Final Environmental Impact Statement: Volume II

Grand Parkway (State Highway 99) Segment B:
From SH 288 to IH 45 South, Houston District
3510-01-001, 3510-01-003, 3510-02-001,
3510-02-003, 3510-02-004, & 3510-02-905
Brazoria & Galveston Counties, Texas
April 2016

Submitted Pursuant to 42 U.S.C. 4332 920 (c) and 49 U.S.C. 303 by the:
Texas Department of Transportation
Grand Parkway Association
Cooperating Agency:
U.S. Army Corps of Engineers

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT

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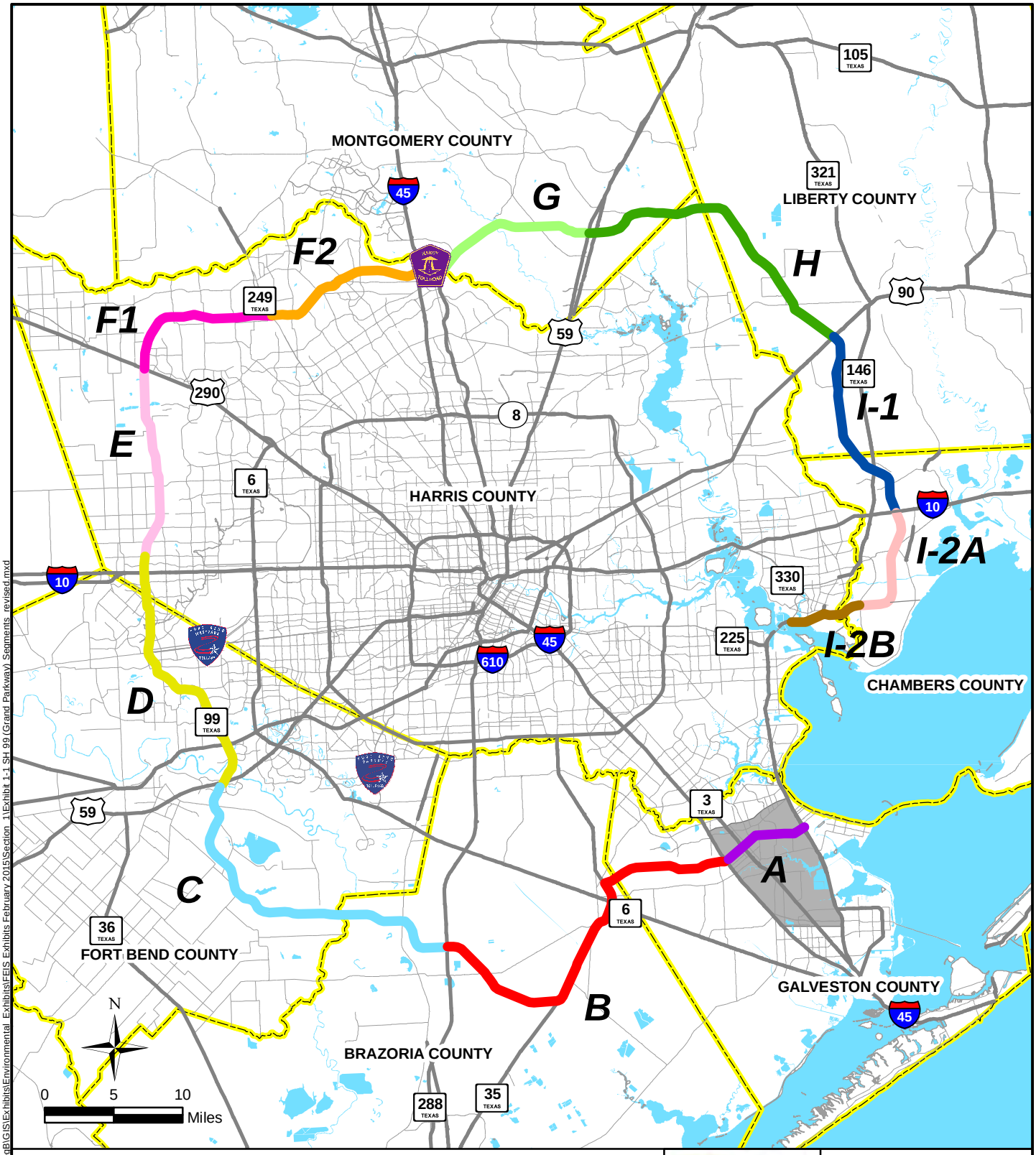

Source:
Background - HGAC StarMap September 27, 2012

Legend

Grand Parkway Segments

A	No Activity	E	Open to Traffic	H	Planning Phase		
B	Planning Phase	F1	Under Construction	I-1	Planning Phase		
C	Planning Phase	F2	Under Construction	I-2A	Open to Traffic		
D	Open to Traffic	G	Under Construction	I-2B	Under Design		

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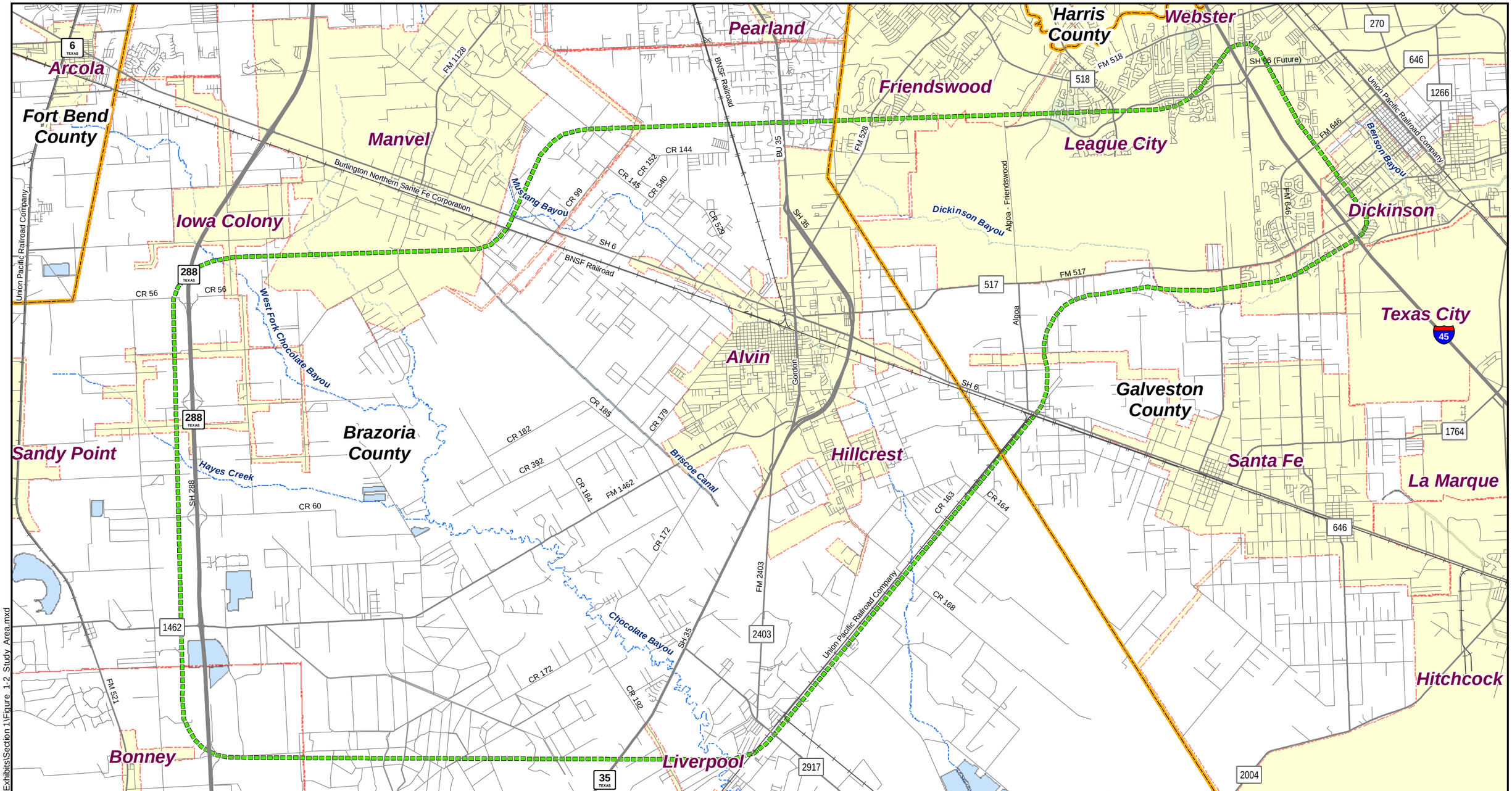
State Highway 99
Segment B
From SH 288 to IH 45 South

SH 99 (Grand Parkway) Segments

Exhibit 1-1

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_1\Exhibit 1-1 SH 99 (Grand Parkway) Segments_revised.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 4,500 9,000 Feet

Legend

- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area
- Major Stream
- Railroad

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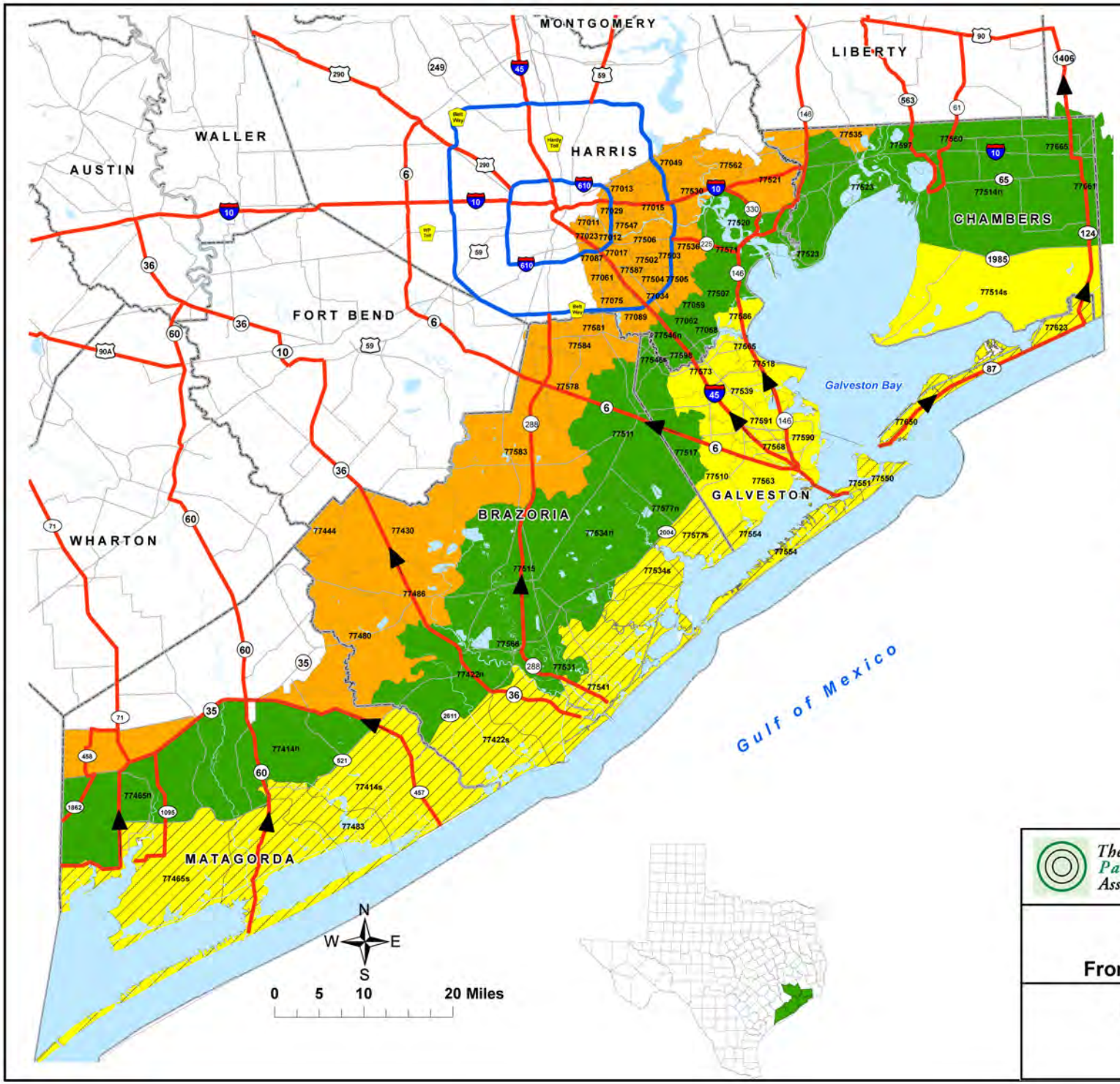
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Study Area

Exhibit 1-2

P:\052511121 0001 Grand Pkwy Seg B\Exhibits\Section 1\Figure 1-2 Study Area.mxd



Brazoria, Chambers, Galveston, Harris and Matagorda Hurricane Evacuation Zip-Zones Coastal, A, B, C

Zip-Zone Coastal				
77414s	77483	77550	77577s	77650
77422s	77534s	77551	77617	
77465s	77541	77554	77623	
Zip-Zone A				
77510	77539	77568	77590	
77514s	77563	77573	77591	
77518	77565	77586		
Zip-Zone B				
77058	77507	77522	77560	77661
77059	77511	77523	77566	77665
77062	77514n	77531	77571	
77414n	77515	77534n	77577n	
77422n	77517	77546n	77597	
77465n	77520	77546s	77598	
Zip-Zone C				
77011	77034	77444	77505	77547
77012	77049	77463	77506	77562
77013	77061	77480	77520	77578
77015	77075	77486	77521	77581
77017	77087	77502	77530	77583
77023	77089	77503	77535	77584
77029	77430	77504	77536	77587

Route Designation

- Evacuation Corridors
- Evacuation Connections
- Other Roads
- County Boundary

Map Created by:
Houston-Galveston Area Council

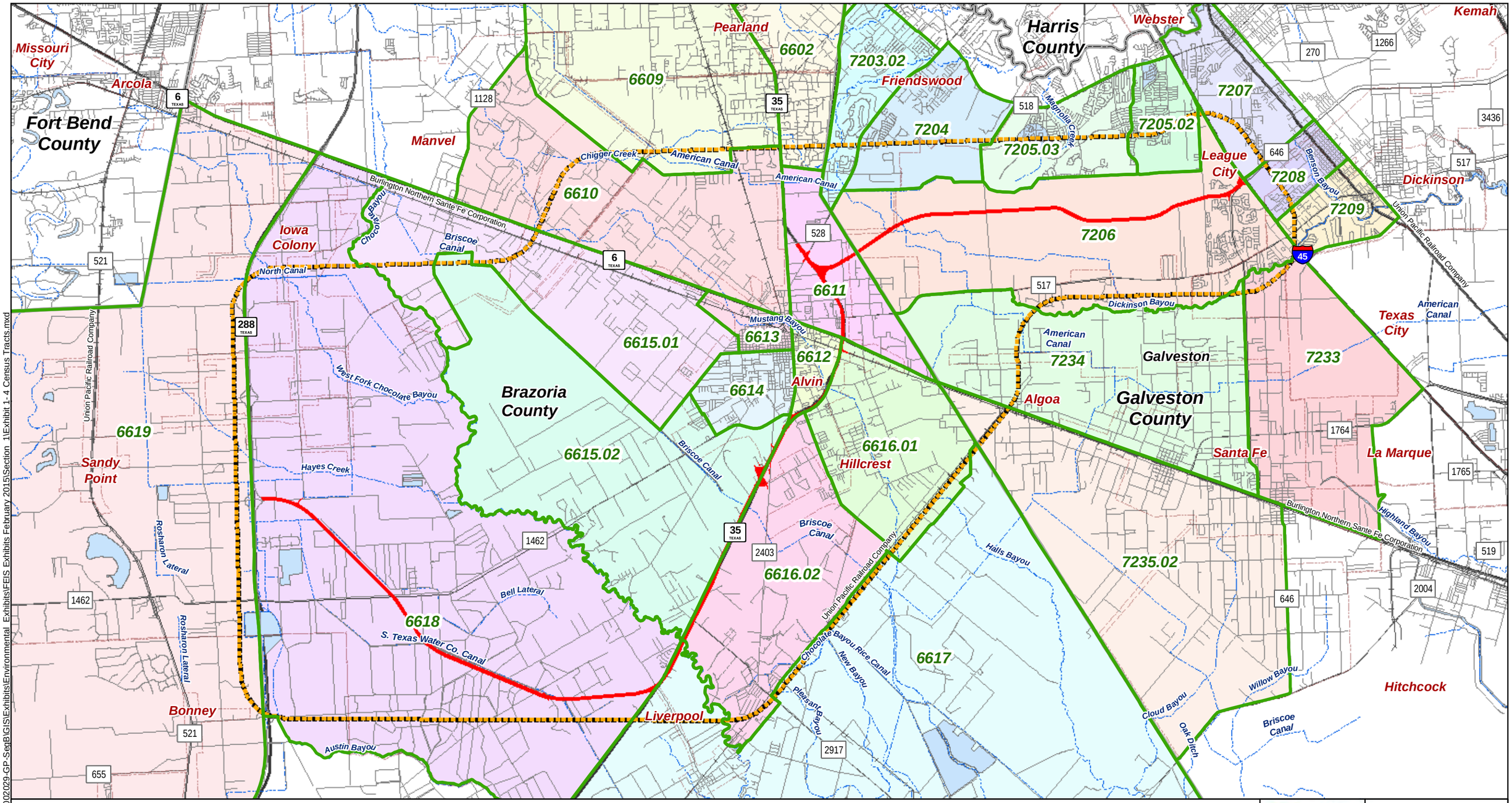
The Grand Parkway Association

Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Evacuation Zones

Figure 1-3



Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_1\Exhibit 1-4 Census Tracts.mxd

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW
- Railroad
- Major Streams
- Canals
- 000 Adjacent Census Tracts within Study Area

Sources:
Background - HGAC StarMap September 27, 2012
Census Bureau Census 2010

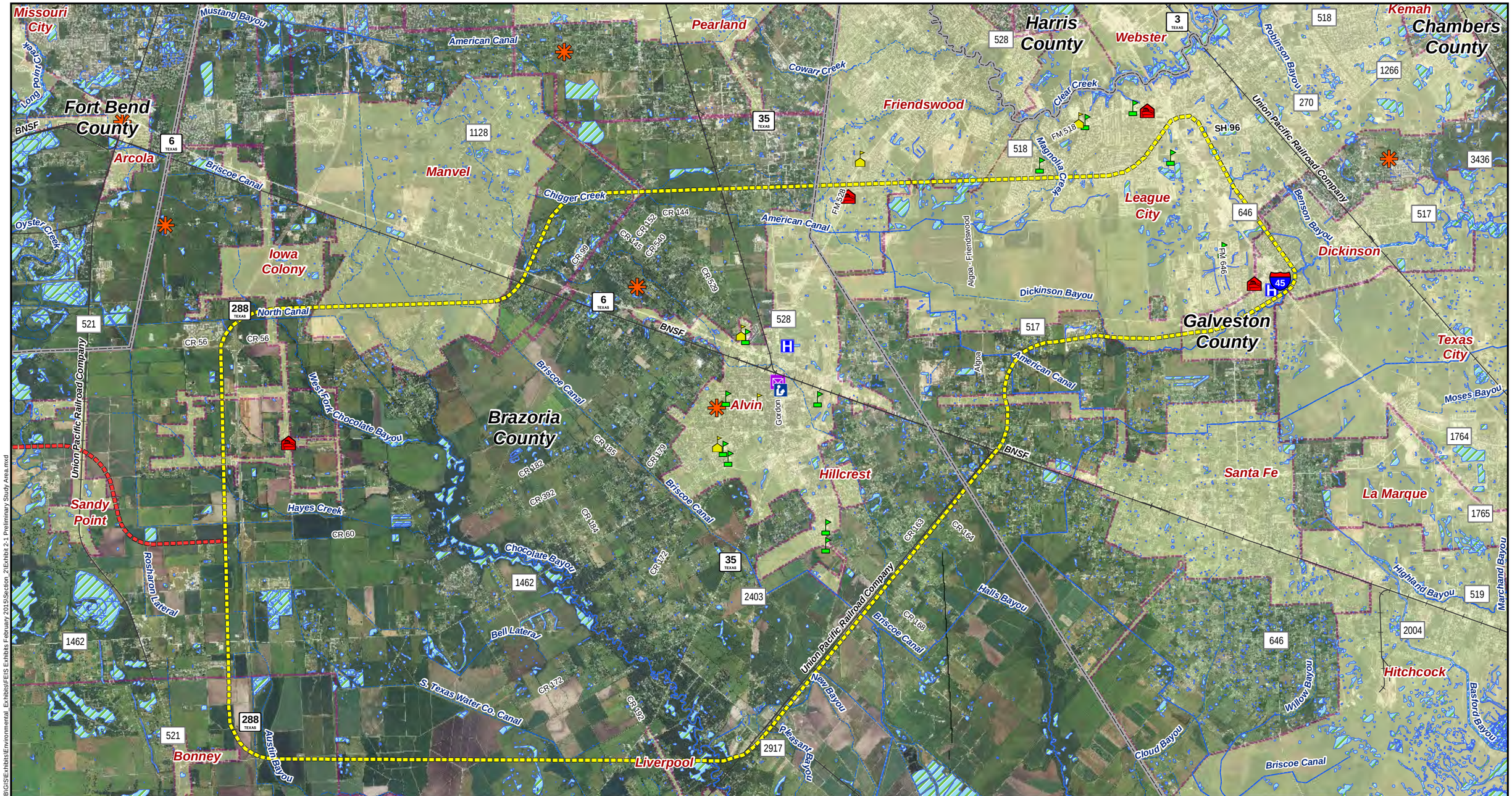
The Grand Parkway Association

Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Census Tracts

Exhibit 1-4



N

0 5,000 10,000 Feet

Legend

- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment C
- Railroads

Built

- Elementary School
- Junior High School
- Senior High School
- Library
- Hospital
- U.S. Post Office
- Fire Station
- TCEQ Superfund Site
- Major Streams
- USFWS National Wetlands Inventory

