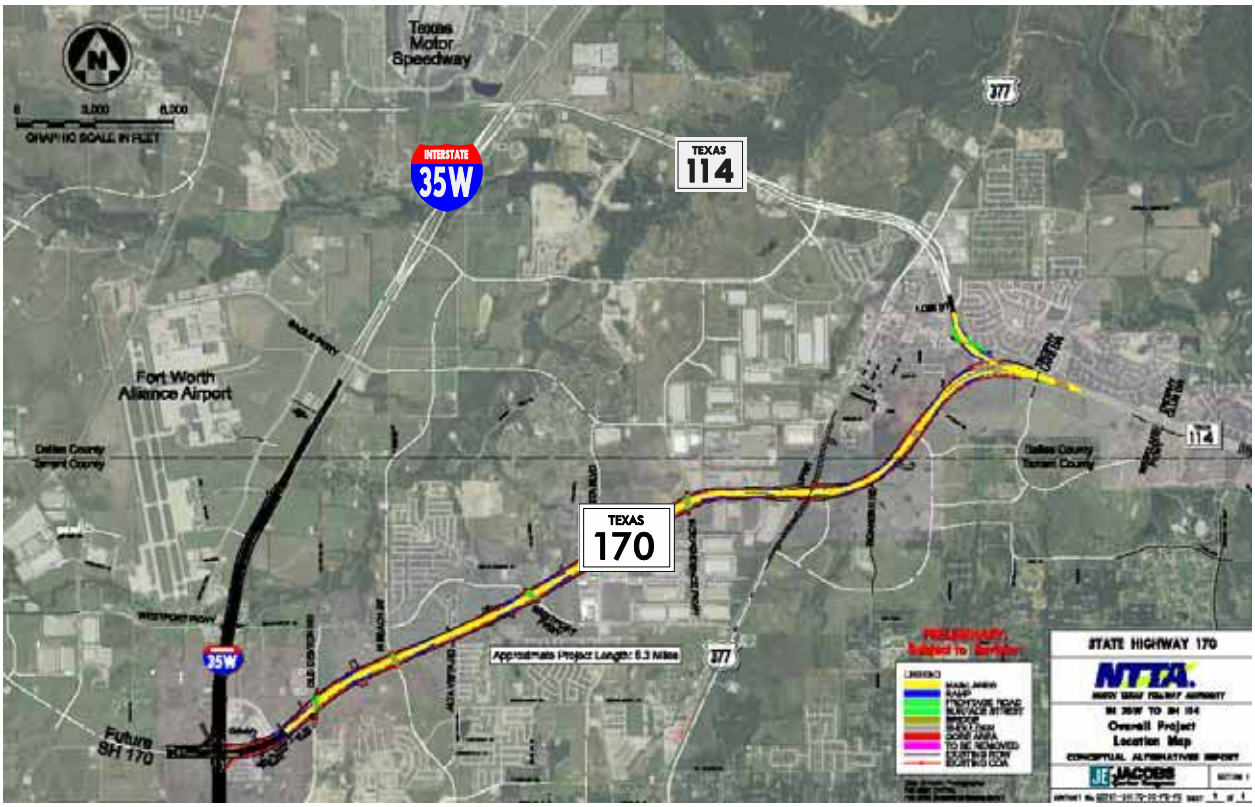
# SH 170
## From IH 35W to SH 114

# Draft Conceptual Alternative Analysis Report




**TARRANT & DENTON COUNTIES**

**March 19, 2008**

**Prepared by: Carter & Burgess, Inc.**

**For: North Texas Tollway Authority**

**DRAFT REPORT – 3/19/2008**

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# SH 170 Conceptual Alternative Analysis Report

## I. INTRODUCTION

The North Texas Tollway Authority (NTTA) has contracted with Carter & Burgess, Inc. to perform comprehensive planning services related to project management, data collection, advanced planning, and preliminary design and environmental documentation for the proposed SH 170 toll road project. The project limits are from IH 35W to SH 114 in northern Tarrant and Southern Denton Counties; a project length of approximately 6.3 miles. The county line also represents the boundary of the Fort Worth and Dallas Districts of the Texas Department of Transportation (TxDOT), thus most of the project corridor is located within the Fort Worth District (Tarrant County), while less than a quarter of the project length is located in the Dallas District (Denton County).

A schematic design for SH 170 was prepared by TxDOT in the late 1980's, and this schematic has served as the basis for construction of frontage roads that currently exist along the full length of the project corridor. The original schematic will serve as the baseline for the refinement of the NTTA schematic. Existing adjacent development requires that implementing the original ramping scheme at some locations may require adjustments which are identified as options in this report.

The proposed SH 170 typical section has four twelve-foot travel lanes (two lanes in each direction) with auxiliary lanes between appropriate ramps, 10'-12' shoulders and an NTTA-standard 50' median. A key aspect of the project is to utilize the existing right-of-way (ROW) and control-of-access (COA) as much as is feasible to tie access ramps to and from the existing frontage roads.

## II. CONCEPTUAL ALTERNATIVES ANALYSIS REPORT CONTENTS

The Conceptual Alternative Analysis Report contains several items:

- Development of Criteria for Evaluation of Alternatives
- Development of Geometric Criteria and Typical Sections
- Summarize the Results of a Design Concept Conference (DCC)
- Development of Conceptual Options, including:
    - Major Interchange Configurations
    - Evalution to Changes in Access
    - Preliminary Relative Cost Analyses
    - Tabular Summary of ROW Needs
    - Tabular Comparison of Options

The final version of the report will also take into account the important public involvement input from stakeholder meetings and public meetings. It will also take into account other meetings that provide input to the project development, such as meetings with public officials. Ongoing environmental investigations and traffic projections will provide further documentation for alternatives analysis and any available pertinent information will be included in the final report.

## III. CONCEPTUAL ALTERNATIVES ANALYSIS CRITERIA

With the corridor defined by the TxDOT schematic, ROW and Access Control purchased, and existing frontage roads in place, the nature of the alternatives for this project focus primarily on matching the previously planned facility to the ongoing existing development and access. Centerline modifications to SH 170 are not proposed, nor are re-alignment of any of the existing frontage roads.

Therefore, criteria for the various options are focused on mainlane operations, ramp operations, frontage road operations, control of access impacts, anticipated relative cost impacts and safety impacts. Favorable rankings are indicated by shading in the table of options.

## IV. GEOMETRIC CRITERIA

Design Criteria have been developed, tabulated, and referenced using the latest edition of the TxDOT *Roadway Design Manual*. Design criteria developed to date have been approved by the NTTA's Project Management Operations (PMO) group for use on the project.

These criteria tables are included in the Appendix for reference.

## V. TYPICAL SECTIONS

Typical Sections have been developed for the corridor, reflecting:

- the existing TxDOT schematic design
- frontage roads already in place and operational
- NTTA standard median width of 50'
- PMO direction on cross-slopes and superelevation rotation point / profile grade location.

The TxDOT schematic calls for 2.6% cross-slopes throughout the project, including mainlanes, ramps, and frontage roads. The PMO directed Carter & Burgess to use a standard cross-slope on the mainlanes and ramps to be constructed at 2.5%. Cross-slopes on any SH 114 mainlanes will be kept at the 2.6% planned by TxDOT.

A Profile Grade Line (PGL) and superelevation rotation point was discussed as being at either the centerline or along each inside lane line of the mainlanes. Each has an advantage: rotating about the centerline allows future widening to the center of the mainlanes to produce a singular plane of paving meeting at a center barrier; rotating about the inside lane line on each side shortens superelevation transition lengths and improves clearance efficiencies under structures. Upon review, the PMO directed use of the inside lane line as the PGL and rotation point.

Inside shoulder widths of 12' have also been discussed; the advantage to these is when any widening to the inside of the SH 170 mainlanes is warranted, the paving joint will occur at a lane line as opposed to at a point 2' off the lane line for a 10' inside shoulder.

The 10' inside shoulder puts the future paving joint essentially at the wheel path. To date, the NTTA has looked favorably on aiming to keep future paving joints at lane lines.

Typical Section exhibits are included in the Appendix for reference.

## VI. DESIGN CONCEPT CONFERENCE

To date, this meeting has not been held. Once held, meeting agendas, attendance rosters, and notes will be included in the final version of this report.

## VII. ALTERNATIVES / OPTIONS ANALYSIS

The corridor is partially constructed to date, based on the previous TxDOT schematic:

- Frontage roads are in place throughout the entire length of the Project Study Area.
- ROW has been purchased and Access Control areas are defined and have been purchased.
- Major grading has been completed to a practical extent.
- Several crossovers have been constructed at-grade to allow circulation between the frontage roads. These crossovers function as either cross-streets or as temporary connector pavement to be removed in the preferred alternative.

Development of the corridor is primarily residential on the western half of the Study Area (West of Park Vista), with a considerable amount of industrial buildings between Park Vista and US 377 on the eastern half of the Study Area.

Driveways accessing the existing frontage roads have been constructed based on the original TxDOT schematic. Over time, the State's direction has defined longer areas for denial of access to enhance safety and traffic operations. As such, there exist along the SH 170 corridor combinations of TxDOT schematic ramp locations and existing access control zones that create areas where existing driveways placed immediately after control of access zones may need adjustments to either driveway location, control of access, ramp terminal adjustment, or some other adjustment measure.

Given the definition of the existing corridor, a majority of the analysis for the alternatives will not define variations on centerline, but rather ramp locations. In some cases moving ramps slightly may alleviate an access control conflict. In other cases, reversing consecutive ramps to a modified configuration will be analyzed. The goal is to maintain as much of the baseline TxDOT schematic, existing frontage roads, and ROW as possible, while not creating excessive areas of access impacts to existing adjacent development.

Following are options for certain areas where access may present design and operations issues.

### A. Options 1A, 1B, 1C, 1D

Option 1A proposes to move the WB 170 ramp to NB 35W (access to frontage road and Cabela Dr) east to avoid an access issue at the Cabela Dr intersection with the WB frontage road. This option does reduce the weave distance from the previous ramp, but level-of-service analysis will determine if this is an issue. An auxiliary lane is planned between the two ramps. Options 1B, 1C, and 1D address situations where driveways to adjacent commercial property have been constructed so close to access control zones that applying current TxDOT ramp design criteria would create issues with keeping those driveways open. Additional ROW and/or access rights in the vicinity of these driveways may need to be acquired. Three such existing driveway locations were identified:

1. Exit ramp from WB SH 170 to Westport Parkway,
2. Exit ramp from EB SH 170 to US 377, and
3. Exit ramp from WB SH 170 to Independence Parkway

### B. Option 2

Option 2 includes shifting the entrance ramp from North Beach Street to WB SH 170 approximately 1000 feet to the east to allow increased weaving distance between the consecutive Beach St and IH 35W ramps. To reduce cost and minimize number of structures over the creek, this ramp should be shifted far enough to the east to share the proposed bridge of the westbound mainlanes.

### C. Option 3

Alta Vista Road within the SH 170 ROW was originally built as a temporary crossover between the eastbound and westbound frontage roads. With existing residential development in this vicinity on both sides of the SH 170 corridor now in place, roadway users use Alta Vista to access the SH 170 frontage roads in both directions for trips to and from the residential areas.

Often, removing a connection that provides access to a high-volume facility receives negative public response. Therefore, anticipating this view on Alta Vista Road, Option 3 allows the existing access to remain by replacing the existing crossover with a proposed bridge over SH 170. A modification to the SH 170 profile grade from the existing TxDOT schematic design would be necessary. However, depressing the SH 170 mainlanes in this area should reduce noise impacts to the residential areas. Additionally, the revised profile grade for this option is gentler than the baseline schematic; operational improvements may be seen by keeping the profile grades at lower values. This option would require retaining walls between the existing frontage roads and the proposed mainlanes, so costs would be higher than the baseline schematic.

### D. Option 4

Option 4 includes shifting the exit ramp from WB SH 170 to Westport Parkway to the east. This would eliminate a control of access conflict with the property just west of Westport Parkway. However, moving the ramp east reduces the weaving distance between this ramp and next ramp, the entrance ramp from Independence Parkway to WB SH 170. LOS analysis would determine if this weaving distance remains acceptable.

### E. Option 5

Option 5 modifies the schematic ramp configuration eastbound between Independence Parkway and US 377. In this option, the exit ramp to US 377 would be shifted east and the entrance ramp from Independence Parkway would be shifted west. This modification would eliminate some of the control of access issues related to existing driveways in this area. The trade-off for this option is that access to and from some of the properties from the frontage roads in this vicinity would require passing through signals at Independence or US 377. Victory Lane, an existing roadway, could provide indirect access functionality to allow the commercial properties along the EB frontage road between Indpendence and US 377 the ability to enter SH 170 without passing through the US 377 signal.

### F. Option 6

Option 6 includes shifting the WB exit ramp to Independence Parkway to the east. While this option would eliminate the control of access issue in this vicinity, it would also slightly reduce the weaving distance between this ramp and entrance ramp just to the east of it.

### G. Option 7

Similar to Option 5 but in the westbound direction, Option 7 modifies the westbound ramp configurations between Independence Parkway and US 377. The WB exit ramp to Independence Parkway would shift west while the WB on-ramp from US 377 would shift east, reversing the ramp arrangement from the TxDOT schematic. While this modification would eliminate control of access issues in this area, access to the properties in this vicinity would then require passing through the signalized intersection at US 377 or Independence Pkwy. Additionally, there is no roadway behind the commercial properties to circle back once exiting SH 170 for Independence Pkwy.

