 3,000 (peak) PPHPD. The estimate is a range of costs from $287 to $555 million to include aerial cables and towers, stations, cabins including spares, and a cable car storage facility. The estimate does not include right of way, environmental mitigation, or similar development expenses. A detailed capital cost estimate will depend on a more specific project definition that includes the schematics for the location and dimensions of each tower and station. The proposer's estimate of the capital costs did not include purchase of right-of-way. Purchase of right of way may be required for some towers and stations and could be required for parking. In addition, relocation of utilities, especially along South First Street, may involve costs not included in the proposer's allowance for that purpose.

Annual Operating and Maintenance Costs

The estimated annual operating and maintenance costs assumes the Wire One Austin system will operate daily, 19 hours per day, with a few hours of downtime each day for required maintenance. The estimate is a range of costs from $3 to $6 million per year, based on the proposer's estimates from previous work. A detailed operating and maintenance cost estimate will depend on a complete operations plan and more detail for the design of the Wire One Austin system to confirm the estimate for maintenance and repair expenses. The detailed operating and maintenance costs should include labor for staff (managers, operators, station attendants, and mechanics), preventive maintenance expenses, annualized cost for major maintenance and repairs, and energy costs.

Project Funding Options

One of the primary considerations for any transportation project is finding and securing approval for funding. The following section identifies several possible sources of funding for the Wire One Project. These funding sources are available conceptually; however, most sources of funding are competitive, at local, state, or federal levels. Without the regional transportation planning steps to identify need, model travel demand and mode choice, conduct corridor analysis, and evaluate alternatives, the financial feasibility of a gondola system is difficult to gauge. Given a limited source of federal, state, and local revenues, an investment in an urban gondola will require reprioritizing other projects.

A successful funding strategy may require multiple funding sources that might include innovative financing such as a public-private partnership. This section is organized by public sources of funding (federal, state, local), financing tools, project-generated revenues, and private sources of funding.

Federal Transit Administration

Federal funding for transit comes through the U.S. Department of Transportation (USDOT). Funding for USDOT is authorized by the Fixing America's Surface Transportation Act (FAST Act), approved by Congress in December 2015 to fund federal surface transportation programs from October 2015 through September 2020. The FAST Act provides funding for USDOT and its subsidiary agencies, including the Federal Transit Administration. FTA administers the different transit grant programs authorized under Title 49, Chapter 53 of the United States Code (USC).

Capital Investment Grant Program

The FTA discretionary Capital Investment Grant (CIG) program provides funding for fixed guideway investments (Chapter 53, Section 5309). Two categories of funding under CIG could apply to the Wired One Austin proposal:

- **New Starts** projects are new fixed guideway projects or extensions to existing fixed guideway systems with a total estimated cost of $300 million or more, **or** that seek $100 million or more in federal Section 5309 CIG program funds.
- **Small Starts** projects are new fixed guideway projects, extensions to fixed guideway systems, or corridor-based bus rapid transit projects with a total estimated capital cost of less than $300 million **and** that seek less than $100 million in federal Section 5309 CIG program funds.

Each category of funding has a unique set of requirements in the FAST Act. FTA must evaluate and rate all projects in accordance with statutorily defined criteria at various points during the development process. In order to be eligible to receive a construction grant, all projects must go through a multistep, multiyear process and receive at least a medium overall rating from FTA. For a New Starts project, the multistep, multiyear process consists of three steps, as illustrated in Figure 7. The first step is **project development**, the second step is **engineering**, and the third step is a **full funding grant agreement** for construction. The FAST Act specifies that New Starts projects are limited to a maximum federal Section 5309 CIG program share of 60 percent. The maximum contribution from all federal sources to a New Starts project is 80 percent.

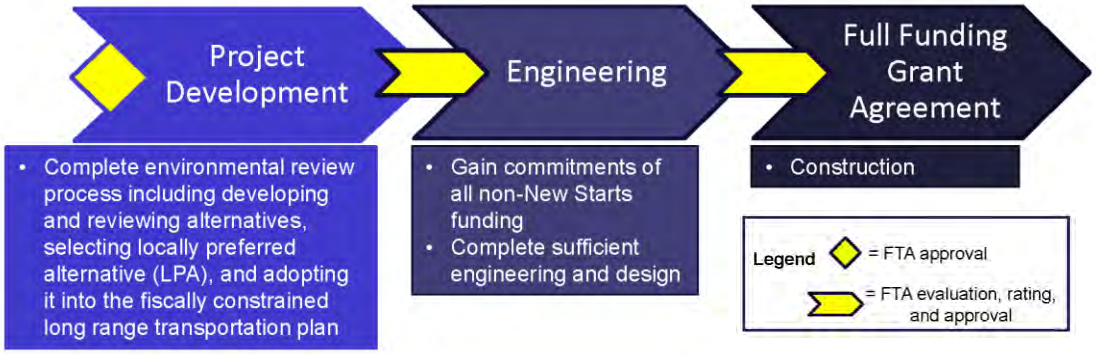

Figure 7. FTA New Starts Process (*18*)

For a Small Starts project, the multistep, multiyear process consists of two steps. The first step is **project development** and the second step is the **small starts grant agreement** for construction. Figure 8

provides an illustration of the Small Starts process. The FAST Act specifies that Small Starts projects are limited to a maximum federal Section 5309 CIG program share of 80 percent. The maximum contribution from all federal sources to a Small Starts project is 80 percent.

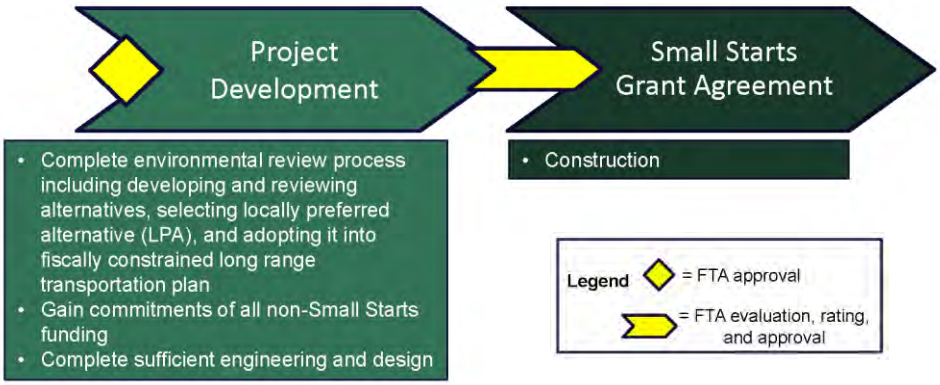

Figure 8. FTA Small Starts Process (*18*)

Key considerations associated with the FTA CIG program are:

- FTA New Starts and Small Starts are discretionary funding programs with limited resources. While funds are authorized under the FAST Act, Congress must appropriate the funds each fiscal year.
- FTA evaluates and rates each CIG project according to New Starts and Small Starts project evaluation criteria. The evaluation criteria and performance measures are described in the *Final Interim Policy Guidance Federal Transit Administration Capital Investments Grant Program* (*19*). The project must earn at least a medium rating for FTA's project justification and financial commitment criteria. Without further feasibility assessment, it is not possible to know how the Wire One Austin project would rate on these criteria.
- FTA New Starts and Small Starts are competitive funding programs. Every project is competing against other projects across the nation.
- Grants have no certainty until the funds are actually awarded. In other words, all of the work done during pre-grant steps is at risk.

TIGER Discretionary Program

The Transportation Investment Generating Economic Recovery (TIGER) Program fosters innovative, multi-modal, and multi-jurisdictional transportation projects that promise significant economic and environmental benefits to an entire metropolitan area, a region, or the nation. USDOT awards funds for the TIGER Discretionary Grant program on a competitive basis, typically on an annual schedule. The Federal government, generally, must ensure the awards represent an equitable geographic distribution of funds, appropriate balance in addressing the needs of urban and rural areas, and investment in a variety of transportation modes.

Key considerations associated with TIGER grants are:

- TIGER is a discretionary funding program with limited resources. While funds are authorized under the FAST Act, Congress must appropriate the funds each fiscal year.
- Competition for TIGER funds is intense.
- Grants tend to be no more than $50 million, and most awards are less than $25 million.

FTA Section 5307 Urban Area Formula Funds

The FTA Section 5307 Urban Area Formula Program (Chapter 53, Section 5307) provides grants to urbanized areas (UZAs) to support public transportation. FTA apportions urban area formula funds to the locally identified designated recipient. In the Austin urbanized area, the Capital Metropolitan Transportation Authority (Capital Metro) is the designated recipient. During fiscal year 2015, the FTA Section 5307 apportionment to the Austin UZA was $28.75 million. Section 5307 funds may be used for capital project expenses. In large urbanized areas, operating expenses are not an eligible use of federal Section 5307 funds (with limited exceptions for small transit operators within the large urbanized area).

Key considerations associated with FTA Section 5307 funds are:

- FTA Section 5307 is a formula funding program, and a new project, such as Wire One Austin, will not bring new funds to the region.
- The annual apportionment is less than 10 percent of the low end of the range for estimated capital costs for Wire One Austin (from $287 to $555 million).
- Capital Metro has programmed Section 5307 formula funds for regional transit projects. Wire One Austin is eligible for these funds but will have to compete with other regional priorities.

Federal Flexible Funds

In addition to FTA grant programs, the Federal Highway Administration administers programs that provide the flexibility to transfer funds to FTA for transit projects. The **Surface Transportation Program (STP)** (23 USC 133) provides flexibility in the use of funds (as capital funding) for public transportation capital improvements. STP funds may be used as capital funding for public transportation capital improvements, carpool and vanpool projects, fringe and corridor parking facilities, bicycle and pedestrian facilities, public sidewalk improvements to comply with ADA, and intercity or intra-city bus terminals and bus facilities.

Key considerations associated with a flexible funding source are:

- STP is a formula funding program, and a new project, such as Wire One Austin, will not bring new funds to the region.
- CAMPO prioritizes use of these funds. Wire One Austin will compete with other regional priorities.

State Funding

TxDOT uses 12 funding categories to support transportation project and planning activities in each metropolitan planning area in the state. Each of the funding categories has a specific purpose and allowable uses. Most of these funds are dedicated to highway projects; however, some funding categories can be used flexibly (i.e., for highway, transit, or active transportation modes). The policy board for CAMPO makes decisions on the prioritization of projects. Applicable categories from TxDOT consist of the following:

- **Category 2: Metropolitan and Urban Corridor Projects** can apply to mobility and added capacity projects along a corridor with reduced travel times due to traffic congestion.
- **Category 9: Transportation Alternatives Program** can apply to non-motorized transportation and related improvements (e.g., pedestrian and bicycle improvements). Projects are selected competitively.

Key considerations associated with state funding sources are:

- TxDOT funding categories (e.g., Categories 2 and 9) are formula funding programs and a new project, such as Wire One Austin, will not bring new funds to the region.
- The CAMPO Transportation Policy Board prioritizes use of these funds. Wire One Austin will compete with other regional priorities.

Local Funding

The Wire One Austin project could be eligible for funding from one of several sources of locally generated funds. The local funding sources consist of:

- **Capital Metro.** Voters in Austin and surrounding areas approved a 1 percent sales tax as local funding support for transit operating and capital expenses. The 1 percent sales tax makes up about 61 percent of Capital Metro's fiscal year 2016 operating and capital budget.
- **CTRMA.** CTRMA generates revenue through a combination of tolls, fees, bonds, and interest. Toll revenue can pay off encumbered debt as well as to invest in new transportation projects. All CTRMA projects begin as recommendations in the CAMPO Regional Transportation Plan. These projects are usually long-term projects, which can be done more quickly through a tolled option because toll projects receive full funding commitments prior to construction start. A continuous funding stream needs to maintain the road, and this can only be paid through tolls.
- **City of Austin.** Local governments can also generate revenue to support transportation projects. For example, the City of Austin generates the majority of revenues for transportation investments from the transportation user fee and parking fees. The City also has the authority to issue voter-approved bonds for transportation projects. Additional revenue comes from permits and the city's general fund.

Key considerations associated with local funding sources are:

- Local and regional governments have programmed use of these funds. Wire One Austin will compete with other local and regional priorities.
- Long-term bonds require a public referendum for approval.

Financing Tools

Financing tools are not actually sources of revenues. Rather, these are strategies for leveraging debt to support local and regional transportation projects. Some financing tools include:

- **Transportation Infrastructure Finance and Innovation Act (TIFIA).** TIFIA provides federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. TIFIA can help advance expensive projects that otherwise might be delayed or deferred because of size, complexity, or uncertainty over the timing of revenues.
- **State Infrastructure Bank (SIB). A**s authorized by the FAST Act, every state can set up an SIB that can manage a revolving loan fund, provide credit, or issue bonds capitalized with seed money from federal and state sources.

Key considerations associated with using these financing tools are:

- The project has to be eligible for federal funding.
- Financing mechanisms represent debt to be repaid.

Project-Generated Revenue

Other revenues to support operating and maintenance costs for the Wired One Austin project include:

- **Fare Revenues.** Based on ridership, the system would generate fares that would partially fund operating and maintenance costs.
- **Advertising Revenues.** Advertising revenues are earned from displaying advertising materials on vehicles and property (stations).
- **Naming Rights at Stations.** Revenues could be generated by auctioning naming rights for one or more stations.

Key considerations associated with projected generated revenues are:

- Project ridership forms the basis for fare revenue estimates. Any riders shifting travel from existing transit will not increase net fare revenues.
- Advertising and naming rights at stations may not generate significant revenues.

Private Funding

Public-private partnerships and value capture opportunities may be available for the Wire One Austin project. Some sources of private funding include the following:

- **Public-private partnerships (P3)** are agreements between public entities and private firms intended to take advantage of the benefits and expertise each party offers. P3s are structured so that the private partner has the opportunity to generate a return on its investment in exchange for assuming a portion of the risk and financial liability. The public entity may engage in a P3 with a developer to finance, build, operate, and maintain (or any combination of these) the project and grant the private partner the right to recover initial development costs by charging for parking, leasing space within the facility for other uses (e.g., ground-floor retail), or some other means.
- **Value capture** includes a variety of techniques to extract value or fees resulting from the increase in value that the project brings to the community. These techniques include joint development at station sites, assessment districts, and tax increment financing.
- **Joint development** (or transit-oriented development) is a method of developing or redeveloping transit facilities that maximizes the use of the land. This type of development can complement transit service by enhancing station locations with other uses, including residential, retail, and office space.
- **Special assessment districts** are special taxing districts where private property owners deemed to benefit from the infrastructure improvements support the cost of infrastructure. These assessments apply to the full value of the subject property, or use a Tax Increment Financing technique (see next item).
- **Tax increment financing** is a technique in which bonds finance public infrastructure improvements, to be repaid with dedicated revenues from the increment in property taxes because of such improvements.

Key considerations associated with private funding sources are:

- Public-private partnerships may face challenges due to timing, site selection and analysis, and the negotiation process.
- Joint development can be at risk if the station locations do not generate interest from the private sector for real estate development.

REVIEW

Wire One Austin is a proposed urban gondola system predicated on the development of similar ropeways internationally and in the United States. Gondolas in the United States are most often associated with ferrying tourist traffic within ski resorts, historical sites, and other attractions. However, international cities and governments have implemented gondolas within urbanized settings as a mode for transit. Urban gondolas can operate above the existing street network and function similarly to rail transit. Passengers access stations at ground level and walk or use escalators and elevators to a platform. Boarding occurs at the platform where passengers can board slow-moving cabins. The appeal for urban gondolas stems from the prospect of having a transit service that operates independently of roadway traffic congestion, provides passenger safety, limits emissions, and offers pleasing aerial views for travelers.

Wire One Austin is a unique proposal compared to other urban gondolas. As proposed, Wire One is more extensive than many systems currently in operation internationally or any proposed in the United States. Most gondolas extend for 0.5 to 3.0 mi and have up to five intermediate stations in addition to two terminal stations. The proposed Wire One Austin system consists of two 4.2-mi main lines and a third 0.3-mi connector, for a total of 8.7 mi and 19 stations. Almost all urban gondolas either cross a river, traverse a steep slope, or connect neighborhoods with a poorly connected street grid. Wire One Austin would cross Lady Bird Lake for a short part of the route, but it would generally follows an existing arterial roadway in parallel alignment to other city streets.

The Wire One proposal is not included in the CAMPO 2040 Regional Transportation Plan or any current modal transportation plans or transportation planning scenarios for the region. The urban gondola mode has not been evaluated as a transit technology compared to bus rapid transit or urban rail. The proposed alignment along South First Street/Lavaca Street from West Slaughter Lane to the University of Texas has not been previously identified for a fixed guideway transit investment.

If the Wire One proposal is evaluated for funding opportunities, the regional transportation plan would have to be modified to incorporate Wire One Austin. The transportation planning process is an extensive systematic process, and any modification or addition of a project may take time and resources. The regional travel demand model would likely need to be adapted to include a new mode. Modifying a demand model takes a significant investment of time and resources. Any fixed guideway investment should follow corridor-level planning to assess and evaluate alternative modes, alignments, station locations, termini, etc. and to identify a locally preferred alternative for mode and alignment.

Funding and financing for Wire One Austin will likely be a significant challenge. Most sources of funding for local, state, and federal funding programs are competitive. Many transportation needs exist and funding is typically limited. The financial feasibility of a gondola system is difficult to gauge without the planning steps to identify need, model travel demand, conduct corridor analyses, and evaluate alternatives. Given a limited source of revenues, an investment in an urban gondola will likely require reprioritizing other projects.

If the agencies reviewing the Wire One proposal are interested in gaining a more complete understanding of the likely magnitude of gondola commuters, the Federal Transit Administration makes a standardized travel model available called the Simplified Trips-on-Project Software (STOPS). STOPS may help to quantify the measures used by FTA to evaluate and rate projects for New Starts funding. FTA uses this tool to ensure that consistent modeling practices apply across metropolitan regions.

However, STOPS is a travel demand modeling technique similar to the CAMPO regional travel demand model that requires significant data input. Using this toll requires similar assumptions about operating and other characteristics of a potential gondola in the context of an urban corridor.

Much of the success of a new transit mode is how the public would react and use the service. Wire One Austin would be would be a unique project in the U.S. for use of the urban gondola mode for a transit commuter corridor.

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March 24, 2017

Dear Stakeholders,

Capital Metro, the Central Texas Regional Mobility Authority and the City of Austin Transportation Department worked collaboratively over the past several months to engage the Texas A&M Transportation Institute (TTI) in an analysis of the Wire One Austin Urban Gondola proposal. This work was initiated to assess the potential use of gondola technology as one means of addressing the mobility challenges of Central Texas. The analysis was requested as a result of community and stakeholder interest in this possible mobility alternative. On February 24, 2017, TTI provided their findings to the agencies. A copy of their report and the Wire One Austin proposal is attached to this cover letter.

After reviewing the report, below are some shared conclusions of the three study sponsors that emerged from our review of the analysis combined with supplemental information:

General Observations

- Based on a worldwide review of deployments, gondolas appear to be best suited to 'niche' applications and not as a primary means of moving people or goods as a part of a regional network or along a major corridor.
- Most places where gondolas were selected for use have a unique geographic barrier or challenge. A major change in elevation, a large waterway or some other significant constraint on more established and higher capacity mobility options appears to be a common trait.
- Based on our review of TTI's gondola cost information, capital and operating costs are relatively comparable to other modes of travel used in Austin and similar metropolitan areas. As a result, there does not appear to be an opportunity for a major cost savings by choosing gondola relative to another, more established mode.
- Travel speeds and carrying capacity also are not substantially different or better than other modes.
- Like other fully grade-separated modes, the primary advantage of a gondola system is that it can offer very reliable and consistent travel times with near 'on-demand' availability (dependent on demand).
- The fully elevated design on a gondola system can offer both advantages (more attractive user experience) and disadvantages (aesthetic concerns, fit within the right of way, potential conflicts with overhead utilities and/or adjacent structures, and possible safety concerns in the event of a system failure).