Source:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas
NWI: USFWS 1979, Texas

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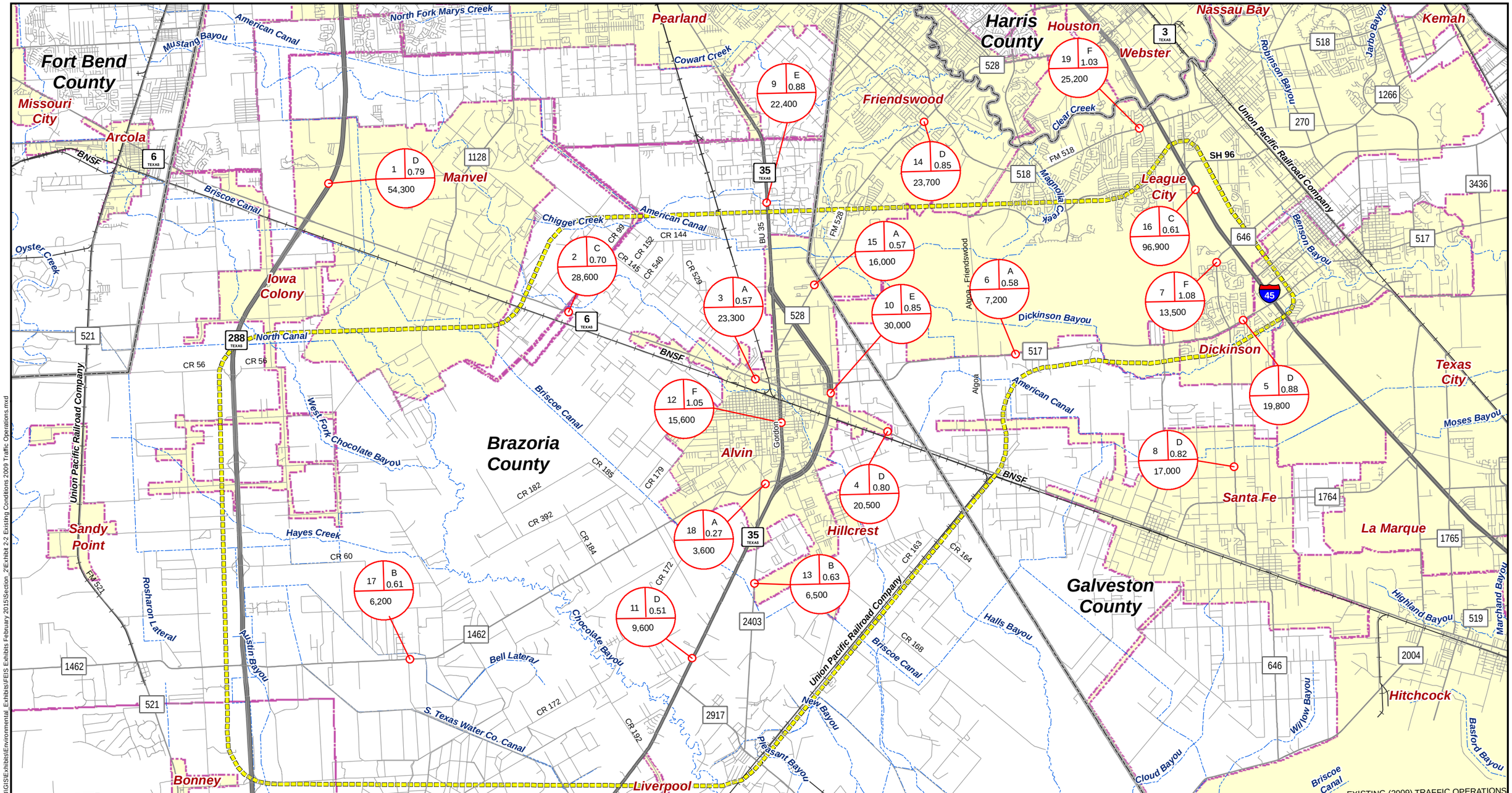
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

SH 99 Segment B Study Area

Exhibit 2-1

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-Seg\B\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-1 Preliminary Study Area.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Proposed SH 99 Segment B Study Area
- City Limits
- Railroads
- Major Streams

X = FACILITY IDENTIFICATION NUMBER
A = LEVEL OF SERVICE, LOS
XX = VOLUME TO CAPACITY RATIO, V/C
XXX = 2009 AVERAGE ANNUAL DAILY TRAFFIC, AADT

*For the segments including the mainlane and frontage road volumes, the V/C and LOS reported are for mainlanes only.

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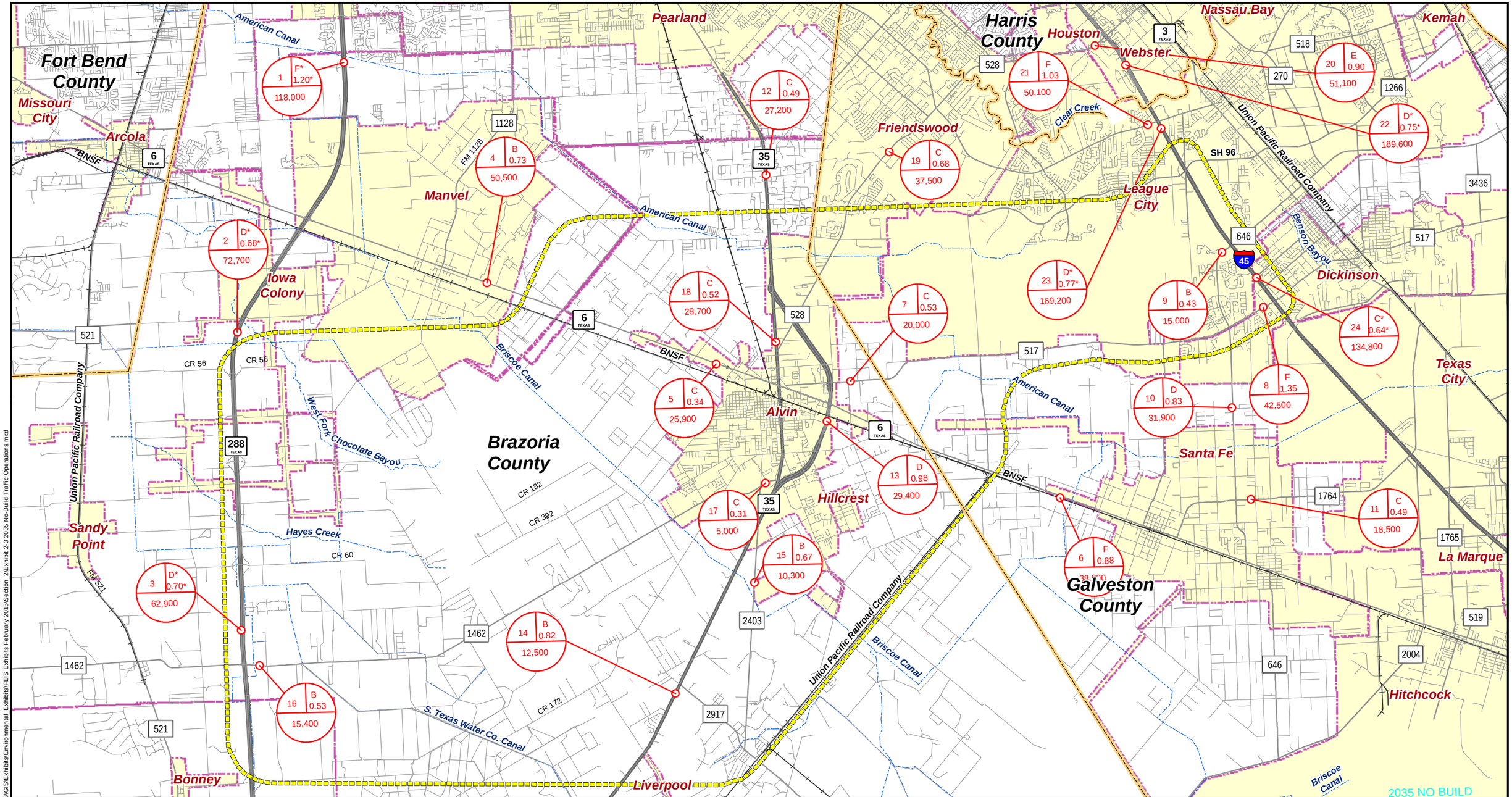
State Highway 99
Segment B
From SH 288 to IH 45 South

Existing Conditions
(Year 2009) Traffic Operations

Exhibit 2-2

Path: P:_TRANS\GrandPkwyAssoc\60002209-GP-Seg B\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-2 Existing Conditions 2009 Traffic Operations.mxd



N

0 5,000 10,000 Feet

Legend

- City Limits
- County Boundaries
- Proposed SH 99 Segment B Study Area
- Railroads
- Major Streams

X | A XX | XXX

X = FACILITY IDENTIFICATION NUMBER
A = LEVEL OF SERVICE, LOS
XX = VOLUME TO CAPACITY RATIO, V/C
XXX = 2035 AVERAGE ANNUAL DAILY TRAFFIC, AADT

*For the segments including the mainlane and frontage road volumes, the V/C and LOS reported are for mainlanes only.

Source:
Background - HGAC StarMap September 27, 2012

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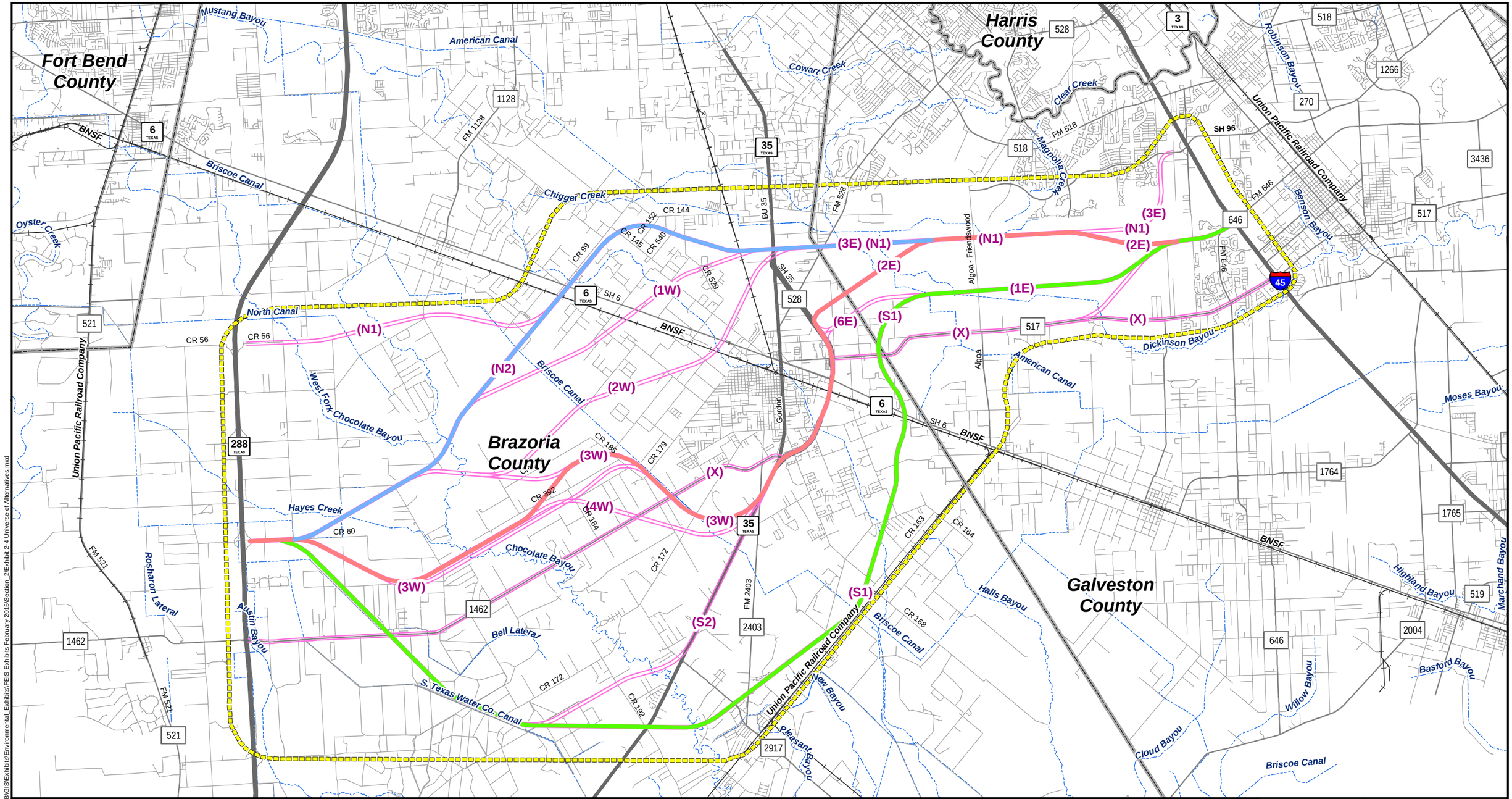
State Highway 99
Segment B
From SH 288 to IH 45 South

2035 No-Build Traffic Operations

Exhibit 2-3

Path: P:_TRAN\S\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-3 2035 No-Build Traffic Operations.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Railroads
- Major Streams
- Proposed SH 99 Segment B Study Area
- Candidate Corridor Components
- Northern Alternative
- Central Alternative
- Southern Alternative

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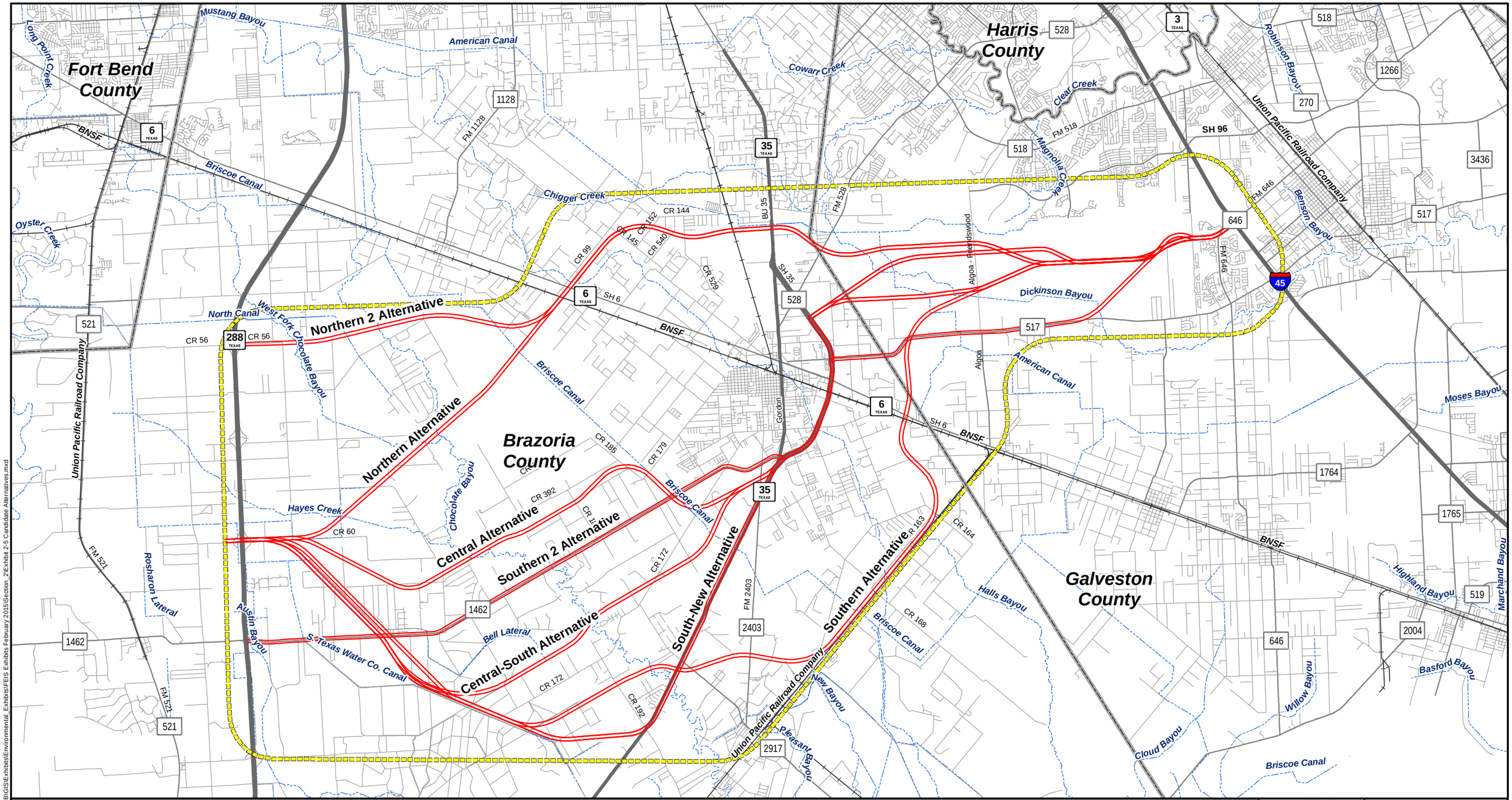
State Highway 99
Segment B
From SH 288 to IH 45 South

Preliminary Build Alternatives

Exhibit 2-4

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-4 Universe of Alternatives.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Proposed SH 99 Segment B Study Area
- Railroads
- Alternatives
- Major Streams

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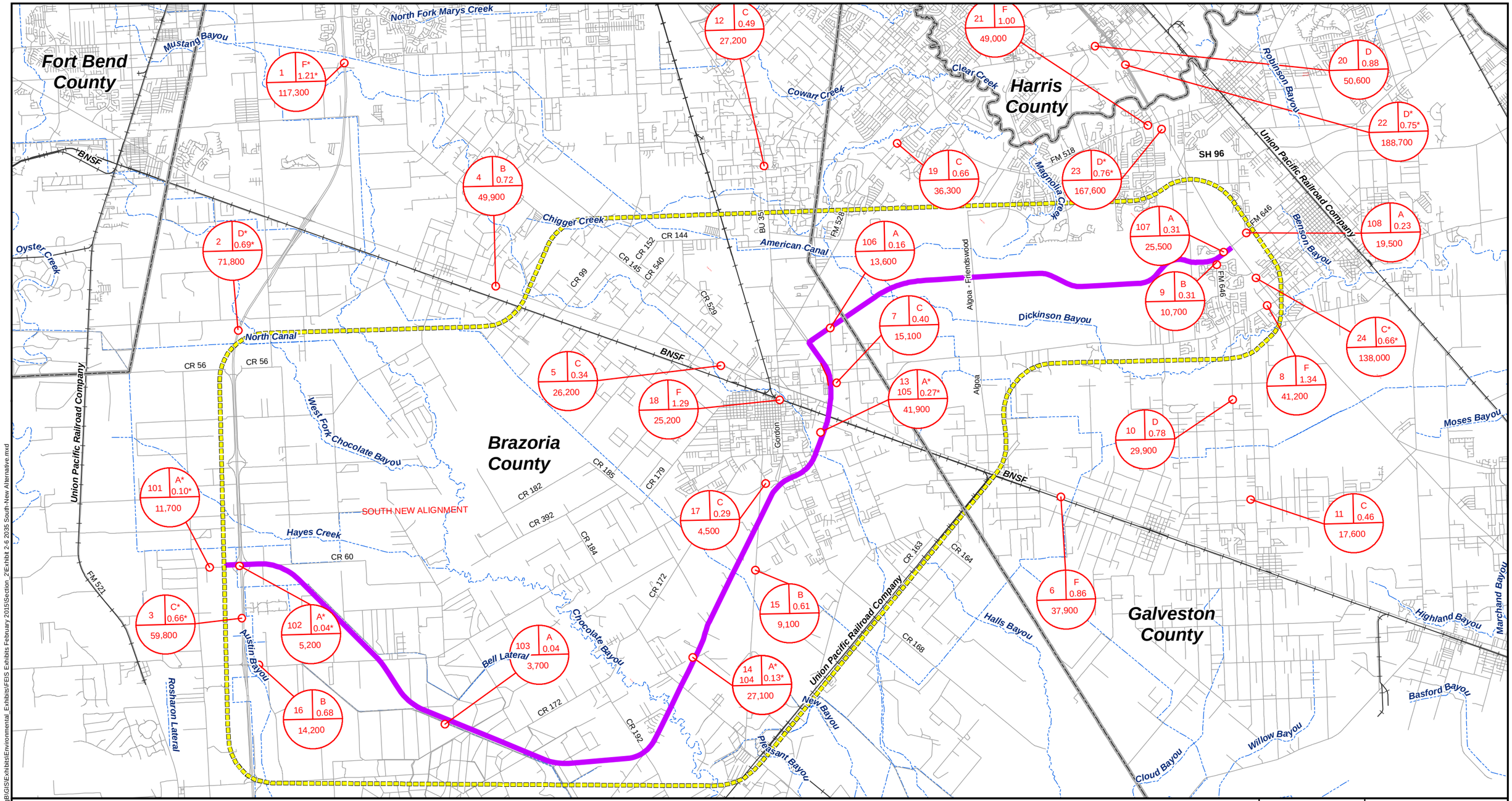
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Candidate Alternatives

Exhibit 2-5

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-Seg\B\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-5 Candidate Alternatives.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Railroads
- Major Streams
- Proposed SH 99 Segment B Study Area
- South-New Alternative

X = FACILITY IDENTIFICATION NUMBER
A = LEVEL OF SERVICE, LOS
XX = VOLUME TO CAPACITY RATIO, V/C
XXX = 2035 AVERAGE ANNUAL DAILY TRAFFIC, AADT

*For the segments including the mainlane and frontage road volumes, the V/C and LOS reported are for mainlanes only.

