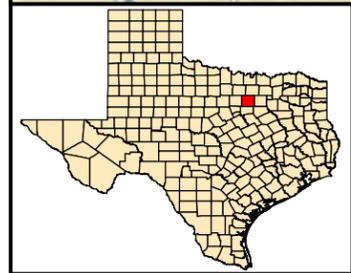
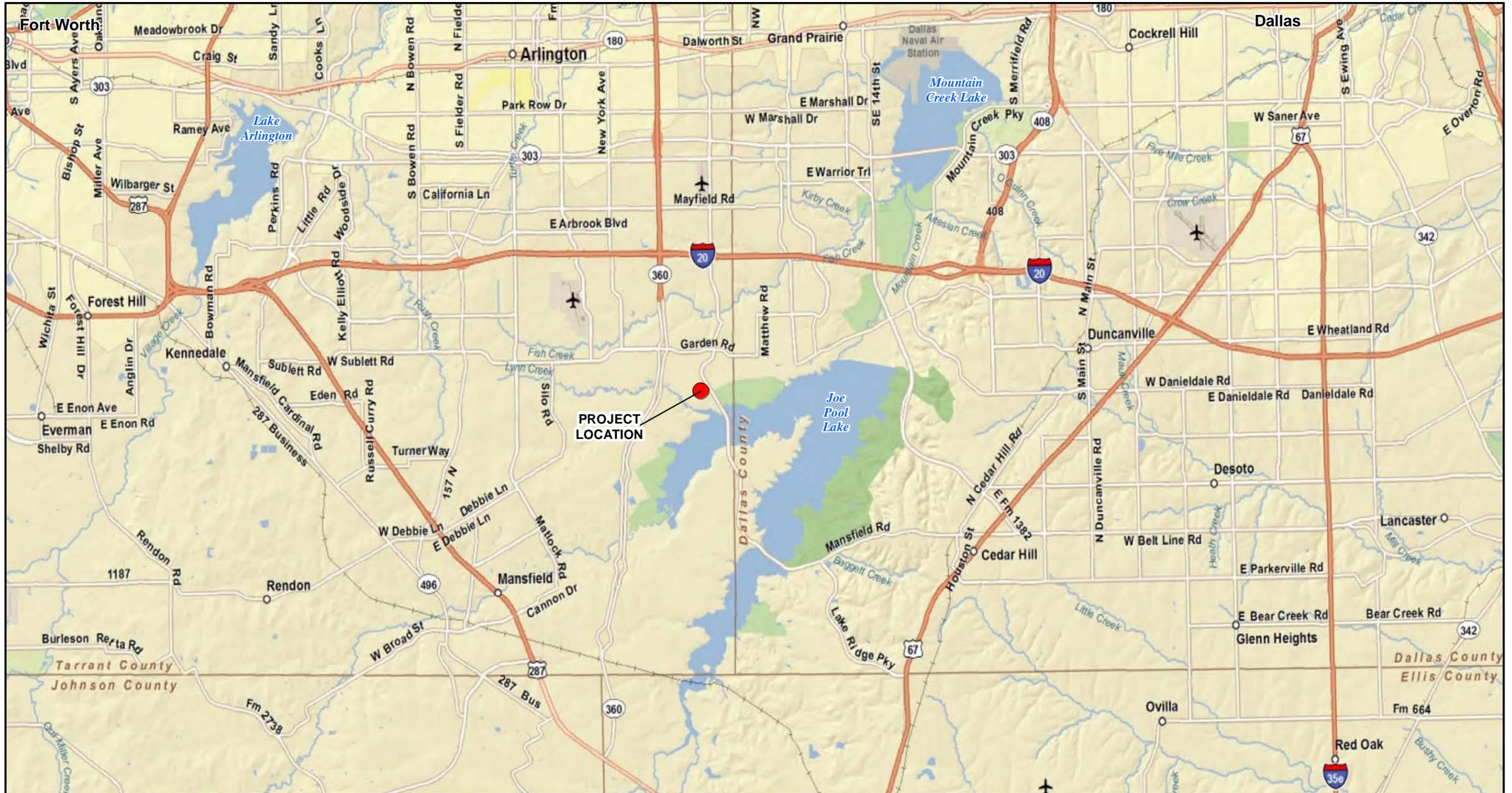
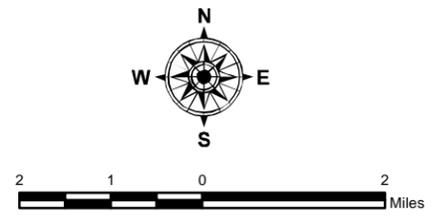


Appendix A

Recreational Development Plan



Base Map: ESRI StreetMap World 2DData

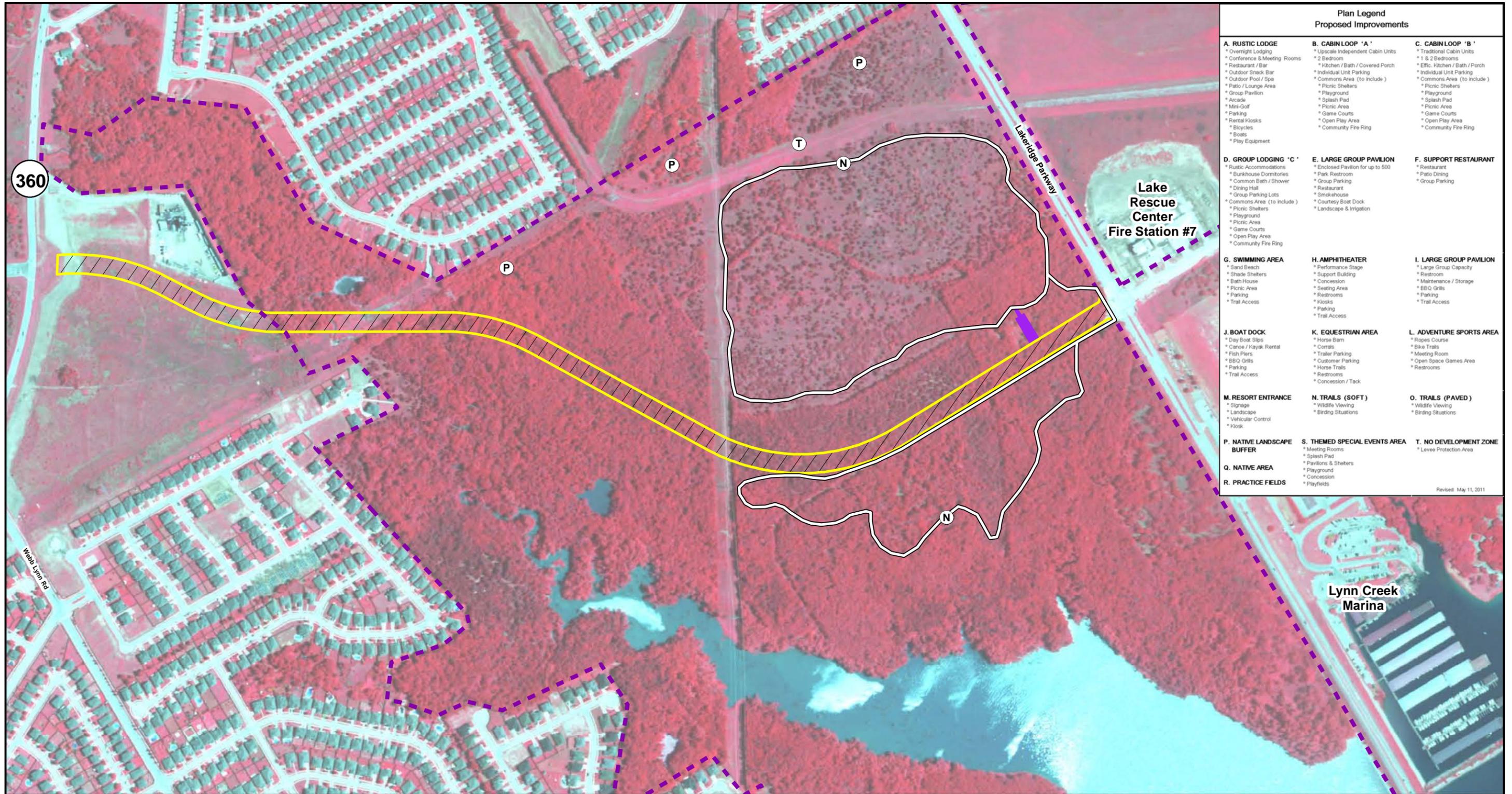


ATKINS

FIGURE A
LYNN CREEK WEST
RECREATIONAL DEVELOPMENT PLAN
PROJECT LOCATION MAP
TARRANT COUNTY, TX

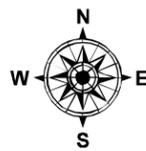
100002496

MAY 19, 2011



Plan Legend
Proposed Improvements

A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Snack Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
D. GROUP LODGING 'C' * Rustic Accommodations * Bunkhouse Dormitories * Common Bath / Shower * Dining Hall * Group Parking Lots * Commons Area (to include) * Picnic Shelters * Playground * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	E. LARGE GROUP PAVILION * Enclosed Pavilion for up to 500 * Park Restroom * Group Parking * Restaurant * Simulacrum * Courtesy Boat Dock * Landscape & Irrigation	F. SUPPORT RESTAURANT * Restaurant * Patio Dining * Group Parking
G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Kiosks * Parking * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corrals * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	
R. PRACTICE FIELDS		



- Trails - Soft
- Lynn Creek Parkway
- USACE Property
- Off-Street Parking (20 Spaces)

ATKINS

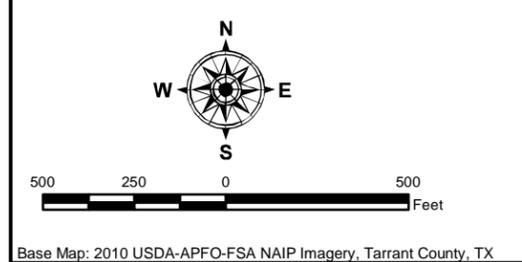
FIGURE B: PHASE I
LYNN CREEK WEST
RECREATIONAL DEVELOPMENT PLAN
PREFERRED ALTERNATIVE
TARRANT COUNTY, TX

100002496

MAY 19, 2011



Plan Legend		
Proposed Improvements		
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Snack Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
D. GROUP LODGING 'C' * Rustic Accommodations * Bunkhouse Dormitories * Common Bath / Shower * Dining Hall * Group Parking Lots * Commons Area (to include) * Picnic Shelters * Playground * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	E. LARGE GROUP PAVILION * Enclosed Pavilion for up to 500 * Park Restroom * Group Parking * Restaurant * Simulacrum * Courtesy Boat Dock * Landscape & Irrigation	F. SUPPORT RESTAURANT * Restaurant * Patio Dining * Group Parking
G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Kiosks * Parking * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corral * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	
R. PRACTICE FIELDS		



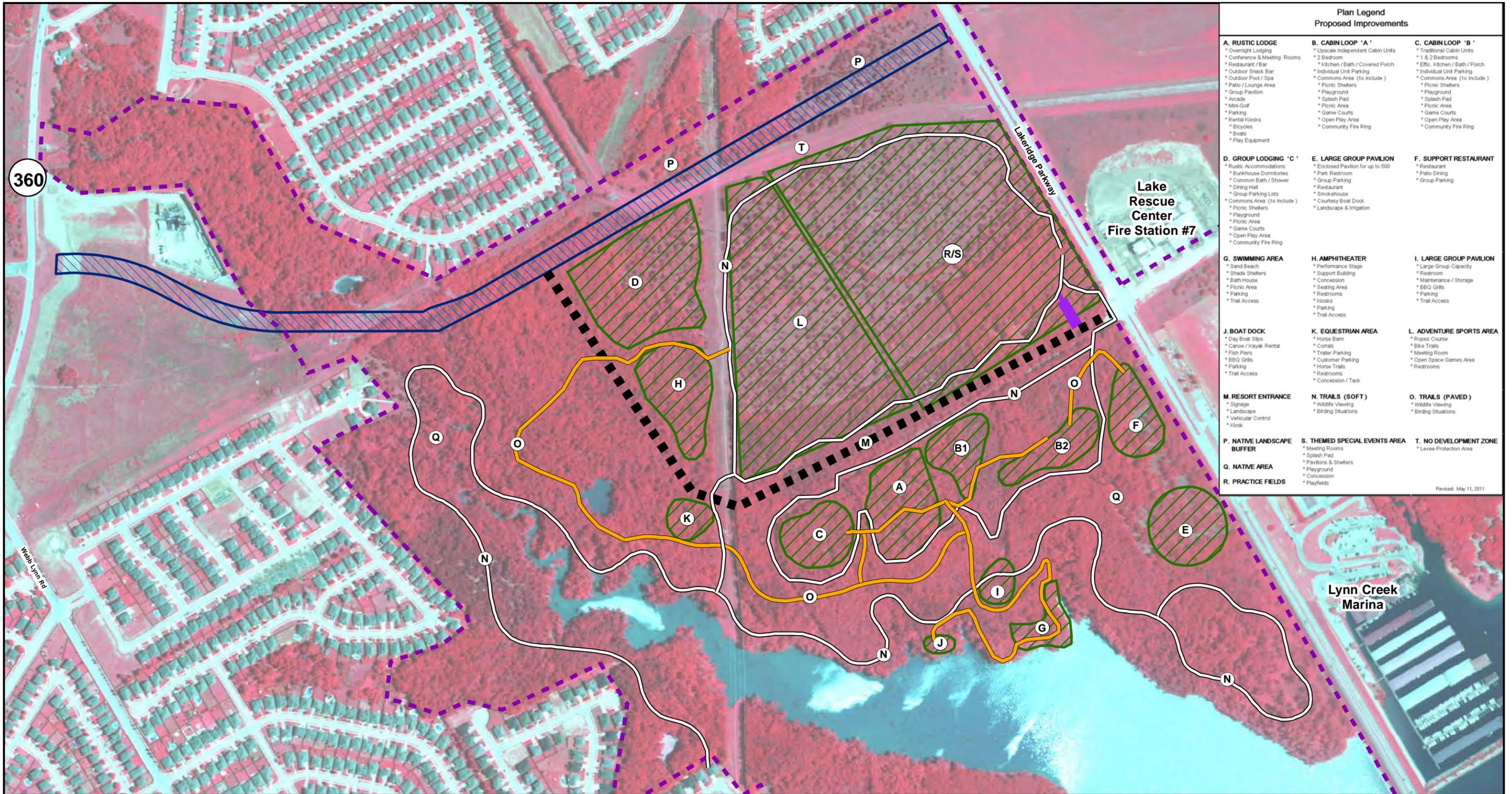
- ■ ■ Maintenance/Access Roadway (Phase III)
- Trails - Soft (Phase IV)
- Trails - Paved (Phase IV)
- ⋯ USACE Property

- Proposed Improvements by Phase
- ▨ Phase II
 - ▨ Phase III
 - ▨ Phase IV
 - ▨ Phase II & IV

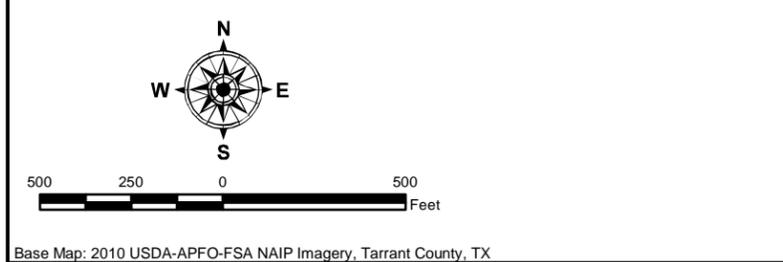
ATKINS

FIGURE B: PHASE II-IV
 LYNN CREEK WEST
 RECREATIONAL DEVELOPMENT PLAN
 PREFERRED ALTERNATIVE
 TARRANT COUNTY, TX

100002496 MAY 19, 2011



Plan Legend Proposed Improvements		
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Shack / Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
D. GROUP LODGING 'C' * Rustic Accommodations * Bunkhouse Dormitories * Common Bath / Shower * Dining Hall * Group Parking Lots * Commons Area (to include) * Picnic Shelters * Playground * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	E. LARGE GROUP PAVILION * Enclosed Pavilion for up to 500 * Park Restroom * Group Parking * Restaurant * Smokehouse * Courtesy Boat Dock * Landscape & Irrigation	F. SUPPORT RESTAURANT * Restaurant * Patio Dining * Group Parking
G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Kiosks * Parking * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corral * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	
R. PRACTICE FIELDS		

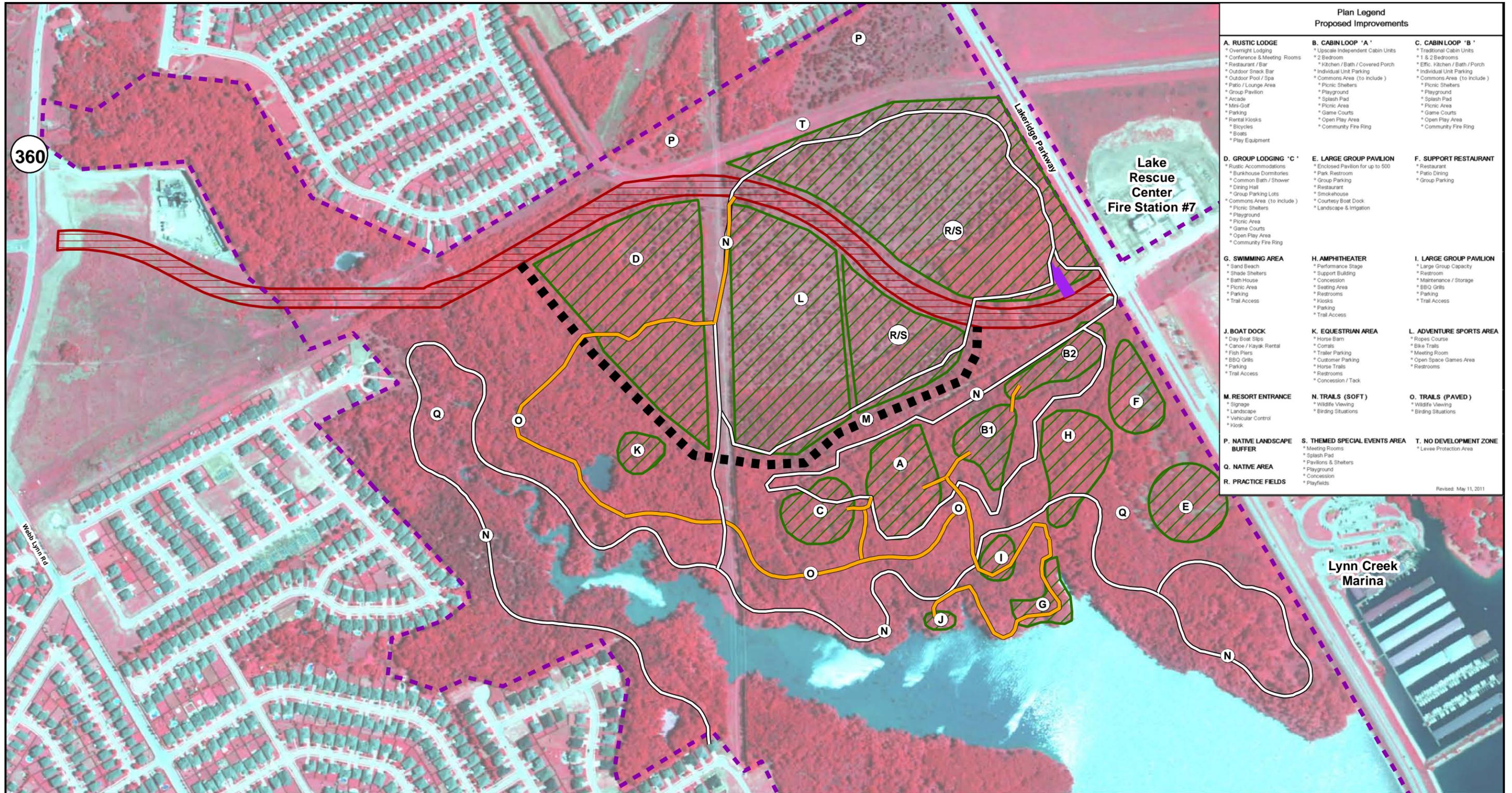


- ■ ■ Maintenance/Access Roadway
- Trails (Soft)
- Trails (Paved)
- ▨ Proposed Alternative 2
- ▤ USACE Property
- ▧ Proposed Improvements
- Off-Street Parking (20 Spaces)

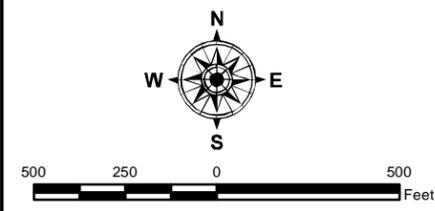
ATKINS

FIGURE C
 LYNN CREEK WEST
 RECREATIONAL DEVELOPMENT PLAN
 ALTERNATIVE 2
 TARRANT COUNTY, TX

100002496 MAY 19, 2011



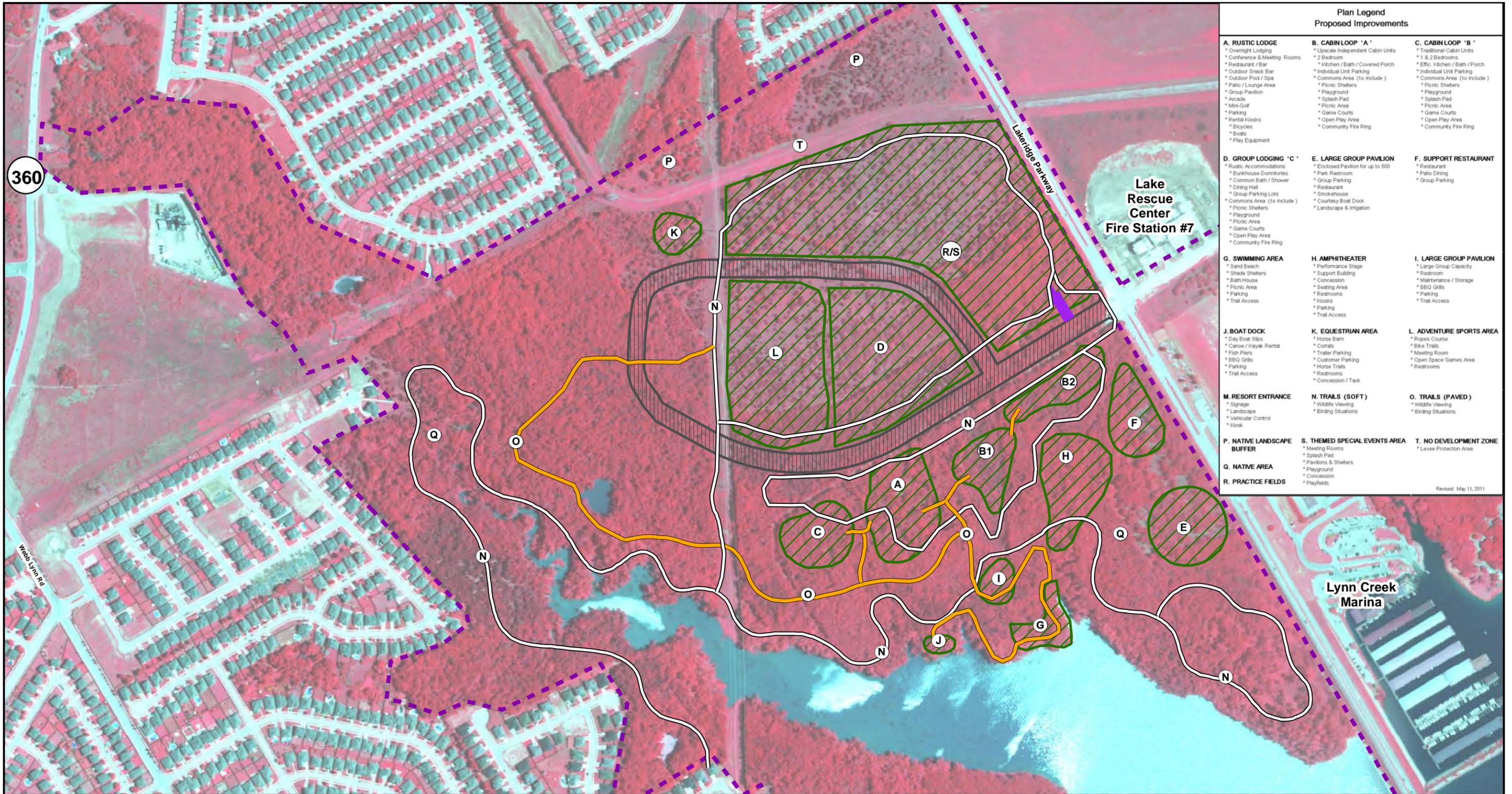
Plan Legend Proposed Improvements		
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Shack / Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
D. GROUP LODGING 'C' * Rustic Accommodations * Bunkhouse Dormitories * Common Bath / Shower * Dining Hall * Group Parking Lots * Commons Area (to include) * Picnic Shelters * Playground * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	E. LARGE GROUP PAVILION * Enclosed Pavilion for up to 500 * Park Restroom * Group Parking * Restaurant * Smokehouse * Courtesy Boat Dock * Landscape & Irrigation	F. SUPPORT RESTAURANT * Restaurant * Patio Dining * Group Parking
G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Kiosks * Parking * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corral * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	