Wire One Austin Observations

- The Capital Area Metropolitan Planning Organization (CAMPO) 2040 Regional Transportation Plan identifies how the region intends to invest in the transportation system and considers how roadways, transit, non-motorized transportation, and intermodal connections perform. The urban gondola mode has not been included or evaluated against bus or rail transit.
- The urban gondola mode would need to be included in a corridor level planning effort and examined as one of several potential transit mode alternatives. Urban gondolas are not currently

included as a part of Capital Metro's Project Connect corridor planning effort.

- There is not a sufficient level of detail at this time to advance Wire One for further planning and development. To do so would require a detailed feasibility assessment that confirms the optimal alignment, estimates demand, and more firmly establishes capital, operations and maintenance costs. The Wire One proposer (sponsor) would need to perform this work to further develop the proposal and be able to adequately address the project considerations identified in the TTI Report.
- As proposed, Wire One Austin would be, by far, the largest and longest gondola system in the world. While this is not a fatal flaw, it does raise additional concerns about operational viability.
- The proposed alignment has some apparent benefits, but also significant challenges including constrained right-of-way; visual/aesthetic issues; and possible impacts upon City transportation planning and potential conflicts with Capitol view corridors.
- An urban gondola might be appropriate for installation along city owned waterfront property, but this would require a level of study and approval by appropriate City Boards and Commissioners and Council.

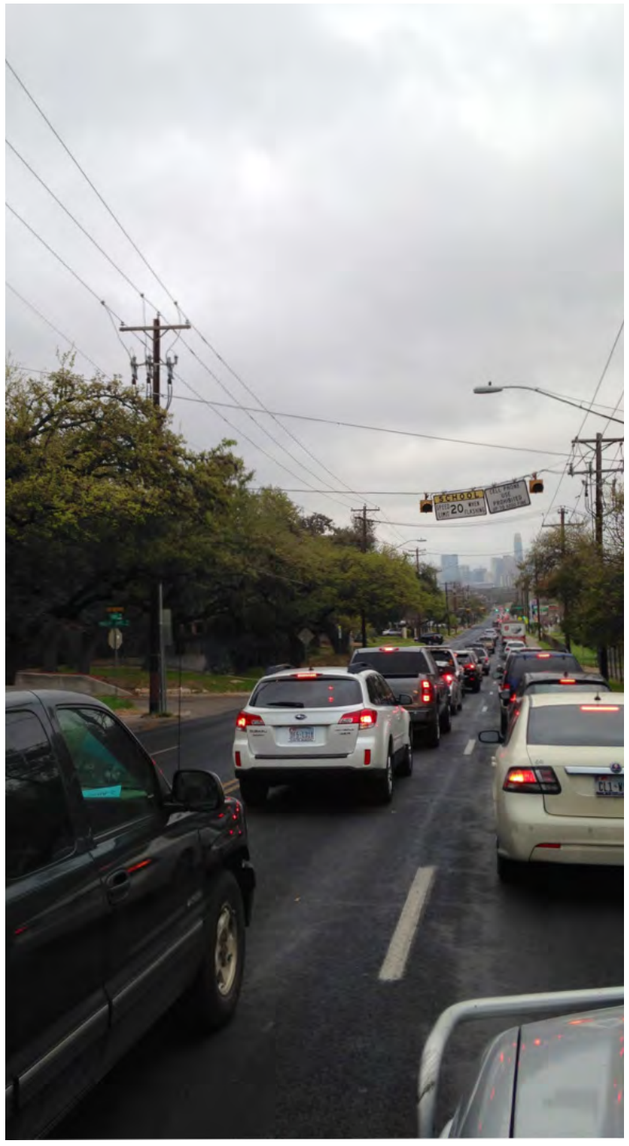
Capital Metro, CTRMA and the City of Austin recognize and appreciate the need and desire for innovative mobility options to address the significant challenges we face in Central Texas, and we applaud the Wire One Austin team for their creative proposal. To that end, we brought in TTI to provide the attached assessment. Based on that analysis, the sponsoring agencies conclude that, at this time, the proposal is not of sufficient detail to perform further assessment. If the sponsor or another interested party can advance the concept further and address the need for additional detail in the proposal, it may be worth revisiting in the future. The region can engage in regional planning efforts to consider this mode of travel. CAMPO might be able consider using the value of this mode on a regional basis.

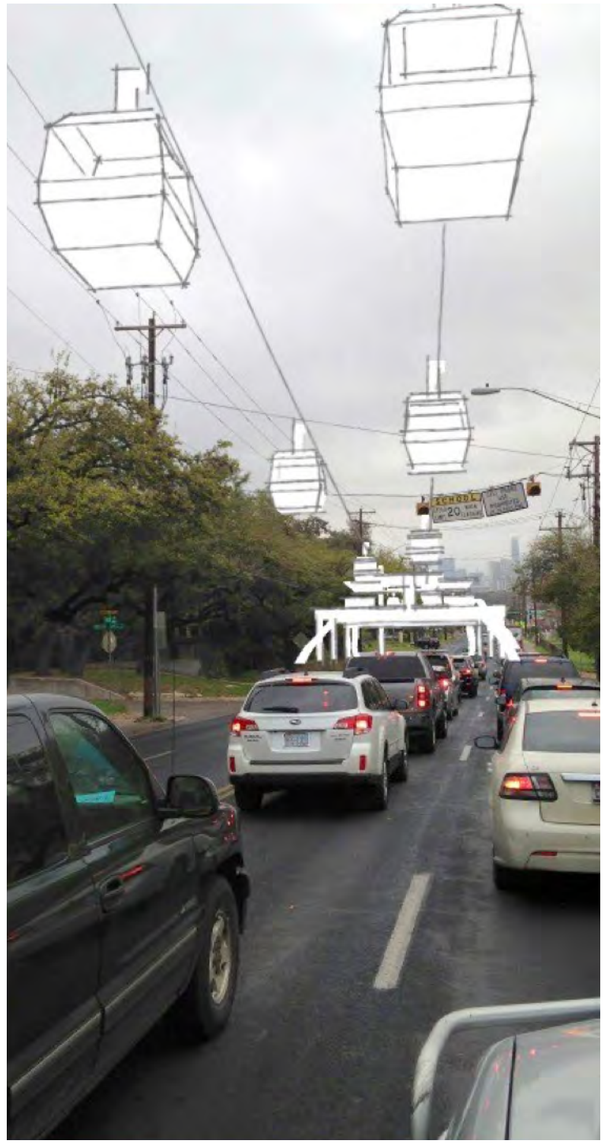
WIRE ONE **AUSTIN**

An Urban Cable Mass Transit Vision
Jared Ficklin, Co-Creator of The Wire
jared.ficklin@argodesign.com
512.576.8981

THE SHORT CASE FOR URBAN CABLE

South 1st is at capacity, the congestion point for a downtown commute now begins at Ben White. Urban Cable offers an affordable, culturally compatiable way to add capacity.





AFFORDABLE

Cost similar or lower than the Red Line
Low cost per rider
Functions like an inexpensive subway

COMPATIBLE

A Mass Transit artery into downtown
Serves downtown commuters
Allows redeployment of bus lines
Predictable Trip Times
Easily included in multi-modal routing
Safe & easy for mobility impaired
Faster than bus

SUSTAINABLE

Removes cars from congestion points
Can be carbon negative
Pedestrian & Bike friendly

ADOPTABLE

Serves tourism
Predictable Trip Times
Safe & easy for mobility impaired
No schedule
Personal space
Climate controlled

URBAN CABLE HAS WORLDWIDE DEPLOYMENTS

Urban Cable has been used around the world including in the U.S. In the modern era there has been a surge in new deployments in Europe, Asia & South America that use Urban Cable as a form of Mass Transit across a wide variety of geography.

The same strengths that help urban cable bridge valleys or cross rivers at low cost are being recognized for their ability to bridge features of urbanization. Such as connecting walkable districts or opening up capacity in areas that are already at high density. A 22 lane freeway or natural greenbelts or rivers can be crossed for little or even no additional cost.

Mid-sized Cities with pre-automotive history are primed for the benefits. Especially those cities that have a dense core and are seeing the urbanization of the first suburbs. Or divided by rivers, freeways or pushed against waterfronts. Cities with need for a circulator at lower cost than subway.

Venlo, Netherlands

The city center and an park area that hosts festivals are connected.

Barcelona, Spain

Two walkable museum districts are connected over a forested park.

Medellin, Columbia

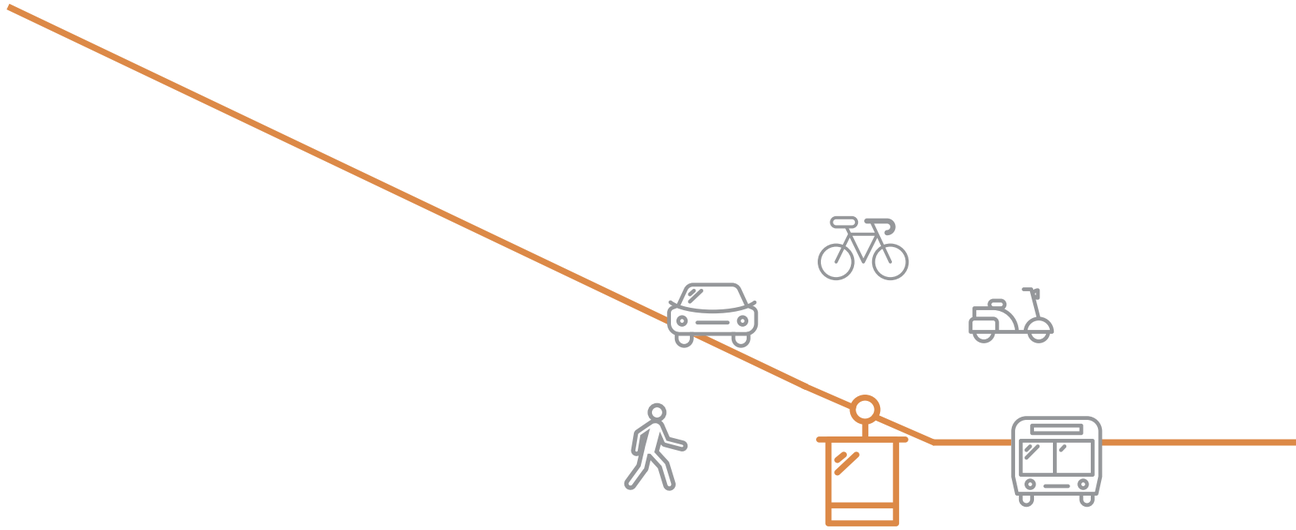
Three lines connect exterior neighborhoods with city center transit lines. Hundreds of thousands of commuters ride Metro Cable daily.

KEY ATTRIBUTES

1,200 people per hour, per direction.
With expansion to 3,600 PPPHD possible.

Like 25 full busses stopping every hour

X 25



New capacity added to a route that commuters already use. A central route that can grow into a central circulator.

At last traffic count 30,000 cars a day use this route for a commute into & out of downtown. With the closure of MoPac this number has increased with drivers using South 1st as an alternative route.

Wire One removes vehicle traffic from peak congestion, eliminates micro trips, parking search trips & services tourism. A meaningful impact on the entire Core.

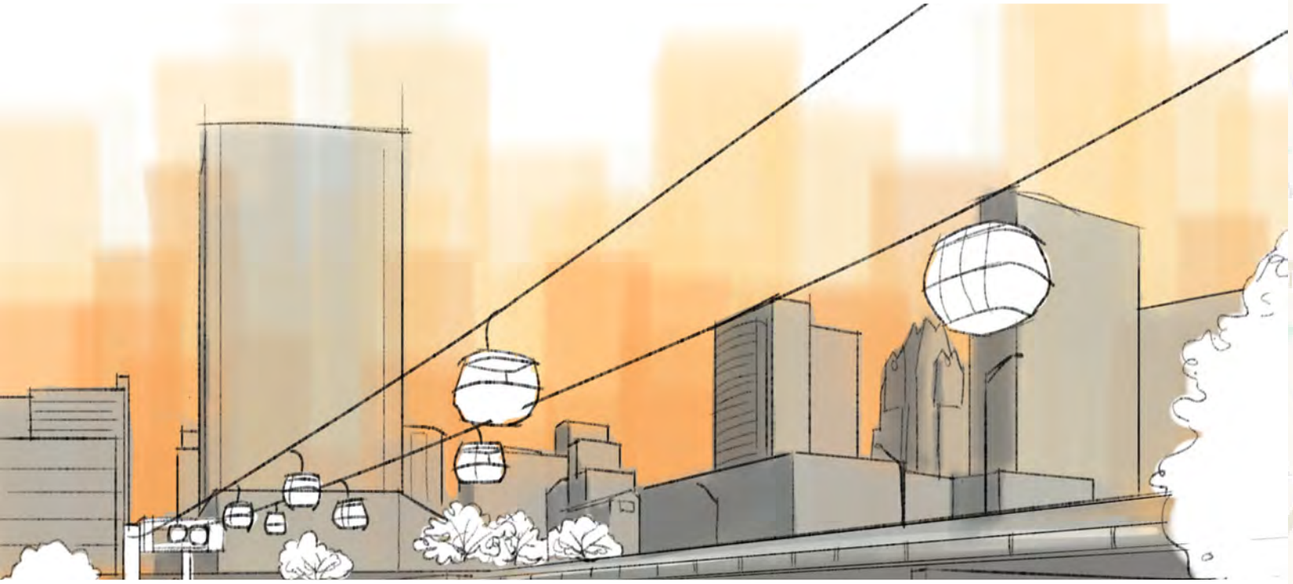
A 30% to 50% takeover of vehicle trips is possible

The lack of schedule & continuous operation encourages adoption without asking for cultural or demographic changes. Wire One is an amplifier for car share, biking & pedestrian travel. Wire One is an adaptable back bone for smart transit planning.

5% of residents living along South 1st commute without a car. Some bus commutes can take more than an hour.

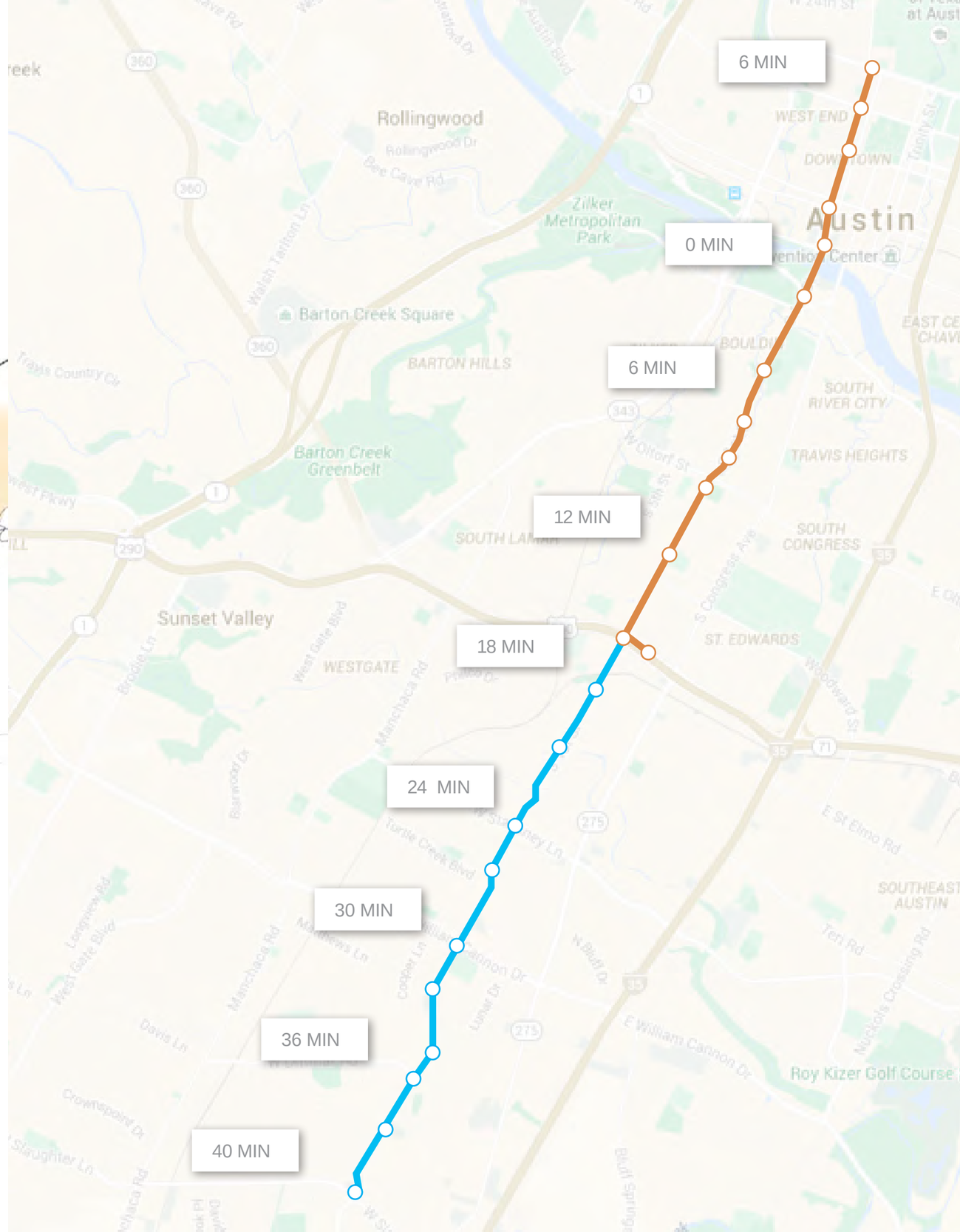
WIRE ONE OVERVIEW

Using High Speed
Detachable Mono Cable



Target Capacity: 1,200 Persons Per Hour Per Direction
Expanded Capacity: 6,000 Persons Per Hour possible
19 hours per day run time

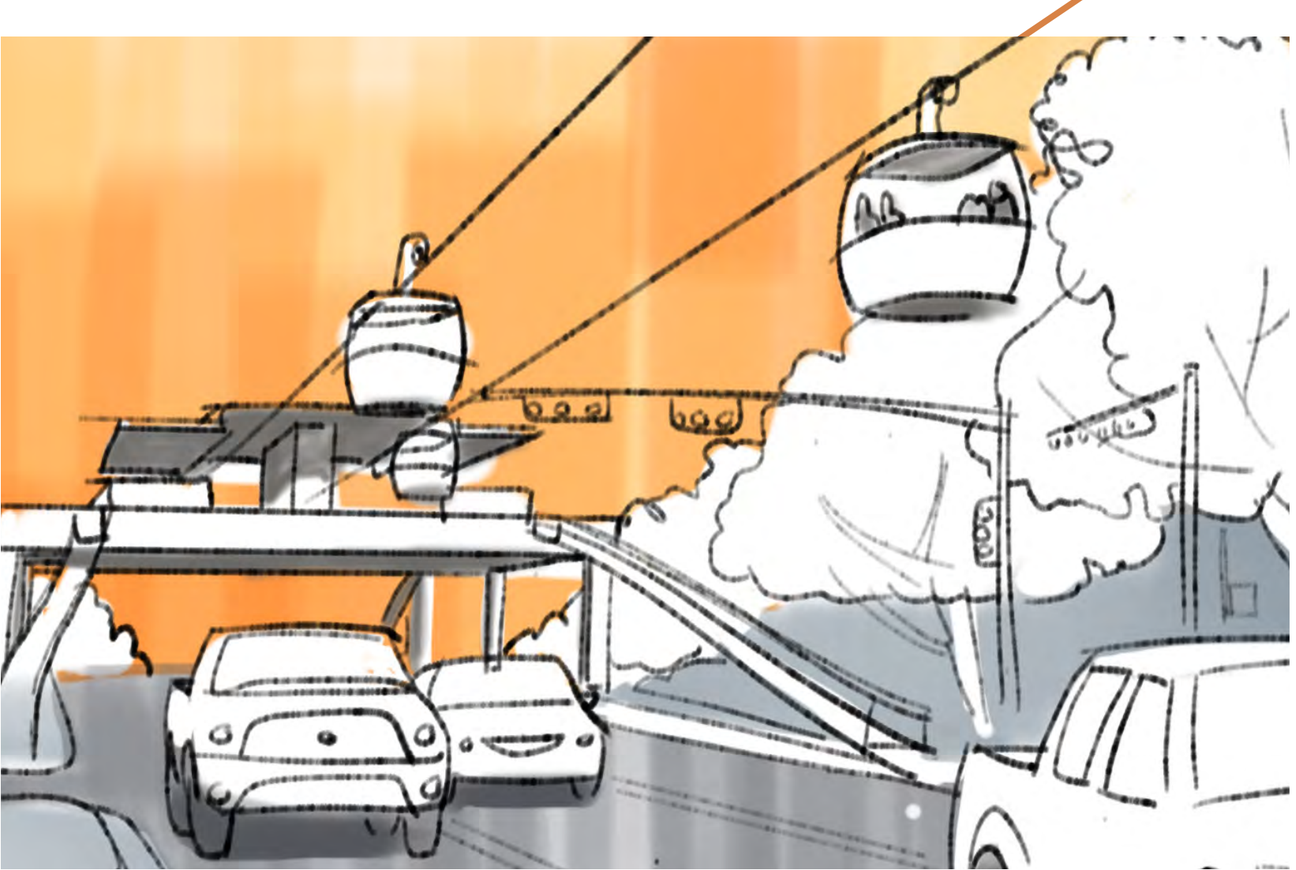
This map is a early draft. Locating stops is something that takes study.
But this is a good representation of what we could accomplish.