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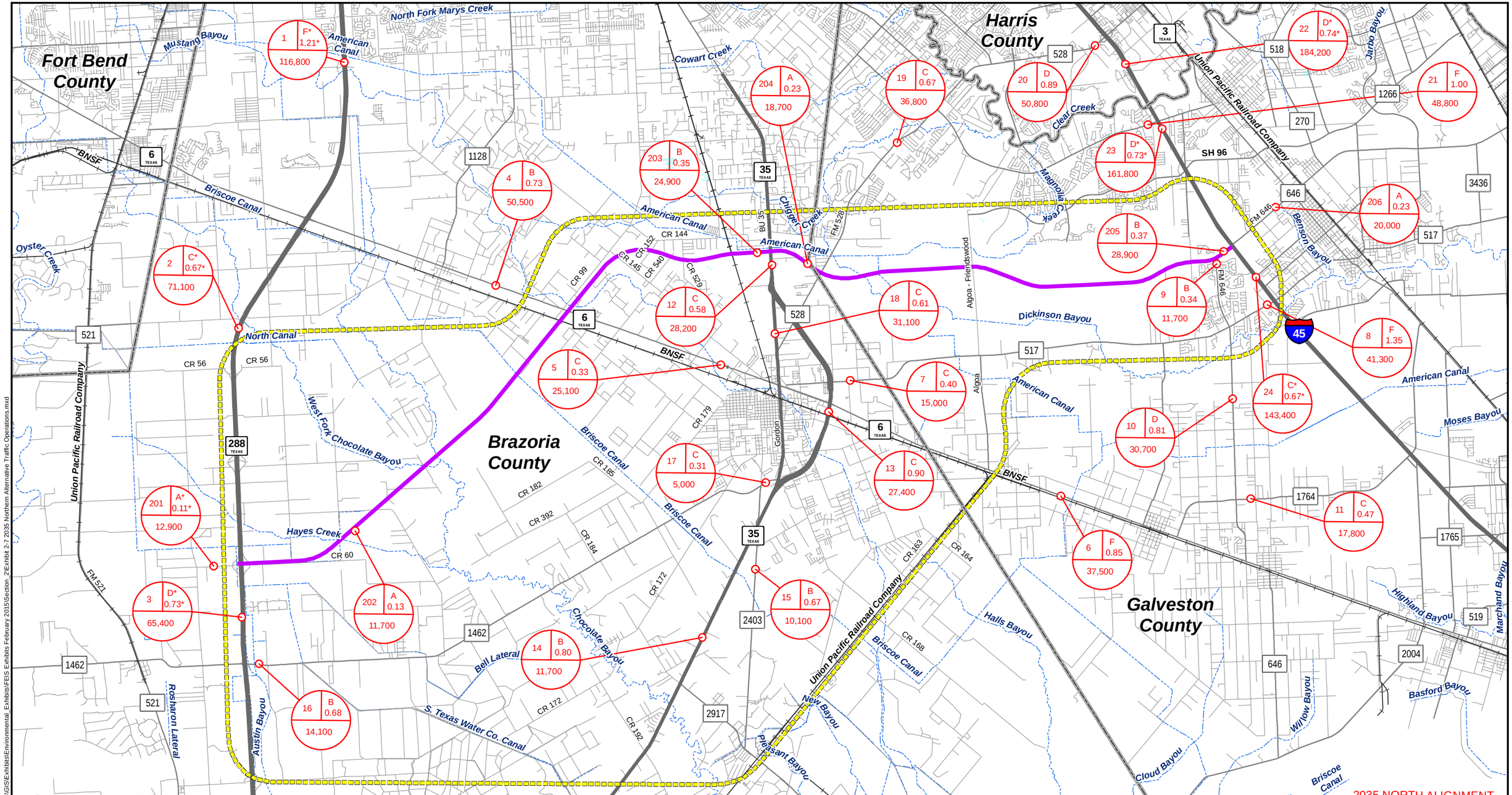
State Highway 99
Segment B
From SH 288 to IH 45 South

2035 South-New Alternative
Traffic Operations

Exhibit 2-6

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-6 2035 South-New Alternative.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Railroads
- Major Streams
- Proposed SH 99 Segment B Study Area
- Northern Alternative

X = FACILITY IDENTIFICATION NUMBER
A = LEVEL OF SERVICE, LOS
XX = VOLUME TO CAPACITY RATIO, V/C
XXX = 2035 AVERAGE ANNUAL DAILY TRAFFIC, AADT

*For the segments including the mainlane and frontage road volumes, the V/C and LOS reported are for mainlanes only.

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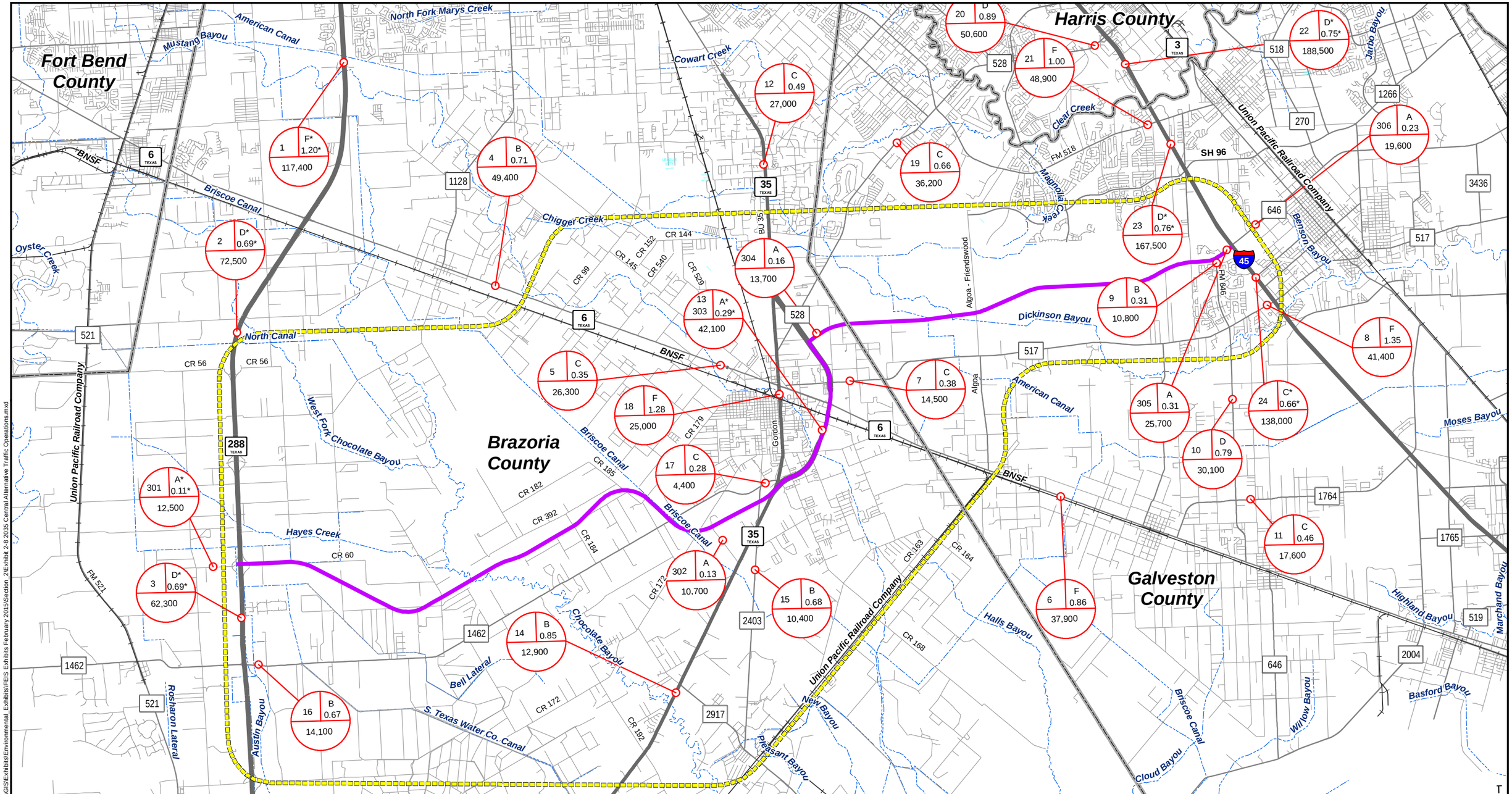
State Highway 99
Segment B
From SH 288 to IH 45 South

2035 Northern Alternative Traffic Operations

Exhibit 2-7

Path: P:_TRAN\SGrandParkwayAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-7 2035 Northern Alternative Traffic Operations.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Railroads
- Major Streams
- Proposed SH 99 Segment B Study Area
- Central Alternative

X = FACILITY IDENTIFICATION NUMBER
A = LEVEL OF SERVICE, LOS
XX = VOLUME TO CAPACITY RATIO, V/C
XXX = 2035 AVERAGE ANNUAL DAILY TRAFFIC, AADT

*For the segments including the mainlane and frontage road volumes, the V/C and LOS reported are for mainlanes only.

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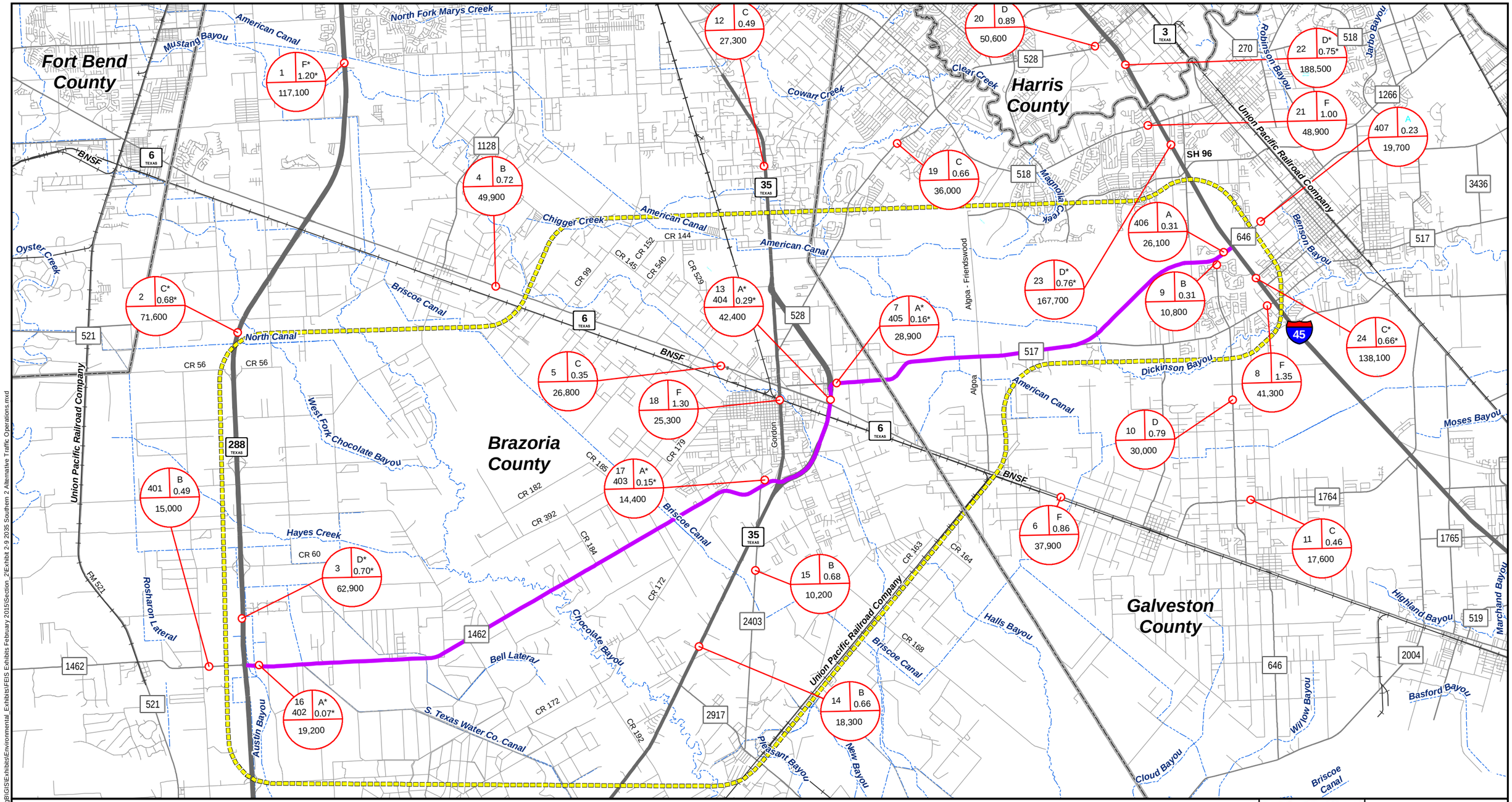
State Highway 99
Segment B
From SH 288 to IH 45 South

2035 Central Alternative Traffic Operations

Exhibit 2-8

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-8 2035 Central Alternative Traffic Operations.mxd



Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-9 2035 Southern 2 Alternative Traffic Operations.mxd

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Railroads
- Major Streams
- Proposed SH 99 Segment B Study Area
- Southern 2 Alternative

X = FACILITY IDENTIFICATION NUMBER
A = LEVEL OF SERVICE, LOS
XX = VOLUME TO CAPACITY RATIO, V/C
XXX = 2035 AVERAGE ANNUAL DAILY TRAFFIC, AADT

*For the segments including the mainlane and frontage road volumes, the V/C and LOS reported are for mainlanes only.

Source:
Background - HGAC StarMap September 27, 2012

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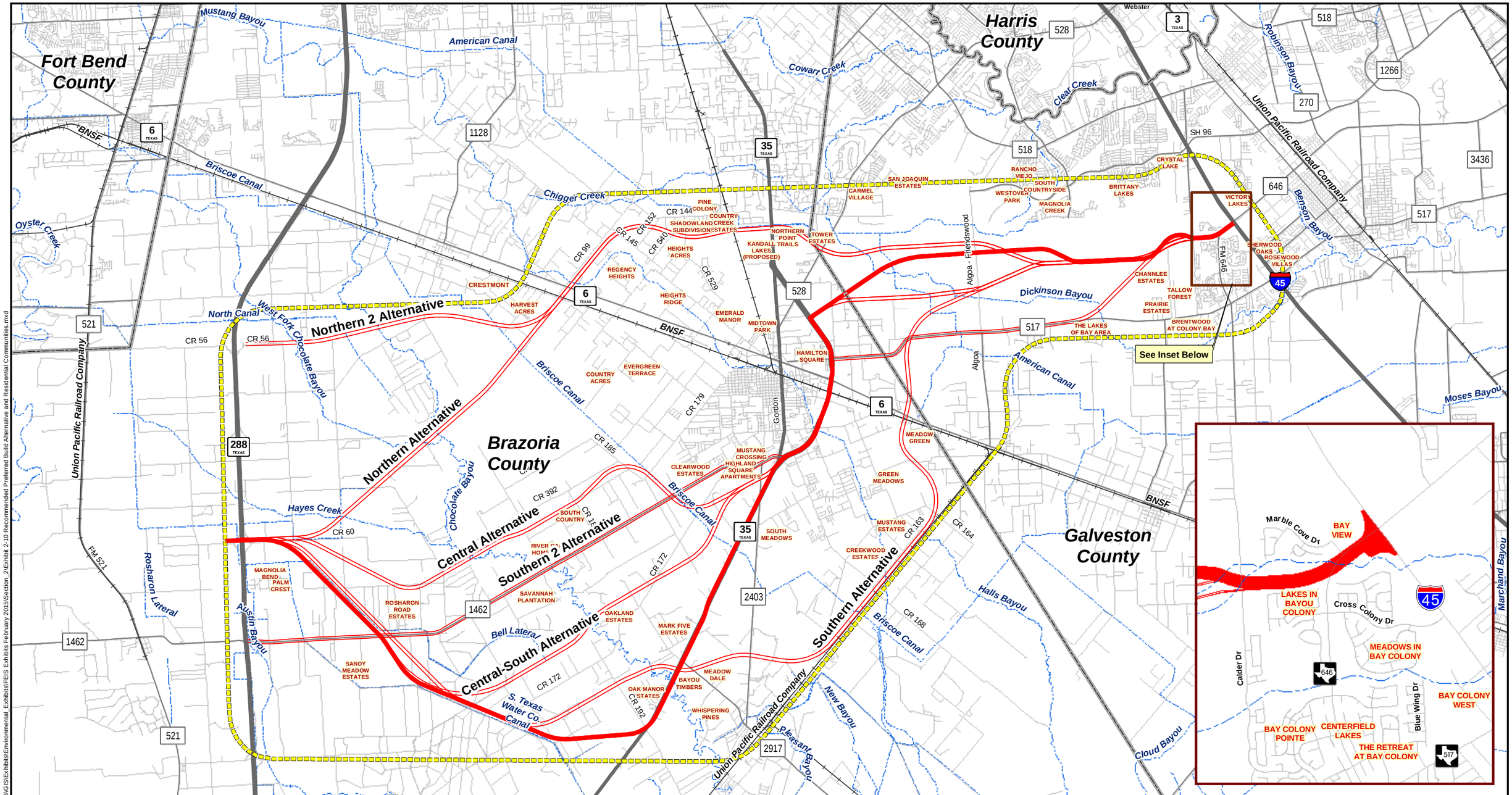
State Highway 99
Segment B
From SH 288 to IH 45 South

2035 Southern 2 Alternative
Traffic Operations

Exhibit 2-9

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-Seg B\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-10 Recommended Preferred Build Alternative and Residential Communities.mxd



Source:
Background - HGAC StarMap September 27, 2012

N

0 5,000 10,000 Feet

Legend

- County Boundaries
- Railroads
- Major Streams
- Proposed SH 99 Segment B Study Area
- South-New Alternative
- Alternatives