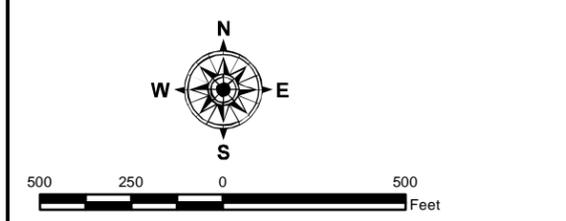
- Maintenance/Access Roadway
- Trails (Soft)
- Trails (Paved)
- USACE Property
- Proposed Alternative 3
- Off-Street Parking (20 Spaces)
- Proposed Improvements

ATKINS

FIGURE D
 LYNN CREEK WEST
 RECREATIONAL DEVELOPMENT PLAN
 ALTERNATIVE 3
 TARRANT COUNTY, TX



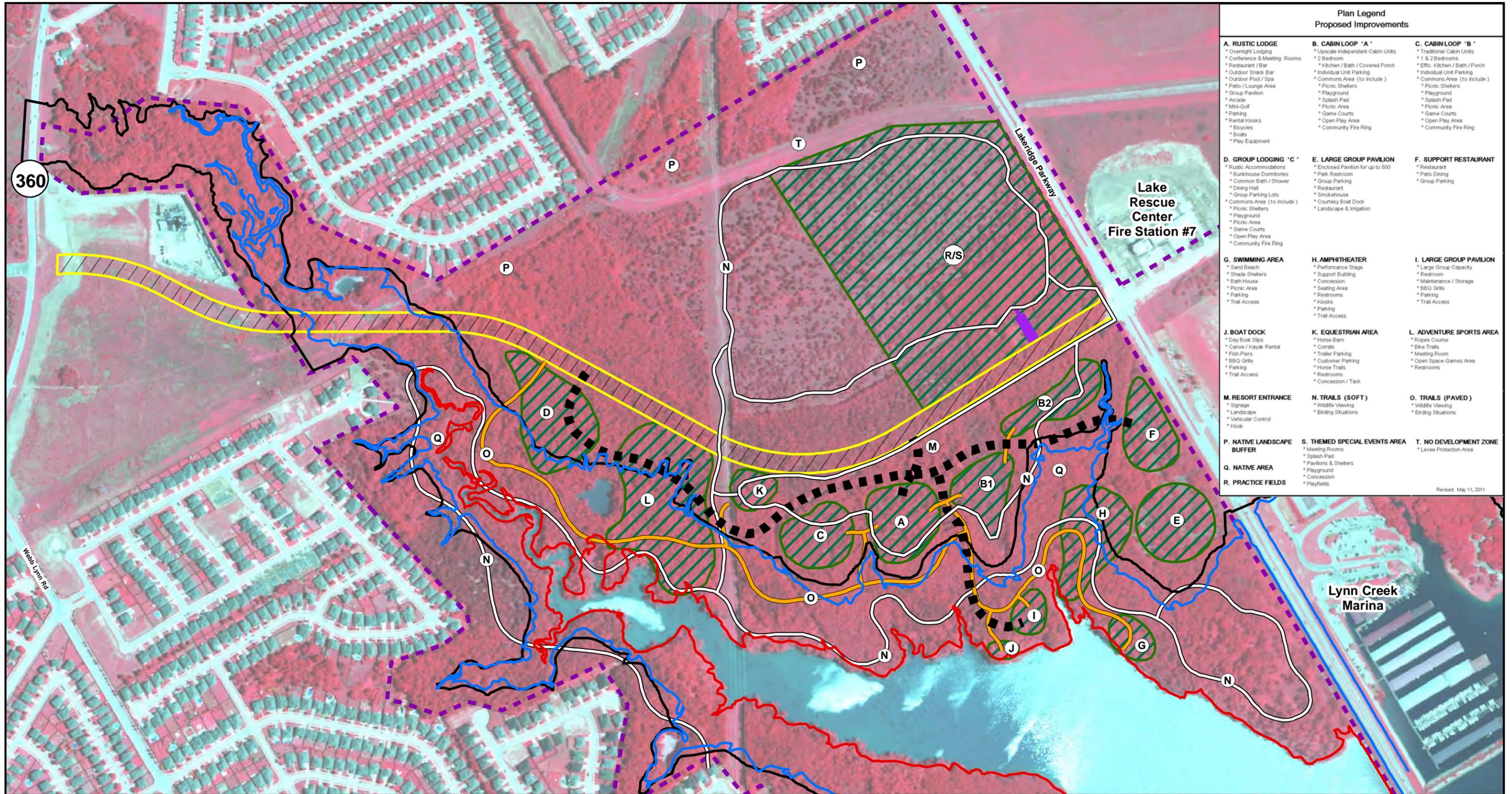
Plan Legend		
Proposed Improvements		
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Snack Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
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G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Kiosks * Parking * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corral * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	
R. PRACTICE FIELDS		



- Trails (Soft)
- Trails (Paved)
- ▨ Proposed Alternative 4
- - - USACE Property
- Off-Street Parking (20 Spaces)
- ▨ Proposed Improvements

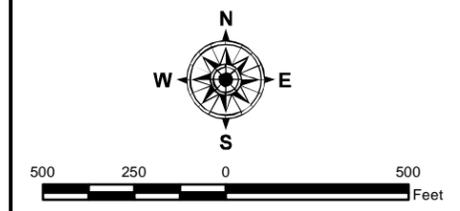
ATKINS

FIGURE E
 LYNN CREEK WEST
 RECREATIONAL DEVELOPMENT PLAN
 ALTERNATIVE 4
 TARRANT COUNTY, TX



Plan Legend
Proposed Improvements

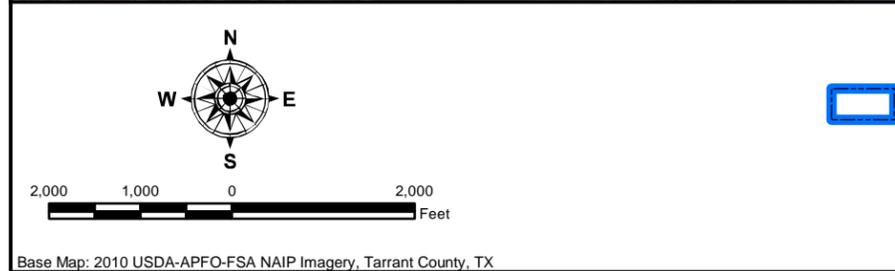
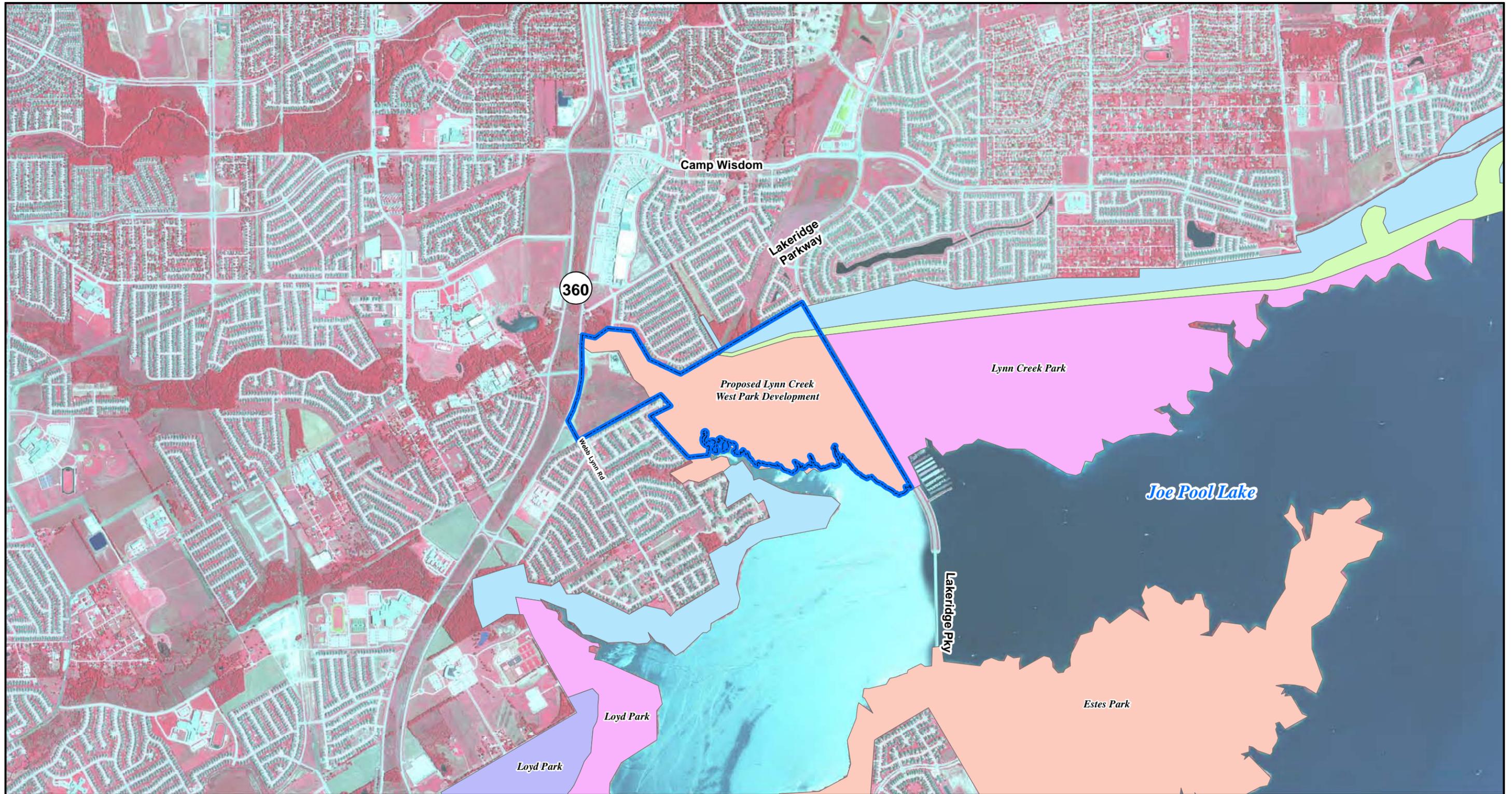
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Snack Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
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G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Kiosks * Parking * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corrals * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	
R. PRACTICE FIELDS		



■ ■ ■ Maintenance/Access Roadway	▨▨▨ Lynn Creek Parkway	— 100-year Floodplain
— Trails (Soft)	▨▨▨ Off-Street Parking (20 Spaces)	— Flood Pool Elevation
— Trails (Paved)	▨▨▨ Proposed Improvements	— Conservation Pool Elevation
	▨▨▨ USACE Property	



FIGURE F
PHASE I - IV: LYNN CREEK WEST
RECREATIONAL DEVELOPMENT PLAN
CONSERVATION AND
FLOOD POOL ELEVATION
TARRANT COUNTY, TX



ATKINS

FIGURE G
LYNN CREEK WEST
RECREATIONAL DEVELOPMENT PLAN
LAND USE
TARRANT COUNTY, TX

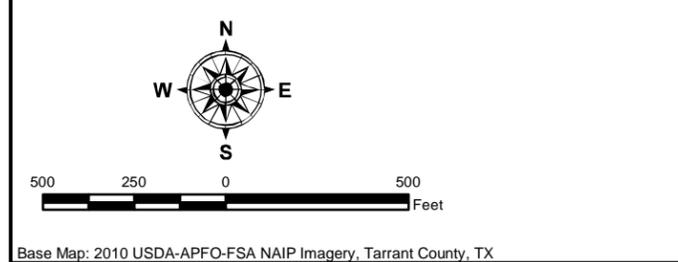
100002496 MAY 19, 2011

Base Map: 2010 USDA-APFO-FSA NAIP Imagery, Tarrant County, TX

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Plan Legend Proposed Improvements		
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Snack Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
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G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Parking * Kiosks * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corrals * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	
R. PRACTICE FIELDS		



Maintenance/Access Roadway Trails (Soft) Trails (Paved)	Lynn Creek Parkway Off-Street Parking (20 Spaces) Proposed Improvements USACE Property	Grassland Mixed Hardwood Savannah Riparian Woods Upland Woods
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ATKINS

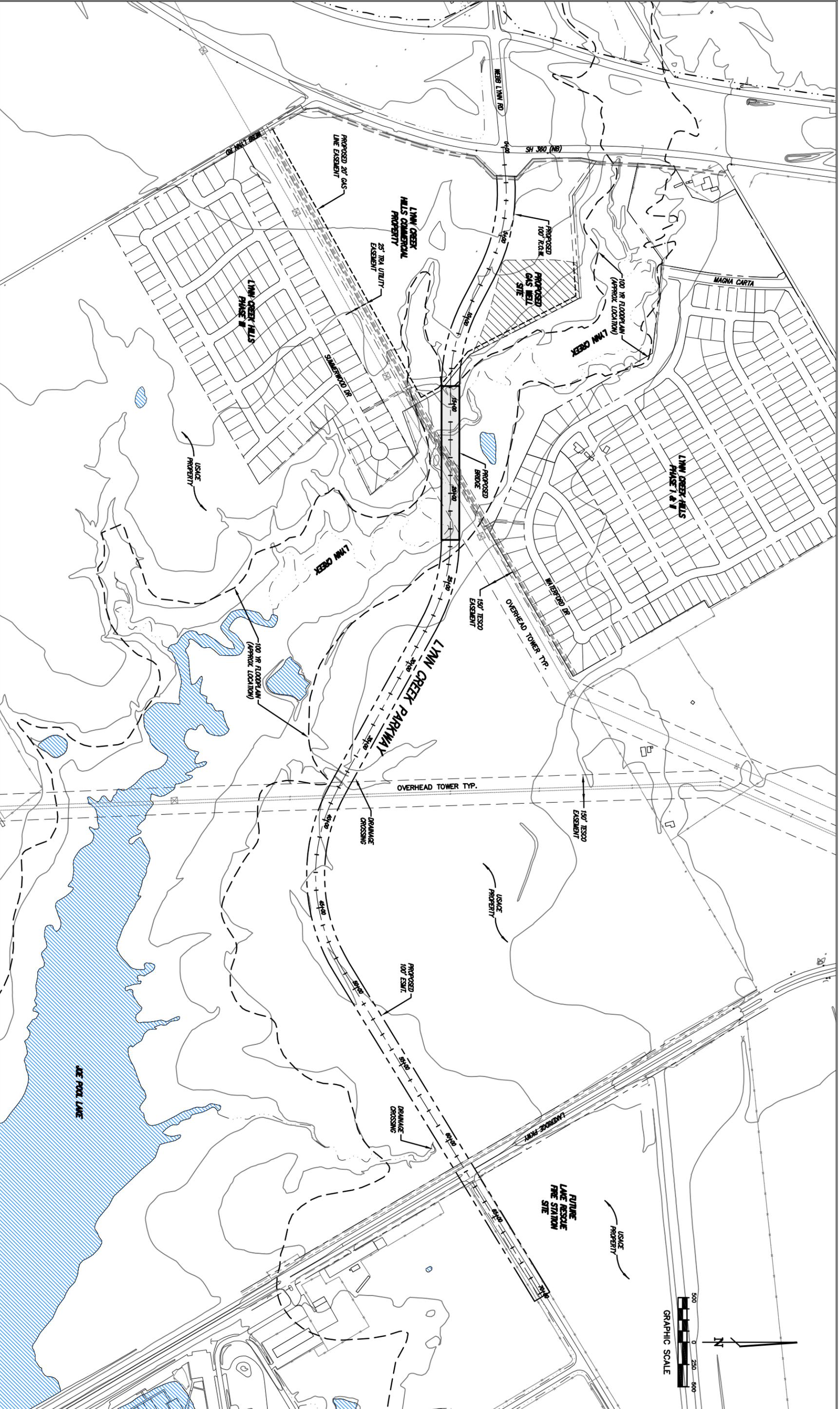
FIGURE H
 PHASE I - IV: LYNN CREEK WEST
 RECREATIONAL DEVELOPMENT PLAN
 VEGETATION TYPES
 TARRANT COUNTY, TX

100002496 MAY 19, 2011

Base Map: 2010 USDA-APFO-FSA NAIP Imagery, Tarrant County, TX

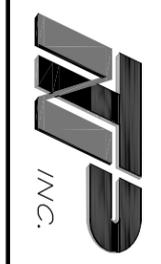
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Appendix B
Roadway Designs



NO.	REVISION	BY	DATE

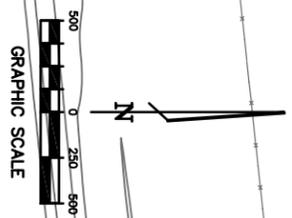
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1" = 500'	1" = 500'	N/A
DATE	JAN 2008	

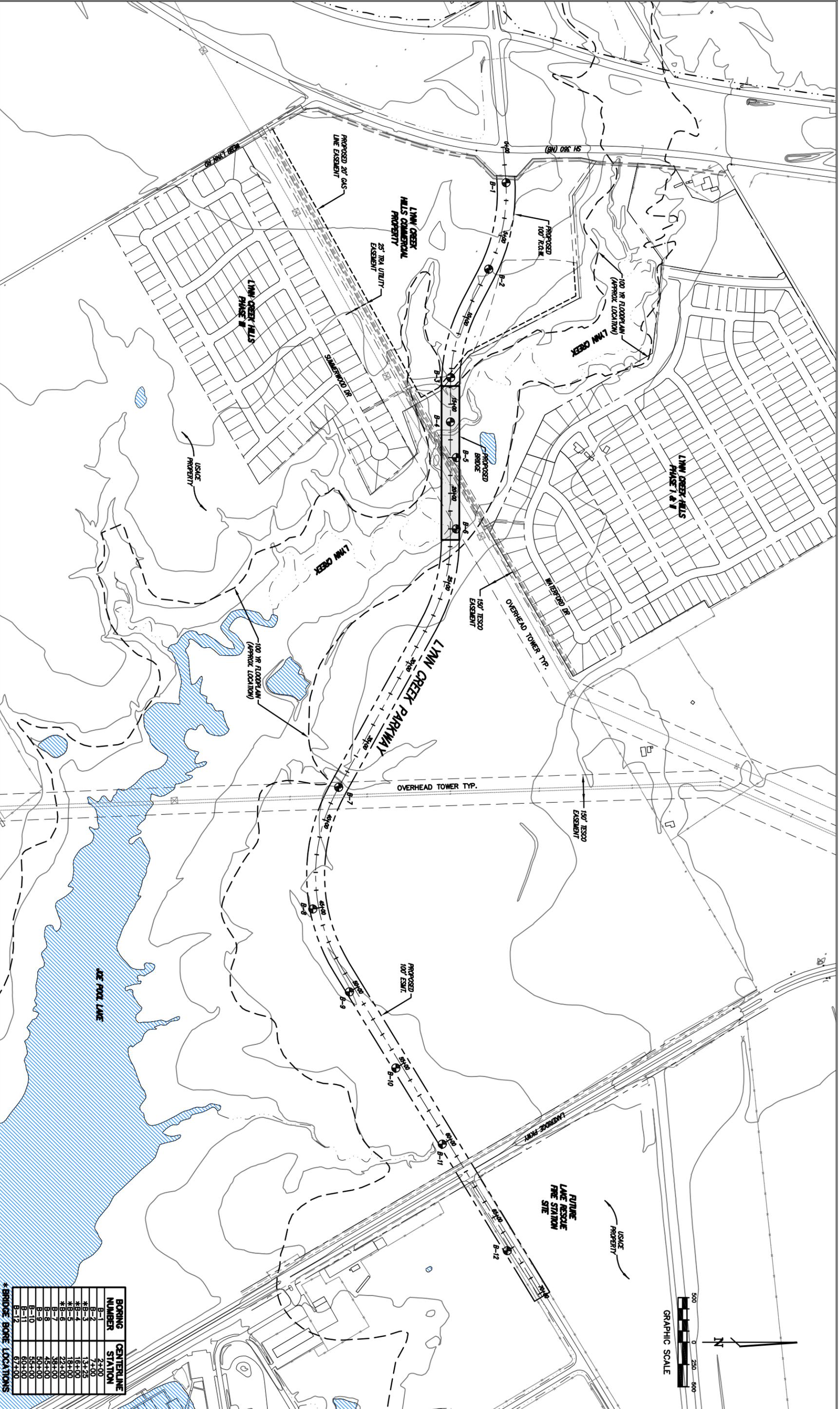


TEAGUE NALL AND PERKINS
 1100 Macon Street
 Fort Worth, Texas 76102
 Phone: (817) 336-6773 + Fax: (817) 336-2813
 www.tnp-online.com

CITY OF GRAND PRAIRIE, TEXAS
DESIGN MEMORANDUM
LYNN CREEK PARKWAY
PROPOSED ALIGNMENT

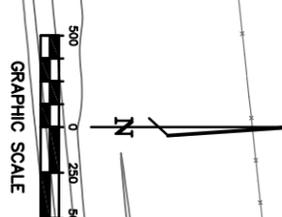
PROJECT	GNP
PROJECT NO.	359
EXHIBIT	1





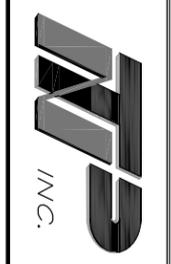
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B-1	2+00
B-2	7+00
*B-3	13+25
*B-4	18+00
*B-5	18+00
*B-6	22+00
B-7	38+00
B-8	45+00
B-9	50+00
B-10	55+00
B-11	60+00
B-12	67+00

*BRIDGE BORE LOCATIONS



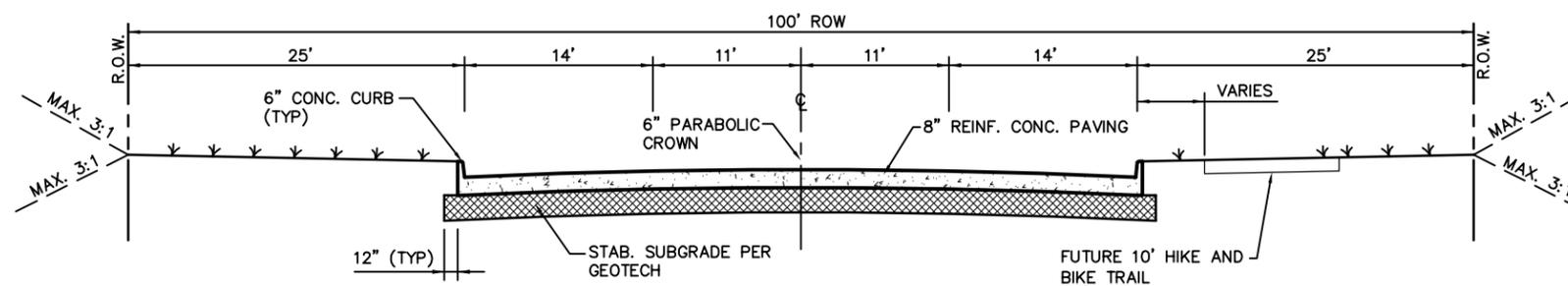
NO.	REVISION	BY	DATE

SCALE	HORIZ	1" = 500'
	VERT	N/A
	DATE	JAN 2008

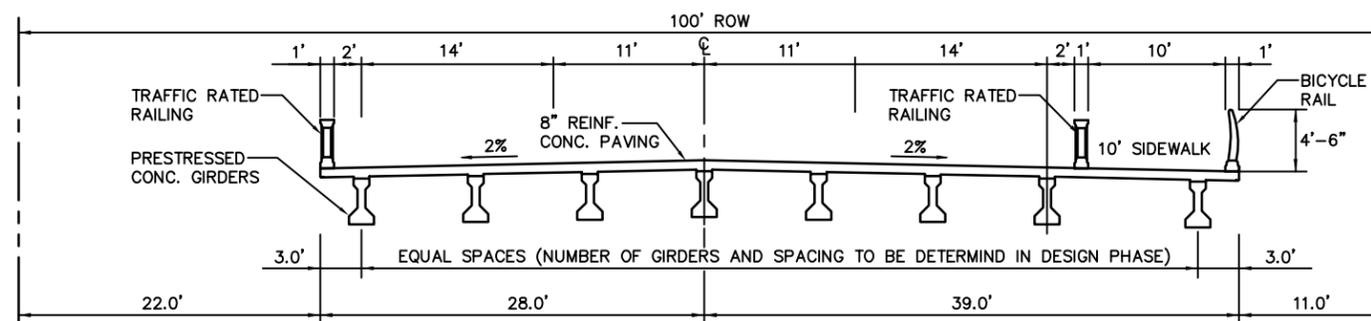


TEAGUE NALL AND PERKINS
 1100 Macon Street
 Fort Worth, Texas 76102
 Phone: (817) 336-6773 • Fax: (817) 336-2813
 www.tnp-online.com