CAR PROFILE

Wire One would use 10 person cars similarto what is shown above except with added onboard climate control. Bicycles, strollers, scooters, walkers & wheelchairs can fit in the cabin.

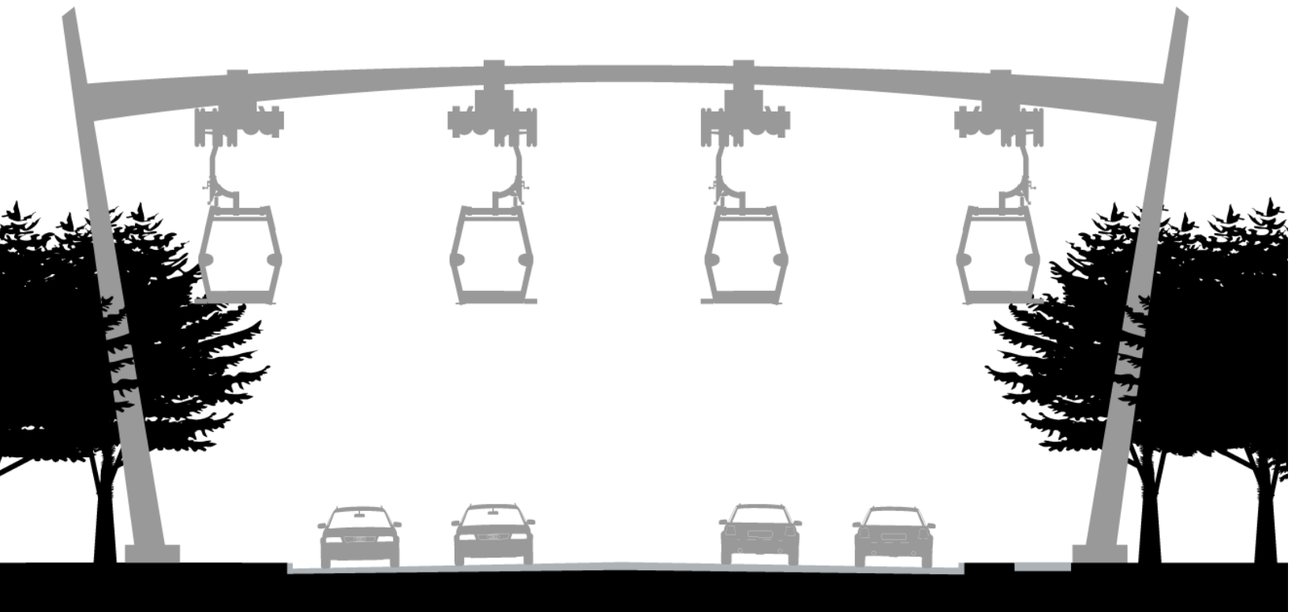
Cars would arrive at a station every few seconds. Boarding is across a flat level deck. There are station attendants to help monitor loading, but for the most part loading is continuous and does not require assistance.



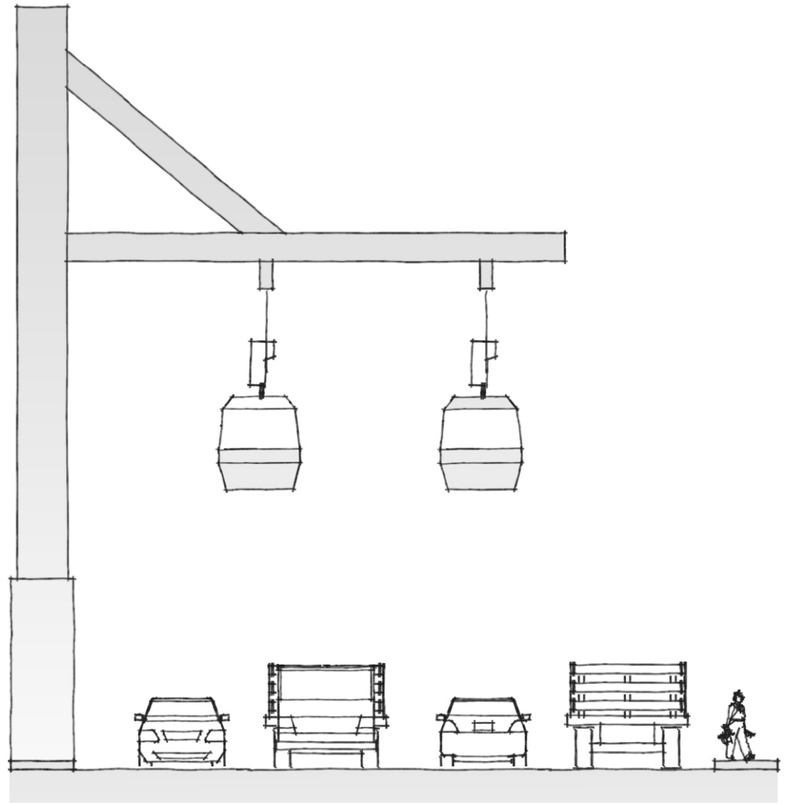
TOWER PROFILE

Wire One would use either cantilevered or bridged towers so the cars could use the eminent domain directly above south first.

This equipment is able to locate in the right of way beside the street without interrupting sidewalk service.

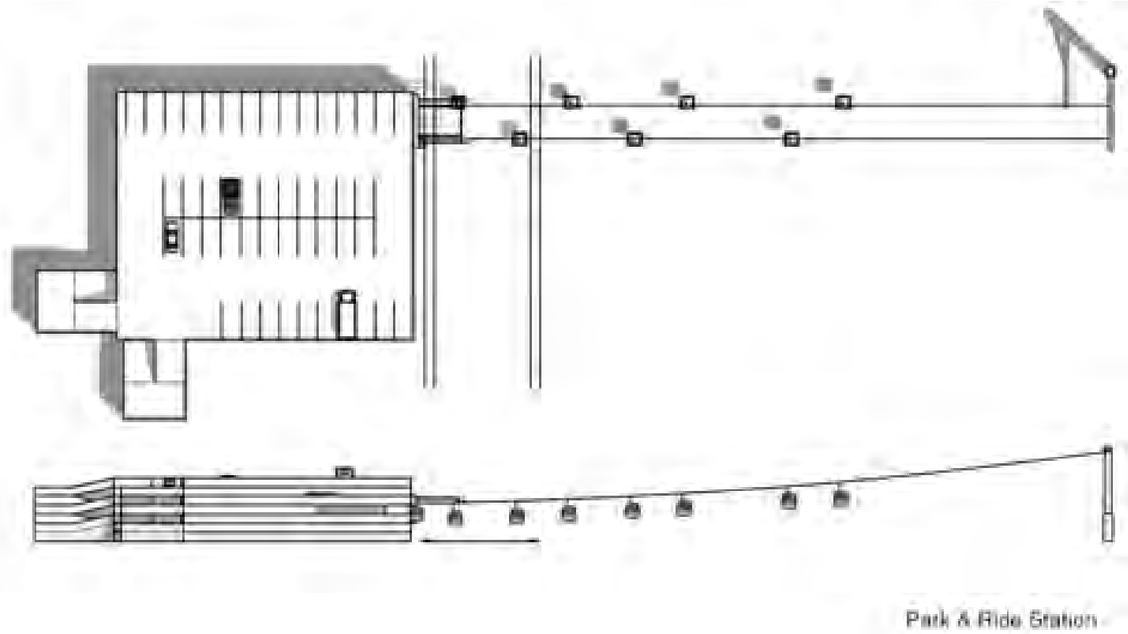


The tower bases themselves in most case are similar to what is used for freeway pylons or power service lines. Cars themselves require a small amount of horizontal clearance and vertical clearance is set by the route profile and safe transportation standards.



WIRE ONE PARK & FLY STATIONS

Urban Cable can be integrated into structures. For Wire One there are several areas that could be developed by public/ private partnership into a combined retail and Park & Fly structure where there is retail and drive up parking on the ground floor with Urban Cable on the second story and garage parking above.



Park & Ride Station

With no schedule the normal drive, park, walk to office commute remains nearly the same with only minutes on Wire One connecting parking with the final walk to the office.

SW & NE Corner of Ben White & South 1st

Overtop Ben White Bus Interchange

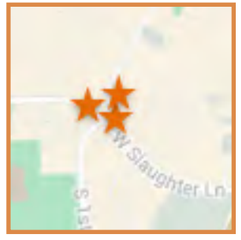
William Canon HEB Shopping Center

Examples of areas with Park & Fly potential & areas that have not undergone vertical development.

Dittmar & South 1st

Stassney & South 1st Retail Areas

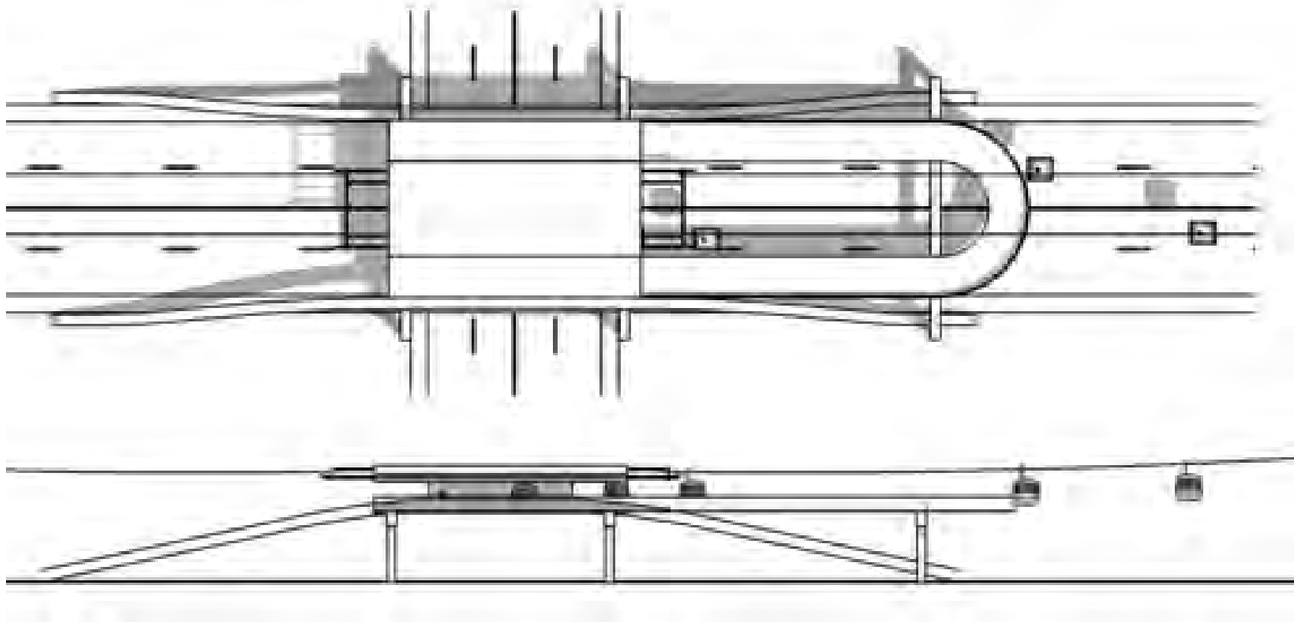
Long Center



Slaughter Drainage, Red Barn or Car Wash

WIRE ONE PEDESTRIAN CENTERS

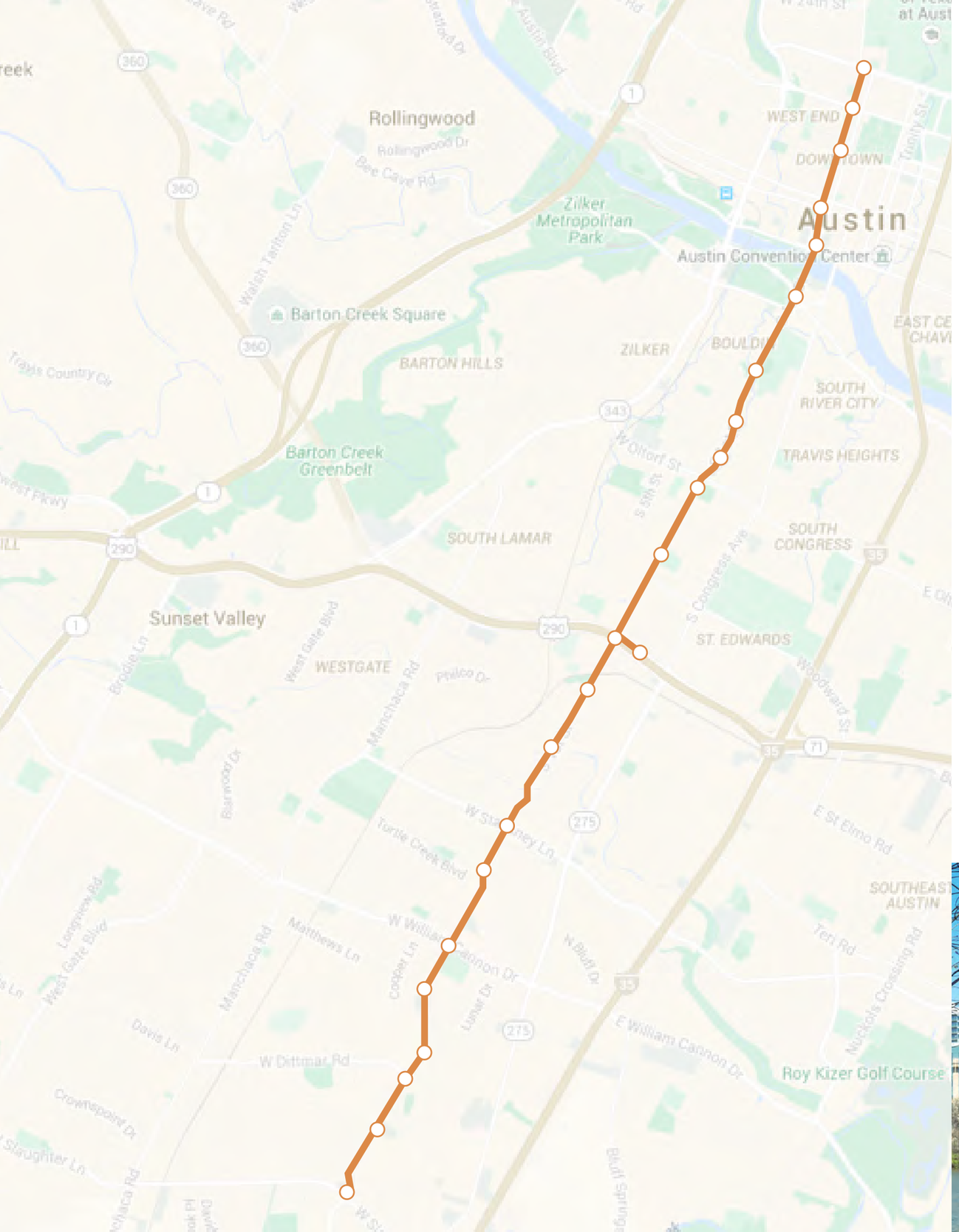
Urban Cable can locate over streets or intersections. Wire One would utilize these stations for local stops along South 1st. Such stations if designed correctly can also serve as pedestrian bridges. Ramps can be used for ADA as well as easy use for cycling.



Elevated Station Type 2

A family with a stroller boarding a 6 person car in Zaragoza.

A cyclist boarding a 6 person car.



ROUTING WIRE ONE

Urban Cable offers low cost infill of Mass Transit without displacement. However Urban Cable lays out best in segments that are straight lines. There are cost savings when turns can be made at stops.

South 1st is less developed and has linear geography that favors Urban Cable. Wire One would be a back bone connecting Slaughter to South Campus adding capacity to a route heavily used by the central & southern core of Austin as the path into downtown.

Wire One can cover bus service on South 1st and could be tied into the bus interchange allowing bus re-deployment throughout south Austin to better serve adoption of Transit. Car share can also enjoy routing advantages as services can drop riders at stations rather than add to the congestion on routes into downtown.

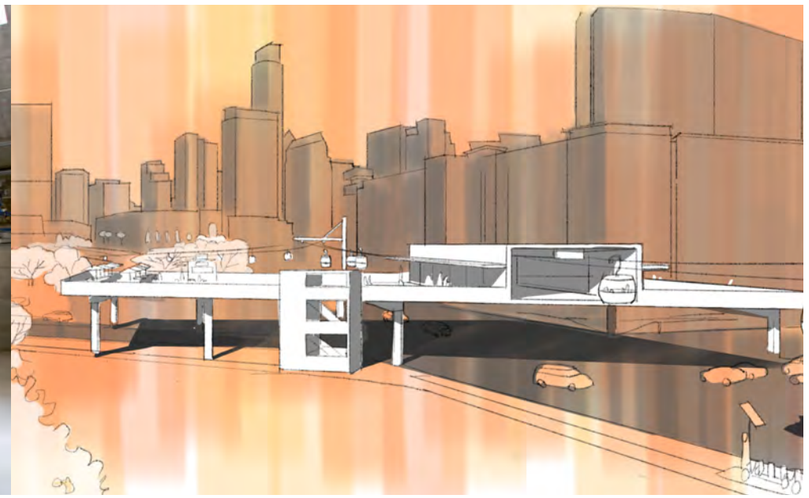
Future lines could be added running east west or Point to Point to create Park & Fly or numerous connected walkable districts.