## H. Option 8

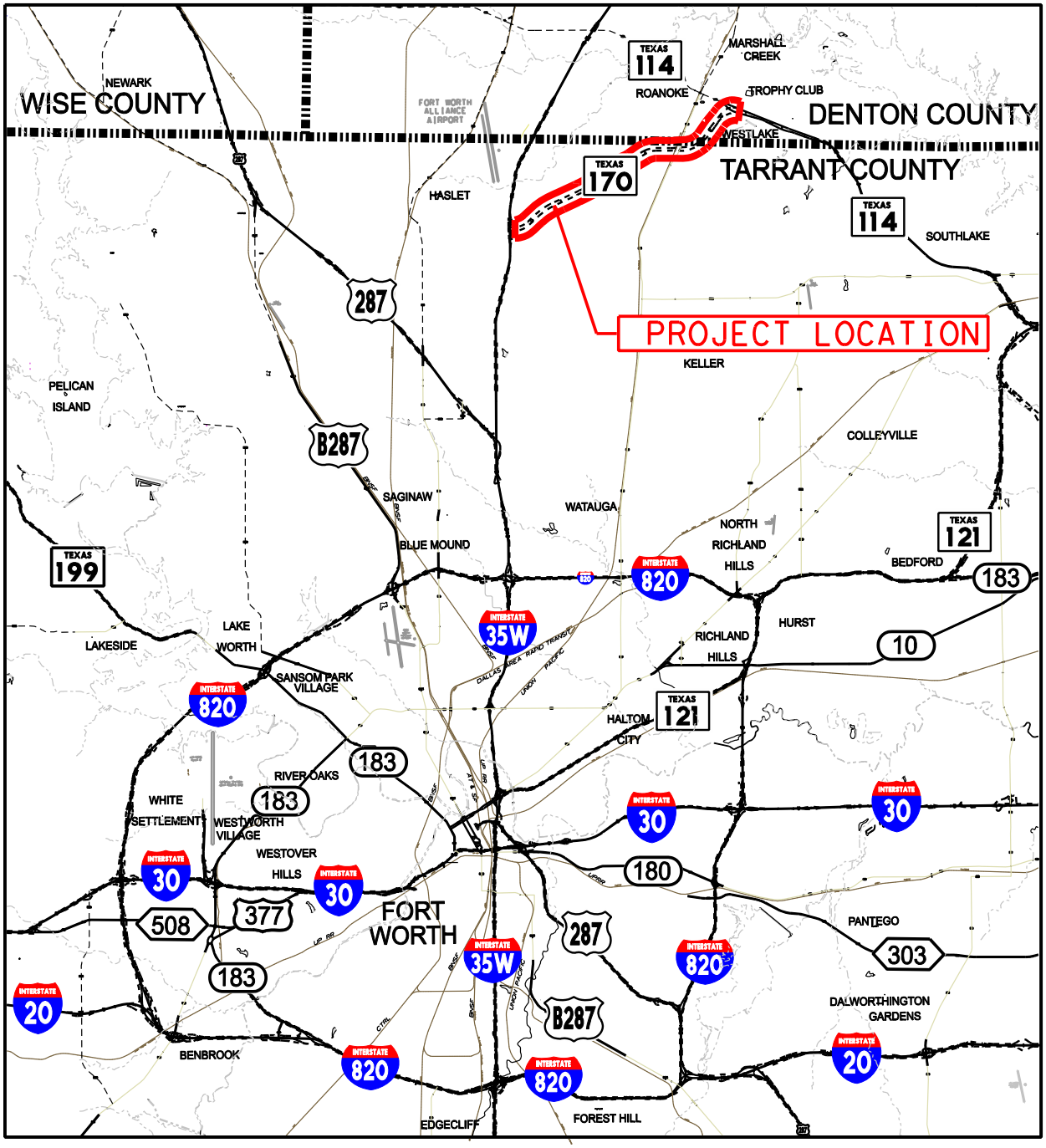
Option 8 consists of adding U-turn bridges in both directions at US 377 intersection. This change would improve the safety and operation of the intersection. However, cost estimates would reflect the two additional bridges constructed over SH 170 for this option. Given the truck traffic that is undoubtedly heavier in this area of the project due to the industrial land use, providing these U-turns may help keep the less agile trucks out of the signalized intersections.

## SH 170 Draft Conceptual Alternatives Analysis

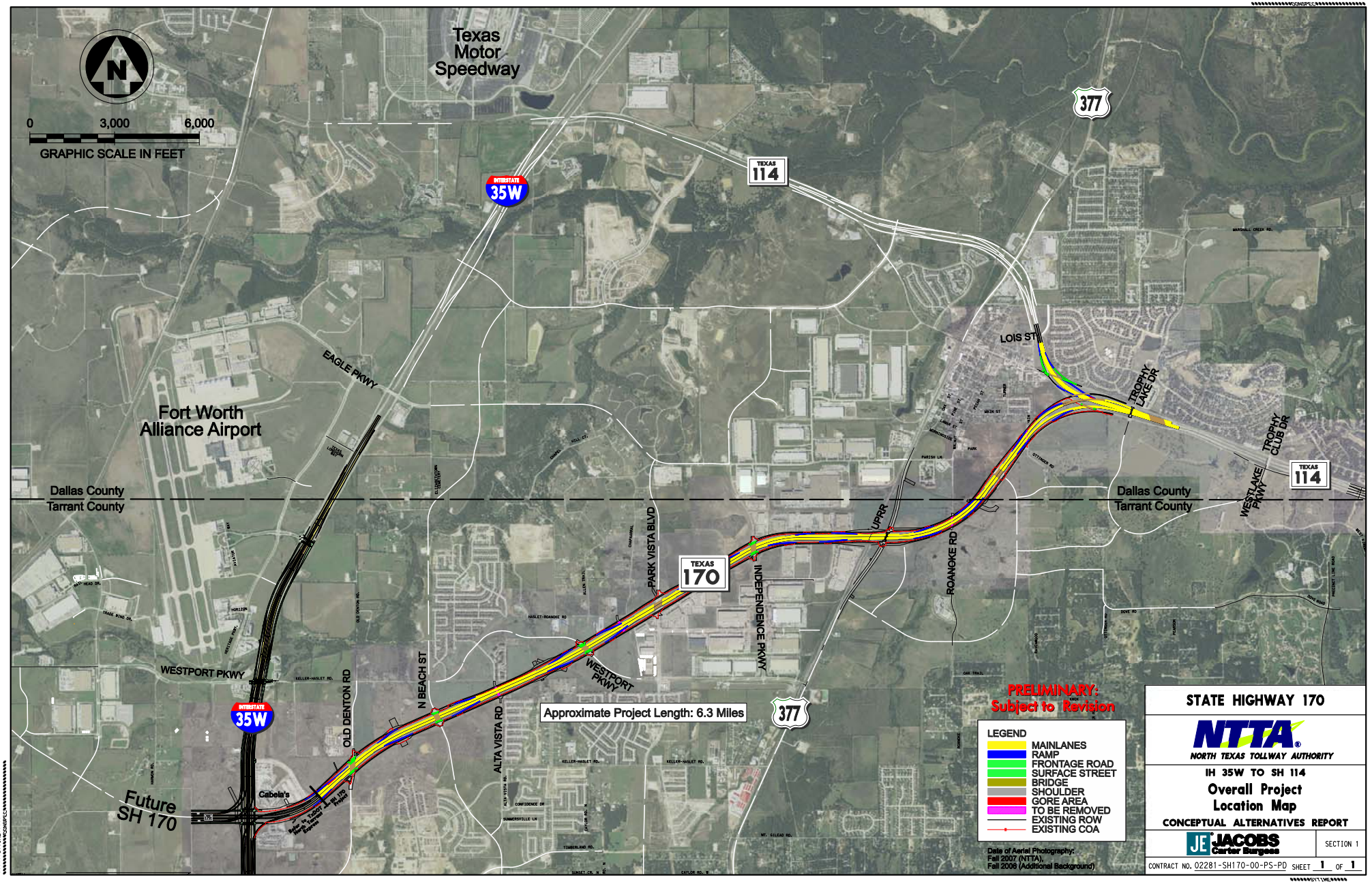
| Option Number | Option Description | Mainlane Impacts | Ramp Impacts | Frontage Road Impacts | Access Control Impacts | Cost Impacts | Safety Impacts |
|---|---|---|---|---|---|---|---|
| **1A** | Move WB exit ramp to IH 35W (frontage road & Cabela Dr) to the east | Improves capacity due to further spacing of consecutive major exits from SH 170; also affected by Option 2 | Improves weave to next ramp for IH 35W south, but reduces weave back to Beach St; depends on Option 2 | Improves operations-moves ramp terminal further from Cabela Dr and IH 35W frontage roads | Improves access to Cabela Dr | Additional access rights | Removes access conflict, increases distance to signalized intersection |
| **1B** | Provide alternate access to driveway nearest to WB Westport ramp terminal | N/A | Ramp remains as planned | Removes access issue; requires construction of separate access drive | Removes access issue | Additional pavement required, possible additional ROW | Removes access conflict |
| **1C** | Provide alternate access method to driveway nearest to EB ramp to US 377 | N/A | Ramp remains as planned | Removes access issue; requires construction of separate access drive | Removes access issue | Additional pavement required, possible additional ROW | Removes access conflict |
| **1D** | Provide alternate access method to driveway nearest to WB Independence ramp terminal | N/A | Ramp remains as planned | Removes access issue; requires construction of separate access drive | Removes access issue | Additional pavement required, possible additional ROW | Removes access conflict |
| **2** | Move entrance ramp from Beach St east approximately 1000' | Improves WB capacity approaching IH 35W; increases weave distance | Improves IH 35W ramp due to increase weave distance | Reduces distance from Beach St to ramp entry | N/A | Additional access rights | Mainlane weave distance increase should improve mainlane safety near major interchange |
| **3** | Depress Mainlanes, Build Permanent Bridge for Alta Vista | Gentler grade line, depressed section should reduce noise impacts to adjacent receivers | N/A | N/A | Access to local residential areas maintained as per existing | Additional cost of excavation, bridge for Alta Vista, and retaining walls. | Gentler mainlane grades improve visibility and capacity |
| **4** | Move WB Exit Ramp to Westport to the east | Slightly shortens mainlane weave | Ramp LOS may be affected by mainlane weave | N/A | Improves access to existing driveway | Additional access rights | Improves access to existing driveway |
| **5** | Reverse EB ramps between Independence & US 377 | Places weave on mainlanes, would require auxiliary lane | Ramp LOS may be affected by mainlane weave | Weave removed from frontage road | Less access issues with existing driveways; requires exiting prior to Independence | Additional access rights | Frontage Road may be safer, Mainlanes weave may not be safer |
| **6** | Move WB Exit Ramp to Westport Pkwy to the east | Slightly shortens mainlane weave | Ramp LOS may be affected by mainlane weave | N/A | Removes access issue | Additional access rights | Improves access to existing driveway |
| **7** | Reverse WB ramps between US 377 & Independence | Places weave on mainlanes, would require auxiliary lane | Ramp LOS may be affected by mainlane weave | Weave removed from frontage road | Less access control issues with existing driveways, but requires exiting prior to US 377 | Additional access rights | Frontage Road may be safer, Mainlanes weave may not be safer |
| **8** | Add U-turns at US 377 | N/A | N/A | Improves Signal Operations | N/A | Additional 2 Bridges | Reduces Intersection Conflicts |

Note: Favorable Ranking Construed as Positive Indicated by Gray Shading

# APPENDIX




**Regional Location Map**




# STATE HIGHWAY 170

NTTA NORTH TEXAS TOLLWAY AUTHORITY

IH 35W TO SH 114

## Overall Project Location Map

CONCEPTUAL ALTERNATIVES REPORT

JE JACOBS Carter Burgess

SECTION 1

CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1

NORTH TEXAS TOLLWAY AUTHORITY

# SH 170
# Design Criteria
From IH 35W to SH 114

JACOBS Carter Burgess

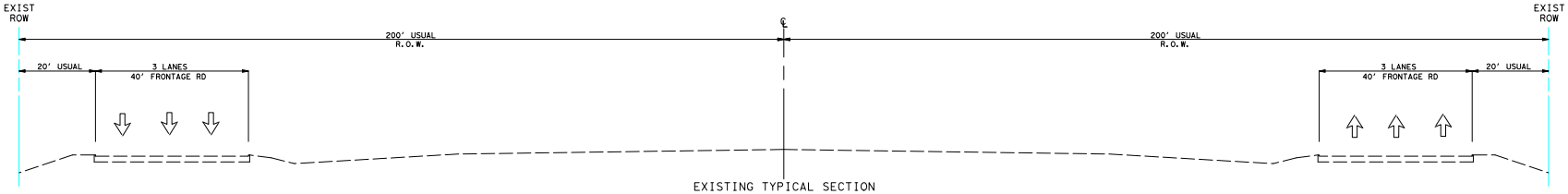
| Item | Mainlanes | | Direct Connectors/Ramps | | Frontage Roads | | Cross Streets | | Design Criteria Location | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Desirable | Absolute Min | Desirable | Absolute Min | Desirable | Absolute Min | | | Reference | Page |
| Roadway Classification | Urban Freeway | | Urban Freeway | | Urban Arterial | | See City thoroughfare Plans | | RDM | Section 2-1 |
| Design Speed | 70 mph | | 50 mph | 35 mph | 45mph | | 30 mph min | 45 mph desirable | RDM | Section 3-6 & Table 3-20 |
| **Horizontal Alignment** | | | | | | | | | | |
| Control Location | Roadway Centerline | | Outside Lane Edge | | Outside Face of Curb | | Roadway Centerline | | | |
| Stopping Sight Distance | 730' | | 425' | 250 | 360' | | | | RDM | Table 2-1 |
| Minimum Centerline Radius | 3405' | 2050' | 1055' | 835' | 950' | | | | RDM | Table 2-3, Figure 2-2 |
| Superelevation Rate | e(max) = 6% | | e(max) = 6% | | N/A | | | | RDM | Table 2-6 |
| Superelevation Runoff | 0.40% relative gradient | | 0.50% relative gradient | 0.62% relative gradient | N/A | | | | RDM | Table 2-8 |
| **Vertical Alignment** | | | | | | | | | | |
| PGL/Axis of Location | Inside Lane Edge (SH 170) / Roadway CL (SH 114) | | Outside Lane Edge | | Outside FOC (Top of Pavement) | | | | | |
| Longitudinal Gradient | 0% Min [1] | 3.00% Max | 0% Min [1] | 5.00% Max | 0.35% (curbed) Min | 7% Max | | | RDM | Table 2-9 & Section 2-5, page 2-34 |
| Longitudinal Gradient @Toll Plazas | 0.50% | 1.00% Max | 0.50% | 1.00% Max | N/A | | | | NTTA Preference | |
| K Value for Crest Curves, min | 247 | | 84 | 29 | 61 | | | | RDM | Figure 2-9 |
| K Value for Sag Curves, min | 181 | | 96 | 49 | 79 | | | | RDM | Figure 2-11 |
| Grade change without a vertical curve | 0.50 % max | | 0.50 % max | 1.0% max | 1.0 % max | | | | RDM | Section 2-5 |
| Vertical Clearance | | | | | | | | | | |
| Over Roadways | 16' - 6" | | 16' - 6" | | 16' - 6" | | | | RDM | Table 3-1 |
| **Cross-Sectional Elements** | | | | | | | | | | |
| Widths of Travel Lanes | 12' | | One Lane 14', Two Lane 24' | One Lane 14', 22' Curbed | 12' | | 12' desirable; 11' min. | | RDM | Table 3-1 & Table 3-18 |
| Number of mainlanes at ground level | 2 lanes with 1 auxiliary lane on each side | | N/A | | N/A | | N/A | | NTTA Preference | |
| Shoulder Widths | | | | | | | | | | |
| Inside | 12' [2] | | 2' on Roadway; 4' on Structure | | N/A | | N/A | | RDM | Table 3-18 |
| Outside | 10' | | 8' | 6' | N/A | | N/A | | RDM | Table 3-18 |
| Offset to face of curb | N/A | | N/A | | 2' | 1' | 2' desirable | | RDM | Table 3-1 |
| Cross Slope (Lane & Shoulder) | 2.5% / 2.6% | | 2.5% | | 2.6% [3] | | 2.0% | | RDM | Section 2-6, Page 2-42 |
| Medians | | | | | | | | | | |
| Type | depressed, divided | | N/A | | N/A | | N/A | | TxDot/NTTA Preference | |
| Width | 50' | | N/A | | N/A | | N/A | | RDM | Section 3-5, Page 3-45 Section 3-6, Page 3-69 |
| Traffic Safety Protection | SSCB on one side - side to be determined | | N/A | | N/A | | N/A | | TxDot/NTTA Preference | |
| Monolithic Curbs | | | | | | | | | | |
| Inside | N/A | | none @ direct connectors : yes @ ramps [4] | | yes | | yes | | TxDot/NTTA Preference | |
| Outside | N/A | | none @ direct connectors : yes @ ramps [4] | | yes | | yes | | TxDot/NTTA Preference | |
| Clear Zone Width | 30' | | 16' | | 1.5' min, 3' desirable | | 1.5' min, 3.0' desirable | | RDM | Table 2-11 |
| Side Slopes | | | | | | | | | | |
| Within Clear Zone | 10:1 desirable in Median, 6:1 max | | 6:1 max | | 4:1 max | | 6:1 max | | RDM | Section 2-6, Page 2-43 |
| Outside Clear Zone | 3:1 max | | 3:1 max | | 3:1 max | | 4:1 max | | RDM | Section 2-6, Page 2-43 |
| Through guard rail | 1:10 max | | 1:10 max | | 1:10 max | | 1:10 max | | RDM | Section 2-6, Page 2-43 |
| Sidewalk Width | N/A | | N/A | | 5' min, 6, desirable | | 5' min, 6, desirable | | RDM | Section 2-6, Page 2-46 |
| Border Width | N/A | | N/A | | Match Existing | | Match Existing | | RDM | Table 3-1 |
| Concrete Pvmt. Thickness | To be Determined | | To be Determined | | To be Determined | | City Criteria | | | |
| **Intersections** | | | | | | | | | | |
| Corner Radii | | | | | | | | | | |
| Major Cross Streets | N/A | | N/A | | N/A | | 50' desirable | | RDM | Section 7-7, Page 7-14 |
| Minor Cross Streets | N/A | | N/A | | N/A | | 30' desirable | | RDM | Section 7-7, Page 7-14 |
| Driveways | N/A | | N/A | | N/A | | 20' desirable | | RDM | Section 7-7, Page 7-14 |
| **Deisgn Vehicles** | | | | | | | | | | |
| Structural Desing | HL-93 | | HL-93 | | HL-93 | | | | LRFD | Section 2-2, Page 2-3 |
| Horizontal Geometry | N/A | | N/A | | N/A | | | | RDM | |
| **Hydraulic Design Frequency** | | | | | | | | | | |
| Inles and Drainage Pipe | 10 year | | 10 year | | 5 year | | | | HDM | Section 5-3, Page 5-12 |
| Inlets for Depressed Roadways | 50 year | | 50 year | | 25 year | | | | HDM | Section 5-3, Page 5-12 |
| Culvert Design | 50 year | | 50 year | | 10 year | | | | HDM | Section 5-3, Page 5-12 |
| Bridge Design | 50 year | | 50 year | | 50 year (major river crossing) | 25 year (small bridges) | | | HDM | Section 5-3, Page 5-12 |
| Flood Check Frequency | 100 year | | 100 year | | 100 year | | | | HDM | Section 5-3, Page 5-12 |
| **Hydrologic Method** | | | | | | | | | | |
| Drainage Area < 200 ac | Rational Method | | Rational Method | | Rational Method | | | | HDM | Figure 5-3, Page 5-21 |
| Drainage Area > 200 ac | NRCS Unit Hydrograph, Regression Equations | | NRCS Unit Hydrograph, Regression Equations | | NRCS Unit Hydrograph, Regression Equations | | | | HDM | Figure 5-3, Page 5-21 |
| **Culverts** | | | | | | | | | | |
| Headwater Control Location | Bottom of Paving Section | | Bottom of Paving Section | | Bottom of Paving Section | | Bottom of Paving Section | | | |
| Outfall Velocity | 2 fps | 6 fps (w/o protection) | 2 fps | 6 fps (w/o protection) | 2 fps | 6 fps (w/o protection) | 2 fps min | 6 fps max (w/o protectoin) | HDM | Section 8-2, Page 8-12 |
| **Storm Drainage** | | | | | | | | | | |
| Max allowable Ponding Width | | Shld + 1/2 of outside lane | | Shoulder | | Outer Lane | One Lane | | | Section 10-2, Page 10.9 |
| Pipe Size | 24" | | 24" | | 24" | | 24" | | TxDot / NTTA / City | |
| Pipe Velocity | 2.0 fps | 12.0 fps max | 2.0 fps | 12.0 fps max | 2.0 fps | 12.0 fps max | 2.0 fps min | 12.0 fps max | HDM | Section 10-2, Page 10.10 |
| Pipe Material | Reinforced Concrete Pipe | | Reinforced Concrete Pipe | | Reinforced Concrete Pipe | | Reinforced Concrete Pipe | | TxDot / NTTA | |