CITY OF GRAND PRAIRIE, TEXAS
 DESIGN MEMORANDUM
LYNN CREEK PARKWAY
PROPOSED SOIL BORE MAP
 NIP PROJECT GPR07359
 EXHIBIT **9**



TYPICAL ROADWAY SECTION
LYNN CREEK PARKWAY
NOT TO SCALE



TYPICAL BRIDGE SECTION
LYNN CREEK PARKWAY
NOT TO SCALE

NO.	REVISION	BY	DATE

SCALE
HORIZ N/A
VERT N/A
DATE
JAN 2008



TEAGUE NALL AND PERKINS

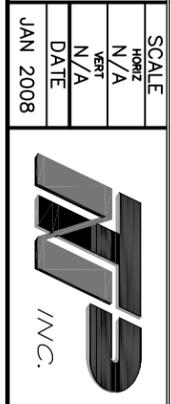
1100 Macon Street
Fort Worth, Texas 76102
Phone: (817) 336-5773 • Fax: (817) 336-2813
www.tnp-online.com

CITY OF GRAND PRAIRIE, TEXAS
DESIGN MEMORANDUM
LYNN CREEK PARKWAY
LYNN CREEK PARKWAY
ROADWAY & BRIDGE SECTIONS

TNP PROJECT
GPR07359
EXHIBIT
8

NO.	REVISION	BY	DATE

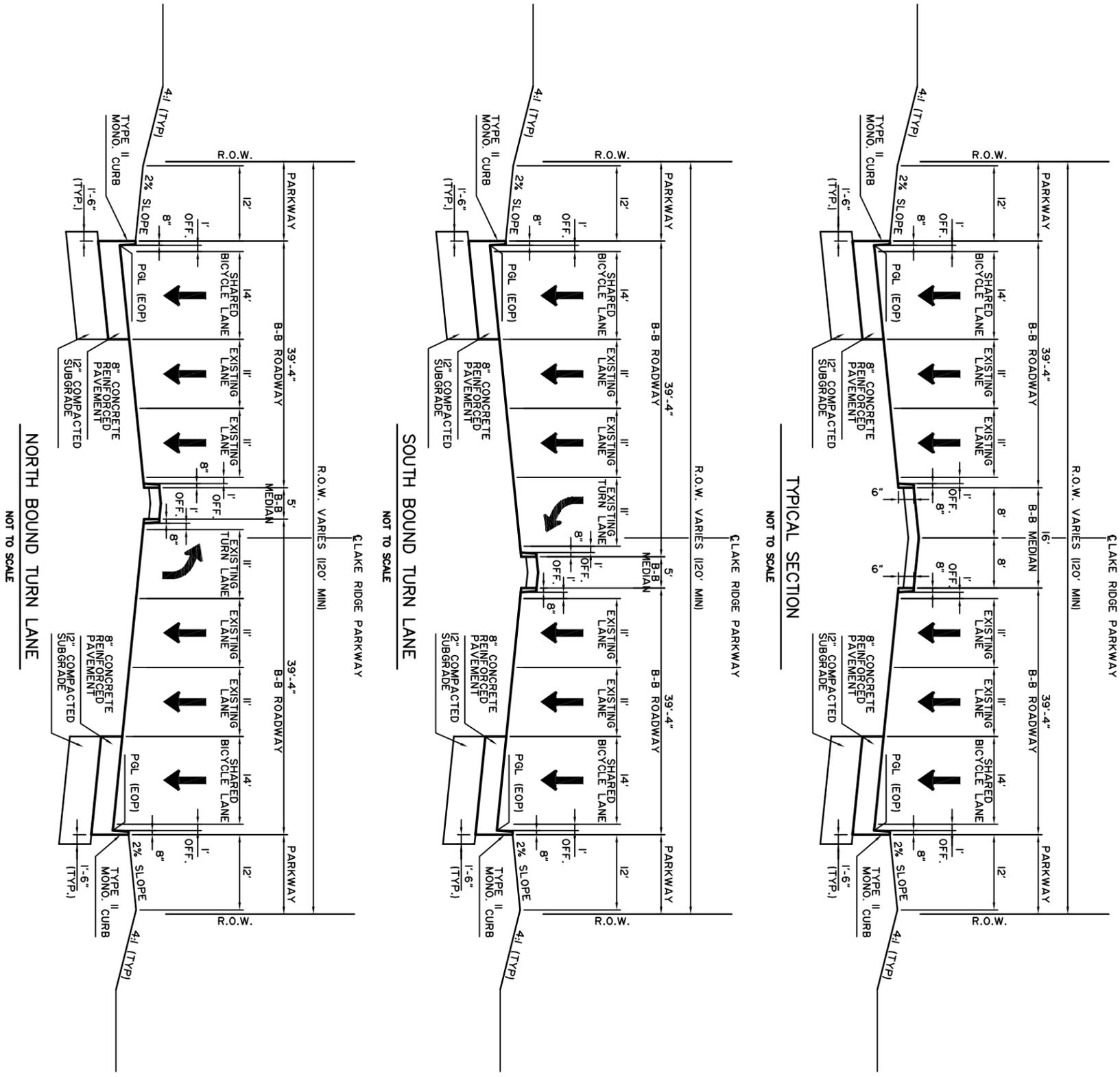
SCALE	HORIZ	VERT
N/A	N/A	N/A
DATE	JAN 2008	

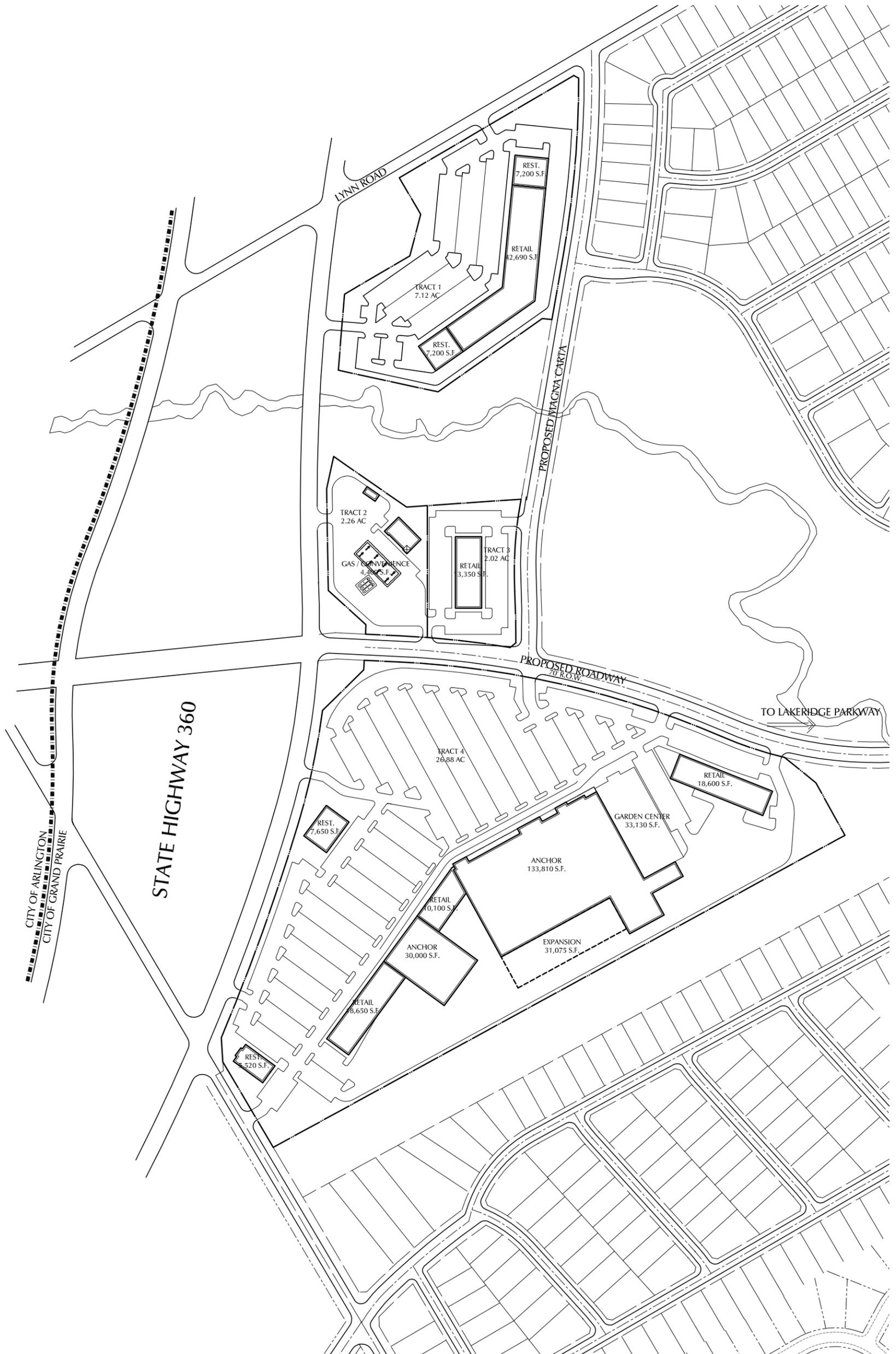


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 1100 Macon Street
 Fort Worth, Texas 76102
 Phone: (817) 336-6773 + Fax: (817) 336-2813
 www.tnp-online.com

CITY OF GRAND PRAIRIE, TEXAS
DESIGN MEMORANDUM
LYNN CREEK PARKWAY
PROPOSED LAKERIDGE
CROSS SECTIONS

PROJECT	7
EXHIBIT	7





CONCEPTUAL SITE PLAN A

LYNN CREEK HILLS RETAIL
GRAND PRAIRIE, TEXAS

BARHAM & HARRIS INC.

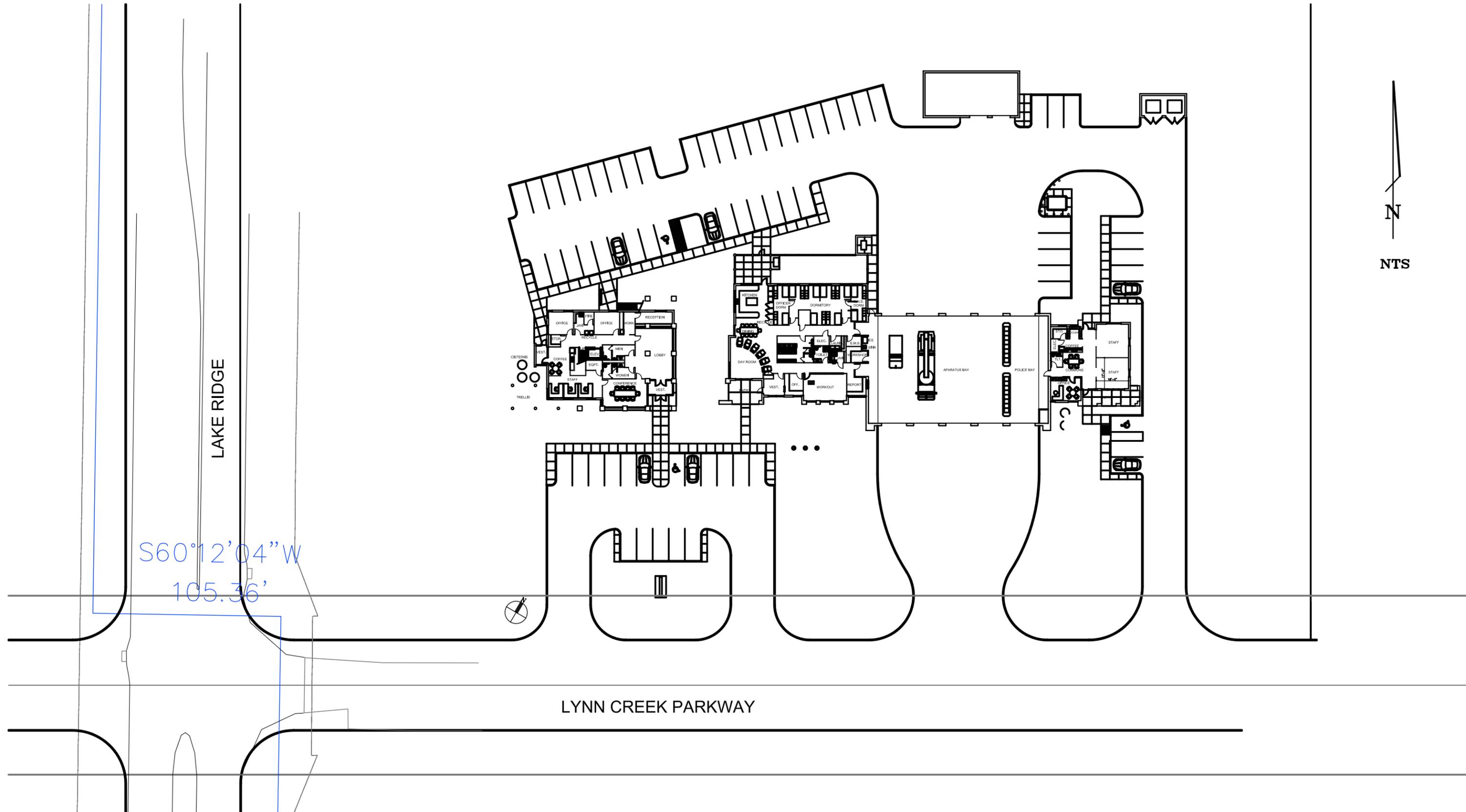


0 100 200 400 Feet

GOOD FULTON & FARRELL

PLANNING

2808 Fairmount, Suite 300 Dallas, TX 75201 214.303.1500 214.303.1512 Fax
Job Number:04155 File Name:SP-B.dwg Date:09/21/04 Drawn by:RLG/ARS



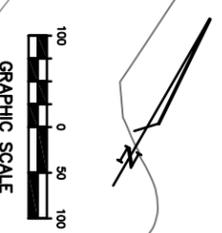
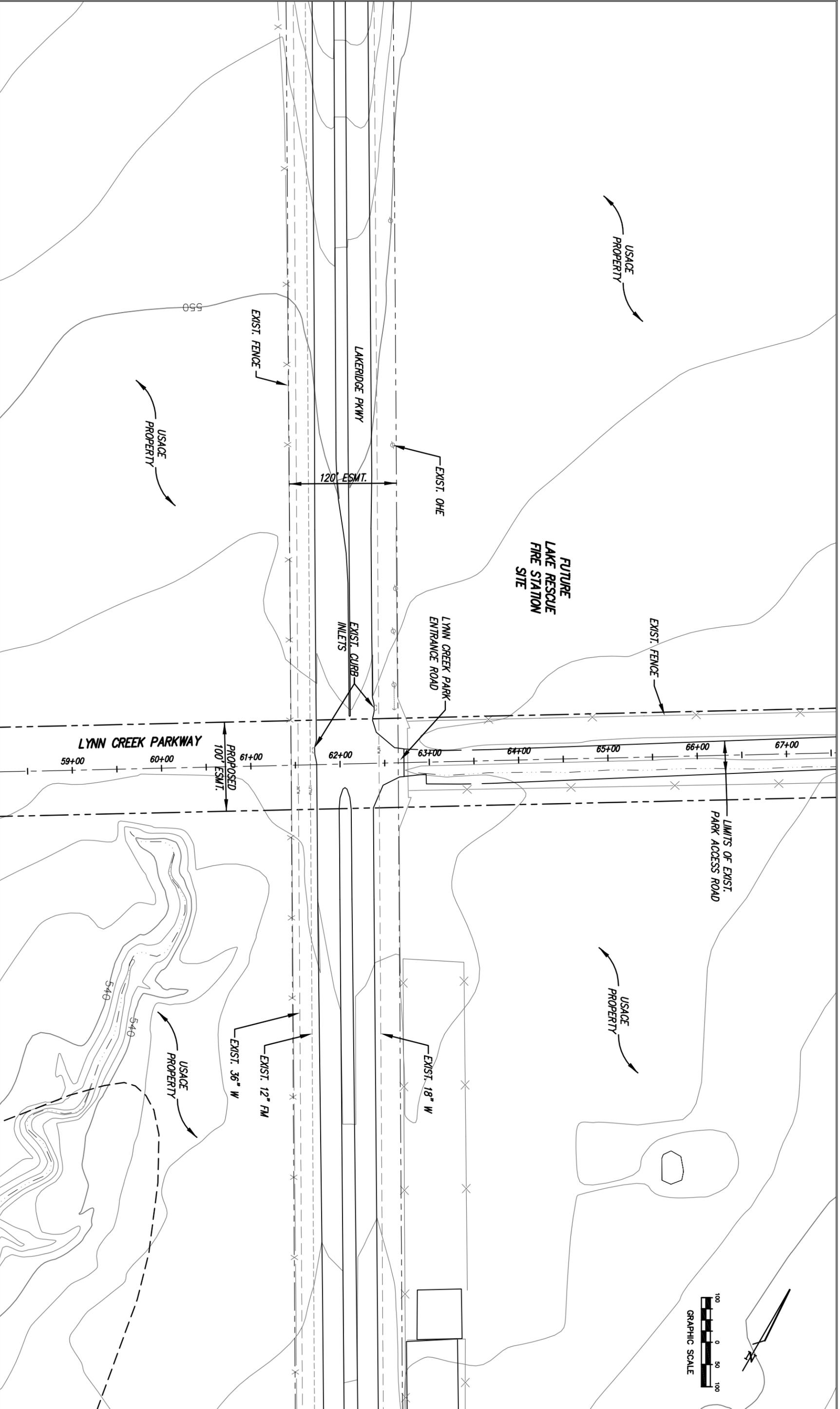
LAKE RIDGE

S60°12'04"W
105.36'

LYNN CREEK PARKWAY



NTS



NO.	REVISION	BY	DATE

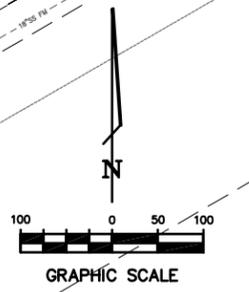
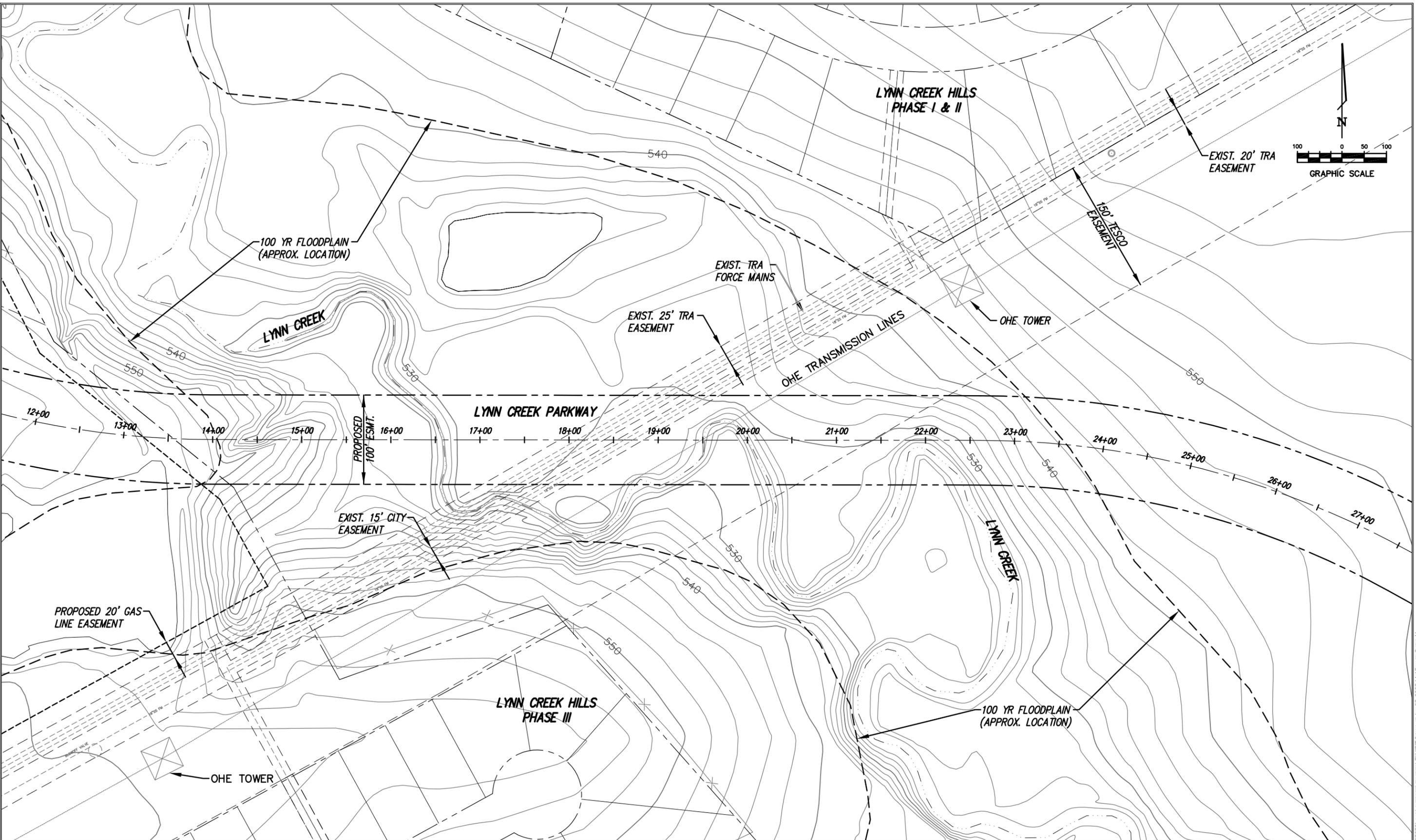
SCALE	
HORIZ	1" = 100'
VERT	N/A
DATE	JAN 2008



TEAGUE NALL AND PERKINS
1100 Macon Street
Fort Worth, Texas 76102
Phone: (817) 336-6773 • Fax: (817) 336-2813
www.tnp-online.com