THE 290 BUS INTERCHANGE PARK & FLY

Wire One could overtop the main bus interchange on Ben White with a spur line or end line that connects to the Ben White Interchange. Passengers from buses could transfer to the Wire One into downtown and drivers could park above the bus interchange in order to avoid the wait into downtown or the average $180 a month parking fees.

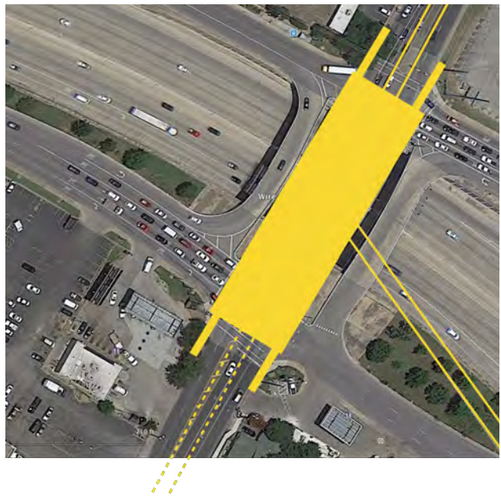
With the zoning in place this also a good location for the car service yard. This is where excess capacity is added and removed to a line as well as where cars can be pulled for cleaning and maintenance.

THE PALMER PEDESTRIAN CENTER

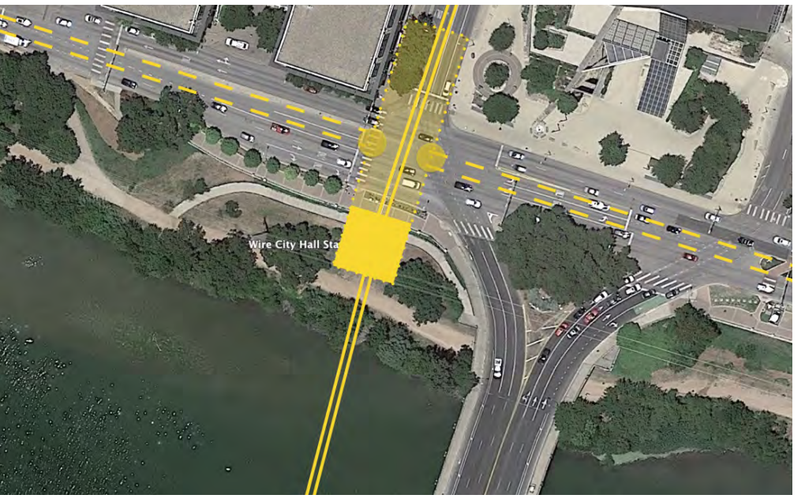


The Pedestrian center could also serve the transfer crowds over the intersection as a large pedestrian bridge.e.

With its proximity to festivals & the Lady Bird Lake Hike & Bike this intersection is an ideal location to build up with a pedestrian center. The center would also allow ramps to bridge easily into one of the main entries for auditorium shores and the Long & Palmer Events Center.

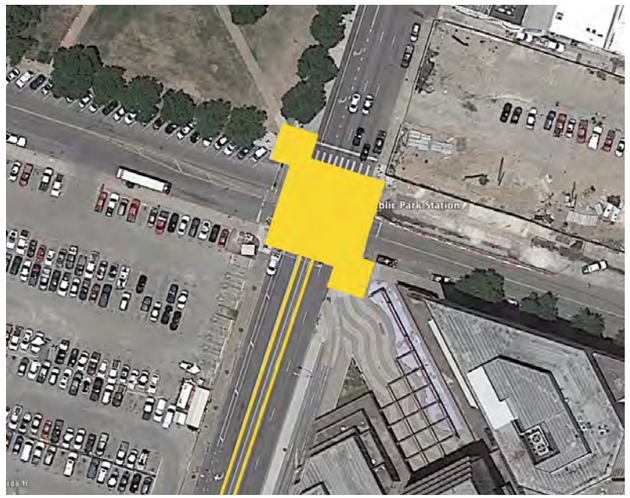


CITY HALL FUTURE INTERCHANGE



At City Hall Wire One shifts over the lake to line up with Guadalupe in order to provide downtown service without interrupting the Congress Avenue view of the capitol dome. This stop offers an opportunity to expand along Caesar Chavez. Starting as a pedestrian center and later becoming an interchange for a line that reaches from Airport to Zilker and the Grounds of ACL.

REPUBLIC SQUARE PARK



Of the Downtown Wire One stops this one is an important stop for tying into tourist activities. A major departure point for Zilker Shuttles during ACL and other activities.

RIDERSHIP

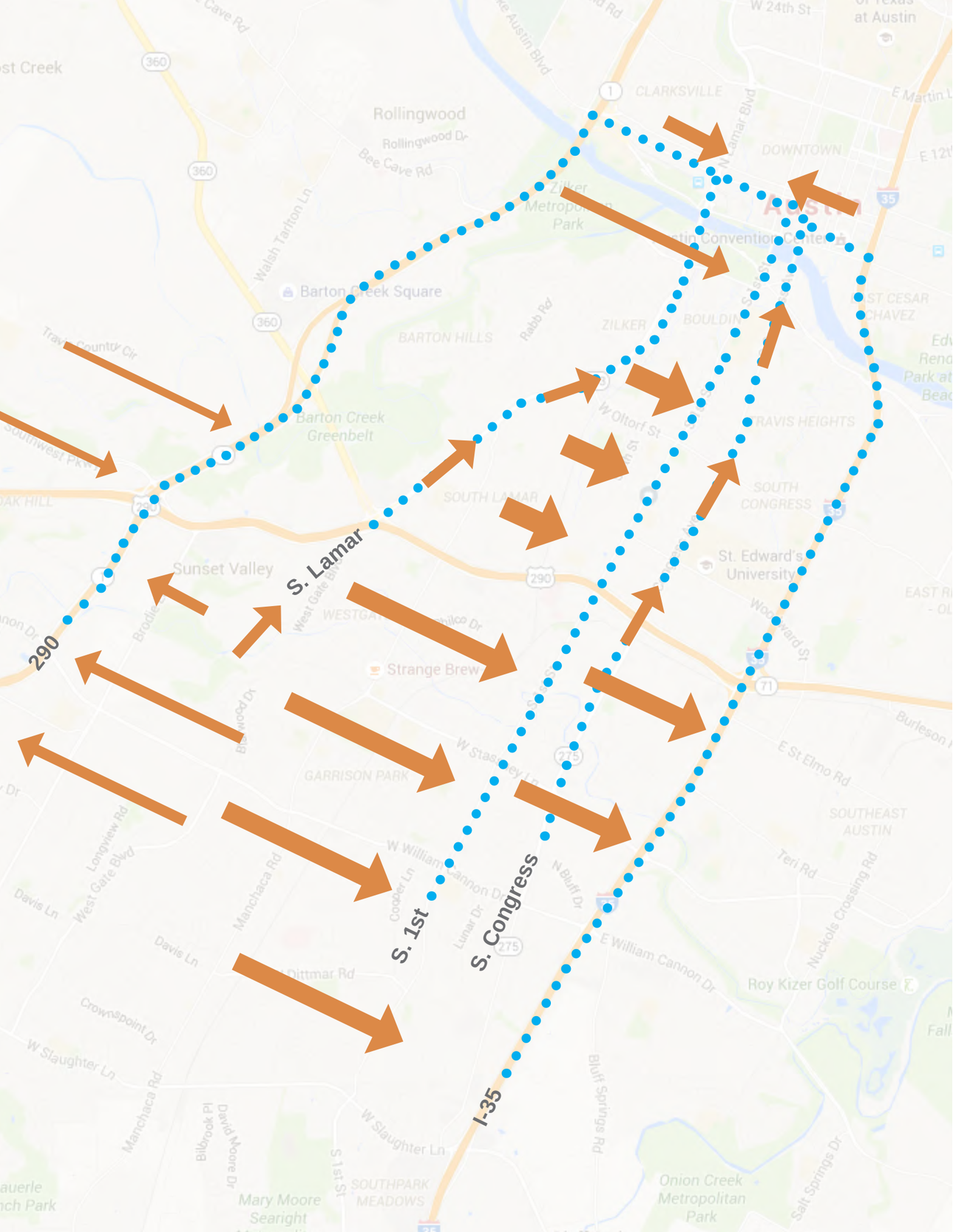
Wire One fosters adoption by borrowing characteristics of the car culture discovered in research. Which is a lack of schedule & a greater availability of personal space. These are inherent in the continuous operation and smaller car design.

Ridership will also be boosted by the ability to locate Wire One on a route that commuters already plan around, South 1st. This makes adoption as an alternative to a car commute feasible. This makes the commuter a real source of ridership.
Connecting walkable residential neighborhoods with a walkable downtown and the many shopping districts along South 1st will draw core ridership from the neighborhood micro-trips along Wire One.

Finally those neighborhoods have an important role in participating in the festival tourism of Austin.

The three pillars of commuters, neighborhood micro-trips and supporting tourism will lead to a better adoption for Wire One than rail or bus.

Last the continuous operation lends itself to easy inclusion in route planning software like that used by car share companies or integrations with multi-mode transportation systems & planning. The reach of Wire One will spread to anyone in South Austin planning a trip to Downtown or any destination along the line.



CURRENT COMMUNTING PATTERNS

95% BY CAR & 5% BY MODES OTHER THAN CAR

Time is an important consideration. These are the Google/Waze shortest routes & commuters follow.

WIRE ONE MONO CABLE

Travel Times by Car at 8:40am. As timed by Google Maps from points to City Hall. They do not include time in Downtown Congestion. Parking Time or Time Walking to Work.

vs.

Car times to downtown

Wire One Commute times to downtown

WIRE ONE MONO CABLE

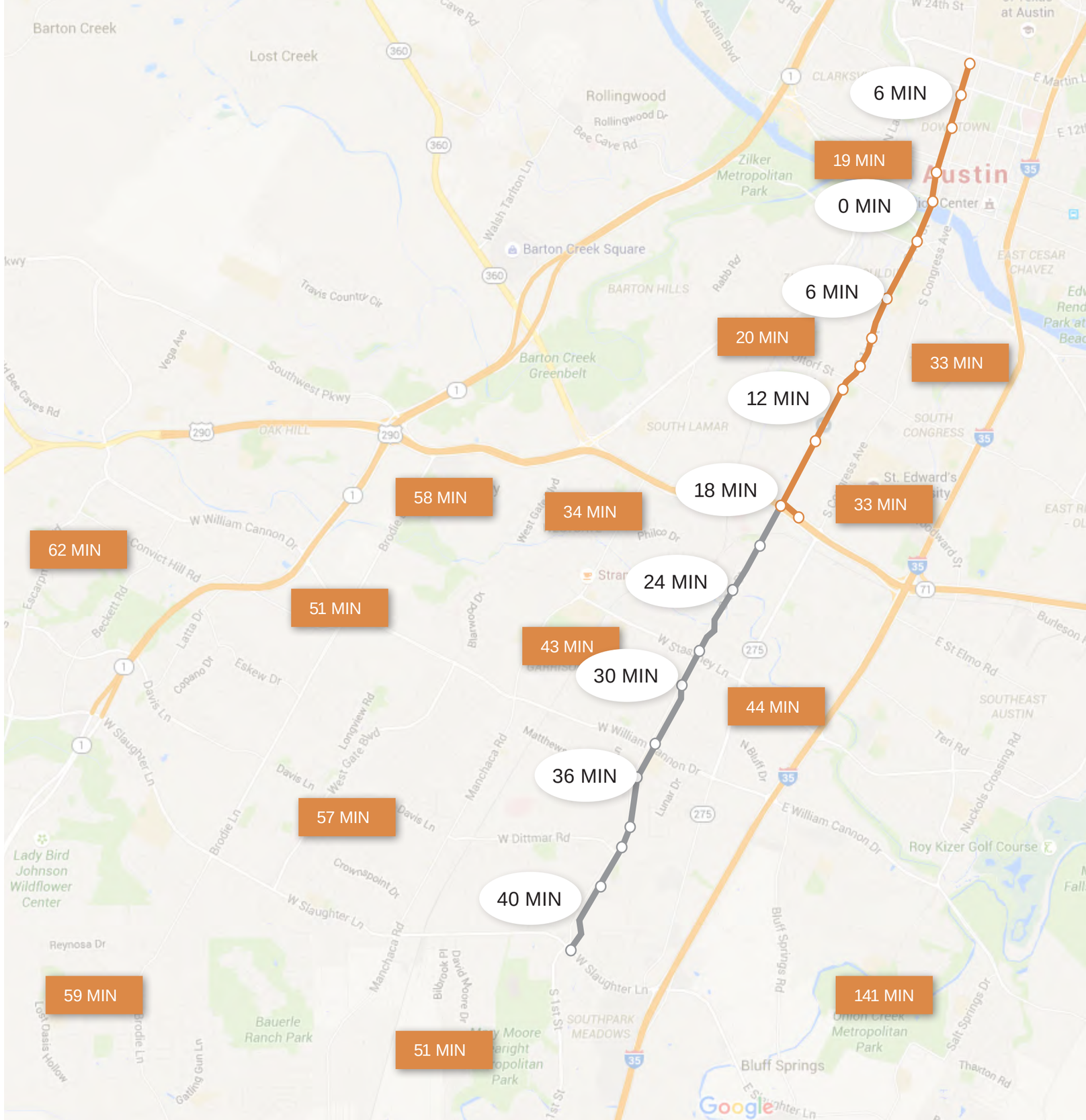
As timed by Google Maps from points to City Hall. They do not include time in Downtown Congestion. Parking Time or Time Walking to Work.

Bus schedules, transfers and the frequent trips into neighborhood routes is a major contributor to these times.

vs.

Bus times to downtown

Wire One Commute times to downtown

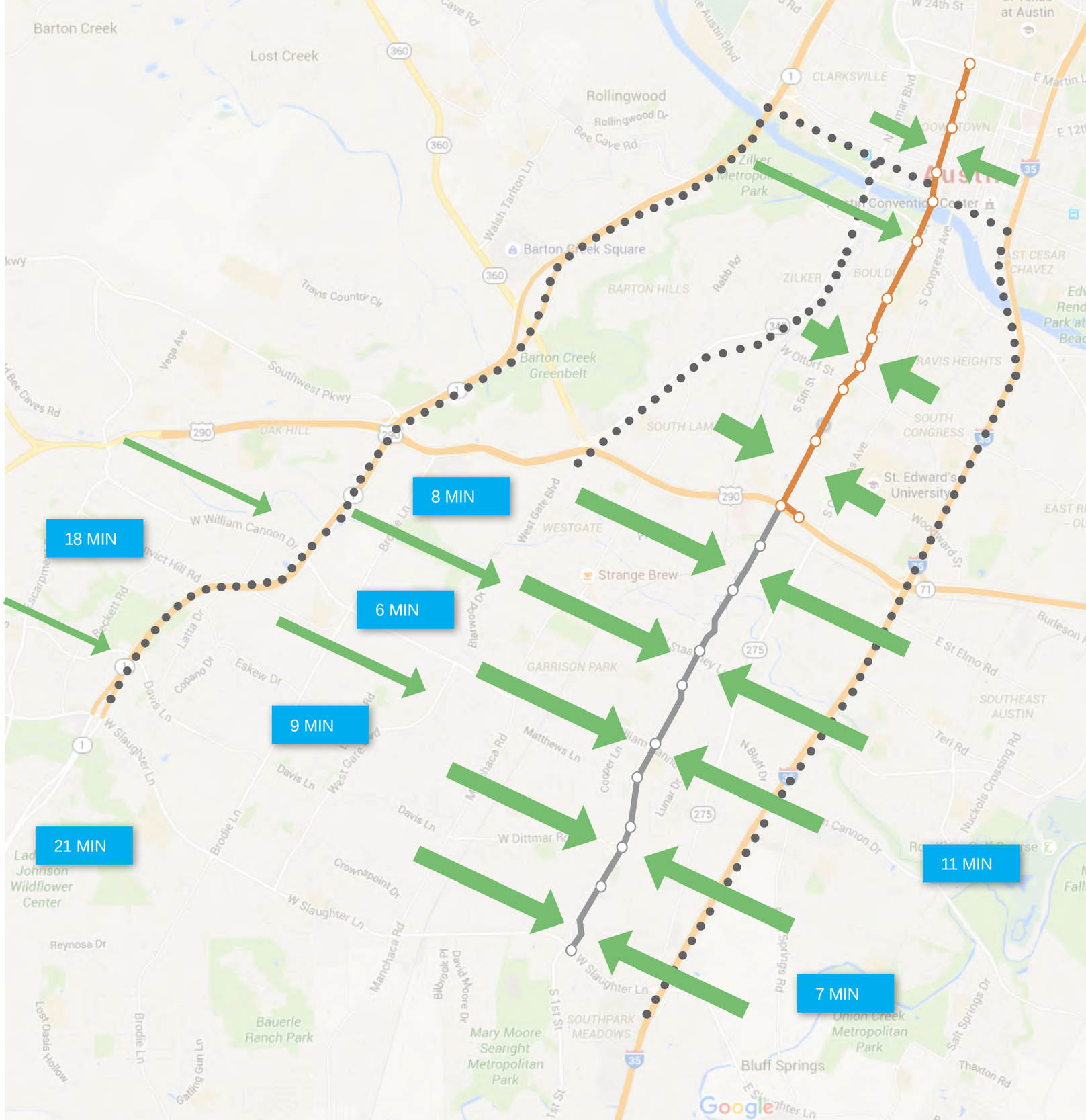


THE WIRE
ONE SHIFT

Looking at travel times to South 1st you can see a potential for shift is large in first mile. Building Park & Fly or expanding bus schedule and direct routes begins to make Wire One a shorter commute than MoPac for more distant neighborhoods.

This could create a break over where cost and convenience line up and we begin having a meaningful impact on access to Downtown from the whole of South Austin.

Car times to Park and Fly



EARLY ESTIMATES

System Phase I	not including Park & Fly	**$300 – $400 Million**
System Phase II	not including Park & Fly	**$200 – $300 Million**
Ridership Model A	75% capacity at peak 25% capacity off peak	**5,913,000 per year**
O+M		**$3 – $6 Million**
Cost per rider	75% capacity at peak 25% capacity off peak	**$0.51 - $1.01 per rider**

These are wide estimates based on formulas. Costing has enormous variability. More accurate cost would require study. Ridership estimates are at the initial 1,200 pphpd capacity.

Ridership also requires study. But capturing existing bus & tourism traffic will create an instant base of ridership. Commuters will also likely convert.

Beyond Land Use & fees there are financial opportunities in Urban Cable in advertising & naming rights. Emirates Airlines paid London $56 million for 10 year naming rights.

Consider also the costs not incurred, namely crossing obstacles.