See City Standards for other Criteria

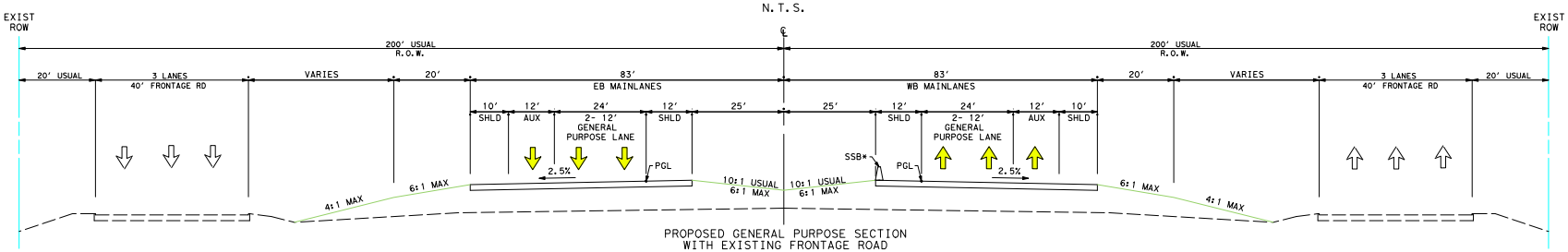
**Notes:** **RDM = TxDOT on Line Roadway Design Manual; HDM = TxDOT On Line Hydraulic Design Manual; LRFD = TxDOT On Line LRFD Bridge Design Manual.**

Revised: February, 2008

[1] If gradient less than 0.35% is used along non-curbed roadways, pavement cross-slope must provide adequate lateral drainage.
[2] To consider future expansion.
[3] Refer to plans CSJ:3559-02-002, etc.
[4] At frontage roads

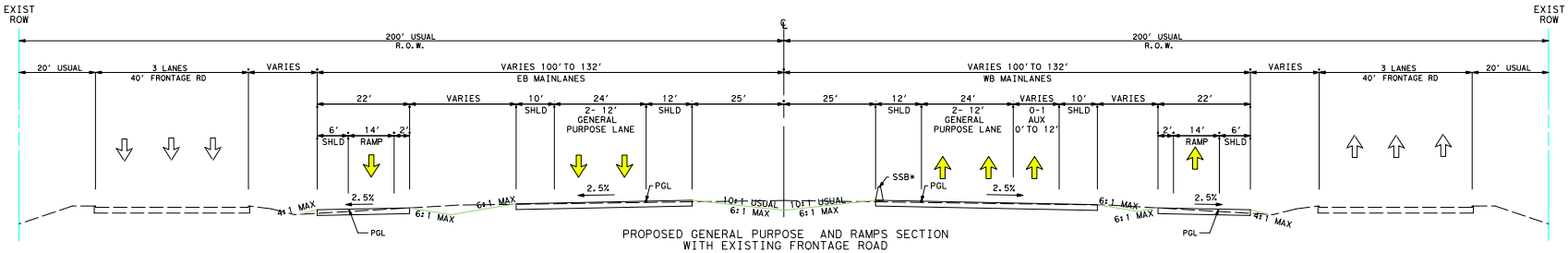



EXISTING TYPICAL SECTION
SH 170
N. T. S.




PROPOSED GENERAL PURPOSE SECTION
WITH EXISTING FRONTAGE ROAD
SH 170
N. T. S.

* SIDE TO BE DETERMIND




PROPOSED GENERAL PURPOSE AND RAMPS SECTION
WITH EXISTING FRONTAGE ROAD
SH 170
N. T. S.

* SIDE TO BE DETERMIND

**STATE HIGHWAY 170**

NTTA NORTH TEXAS TOLLWAY AUTHORITY

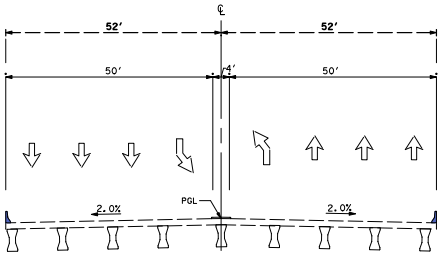
**IH 35W TO SH 114**

# TYPICAL SECTIONS SH 170

**CONCEPTUAL ALTERNATIVES REPORT**

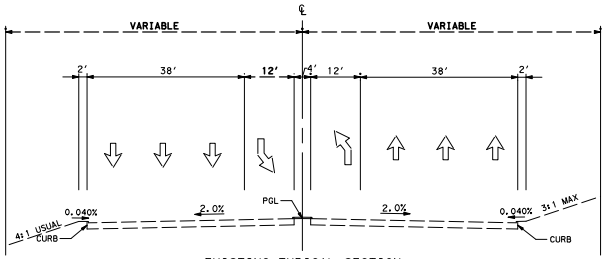
JACOBS Carter Burgess | SECTION 1

CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1



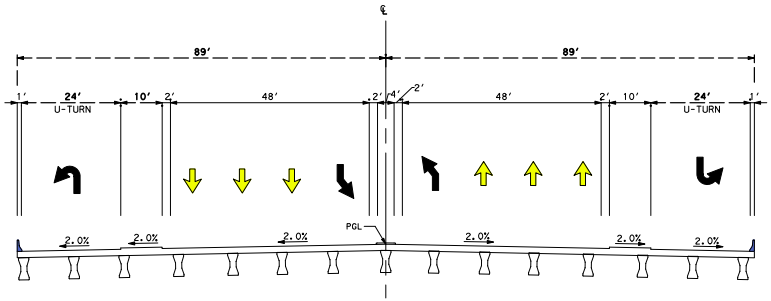

EXISTING TYPICAL SECTION
AT CROSS-STREETS *
BETWEEN FRONTAGE ROADS
N. T. S.

* US 377
TROPHY LAKE DR



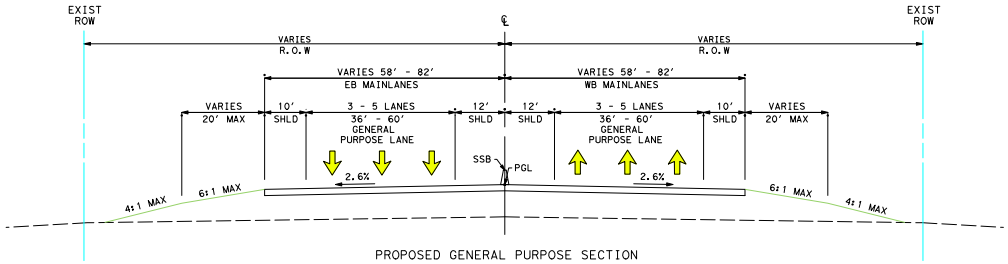

EXISTING TYPICAL SECTION
AT CROSS-STREETS *
BETWEEN FRONTAGE ROADS
N. T. S.

* OLD DENTON RD
N BEACH ST
WESTPORT PKWY
INDEPENDENCE PKWY




PROPOSED TYPICAL SECTION
AT CROSS-STREETS *
BETWEEN FRONTAGE ROADS
N. T. S.

* OLD DENTON RD
N BEACH ST
WESTPORT PKWY
INDEPENDENCE PKWY




PROPOSED GENERAL PURPOSE SECTION

SH 114
N. T. S.

**STATE HIGHWAY 170**

NTTA
NORTH TEXAS TOLLWAY AUTHORITY

IH 35W TO SH 114

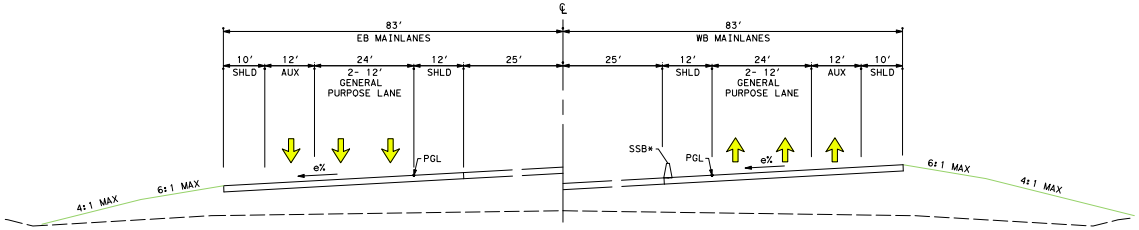
# TYPICAL SECTIONS
# CROSS STREETS & SH 114

CONCEPTUAL ALTERNATIVES REPORT

JACOBS Carter Burgess

SECTION 1

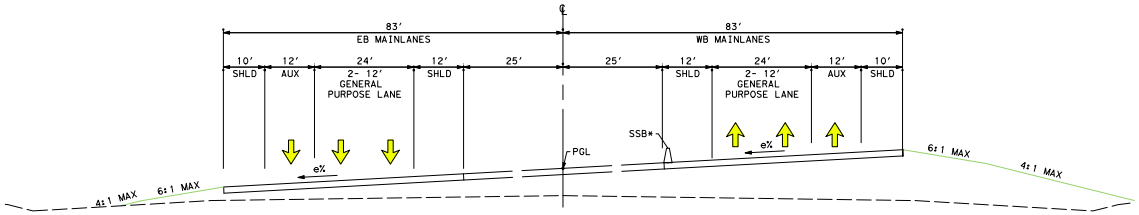
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1




SUPERELEVATED TYPICAL SECTION
PGL AT LANE EDGE
SH 170
N.T.S.

* SIDE TO BE DETERMIND

POSSIBLE FUTURE INSIDE PAVEMENT WIDENING




SUPERELEVATED TYPICAL SECTION
PGL AT CL
SH 170
N.T.S.