CITY OF GRAND PRAIRIE, TEXAS
DESIGN MEMORANDUM
LYNN CREEK PARKWAY
LAKERIDGE INTERSECTION

PROJECT GPR07359
EXHIBIT
4



NO.	REVISION	BY	DATE

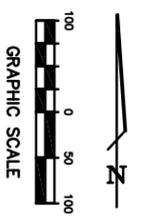
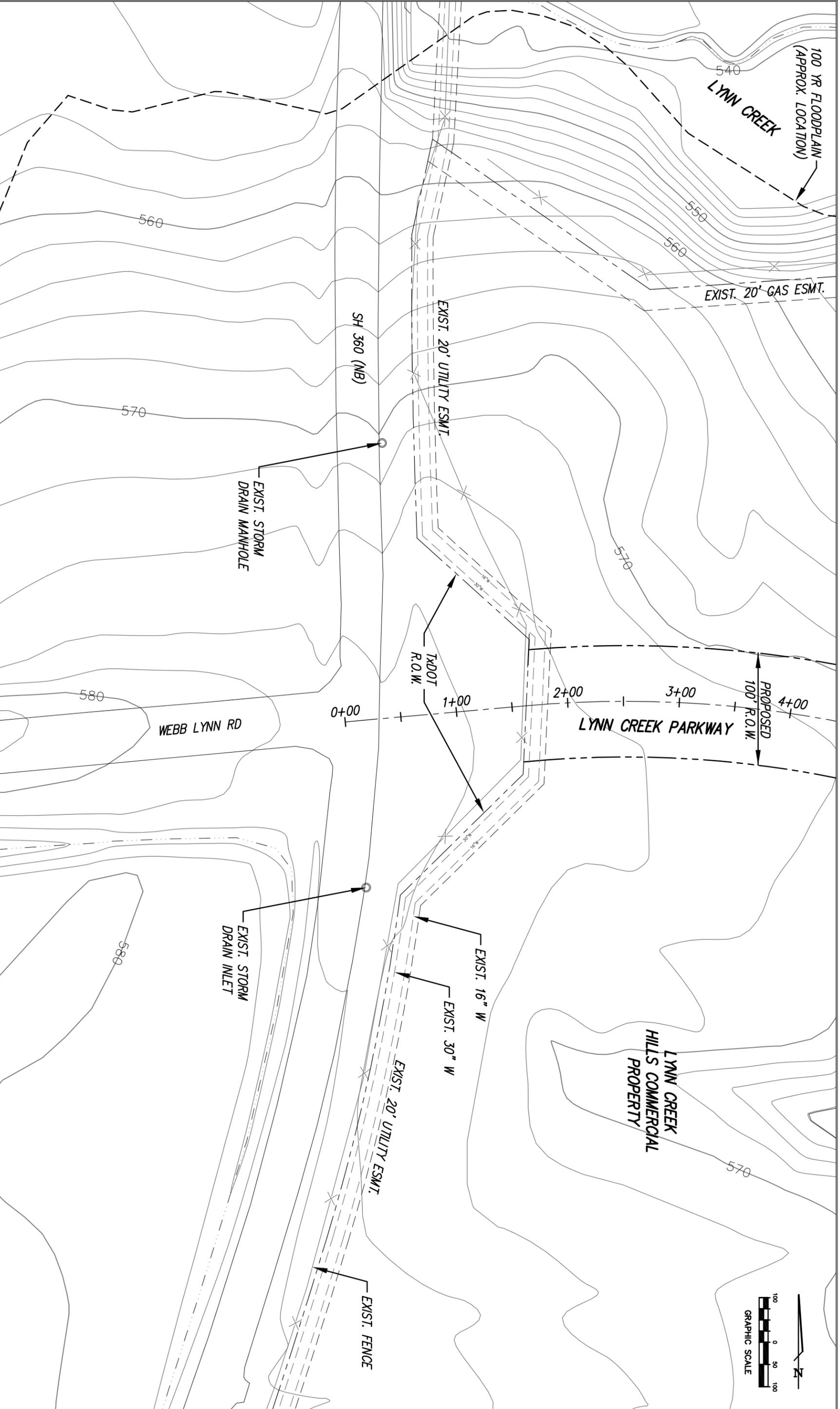
SCALE	HORIZ	1"=100'
	VERT	N/A
	DATE	JAN 2008

TEAGUE NALL AND PERKINS

1100 Macon Street
 Fort Worth, Texas 76102
 Phone: (817) 336-5773 • Fax: (817) 336-2813
 www.tnp-online.com

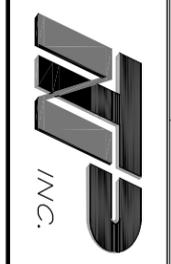
CITY OF GRAND PRAIRIE, TEXAS
 DESIGN MEMORANDUM
LYNN CREEK PARKWAY
 LYNN CREEK UTILITY CROSSINGS

TNP PROJECT
 GPR07359
 EXHIBIT
3



NO.	REVISION	BY	DATE

SCALE	HORIZ	VERT
1" = 100'	1" = 100'	N/A
DATE	JAN 2008	



TEAGUE NALL AND PERKINS

1100 Macon Street
 Fort Worth, Texas 76102
 Phone: (817) 336-6773 + Fax: (817) 336-2813
 www.tnp-online.com

CITY OF GRAND PRAIRIE, TEXAS
 DESIGN MEMORANDUM
 LYNN CREEK PARKWAY
 S.H. 360 INTERSECTION

PROJECT	EXHIBIT
GPR07359	2

JOINS PANEL 046A



APPROXIMATE SCALE IN FEET
500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
TARRANT COUNTY,
TEXAS AND
INCORPORATED AREAS

PANEL 468 OF 595
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
ARLINGTON, CITY OF	485454	0468	H
TARRANT COUNTY UNINCORPORATED AREAS	480582	0468	H

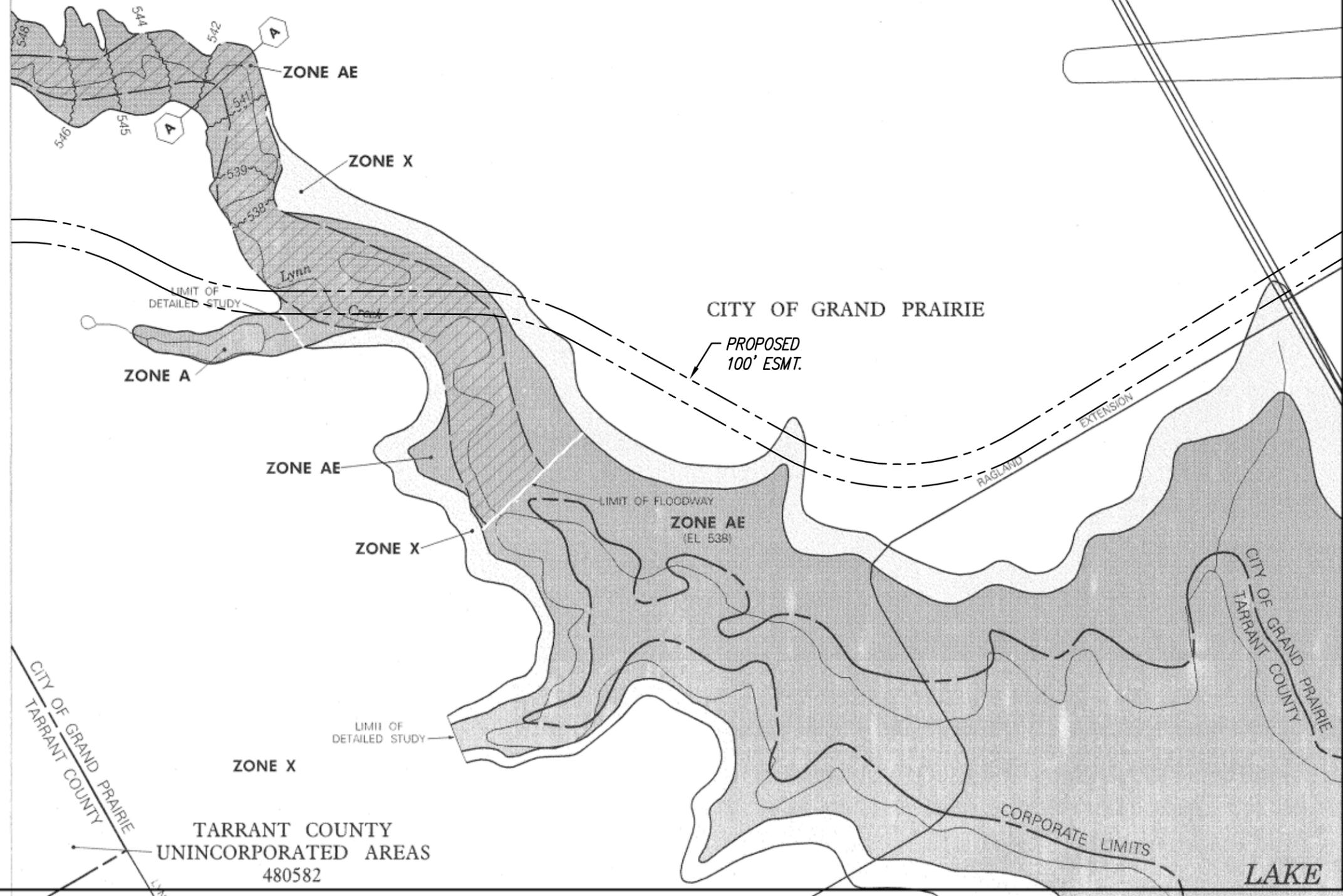
MAP NUMBER
48439C0468 H

MAP REVISED:
AUGUST 2, 1995



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



TARRANT COUNTY
UNINCORPORATED AREAS
480582

Appendix C

City Council Meeting/Transportation Plan Records



CITY COUNCIL COMMUNICATION

From: The Office of the City Manager

Date: 4-19-2005

Subject: Agenda Item No. C.5

MTP050301 - Amending Article 23, "Master Transportation Plan", Deleting Designated Portions of Magna Carta Blvd. and Extending North Webb-Lynn Road from Magna Carta Blvd. to Lake Ridge Parkway. (City Council District 6).

Map Amendment to Article 23, "Master Transportation Plan", to remove a portion of Magna Carta Boulevard from North Webb-Lynn road to South Webb-Lynn Road, and to extend North Webb-Lynn Road eastward from Magna Carta Boulevard to Lake Ridge Parkway to a point of terminus with the Lynn Creek Park entrance road. On April 11, 2005 the Planning and Zoning Commission recommended approval of this case by a vote of 9-0.

PRESENTER:

Chief City Planner Kevin Lasher

SUMMARY

AMENDING ARTICLE 23, "MASTER TRANSPORTATION PLAN," BY REVISING THE THOROUGHFARE MAP TO REFLECT THE DELETION OF DESIGNATED PORTIONS OF MAGNA CARTA BOULEVARD AND EXTENDING NORTH WEBB-LYNN ROAD FROM MAGNA CARTA BOULEVARD TO LAKE RIDGE PARKWAY.

This is a Map Amendment to Article 23, "Master Transportation Plan," to remove a portion of Magna Carta Boulevard from North Webb-Lynn Road to South Webb-Lynn Road and extend North Webb-Lynn Road from Magna Carta Boulevard to Lake Ridge Parkway as shown in Exhibit "A" of the attached draft ordinance. The new extension of North Webb Lynn Road would include a bridge over Lynn Creek and would be aligned with the intersection of the Lynn Creek Park entrance at Lake Ridge Parkway. Magna Carta Blvd to the north and south of these points will remain as stated in the current Transportation Plan.

[NOTE: This case was tabled at the March 28th meeting of the P&Z to allow staff more time to respond to the concerns of adjacent residents regarding road alignment issues and impacts on area drainage.]

ISSUES:

- The request is being initiated by staff to improve access from Lake Ridge Parkway to State Highway 360 and minimize the design and dedication impact of Magna Carta on adjacent properties.
- The realignment of North Webb-Lynn Road requires additional right-of-way dedication from adjacent property owners. The elimination of Magna Carta will offset some of the dedication impacts.
- The developers of future commercial projects along SH-360 that adjoin the proposed deleted segment of Magna Carta will be able to provide access easements across their property to maintain circulation.

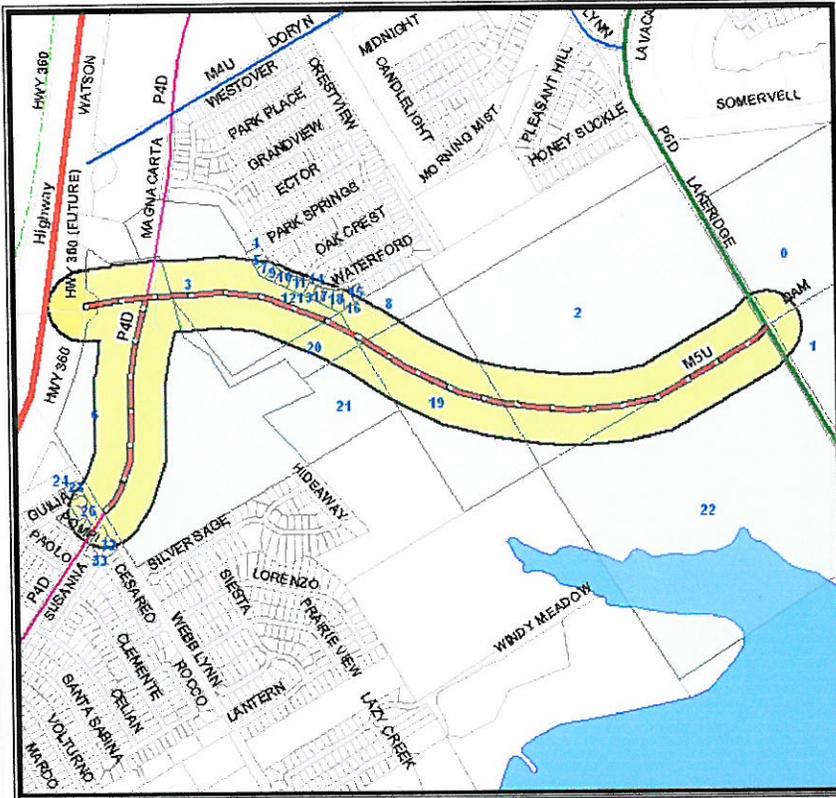
RECOMMENDATION:

The Development Review Committee is in support of the proposed Master Transportation Plan Amendment as submitted.

PLANNING AND ZONING COMMISSION RECOMMENDATION:

On April 11, 2005, the Planning and Zoning Commission voted 9 to 0 to recommend approval of this request per staff's recommended provisions.

PROPERTY OWNER NOTIFICATION / LOCATION MAP



Cross Hatched Area
Indicates Property
Under Review

Shaded Area Indicates
Notification Boundary
(if applicable)

CASE NUMBER: MTP050301

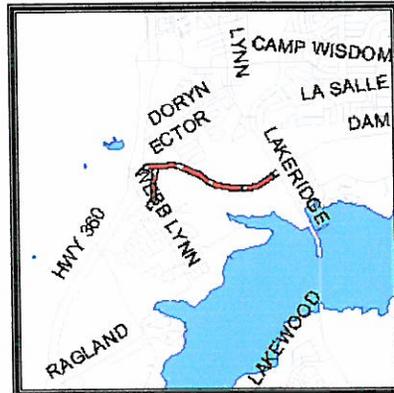
MASTER TRANSPORTATION PLAN -
AMENDMENT

CURRENT ZONING: NA

REQUEST:

Consider a request to modify the
Master Transportation Plan (MTP) by:
removing a portion of Magna Carta Boulevard
from North Webb-Lynn road to South Webb-Lynn Road
and; extend North Webb-Lynn Road from
Magna Carta Boulevard to Lake Ridge Parkway.

960 480 0 960 1,920 2,880
Feet



AN ORDINANCE AMENDING ARTICLE 23: "MASTER TRANSPORTATION PLAN" OF THE UNIFIED DEVELOPMENT CODE ESTABLISHED BY ORDINANCE NUMBER 4779 AND PASSED ON NOVEMBER 20, 1990, TO REMOVE A PORTION OF MAGNA CARTA BOULEVARD FROM NORTH WEBB-LYNN ROAD TO SOUTH WEBB-LYNN ROAD AND EXTEND NORTH WEBB-LYNN ROAD FROM MAGNA CARTA BOULEVARD EASTWARD TO LAKE RIDGE PARKWAY; REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT HEREWITH; CONTAINING A SAVINGS CLAUSE; AND TO BECOME EFFECTIVE UPON ITS PASSAGE AND APPROVAL.

WHEREAS, Notice was given of a public hearing on said amendment to be held by the Planning and Zoning Commission of Grand Prairie, Texas, in the City Hall Plaza Building at 7:00 o'clock P.M. on April 11, 2005, such Notice of the time and place of such hearing having been given at least ten (10) days prior to such hearing by publication in the Fort Worth Star Telegram, Fort Worth, Texas, a newspaper of general circulation in such municipality; and

WHEREAS, after consideration of said amendment, the Planning and Zoning Commission of the City of Grand Prairie, Texas voted 9 to 0 to recommend to the City Council of Grand Prairie, Texas, that said amendment should be approved since its provisions are in the public interest and will promote the health, safety and welfare of the community; and

WHEREAS, Notice was given of a further public hearing to be held by the City Council of the City of Grand Prairie, Texas, in the City Hall Plaza Building at 6:30 o'clock P.M. on April 19, 2005 to consider the advisability of amending the Zoning Ordinance as recommended by the Planning and Zoning Commission, such Notice of the time and place of such hearing having been given at least fifteen (15) days prior to such hearing by publication in the Fort Worth Star Telegram, Fort Worth, Texas, a newspaper of general circulation in such municipality; and

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF GRAND PRAIRIE, TEXAS:

I.

THAT Article 23, "Master Transportation Plan" of the Unified Development Code and the City's Thoroughfare Map be amended to remove the portion of Magna Carta Boulevard from North Webb-Lynn Road to South Webb-Lynn Road and extend North Webb-Lynn Road from Magna Carta Blvd to Lake Ridge Parkway as shown in the attached Exhibit "A" incorporated herein by reference.

II.

THAT all other provisions of Article 23, "Master Transportation Plan" of the Unified Development Code of the City of Grand Prairie, Texas shall remain in full force and effect.

III.

THAT if any section, subsection, sentence, clause, phrase, or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provisions and such holding shall not affect the validity of the remaining portions thereof.

IV.

THAT all of the regulations provided in this ordinance are hereby declared to be governmental and for the health, safety and welfare of the general public. Any member of the City Council or any City official or employee charged with the enforcement of this ordinance, acting for the City of Grand Prairie, Texas, in the discharge of his duties, shall not thereby render himself personally liable; and he is hereby relieved of all personal liability for any damage that might occur to persons or property as a result of any act required or permitted in the discharge of his said duties.

V.

THAT this ordinance shall be in full force and effect from and after its passage, approval and publication.

VI.

PASSED AND APPROVED BY THE CITY COUNCIL OF THE CITY OF GRAND PRAIRIE, TEXAS
ON THIS THE 19th DAY OF APRIL 2005.

CHARLES V. ENGLAND, MAYOR

ATTEST:

APPROVED AS TO FORM:

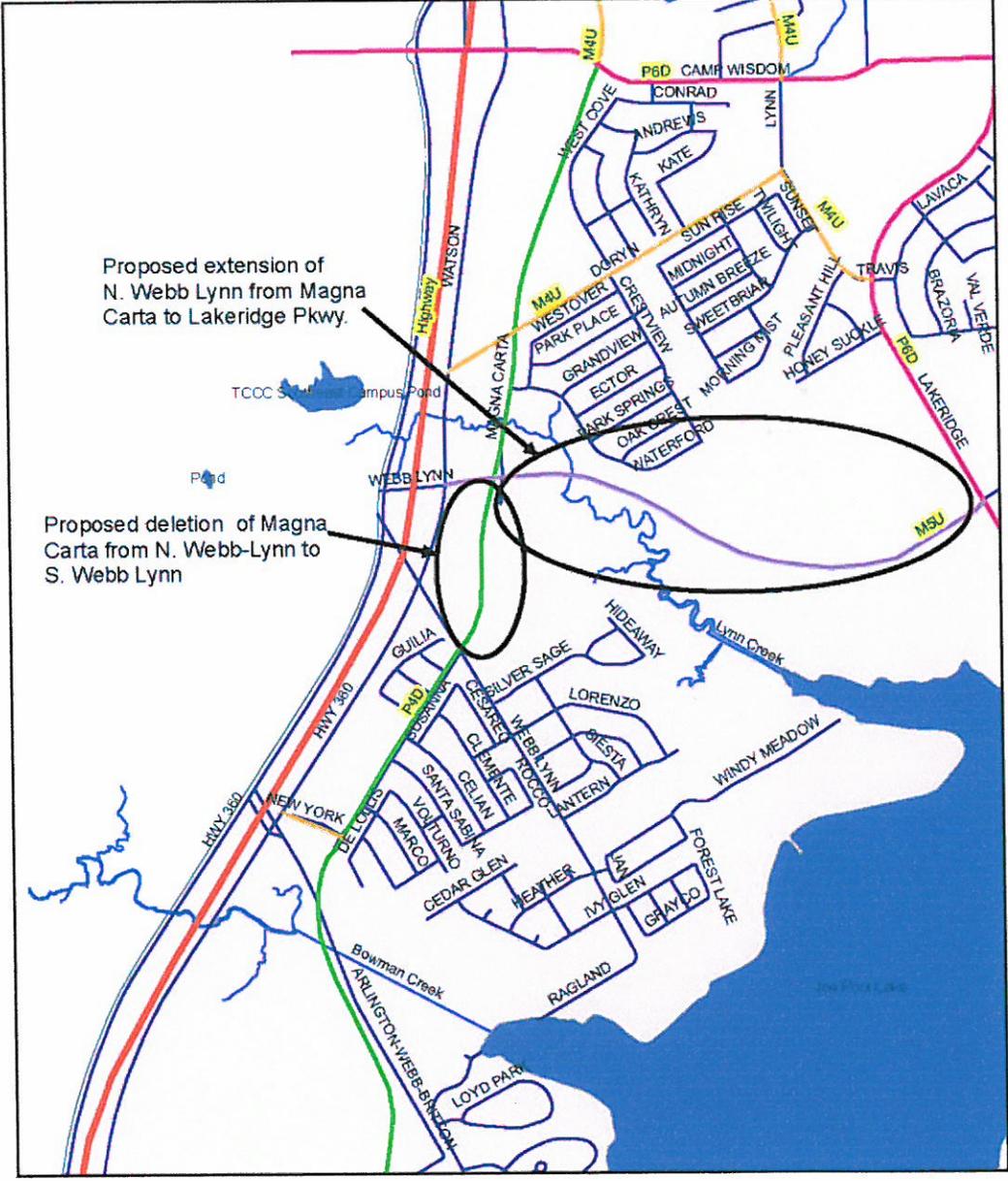
City Secretary

City Attorney

Case MTP050301

Exhibit A Proposed extension of N. Webb-Lynn and removal of Magna Carta From N. Webb-Lynn to S. Webb-Lynn

MTP 050301



PLANNING AND ZONING COMMISSION DRAFT MINUTES APRIL 11, 2005

9. MTP050301 – Amending Article 23, “Master Transportation Plan”, Deleting Designated Portions of Magna Carta Blvd. and extending North Webb-Lynn Road from Magna Carta Boulevard to Lake Ridge Parkway (City Council District 6).
[TABLED FROM A PREVIOUS MEETING]
Owner/Applicant: City of Grand Prairie
Applicant: City of Grand Prairie

Transportation Planner Daon Stephens presented the case report and stated this is a Map Amendment to Article 23, “Master Transportation Plan,” to remove a portion of Magna Carta Boulevard from North Webb-Lynn Road to South Webb-Lynn Road and extend North Webb-Lynn Road from Magna Carta Boulevard eastward to Lake Ridge Parkway as shown in Exhibit “A” of the attached draft ordinance. The new extension of North Webb Lynn Road would include a bridge over Lynn Creek and would be aligned with the intersection of the Lynn Creek Park entrance at Lake Ridge Parkway. Magna Carta Blvd to the north and south of these points will remain as stated in the current Transportation Plan.

The Development Review Committee is in support of the proposed Master Transportation Plan Amendment as submitted.

Commissioner Ethridge asked if it would be up to the Corps of Engineers to choose the alignment alternatives.

Mr. Stephens replied no, but noted staff would still need to work with the Corps of Engineers no matter what alternative is chosen for this project.

There being no more questions or speaker cards, Commissioner Fitzwilliams moved to close the public hearing and approve case MTP050301 per staff’s recommendations, seconded by Commissioner Thorn.