SAFETY, ENVIRONMENT & POLICY

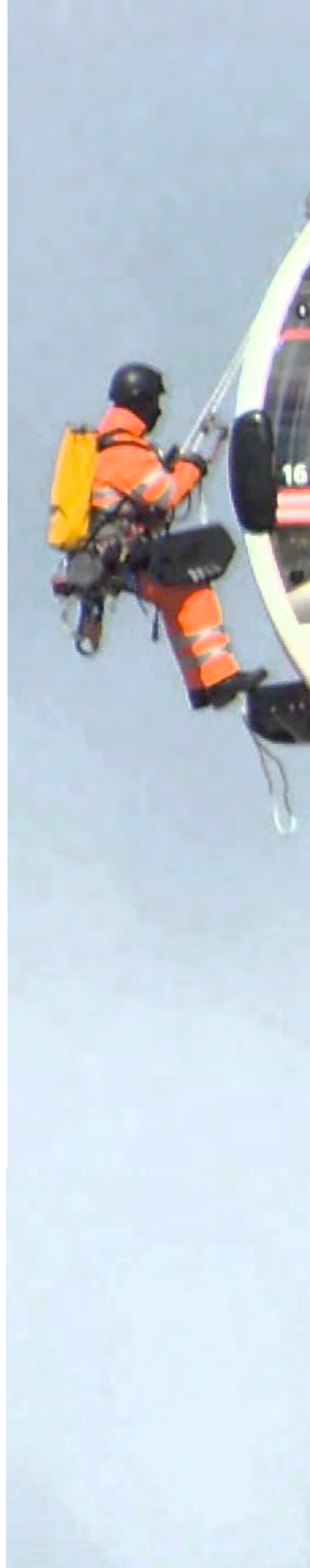
Safety is engineered into Urban Cable. The manufacturers provide service contracts and a program maintenance schedule to ensure both uptime and safe operation. Urban Cable is designed around redundant systems like air travel. In the U.S. there are regulatory and engineering bodies governing safety and policy. In urban applications call boxes like used on college campuses are installed into cars to provide individual safety. Station attendants are required for operation.

Environmental impact is extremely low. The equipment footprint is low. The energy requirements are low. An entire 7 mile line can run off of only a few Kilowatt Hours of electricity provided by the grid. In Austin we can use wind or solar. When measured against reduced car trips Wire One could end up carbon negative. Climate control may impact that formula based on the approach taken. Current thinking is the safest most robust approach is using small LCNG fueled generators to provide power and climate control. Battery & Ultra capacitor are other approaches with cost and reliability tradeoffs. Choosing an approach for climate controls requires study.

Urban Cable is impacted by winds. Wire One would run safely up to 50 mile per hour winds. In Central Texas we may experience outages due to extreme winds. But those occasions are short and are well predicted.

Urban Cable is quiet relative to transit. The noise from a running a line is less than that of cars or busses on a street. Riding Urban Cable is actually peaceful. Cell reception is typically excellent.

It is unknown how flyover of private property will be handled in the U.S. Therefore Wire One was envisioned to occupy public or City owned property. Flyover of private property is probably negotiated with the owner.



To learn more
or stay updated visit:

facebook.com/wireAustin

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #15

Executive Session

Executive Session:

Discuss acquisition of one or more parcels or interests in real property needed for the 183 South Project (Bergstrom Expressway) and related legal issues, including consideration of the use of eminent domain to condemn property, pursuant to §551.072 (Deliberation Regarding Real Property) and §551.071 (Consultation with Attorney).

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #16

Executive Session

Executive Session:

Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation With Attorney).

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #17

Executive Session

Executive Session:

Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects, as authorized by §551.071 (Consultation With Attorney).

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #18

Executive Session

Executive Session:

Discuss personnel matters as authorized by §551.074 (Personnel Matters).

CENTRAL TEXAS
Regional Mobility Authority

March 29, 2017
AGENDA ITEM #19

Consideration of the use of eminent domain to condemn property for the 183 South Project

Strategic Plan Relevance:	Regional Mobility
Department:	Engineering / Law
Contact:	Justin Word P.E., Director of Engineering / Geoff Petrov, General Counsel
Associated Costs:	Not Applicable
Funding Source:	Not Applicable
Action Requested:	Consider and act on draft resolution(s)

Summary:

The Mobility Authority must acquire utility easements, related property interests, or both ("Property") from real estate that abuts or is near the existing 183 South Project right-of-way.

Each owner of a parcel or property interest identified has received an official written offer to purchase the Property for an amount determined by an independent, professional appraiser. The Mobility Authority or its agent is required to pay no less than the offer made for the Property.

If, for any reason, a negotiation to acquire a parcel reaches an impasse, having this authorization to file a condemnation suit will minimize the risk of a possible delay and additional costs.

The parcels for your consideration and action at this meeting are:

A. Parcel E13B of the 183 South (Bergstrom Expressway) Project, a 0.044 acre parcel of real estate, **owned by New Century Investment, LLC and Morning Star Projects, LLC**, and located at 6000 FM 969 in Austin, TX 78724.

B. Parcel 118 of the 183 South (Bergstrom Expressway) Project, a 0.688 acre parcel of land, **owned by the City of Austin**, located at the Southeast corner of Ed Bluestein Blvd (U.S. Highway 183) and Smith Road, Austin, TX 78721.

Backup provided: Draft Resolutions; Parcel Surveys; Easement Maps

GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION NO. 17-0XX

RESOLUTION AUTHORIZING ACQUISITION OF PROPERTY RIGHTS BY AGREEMENT OR CONDEMNATION OF CERTAIN PROPERTY IN TRAVIS COUNTY FOR THE 183 SOUTH / BERGSTROM EXPRESSWAY PROJECT (PARCEL E13B)

WHEREAS, pursuant to and under the authority of Subchapter E, Chapter 370, Texas Transportation Code and other applicable law, the Central Texas Regional Mobility Authority ("Mobility Authority") hereby finds and determines that to promote the public safety, to facilitate the safety and movement of traffic, and to preserve the financial investment of the public in its roadways and the roadways of the State of Texas, the public convenience and necessity require acquisition of a utility easement, as that utility easement is described by metes and bounds in Exhibit A to this Resolution (the "Property"), owned by New Century Investment, LLC and Morning Star Projects, LLC (the "Owner"), located adjacent to the US Hwy 183S at 6000 FM 969, Austin, in Travis County, Texas for the construction, reconstruction, maintaining, widening, straightening, lengthening, and operating of the US 183 South / Bergstrom Expressway Project (the "Project"), as a part of the improvements to the Project; and

WHEREAS, an independent, professional appraisal report of the Property has been submitted to the Mobility Authority or its agent, and an amount has been established to be just compensation for the property rights to be acquired; and

WHEREAS, the Executive Director of the Mobility Authority, through agents employed or contracted with the Mobility Authority, has transmitted an official written offer to the Owner, based on the amount determined to be just compensation, and has entered into good faith negotiations with the Owner of the Property to acquire the Property; and

WHEREAS, as of the date of this Resolution, the Executive Director and the Owner have failed to agree on the amount determined to be just compensation due to said Owner for the Property; and

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors that the Executive Director is specifically authorized to negotiate and execute, if possible, an agreement to acquire the Property for consideration in an amount that does not exceed the official written offer previously transmitted to the Owner; and

BE IT FURTHER RESOLVED that the Executive Director is authorized and directed to negotiate an agreement to acquire the Property and all leasehold interests in the Property by agreement, subject to approval of the agreement and acquisition price by the Board of Directors; and

BE IT FURTHER RESOLVED that at such time as the Executive Director concludes that further negotiations with Owner to acquire the Property by agreement would be futile, the Executive Director or his designee is hereby authorized and directed to file or cause to be filed a suit in eminent domain to acquire the Property for the aforesaid purposes against the Owner and the owners of any interest in, and the holders of any lien secured by, the Property described in the attached Exhibit A; and

BE IT FURTHER RESOLVED that the Executive Director or his designee is hereby authorized and directed to incur such expenses and to employ such experts as he shall deem necessary to assist in the prosecution of such suit in eminent domain, including, but not limited to, appraisers, engineers, and land use planners.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of March, 2017.

Submitted and reviewed by:

_____

Geoff Petrov, General Counsel

Approved:

_____

Ray A. Wilkerson
Chairman, Board of Directors

Exhibit A

Exhibit "__"

Morning Star Project, LLC.
To
City of Austin
(Water Line Easement)

Field Notes for Parcel 13B WE

BEING 0.044 OF ONE ACRE (1927 S.F.) OF LAND, MORE OR LESS, OUT OF AND A PART OF THE JESSE C. TANNEHILL SURVEY No. 29, ABSTRACT No. 22 IN TRAVIS COUNTY, TEXAS, SAME BEING A PORTION OF LOT C, R.F. BEARDEN SUBDIVISION, RECORDED IN BOOK 85, PAGE 184C OF THE PLAT RECORDS OF TRAVIS COUNTY, TEXAS CONVEYED TO MORNING STAR PROJECT, LLC BY GENERAL WARRANTY DEED EXECUTED ON NOVEMBER 20, 2009, FILED FOR RECORD ON DECEMBER 7, 2009 AND RECORDED IN DOCUMENT 2009201195 OF THE OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS, SAID 0.044 OF ONE ACRE (1927 S.F.) OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS AND AS SHOWN ON THE ATTACHED SKETCH:

Beginning at a calculated point in the interior of said Lot C, same being in a southeasterly line of the 1.272 acre tract conveyed to Braker-Park LP by deed recorded in Document 2015161780 of the Official Public Records of Travis County, Texas and in a northerly line of the Water and Wastewater Easement recorded in Volume 10061, Page 369 of the Real Property Records of Travis County, Texas, for the Point of Beginning and a southwesterly corner of the herein described tract of land having grid coordinate (Texas State Plane, Central Zone, NAD 83(HARN) U.S. Feet, Surface Adjustment Factor of 1.00011) values of N=10077745.99 and E=3139087.26, from which TxDOT Type I Monument found at a corner in the easterly right-of-way line of U.S. Highway 183 (known locally as Ed Bluestein Boulevard-ROW Varies) and in the northerly right-of-way line of F.M. 969 (ROW varies), same being in a southerly line of said Lot C bears South 21°57'54" West, a distance of 20.00 feet to a 1/2 inch iron rod found at a southeasterly corner of said Braker-Park LP tract and North 68°02'45" West, a distance of 84.13 feet;

1. THENCE, North 21°57'54" East, a distance of 17.00 feet, with a southeasterly line of said Braker-Park LP tract, to a calculated point for a northwesterly corner of the herein described tract of land, from which a 1/2 inch iron rod found at a westerly corner of said Lot C and at a southeasterly corner of Lot B, of said R. F. Bearden Subdivision, same being a northwesterly corner of said Braker-Park LP tract bears North 21°57'54" East, a distance of 16.87 feet, North 52°00'54" East, a distance of 113.20 feet, North 37°40'49" West, a distance of 275.40 feet and South 51°57'52" West, a distance of 126.37 feet;

2. THENCE, South 68°02'45" East, a distance of 138.23 feet, leaving a southeasterly line of said Braker-Park LP tract, to a calculated point for a northeasterly corner of the herein described tract of land;

3. THENCE, South 21°57'15" West, a distance of 3.31 feet, to a calculated point in a northerly line of said Water and Wastewater Easement, for a southeasterly corner of the herein described tract of land;

4. THENCE, North 80°33'18" West, a distance of 63.18 feet, with a northerly line of said Water and Wastewater Easement, to a calculated point for a corner;

5. THENCE, North 68°02'45" West, a distance of 76.55 feet, to the Point of Beginning and containing an area of 0.044 of one acre (1927 s.f.) of land, more or less.

I hereby declare that this survey was made on the ground, under my supervision, and that it substantially complies with the current Texas Society of Professional Surveyors standards.

David Edward Martinez
Registered Professional Land Surveyor 5434

02/18/16
Date

STATE OF TEXAS
REGISTERED
DAVID EDWARD MARTINEZ
5434
PROFESSIONAL
LAND SURVEYOR

MWM DesignGroup
305 East Huntland Drive, Suite 200
Austin, Texas, 78752 (512) 453-0767
TBPLS Firm Registration No. 10065600

Bearing Basis: The bearings described herein are Texas State Plane, Central Zone, NAD 83(Harn), U.S. Feet. For surface coordinates multiply grid coordinates by the Surface Adjustment Factor of 1.00011. The reference points for this project are MWM control point 112, a cotton spindle in the centerline of sidewalk on the east side of Springdale Road approximately 85' east of Rockhurst Lane, having surface coordinate values of N=10088638.55, E=3138681.05 and MWM control point 141, a cotton gin spindle on the south side of Smith Road, approximately 920 feet east of U. S. Highway 183 centerline, at the 90 degree bend, having surface coordinate values of N= 10068786.90, E= 3136881.27, having a grid bearing of South 05°10'49" West and a surface distance of 19,933.07 feet.

TCAD No.: 0213280710
City Grid: N24

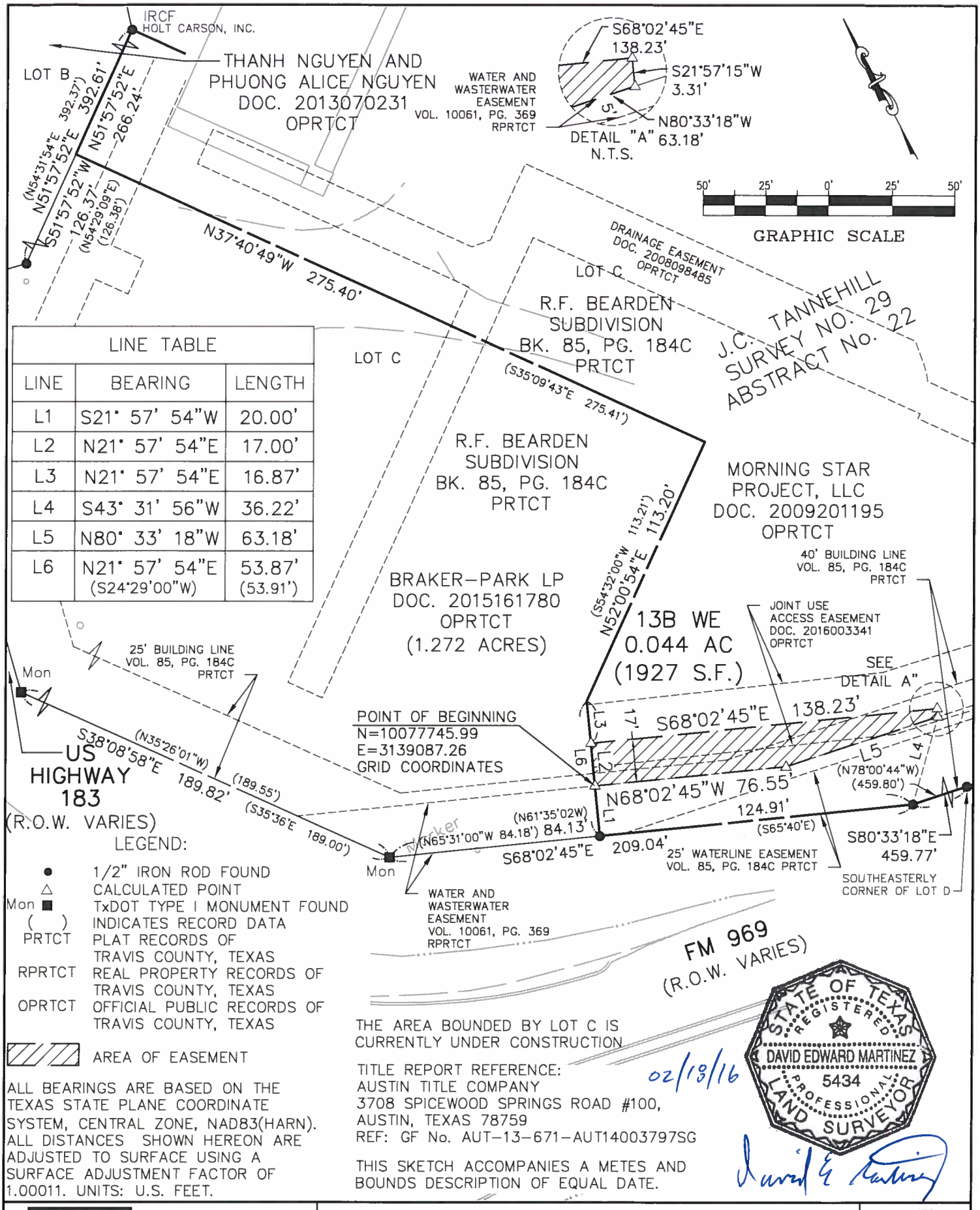
FIELD NOTES REVIEWED

By: _____

Date: _____

Signed: _____

Austin Water Utility



LINE TABLE		
LINE	BEARING	LENGTH
L1	S21° 57' 54"W	20.00'
L2	N21° 57' 54"E	17.00'
L3	N21° 57' 54"E	16.87'
L4	S43° 31' 56"W	36.22'
L5	N80° 33' 18"W	63.18'
L6	N21° 57' 54"E (S24°29'00"W)	53.87' (53.91')

LEGEND:

- ● 1/2" IRON ROD FOUND
- △ CALCULATED POINT
- Mon ■ TxDOT TYPE I MONUMENT FOUND
- ( ) INDICATES RECORD DATA
- PRTCT PLAT RECORDS OF TRAVIS COUNTY, TEXAS
- RPRTCT REAL PROPERTY RECORDS OF TRAVIS COUNTY, TEXAS
- OPRTCT OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS

AREA OF EASEMENT

ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NAD83(HARN). ALL DISTANCES SHOWN HEREON ARE ADJUSTED TO SURFACE USING A SURFACE ADJUSTMENT FACTOR OF 1.00011. UNITS: U.S. FEET.

THE AREA BOUNDED BY LOT C IS CURRENTLY UNDER CONSTRUCTION.

TITLE REPORT REFERENCE:
AUSTIN TITLE COMPANY
3708 SPICEWOOD SPRINGS ROAD #100,
AUSTIN, TEXAS 78759
REF: GF No. AUT-13-671-AUT14003797SG

THIS SKETCH ACCOMPANIES A METES AND BOUNDS DESCRIPTION OF EQUAL DATE.

02/19/16

STATE OF TEXAS
REGISTERED
DAVID EDWARD MARTINEZ
5434
PROFESSIONAL
LAND SURVEYOR

mwm Design Group
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBAE 1452
TBPE F-1416
TBPLS 10065600

SKETCH TO ACCOMPANY FIELD NOTES

TRAVIS COUNTY, TEXAS

DATE: 18 FEB 16
JOB NO: 658-01
FILE: 13B_WE.dwg

File:Y:\658-01_183_Bergstrom\CAD\Survey\Sketches\13B_WE.dwg

Exhibit “A”

Parcel E13B – Approximately 1,927 Square Feet (0.044 Ac).

GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION N0.17-0XX

RESOLUTION AUTHORIZING ACQUISITION OF PROPERTY RIGHTS BY AGREEMENT OR CONDEMNATION OF CERTAIN PROPERTY IN TRAVIS COUNTY FOR THE 183 SOUTH *I* BERGSTROM EXPRESSWAY PROJECT (PARCEL 118)

WHEREAS, pursuant to and under the authority of Subchapter E, Chapter 370, Texas Transportation Code and other applicable law, the Central Texas Regional Mobility Authority ("Mobility Authority") hereby finds and determines that to promote the public safety, to facilitate the safety and movement of traffic, and to preserve the financial investment of the public in its roadways and the roadways of the State of Texas, the public convenience and necessity require acquisition of fee simple title and access control rights in and to that certain parcel of land which is described by metes and bounds in Exhibit A to this Resolution (the "Property"), owned by the City of Austin (the "Owner"), located at the Northeast corner of US183 South and Bolm Road, Austin, in Travis County, Texas for the construction, reconstruction, maintaining, widening, straightening, lengthening, and operating of the US 183 South *I* Bergstrom Expressway Project (the "Project"), as a part of the improvements to the Project; and

WHEREAS**,** an independent, professional appraisal report of the Property has been submitted to the Mobility Authority or its agent, and an amount has been established to be just compensation for the property rights to be acquired; and

WHEREAS, the Executive Director of the Mobility Authority, through agents employed or contracted with the Mobility Authority, has transmitted an official written offer to the Owner, based on the amount determined to be just compensation, and has entered into good faith negotiations with the Owner of the Property to acquire the Property; and

WHEREAS, as of the date of this Resolution, the Executive Director and the Owner have failed to agree on the amount determined to be just compensation due to said Owner for the Property; and

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors that the Executive Director is specifically authorized to negotiate and execute, if possible, an agreement to acquire the Property for consideration in an amount that does not exceed the official written offer previously transmitted to the Owner; and

BE IT FURTHER RESOLVED that the Executive Director is authorized and directed to negotiate an agreement to acquire the Property and all leasehold interests in the Property by agreement, subject to approval of the agreement and acquisition price by the Board of Directors; and

BE IT FURTHER RESOLVED that at such time as the Executive Director concludes that further negotiations with Owner to acquire the Property by agreement would be futile, the Executive Director or his designee is hereby authorized and directed to file or cause to be filed a suit in eminent domain to acquire the Property for the aforesaid purposes against the Owner and the owners of any interest in, and the holders of any lien secured by, the Property described in the attached Exhibit A; and

BE IT FURTHER RESOLVED that the Executive Director or his designee is hereby authorized and directed to incur such expenses and to employ such experts as he shall deem necessary to assist in the prosecution of such suit in eminent domain, including, but not limited to, appraisers, engineers, and land use planners.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 29th day of March 2017.