* SIDE TO BE DETERMIND

**STATE HIGHWAY 170**

NORTH TEXAS TOLLWAY AUTHORITY

**IH 35W TO SH 114**

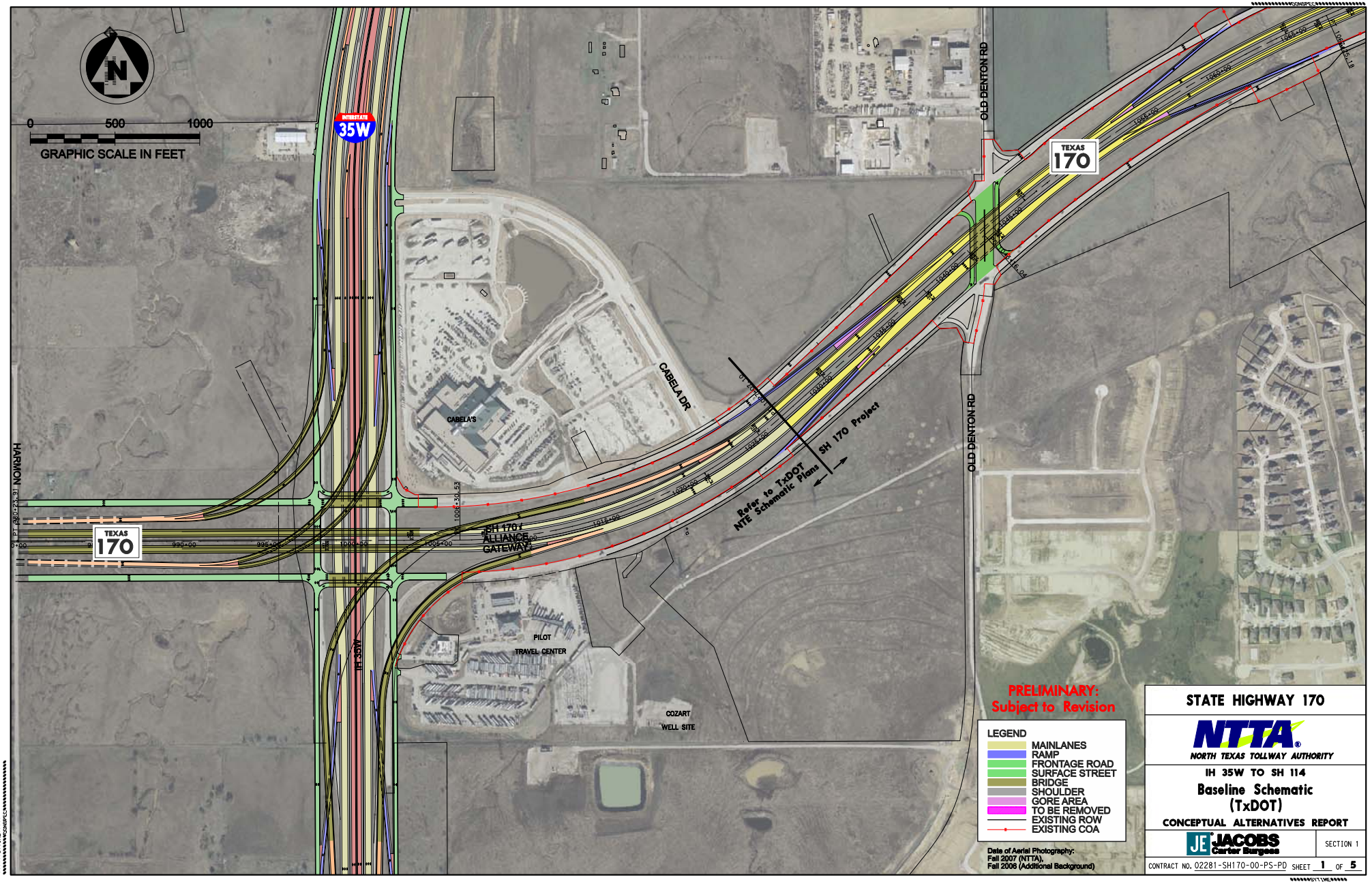
# TYPICAL SECTIONS ROTATION POINT COMPARISON

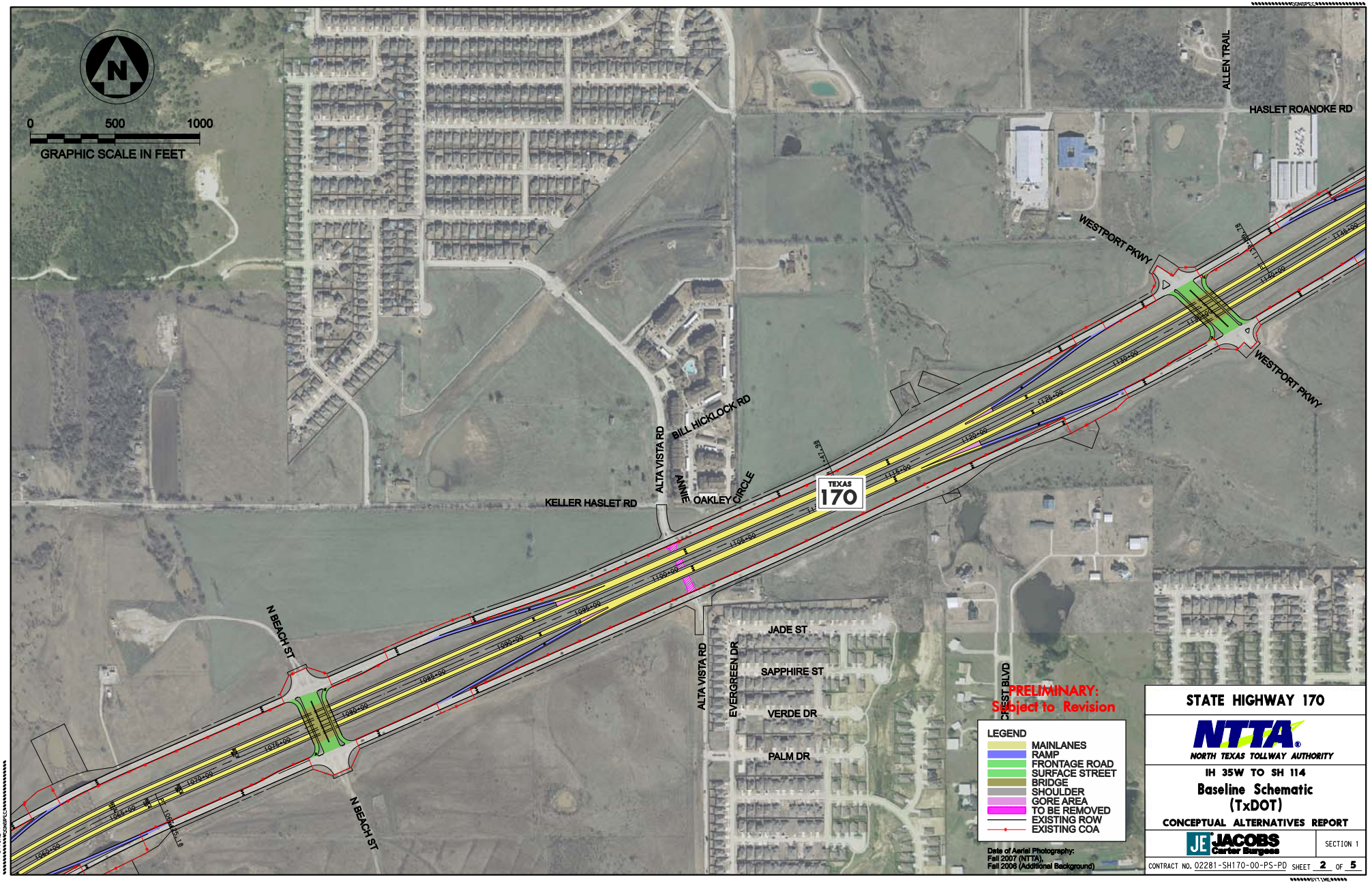
**CONCEPTUAL ALTERNATIVES REPORT**

JACOBS Carter Burgess

SECTION 1

CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1


0
500
1000
GRAPHIC SCALE IN FEET
INTERSTATE
35W
TEXAS
170
OLD DENTON RD
CABELA DR
CABELA'S
HARMON
SH 170 Project
Refer to TxDOT NTE Schematic Plans
SH 170/ ALLIANCE GATEWAY
PILOT
TRAVEL CENTER
COZART
WELL SITE
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2008 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Baseline Schematic
(TxDOT)
CONCEPTUAL ALTERNATIVES REPORT
JACOBS
Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 5




# STATE HIGHWAY 170

NTTA NORTH TEXAS TOLLWAY AUTHORITY

IH 35W TO SH 114

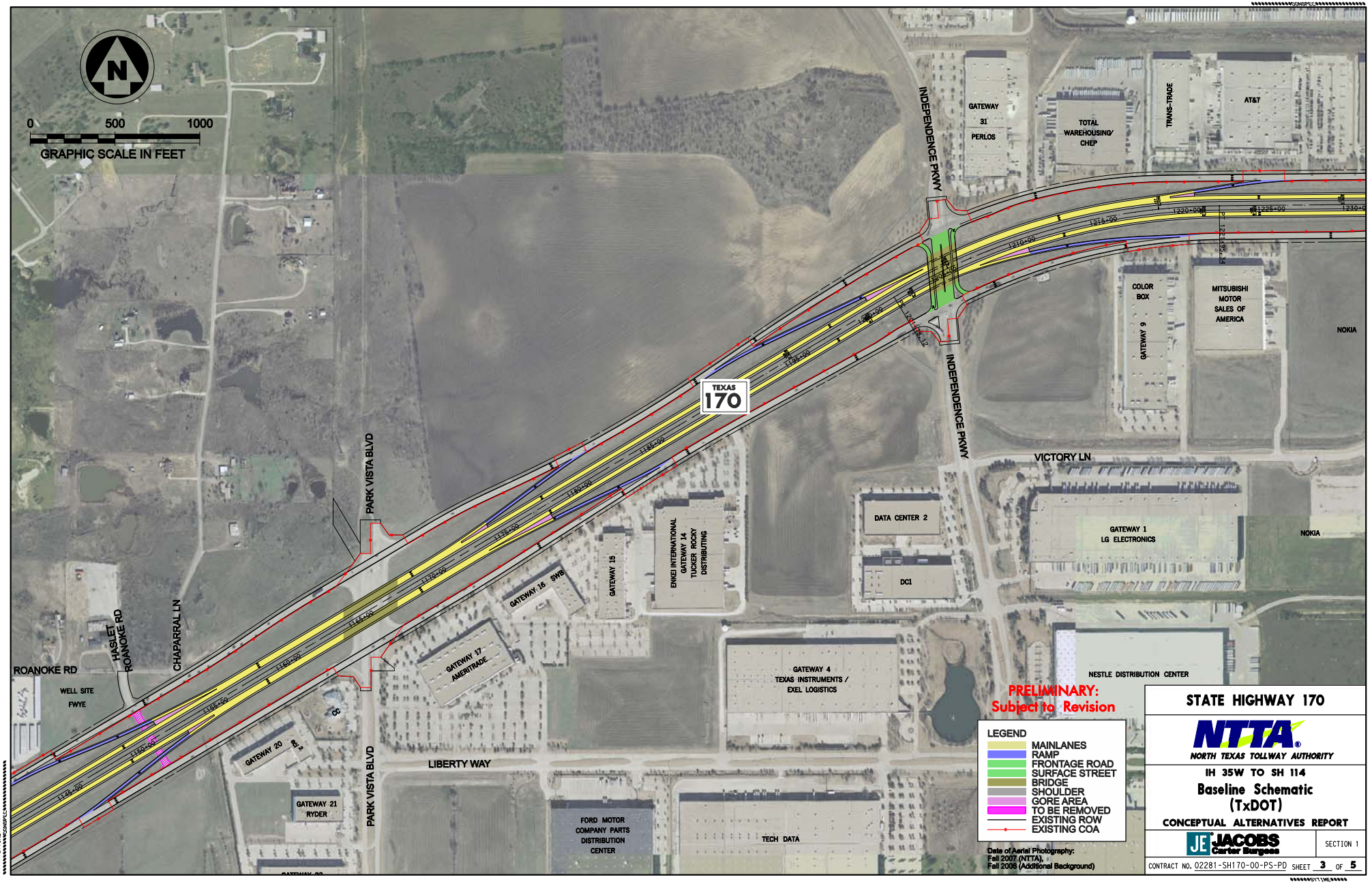
## Baseline Schematic (TxDOT)