MOTION APPROVED: 9-0

PROPERTY NOTIFICATION LIST

ID	Acct	TAXPAYNAME	TAXPAYADR2	TAXPAYCITY	TAX	TAXPAYZIP
0	810089K1700010100	U S A	801 CHERRY ST STE 1700	FORT WORTH	TX	761026803
1	810961K1700010000	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
2	810973K1700060000	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
3	810972J1700060100	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
4	81237200100040000	GOODMAN FAMILY OF	5808 W PLANO PKWY	PLANO	TX	750934636
5	81237200100050000	GOODMAN FAMILY OF	5808 W PLANO PKWY	PLANO	TX	750934636
6	810972J1700050000	KP LAND PARTNERS LP	6300 RIDGLEA PL	FORT WORTH	TX	761165730
7	81237200100060000	HOOKER AMOS JOEL	5919 WATERFORD DR	GRAND PRAIRIE	TX	750528524
8	810972J1700030000	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
9	81237200100070000	SUTTERFIELD JANICE E & LYNN CRK	5923 WATERFORD DR	GRAND PRAIRIE	TX	750528524
10	81237200100080000	HILLS HOMEOWNERS	6300 RIDGLEA PL STE 210	FORT WORTH	TX	761165707
11	81237200100090000	KP DEV PARTNERS LP	2929 W 5TH ST	FORT WORTH	TX	761072241
12	81237200100100000	KP DEV PARTNERS LP	2929 W 5TH ST	FORT WORTH	TX	761072241
13	81237200100110000	KP DEV PARTNERS LP	2929 W 5TH ST	FORT WORTH	TX	761072241
14	81237200100120000	KP DEV PARTNERS LP	2929 W 5TH ST	FORT WORTH	TX	761072241
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18	812372001014R0000	KP DEV PARTNERS LP	2929 W 5TH ST	FORT WORTH	TX	761072241
19	81097300000010000	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
20	810972J1700040100	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
21	81097300000050100	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
22	81096100000020000	U S A CORP OF ENGINEERS	1114 COMMERCE ST	DALLAS	TX	752421021
23	812506000K0270000	SANCHEZ GILBERT & CHRIS C	6003 GUILIA DR	GRAND PRAIRIE	TX	750528757
24	812506000K0260000	COPELAND BASH JR	6007 GUILIA DR	GRAND PRAIRIE	TX	750528757
25	812506000K0250000	HIGHTS COREY A &	6011 GUILIA DR	GRAND PRAIRIE	TX	750528757

26	812506000K0280000	VASQUEZ DAVID & OLGA H	6004 GUILIA DR	GRAND PRAIRIE	TX	750528756
27	812506000K0290000	NYANDA FREDERICK O & SMITH	6008 GUILIA DR	GRAND PRAIRIE	TX	750528756
28	812506000K0300000	ANTHONY W ORTEGA MARY	6012 GUILIA DR	GRAND PRAIRIE	TX	750528756
29	812506000K0320000	H BLACK RYAN &	3108 POMPI DR	GRAND PRAIRIE	TX	750528754
30	812506000K0310000	SONYA RAWLINSON	6016 GUILIA DR	GRAND PRAIRIE	TX	750528756
31	812506000K0330000	JOHN W & ROBINSON	3104 POMPI DR	GRAND PRAIRIE	TX	750528754
32	812506000J0150000	JAMES A JR & DE SILVETTI	6007 SUSANNA DR	GRAND PRAIRIE	TX	750528746
33	812506000J0140000	GEORGE KIRKLAND	3056 CESAREO DR	GRAND PRAIRIE	TX	750528739
34	812506000J0160000	ODESSA	6011 SUSANNA DR	GRAND PRAIRIE	TX	750528746

Nays: None

The motion carried unanimously.

C.1 Z040303 - Zoning Change - Villas of Nottingham (City Council District 1)

Table indefinitely a request for approval of a zoning change of approximately 17.18 acres from Light Industrial (LI) to a Planned Development (PD) for 72 Single Family-Zero Lot Line (SF-ZLL) residential units with a minimum lot area of 6,000 square feet. The site is generally located north of Avenue K East and west of Duncan Perry Road.

C.2 MTP041004 - Amending Article 23, "Master Transportation Plan" Section 23.8.2 (2) and the Thoroughfare Map

Table indefinitely an amendment to the Master Transportation Plan, Section 23.8.2(2) to delete a segment of Great Southwest Parkway between Fountain/ Sunnyvale Parkway to the north and Avenue J to the south.

C.3 SU050301 - Specific Use Permit - Calab Learning Center (City Council District 5)

Table indefinitely a Specific Use Permit for a proposed rehabilitation and vocational training center for mentally and physically handicapped adults. The site is generally located north of Dalworth Street and east of Duncan Perry Road, and is currently zoned Office (O) District.

C.4 Z050302 - Zoning Change - County Club Townhomes (City Council District 3).

Table until May 17, 2005, a request for approval to amend Planned Development-198. The proposed amendment is for the development of 45-townhome lots on an approximate 5.02 acre tract. The site is located at the terminus of Country Club Drive which serves as the entrance to the Woodcrest Country Club (dba: Grand Prairie Country Club), and is currently zoned Planned Development-198 (PD-198).

Mayor England asked Mayor Pro Tem Swafford to conduct the remainder of the meeting and left the Chambers at 6:50 p.m.



C.5 MTP050301 - Amending Article 23, "Master Transportation Plan", Deleting Designated Portions of Magna Carta Blvd. and Extending North Webb-Lynn Road from Magna Carta Blvd. to Lake Ridge Parkway (City Council District 6)

Daon Stephens, Traffic Engineer, made a presentation of the proposed amendment to the Master Transportation Plan. Mr. Stephens explained that Webb Lynn is on the Transportation Plan to tie in to Magna Carta. This amendment would extend Webb Lynn to Lake Ridge Parkway at the entrance to Webb Lynn Park. The second part of the amendment would delete a portion of Magna Carta from North Webb Lynn to South Webb Lynn. Mr. Stephens said that the North Central Texas Council of Governments had done a traffic

capacity analysis to determine how many vehicles each day would be on each of these thoroughfares. At England Parkway near SH360, by the year 2025 it is anticipated that there will be over 45,000 trips per day. Closer to Lake Ridge Parkway, there are estimated to be nearly 19,000 trips per day. Across the north bridge of Lake Ridge Parkway, there are estimated to be 42,000 trips per day. At the proposed extension of Webb Lynn there would be over 11,000 trips per day on a typical day (not special events). At Camp Wisdom currently being constructed as a 6-lane divided highway, there will be over 40,000 trips per day. Doran Road is going to be a 4-lane undivided roadway and has several residential streets tying into it and currently has over 12,000 trips per day. It also has a sharp 90 degree turn and so this road can only be used as a 4-lane undivided roadway. Because of the projected number of trips on these roadways, it is clear that a roadway is needed to connect to Lake Ridge Parkway over to SH360. Mr. Stephens showed different alignments that had been considered. Staff proposed that Magna Carta would tie in to the extension of Webb Lynn, but it would not extend further south. The preliminary cost for the extension of Webb Lynn is \$9.2 million.

Council Member Shotwell stated that if this piece of Magna Carta is deleted, it will make SH 360 the only north/south exit from this development. Mr. Stephens replied that the property owner would have an access easement across their property to access south Webb Lynn. Otherwise the traffic would have to come down to south Webb Lynn and turn around on the "Texas U Turn" or go through the intersection and come back up to Magna Carta. If they are leaving the development to access I-20, they would go to south Webb Lynn, cut out to the northbound frontage road and go through. Council Member Shotwell remarked that he felt that taking out this section will cause a problem for those traveling north. Mr. Stephens said that TXDOT has an approved and funded project to extend the main lanes of SH360 over Kingswood and Green Oaks. Staff asked TXDOT to extend these lanes south of Camp Wisdom.

Keith Armstrong, 5915 Silver Sage (Southgate Community), stated that the plan to have Magna Carta extend to Webb Lynn is a good plan, but the plan to delete a portion of Magna Carta is not a good plan. This would provide two accesses in and out of this development (200 homes). Mr. Armstrong stated there are two more communities being built. The congestion on SH360 is very heavy. He stated that section of road is very important with regard to handling heavy traffic and for emergency response because two accesses are needed. Mr. Armstrong urged Council to keep the original design.

City Attorney Don Postell read into the record those who did not wish to speak but wished to record their opposition: Hamid Kiani, 5927 Prairie View Court; Linda Kiani, 5928 Prairie View Court; George Crouch, 5856 Prairie View Court; Jenny Holsomback, 2996 Hideaway Drive; Thermara Smith, 5915 Prairie View Court; Mattie Buchanan, 5835 Lantern Lane; Cynthia Lopez, 5828 Silver Sage Lane; Shon Connor, 5804 Lorenzo.

Council Member Jensen clarified with Mr. Armstrong that what he was asking for was to work out something on Magna Carta going from Webb Lynn up to the new Webb Lynn.

Council Member Herring noted that the 2025 traffic impact numbers are very high on Lake Ridge Parkway and Camp Wisdom. With north/south roads being taxed to the limit, the city needs to look very closely at deleting this section of road. Mr. Herring stated that he did not see the benefits of this deletion.

Council Member Jensen stated that there needs to be access from Lake Ridge over to SH360, and that he was not ready to remove Webb Lynn.

Council Member Jensen moved, seconded by Council Member Jackson, to close the public hearing and approve the proposed extension of north Webb Lynn Road from Magna Carta to Lake Ridge, and to not include the deletion of Magna Carta Blvd.

Council was advised by City Manager Tom Hart that if they delete the Magna Carta portion of the case, it would need to go back to the Planning and Zoning Commission.

Council Member Jensen moved to amend his motion, seconded by Council Member Jensen, to close the public hearing and approve the proposed extension of north Webb Lynn Road from Magna Carta to Lake Ridge and table the removal of Magna Carta Blvd.

Mayor Pro Tem Swafford asked for clarification on the tabling of the removal of Magna Carta Blvd. with regard to notification to neighbors when that is to be considered again. Mr. Postell stated that there would not be a legal requirement to send another notification. Mr. Swafford stated that he felt it would be better to send it back to the Planning and Zoning Commission so that neighbors would be notified.

Council Member Shotwell suggested to Mr. Stephens that he should look at moving Magna Carta to one side of the property so it is still developable. Mr. Stephens stated that he would meet with the developer and neighboring homeowners.

Mayor Pro Tem Swafford asked Council Member Jensen to restate the motion for the record:

Council Member Jensen moved, seconded by Council Member Jackson, to close the public hearing and table Case MTP050301 for one month.

Ayes: Council Members Fregoe, Herring, Jackson, Jensen, Lennard, Robertson, Shotwell, and Mayor Pro Tem Swafford

Nays: None

The motion carried unanimously.

C.6 TA050201 - Text Amendment - Appendix P, "Beltline Corridor Overlay District"

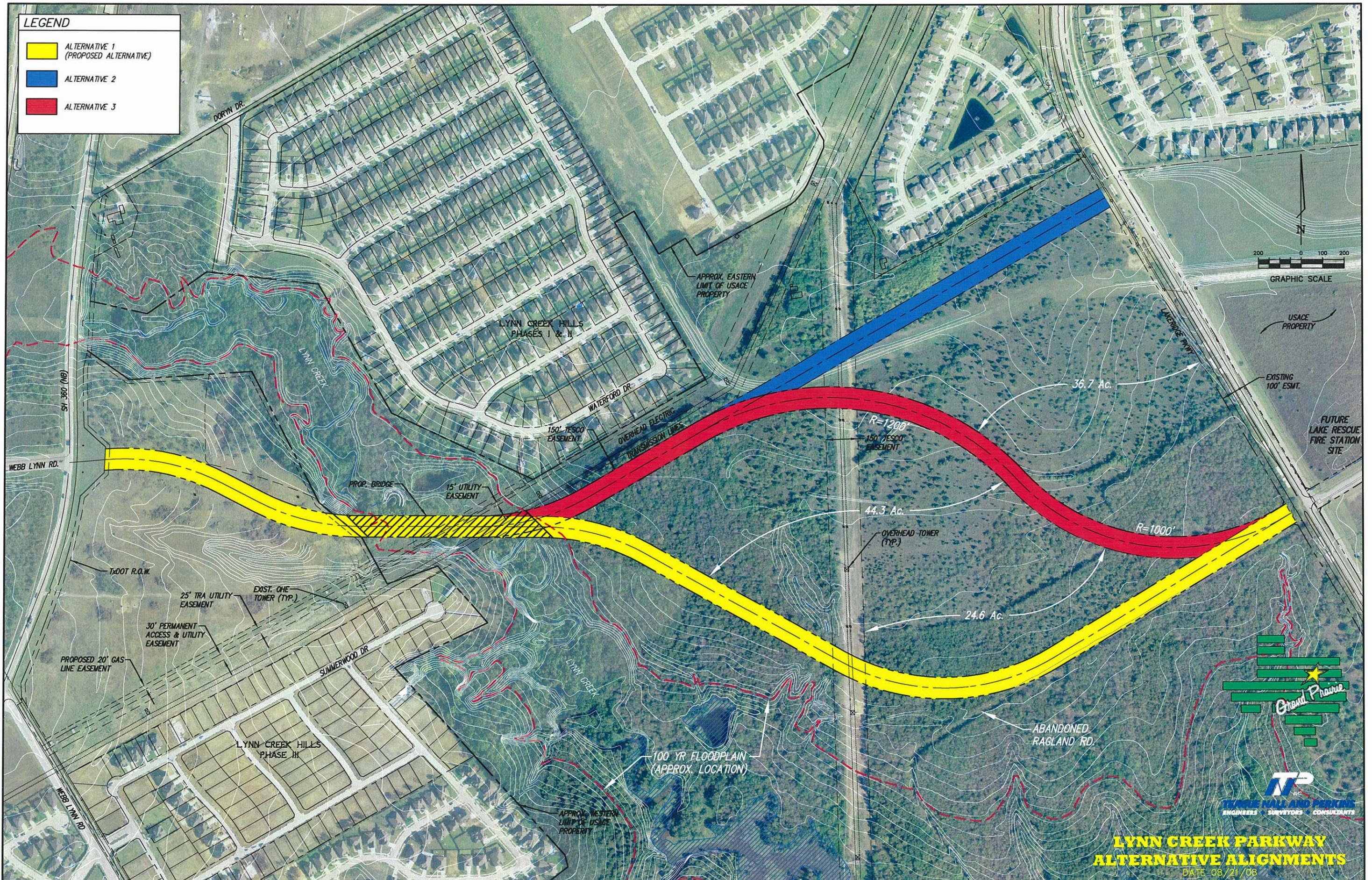
Mr. Lasher stated that this text amendment is to allow a marquee sign to advertise events at Nokia Theatre and events within the entertainment district. The reason this is not being done

Appendix D

Proposed Alternative Maps

LEGEND

- ALTERNATIVE 1
(PROPOSED ALTERNATIVE)
- ALTERNATIVE 2
- ALTERNATIVE 3

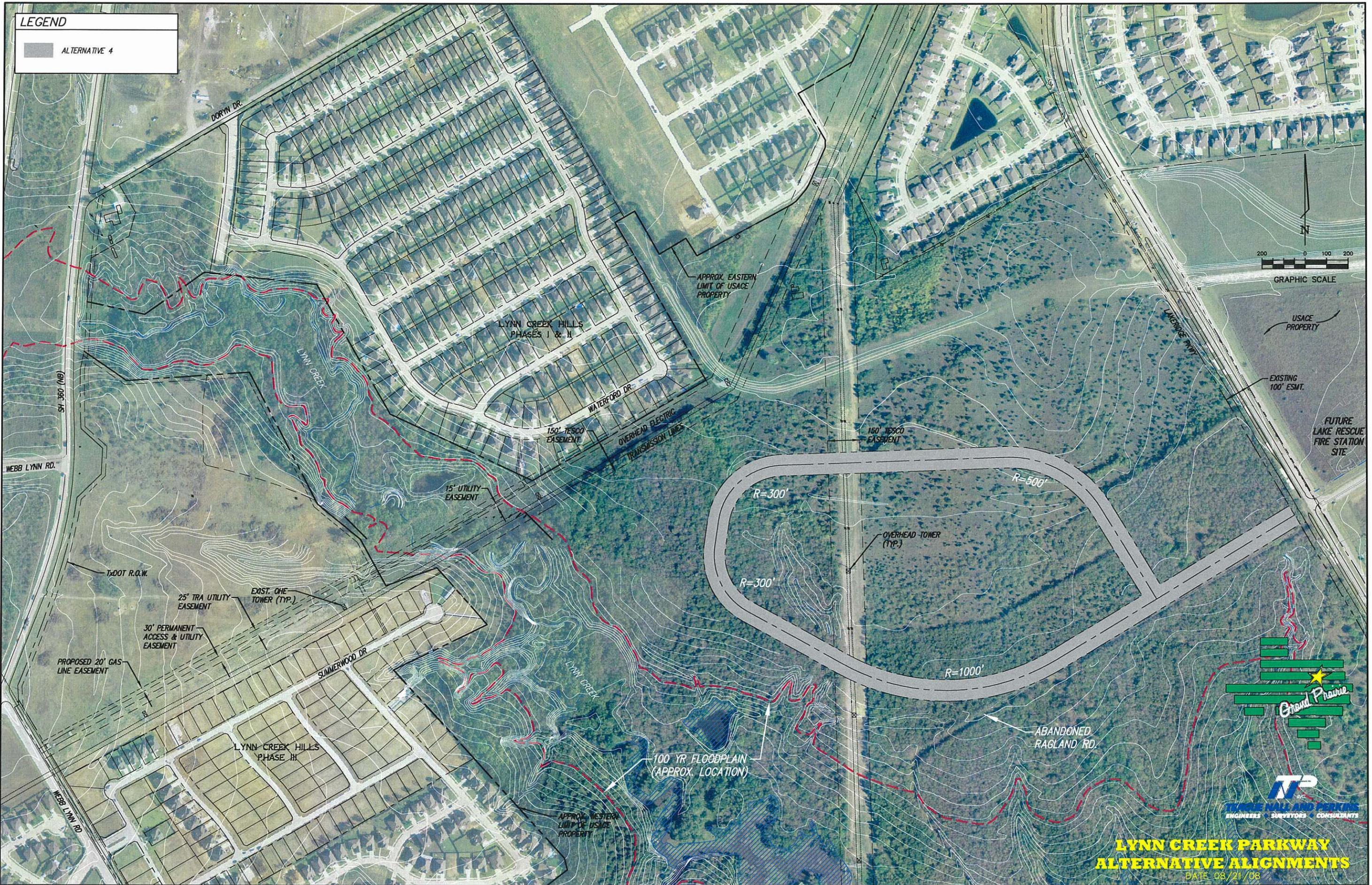


**LYNN CREEK PARKWAY
ALTERNATIVE ALIGNMENTS**

DATE 08/21/08

LEGEND

ALTERNATIVE 4



**LYNN CREEK PARKWAY
ALTERNATIVE ALIGNMENTS**
DATE 08/21/08



Appendix E

Preliminary Wetland Evaluation



December 20, 2007

Mr. Sol Stigall, P.E., CFM
Teague Nall and Perkins, Inc.
1100 Macon Street
Fort Worth, Texas 76102

Telephone: (817) 336-5773
Facsimile: (817) 336-2813

Re: Preliminary Wetlands Determination
Approximately 7,000 Feet of Proposed Roadway
To be Known as Lynn Creek Parkway
From State Highway 360 East to a Point East of Lakeridge Parkway
Grand Prairie, Texas

Mr. Stigall:

Jones & Ridenour, Inc. (J&R) is pleased to submit the results of a Preliminary Wetlands Determination for the above-referenced project (the location for which is hereinafter referred to as the Site).

Introduction:

The objectives of the Preliminary Wetlands Determination are to attempt to identify areas on-site that appear to exhibit physical characteristics typical of jurisdictional Wetlands that are Waters of the United States and/or jurisdictional Other Waters of the United States (e.g. certain creeks, certain ponds). J&R has performed this Preliminary Wetlands Determination by physically exploring the Site, searching for and documenting indicators of the presence or absence of hydrophytic (water-loving) vegetation, wetlands hydrology, and hydric soils, as well as other physical characteristics and apparent past and present land use practices that could determine the jurisdictional / non-jurisdictional nature of on-site features. In addition, J&R has reviewed readily available, published information referenced hereafter.

J&R completed this Preliminary Wetlands Determination in general accordance with the methodologies described in the January 1987 Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1). While suspect wetlands were not encountered on-site, those areas appearing to meet established criteria for Other Waters of the United States (e.g. exhibiting an Ordinary High Water Mark) were considered potential jurisdictional Other Waters of the United States.

Jones & Ridenour, Inc.
2000 E. Lamar Blvd., Suite 600 | P.O. Box 494
Arlington, TX 76006 | Denison, TX 75021
Phone: 817.303.2112 | Phone: 903.464.9055
Fax: 817.860.2112 | Fax: 903.463.1361

Limitations:

It should be understood that only the U.S. Army Corps of Engineers (USACE) can make the final jurisdictional wetlands determination, including the type of permit, if any, that may be required prior to development of potentially jurisdictional areas.

J&R's Preliminary Wetlands Determination has been based on generally accepted practices of professionals undertaking similar projects at the same time, and in the same geographical area. J&R observes that same degree of care and skill generally exercised by professionals under similar circumstances and conditions. J&R utilized surveyors' lathes marked with Station Numbers to identify the centerline of the Site in the field, and utilized surveyors' flagging, where present, to identify Site boundaries.

J&R's observations, findings, and opinions must not be considered as scientific certainties, but solely as opinions based on our professional judgment concerning the significance of the limited data gathered during the course of the project. Further, the services herein shall in no way be construed, designed, or intended to be relied upon as legal interpretation or advice.

Preliminary Wetlands Determination:

J&R biologists Mr. Doug Ridenour and Mr. Lance C. Jones observed the mostly wooded, linear Site November 28, 2007, approximately four days following rainfall in the area. Exhibits and information identifying the extent of the Site were previously provided to J&R by Teague Nall and Perkins, Inc. Assessed potentially jurisdictional features and excerpts from documented observations made during the Site reconnaissance are as follows. As suspect Wetlands that are Waters of the United States were not encountered on-site during the Site visit, USACE Routine Wetland Determination Data Forms were not completed for the project. Versus the wetland criteria, the absence or presence of an Ordinary High Water Mark (OHWM) was the defining factor in determining the absence, presence, and extent of jurisdictional feature(s). Swales and draws that were found to lack an OHWM were observed across the Site, while potentially jurisdictional reaches of stream and a potentially jurisdictional reach of drainage were observed on the western portion of the Site. Dimensions of potentially jurisdictional, aquatic features (Other Waters of the United States) encountered along the project route are provided hereafter as observed average stream / drainage widths. Identified and observed, potentially jurisdictional, aquatic features are presented from east to west. Habitat / community types for potentially jurisdictional and non-jurisdictional areas are presented after the following, four descriptions.

1. Location: Located near Station 23+00

Habitat Characterization: The Site extends along the edge of Lynn Creek, which appears intermittent in nature. No fringe wetlands were observed along the stream at this location, although mature trees were found to be present up on the banks. Although the south boundary of the Site was not found to be marked in this location, the centerline of the Site was observed to be approximately ten feet from an approximately ten-foot tall, cut bank present along the north side of this meander in the stream. Significant flow was found to be present at the time of the Site visit, with a pool up to approximately three feet deep observed down within the nearby bend.

Jurisdictional Area: Average width of the OHWM was observed to be approximately 15 feet.

2. **Location:** Located near Station 20+15

Habitat Characterization: Similar to the previous location, the centerline of the Site was found to be staked at the top of the north bank of Lynn Creek. This meander in the stream appeared to extend well into the Site at this location. As with the previously referenced reach, the stream appeared intermittent in nature, no fringe wetlands were observed, and mature trees were present up on the banks. Banks were observed to be approximately eight feet tall, with flow observed in this reach of stream as well.

Jurisdictional Area: Average width of the OHWM was observed to be approximately 12 feet.

3. **Location:** Located near Station 19+00

Habitat Characterization: The centerline of the Site extends diagonally across a small, ephemeral drainage just upgradient (northwest) of where the ephemeral drainage intersects Lynn Creek. While the southern boundary of the Site was not found to be marked at this location, it appeared the intersection of the ephemeral drainage and the reach of Lynn Creek referenced above was also located on-site near this location. No fringe wetlands were found to be located along the small, ephemeral drainage, which was located out in an open (non-wooded) highline right-of-way. The ephemeral drainage was found to be incised approximately three feet deep, with small pools present down within the drainage.

Jurisdictional Area: Average width of the OHWM was observed to be approximately two feet.

4. **Location:** Located near Station 16+00

Habitat Characterization: After paralleling Lynn Creek, the Site extends perpendicularly across Lynn Creek, which appears intermittent in nature. No fringe wetlands were observed along the stream at this location, although a riffle / pool complex was observed to the south near where the unmarked southern Site boundary was estimated to be located. This reach of stream was found to be more open, lacking a mature, wooded, riparian corridor. Bank heights were found to vary in this location, with the eastern bank being well laid back. Significant flow was found to be present at the time of the Site visit, with water observed to approximately one foot deep at this location.

Jurisdictional Area: Average width of the OHWM was observed to be approximately 15 feet.