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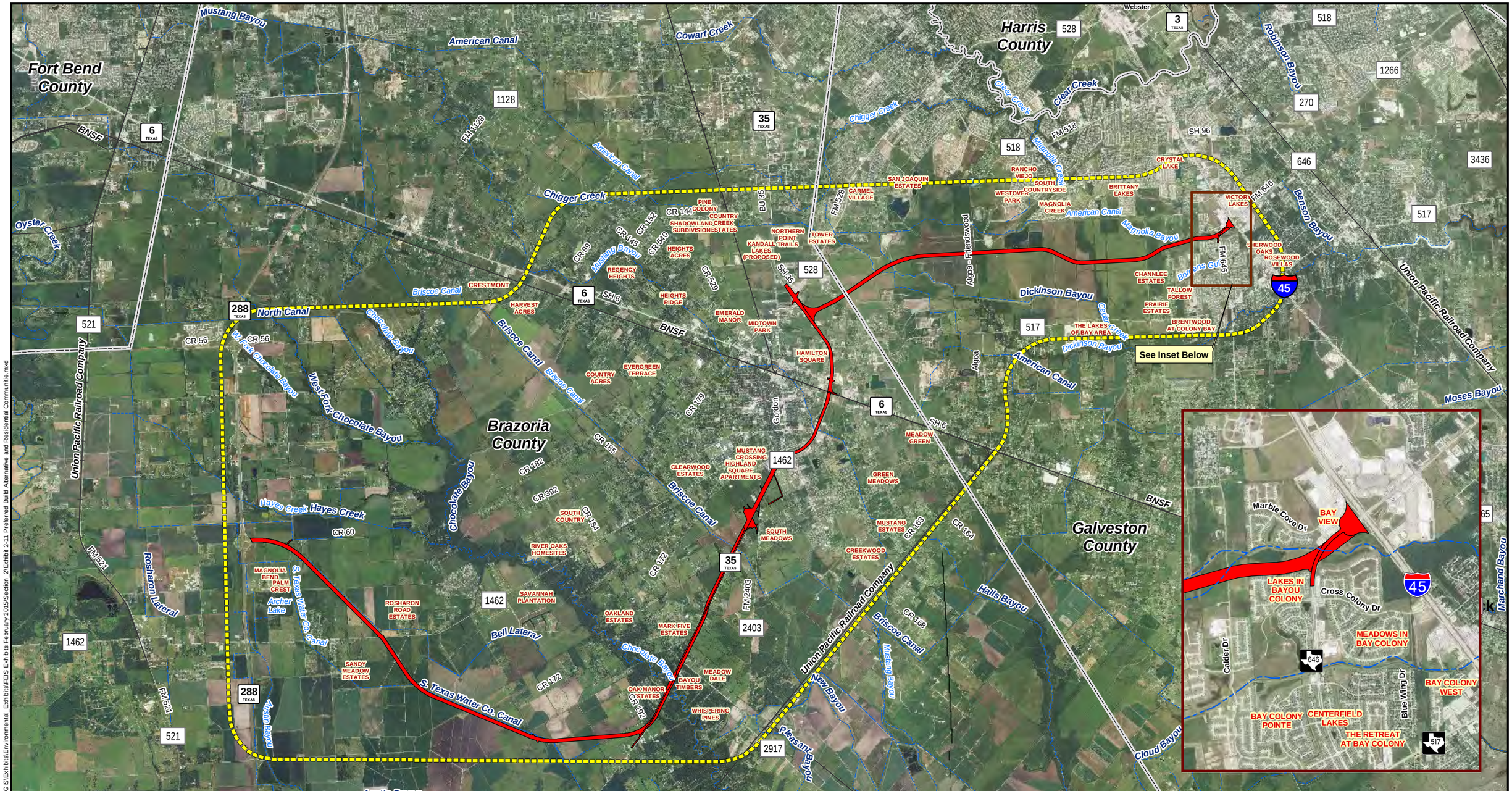
State Highway 99
Segment B
From SH 288 to IH 45 South

Recommended Preferred Build Alternative and Residential Communities

Exhibit 2-10

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-Seg B\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_2\Exhibit 2-11 Preferred Build Alternative and Residential Communitie.mxd



N

0 4,500 9,000 Feet

Legend

- County Boundaries
- Railroads
- Major Streams
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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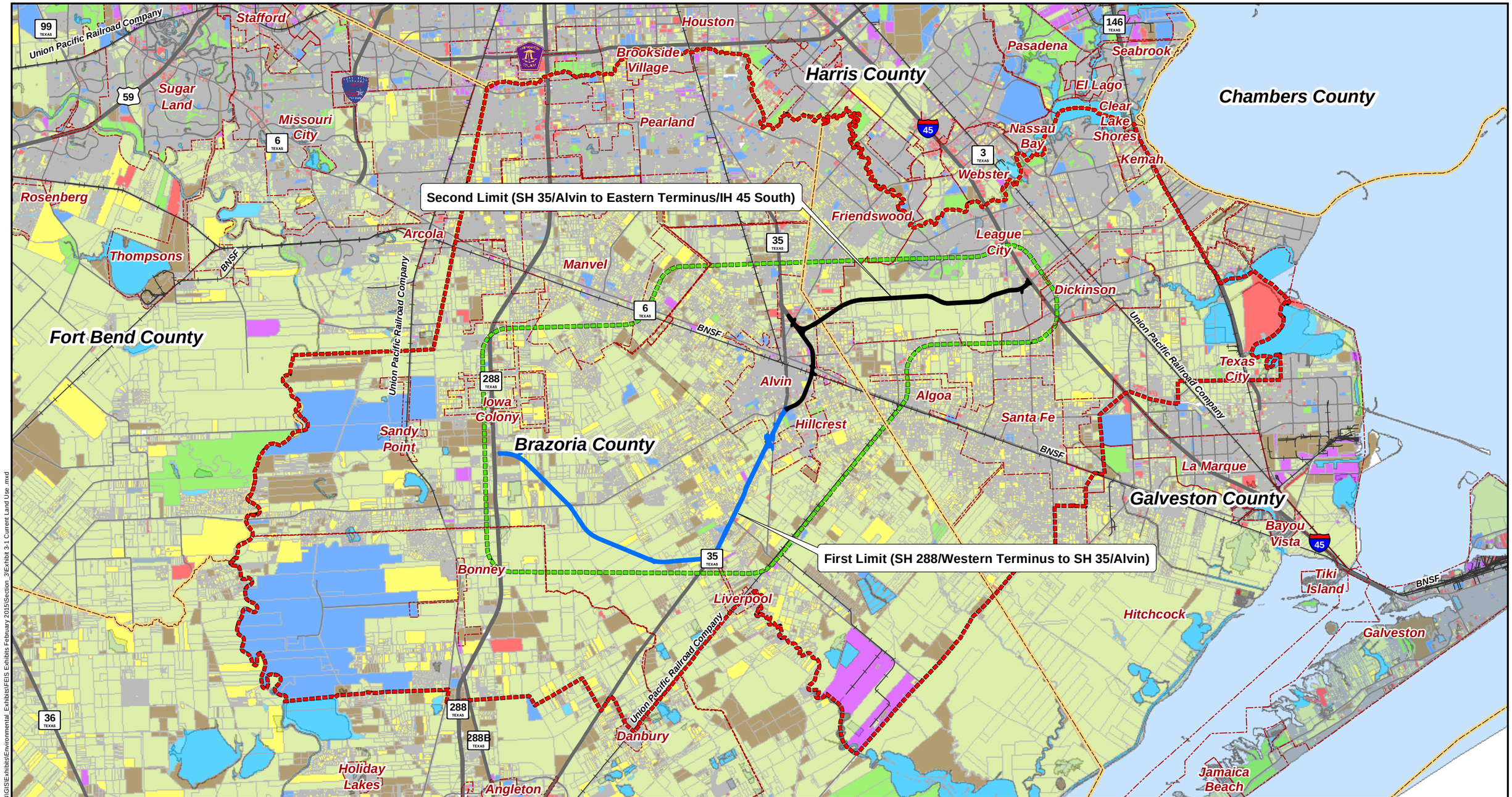
State Highway 99
Segment B
From SH 288 to IH 45 South

Preferred Build Alternative and Residential Communities

Exhibit 2-11



N

0 1.75 3.5 Miles

Legend

- Boundary of RAZs
- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area

Land Use Limits

- Second Limit
- First Limit

Current Land Use

- Commercial
- Government/Medical/Education
- Industrial
- Other
- Parks/Open Spaces
- Residential
- Undevelopable
- Unknown
- Vacant/Developable (includes farming)
- Water

Sources:
Background - HGAC StarMap September 27, 2012
Land Use - HGAC 2013

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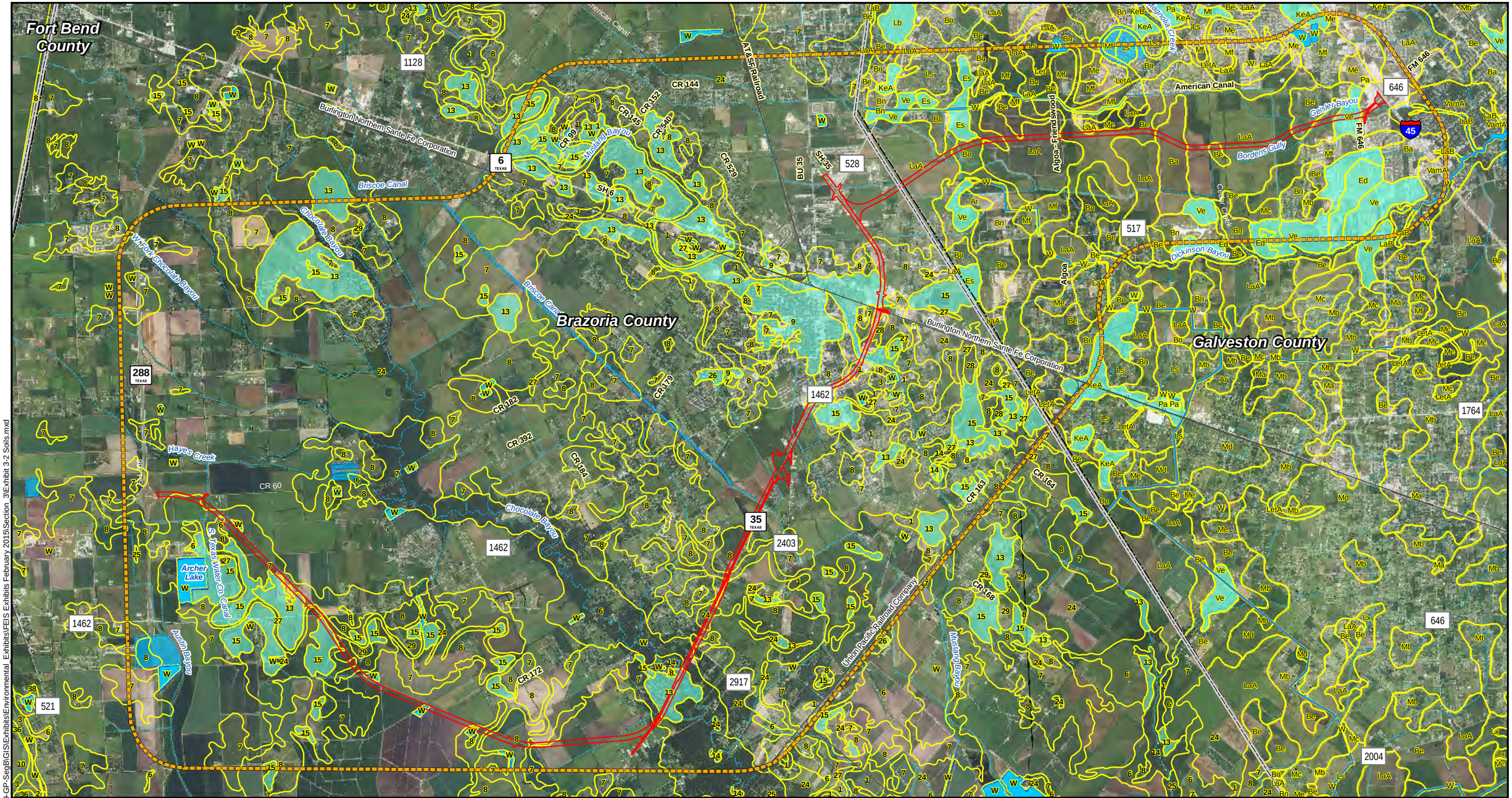
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Current Land Use

Exhibit 3-1

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-1 Current Land Use.mxd



Brazoria County Soil Legend

1	Aris fine sandy loam
3	Asa silty clay loam
6	Bacliff clay, 0 to 1 percent
7	Bernard clay
8	Bernard-Edna complex
9	Bernard-Urban land complex
13	Edna find sandy loam, 0 to 1 percent
14	Edna find sandy loam, 1 to 5 percent
15	Edna-Aris complex
24	Lake Charles clay, 2 to 5 percent slopes
25	Lake Charles clay, 1 to 8 percent slopes
26	Lake Charles-Urban land complex
27	Leton loam
28	Leton-Aris complex
29	Morey silt loam

Galveston County Soil Legend

Ar	Aris fine sandy loam
Ba	Bacliff clay
Be	Bernard clay loam
Bn	Bernard-Edna complex
Bu	Bernard-Urban land complex
Ed	Edna fine sandy loam
Es	Edna-Aris complex
KeA	Kemah silt loam, 0 to 1 percent slopes
KeB	Kemah silt loam, 1 to 3 percent slopes
LaA	Lake Charles clay, 0 to 1 percent slopes
LaB	Lake Charles clay, 2 to 5 percent slopes
Ls	Leton-Aris complex
Mb	Mocarey-Algoa complex
Mc	Mocarey-Cieno complex
Me	Morey silt loam
Mf	Morey-Leton complex
Pa	Pledger clay
Va	Vamont clay
Ve	Verland silty clay loam

N

0 4,000 8,000 Feet

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas
Soil Survey Geographic (SSURGO) database for Brazoria and Galveston Counties, Texas, 2012

Legend

- County Boundaries
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW
- Railroad
- Soil Mapping Unit Boundary
- Non-Prime Farmland Soils
- Streams / Rivers
- Water

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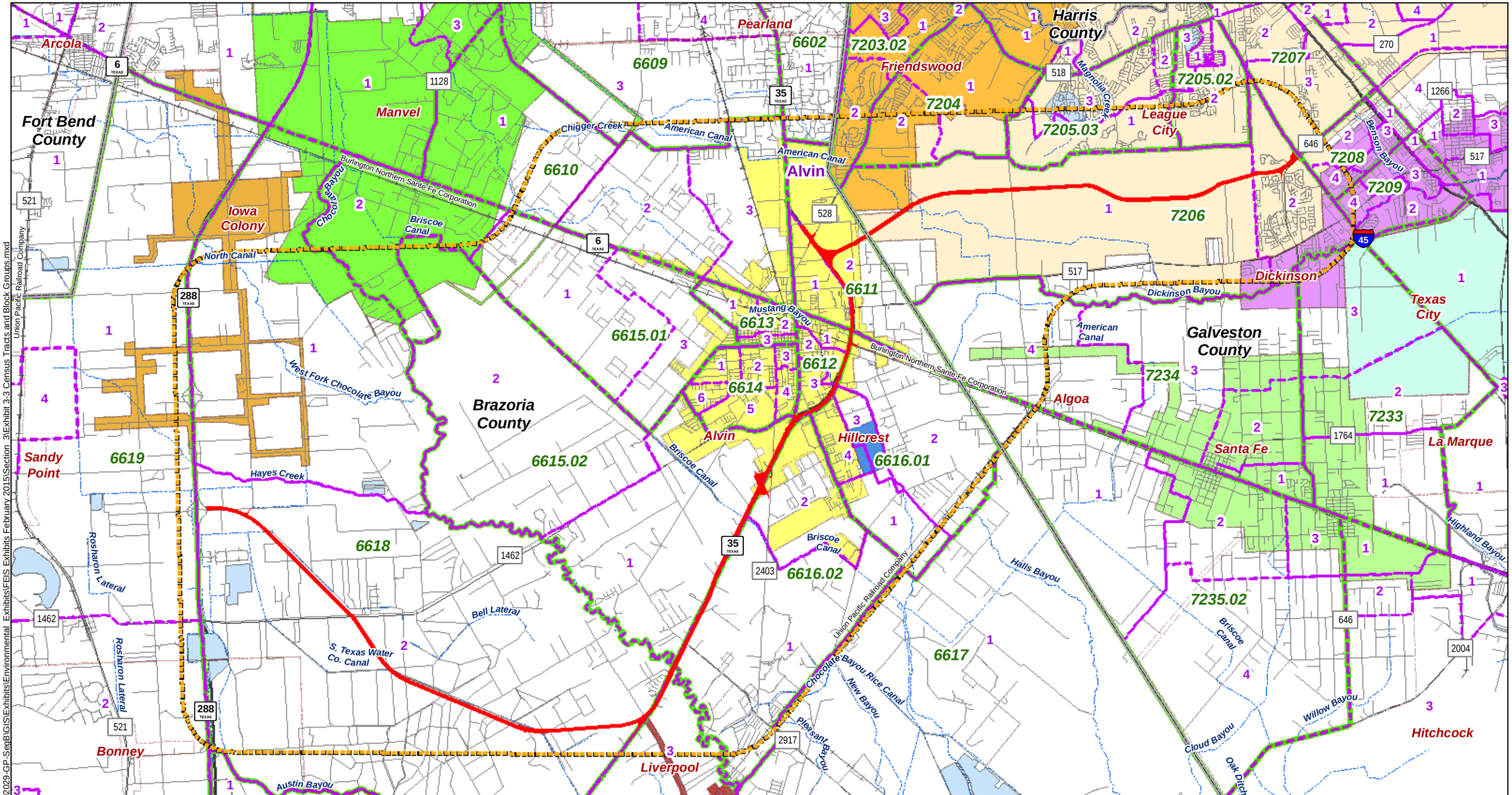
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Soils

Exhibit 3-2

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-Seg B\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-2 Soils.mxd



Path: P:\ TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental Exhibits\FEIS Exhibits February 2015\Section 3\Exhibit 3-3 Census Tracts and Block Groups.mxd

Union Pacific Railroad Company

N

0 4,500 9,000 Feet

Legend

- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW
- 000 Census Tracts
- 0 Block Groups
- Railroad
- Major Streams

Cities In Study Area

- Dickinson
- Friendswood
- Hillcrest
- Iowa Colony
- League City
- Liverpool
- Manvel
- Santa Fe
- Texas City
- Alivn

Sources:
Background - HGAC StarMap September 27, 2012
Census Bureau Census 2010
City Boundaries - Texas Strategic Mapping Program (StratMap) 2013