Submitted and reviewed by:

Geoff Petrov, General Counsel

Approved:

Ray A. Wilkerson
Chairman, Board of Directors

Exhibit A

EXHIBIT ____

County: Travis
Highway: US 183
Limits: From: East of US 29 To: SH 71
RCSJ: 0151-09-037
Station: 444+54.81 to 465+14.33

DESCRIPTION FOR PARCEL 118

DESCRIPTION OF A 0.688 ACRE (29,966 SQ. FT.) PARCEL OF LAND LOCATED IN THE JAMES BURLESON SURVEY NO. 19, ABSTRACT NO. 4, IN THE CITY OF AUSTIN, TRAVIS COUNTY, TEXAS, AND BEING A PORTION OF A CALLED 67.10 ACRE TRACT OF LAND DESCRIBED IN A SPECIAL WARRANTY DEED TO THE CITY OF AUSTIN AND RECORDED IN DOCUMENT NO. 2013117685 OF THE OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS (O.P.R.T.C.TX.). SAID 0.688 ACRE (29,966 SQ. FT.) PARCEL, AS SHOWN ON A RIGHT-OF-WAY SKETCH PREPARED BY SAM, INC. FOR THIS PARCEL, BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING at a Texas Department of Transportation (TxDOT) Type I concrete monument found 213.37 feet left of Engineer's Centerline Station (E.C.S.) 465+63.04, being on the existing east right-of-way line of U.S. Highway 183 (variable width right-of-way) as conveyed to the State of Texas in Document No. 2001153258 of the O.P.R.T.C.TX., also being a point on the west line of said 67.10 acre tract;

THENCE N 27°47'38" E, with the existing east right-of-way line of said U.S. Highway 183, same being the west line of said 67.10 acre tract, a distance of 52.19 feet to a ⅝-inch iron rod with TxDOT aluminum cap set 207.35 feet left of E.C.S. 465+14.33**, being on the proposed east right-of-way line of said U.S. Highway 183 for the **POINT OF BEGINNING** and the most southerly corner of the parcel described herein;

THENCE, with the existing east right-of-way line of said U.S. Highway 183, same being the west line of said 67.10 acre tract, the following two (2) courses and distances numbered 1 and 2:

1) N 27°47'38" E, passing at a distance of 345.62 feet a ½-inch iron rod found with cap stamped "C.O.A." for the beginning of an existing Access Denial Line (A.D.L.), continuing with the existing A.D.L., passing at a distance of 932.53 feet a ½-inch iron rod with cap stamped "C.O.A." for the end of an existing A.D.L., passing at a distance of 1,131.83 feet to a ½-inch iron rod with cap stamped "C.O.A." for the beginning of an existing A.D.L., with the existing A.D.L., passing at a distance of 1,536.01 feet, a TxDOT Type II concrete monument found, passing at a distance of 1,801.83 feet, a ½-inch iron rod with cap stamped "C.O.A." for the end of an existing A.D.L., departing existing A.D.L., passing at a distance of 1923.86 feet, a TxDOT Type II concrete monument found and continuing a total distance of 2,046.83 feet to a TxDOT Type II concrete monument found, and

2) N 27°42'36" E, a distance of 35.25 feet to a TxDOT Type II concrete monument found at the northwest corner of the parcel described herein, same being in the common line of the existing east right-of-way line of said U.S. Highway 183 and the existing south right-of-way line of Smith Road (no record information found);

3) **THENCE** S 64°59'09" E, with the existing south right-of-way line of said Smith Road, same being the north line of said 67.10 acre tract, a distance of 10.01 feet to a ⅝-inch iron rod with TxDOT aluminum cap set 197.50 feet left of E.C.S. 444+54.81**, same being the beginning of the proposed east right-of-way line of said U.S. Highway 183;

EXHIBIT ____

County: Travis
Highway: US 183
Limits: From: East of US 29 To: SH 71
RCSJ: 0151-09-037
Station: 444+54.81 to 465+14.33

DESCRIPTION FOR PARCEL 118

4) **THENCE** S 27°46'58" W, departing the south right-of-way line of said Smith Road, and with the proposed east right-of-way line of said U.S. Highway 183, over and across said 67.10 acre tract, passing at a distance of 20.00 feet to a ⅝-inch iron rod with TxDOT aluminum cap stamped "A.D.L." set 197.38 feet left of E.C.S. 444+74.64** same being the beginning of the proposed Access Denial line of said U.S. Highway 183, and continuing for a total distance of 280.75 feet to a ⅝-inch iron rod with TxDOT aluminum cap set 197.01 feet left of E.C.S. 447+34.20**, for the end of the proposed Access Denial line, same being the beginning of the transfer of Access Denial line;

THENCE, with the proposed east right-of-way and the transfer of Access Denial line of said U.S. Highway 183, over and across said 67.10 acre tract, the following three (3) courses and distances numbered 5 through 7:

5) S 27°47'38" W, a distance of 356.73 feet to a ⅝-inch iron rod with TxDOT aluminum cap set 197.01 feet left of E.C.S. 450+90.92**,

6) S 27°47'45" W, a distance of 67.38 feet to a ⅝-inch iron rod with TxDOT aluminum cap set 197.01 feet left of E.C.S. 451+58.30**, and

7) S 26°05'48" W, a distance of 245.99 feet to a ⅝-inch iron rod with TxDOT aluminum cap stamped "A.D.L." set 204.29 feet left of E.C.S. 454+04.18**, for the end of the transfer of Access Denial line;

THENCE, continuing with the proposed east right-of-way line of said U.S. Highway 183, over and across said 67.10 acre tract, the following two (2) courses and distances numbered 8 through 9:

8) S 26°05'48" W, a distance of 93.45 feet to a ⅝-inch iron rod with TxDOT aluminum cap set 207.06 feet left of E.C.S. 454+97.59**, and

9) S 27°47'38" W, a distance of 105.89 feet to a ⅝-inch iron rod with TxDOT aluminum cap stamped "A.D.L." set 207.06 feet left of E.C.S. 456+03.49, for the beginning of the transfer of Access Denial line;

THENCE, continuing with the proposed east right-of-way and the transfer of Access Denial line of said U.S. Highway 183, over and across said 67.10 acre tract, the following two (2) courses and distances numbered 10 through 11:

10) S 27°47'38" W, a distance of 544.45 feet to a ⅝-inch iron rod with TxDOT aluminum cap se 207.06 feet left of E.C.S. 461+47.93**, same being the beginning of a curve to the right, and

11) Southwesterly, with said curve to the right, having an arc distance of 42.64 feet, through a central angle of 00°50'31", having a radius of 2,901.79 feet, and a chord that bears S 28°12'54" W, a distance of 42.64 feet to a ⅝-inch iron rod with TxDOT aluminum cap stamped "A.D.L." set 206.88 feet left of E.C.S. 461+88.77, for the end of the transfer of Access Denial line;

EXHIBIT ____

County: Travis
Highway: US 183
Limits: From: East of US 29 To: SH 71
RCSJ: 0151-09-037
Station: 444+54.81 to 465+14.33

DESCRIPTION FOR PARCEL 118

THENCE, continuing with the proposed east right-of-way line of said U.S. Highway 183, over and across said 67.10 acre tract, the following two (2) courses and distances numbered 12 through 13:

12) Southwesterly, continuing with said curve to the right, having an arc distance of 159.94 feet, through a central angle of 03°09'29", having a radius of 2,901.79 feet, and a chord that bears S 30°12'54" W, a distance of 159.92 feet to a ⅝-inch iron rod with TxDOT aluminum cap set 205.19 feet left of E.C.S. 463+39.23**, and

13) S 31°47'38" W, a distance of 186.12 feet to the **POINT OF BEGINNING** and containing 0.688 acres (29,966 sq. ft.) of land more or less.

**This monument may be replaced by a TxDOT Type II right-of-way upon the completion of the highway construction project under the supervision of a RPLS either employed or retained by TxDOT.

This property description is accompanied by a plat of even date.

All bearings are based on the Texas State Plane Coordinate System, Central Zone, NAD 83(NonHARN). All distances shown hereon are adjusted to surface multiplying the grid coordinates by a surface adjustment factor of 1.00011.

THE STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF TRAVIS §

That I, William Reed Herring, a Registered Professional Land Surveyor, do hereby certify that the above description is true and correct to the best of my knowledge and belief and that the property described herein was determined by a survey made on the ground under my direction and supervision.

WITNESS MY HAND AND SEAL at Austin, Travis County, Texas this the 22nd of September, 2016 A.D.

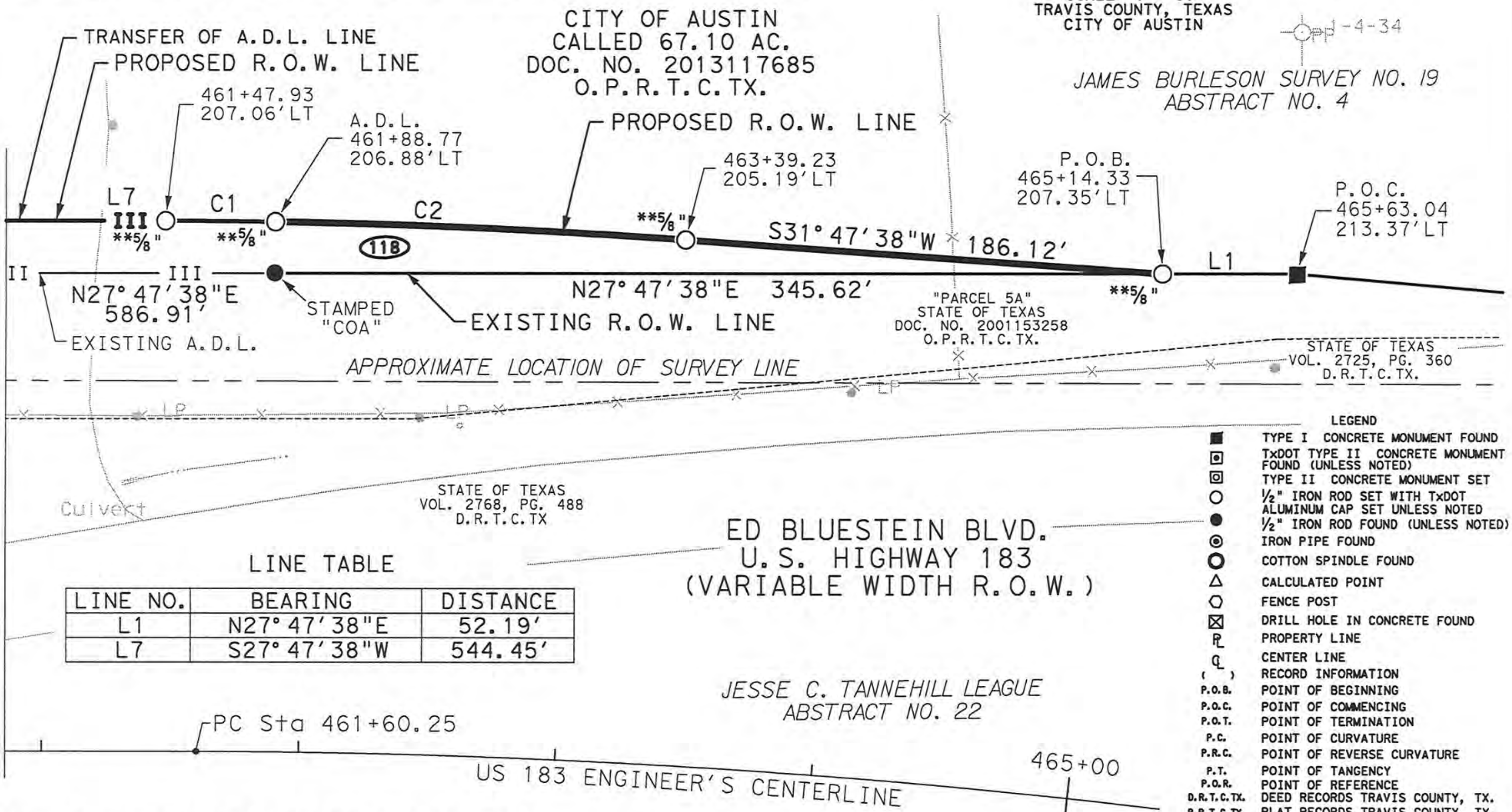
SURVEYING AND MAPPING, LLC
4801 Southwest Parkway
Building Two, Suite 100
Austin, Texas 78704
Texas Firm Registration Number 10064300

William Reed Herring
Registered Professional Land Surveyor
No. 6355 - State of Texas

CURVE TABLE

NO.	DELTA	RADIUS	LENGTH	CHORD	CHORD BEARING
C1	00° 50′ 31"RT	2,901.79′	42.64′	42.64′	S28° 12′ 54"W
C2	03° 09′ 29"RT	2,901.79′	159.94′	159.92′	S30° 12′ 54"W

GRAPHIC SCALE
SCALE: 1"= 60′
TRAVIS COUNTY, TEXAS
CITY OF AUSTIN



LINE TABLE

LINE NO.	BEARING	DISTANCE
L1	N27° 47′ 38"E	52.19′
L7	S27° 47′ 38"W	544.45′

LEGEND

- TYPE I CONCRETE MONUMENT FOUND
- TxDOT TYPE II CONCRETE MONUMENT FOUND (UNLESS NOTED)
- TYPE II CONCRETE MONUMENT SET
- ½" IRON ROD SET WITH TxDOT ALUMINUM CAP SET UNLESS NOTED
- ½" IRON ROD FOUND (UNLESS NOTED)
- IRON PIPE FOUND
- COTTON SPINDLE FOUND
- CALCULATED POINT
- FENCE POST
- DRILL HOLE IN CONCRETE FOUND
- PL PROPERTY LINE
- CL CENTER LINE
- ( ) RECORD INFORMATION
- P.O.B. POINT OF BEGINNING
- P.O.C. POINT OF COMMENCING
- P.O.T. POINT OF TERMINATION
- P.C. POINT OF CURVATURE
- P.R.C. POINT OF REVERSE CURVATURE
- P.T. POINT OF TANGENCY
- P.O.R. POINT OF REFERENCE
- D.R.T.C.TX. DEED RECORDS TRAVIS COUNTY, TX.
- P.R.T.C.TX. PLAT RECORDS TRAVIS COUNTY, TX.
- R.P.R.T.C.TX. REAL PROPERTY RECORDS TRAVIS COUNTY, TEXAS
- O.P.R.T.C.TX. OFFICIAL PUBLIC RECORDS TRAVIS COUNTY, TEXAS
- ACCESS DENIAL LINE [A.D.L.] (C. OF A. LINE) ["C.O.A."]

NOTES:

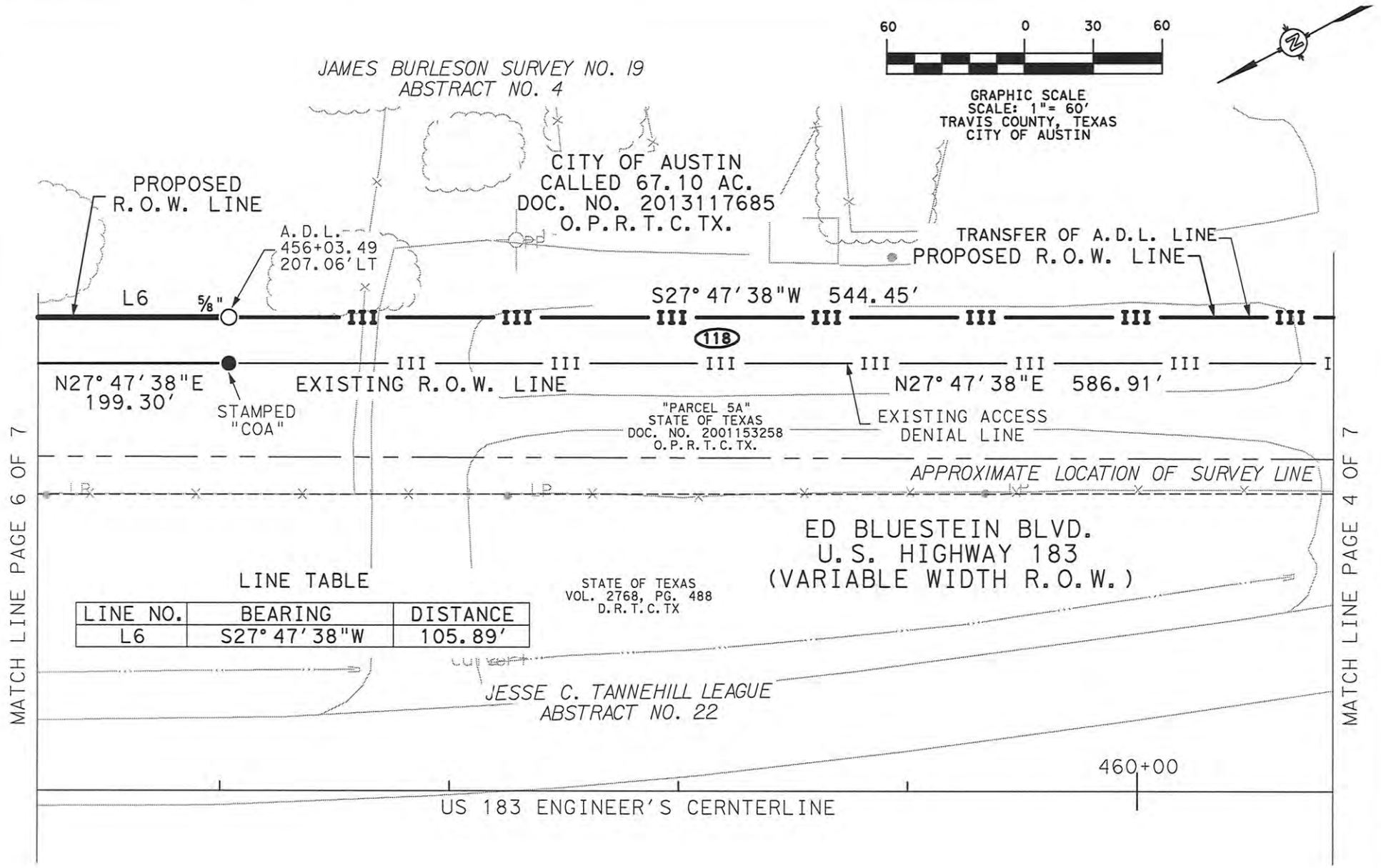
1. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT. RECORD INFORMATION ON THIS DRAWING IS BASED ON A PUBLIC RECORDS SEARCH BY THE SURVEYOR AND MAY NOT INCLUDE ALL EASEMENTS OR INSTRUMENTS PERTAINING TO THIS PROPERTY.
2. ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NAD 83(NonHARN), ALL DISTANCES AND COORDINATES ARE ADJUSTED TO SURFACE USING THE PROJECT SURFACE ADJUSTMENT FACTOR OF 1.00011.
3. IMPROVEMENTS SHOWN HEREON ARE BASED UPON TXDOT AERIAL SURVEY DIGITAL FILES.
4. ALL VOLUME NUMBERS REFER TO THE DEED RECORDS OF TRAVIS COUNTY, TEXAS UNLESS OTHERWISE NOTED.
5. ACCESS IS PROHIBITED ACROSS THE "ACCESS DENIAL LINE" TO THE TRANSPORTATION FACILITY FROM THE ADJACENT PROPERTY.