The vast majority of the Site was found to be comprised of forested uplands, with openings of native pasture present. Dominating the overstory of this complex are species such as sugarberry (*Celtis laevigata*), eastern red cedar (*Juniperus virginiana*), pecan (*Carya illinoensis*), winged elm (*Ulmus alata*), honey-locust (*Gleditsia triacanthos*), gum bumelia (*Bumelia lanuginosa*), Osage-orange (*Maclura pomifera*), Shumard oak (*Quercus shumardii*), and American elm (*Ulmus americana*). Within the midstory species such as mesquite (*Prosopis glandulosa*), Mexican plum (*Prunus mexicana*), yaupon (*Ilex vomitoria*), privet (*Ligustrum sinense*), Hercules-club (*Zanthoxylum clava-herculis*), elbow-bush (*Forestiera pubescens*), soapberry (*Sapindus saponaria*), red mulberry (*Morus rubra*), possumhaw (*Ilex decidua*) and roughleaf dogwood (*Cornus drummondii*) were found to be present. Understory vegetation includes species such as dewberry (*Rubus spp.*), panicum (*Panicum oligosanthos*), ground-cherry (*Physalis spp.*) chervil (*Chaerophyllum tainturieri*), giant ragweed (*Ambrosia trifida*), Carolina snailseed vine (*Cocculus carolinus*), mustang grape (*Vitis mustangensis*), Virginia wild rye (*Elymus virginicus*), saw greenbrier (*Smilax bona-nox*) and poison-ivy (*Toxicodendron radicans*). Within and adjoining the forested uplands are openings consisting of various grasses and forbs. Dominate vegetation within these openings consists of horse-tail (*Conyza*

Canadensis), woolly croton (*Croton capitatus*), black-eyed susan (*Rudbeckia hirta*), common broomweed (*Amphiachyrus dracunculoides*), narrowleaf baccharis (*Baccharis neglecta*), mustang grape, Johnson grass (*Sorghum halepense*), KR bluestem (*Bothriochloa ischaemum*), silver bluestem (*Bothriochloa laguroides*), Indian blanket (*Gaillardia pulchella*), spotted beebalm (*Monarda punctata*), musk-thistle (*Carduus nutans*), broomsedge bluestem (*Andropogon virginicus*), Indian grass (*Sorghastrum nutans*) and purpletop (*Tridens flavus*). The westernmost portion of the Site was found to consist of a pasture almost completely grown over with common broomweed.

Wooded Riparian areas were found to consist of a different community type, and were generally made up of more mature trees. Species occurring in the overstory of this complex include Osage-orange, cedar elm (*Ulmus crassifolia*), American elm, sugarberry, eastern red cedar, Shumard oak, pecan, honey-locust, cottonwood (*Populus deltoides*), black willow (*Salix nigra*), and green ash (*Fraxinus pennsylvanica*). Midstory vegetation was found to include soapberry, possumhaw, sugarberry (regen), and roughleaf dogwood. Understory vegetation includes large stands of Virginia wild rye and sea oats (*Chasmanthium latifolium*). Other understory species include rattlebox (*Sesbania vesicaria*), giant ragweed, poison ivy, saw greenbrier, common greenbrier (*Smilax rotundifolia*), and Japanese honeysuckle (*Lonicera japonica*).

As presented, the Site appears to extend across three reaches of Lynn Creek and an ephemeral drainage that intersects nearby Lynn Creek. Of these identified and assessed drainage features, three were found to be intermittent and one was found to be ephemeral. As noted, fringe wetlands were not observed to be associated with the identified, on-site, potentially jurisdictional intermittent stream and ephemeral drainage. Aside from these drainage features, the Site was found to be comprised of apparently non-jurisdictional, upland areas, including a grassy swale, a wooded swale, a rather large wooded draw, and a wooded gully, all found to be lacking an OHWM. Additionally, borrow ditches present along the road east of Lakeridge Parkway and along the old road the Site parallels on its eastern end appeared to be located on-site. These borrow ditches also appeared non-jurisdictional, as they did not appear to have been built in suspect wetland areas, to drain suspect wetland areas, or on top of previously existing Other Waters of the United States.

Review of the 1973 aerial photograph contained within the Soil Survey of Tarrant County, Texas revealed that, beginning from the east and working west, the Site extends in a southwesterly direction through what appear to be agricultural (farmed) fields, crossing a small road now known as Lakeridge Parkway and paralleling an old road present just southeast of the Site, and crosses the upper ends of what is depicted as a forked, intermittent drainage system. The Site then turns northwest and, while the scale and quality of the aerial photograph are poor, appears to cross the very upper end of what is depicted as another intermittent drainage, and then extends into what appears to be a wooded area. The Site then turns in a westerly direction and crosses what is illustrated as a "Flood Pool Line" on the east side of Lynn Creek. The Site then extends along, and then crosses, an intermittent drainage identified as Lynn Creek. Continuing in a westerly direction, the Site then crosses (out of) the Flood Pool Line on the west side of Lynn Creek, and extends north of what is depicted as a dammed pond and out into what appears to be another agricultural field. Neither State Highway 360, nor its service roads, is constructed west of the Site at the time the aerial photograph was taken.

In some disagreement with the previously-referenced resource, the 1959 (revised / inspected 1981), USGS, Arlington, Texas, 7.5 minute, quadrangle (topographic) illustrates the Site extending through open (non-wooded) land, across the present-day Lakeridge Parkway, and paralleling the old road referenced above. The Site then turns northwest and crosses a contour interval and into what is illustrated as a wooded area. The Site then turns west and extends along two meanders of Lynn Creek, illustrated on this resource as a perennial stream. The Site then crosses Lynn Creek and extends out of the wooded area and into more open land north of two ponds – the easternmost of which is illustrated as having been built on a short reach of channel sometime between 1959 and 1981, and the westernmost illustrated as having been built at the head of the same reach of stream prior to 1959. As with the above-referenced resource, State Highway 360 is not illustrated as having yet been constructed west of the Site on this resource.

Conclusions:

Based on the physical natures of the three reaches of the apparently intermittent Lynn Creek and the nearby, apparently ephemeral drainage that intersects Lynn Creek (all four previously referenced by Station Number), these features do appear to be of the types that would fall under the jurisdiction of the USACE as Other Waters of the United States. It is the current policy of the Fort Worth District of the USACE that they do claim jurisdiction over aquatic features of these types.

Developmental options typically consist of avoidance, minimization of impacts (as described hereafter), or permitting (often times requiring compensatory mitigation).

Should avoidance to what appear to be Other Waters of the United States be the desired developmental approach, impacts (e.g. grading, filling, ditching) would need to occur outside the associated jurisdictional boundaries. While this line would be the OHWM for aquatic features such as intermittent and perennial streams, the OHWM for ephemeral drainages is not as easily identifiable or distinguishable. For a practical approach, avoidance of this potentially jurisdictional feature could be accomplished by staying outside of, and above, small cut banks present along this reach of drainage. As an alternative, a Wetlands Delineation performed by a qualified wetlands consultant, whereby the OHWM would be flagged in the field, could be conducted. The use of silt fences often helps prohibit impacts to jurisdictional areas and/or adjoining buffers.

Under Nationwide Permit 14 (designed to cover linear transportation projects), impacts which are less than one-tenth of an acre may qualify under Nationwide Permit 14, where no Preconstruction Notification (permit application) to the USACE would be required. Certain criteria (such as that there are no impacts to Special Aquatic Sites (e.g. wetlands, riffle / pool complexes)), conditions (e.g. that the width of the fill is limited to the minimum necessary for the crossing), and Nationwide Permit General Conditions must be met. Regarding the width of the fill being limited to the minimum necessary for the crossing, this is typically achieved by crossing the stream (or the drainage) in a more-or-less perpendicular manner. Additionally, “appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows.

Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.”

Nationwide Permit 14 is unique in that it may be used for more than one crossing, with thresholds applying to impacts at each, individual crossing. This would often be the case where a road crosses different streams, or different roads cross the same stream (where each crossing is a single and complete linear project). However, it has been J&R’s experience that the USACE might consider multiple crossings part of the same project when a single road avoidably crosses the same stream in more than one location.

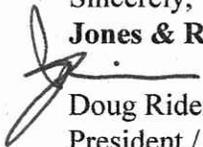
Applicable impact(s) to greater than one-tenth of an acre, yet less than one-half of an acre, to on-site, jurisdictional aquatic features (e.g. streambed), and/or impact(s) which do not meet the required criteria, may qualify for permitting under Nationwide Permit 14. In this case, a Preconstruction Notification (and the subsequent acquisition of a permit) is required prior to impact(s) that might affect jurisdictional areas. As a condition of the permit, compensatory mitigation (i.e. creation, enhancement, restoration, and/or preservation of Wetlands that are Waters of the United States / Other Waters of the United States) is most often required.

In order to comply with TCEQ 401 Water Quality Certification Conditions for Nationwide Permits, construction practices incorporated into the project should include at least one Best Management Practice from each of the applicable categories of on-site water quality management. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the OHWM, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within Other Waters of the United States during periods of low-flow or no-flow. Attached, for your convenience, is a copy of the Water Quality Certification Conditions.

Developmental impacts that do not meet the criteria and/or conditions of one of the many Nationwide Permits, and/or that exceed one-half acre to Waters of the United States, may require the more involved Individual Permitting process. In this case, a permit application package to, and subsequent acquisition of a permit from, the USACE is required prior to impacts that might affect jurisdictional areas. As a condition of the permit, compensatory mitigation is most often required. Additionally, certain criteria and associated conditions must be met. Individual Permits require more time to secure than Nationwide Permits, and include a public notice and commenting period.

Jones & Ridenour, Inc. appreciates the opportunity to have been able to provide wetlands consulting services to Teague Nall and Perkins, Inc. Jones & Ridenour, Inc. will remain available to assist with fulfillment of the permitting process, if that alternative is deemed necessary and so desired. If you have any questions regarding the above, please feel free to call the undersigned at (817) 303-2112.

Sincerely,
Jones & Ridenour, Inc.



Doug Ridenour
President / Biologist

Attachment: TCEQ 401 Water Quality Certification Conditions for Nationwide Permits



Texas Commission on Environmental Quality
401 Water Quality Certification Conditions for Nationwide Permits
Attachment 1

Below are the 401 water quality certification conditions the Texas Commission on Environmental Quality (TCEQ) added to the March 12, 2007 issuance of Nationwide Permits (NWP), as described in the Federal Register (Part II, Vol. 67, No. 10, pages 2020-2095).

Additional information regarding these conditions, including descriptions of the best management practices (BMPs), can be obtained from the TCEQ by contacting the 401 Coordinator, MC-150, P.O. Box 13087, Austin, Texas 78711-3087 or from the appropriate U.S. Army Corps of Engineers district office.

I. Erosion Control

Disturbed areas must be stabilized to prevent the introduction of sediment to adjacent wetlands or water bodies during wet weather conditions (erosion). *At least one* of the following BMPs must be maintained and remain in place until the area has been stabilized for NWPs 3, 6, 7, 12, 13, 14, 15, 17, 18, 19, 21, 22, 25, 27, 29, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, and 50. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required.

- o Temporary Vegetation
- o Blankets/Matting
- o Mulch
- o Sod
- o Interceptor Swale
- o Diversion Dike
- o Erosion Control Compost
- o Mulch Filter Berms and Socks
- o Compost Filter Berms and Socks

II. Sedimentation Control

Prior to project initiation, the project area must be isolated from adjacent wetlands and water bodies by the use of BMPs to confine sediment. Dredged material shall be placed in such a manner that prevents sediment runoff into water in the state, including wetlands. Water bodies can be isolated by the use of one or more of the required BMPs identified for sedimentation control. These BMP's must be maintained and remain in place until the dredged material is stabilized. *At least one* of the following BMPs must be maintained and remain in place until the area has been stabilized for NWPs 3, 6, 7, 12, 13, 14, 15, 17, 18, 19, 21, 22, 25, 27, 29, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, and 50. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required.

- o Sand Bag Berm
- o Rock Berm
- o Silt Fence
- o Hay Bale Dike
- o Triangular Filter Dike
- o Brush Berms

401 Water Quality Certification Conditions for Nationwide Permits
Page 2

- o Stone Outlet Sediment Traps
- o Erosion Control Compost
- o Compost Filter Berms and Socks
- o Sediment Basins
- o Mulch Filter Berms and Socks

III. Post-Construction TSS Control

After construction has been completed and the site is stabilized, total suspended solids (TSS) loadings shall be controlled by *at least one* of the following BMPs for NWP's 12, 14, 17, 18, 21, 29, 31, 36, 39, 40, 41, 42, 44, 45, 49, and 50. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required. Runoff from bridge decks has been exempted from the requirement for post construction TSS controls.

- o Retention/Irrigation Systems
- o Extended Detention Basin
- o Vegetative Filter Strips
- o Grassy Swales
- o Erosion Control Compost
- o Compost Filter Berms and Socks
- o Constructed Wetlands
- o Wet Basins
- o Vegetation lined drainage ditches
- o Sand Filter Systems
- o Mulch Filter Berms and Socks
- o Sedimentation Chambers*

* Only to be used when there is no space available for other approved BMPs.

IV. NWP 16: Return Water from Upland Contained Disposal Areas

Effluent from an upland contained disposal area shall not exceed a TSS concentration of 300 mg/L unless a site-specific TSS limit, or a site specific correlation curve for turbidity (nephelometric turbidity units (NTU)) versus (TSS) has been approved by TCEQ.

V. NWP 29, 39, 40, and 42, 43

The Corps will copy the TCEQ on all authorizations for impacts of greater than 300 linear feet of intermittent and ephemeral streams.

VI. NWP 13 and 41

The Corps will copy the TCEQ on all authorizations for impacts greater than 500 linear feet in length of ephemeral, intermittent, perennial streams or drainage ditches.

401 Water Quality Certification Conditions for Nationwide Permits
Page 3

VII. NWP 36

The Corps will copy the TCEQ on all authorizations for discharges greater than the 50 cubic yard limit or boat ramps greater than 20 feet in width.

VIII. NWPs 7, 12, 14, 15, 17, 18, 19, 22, 25, 29, 30, 31, 32, 33, 36, 37, 39, 40, 41, 42, 43, 44, 45, 46

These NWPs are not authorized for use in coastal dune swales in Texas.



an Atkins company

November 9, 2010

Mr. Romin A. Khavari, P.E., CFM
City Engineer
City of Grand Prairie, Engineering
206 W. Church Street
Grand Prairie, Texas 75053-4045.

**RE: Desktop Assessment for Waters of the U.S. including Wetlands
Proposed Lynn Creek West Recreational Development Area
Tarrant County, Texas
PBS&J No. 100002496**

Dear Mr. Khavari:

The City of Grand Prairie (City) is proposing to begin development on a currently undeveloped portion of Lynn Creek Park located on federal land at Joe Pool Lake. The federal land in question is administered by the U.S. Army Corps of Engineers (USACE). Directly related to the City's park development plans is the need to relieve traffic congestion in the vicinity of Lynn Creek Park. To achieve the related objectives of park development and relief of traffic congestion, the City has examined a number of reasonable alternative development scenarios including a "no action" alternative. Other alternatives examine various alignments for a major arterial road, named Lynn Creek Parkway, that would serve multiple functions including provision of a signature park entrance road off of State Highway (SH) 360, relief of existing traffic congestion in an area bounded by SH 360 on the west, Camp Wisdom Road on the north, and Lake Ridge Parkway on the east, relief of traffic congestion associated with special events sponsored by the City in Lynn Creek Park, and provision of improved emergency access on the north and west sides of Joe Pool Lake. Provided the City can acquire the necessary funding, the proposed Lynn Creek Parkway would be constructed first, followed by construction of a variety of recreational amenities over a fifteen year period. Proposed recreational amenities include trails, cabins, group pavilions, a swimming area, an amphitheater, an equestrian area, multipurpose play fields, a themed special events area, a rustic lodge and a group lodging area with an associated adventure sports area. A restaurant is also envisioned to support the lodge and group pavilions. This type of park development would be compatible with the federal land classifications in the USACE Master Plan for Joe Pool Lake, Design Memorandum No. 11 dated February 1981.

Introduction

PBS&J, an Atkins company, was contracted by the City to perform a desktop assessment of the recreational development area for potential wetlands. Figures 1 and 2 show the proposed project area.

The purpose of the desktop assessment was to identify waters of the United States (including wetlands) within the project area that may be subject to the Fort Worth District of the USACE, pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

Waters of the United States

Using publicly available aerial photography, USGS topographic maps, Natural Resource Conservation Service soil maps and National Wetland Inventory maps, the proposed recreational development area has five ephemeral and/or intermittent streams. The streams identified on Figures 1 and 2 are considered waters of the United States, as defined in Chapter 33 of the Code of Federal Regulations Part 328.3(a) and are subject to jurisdiction of the USACE. In addition, two open water bodies were identified that appear to potentially have a hydrologic connection to waters of the United States. Therefore, PBS&J has determined that this project is under the jurisdiction of Section 404 of the Clean Water Act. Once more detailed plans are developed for the placement of structures as part of the recreational area, the type of permit required can be determined.

Conclusion

This investigation is considered sufficient in detail and scope to form a reasonable basis for the observations and conclusions presented herein as an initial desktop assessment.

Thank you for allowing PBS&J to assist with this project. If there are questions or comments, please contact me at (903) 509-1552 or dmcafee@pbsj.com.

Sincerely,

PBSJ

an Atkins company



Dennis McAfee
Group Manager

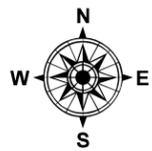
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Attachments



Legend

- STREAM
- OPEN WATER
- PROJECT BOUNDARY
- USACE PROPERTY



Base Map: 2010 USDA-APFO-FSA NAIP Imagery, Tarrant County, TX

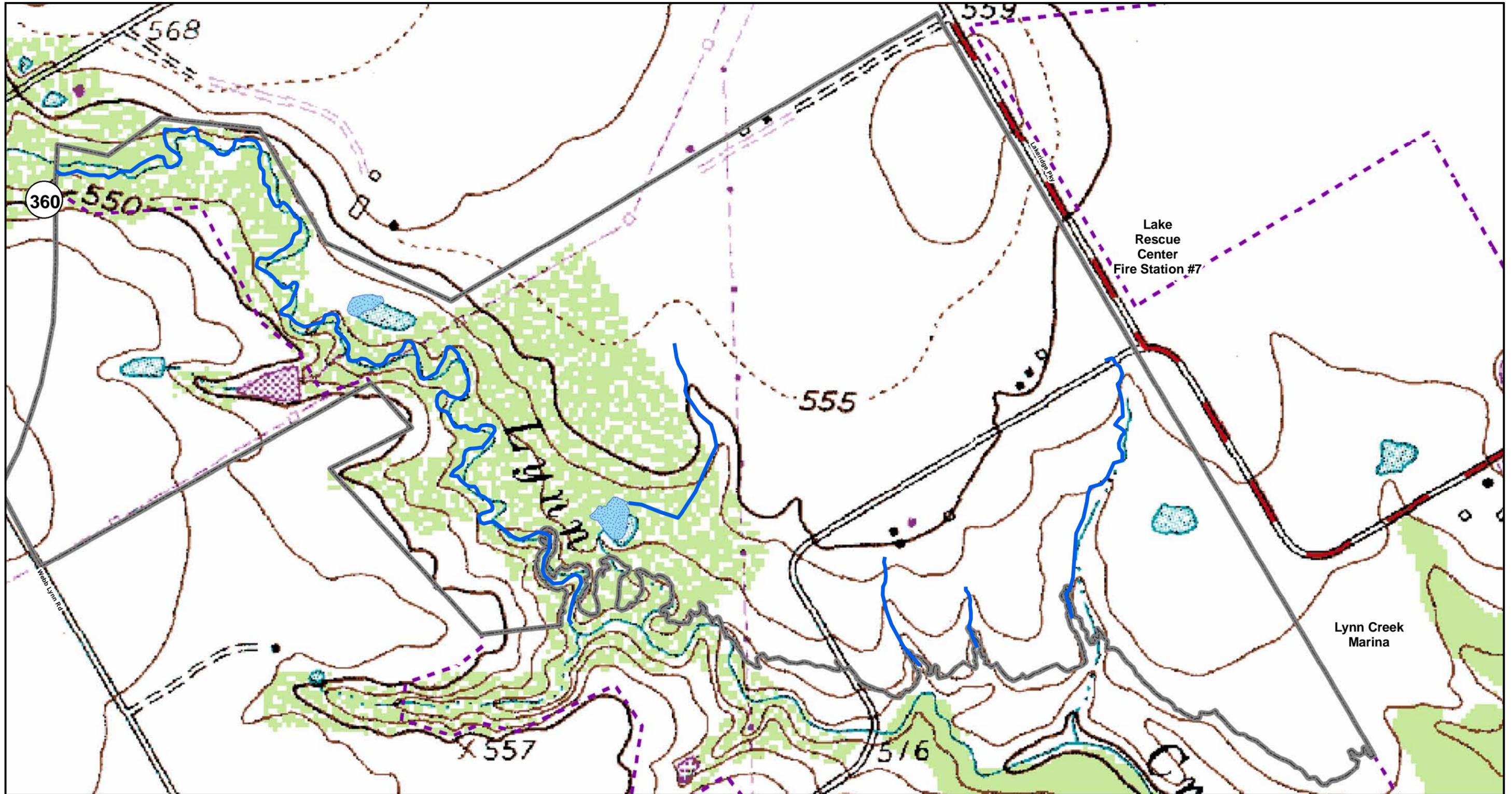
File Path: N:\100002496\projects\APPVAPP_fig1_110810.mxd



FIGURE 1
 LYNN CREEK WEST PARKWAY
 RECREATIONAL DEVELOPMENT PLAN
 STREAMS AND OPEN WATER
 TARRANT COUNTY, TX

100002496

NOVEMBER 8, 2010



500 250 0 500
Feet

Legend

STREAM	PROJECT BOUNDARY
OPEN WATER	USACE PROPERTY

an Atkins company

FIGURE 2
LYNN CREEK WEST PARKWAY
RECREATIONAL DEVELOPMENT PLAN
STREAMS AND OPEN WATER
TARRANT COUNTY, TX

100002496 NOVEMBER 8, 2010

Appendix F

TPWD/USFWS County Lists



U.S. Fish & Wildlife Service

Endangered Species List

[Back to Start](#)

List of species by county for Texas:

Counties Selected: Tarrant

Select one or more counties from the following list to view a county list:

- Anderson
- Andrews
- Angelina
- Aransas
- Archer



[View County List](#)

Tarrant County

<u>Common Name</u>	<u>Scientific Name</u>	<u>Species Group</u>	<u>Listing Status</u>	<u>Species Image</u>	<u>Species Distribution Map</u>	<u>Critical Habitat</u>	<u>More Info</u>
bald eagle	<i>Haliaeetus leucocephalus</i>	Birds	DM				P
least tern	<i>Sterna antillarum</i>	Birds	E				P
whooping crane	<i>Grus americana</i>	Birds	E, EXPN				P



U.S. Fish & Wildlife Service

Endangered Species List

[Back to Start](#)

List of species by county for Texas:

Counties Selected: Dallas

Select one or more counties from the following list to view a county list:

- Anderson
- Andrews
- Angelina
- Aransas
- Archer

[View County List](#)

Dallas County

<u>Common Name</u>	<u>Scientific Name</u>	<u>Species Group</u>	<u>Listing Status</u>	<u>Species Image</u>	<u>Species Distribution Map</u>	<u>Critical Habitat</u>	<u>More Info</u>
bald eagle	<i>Haliaeetus leucocephalus</i>	Birds	DM				P
black-capped Vireo	<i>Vireo atricapilla</i>	Birds	E				P
golden-cheeked warbler (=wood)	<i>Dendroica chrysoparia</i>	Birds	E				P
least tern	<i>Sterna antillarum</i>	Birds	E				P
piping Plover	<i>Charadrius melodus</i>	Birds	E, T				P
whooping crane	<i>Grus americana</i>	Birds	E, EXPN				P

TARRANT COUNTY BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	E
year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	T
migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south;			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts,			
Henslow's Sparrow	<i>Ammodramus henslowii</i>		
wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along			
Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E
subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	E T
both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along			
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>		
open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human			
Whooping Crane	<i>Grus americana</i>	LE	E
potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun,			

MAMMALS

		Federal Status	State Status
Gray wolf	<i>Canis lupus</i>	LE	E
extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands			
Plains spotted skunk	<i>Spilogale putorius interrupta</i>		
catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded,			
Red wolf	<i>Canis rufus</i>	LE	E
extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal			

MOLLUSKS

		Federal Status	State Status
Fawnsfoot	<i>Truncilla donaciformis</i>		
small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in			
Little spectaclecase	<i>Villosa lienosa</i>		
creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower			
Louisiana pigtoe	<i>Pleurobema riddellii</i>		
streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally			
Pistolgrip	<i>Tritogonia verrucosa</i>		
stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through			
Rock pocketbook	<i>Arcidens confragosus</i>		
mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate			
Sandbank pocketbook	<i>Lampsilis satura</i>		

small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas,
Texas heelsplitter *Potamilus amphichaenus*
quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins

REPTILES

Federal Status State Status

Texas garter snake *Thamnophis sirtalis annectens*
wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them;
Texas horned lizard *Phrynosoma cornutum* T
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees;
Timber/Canebrake rattlesnake *Crotalus horridus* T
swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone

PLANTS

Federal Status State Status

Glen Rose yucca *Yucca necopina*
grasslands on sandy soils; flowering April-June(?), also found in limestone bedrock, clayey soil on top of