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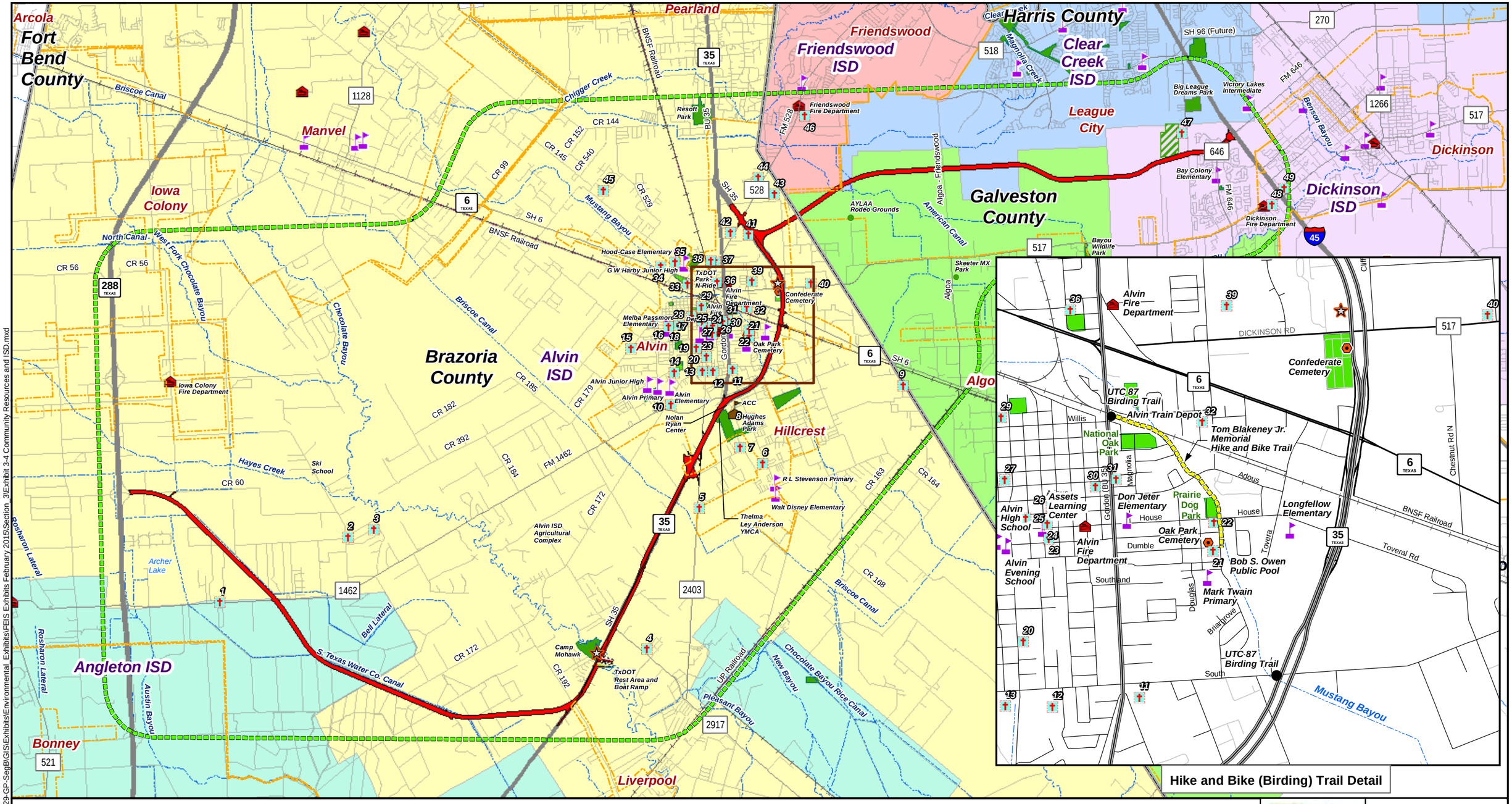
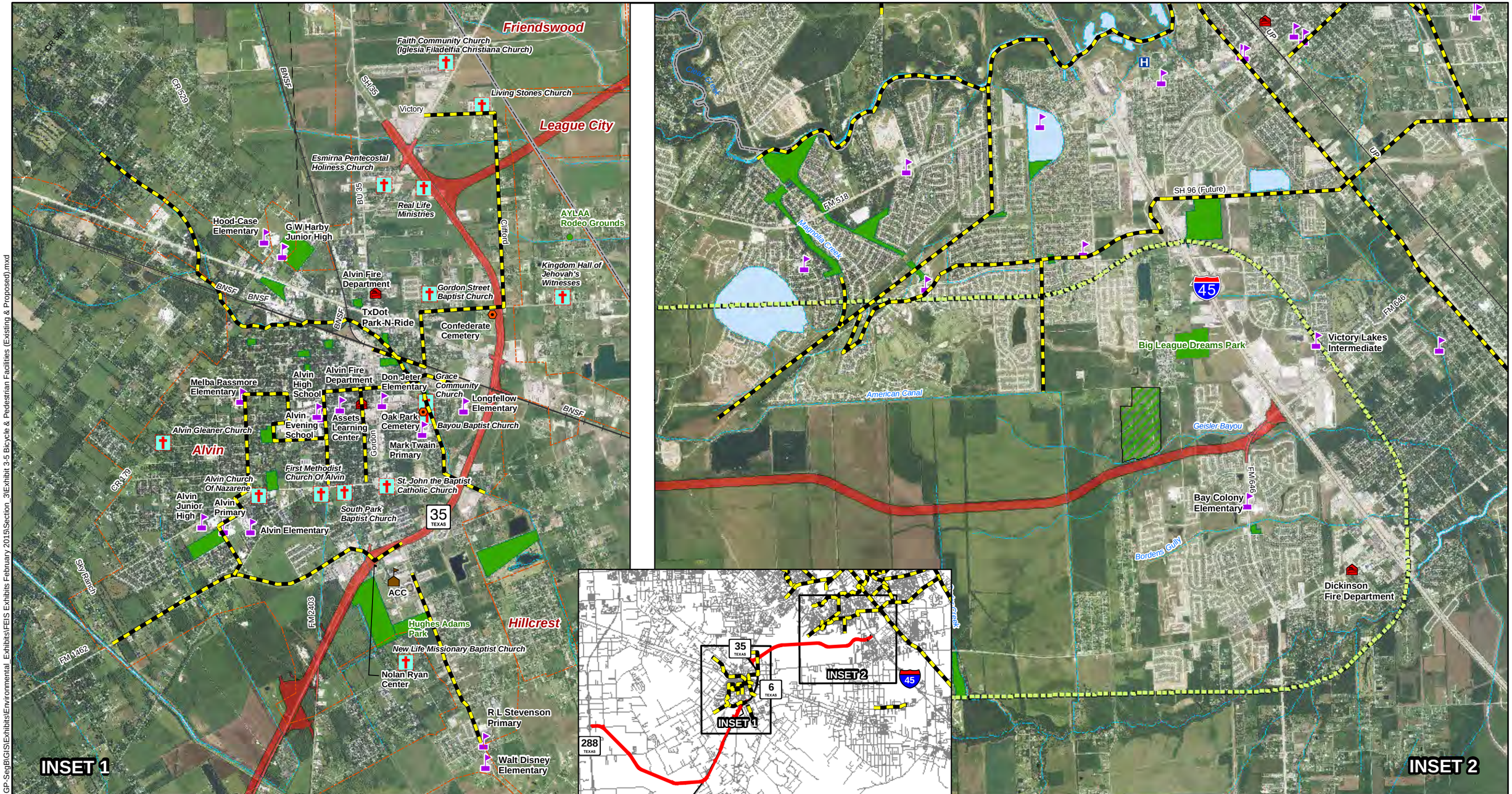
State Highway 99
Segment B
From SH 288 to IH 45 South

Census Tracts and Block Groups

Exhibit 3-3


Arcola
Fort Bend County
Pearland
Harris County
Friendswood
Friendswood ISD
Clear Creek ISD
League City
Galveston County
Dickinson
Dickinson ISD
Manvel
Iowa Colony
Brazoria County
Alvin
Alvin ISD
Algoa
Hillcrest
Angleton ISD
Bonney
Liverpool
Briscoe Canal
Chigger Creek
Mustang Bayou
Chocolate Bayou
Hayes Creek
Bell Lateral
Rosharon Lateral
Austin Bayou
Pleasant Bayou
New Bayou
Chocolate Bayou Rice Canal
Algoa - Friendswood
American Canal
Magnolia Creek
Benson Bayou
S. Texas Water Co. Canal
UP Railroad
BNSF Railroad
SH 96 (Future)
Resort Park
Friendswood Fire Department
Big League Dreams Park
Victory Lakes Intermediate
Bay Colony Elementary
Dickinson Fire Department
AYLAA Rodeo Grounds
Bayou Wildlife Park
Skeeter MX Park
Hood-Case Elementary
G W Harby Junior High
TxDOT Park-N-Ride
Alvin Fire Department
Confederate Cemetery
Melba Passmore Elementary
Oak Park Cemetery
Alvin Junior High
Alvin Primary
Alvin Elementary
Nolan Ryan Center
Iowa Colony Fire Department
Hughes Adams Park
ACC
R L Stevenson Primary
Walt Disney Elementary
Thelma Ley Anderson YMCA
Alvin ISD Agricultural Complex
Ski School
Archer Lake
Camp Mohawk
TxDOT Rest Area and Boat Ramp
Hike and Bike (Birding) Trail Detail
Alvin Fire Department
Confederate Cemetery
UTC 87 Birding Trail
Alvin Train Depot
Tom Blakeney Jr. Memorial Hike and Bike Trail
National Oak Park
Prairie Dog Park
Don Jeter Elementary
Assets Learning Center
Alvin High School
Alvin Fire Department
Oak Park Cemetery
Longfellow Elementary
Bob S. Owen Public Pool
Alvin Evening School
Mark Twain Primary
UTC 87 Birding Trail
Mustang Bayou
DICKINSON RD
Willis
House
Dumble
Southland
South
Adous
Toveral Rd
BNSF Railroad
Chestnut Rd N
Magnolia
Douglas
Briarbrove
Topera
Cliff
Gordon (BU 35)
Algoa
Clear Creek
N
W
E
S
0
4,500
9,000
Feet
Legend
County Boundaries
City Limits
Proposed SH 99 Segment B Study Area
Proposed SH 99 Segment B ROW
Railroad
Major Streams
City-Owned Land
Park/Recreation Area
Church
Historical Marker
Boat Ramp
Cemetery
School
College
Fire Station
Alvin ISD
Angleton ISD
Clear Creek ISD
Dickinson ISD
Friendswood ISD
Santa Fe ISD
Sources:
Background - HGAC StarMap September 27, 2012
Texas Education Agency, 2013
The Grand Parkway Association
Texas Department of Transportation
© 2014
State Highway 99
Segment B
From SH 288 to IH 45 South
Community Resources and Independent School Districts
Exhibit 3-4
Church names and addresses can be found in Section 3 of the FEIS document.
Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-4 Community Resources and ISD.mxd



N
W E
S

0 2,000 4,000
Feet

Legend

- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW
- Bicycle & Pedestrian Facilities (Existing & Proposed)
- School
- Hospital
- Fire Station
- Cemetery
- College
- Church
- City-Owned Land
- Park/Recreation Area
- Streams / Rivers
- Railroads

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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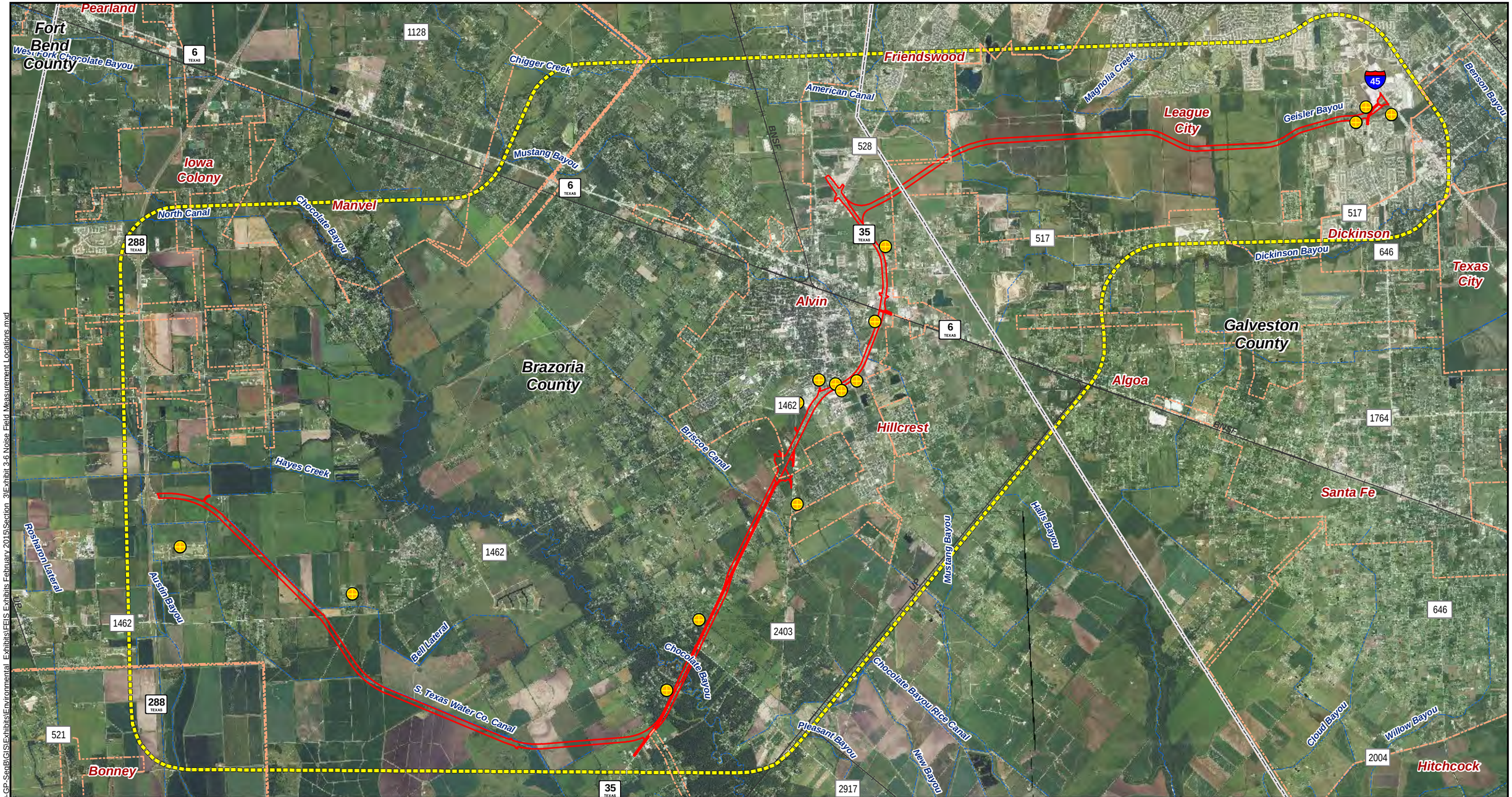
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Bicycle & Pedestrian Facilities (Existing & Proposed)

Exhibit 3-5

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-5 Bicycle & Pedestrian Facilities (Existing & Proposed).mxd



Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Noise Field Measurement Locations

Exhibit 3-6

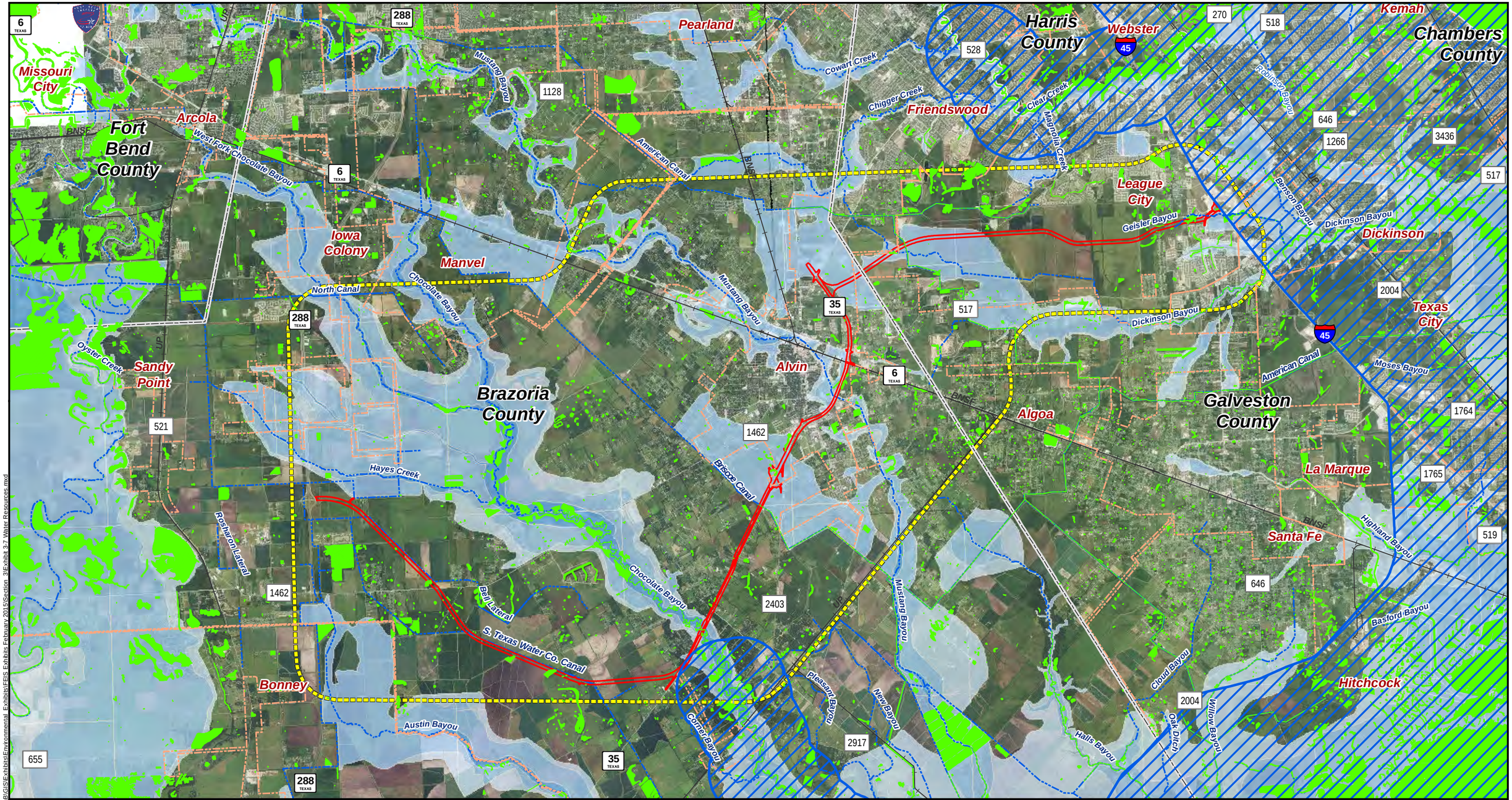
N

0 4,000 8,000 Feet

LEGEND

- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW
- Railroads
- Major Streams
- Noise Field Measurements

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SteB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-6 Noise Field Measurement Locations.mxd



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Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas
Flood Data from FEMA, Q3 Data

N

0 5,000 10,000 Feet

LEGEND

- County Boundaries
- City Limits
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW
- Railroads
- Major Streams
- National Wetlands Iventory
- Coastal Zone Boundary

FEMA Flood Zones

- Effective Floodway
- Effective 100-Yr Floodplain
- Effective 500-Yr Floodplain

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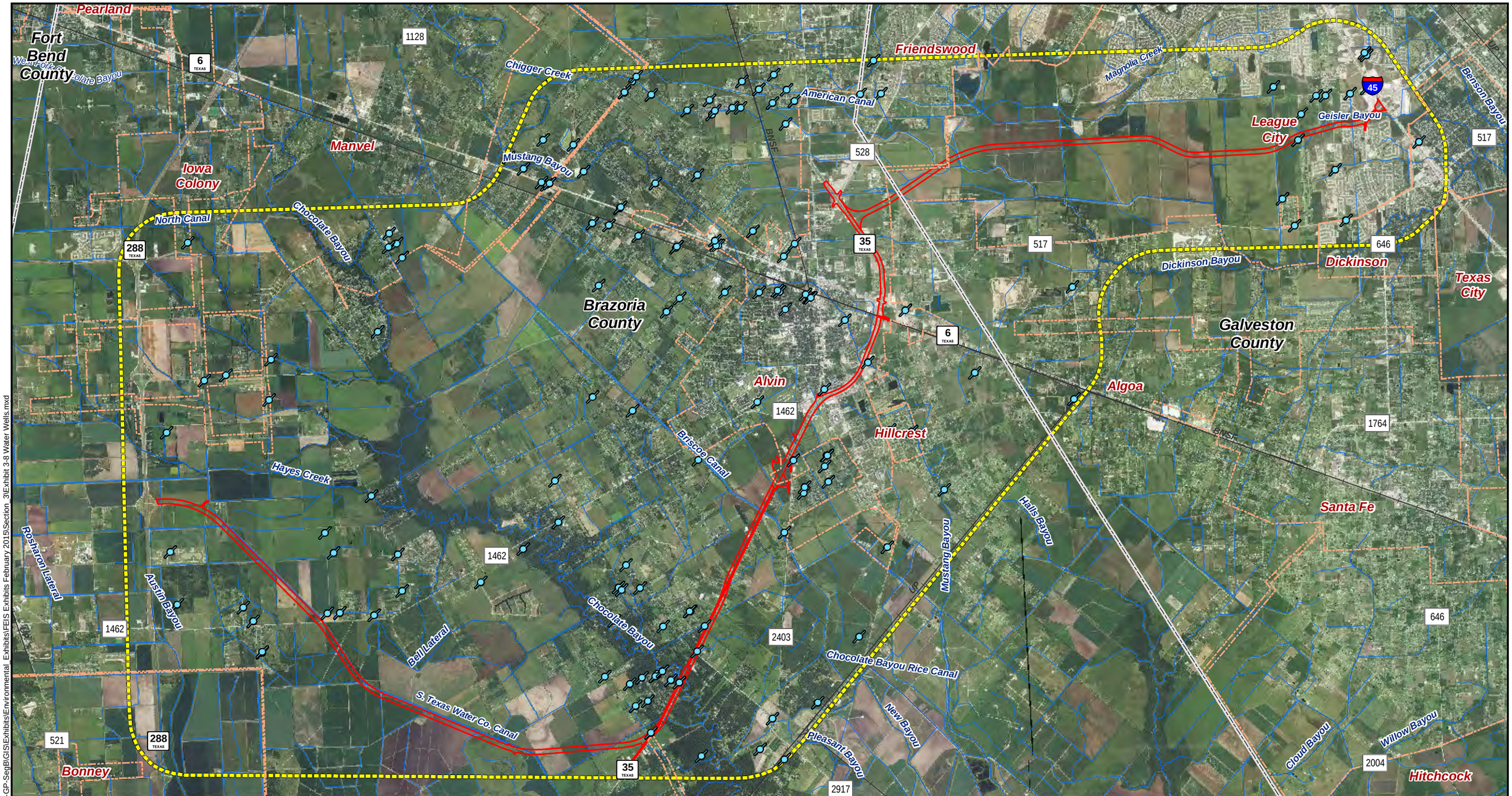
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Water Resources