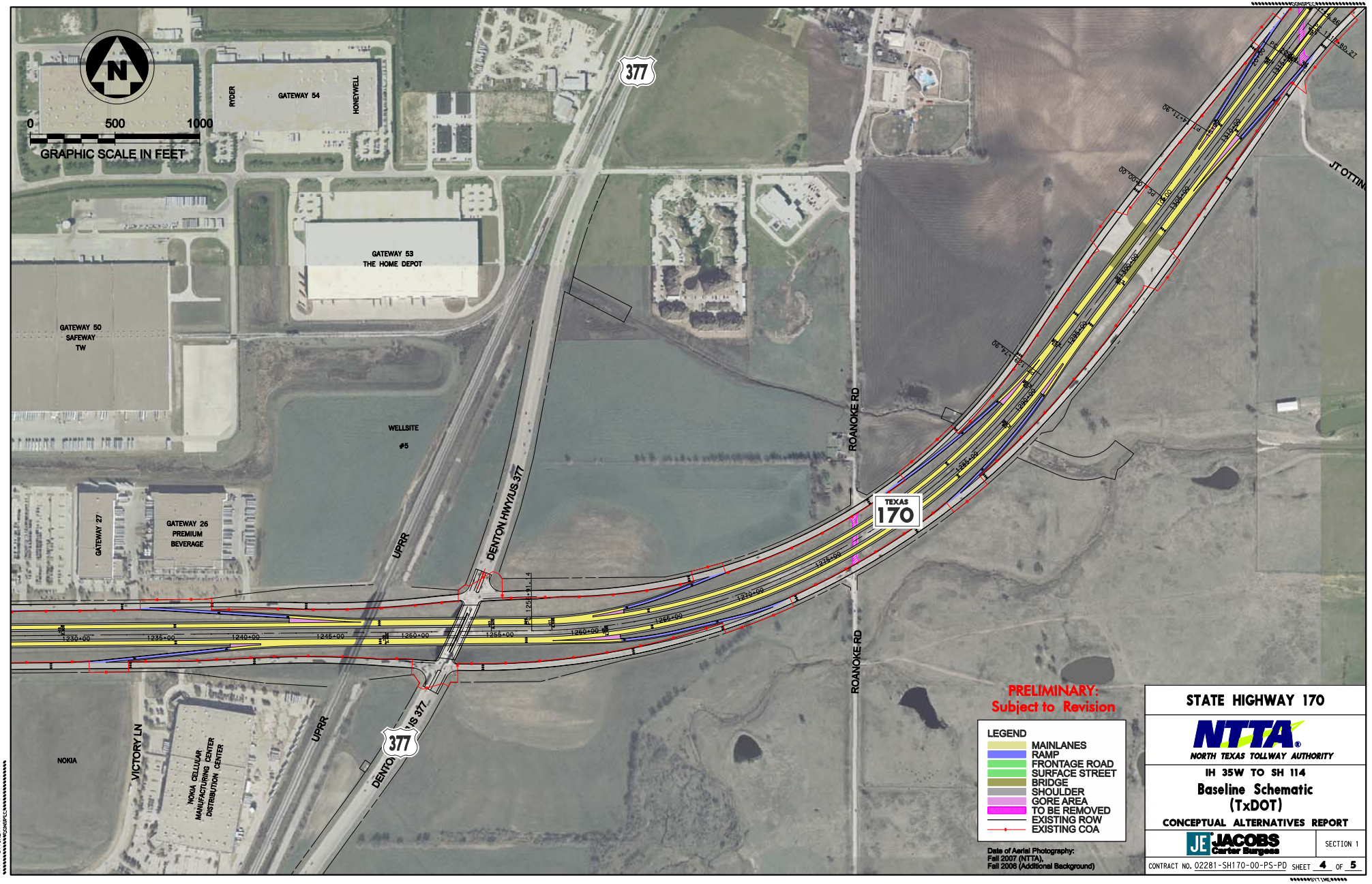
CONCEPTUAL ALTERNATIVES REPORT

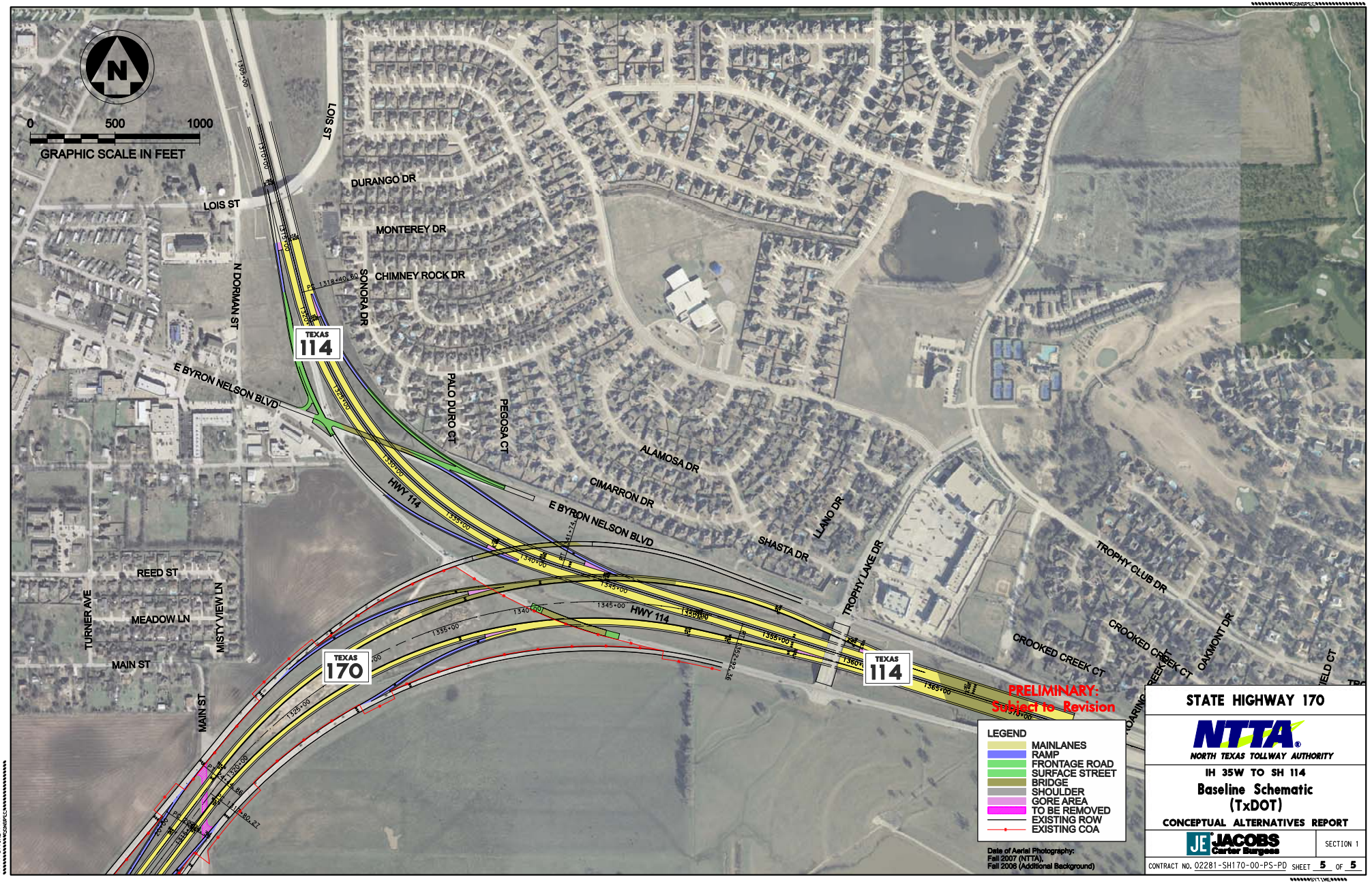
JACOBS Carter Burgess

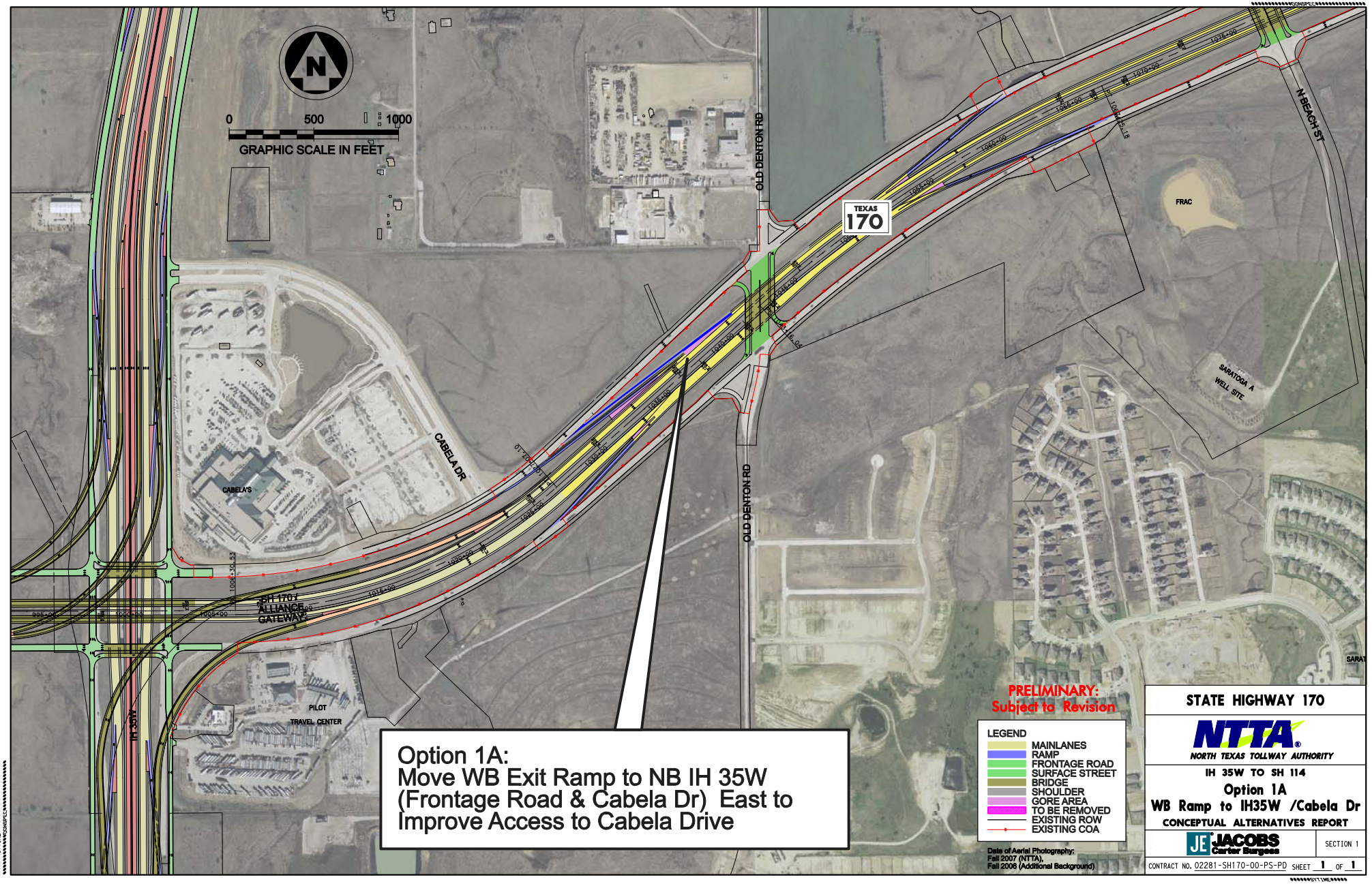
SECTION 1

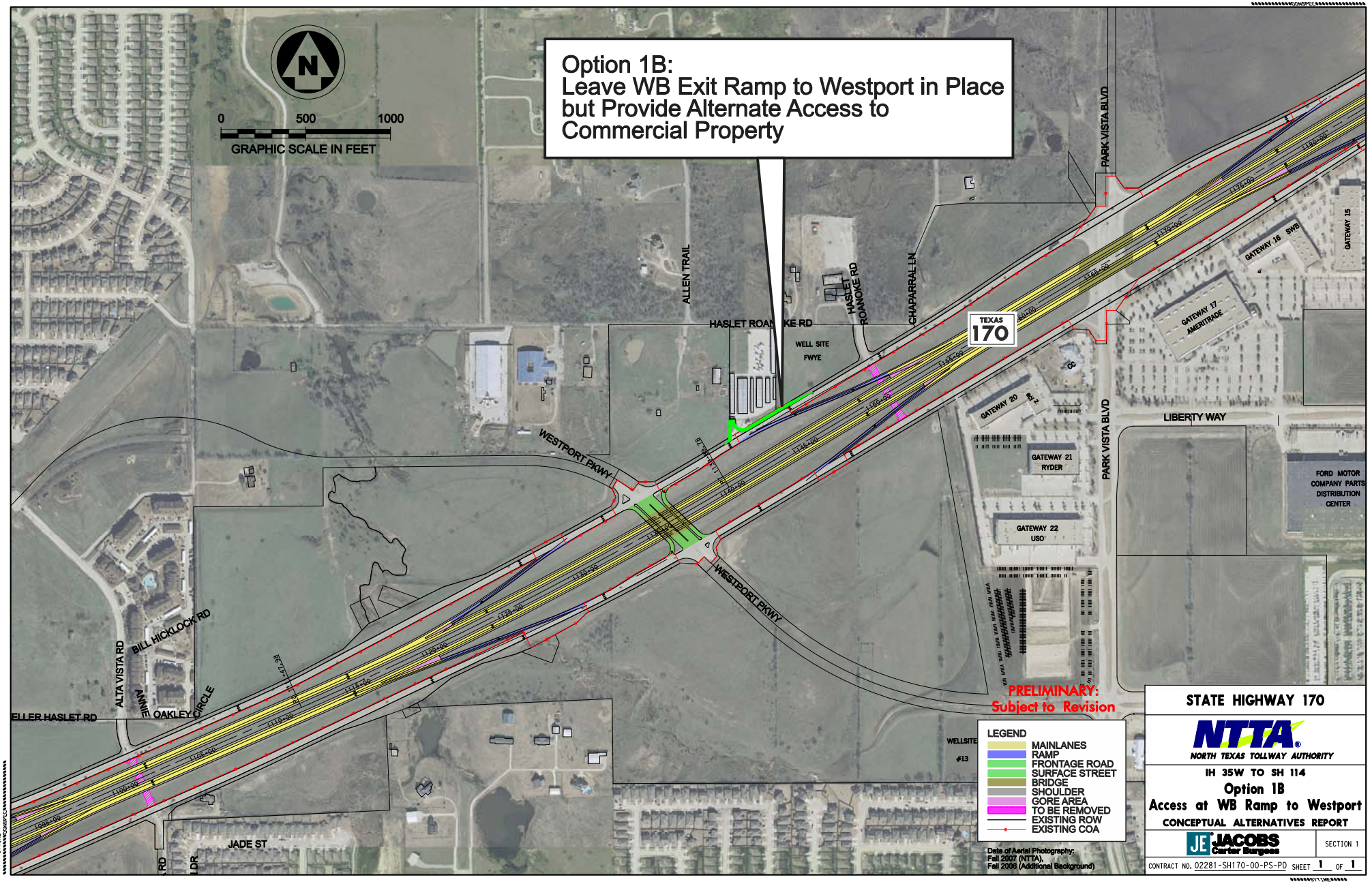
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 2 OF 5

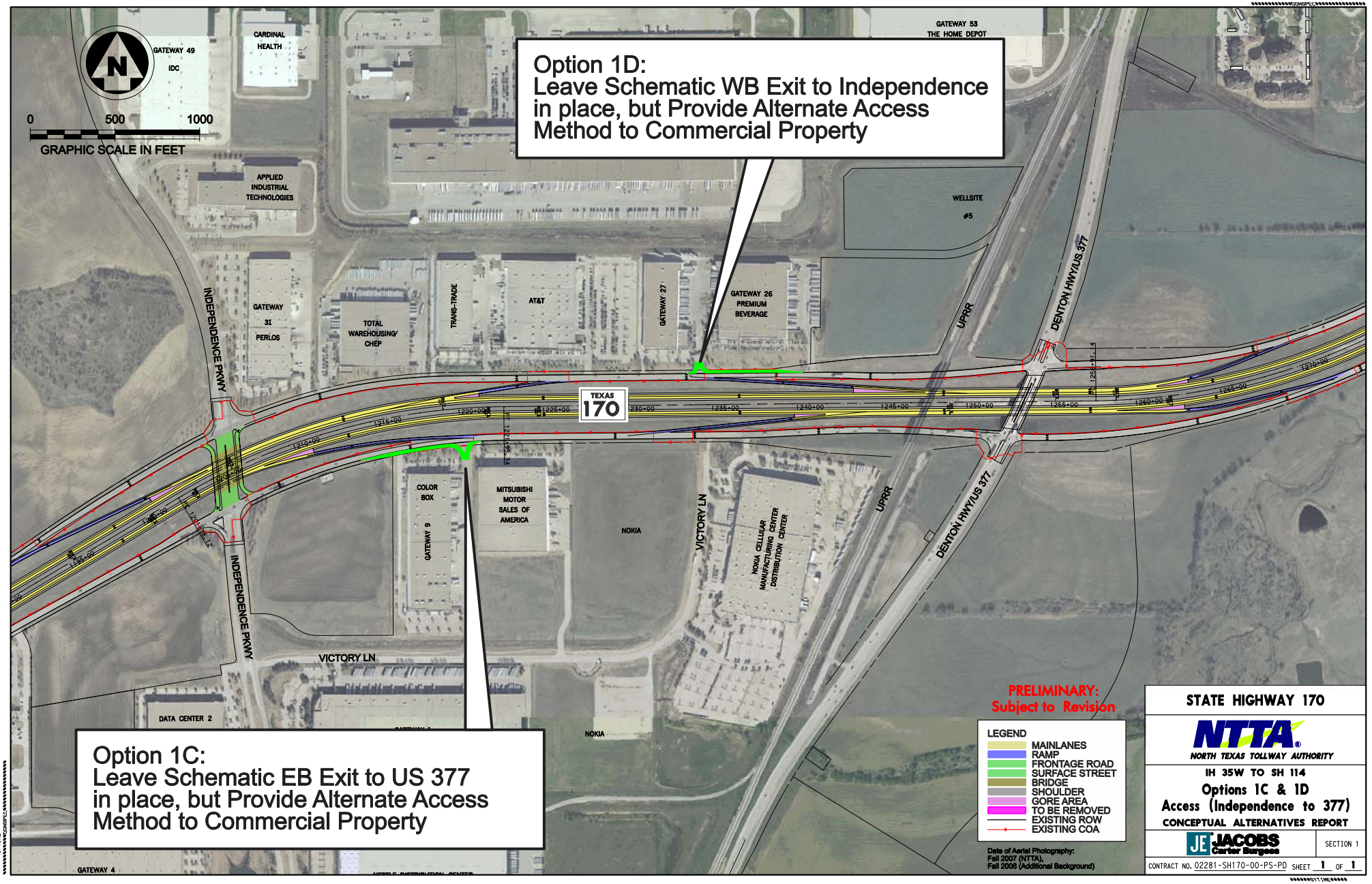

N
0
500
1000
GRAPHIC SCALE IN FEET
TEXAS 170
INDEPENDENCE PKWY
INDEPENDENCE PKWY
PARK VISTA BLVD
PARK VISTA BLVD
VICTORY LN
LIBERTY WAY
ROANOKE RD
HASLET ROANOKE RD
CHAPARRAL LN
GATEWAY 31 PERLOS
TOTAL WAREHOUSING/ CHEP
TRANS-TRADE
AT&T
COLOR BOX
GATEWAY 9
MITSUBISHI MOTOR SALES OF AMERICA
NOKIA
NOKIA
DATA CENTER 2
DC1
GATEWAY 1 LG ELECTRONICS
ENKEI INTERNATIONAL GATEWAY 14 TUCKER ROCKY DISTRIBUTING
GATEWAY 15
GATEWAY 16 SWB
GATEWAY 17 AMERITRADE
GATEWAY 4 TEXAS INSTRUMENTS / EXEL LOGISTICS
NESTLE DISTRIBUTION CENTER
WELL SITE FWYE
GATEWAY 20
GATEWAY 21 RYDER
FORD MOTOR COMPANY PARTS DISTRIBUTION CENTER
TECH DATA
PRELIMINARY: Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2008 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Baseline Schematic (TxDOT)
CONCEPTUAL ALTERNATIVES REPORT
JACOBS Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 3 OF 5