** THIS MONUMENT MAY BE REPLACED BY A TXDOT TYPE II RIGHT-OF-WAY UPON THE COMPLETION OF THE HIGHWAY CONSTRUCTION PROJECT UNDER THE SUPERVISION OF A RPLS EITHER EMPLOYED OR RETAINED BY TXDOT.

9/22/2016

SAM INC.
SURVEYING·AERIAL MAPPING·ENGINEERING
4801 Southwest Parkway
Building Two, Suite 100
Austin, Texas 78735
(512) 447-0575
Fax: (512) 326-3029
Texas Firm Registration No. 10064300

RIGHT-OF-WAY SKETCH SHOWING
PARCEL 118
0.688 AC. (29,964 SQ. FT.)
RCSJ NO. 151-09-039



LINE TABLE

LINE NO.	BEARING	DISTANCE
L6	S27°47'38"W	105.89'

9/22/2016
PAGE 5 OF 7

SAM INC.
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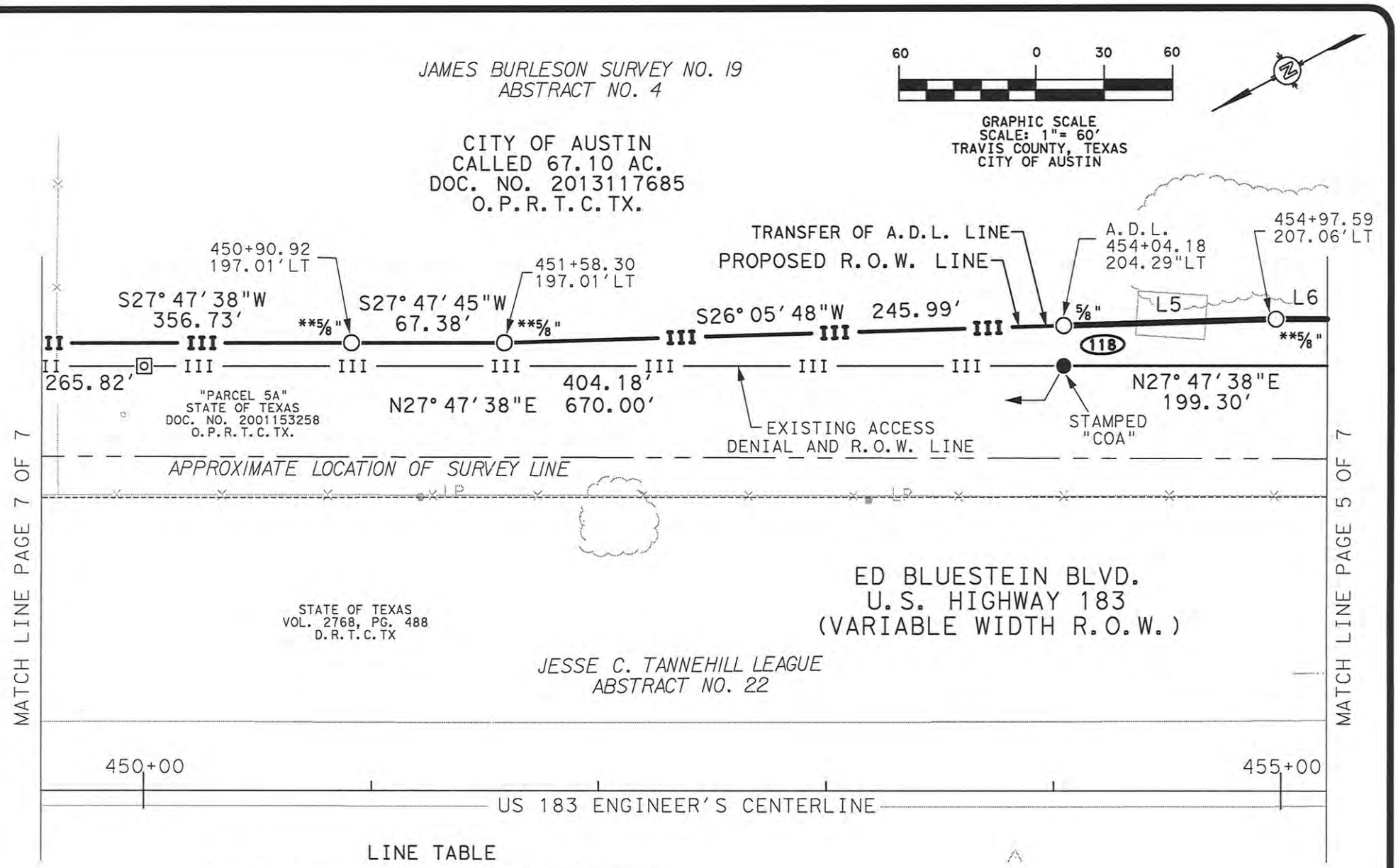

LINE TABLE

LINE NO.	BEARING	DISTANCE
L5	S26°05'48"W	93.45'
L6	S27°47'38"W	105.89'

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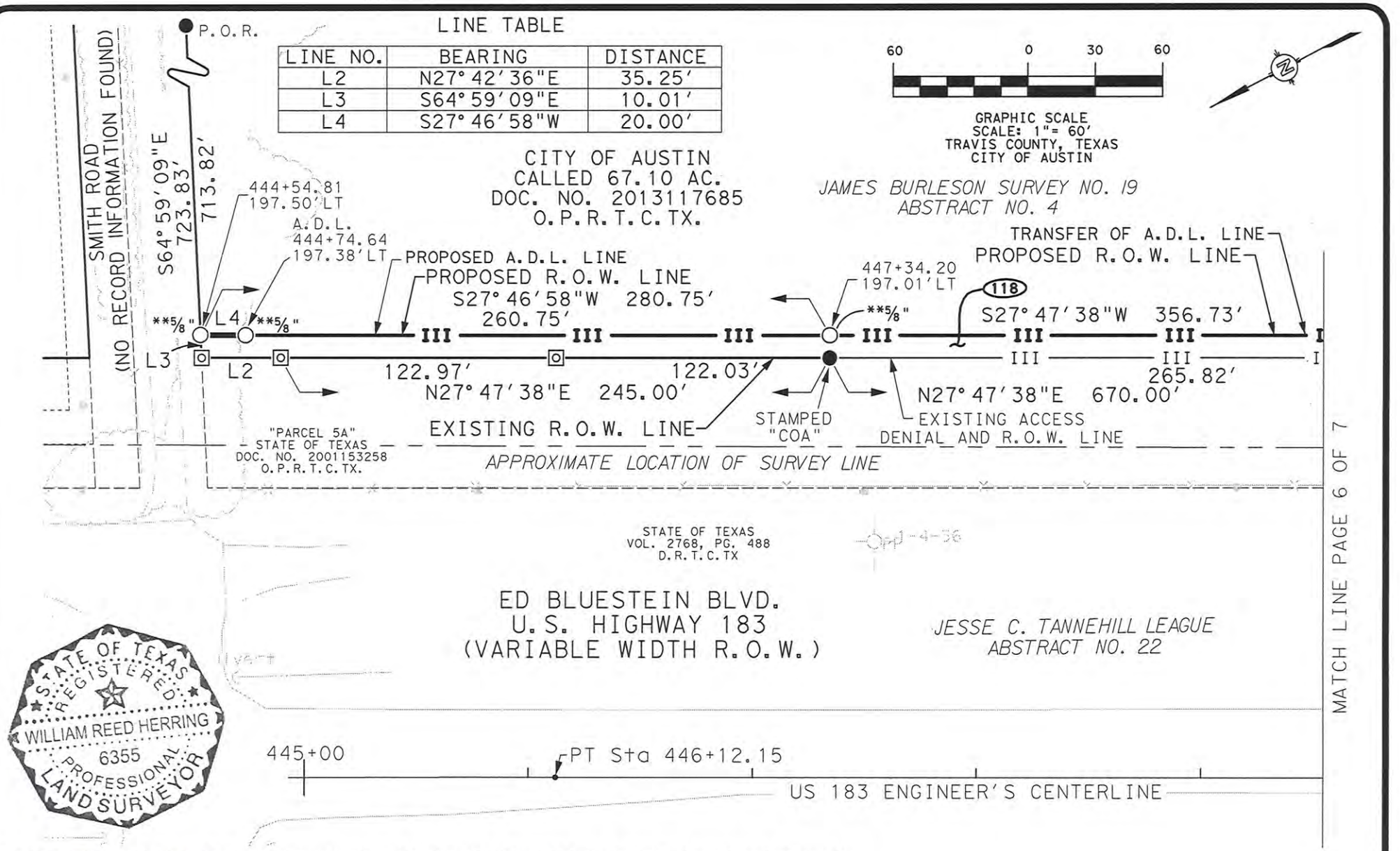

STATE OF TEXAS
REGISTERED
WILLIAM REED HERRING
6355
PROFESSIONAL
LAND SURVEYOR

I HEREBY CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND UNDER MY DIRECTION AND SUPERVISION AND THAT THIS PLAT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

WILLIAM REED HERRING
REGISTERED PROFESSIONAL LAND SURVEYOR
NO. 6355, STATE OF TEXAS

9/22/2016
DATE

9/22/2016
PAGE 7 OF 7

SAM INC.
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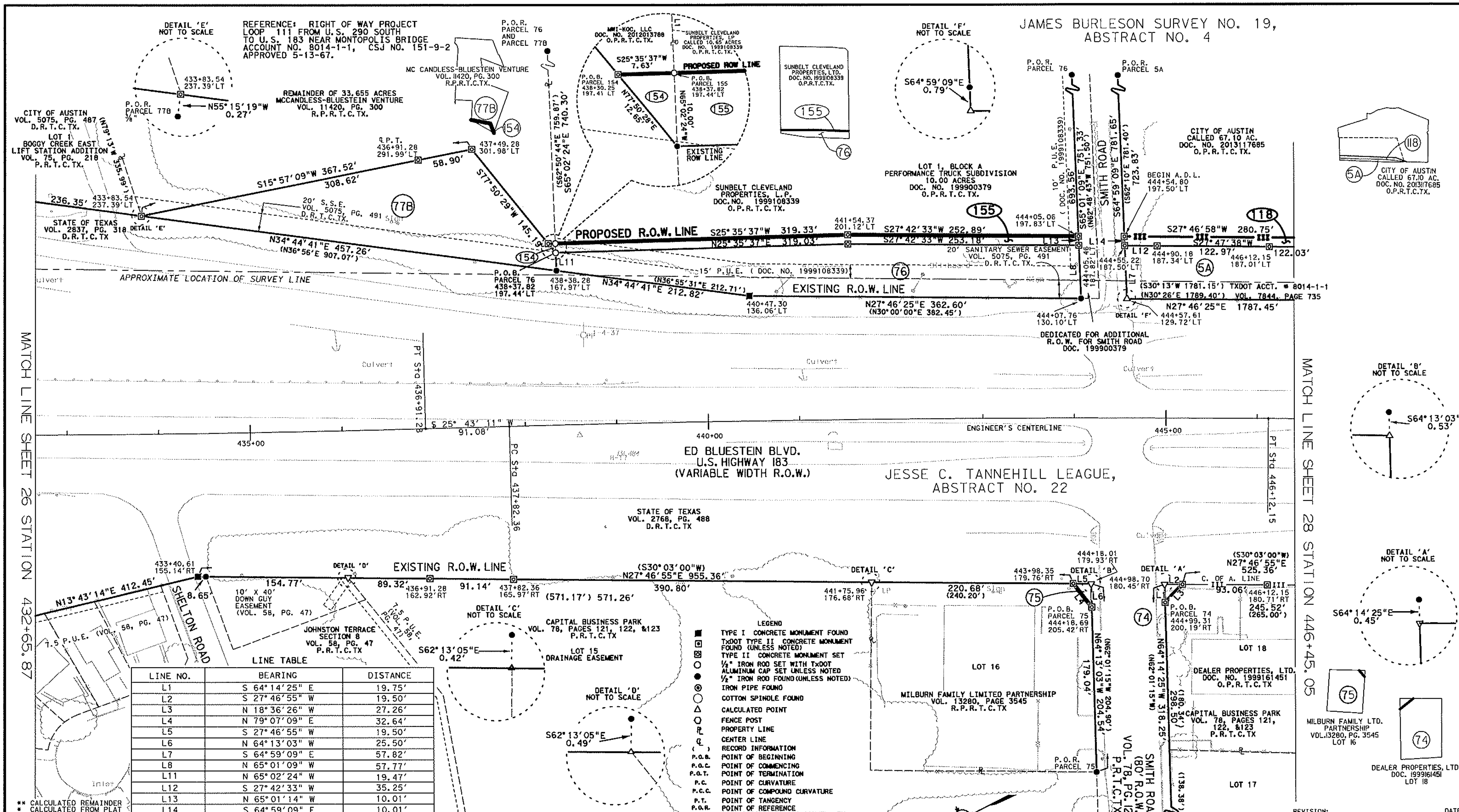
RIGHT-OF-WAY SKETCH SHOWING
PARCEL 118
0.688 AC. (29,964 SQ. FT.)
RCSJ NO. 151-09-039


REFERENCE: RIGHT OF WAY PROJECT
LOOP 111 FROM U.S. 290 SOUTH
TO U.S. 183 NEAR MONTOPOLIS BRIDGE
ACCOUNT NO. 8014-1-1, CSJ NO. 151-9-2
APPROVED 5-13-67.
JAMES BURLESON SURVEY NO. 19,
ABSTRACT NO. 4
DETAIL 'E'
NOT TO SCALE
DETAIL 'F'
NOT TO SCALE
DETAIL 'B'
NOT TO SCALE
DETAIL 'A'
NOT TO SCALE
DETAIL 'C'
NOT TO SCALE
DETAIL 'D'
NOT TO SCALE
MC CANDLESS-BLUESTEIN VENTURE
VOL. 11420, PG. 300
R.P.R.T.C.TX.
REMAINDER OF 33.655 ACRES
MCCANDLESS-BLUESTEIN VENTURE
VOL. 11420, PG. 300
R.P.R.T.C.TX.
CITY OF AUSTIN
VOL. 5075, PG. 487
D.R.T.C.TX.
LOT 1
BOGGY CREEK EAST
LIFT STATION ADDITION
VOL. 75, PG. 218
P.R.T.C.TX.
STATE OF TEXAS
VOL. 2837, PG. 318
D.R.T.C.TX
SUNBELT CLEVELAND
PROPERTIES, L.P.
DOC. NO. 1999108339
O.P.R.T.C.TX.
LOT 1, BLOCK A
PERFORMANCE TRUCK SUBDIVISION
10.00 ACRES
DOC. NO. 199900379
O.P.R.T.C.TX.
CITY OF AUSTIN
CALLED 67.10 AC.
DOC. NO. 2013117685
O.P.R.T.C.TX.
PROPOSED R.O.W. LINE
EXISTING R.O.W. LINE
APPROXIMATE LOCATION OF SURVEY LINE
SMITH ROAD
DEDICATED FOR ADDITIONAL
R.O.W. FOR SMITH ROAD
DOC. 199900379
ENGINEER'S CENTERLINE
ED BLUESTEIN BLVD.
U.S. HIGHWAY 183
(VARIABLE WIDTH R.O.W.)
JESSE C. TANNEHILL LEAGUE,
ABSTRACT NO. 22
STATE OF TEXAS
VOL. 2768, PG. 488
D.R.T.C.TX
MATCH LINE SHEET 26 STATION 432+65.87
MATCH LINE SHEET 28 STATION 446+45.05
SHELTON ROAD
JOHNSTON TERRACE
SECTION 8
VOL. 58, PG. 47
P.R.T.C.TX
CAPITAL BUSINESS PARK
VOL. 78, PAGES 121, 122, &123
P.R.T.C.TX
LOT 15
DRAINAGE EASEMENT
LOT 16
MILBURN FAMILY LIMITED PARTNERSHIP
VOL. 13280, PAGE 3545
R.P.R.T.C.TX
DEALER PROPERTIES, LTD.
DOC. NO. 1999161451
O.P.R.T.C.TX
LOT 18
LOT 17
SMITH ROAD
(80' R.O.W.)
VOL. 78, PG. 121-123
P.R.T.C.TX.
LEGEND
TYPE I CONCRETE MONUMENT FOUND
TxDOT TYPE II CONCRETE MONUMENT FOUND (UNLESS NOTED)
TYPE II CONCRETE MONUMENT SET
½" IRON ROD SET WITH TxDOT ALUMINUM CAP SET UNLESS NOTED
½" IRON ROD FOUND (UNLESS NOTED)
IRON PIPE FOUND
COTTON SPINDLE FOUND
CALCULATED POINT
FENCE POST
PROPERTY LINE
CENTER LINE
RECORD INFORMATION
P.O.B. POINT OF BEGINNING
P.O.C. POINT OF COMMENCING
P.O.T. POINT OF TERMINATION
P.C. POINT OF CURVATURE
P.C.C. POINT OF COMPOUND CURVATURE
P.T. POINT OF TANGENCY
P.O.R. POINT OF REFERENCE
D.R.T.C.TX. DEED RECORDS TRAVIS COUNTY, TX.
P.R.T.C.TX. PLAT RECORDS TRAVIS COUNTY, TX.
R.P.R.T.C.TX. REAL PROPERTY RECORDS TRAVIS COUNTY, TEXAS
O.P.R.T.C.TX. OFFICIAL PUBLIC RECORDS TRAVIS COUNTY, TEXAS
ACCESS DENIAL LINE ["A.D.L."] (C. OF A. LINE) ["C.O.A."]
GRAPHIC SCALE
(IN FEET)
1" = 50'

LINE TABLE

LINE NO.	BEARING	DISTANCE
L1	S 64°14'25" E	19.75'
L2	S 27°46'55" W	19.50'
L3	N 18°36'26" W	27.26'
L4	N 79°07'09" E	32.64'
L5	S 27°46'55" W	19.50'
L6	N 64°13'03" W	25.50'
L7	S 64°59'09" E	57.82'
L8	N 65°01'09" W	57.77'
L11	N 65°02'24" W	19.47'
L12	S 27°42'33" W	35.25'
L13	N 65°01'14" W	10.01'
L14	S 64°59'09" E	10.01'