DALLAS COUNTY BIRDS

		Federal Status	State Status
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	E
year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more			
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	T
migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south;			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts,			
Black-capped Vireo	<i>Vireo atricapilla</i>	LE	E
oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces;			
Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	LE	E
juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available			
Henslow's Sparrow	<i>Ammodramus henslowii</i>		
wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along			
Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E
subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars			
Peregrine Falcon	<i>Falco peregrinus</i>	DL	E T
both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along			
Piping Plover	<i>Charadrius melodus</i>	LT	T
wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats			
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>		
open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human			
White-faced Ibis	<i>Plegadis chihi</i>		T
prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests			
Whooping Crane	<i>Grus americana</i>	LE	E
potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun,			
Wood Stork	<i>Mycteria americana</i>		T
forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-			

INSECTS

		Federal Status	State Status
Black Lordithon rove beetle	<i>Lordithon niger</i>		
historically known from Texas			

MAMMALS

		Federal Status	State Status
Cave myotis bat	<i>Myotis velifer</i>		
colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in			
Plains spotted skunk	<i>Spilogale putorius interrupta</i>		
catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded,			

MOLLUSKS

Federal Status State Status

Fawnsfoot	<i>Truncilla donaciformis</i>		
small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in			
Little spectaclecase	<i>Villosa lienosa</i>		
creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower			
Louisiana pigtoe	<i>Pleurobema riddellii</i>		
streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally			
Pistolgrip	<i>Tritogonia verrucosa</i>		
stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through			
Rock pocketbook	<i>Arcidens confragosus</i>		
mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate			
Sandbank pocketbook	<i>Lampsilis satura</i>		
small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas,			
Texas heelsplitter	<i>Potamilus amphichaenus</i>		
quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins			
Wabash pigtoe	<i>Fusconaia flava</i>		
creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to			

REPTILES

Federal Status State Status

Alligator snapping turtle	<i>Macrochelys temminckii</i>		T
perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near			
Texas garter snake	<i>Thamnophis sirtalis annectens</i>		
wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them;			
Texas horned lizard	<i>Phrynosoma cornutum</i>		T
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees;			
Timber/Canebrake rattlesnake	<i>Crotalus horridus</i>		T
swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone			

PLANTS

Federal Status State Status

Glen Rose yucca	<i>Yucca necopina</i>		
grasslands on sandy soils; flowering April-June(?), also found in limestone bedrock, clayey soil on top of			
Warnock's coral-root	<i>Hexalectris warnockii</i>		
leaf litter and humus in oak-juniper woodlands in mountain canyons in the Trans Pecos but at lower elevations to			

Appendix G

EDR Report



Banks Environmental Data

Environmental FirstSearch™ Report

Target Property: Lynn Creek Parkway

ARLINGTON TX 76002

Job Number: ES38796

PREPARED FOR:

PBS & J, INC.-DALLAS

18383 Preston Road, #500

Dallas, TX 75252

AAI

07-15-08



Tel: (512) 478-0059

Fax: (512) 478-1433

Environmental FirstSearch *Search Summary Report*

Target Site:

ARLINGTON TX 76002

FirstSearch Summary

Database	Sel	Updated	Radius	Site	1/8	1/4	1/2	1/2>	ZIP	TOTALS
NPL	Y	04-07-08	1.00	0	0	0	0	0	0	0
NPL Delisted	Y	04-07-08	1.00	0	0	0	0	0	0	0
CERCLIS	Y	04-22-08	1.00	0	0	0	0	0	0	0
NFRAP	Y	04-22-08	1.00	0	0	0	0	0	0	0
RCRA COR ACT	Y	04-01-08	1.00	0	0	0	0	0	0	0
RCRA TSD	Y	04-01-08	1.00	0	0	0	0	0	0	0
RCRA GEN	Y	04-01-08	1.00	0	0	0	0	2	0	2
Federal IC / EC	Y	04-01-08	1.00	0	0	0	0	0	0	0
ERNS	Y	04-22-08	1.00	0	0	0	0	0	0	0
Tribal Lands	Y	12-01-05	1.00	0	0	0	0	0	4	4
State/Tribal Sites	Y	06-15-07	1.00	0	0	0	0	0	0	0
State Spills 90	Y	06-15-07	1.00	0	0	0	0	0	0	0
State/Tribal SWL	Y	06-15-07	1.00	0	0	0	0	0	0	0
State/Tribal LUST	Y	06-06-07	1.00	0	0	0	0	0	0	0
State/Tribal UST/AST	Y	06-06-07	1.00	0	0	0	0	0	0	0
State/Tribal EC	Y	06-06-07	1.00	0	0	0	0	0	0	0
State/Tribal IC	Y	06-07-07	1.00	0	0	0	0	0	0	0
State/Tribal VCP	Y	03/18/08	1.00	0	0	0	0	0	0	0
State/Tribal Brownfields	Y	06-15-07	1.00	0	0	0	0	0	0	0
State Other	Y	06-15-07	1.00	0	0	0	0	0	0	0
- TOTALS -				0	0	0	0	2	4	6

Notice of Disclaimer

Due to the limitations, constraints, inaccuracies and incompleteness of government information and computer mapping data currently available to Banks Environmental Data, certain conventions have been utilized in preparing the locations of all federal, state and local agency sites residing in Banks Environmental Data's databases. All EPA NPL and state landfill sites are depicted by a rectangle approximating their location and size. The boundaries of the rectangles represent the eastern and western most longitudes; the northern and southern most latitudes. As such, the mapped areas may exceed the actual areas and do not represent the actual boundaries of these properties. All other sites are depicted by a point representing their approximate address location and make no attempt to represent the actual areas of the associated property. Actual boundaries and locations of individual properties can be found in the files residing at the agency responsible for such information.

Waiver of Liability

Although Banks Environmental Data uses its best efforts to research the actual location of each site, Banks Environmental Data does not and can not warrant the accuracy of these sites with regard to exact location and size. All authorized users of Banks Environmental Data services proceeding are signifying an understanding of Banks Environmental Data searching and mapping conventions, and agree to waive any and all liability claims associated with search and map results showing incomplete and or inaccurate site locations.



Environmental FirstSearch

1 Mile Radius
ASTM Map: NPL, RCACOR, STATE Sites



, ARLINGTON TX 76002



Source: 2005 U.S. Census TIGER Files

- Target Site (Latitude: 32.63635 Longitude: -97.05383)
- Identified Site, Multiple Sites, Receptor
- NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste
- Triballand.....
- Railroads
- Black Rings Represent 1/4 Mile Radius; Red Ring Represents 500 ft. Radius



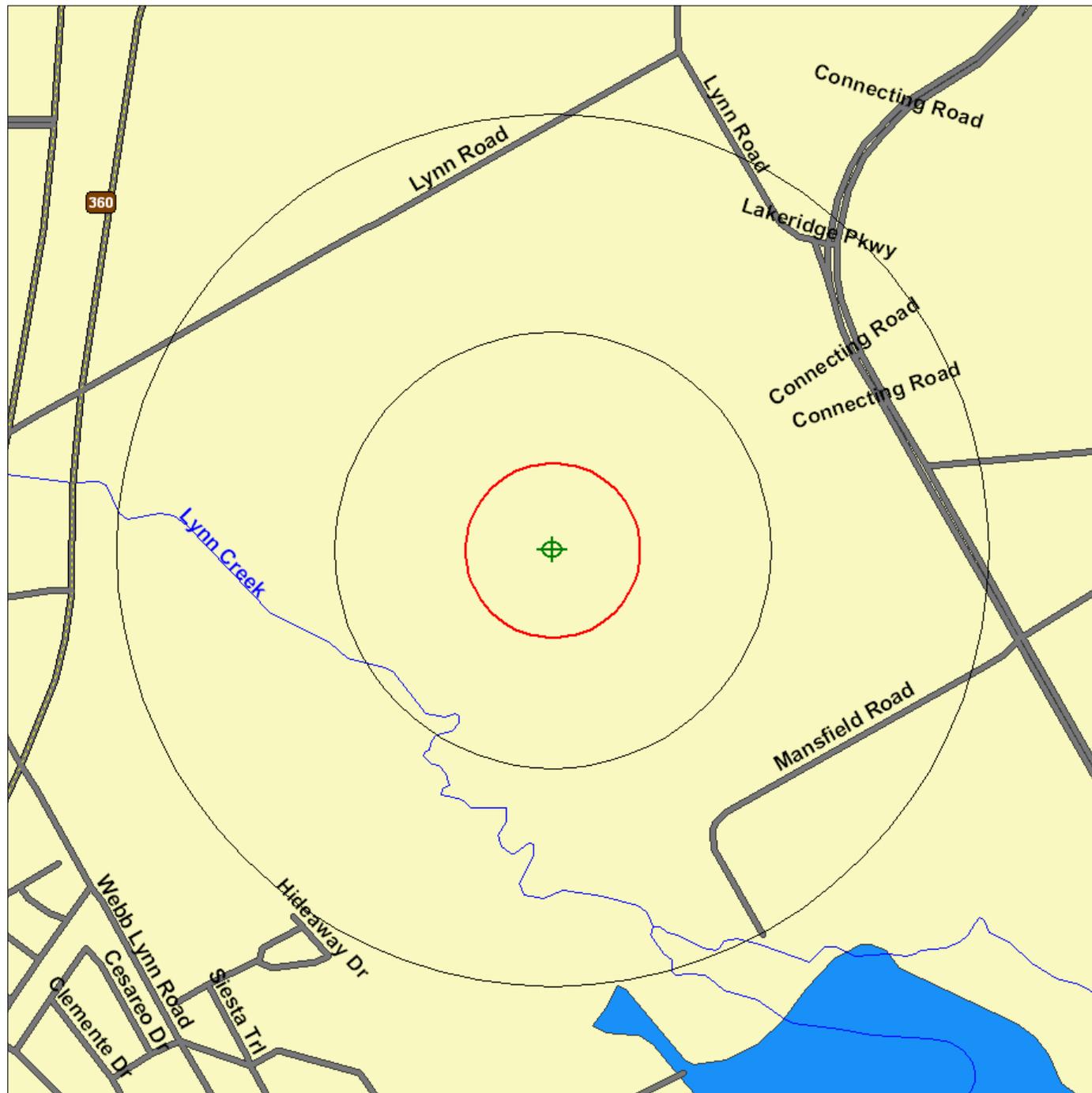


Environmental FirstSearch

.5 Mile Radius
ASTM Map: CERCLIS, RCRATSD, LUST, SWL



, ARLINGTON TX 76002



Source: 2005 U.S. Census TIGER Files

Target Site (Latitude: 32.63635 Longitude: -97.05383)

Identified Site, Multiple Sites, Receptor

NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste

Triballand.....

Railroads

Black Rings Represent 1/4 Mile Radius; Red Ring Represents 500 ft. Radius



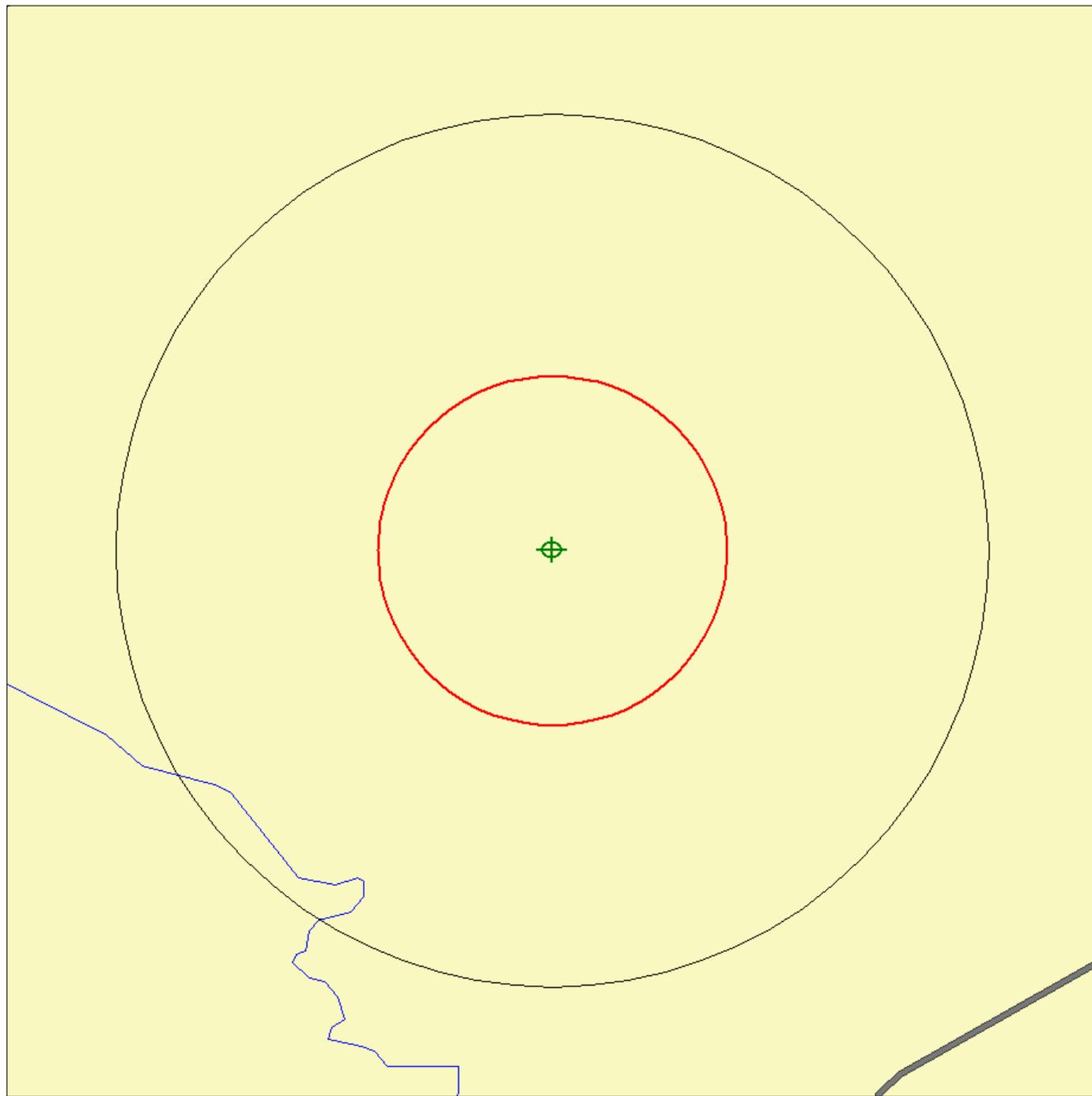


Environmental FirstSearch

.25 Mile Radius
ASTM Map: RCRA GEN, ERNS, UST



, ARLINGTON TX 76002



Source: 2005 U.S. Census TIGER Files

Target Site (Latitude: 32.63635 Longitude: -97.05383)

Identified Site, Multiple Sites, Receptor

NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste

Triballand.....

Railroads

Black Rings Represent 1/4 Mile Radius; Red Ring Represents 500 ft. Radius



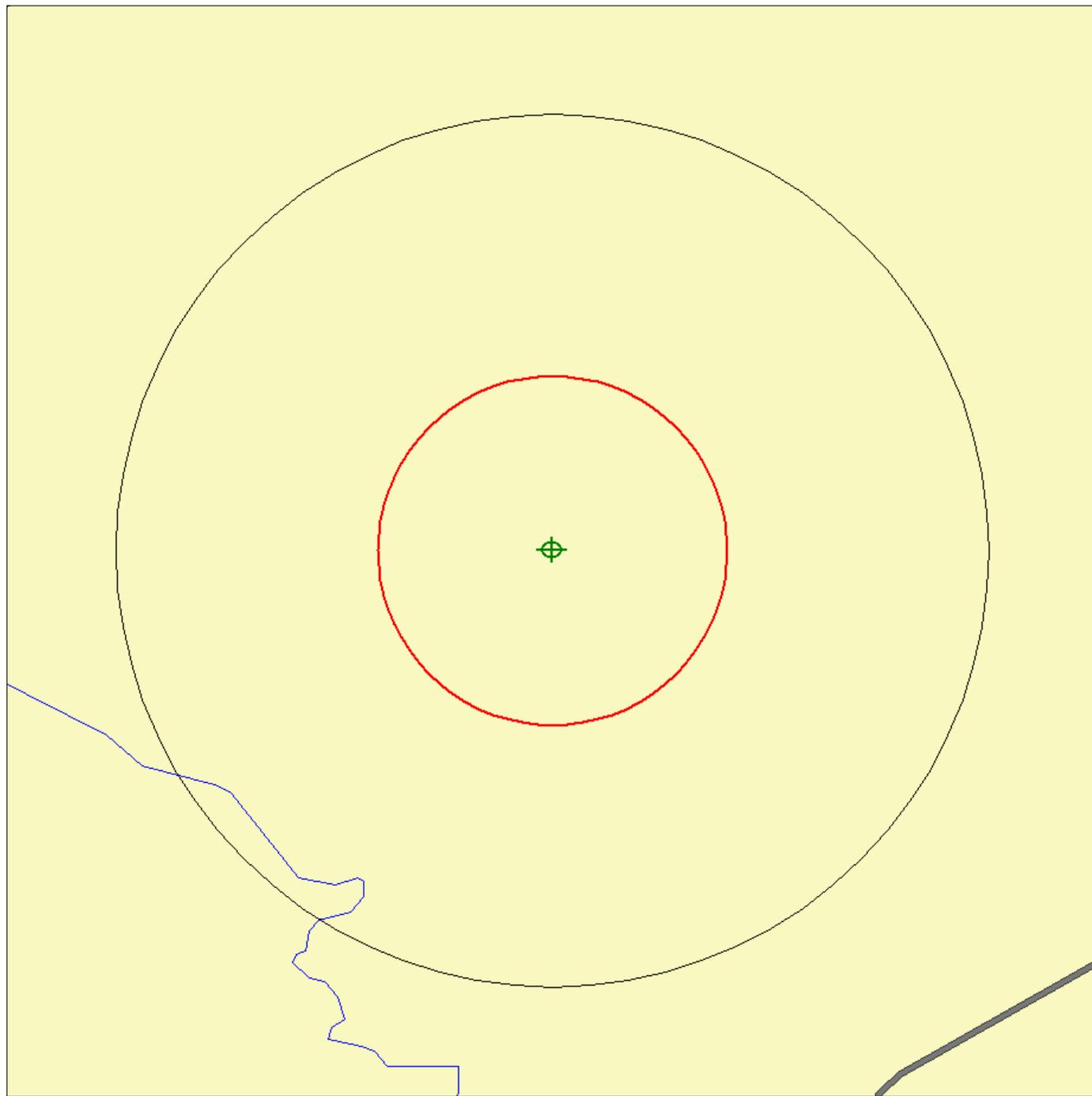


Environmental FirstSearch

.25 Mile Radius
Non-ASTM Map: No Sites Found



, ARLINGTON TX 76002



Source: 2005 U.S. Census TIGER Files

- Target Site (Latitude: 32.63635 Longitude: -97.05383) 
- Identified Site, Multiple Sites, Receptor   
- NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL), Hazardous Waste
Triballand.....  
- National Historic Sites and Landmark Sites  
- Railroads 
- Black Rings Represent 1/4 Mile Radius; Red Ring Represents 500 ft. Radius

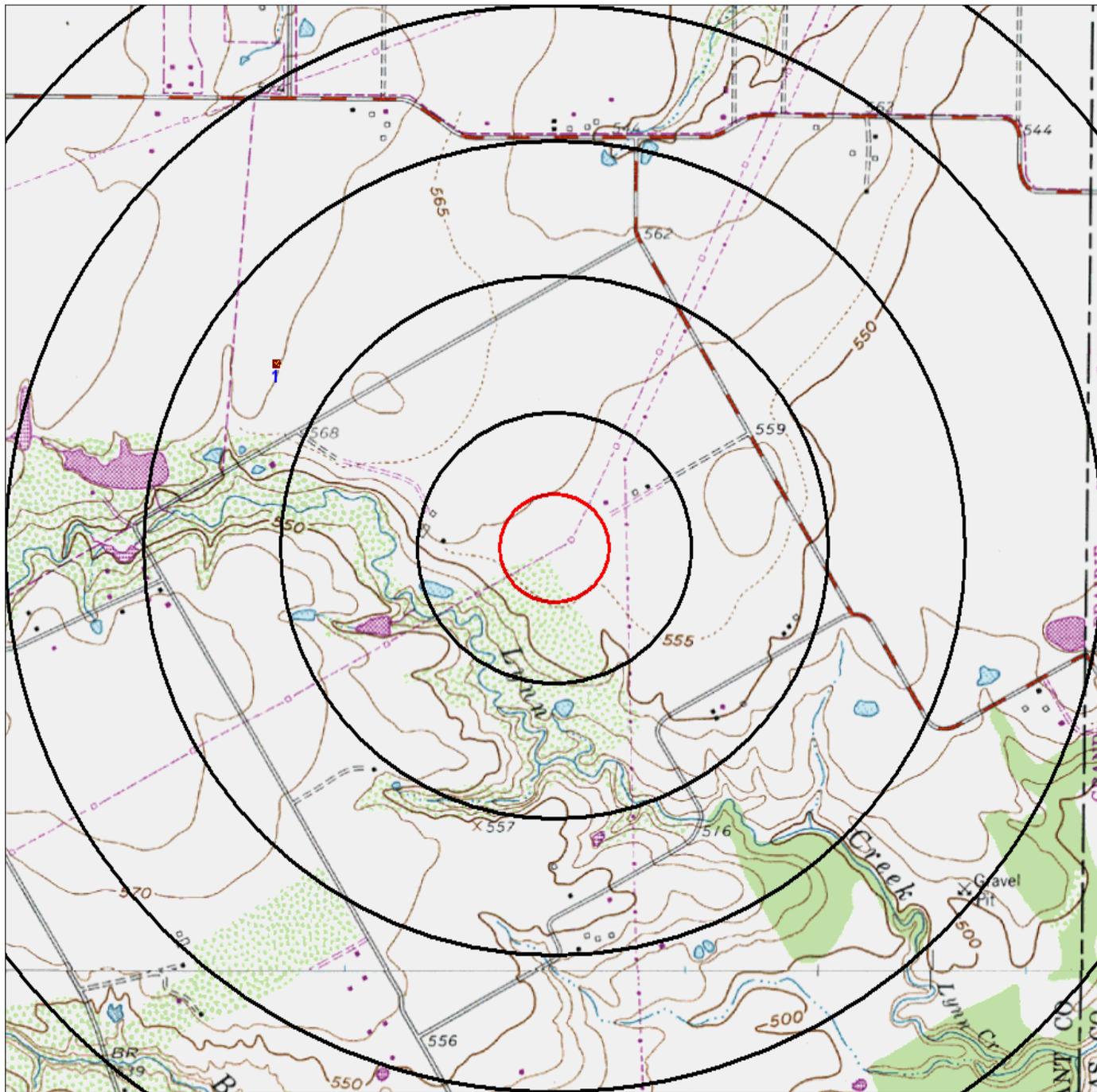


Environmental FirstSearch

Topo : 1.00 Mile Radius

Single Map

, ARLINGTON TX 76002



Source:

Target Site (Latitude: 32.63635 Longitude: -97.05383)



Identified Site, Multiple Sites, Receptor

NPL, DELNPL, Brownfield, Solid Waste Landfill (SWL) or Hazardous Waste

Tribal Land.....