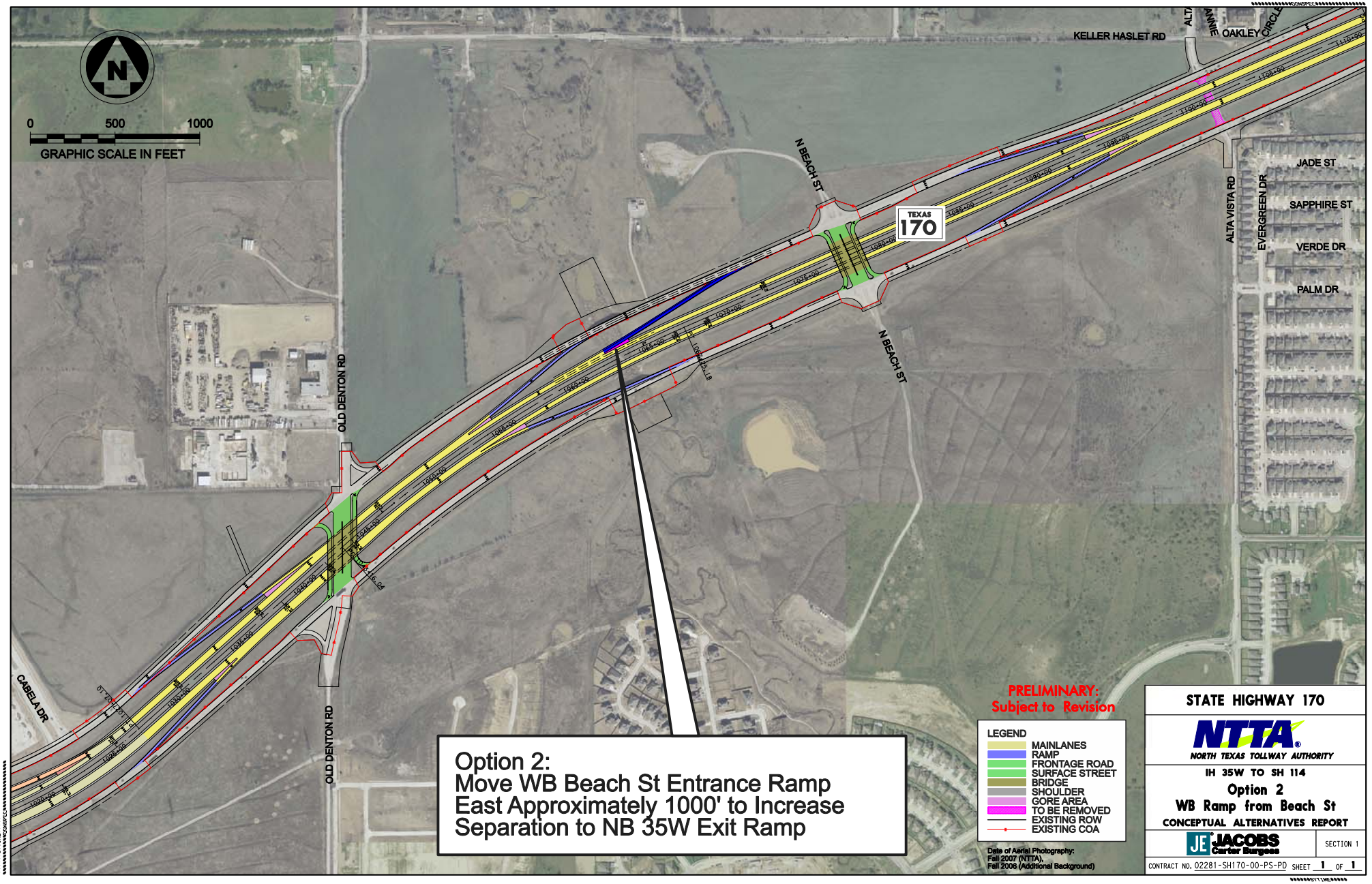

N
0
500
1000
GRAPHIC SCALE IN FEET
RYDER
GATEWAY 54
HONEYWELL
GATEWAY 53
THE HOME DEPOT
GATEWAY 50
SAFEWAY
TW
WELLSITE
#5
GATEWAY 27
GATEWAY 26
PREMIUM
BEVERAGE
NOKIA
VICTORY LN
NOKIA CELLULAR
MANUFACTURING CENTER
DISTRIBUTION CENTER
UPRR
DENTON HWY/US 377
377
ROANOKE RD
TEXAS
170
JT OTTIN
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2008 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Baseline Schematic
(TxDOT)
CONCEPTUAL ALTERNATIVES REPORT
JACOBS
Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 4 OF 5

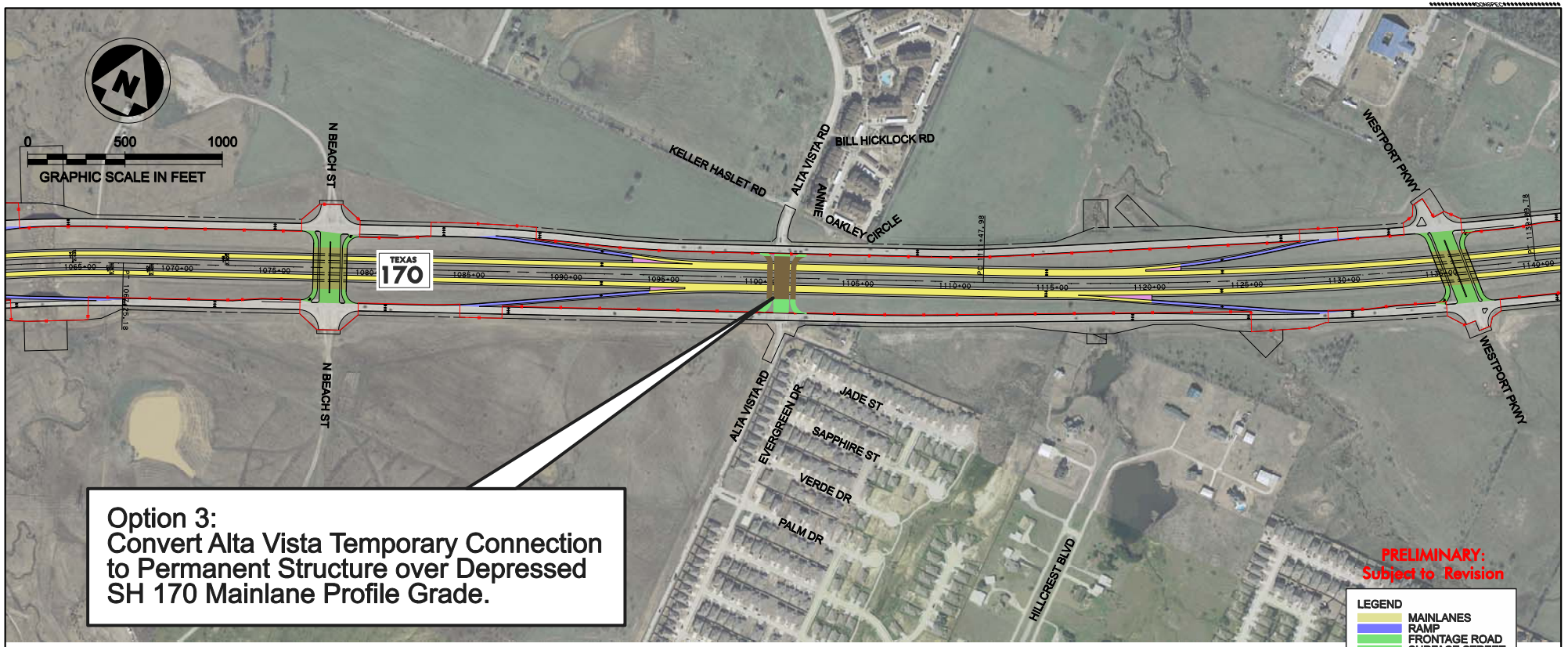

N
0
500
1000
GRAPHIC SCALE IN FEET
LOIS ST
DURANGO DR
MONTEREY DR
CHIMNEY ROCK DR
SONORA DR
N DORMAN ST
TEXAS 114
E BYRON NELSON BLVD
PALO DURO CT
PEGOSA CT
ALAMOSA DR
CIMARRON DR
HWY 114
SHASTA DR
LLANO DR
TROPHY LAKE DR
TROPHY CLUB DR
CROOKED CREEK CT
OAKMONT DR
REED ST
MEADOW LN
TURNER AVE
MISTY VIEW LN
MAIN ST
TEXAS 170
TEXAS 114
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2006 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Baseline Schematic
(TxDOT)
CONCEPTUAL ALTERNATIVES REPORT
JACOBS Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 5 OF 5

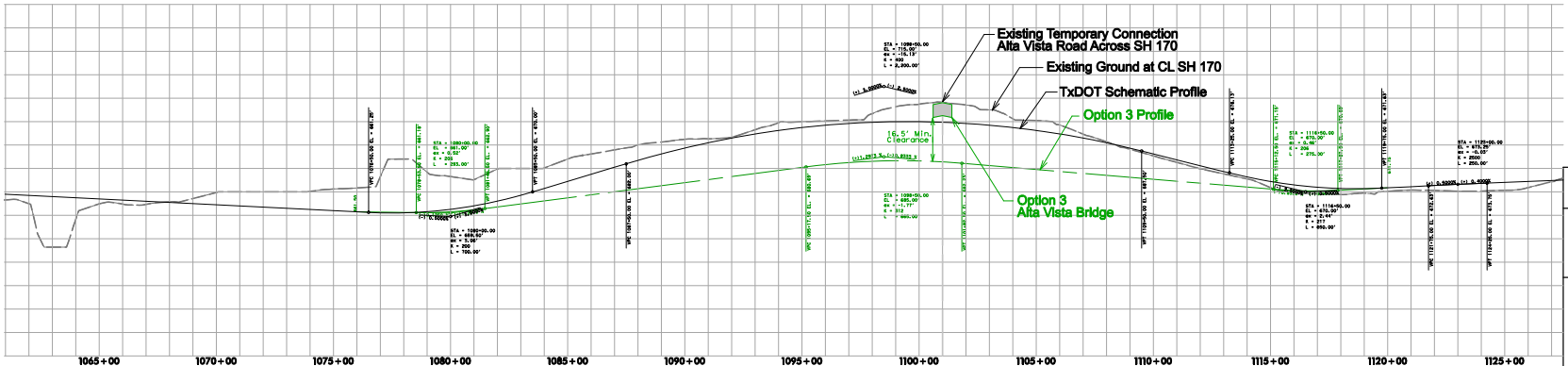

N
0
500
1000
GRAPHIC SCALE IN FEET
OLD DENTON RD
TEXAS
170
N BEACH ST
FRAC
SARATOGA A
WELL SITE
CABELA DR
CABELA'S
SH 170
ALLIANCE
GATEWAY
PILOT
TRAVEL CENTER
IH 35W
OLD DENTON RD
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2008 (Additional Background)
Option 1A:
Move WB Exit Ramp to NB IH 35W
(Frontage Road & Cabela Dr) East to
Improve Access to Cabela Drive
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Option 1A
WB Ramp to IH35W /Cabela Dr
CONCEPTUAL ALTERNATIVES REPORT
JACOBS
Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD
SHEET 1 OF 1


Option 1B:
Leave WB Exit Ramp to Westport in Place but Provide Alternate Access to Commercial Property
0
500
1000
GRAPHIC SCALE IN FEET
TEXAS 170
PARK VISTA BLVD
ALLEN TRAIL
HASLET ROANOKE RD
HASLET ROANOKE RD
CHAPARRAL LN
WELL SITE
FWYE
WESTPORT PKWY
WESTPORT PKWY
LIBERTY WAY
GATEWAY 15
GATEWAY 16 SWB
GATEWAY 17 AMERITRADE
GATEWAY 20
GATEWAY 21 RYDER
GATEWAY 22 USO
FORD MOTOR COMPANY PARTS DISTRIBUTION CENTER
ALTA VISTA RD
BILL HICKLOCK RD
ANNIE OAKLEY CIRCLE
ELLER HASLET RD
JADE ST
WELLSITE #13
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2006 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Option 1B
Access at WB Ramp to Westport
CONCEPTUAL ALTERNATIVES REPORT
JACOBS Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1


Option 1D:
Leave Schematic WB Exit to Independence in place, but Provide Alternate Access Method to Commercial Property
Option 1C:
Leave Schematic EB Exit to US 377 in place, but Provide Alternate Access Method to Commercial Property
0
500
1000
GRAPHIC SCALE IN FEET
GATEWAY 49
IDC
CARDINAL HEALTH
GATEWAY 53
THE HOME DEPOT
APPLIED INDUSTRIAL TECHNOLOGIES
WELLSITE #5
GATEWAY 31
PERLOS
TOTAL WAREHOUSING/ CHEP
TRANS-TRADE
AT&T
GATEWAY 27
GATEWAY 26
PREMIUM BEVERAGE
INDEPENDENCE PKWY
UPRR
DENTON HWY/US 377
TEXAS
170
COLOR BOX
GATEWAY 9
MITSUBISHI MOTOR SALES OF AMERICA
NOKIA
VICTORY LN
NOKIA CELLULAR MANUFACTURING CENTER
DISTRIBUTION CENTER
DATA CENTER 2
GATEWAY 4
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2006 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Options 1C & 1D
Access (Independence to 377)
CONCEPTUAL ALTERNATIVES REPORT
JACOBS Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1