Exhibit 3-7



LEGEND

- County Boundaries
- Major Streams
- City Limits
- Proposed SH 99 Segment B Study Area
- Proposed SH 99 Segment B ROW
- Railroads
- Channels
- Wells

N

0 4,000 8,000 Feet

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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State Highway 99
Segment B
From SH 288 to IH 45 South

Water Wells

Exhibit 3-8

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-8 Water Wells.mxd

Chocolate Bayou

Hayes Creek

288 TEXAS

Brazoria County

Bell Lateral

1462

So. Texas Water Co. Canal

Rosharon Lateral

Austin Bayou

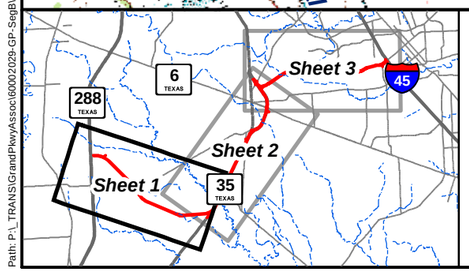
1462

288 TEXAS

521

Rosharon Lateral

35 TEXAS



N

0 1,750 3,500 Feet

LEGEND

County Boundaries

Proposed SH 99 Segment B Study Area

Preferred Alternative

USGS Quadrangle Maps
Algoa, Texas, 1974
Dickinson, Texas, 1974
Juliff, Texas, 1974
Liverpool, Texas, 1974
Manvel, Texas, 1974
Rosharon, Texas, 1974

The Grand Parkway Association

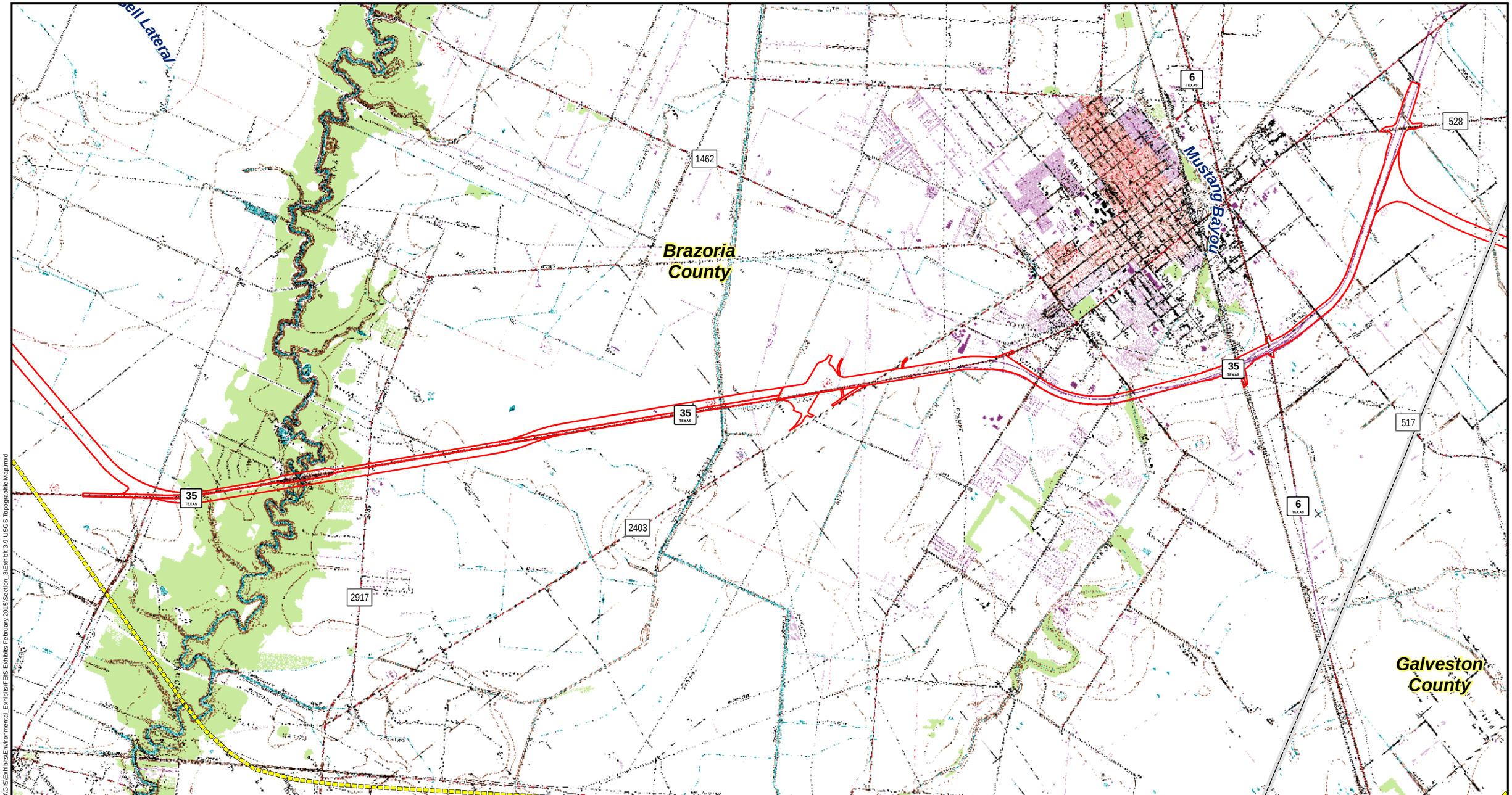
Texas Department of Transportation © 2014

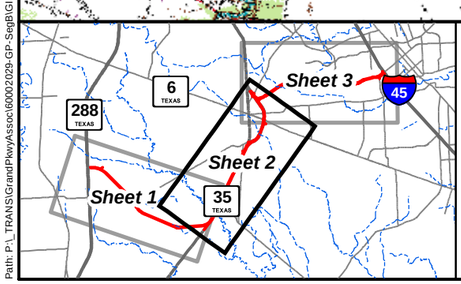
State Highway 99
Segment B
From SH 288 to IH 45 South

USGS Topographic Map

Exhibit 3-9, Sheet 1

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-9 USGS Topographic Map.mxd





N

0 1,750 3,500 Feet

LEGEND

- County Boundaries
- Proposed SH 99 Segment B Study Area
- Preferred Alternative

USGS Quadrangle Maps
Algoa, Texas, 1974
Dickinson, Texas, 1974
Juliff, Texas, 1974
Liverpool, Texas, 1974
Manvel, Texas, 1974
Rosharon, Texas, 1974

The Grand Parkway Association

Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

USGS Topographic Map

Exhibit 3-9, Sheet 2

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-9 USGS Topographic Map.mxd

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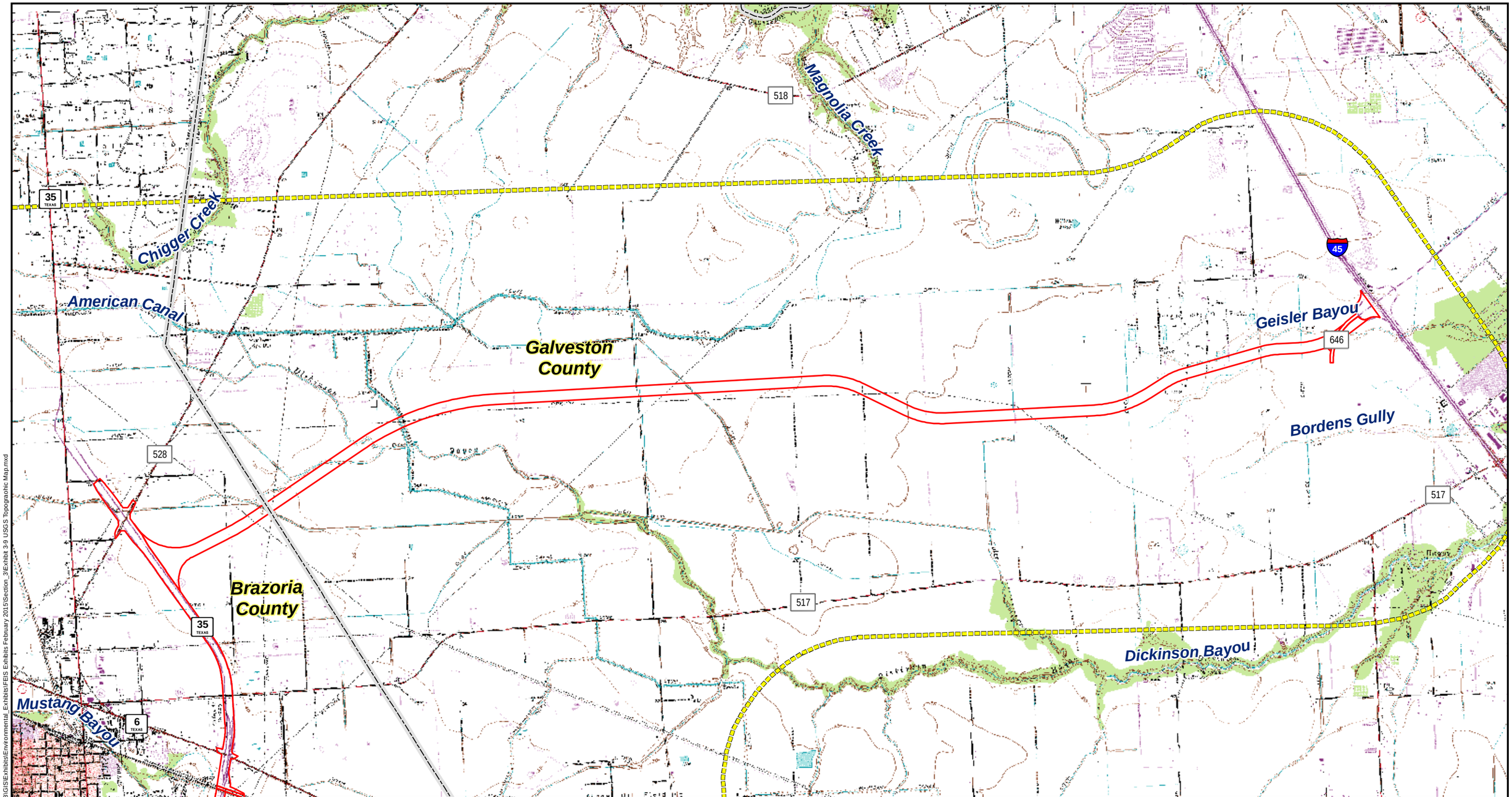

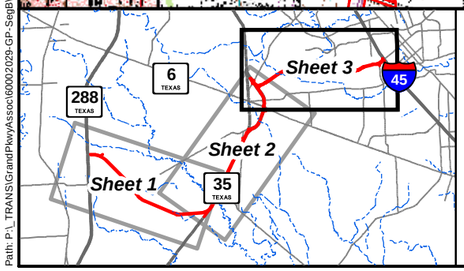

N

0 1,750 3,500 Feet

LEGEND

County Boundaries

Proposed SH 99 Segment B Study Area

Preferred Alternative

USGS Quadrangle Maps
Algoa, Texas, 1974
Dickinson, Texas, 1974
Juliff, Texas, 1974
Liverpool, Texas, 1974
Manvel, Texas, 1974
Rosharon, Texas, 1974

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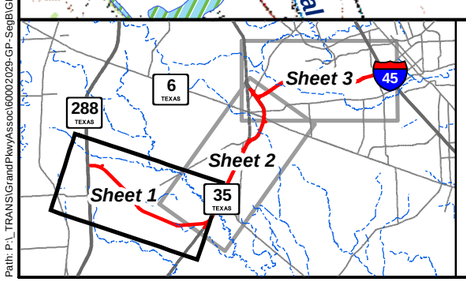
State Highway 99
Segment B
From SH 288 to IH 45 South

USGS Topographic Map

Exhibit 3-9, Sheet 3

Chocolate Bayou
Hayes Creek
Brazoria County
Bell Lateral
PSS1CX
PFO1A
PFO1A
PEM1C
1
So. Texas Water Co. Canal
PEM1Cx
PEM1A
PUBFx
PUBFx
PEM1A
PEM1A
Rosharon Lateral
Austin Bayou
Rosharon Lateral
288
1462
1462
288
521
35
N
0 1,750 3,500 Feet



U.S. Fish and Wildlife Service Cowardin et al. 1979 NWI Classifications

PEM1A	Palustrine Emergent Persistent Temporarily Flooded
PEM1C	Palustrine Emergent Persistent Seasonally Flooded
PEM1Cx	Palustrine Emergent Persistent Seasonally Flooded Excavated
PFO1A	Palustrine Forested Broad-Leaved Deciduous Temporarily Flooded
PSS1A	Palustrine Scrub-Shrub Broad-Leaved Deciduous Temporarily Flooded
PSS1Cx	Palustrine Scrub-Shrub Broad-Leaved Deciduous Seasonally Flooded Excavated
PUBFx	Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated
PUSCx	Palustrine Unconsolidated Shore Seasonally Flooded
R1UBV	Riverine Tidal Unconsolidated Bottom Permanently Flooded-Tidal
R2UBHx	Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded Excavated

LEGEND

- County Boundaries
- Proposed SH 99 Segment B Study Area
- Preferred Alternative
- Major Streams
- USFWS National Wetlands Inventory
- NWI in Proposed ROW

Source: NWI - USFWS July 26, 2012
USGS Quadrangle Maps
Algoa, Texas, 1974
Dickinson, Texas, 1974
Juliff, Texas, 1974
Liverpool, Texas, 1974
Manvel, Texas, 1974
Rosharon, Texas, 1974

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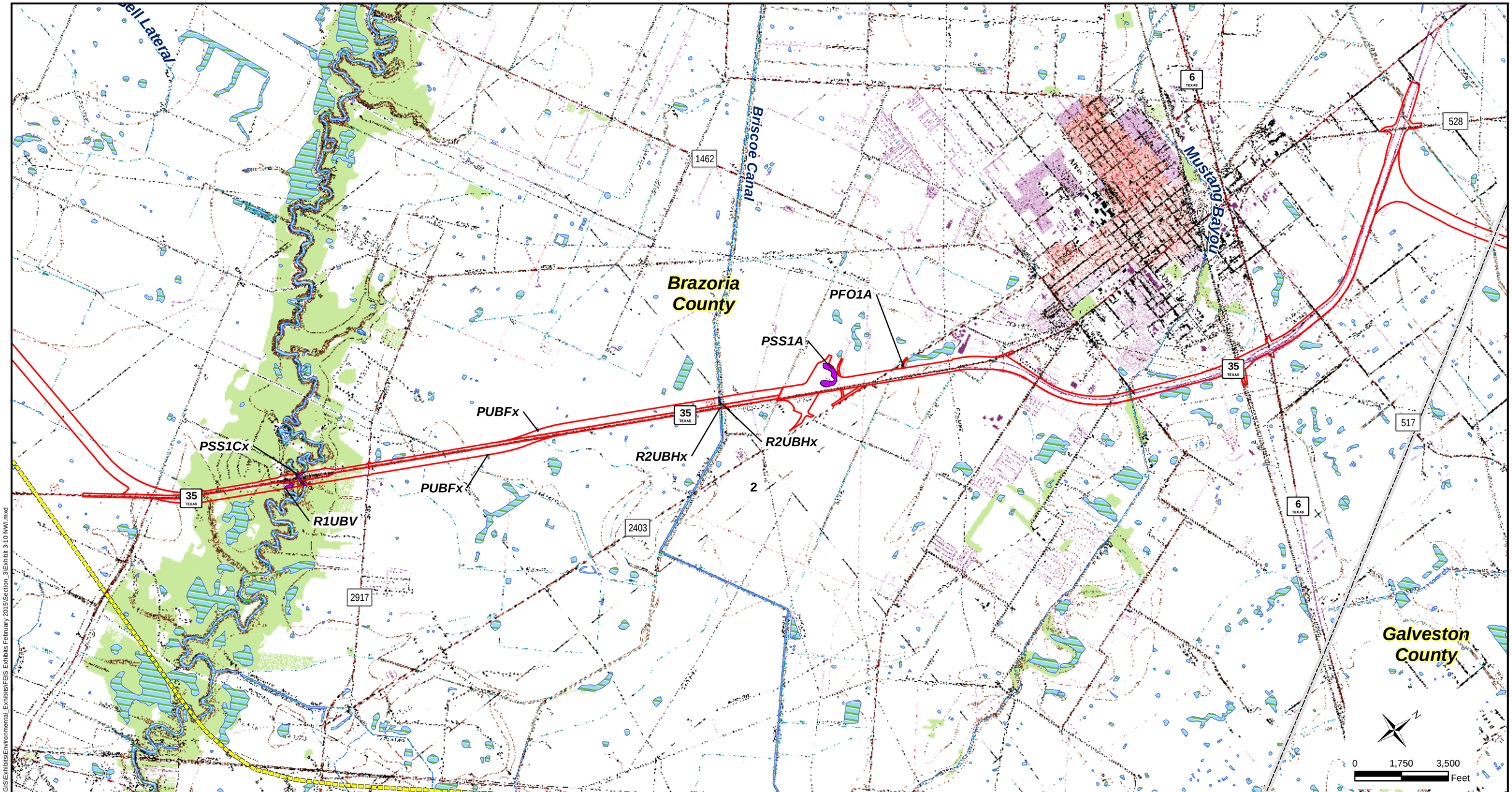
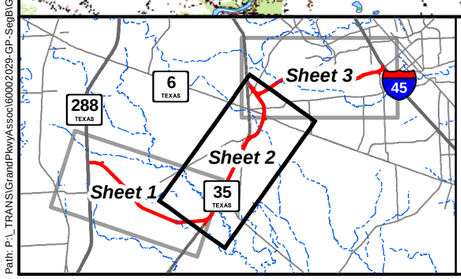
State Highway 99
Segment B
From SH 288 to IH 45 South

National Wetlands Inventory Map

Exhibit 3-10, Sheet 1

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-10 NWI.mxd





U.S. Fish and Wildlife Service Cowardin et al. 1979 NWI Classifications

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PUBFx	Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated
PUSCx	Palustrine Unconsolidated Shore Seasonally Flooded
R1UBV	Riverine Tidal Unconsolidated Bottom Permanently Flooded-Tidal
R2UBHx	Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded Excavated

LEGEND

- County Boundaries
- Proposed SH 99 Segment B Study Area
- Preferred Alternative
- Major Streams
- USFWS National Wetlands Inventory
- NWI in Proposed ROW

Source: NWI - USFWS July 26, 2012
USGS Quadrangle Maps
Algoa, Texas, 1974
Dickinson, Texas, 1974
Juliff, Texas, 1974
Liverpool, Texas, 1974
Manvel, Texas, 1974
Rosharon, Texas, 1974