** CALCULATED REMAINDER
* CALCULATED FROM PLAT

PARCEL NO.	DEED ACREAGE	PROPERTY OWNER	TYPE OF CONV.	CONVEYANCE	TAKING PROP. ℄ STATIONS		TAKING ACRES	REMAINDER	
				DOCUMENT NO.	FROM	TO		LEFT	RIGHT
74	*1.090	DEALER PROPERTIES, LTD.	CORRECTION DEED	2003098146	444+99.31	445+18.35	0.004		1.086
75	*1.146	MILBURN FAM. LTD. PARTNERSHIP	DEED	2002019179	443+98.35	444+18.69	0.006		1.140
76	10.65	SUNBELT CLEVELAND PROPERTIES, LTD.	DEED	2001168148	438+37.97	444+05.46	0.649	10.001	
77B	**21.338	MC CANDLESS-BLUESTEIN VENTURE	WARRANTY DEED	2003065984	433+83.54	438+37.97	0.641	20.697	
5A	115.25	CAPITOL AGGREGATES	DEED	2001153258	444+57.61	468+13.68	2.763	112.487	
154	0.245	MWI-KOC, LLC LOT 1, BLOCK A			438+30.25	438+37.82	0.001	0.244	
155	10.00	SUNBELT CLEVELAND PROPERTIES, L.P.			438+37.82	444+05.06	0.13	9.87	
118	67.10	CITY OF AUSTIN			444+54.81	465+14.33	0.69	66.41	

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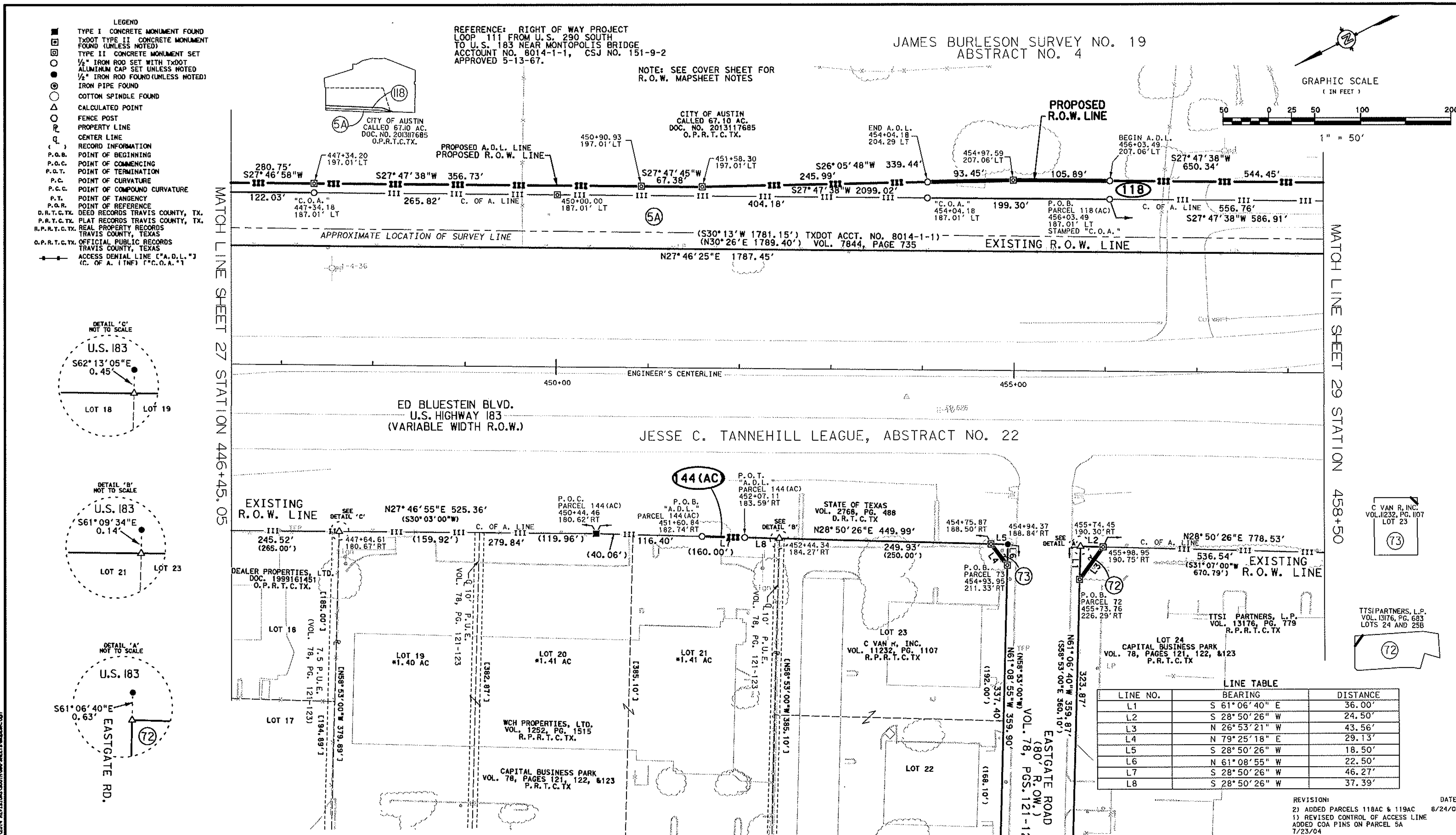
RIGHT OF WAY
WIDENING PROJECT

REVISION: DATE:
1) REVISE PARCEL 77, DELETE L10 07/20/01
2) REVISE PARCEL 77A TO PARCEL 77B, DELETE L9. 11/12/01
3) REVISED CONTROL OF ACCESS LINE 7/23/04

ACCOUNT NO. 8014-1-73

OSA #:[******]		**********.DGN	
RF - ******************************			
FED. RD. DIV. RD.	FEDERAL AID PROJECT NO.		SHEET NO.
			27
STATE	DIST.	COUNTY	
TEXAS	AUSTIN	TRAVIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0151	09	039	U.S. 183



LEGEND
TYPE I CONCRETE MONUMENT FOUND
TxDOT TYPE II CONCRETE MONUMENT FOUND (UNLESS NOTED)
TYPE II CONCRETE MONUMENT SET
½" IRON ROD SET WITH TxDOT ALUMINUM CAP SET UNLESS NOTED
½" IRON ROD FOUND (UNLESS NOTED)
IRON PIPE FOUND
COTTON SPINDLE FOUND
CALCULATED POINT
FENCE POST
PROPERTY LINE
CENTER LINE
RECORD INFORMATION
P.O.B. POINT OF BEGINNING
P.O.C. POINT OF COMMENCING
P.O.T. POINT OF TERMINATION
P.C. POINT OF CURVATURE
P.C.C. POINT OF COMPOUND CURVATURE
P.T. POINT OF TANGENCY
P.O.R. POINT OF REFERENCE
D.R.T.C.TX. DEED RECORDS TRAVIS COUNTY, TX.
P.R.T.C.TX. PLAT RECORDS TRAVIS COUNTY, TX.
R.P.R.T.C.TX. REAL PROPERTY RECORDS TRAVIS COUNTY, TEXAS
O.P.R.T.C.TX. OFFICIAL PUBLIC RECORDS TRAVIS COUNTY, TEXAS
ACCESS DENIAL LINE ["A.D.L."] (C. OF A. LINE) ["C.O.A."]
REFERENCE: RIGHT OF WAY PROJECT LOOP 111 FROM U.S. 290 SOUTH TO U.S. 183 NEAR MONTOPOLIS BRIDGE ACCTOUNT NO. 8014-1-1, CSJ NO. 151-9-2 APPROVED 5-13-67.
NOTE: SEE COVER SHEET FOR R.O.W. MAPSHEET NOTES
JAMES BURLESON SURVEY NO. 19
ABSTRACT NO. 4
GRAPHIC SCALE
(IN FEET)
1" = 50'
CITY OF AUSTIN CALLED 67.10 AC. DOC. NO. 2013117685 O.P.R.T.C.TX.
PROPOSED R.O.W. LINE
PROPOSED A.D.L. LINE
END A.D.L. 454+04.18 204.29' LT
BEGIN A.D.L. 456+03.49 207.06' LT
P.O.B. PARCEL 118(AC) 456+03.49 187.01' LT STAMPED "C.O.A."
APPROXIMATE LOCATION OF SURVEY LINE
(S30°13'W 1781.15') TXDOT ACCT. NO. 8014-1-1)
(N30°26'E 1789.40') VOL. 7844, PAGE 735
EXISTING R.O.W. LINE
N27°46'25"E 1787.45'
MATCH LINE SHEET 27 STATION 446+45.05
MATCH LINE SHEET 29 STATION 458+50
ENGINEER'S CENTERLINE
450+00
455+00
ED BLUESTEIN BLVD.
U.S. HIGHWAY 183
(VARIABLE WIDTH R.O.W.)
JESSE C. TANNEHILL LEAGUE, ABSTRACT NO. 22
DETAIL 'C' NOT TO SCALE
U.S. 183
S62°13'05"E 0.45'
LOT 18
LOT 19
DETAIL 'B' NOT TO SCALE
U.S. 183
S61°09'34"E 0.14'
LOT 21
LOT 23
DETAIL 'A' NOT TO SCALE
U.S. 183
S61°06'40"E 0.63'
EASTGATE RD.
144(AC)
P.O.C. PARCEL 144(AC) 450+44.46 180.62' RT
P.O.B. "A.D.L." PARCEL 144(AC) 451+60.84 182.74' RT
P.O.T. "A.D.L." PARCEL 144(AC) 452+07.11 183.59' RT
STATE OF TEXAS VOL. 2768, PG. 488 D.R.T.C.TX
N27°46'55"E 525.36'
N28°50'26"E 449.99'
N28°50'26"E 778.53'
DEALER PROPERTIES, LTD. DOC. 1999161451 O.P.R.T.C.TX.
WCH PROPERTIES, LTD. VOL. 1252, PG. 1515 R.P.R.T.C.TX.
CAPITAL BUSINESS PARK VOL. 78, PAGES 121, 122, &123 P.R.T.C.TX
C VAN R, INC. VOL. 11232, PG. 1107 R.P.R.T.C.TX
TTSI PARTNERS, L.P. VOL. 13176, PG. 779 R.P.R.T.C.TX
LOT 24 CAPITAL BUSINESS PARK VOL. 78, PAGES 121, 122, &123 P.R.T.C.TX
P.O.B. PARCEL 73 454+93.95 211.33' RT
P.O.B. PARCEL 72 455+73.76 226.29' RT
EASTGATE ROAD (80' R.OW.) VOL. 78, PGS. 121-123
P.O.R. PARCEL 73 ⅝" IRF
P.O.R. PARCEL 72 ⅝" IRF

LINE TABLE

LINE NO.	BEARING	DISTANCE
L1	S 61°06'40" E	36.00'
L2	S 28°50'26" W	24.50'
L3	N 26°53'21" W	43.56'
L4	N 79°25'18" E	29.13'
L5	S 28°50'26" W	18.50'
L6	N 61°08'55" W	22.50'
L7	S 28°50'26" W	46.27'
L8	S 28°50'26" W	37.39'

REVISION: DATE:
2) ADDED PARCELS 118AC & 119AC 8/24/06
1) REVISED CONTROL OF ACCESS LINE ADDED COA PINS ON PARCEL 5A 7/23/04

* CALCULATED FROM PLAT

PARCEL NO.	DEED ACREAGE	PROPERTY OWNER	TYPE OF CONV.	CONVEYANCE DOCUMENT NO.	TAKING PROP. ℄ STATIONS FROM	TAKING PROP. ℄ STATIONS TO	TAKING ACRES	REMAINDER LEFT	REMAINDER RIGHT
5A	115.25	CAPITOL AGGREGATES, LTD.	DEED	2001153258	444+57.61	468+13.66	2.762	112.487	XX
72	8.079	TTSI PARTNERS, L.P.	DEED	2002028361	455+73.76	455+98.95	0.010		8.069
73	*2.203	C VAN R, INC.	DEED	2002019126	454+75.87	454+93.95	0.005		2.198
119(AC)	8.079	TTSI PARTNERS, L.P.			455+98.95	461+35.39			
144(AC)	*1.41	WCH PROPERTIES, LTD.			451+60.84	452+07.11			

SAM INC. SURVEYING · AERIAL MAPPING · ENGINEERING
4801 Southwest Parkway Building Two, Suite 100 Austin, Texas 78735 (512) 447-0575 Fax (512) 326-3029

RIGHT OF WAY WIDENING PROJECT

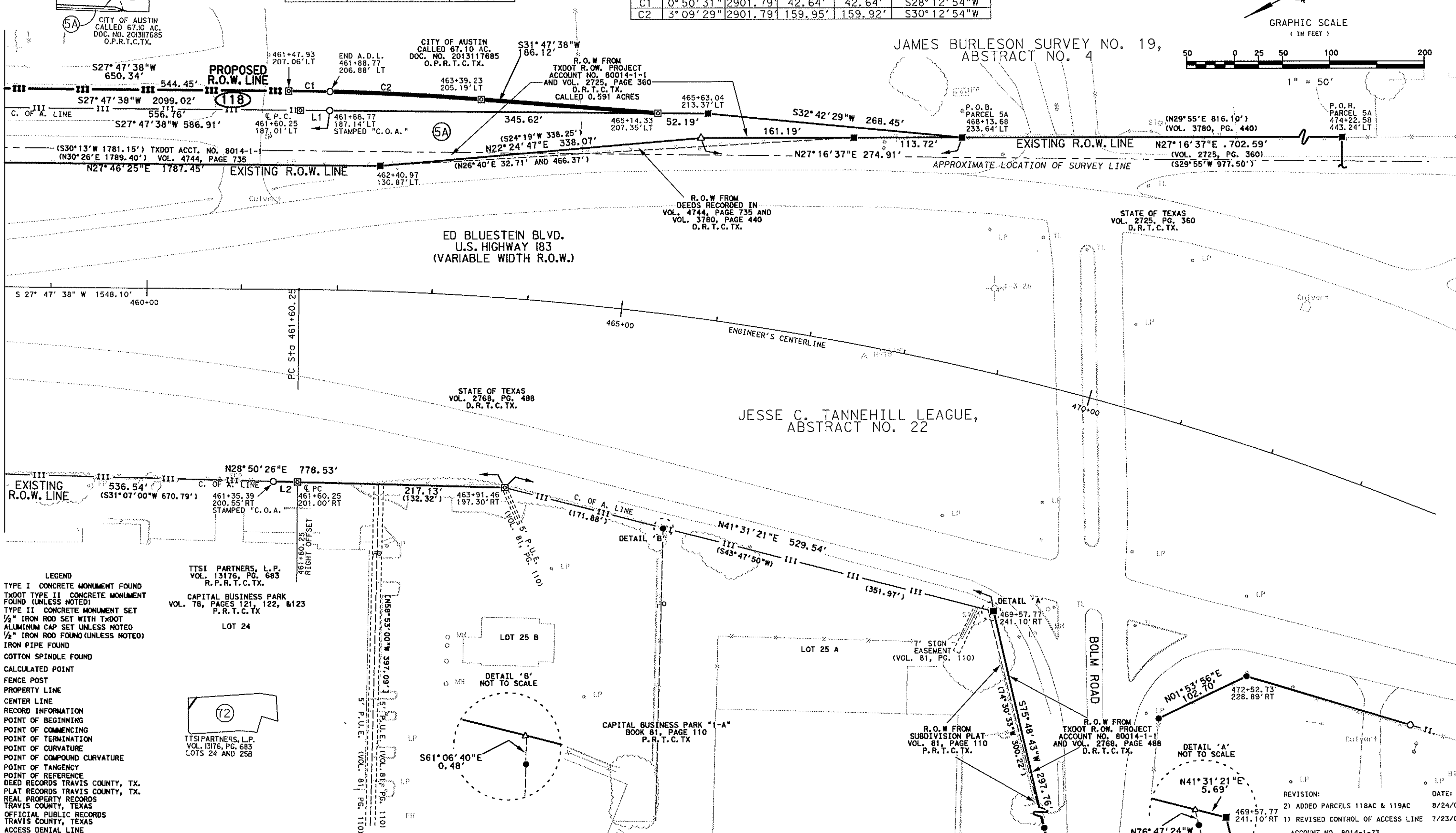
ACCOUNT NO. 8014-1-73

QSA #: [######]	##########.DGN		
RF - ############################			
FED. RD. DIV. RD.	FEDERAL AID PROJECT NO.	SHEET NO.	
		28	
STATE	DIST.	COUNTY	
TEXAS	AUSTIN	TRAVIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0151	09	039	U.S. 183

LINE NO.	BEARING	DISTANCE
L1	S 27° 47' 38" W	30.15'
L2	S 28° 50' 26" W	24.86'

CURVE TABLE

NO.	DELTA	RADIUS	LENGTH	CHORD	CHORD BEARING
C1	0° 50' 31"	2901.79'	42.64'	42.64'	S28° 12' 54"W
C2	3° 09' 29"	2901.79'	159.95'	159.92'	S30° 12' 54"W



LEGEND

- ■ TYPE I CONCRETE MONUMENT FOUND
- TxDOT TYPE II CONCRETE MONUMENT FOUND (UNLESS NOTED)
- TYPE II CONCRETE MONUMENT SET
- ○ ½" IRON ROD SET WITH TxDOT ALUMINUM CAP SET UNLESS NOTED
- ● ½" IRON ROD FOUND (UNLESS NOTED)
- IRON PIPE FOUND
- ◯ COTTON SPINDLE FOUND
- △ CALCULATED POINT
- FENCE POST
- PL PROPERTY LINE
- ℄ CENTER LINE
- ( ) RECORD INFORMATION
- P.O.B. POINT OF BEGINNING
- P.O.C. POINT OF COMMENCING
- P.O.T. POINT OF TERMINATION
- P.C. POINT OF CURVATURE
- P.C.C. POINT OF COMPOUND CURVATURE
- P.T. POINT OF TANGENCY
- P.O.R. POINT OF REFERENCE
- D.R.T.C.TX. DEED RECORDS TRAVIS COUNTY, TX.
- P.R.T.C.TX. PLAT RECORDS TRAVIS COUNTY, TX.
- R.P.R.T.C.TX. REAL PROPERTY RECORDS TRAVIS COUNTY, TEXAS
- O.P.R.T.C.TX. OFFICIAL PUBLIC RECORDS TRAVIS COUNTY, TEXAS
- ACCESS DENIAL LINE (C. OF A. LINE) ["C.O.A."], ["A.D.L."]

PARCEL NO.	DEED ACREAGE	PROPERTY OWNER	TYPE OF CONV.	CONVEYANCE DOCUMENT NO.	TAKING PROP. ℄ STATIONS FROM	TAKING PROP. ℄ STATIONS TO	TAKING ACRES	REMAINDER LEFT	REMAINDER RIGHT
5A	115.25	CAPITOL AGGREGATES, LTD.	DEED	2001153258	444+57.61	468+13.68	2.762	112.487	

REFERENCE: RIGHT OF WAY PROJECT LOOP 111 FROM U.S. 290 SOUTH TO U.S. 183 NEAR MONTOPOLIS BRIDGE ACCTOUNT NO. 8014-1-1, CSJ NO. 151-9-2 APPROVED 5-13-67.

NOTE: SEE COVER SHEET FOR R.O.W. MAPSHEET NOTES

SAM INC. SURVEYING·AERIAL MAPPING·ENGINEERING
4801 Southwest Parkway Building Two, Suite 100 Austin, Texas 78735 (512) 447-0575 Fax: (512) 326-3029

RIGHT OF WAY WIDENING PROJECT

REVISION:	DATE:
2) ADDED PARCELS 118AC & 119AC	8/24/06
1) REVISED CONTROL OF ACCESS LINE	7/23/04

ACCOUNT NO. 8014-1-73

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
			29
STATE	DIST.	COUNTY	
TEXAS	AUSTIN	TRAVIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0151	09	039	U.S. 183