0
500
1000
GRAPHIC SCALE IN FEET
KELLER HASLET RD
ANNIE OAKLEY CIRCLE
JADE ST
SAPPHIRE ST
VERDE DR
PALM DR
ALTA VISTA RD
EVERGREEN DR
N BEACH ST
TEXAS
170
OLD DENTON RD
CABELA DR
Option 2:
Move WB Beach St Entrance Ramp
East Approximately 1000' to Increase
Separation to NB 35W Exit Ramp
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2008 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Option 2
WB Ramp from Beach St
CONCEPTUAL ALTERNATIVES REPORT
JACOBS
Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1




Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2006 (Additional Background)

**STATE HIGHWAY 170**

NTTA NORTH TEXAS TOLLWAY AUTHORITY

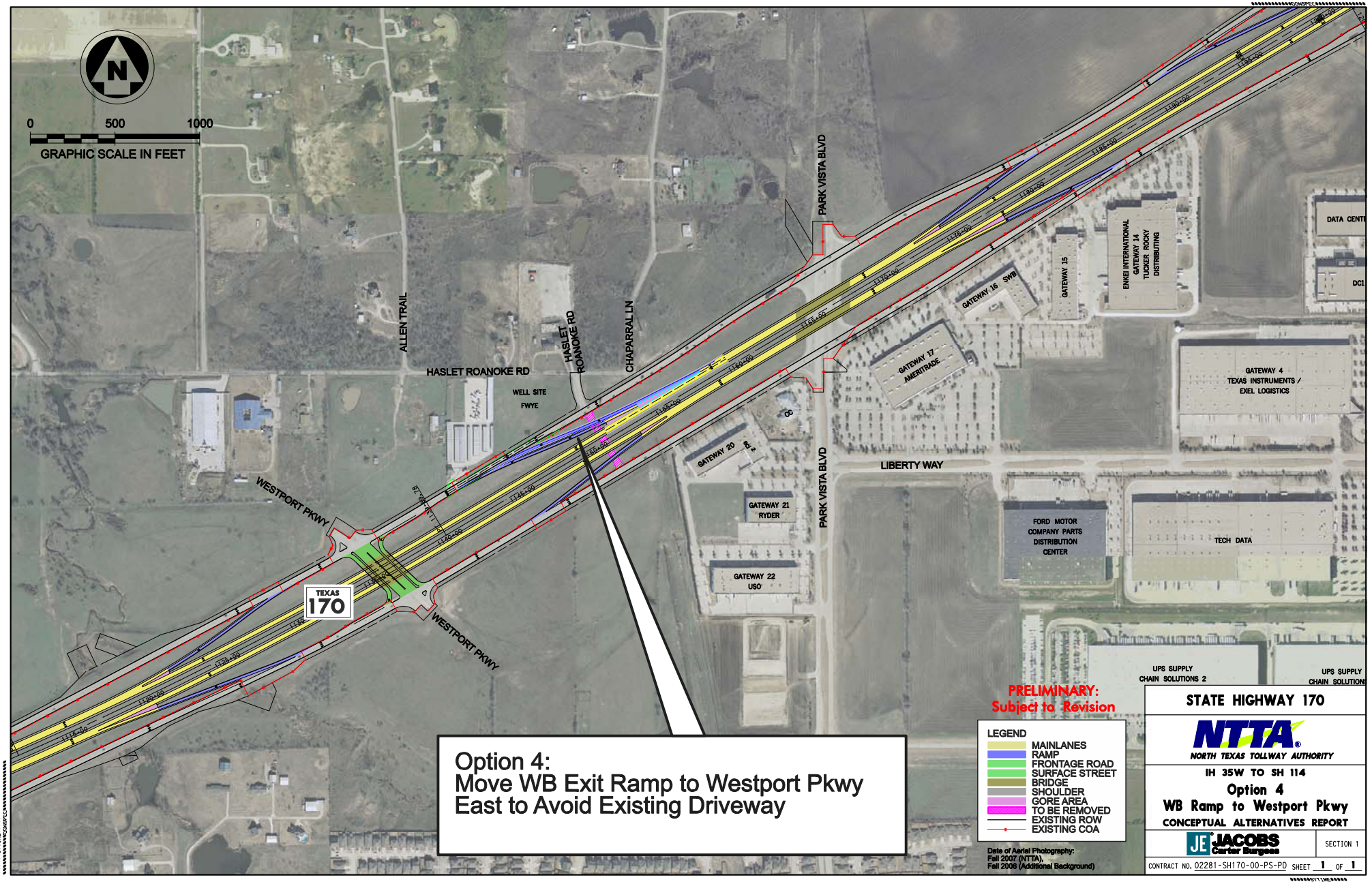
IH 35W TO SH 114

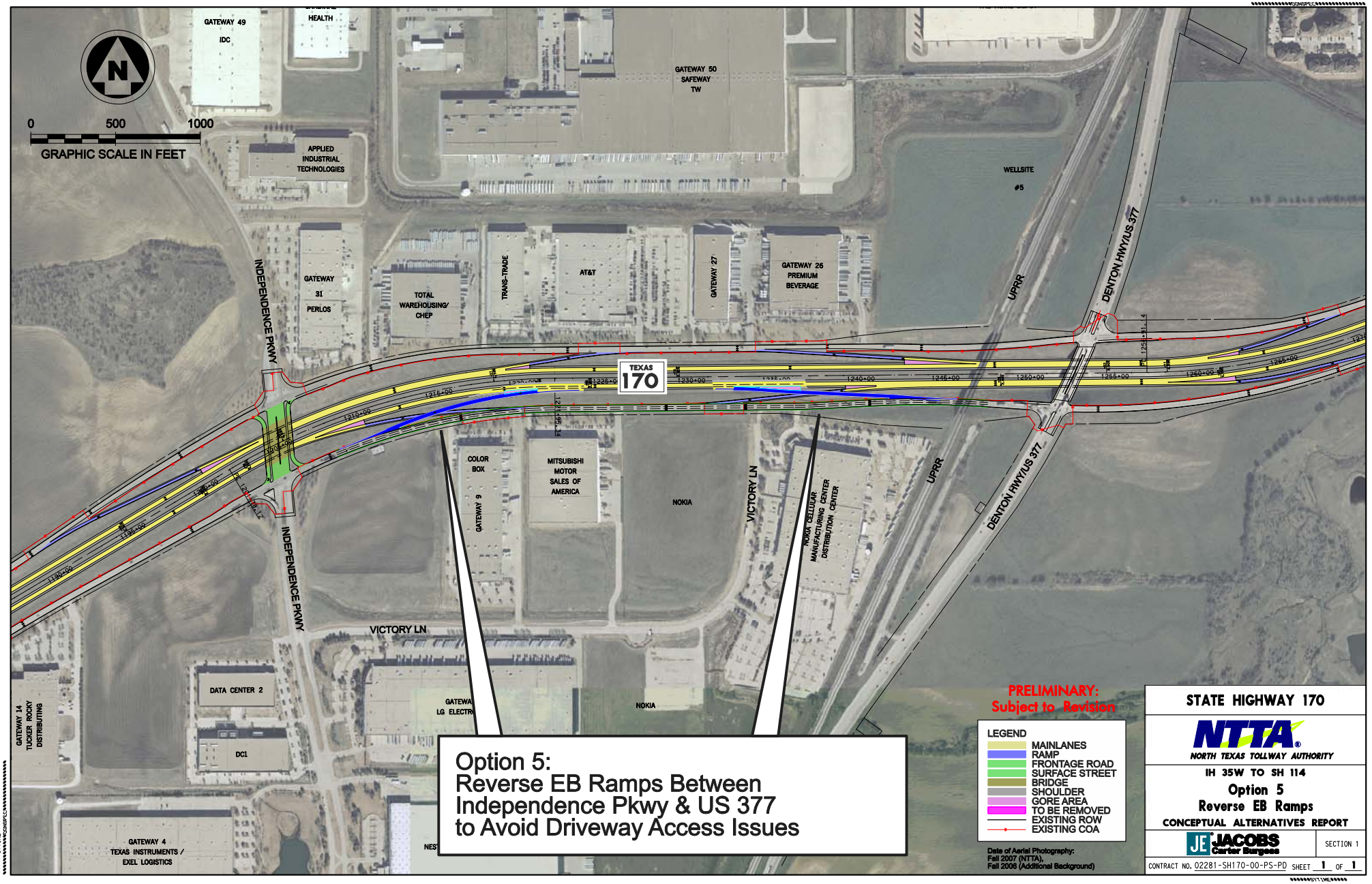
**Option 3**
**Permanent Alta Vista Rd Bridge**