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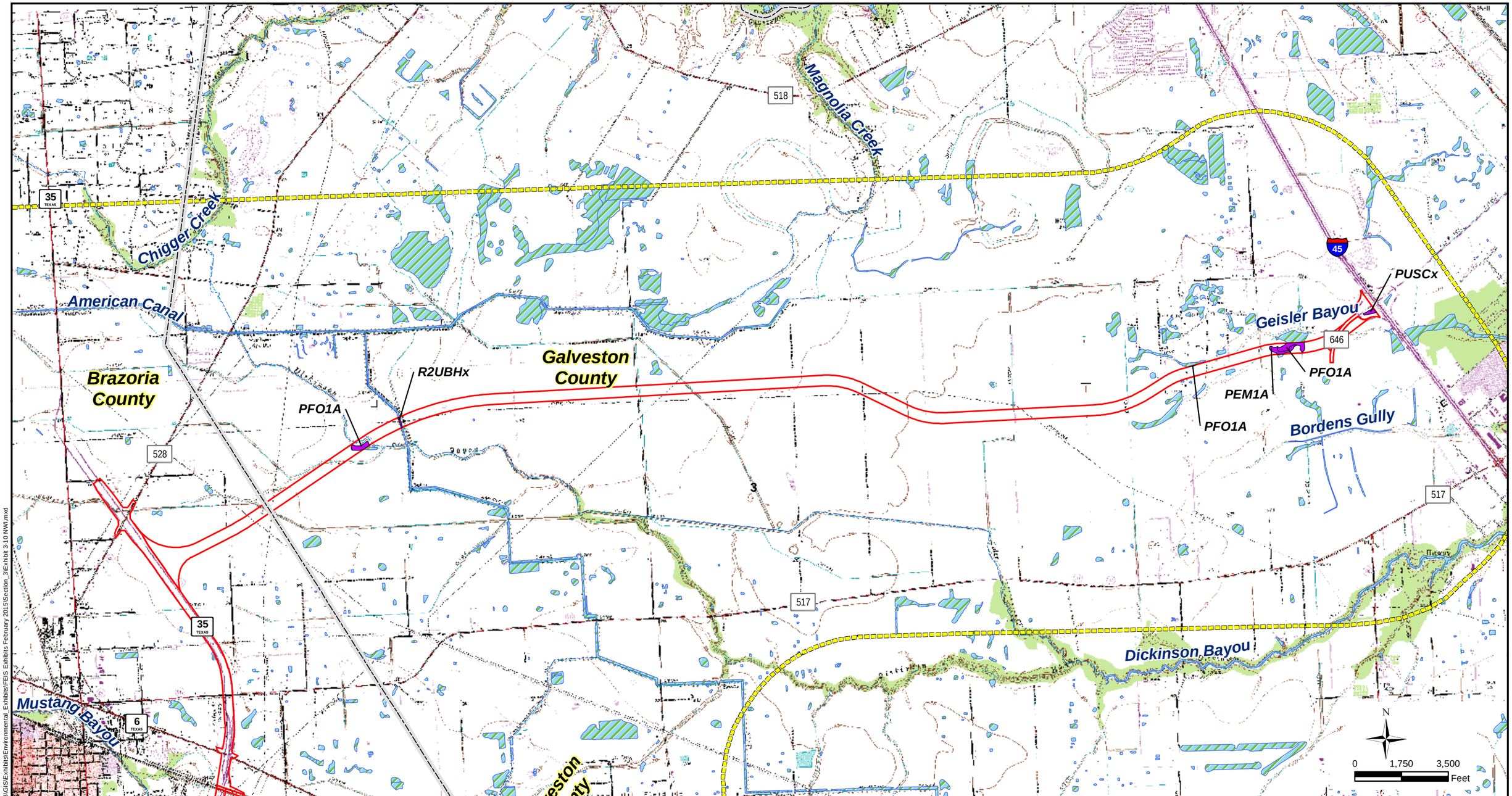
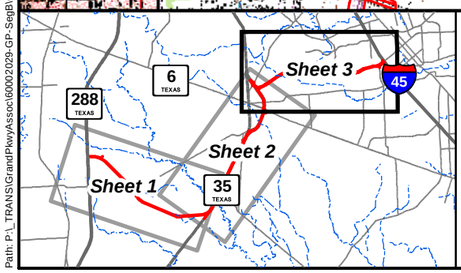
State Highway 99
Segment B
From SH 288 to IH 45 South

National Wetlands Inventory Map

Exhibit 3-10, Sheet 2

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SepB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-10 NWI.mxd





U.S. Fish and Wildlife Service Cowardin et al. 1979 NWI Classifications

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PSS1Cx	Palustrine Scrub-Shrub Broad-Leaved Deciduous Seasonally Flooded Excavated
PUBFx	Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated
PUSCx	Palustrine Unconsolidated Shore Seasonally Flooded
R1UBV	Riverine Tidal Unconsolidated Bottom Permanently Flooded-Tidal
R2UBHx	Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded Excavated

LEGEND

- County Boundaries
- Proposed SH 99 Segment B Study Area
- Preferred Alternative
- Major Streams
- USFWS National Wetlands Inventory
- NWI in Proposed ROW

Source: NWI - USFWS July 26, 2012
USGS Quadrangle Maps
Algoa, Texas, 1974
Dickinson, Texas, 1974
Juliff, Texas, 1974
Liverpool, Texas, 1974
Manvel, Texas, 1974
Rosharon, Texas, 1974

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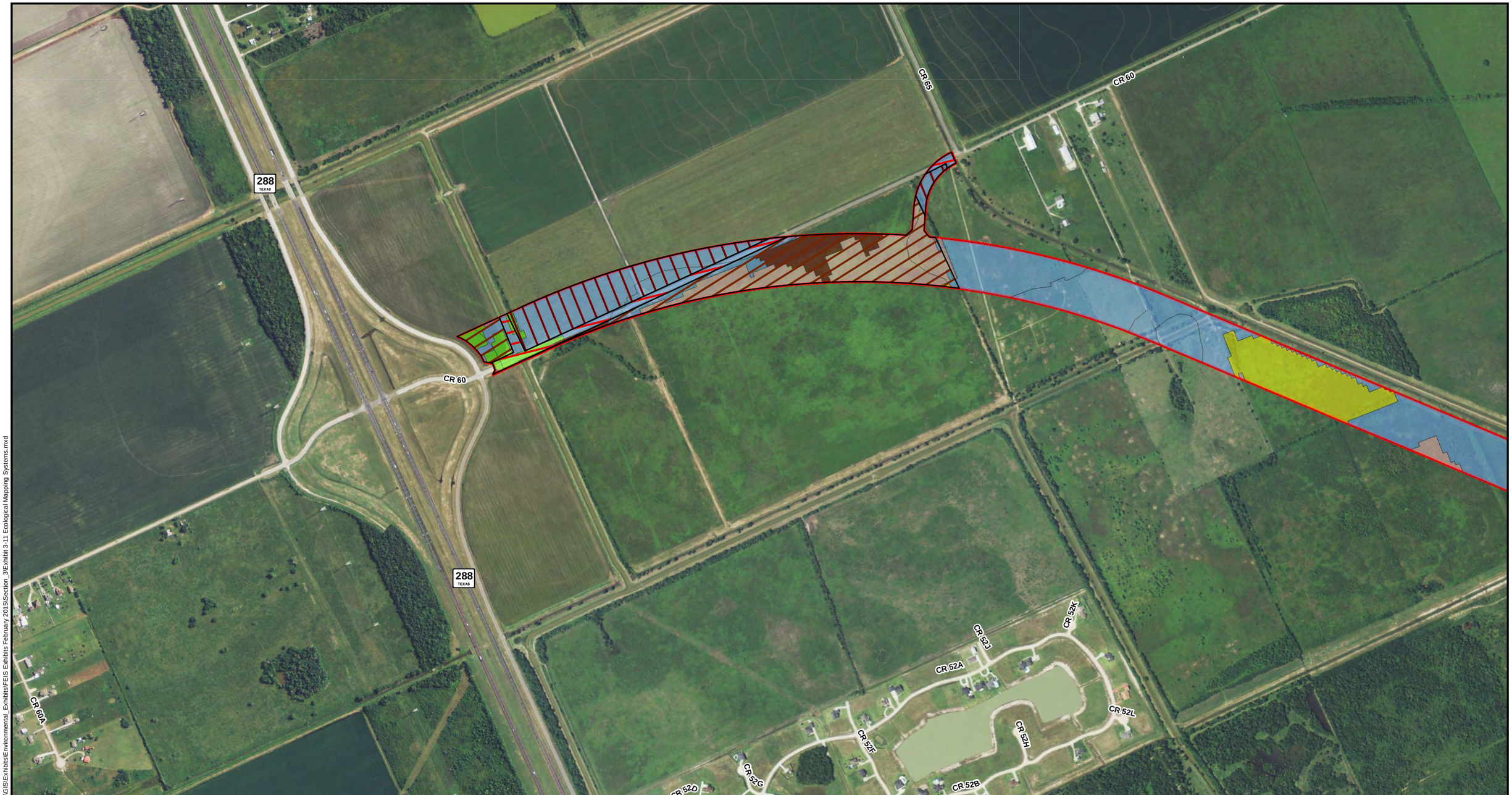
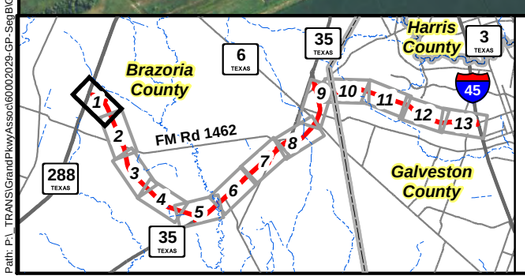
State Highway 99
Segment B
From SH 288 to IH 45 South

National Wetlands Inventory Map

Exhibit 3-10, Sheet 3

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-Sep\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-10 NWI.mxd





LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
- Post Oak Savanna
- Riparian
- Tidal and Salt Marsh
- Urban

EMST Field Verified
TxDOT/TPWD MOU
- Agriculture
- Disturbed Prairie
- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

N E S W

0 400 800 Feet

The Grand Parkway Association

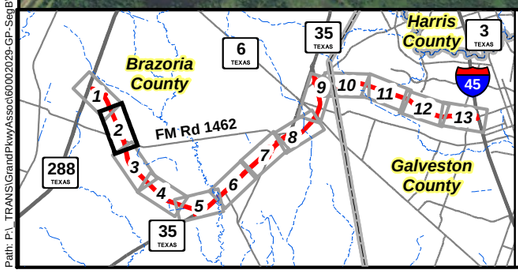
Texas Department of Transportation © 2014

State Highway 99
Segment B
From SH 288 to IH 45 South

Ecological Mapping Systems of Texas

Exhibit 3-11, Sheet 1

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SegB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-11 Ecological Mapping Systems.mxd



LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
- Post Oak Savanna
- Riparian
- Tidal and Salt Marsh
- Urban

EMST Field Verified
TxDOT/TPWD MOU
- Agriculture
- Disturbed Prairie
- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

N E S W

0 400 800 Feet

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Texas Department of Transportation
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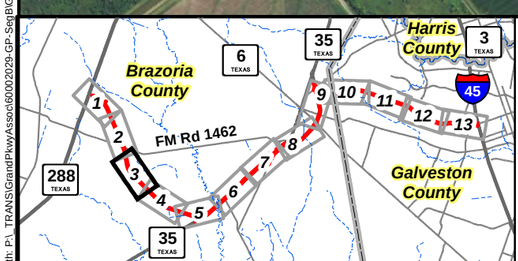
State Highway 99
Segment B
From SH 288 to IH 45 South

Ecological Mapping Systems of Texas

Exhibit 3-11, Sheet 2

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-Sep\BG\S\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-11 Ecological Mapping Systems.mxd



LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
- Post Oak Savanna
- Riparian
- Tidal and Salt Marsh
- Urban

EMST Field Verified
TxDOT/TPWD MOU
- Agriculture
- Disturbed Prairie
- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

N E S W

0 400 800 Feet

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Texas Department of Transportation
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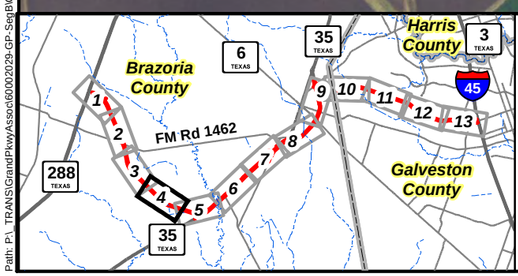
State Highway 99
Segment B
From SH 288 to IH 45 South

Ecological Mapping Systems of Texas

Exhibit 3-11, Sheet 3

Path: P:_TRANS\GrandPkwyAssoc\60002029-GP-SepB\GIS\Exhibits\Environmental_Exhibits\FEIS Exhibits February 2015\Section_3\Exhibit 3-11 Ecological Mapping Systems.mxd



LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
- Post Oak Savanna
- Riparian
- Tidal and Salt Marsh
- Urban

EMST Field Verified
TxDOT/TPWD MOU
- Agriculture
- Disturbed Prairie
- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

N
W E
S

0 400 800
Feet

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State Highway 99
Segment B
From SH 288 to IH 45 South

Ecological Mapping Systems of Texas

Exhibit 3-11, Sheet 4

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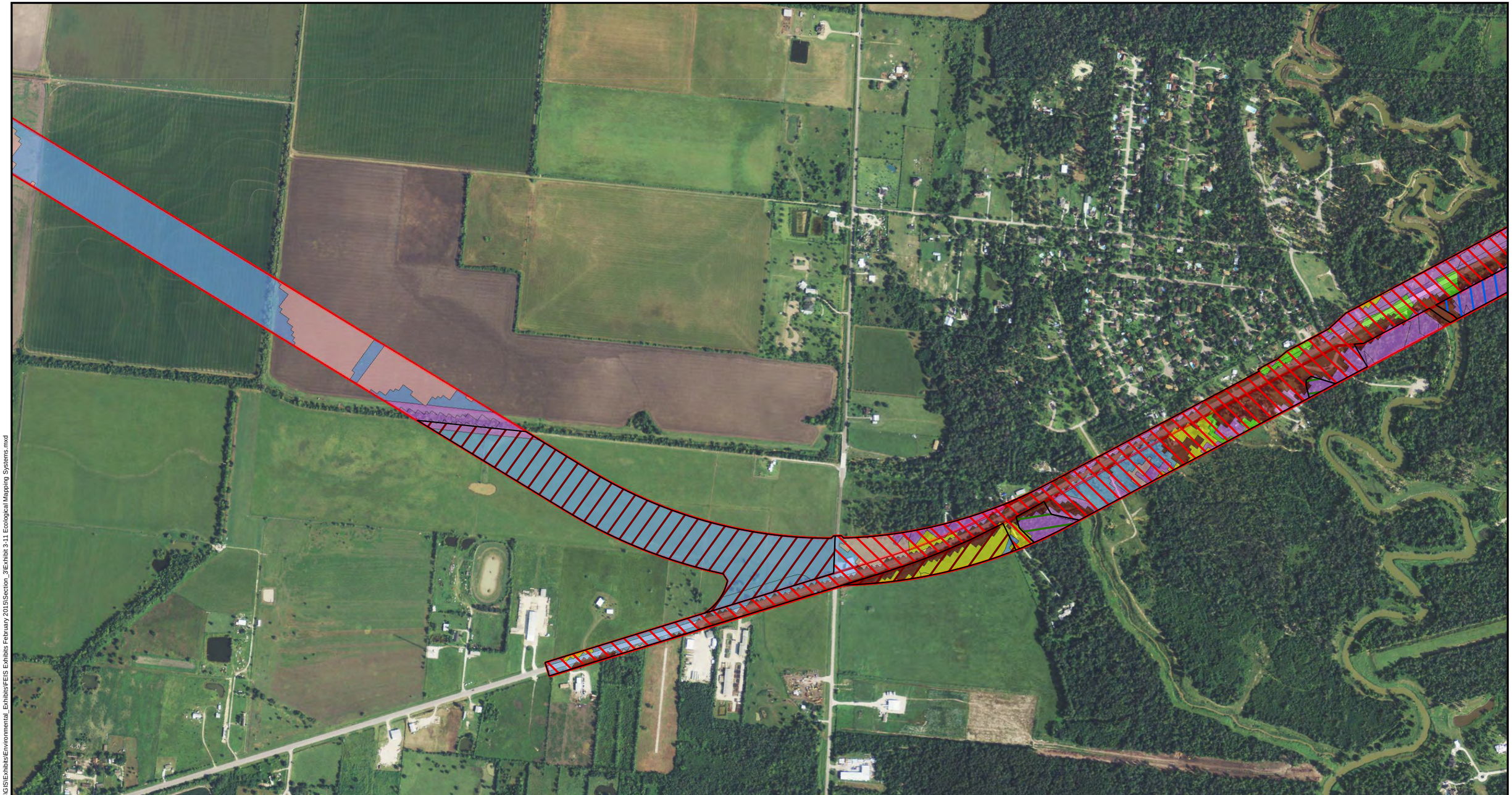

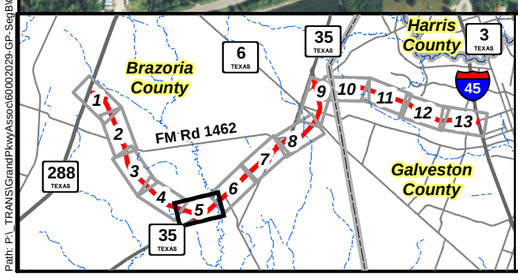

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
- Post Oak Savanna
- Riparian
- Tidal and Salt Marsh
- Urban

EMST Field Verified
TxDOT/TPWD MOU
- Agriculture
- Disturbed Prairie
- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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Segment B
From SH 288 to IH 45 South

Ecological Mapping Systems of Texas

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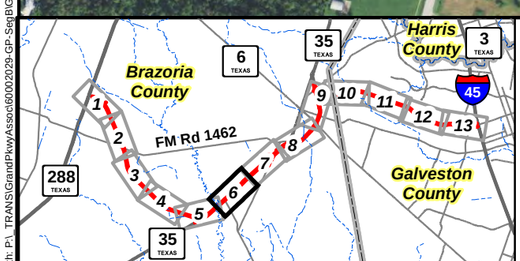

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
- Post Oak Savanna
- Riparian
- Tidal and Salt Marsh
- Urban

EMST Field Verified
TxDOT/TPWD MOU
- Agriculture
- Disturbed Prairie
- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
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Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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From SH 288 to IH 45 South

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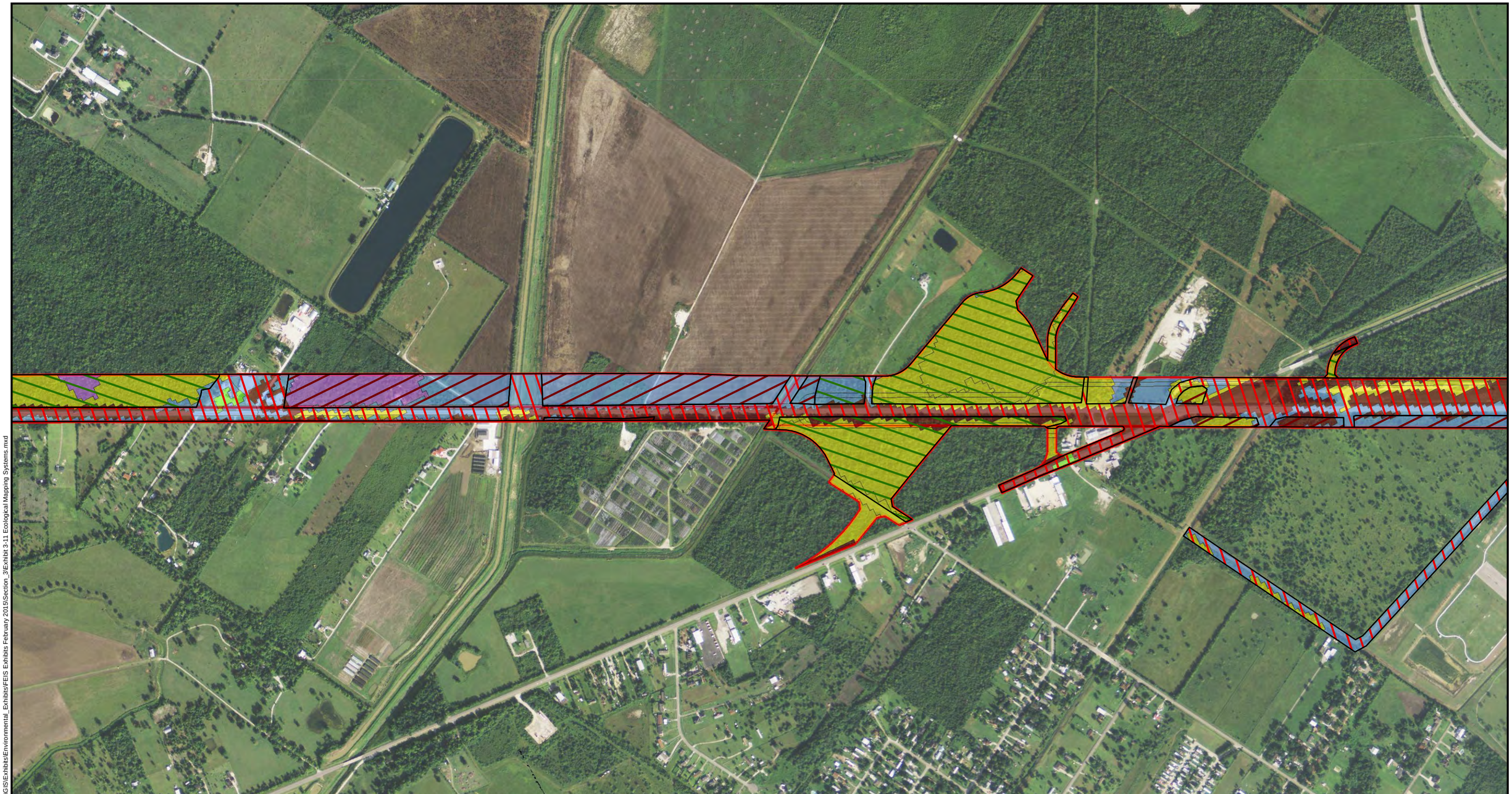