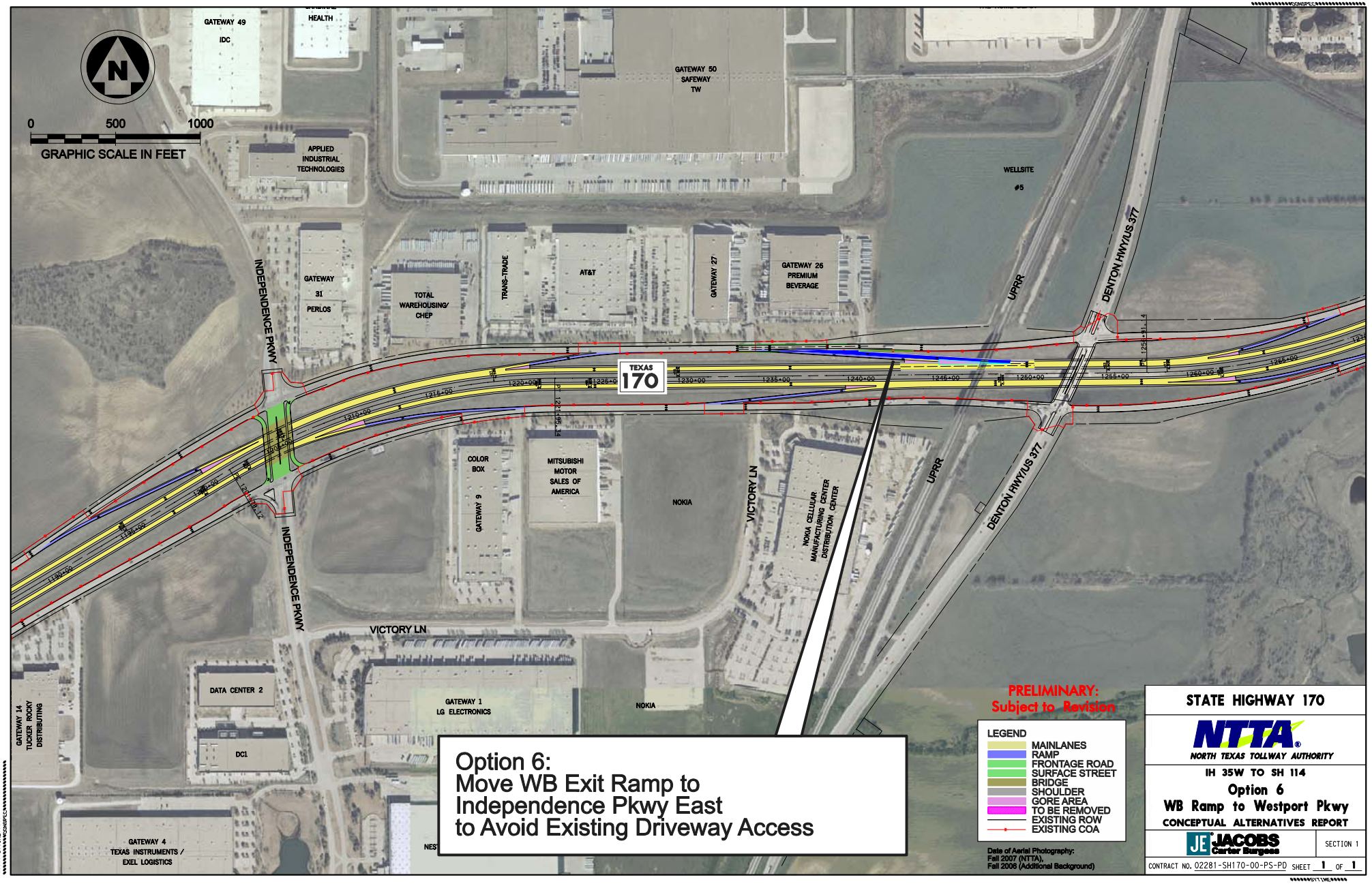
CONCEPTUAL ALTERNATIVES REPORT

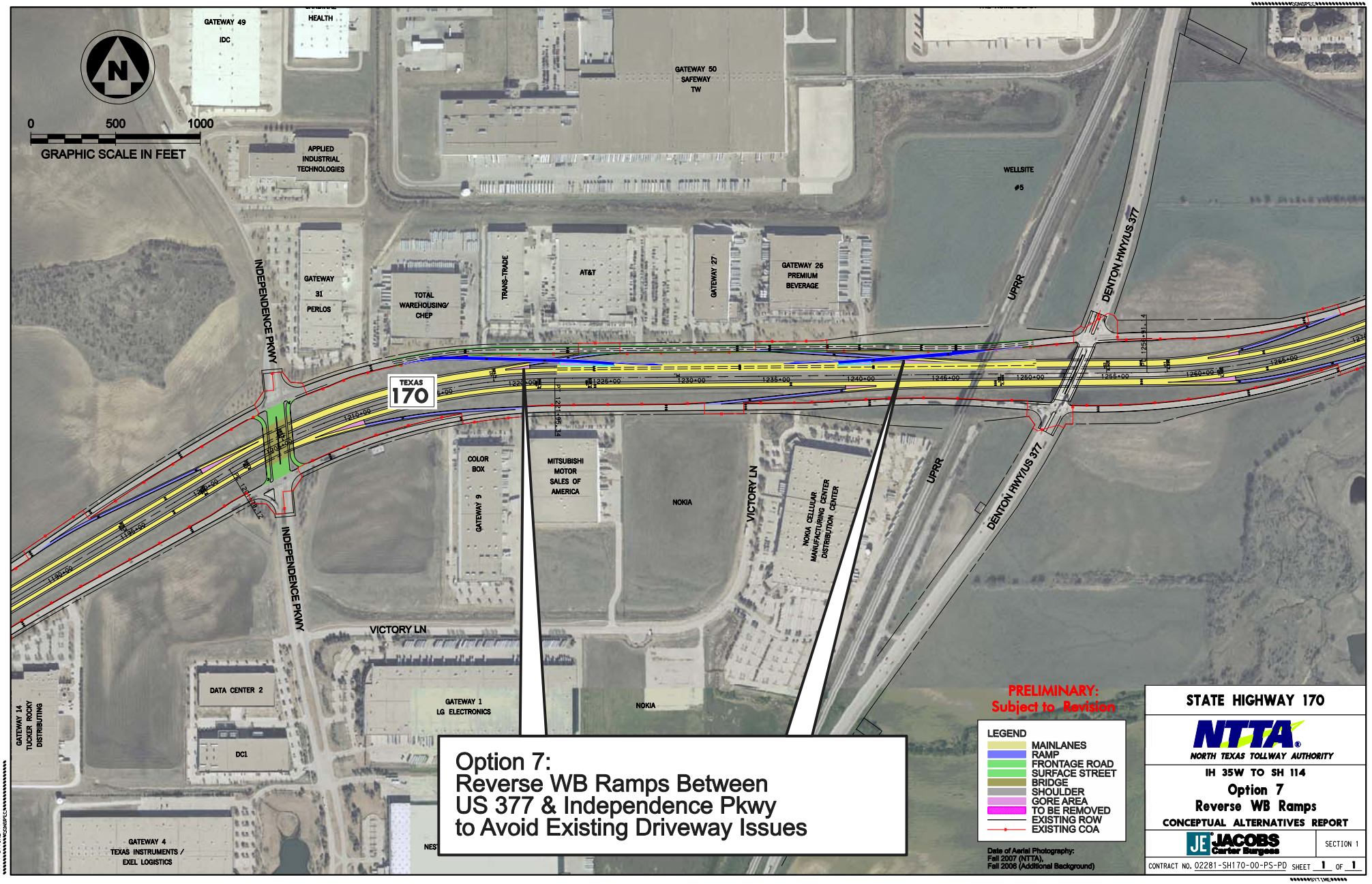
JACOBS Carter Burgess | SECTION 1

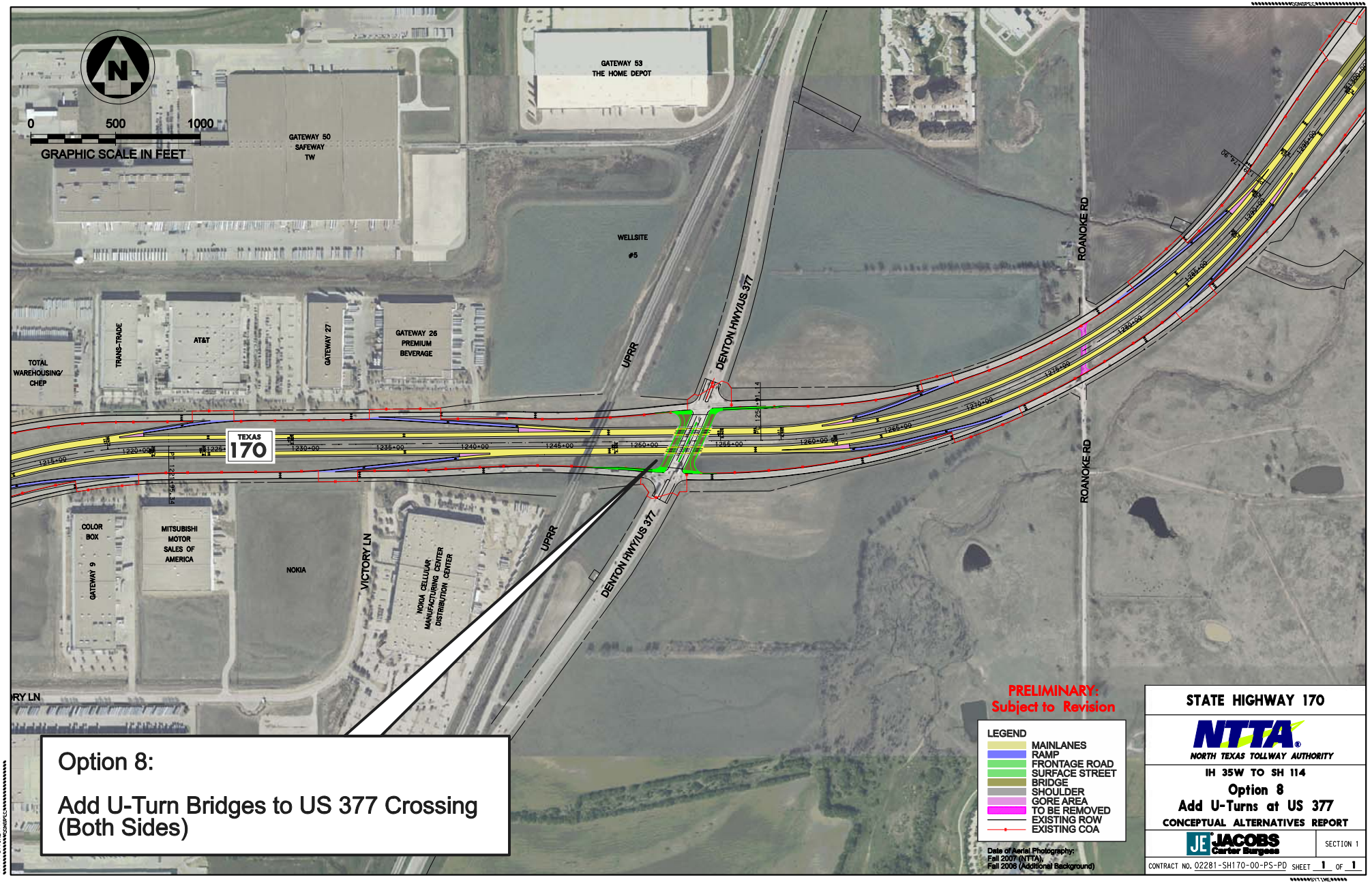
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1


N
0
500
1000
GRAPHIC SCALE IN FEET
ALLEN TRAIL
HASLET ROANOKE RD
HASLET ROANOKE RD
CHAPARRAL LN
WELL SITE
FWYE
PARK VISTA BLVD
PARK VISTA BLVD
LIBERTY WAY
WESTPORT PKWY
WESTPORT PKWY
TEXAS 170
GATEWAY 15 SWB
GATEWAY 15
ENKEI INTERNATIONAL
GATEWAY 14
TUCKER ROCKY DISTRIBUTING
GATEWAY 17
AMERITRADE
GATEWAY 4
TEXAS INSTRUMENTS / EXEL LOGISTICS
GATEWAY 20
GATEWAY 21
RYDER
GATEWAY 22
USO
FORD MOTOR COMPANY PARTS DISTRIBUTION CENTER
TECH DATA
UPS SUPPLY CHAIN SOLUTIONS 2
UPS SUPPLY CHAIN SOLUTIONS
DATA CENTE
DC1
Option 4:
Move WB Exit Ramp to Westport Pkwy East to Avoid Existing Driveway
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2008 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Option 4
WB Ramp to Westport Pkwy
CONCEPTUAL ALTERNATIVES REPORT
JACOBS Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1


GATEWAY 49
IDC
HEALTH
GATEWAY 50
SAFEWAY
TW
0
500
1000
GRAPHIC SCALE IN FEET
APPLIED
INDUSTRIAL
TECHNOLOGIES
WELLSITE
#5
INDEPENDENCE PKWY
GATEWAY
31
PERLOS
TOTAL
WAREHOUSING/
CHEP
TRANS-TRADE
AT&T
GATEWAY 27
GATEWAY 26
PREMIUM
BEVERAGE
UPRR
DENTON HWY/US 377
TEXAS
170
COLOR
BOX
GATEWAY 9
MITSUBISHI
MOTOR
SALES OF
AMERICA
NOKIA
VICTORY LN
NOKIA CELLULAR
MANUFACTURING CENTER
DISTRIBUTION CENTER
DATA CENTER 2
DC1
GATEWAY 14
TUCKER ROCKY
DISTRIBUTING
GATEWAY 4
TEXAS INSTRUMENTS /
EXEL LOGISTICS
Option 5:
Reverse EB Ramps Between
Independence Pkwy & US 377
to Avoid Driveway Access Issues
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2006 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Option 5
Reverse EB Ramps
CONCEPTUAL ALTERNATIVES REPORT
JACOBS
Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1


N
0
500
1000
GRAPHIC SCALE IN FEET
GATEWAY 49
IDC
HEALTH
GATEWAY 50
SAFEWAY
TW
APPLIED
INDUSTRIAL
TECHNOLOGIES
WELLSITE
#5
INDEPENDENCE PKWY
GATEWAY
31
PERLOS
TOTAL
WAREHOUSING/
CHEP
TRANS-TRADE
AT&T
GATEWAY 27
GATEWAY 26
PREMIUM
BEVERAGE
UPRR
DENTON HWY/US 377
TEXAS
170
COLOR
BOX
GATEWAY 9
MITSUBISHI
MOTOR
SALES OF
AMERICA
NOKIA
VICTORY LN
NOKIA CELLULAR
MANUFACTURING CENTER
DISTRIBUTION CENTER
VICTORY LN
DATA CENTER 2
GATEWAY 1
LG ELECTRONICS
NOKIA
GATEWAY 14
TUCKER ROCKY
DISTRIBUTING
DC1
GATEWAY 4
TEXAS INSTRUMENTS /
EXEL LOGISTICS
Option 6:
Move WB Exit Ramp to
Independence Pkwy East
to Avoid Existing Driveway Access
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2006 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Option 6
WB Ramp to Westport Pkwy
CONCEPTUAL ALTERNATIVES REPORT
JACOBS
Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1


N
0
500
1000
GRAPHIC SCALE IN FEET
GATEWAY 49
IDC
HEALTH
GATEWAY 50
SAFEWAY
TW
APPLIED
INDUSTRIAL
TECHNOLOGIES
WELLSITE
#5
INDEPENDENCE PKWY
GATEWAY
31
PERLOS
TOTAL
WAREHOUSING/
CHEP
TRANS-TRADE
AT&T
GATEWAY 27
GATEWAY 26
PREMIUM
BEVERAGE
UPRR
DENTON HWY/US 377
TEXAS
170
COLOR
BOX
GATEWAY 9
MITSUBISHI
MOTOR
SALES OF
AMERICA
NOKIA
VICTORY LN
NOKIA CELLULAR
MANUFACTURING CENTER
DISTRIBUTION CENTER
INDEPENDENCE PKWY
VICTORY LN
DATA CENTER 2
GATEWAY 1
LG ELECTRONICS
NOKIA
GATEWAY 14
TUCKER ROCKY
DISTRIBUTING
DC1
GATEWAY 4
TEXAS INSTRUMENTS /
EXEL LOGISTICS
Option 7:
Reverse WB Ramps Between
US 377 & Independence Pkwy
to Avoid Existing Driveway Issues
PRELIMINARY:
Subject to Revision
LEGEND
MAINLANES
RAMP
FRONTAGE ROAD
SURFACE STREET
BRIDGE
SHOULDER
GORE AREA
TO BE REMOVED
EXISTING ROW
EXISTING COA
Date of Aerial Photography:
Fall 2007 (NTTA),
Fall 2006 (Additional Background)
STATE HIGHWAY 170
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
IH 35W TO SH 114
Option 7
Reverse WB Ramps
CONCEPTUAL ALTERNATIVES REPORT
JACOBS
Carter Burgess
SECTION 1
CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1




## Option 8:

## Add U-Turn Bridges to US 377 Crossing (Both Sides)

**STATE HIGHWAY 170**

NTTA NORTH TEXAS TOLLWAY AUTHORITY

IH 35W TO SH 114

**Option 8**

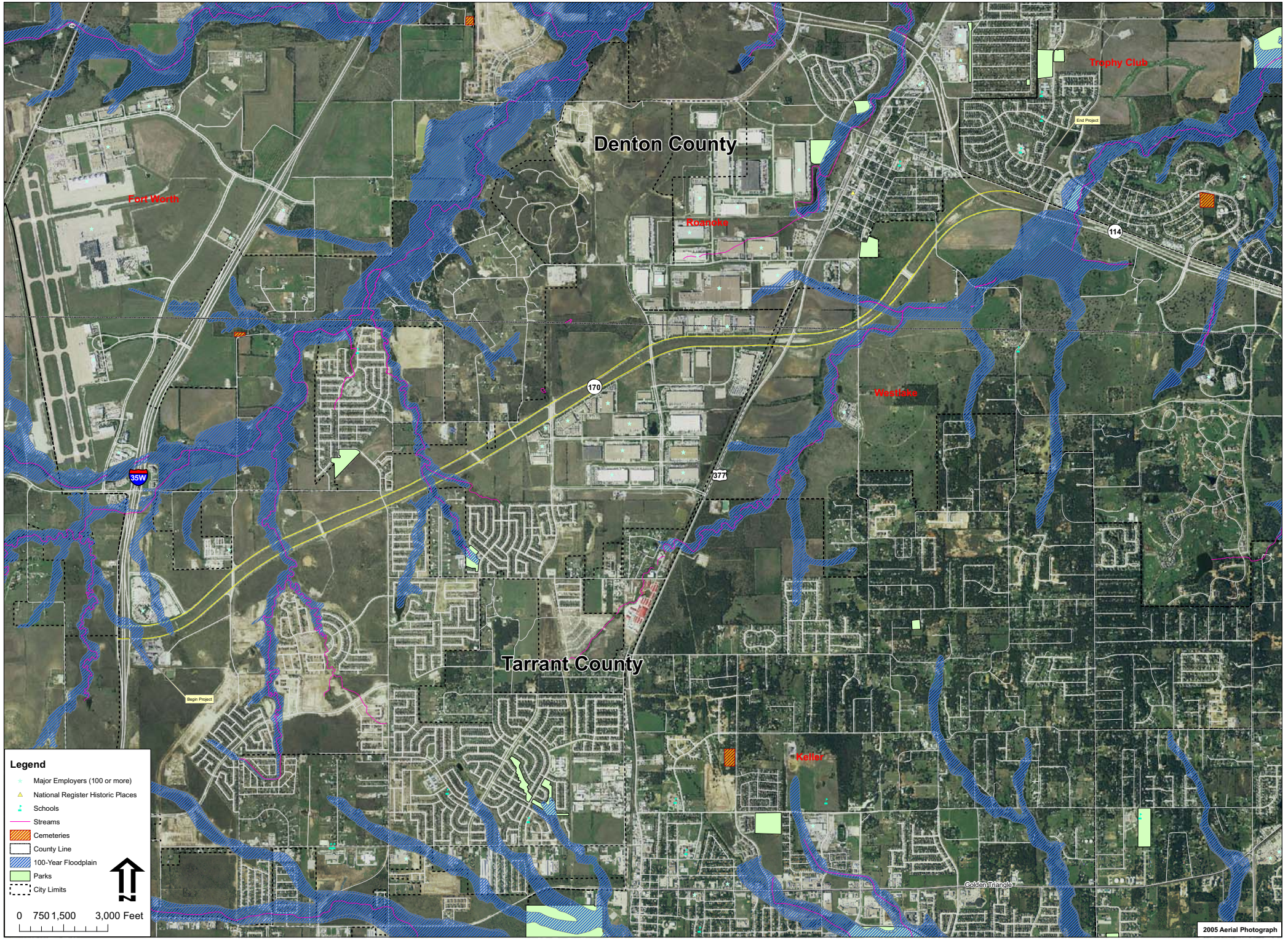
**Add U-Turns at US 377**

CONCEPTUAL ALTERNATIVES REPORT

JACOBS Carter Burgess

SECTION 1

CONTRACT NO. 02281-SH170-00-PS-PD SHEET 1 OF 1




JACOBS Carter Burgess

North Texas Tollway Authority
Tarrant and Denton Counties

# SH 170

*From I-35W to SH 114*

# Environmental Constraints Map

Date Created: January 2008