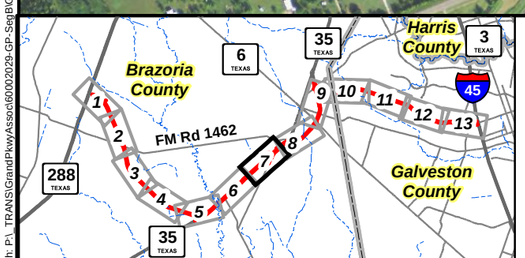

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
- Post Oak Savanna
- Riparian
- Tidal and Salt Marsh
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EMST Field Verified
TxDOT/TPWD MOU
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- Disturbed Prairie
- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
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Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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From SH 288 to IH 45 South

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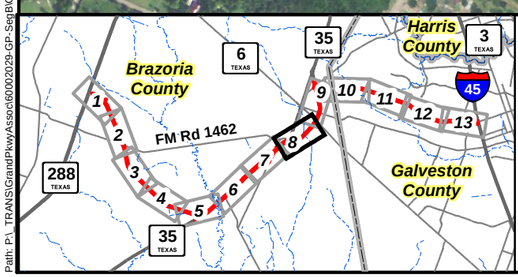

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
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EMST Field Verified
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Sources:
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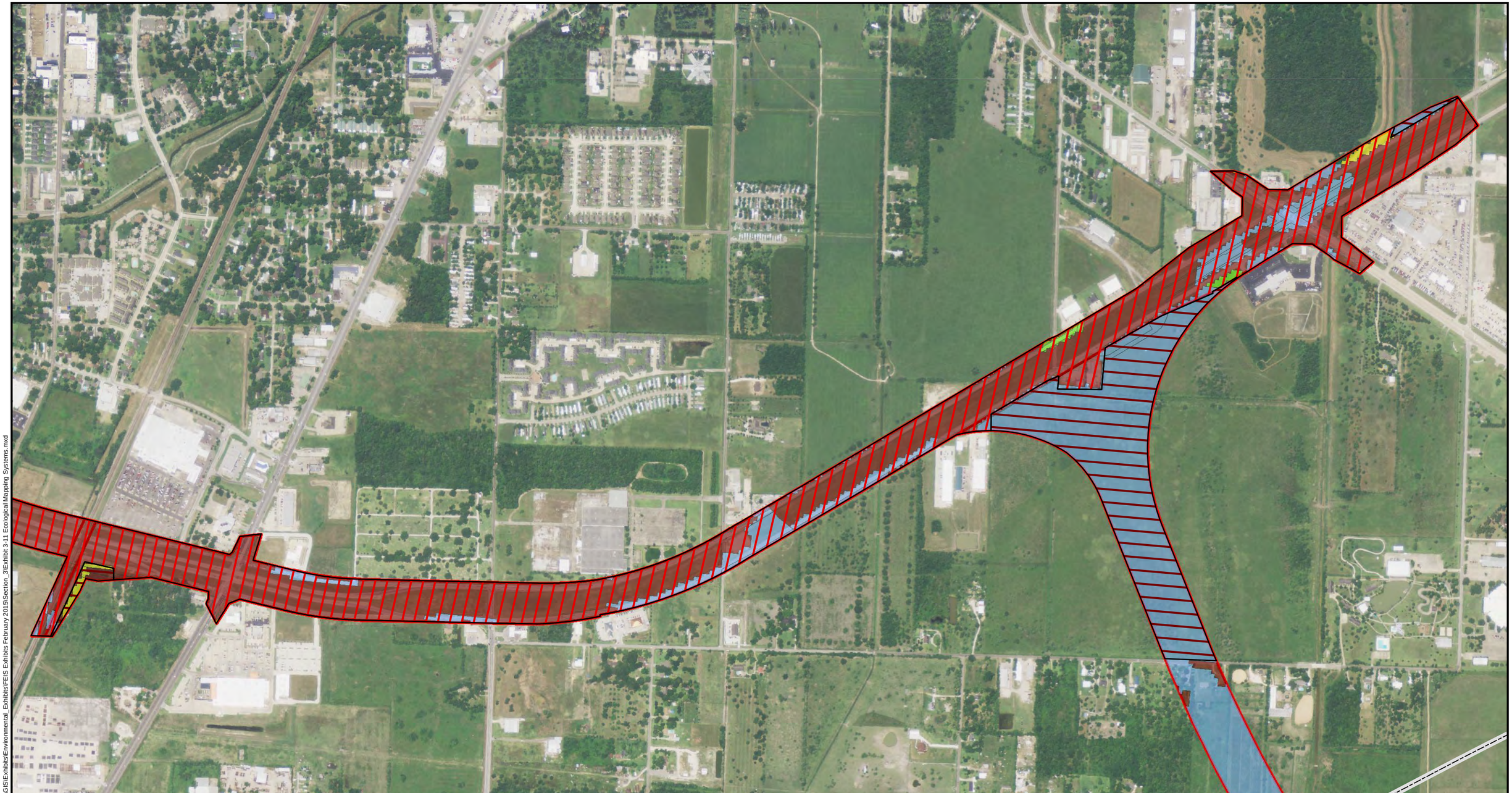

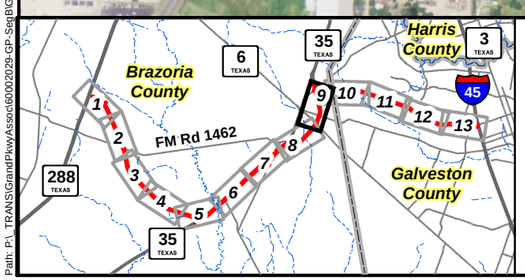

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
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- Tidal and Salt Marsh
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EMST Field Verified
TxDOT/TPWD MOU
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- Disturbed Prairie
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Sources:
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Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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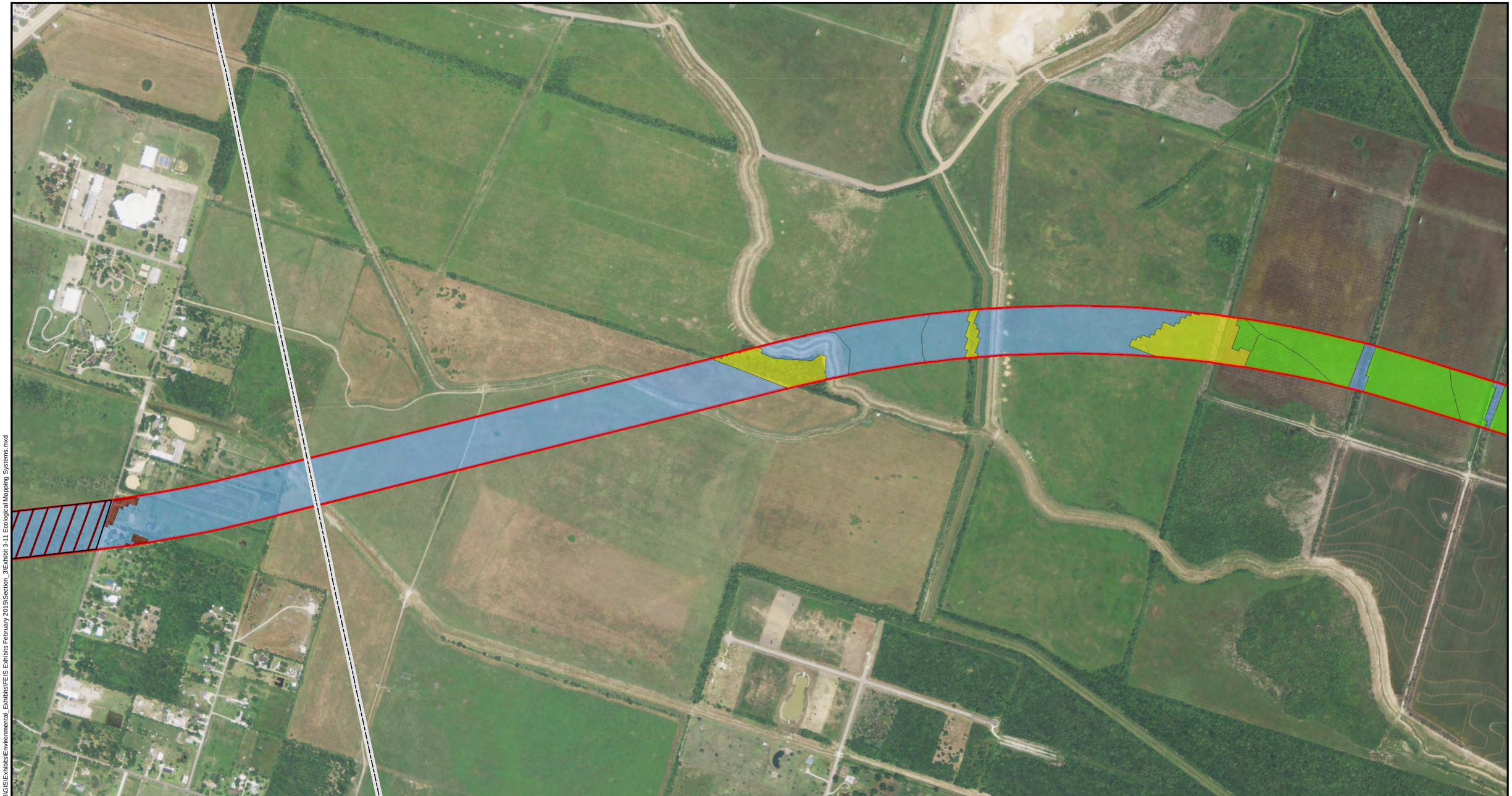

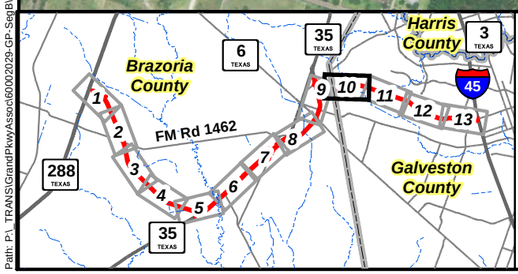

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
- Mixed Woodlands and Forest
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- Tidal and Salt Marsh
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EMST Field Verified
TxDOT/TPWD MOU
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- Mixed Woodlands and Forest
- Riparian
- Urban

Sources:
Background - HGAC StarMap September 27, 2012
Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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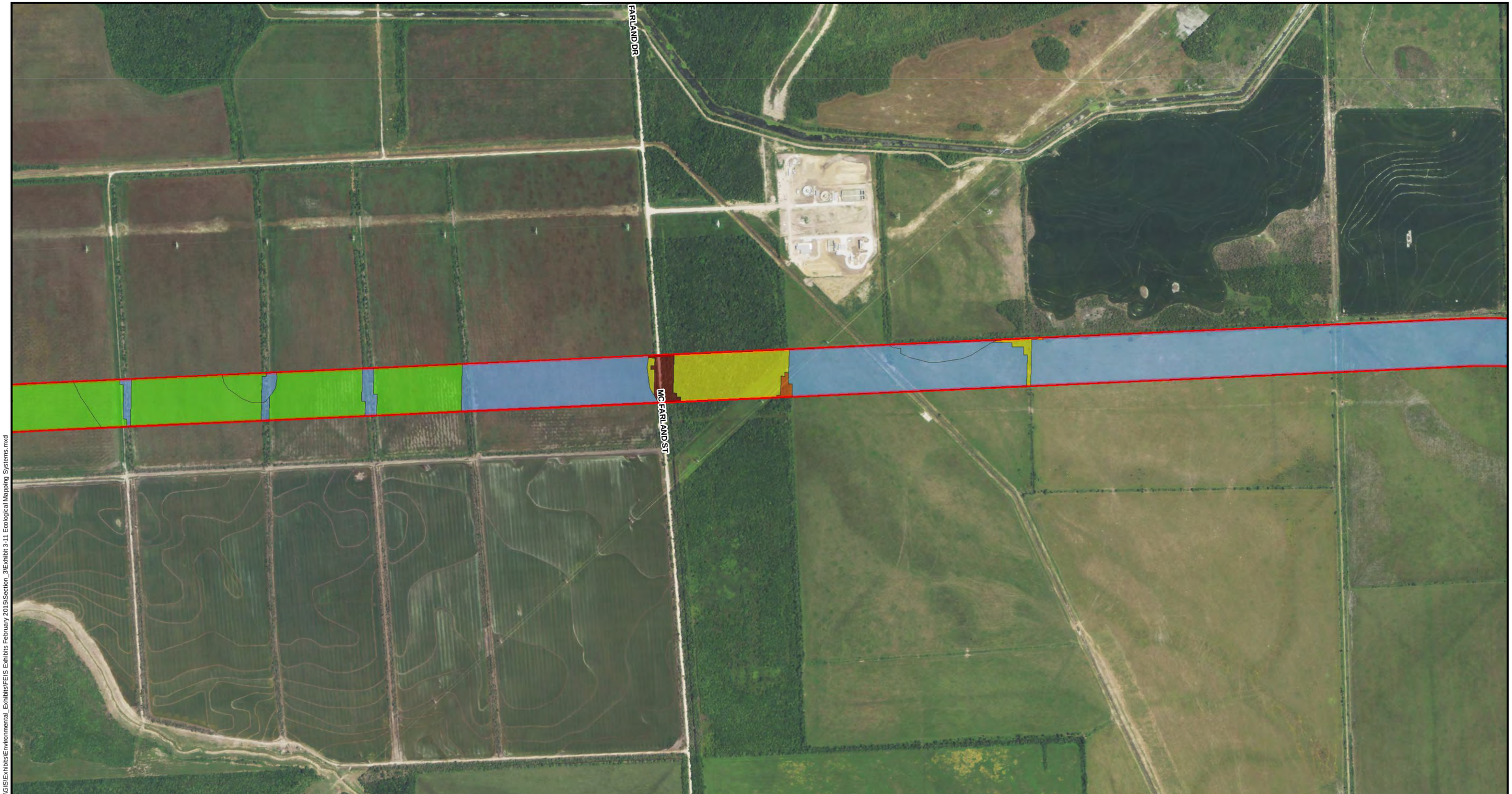

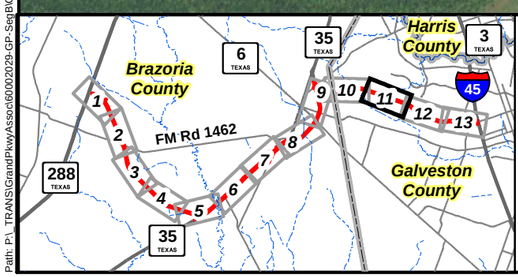

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
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Sources:
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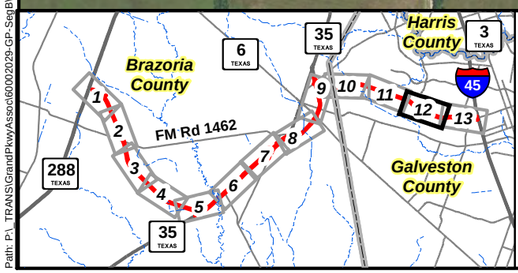

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
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Sources:
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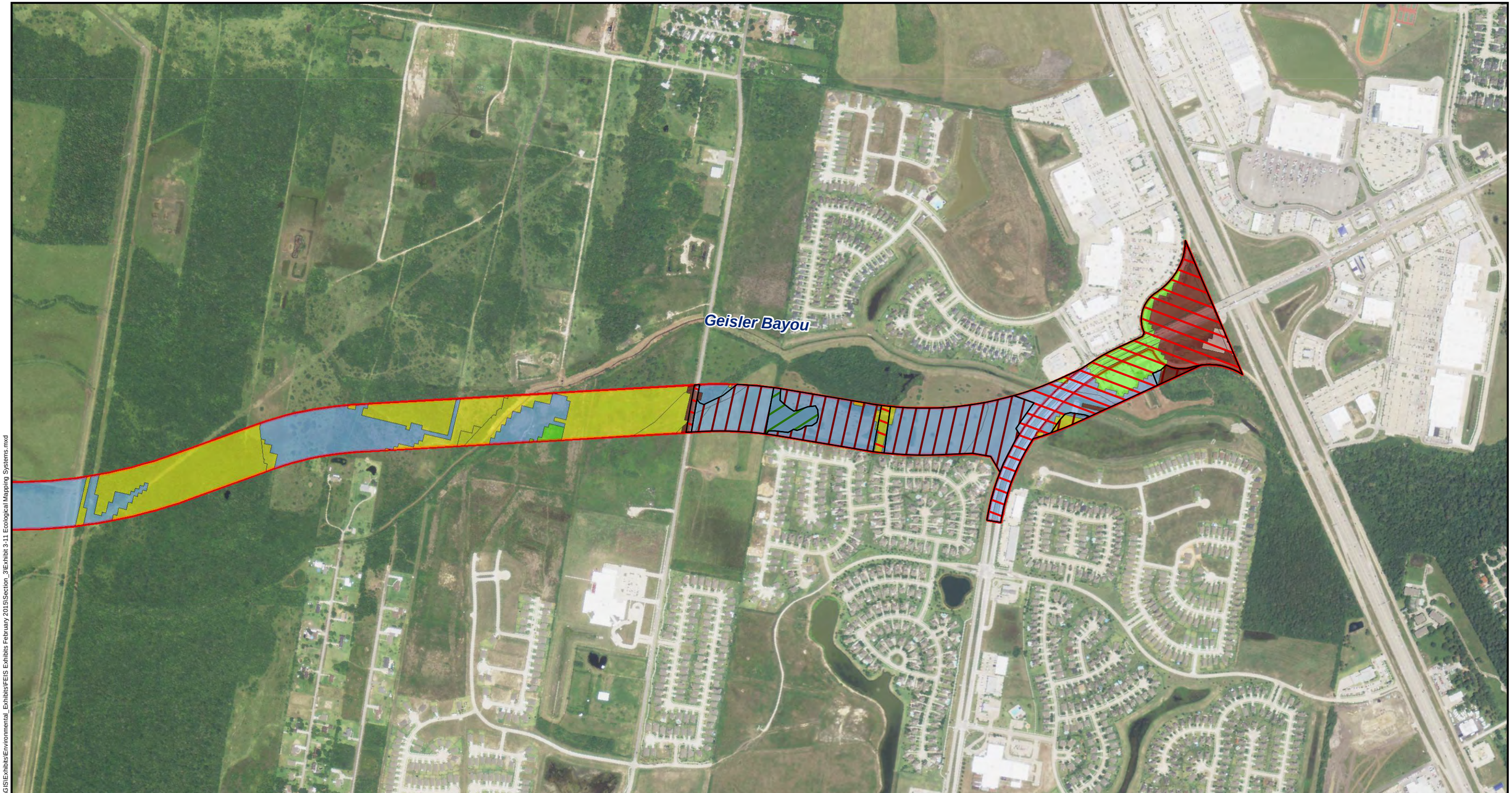

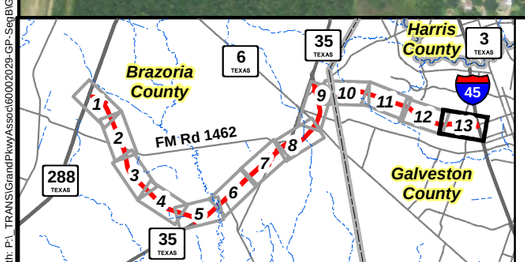

LEGEND

Proposed SH 99 Segment B ROW
County Boundaries

EMST 2014
TxDOT/TPWD MOU
- Agriculture
- Coastal Grassland
- Disturbed Prairie
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- Urban

EMST Field Verified
TxDOT/TPWD MOU
- Agriculture
- Disturbed Prairie
- Mixed Woodlands and Forest
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Sources:
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Aerials: NAIP 2012 Galveston and Brazoria Counties, Texas

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Ecological Mapping Systems of Texas

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