Map Name: ARLINGTON Date Created: 1959-- Date Revised: 1981--

Map Reference Code: 32097-F1-TF-024

Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

**Environmental FirstSearch
Site Information Report**

Request Date: 07-15-08
Requestor Name: Lauren Kinler
Standard: AAI

Search Type: COORD
Job Number: ES38796
Filtered Report

Target Site:

ARLINGTON TX 76002

Demographics

Sites: 6	Non-Geocoded: 4	Population: NA
Radon: NA		

Site Location

	<u>Degrees (Decimal)</u>	<u>Degrees (Min/Sec)</u>	<u>UTMs</u>
Longitude:	-97.05383	-97:3:14	Easting: 682563.991
Latitude:	32.63635	32:38:11	Northing: 3612456.514
			Zone: 14

Comment

Comment: TARRANT COUNTY

Additional Requests/Services

Adjacent ZIP Codes: 1 Mile(s)	Services:
--------------------------------------	------------------

<u>ZIP Code</u>	<u>City Name</u>	<u>ST</u>	<u>Dist/Dir</u>	<u>Sel</u>	<u>Requested?</u>	<u>Date</u>
75052	GRAND PRAIRIE	TX	0.23 SW	Y	Sanborns	No
76018	ARLINGTON	TX	0.75 NW	Y	Aerial Photographs	No
75054	Grand Prairie	TX		Y	Historical Topos	No
75104	CEDAR HILL	TX		Y	City Directories	No
76063	MANSFIELD	TX		Y	Title Search/Env Liens	No
75052	GRAND PRAIRIE	TX		Y	Municipal Reports	No
					Online Topos	Yes 07-15-08

Environmental FirstSearch Sites Summary Report

Target Property:

ARLINGTON TX 76002

JOB: ES38796
TARRANT COUNTY

TOTAL: 6 **GEOCODED:** 2 **NON GEOCODED:** 4 **SELECTED:** 6

Map ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Page No.
1	RCRAGN	THE HOME DEPOT USA INC TXR000078048/SGN	5280 S STATE HIGHWAY 360 GRAND PRAIRIE TX 75052	0.61 NW	1
1	RCRAGN	HOME DEPOT USA INC TXR00007804/SGN	5280 S STATE HIGHWAY 360 GRAND PRAIRIE TX 75052	0.61 NW	2
	TRIBALLAND	BUREAU OF INDIAN AFFAIRS CONTACT I BIA-75054	TX 75054	NON GC	3
	TRIBALLAND	BUREAU OF INDIAN AFFAIRS CONTACT I BIA-76018	TX 76018	NON GC	3
	TRIBALLAND	BUREAU OF INDIAN AFFAIRS CONTACT I BIA-75052	TX 75052	NON GC	4
	TRIBALLAND	BUREAU OF INDIAN AFFAIRS CONTACT I BIA-76002	TX 76002	NON GC	4

**Environmental FirstSearch
Site Detail Report**

Target Property:

ARLINGTON TX 76002

JOB: ES38796
TARRANT COUNTY

TRIBALLAND

SEARCH ID: 6

DIST/DIR: NON GC

MAP ID:

NAME: BUREAU OF INDIAN AFFAIRS CONTACT INFORMATION
ADDRESS: TX 75054
DALLAS
CONTACT:

REV: 01/15/08
ID1: BIA-75054
ID2:
STATUS:
PHONE:

BUREAU OF INDIAN AFFAIRS CONTACT INFORMATION

OFFICE: Southern Plains Regional Office
CONTACT: DAN DEERINWATER,REGIONAL DIRECTOR
ADDRESS: W.C.D. Office Complex PO Box 638
Anadarko OK 73005
PHONE: Phone: 405-247-6673
FAX: Fax: 405-247-5611

The Native American Consultation Database (NACD) is a tool for identifying consultation contacts for Indian tribes, Alaska Native villages and corporations, and Native Hawaiian organizations. The database is not a comprehensive source of information, but it does provide a starting point for the consultation process by identifying tribal leaders and NAGPRA contacts. This database can be accessed online at the following web address <http://home.nps.gov/nacd/>

TRIBALLAND

SEARCH ID: 5

DIST/DIR: NON GC

MAP ID:

NAME: BUREAU OF INDIAN AFFAIRS CONTACT INFORMATION
ADDRESS: TX 76018
TARRANT
CONTACT:

REV: 01/15/08
ID1: BIA-76018
ID2:
STATUS:
PHONE:

BUREAU OF INDIAN AFFAIRS CONTACT INFORMATION

OFFICE: Southern Plains Regional Office
CONTACT: DAN DEERINWATER,REGIONAL DIRECTOR
ADDRESS: W.C.D. Office Complex PO Box 638
Anadarko OK 73005
PHONE: Phone: 405-247-6673
FAX: Fax: 405-247-5611

The Native American Consultation Database (NACD) is a tool for identifying consultation contacts for Indian tribes, Alaska Native villages and corporations, and Native Hawaiian organizations. The database is not a comprehensive source of information, but it does provide a starting point for the consultation process by identifying tribal leaders and NAGPRA contacts. This database can be accessed online at the following web address <http://home.nps.gov/nacd/>

Environmental FirstSearch Descriptions

NPL: EPA NATIONAL PRIORITY LIST - The National Priorities List is a list of the worst hazardous waste sites that have been identified by Superfund. Sites are only put on the list after they have been scored using the Hazard Ranking System (HRS), and have been subjected to public comment. Any site on the NPL is eligible for cleanup using Superfund Trust money.

A Superfund site is any land in the United States that has been contaminated by hazardous waste and identified by the Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment.

FINAL - Currently on the Final NPL

PROPOSED - Proposed for NPL

NPL DELISTED: EPA NATIONAL PRIORITY LIST Subset - Database of delisted NPL sites. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

DELISTED - Deleted from the Final NPL

CERCLIS: EPA COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY INFORMATION SYSTEM (CERCLIS)- CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL.

PART OF NPL- Site is part of NPL site

DELETED - Deleted from the Final NPL

FINAL - Currently on the Final NPL

NOT PROPOSED - Not on the NPL

NOT VALID - Not Valid Site or Incident

PROPOSED - Proposed for NPL

REMOVED - Removed from Proposed NPL

SCAN PLAN - Pre-proposal Site

WITHDRAWN - Withdrawn

NFRAP: EPA COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY INFORMATION SYSTEM ARCHIVED SITES - database of Archive designated CERCLA sites that, to the best of EPA's knowledge, assessment has been completed and has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

NFRAP – No Further Remedial Action Plan

P - Site is part of NPL site

D - Deleted from the Final NPL

F - Currently on the Final NPL

N - Not on the NPL

O - Not Valid Site or Incident

P - Proposed for NPL

R - Removed from Proposed NPL

S - Pre-proposal Site

W – Withdrawn

RCRA COR ACT: EPA RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM SITES - Database of hazardous waste information contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984.

RCRAInfo facilities that have reported violations and subject to corrective actions.

RCRA TSD: *EPA* RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM TREATMENT, STORAGE, and DISPOSAL FACILITIES. - Database of hazardous waste information contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984.

Facilities that treat, store, dispose, or incinerate hazardous waste.

RCRA GEN: *EPA* RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM GENERATORS - Database of hazardous waste information contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984.

Facilities that generate or transport hazardous waste or meet other RCRA requirements.

LGN - Large Quantity Generators

SGN - Small Quantity Generators

VGN – Conditionally Exempt Generator.

Included are RAATS (RCRA Administrative Action Tracking System) and CMEL (Compliance Monitoring & Enforcement List) facilities.

Federal IC / EC: *EPA* BROWNFIELD MANAGEMENT SYSTEM (BMS) - database designed to assist EPA in collecting, tracking, and updating information, as well as reporting on the major activities and accomplishments of the various Brownfield grant Programs.

FEDERAL ENGINEERING AND INSTITUTIONAL CONTROLS- Superfund sites that have either an engineering or an institutional control. The data includes the control and the media contaminated.

ERNS: *EPA/NRC* EMERGENCY RESPONSE NOTIFICATION SYSTEM (ERNS) - Database of incidents reported to the National Response Center. These incidents include chemical spills, accidents involving chemicals (such as fires or explosions), oil spills, transportation accidents that involve oil or chemicals, releases of radioactive materials, sightings of oil sheens on bodies of water, terrorist incidents involving chemicals, incidents where illegally dumped chemicals have been found, and drills intended to prepare responders to handle these kinds of incidents. Data since January 2001 has been received from the National Response System database as the EPA no longer maintains this data.

Tribal Lands: *DOI/BIA* INDIAN LANDS OF THE UNITED STATES - Database of areas with boundaries established by treaty, statute, and (or) executive or court order, recognized by the Federal Government as territory in which American Indian tribes have primary governmental authority. The Indian Lands of the United States map layer shows areas of 640 acres or more, administered by the Bureau of Indian Affairs. Included are Federally-administered lands within a reservation which may or may not be considered part of the reservation.

State/Tribal Sites: *TCEQ* STATE SUPERFUND REGISTRY - TCEQ sites which may constitute an imminent and substantial endangerment to public health and safety or to the environment due to a release or threatened release of hazardous substances into the environment

State Spills 90: *TCEQ* Database of emergency response actions and spill releases dating from 2002 to present

State/Tribal SWL: *TCEQ* Listing of all permitted solid waste landfills, transfer stations, and incinerators

State/Tribal LUST: *TCEQ* Listing of all leaking underground petroleum storage tanks

State/Tribal UST/AST: *TCEQ* Listing of all underground petroleum storage tanks

State/Tribal EC: *TCEQ* See Institutional Controls database

State/Tribal IC: *TCEQ* Listing of sites in the Voluntary Cleanup Program (VCP) and the Innocent Owner/Operator Program (IOP) where Institutional or Engineering Controls have been placed on them.

State/Tribal VCP: *TCEQ* Listing of all sites in the Voluntary Cleanup Program (VCP) and the Innocent Owner/Operator Program (IOP). Some VCP and IOP sites are noted as having institutional controls placed on them.

State/Tribal Brownfields: *TCEQ/EPA* Listing of all former industrial properties that lie dormant or underutilized due to liability associated with real or perceived contamination. Some sites are noted as having institutional controls placed on them.

Brownfields Management System (BMS) is an analytical database designed to assist EPA in collecting, tracking, and updating information, as well as reporting on the major activities and accomplishments of the various Brownfield grant Programs.

RADON: *NTIS* NATIONAL RADON DATABASE - EPA radon data from 1990-1991 national radon project collected for a variety of zip codes across the United States.

State Other: *TCEQ* Texas Industrial Hazardous Waste Notice of Registration (IHW NOR) data. The TCEQ enters all information submitted by industrial and hazardous waste transporters, receivers (including recyclers), generators and one time shipments into a database that tracks industrial and hazardous waste generation and management activities in the state of Texas. All facilities of these types receive a solid waste registration number.

Dry Cleaner Remediation Program (DCRP) - The Dry Cleaner Remediation Program (DCRP) was established by the Texas Legislature in 2003. It created the Dry Cleaning Facility Release Fund for state lead clean up of dry cleaner related contaminated sites. There are two listings from this program:

LIST#1 - A historic listing of any facility that registered with the DCRP indicating whether or not the facility has used Perchloroethylene (PERC) in the past.

LIST#2 - A Prioritization list of dry cleaner sites. Facilities on this list will be investigated in order to determine the existence and or extent of possible contamination. The DCRP administers the Dry Cleaning Facility Release Fund to assist with remediation of contamination caused by dry cleaning solvents.

Facilities which are not current on their DCRP payments get dropped from the program. Banks Information Solutions DOES NOT REMOVE these listings from our database so that we may present a more complete historical listing of facilities that may or may not have used PERC in the past.

State Other: *US DOJ* NATIONAL CLANDESTINE LABORATORY REGISTER - Database of addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the U.S. Department of Justice ("the Department"), and the Department has not verified the entry and does not guarantee its accuracy. All sites that are included in this data set will have an id that starts with NCLR.

Environmental FirstSearch Database Sources

NPL: EPA Environmental Protection Agency

Updated quarterly

NPL DELISTED: EPA Environmental Protection Agency

Updated quarterly

CERCLIS: EPA Environmental Protection Agency

Updated quarterly

NFRAP: EPA Environmental Protection Agency.

Updated quarterly

RCRA COR ACT: EPA Environmental Protection Agency.

Updated quarterly

RCRA TSD: EPA Environmental Protection Agency.

Updated quarterly

RCRA GEN: EPA Environmental Protection Agency.

Updated quarterly

Federal IC / EC: EPA Environmental Protection Agency

Updated quarterly

ERNS: EPA/NRC Environmental Protection Agency

Updated annually

Tribal Lands: DOI/BIA United States Department of the Interior

Updated annually

State/Tribal Sites: TCEQ The Texas Commission on Environmental Quality's Office of Permitting, Remediation and Registration, Remediation Division

Updated quarterly

State Spills 90: *TCEQ* The Texas Commission on Environmental Quality

Updated quarterly

State/Tribal SWL: *TCEQ* The Texas Commission on Environmental Quality's Office of Permitting, Remediation and Registration, Waste Permits Division, Municipal Solid Waste Permits Section

Updated annually

State/Tribal LUST: *TCEQ* The Texas Commission on Environmental Quality's Office of Permitting, Remediation and Registration, Waste Permits Division, Petroleum Storage Tank Program

Updated quarterly

State/Tribal UST/AST: *TCEQ* The Texas Commission on Environmental Quality's Office of Permitting, Remediation and Registration, Waste Permits Division, Petroleum Storage Tank Program

Updated quarterly

State/Tribal EC: *TCEQ* The Texas Commission on Environmental Quality

Updated quarterly

State/Tribal IC: *TCEQ* The Texas Commission on Environmental Quality

Updated quarterly

State/Tribal VCP: *TCEQ* The Texas Commission on Environmental Quality

Updated quarterly

State/Tribal Brownfields: *TCEQ/EPA* The Texas Commission on Environmental Quality

Updated quarterly

RADON: *NTIS* Environmental Protection Agency, National Technical Information Services

Updated periodically

State Other: *TCEQ* The Texas Commission on Environmental Quality's Office of Permitting, Remediation and Registration

Updated quarterly

State Other: *US DOJ* U.S. Department of Justice

Updated when available

Environmental FirstSearch
Street Name Report for Streets within 1 Mile(s) of Target Property

Target Property:
 ARLINGTON TX 76002

JOB: ES38796
 TARRANT COUNTY

Street Name	Dist/Dir	Street Name	Dist/Dir
Bantry Dr	0.79 SW	Montego Dr	0.84 SW
Bolivar Dr	0.98 SW	O Connor St	0.74 SW
Capstan Dr	0.97 SW	Paolo Dr	0.75 SW
Celian Dr	0.84 SW	Pietro Dr	0.76 SW
Cesareo Dr	0.70 SW	Pompi Dr	0.70 SW
Clemente Dr	0.77 SW	Port Phillip Dr	0.87 SW
Connecting Rd	0.41 NE	Porta Dr	0.92 SW
Crescenzo Dr	0.80 SW	Prairie View Ct	0.73 SW
De Lollis Dr	0.95 SW	Ragland Rd	0.62 SE
Delaforde Dr	0.98 SW	Red Oak Dr	0.96 NW
Divanna Ct	0.88 SW	Rocco Dr	0.76 SW
Garden Oaks Pl	0.76 NE	Saddleridge Ct	0.77 SW
Guilia Dr	0.67 SW	Santa Sabina Dr	0.90 SW
Harwood Rd	0.92 NW	Siesta Trl	0.64 SW
Hideaway Dr	0.51 SW	Silver Sage Ln	0.53 SW
Lake Ridge Pky	0.41 NE	Southeast Pky	0.75 NW
Lakeridge Pky	0.47 NE	State Highway 360	0.55 NW
Lantern Ln	0.70 SW	Susanna Dr	0.70 SW
Lorenzo Dr	0.68 SW	Teodoro Dr	0.81 SW
Lynn Creek Park	0.44 NE	Timber Ct	0.90 NE
Lynn Rd	0.43 NW	Turtle Cove Ct	1.00 NW
Magna Carta Blvd	0.65 SW	Volturno Dr	0.95 SW
Mainsail Ln	0.73 SW	W Camp Wisdom Rd	0.76 NE
Mansfield Rd	0.47 SE	Weatherford Trl	0.52 SW
Martin Barnes Rd	0.84 NE	Webb Lynn Rd	0.55 SW
Merritt Way Ct	0.95 NW	White Oak Dr	0.96 NW
Merritt Way	1.00 NW	Willowstone Trl	0.99 NW
Modelli Dr	1.00 SW	Wind Elm Ct	0.97 SW
Montego Ct	0.86 SW		

Appendix H

Traffic Impact Analysis

**TRAFFIC IMPACT ANALYSIS FOR
PROPOSED LYNN CREEK PARKWAY
GRAND PRAIRIE, TEXAS**

Prepared for:

Teague Nall and Perkins, Inc.
1100 Macon Street
Fort Worth, Texas 76102

Prepared by:



LEE ENGINEERING

3030 LBJ Freeway, Suite 1660
Dallas, Texas 75234
Phone: (972) 248-3006
Fax: (972) 248-3855



January 2008

Kelly D. Parma
1/16/08

TABLE OF CONTENTS

INTRODUCTION	1
EXISTING SITE CONDITIONS	4
FUTURE STUDY AREA DEVELOPMENTS	7
TRAFFIC VOLUMES.....	11
AUXILIARY LANE ANALYSIS	18
RECOMMENDED LANE CONFIGURATIONS.....	20
CONCLUSIONS AND RECOMMENDATIONS	23
APPENDIX.....	24

LIST OF TABLES

Table 1. Trip Generation Rates for Proposed Developments	8
Table 2. Directional Splits for Proposed Developments.....	8
Table 3: Estimated Trip Generation for Proposed Developments	8
Table 4. Historical Daily Traffic Volumes	11
Table 5. Right Turn Lane Volumes	18
Table 6. Left Turn Lane Volumes.....	19

LIST OF FIGURES

Figure 1. Preliminary Lynn Creek Parkway Layout.....	2
Figure 2. Map of Study Area	3
Figure 3. Existing Roadway and Intersection Lane Configurations	5
Figure 4. Proposed Roadway and Intersection Lane Configurations	6
Figure 5. Assumed Percent Directional Distribution.....	9
Figure 6. Site Generated Peak Hour Traffic Volumes.....	10
Figure 7. Existing (2007) Peak Hour Traffic Volumes	13
Figure 8. Analysis Year (2009) Peak Hour Background Traffic Volumes	14
Figure 9. Lynn Creek Parkway – Analysis Year (2009) Directional Distribution	15
Figure 10. Lynn Creek Parkway – Analysis Year (2009) Peak Hour Background Traffic Volumes	16
Figure 11. Analysis Year (2009) Peak Hour Total Traffic Volumes.....	17
Figure 12. Recommended Roadway and Intersection Lane Configurations	22

INTRODUCTION

This traffic study was conducted to analyze the traffic impacts of the proposed Lynn Creek Parkway on the intersections bordering the new roadway. Lynn Creek Parkway will be an east-west five-lane undivided arterial roadway intersecting Webb Lynn Road and the SH 360 northbound frontage road to the west and Lake Ridge Parkway and the Lynn Creek Park entrance to the east. Construction of Lynn Creek Parkway is expected to be complete near the end of 2009. A preliminary layout of Lynn Creek Parkway is provided in **Figure 1**.

The study area for this project consisted of the existing signalized intersection of Webb Lynn Road and the SH 360 northbound frontage road and the existing unsignalized intersection of the Lynn Creek Park entrance and Lake Ridge Parkway. A vicinity map of the study area is shown in **Figure 2**. The following elements were included as part of this study:

Data Collection

- Collected 24-hour traffic volume data on the approaches to the SH 360 northbound frontage road and Webb Lynn Road intersection and the Lake Ridge Parkway and Lynn Road intersection.
- Collected existing AM and PM peak period turning movement counts at the SH 360 northbound frontage road and Webb Lynn Road intersection and the Lake Ridge Parkway and Lynn Road intersection.
- Obtained historical traffic counts in the area from the City of Grand Prairie and Texas Department of Transportation (TxDOT).
- Performed a field visit of the study area roadways and intersections.
- Obtained the proposed Lynn Creek Parkway alignment plans, information related to planned improvements and future developments, and other relevant information.

Traffic Analysis

- Estimated the number of trips that would be used by the proposed Lynn Creek Parkway.
- Estimated the number of trips generated by proposed developments adjacent to Lynn Creek Parkway.
- Estimated the directional distribution of traffic approaching / departing the new roadway.
- Assigned the estimated traffic to Lynn Creek Parkway and the area street network.
- Analyzed the impact of Lynn Creek Parkway on the area roadways and intersections.

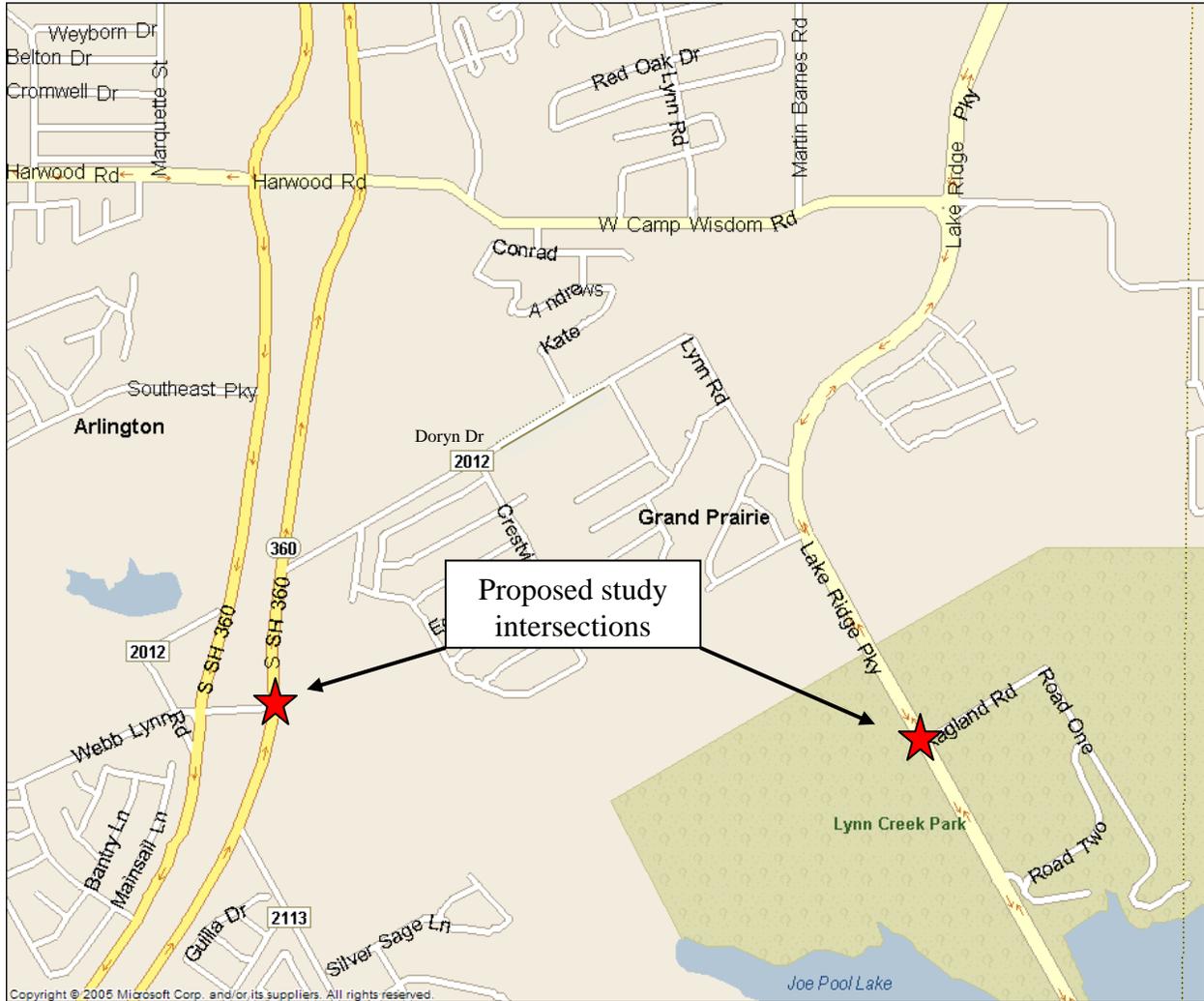
Recommendations

- Recommended roadway lane configurations for the analysis year (2009).

Documentation

- Prepared a report documenting the study procedures and results.

Figure 2. Map of Study Area



EXISTING SITE CONDITIONS

The proposed Lynn Creek Parkway will be located south of Camp Wisdom Road and east of SH 360 in Grand Prairie, Texas. Lynn Creek Parkway will be an east-west five-lane undivided arterial roadway intersecting Webb Lynn Road and the SH 360 northbound frontage road to the west and Lake Ridge Parkway and the Lynn Creek Park entrance to the east. The existing lane configurations for the area roadways and the critical intersections within the study area are provided in **Figure 3**; a brief description of the area roadways is provided below:

SH 360 –SH 360 is currently a four-lane frontage road system with a posted speed limit of 55 mph in the study area. SH 360 begins at US 287 and extends northward to north of Southeast Green Oaks Boulevard in Grand Prairie where the existing controlled access section begins and continues north. The SH 360 northbound and southbound frontage roads operate as an arterial roadway running generally north-south through the City of Grand Prairie.

Webb Lynn Road – Webb Lynn Road extends from Arlington Webb Road in Arlington to the east as a minor collector and terminates at the SH 360 northbound frontage road. At the intersection of Webb Lynn Road and the SH 360 northbound frontage road, Webb Lynn has dual eastbound left turns.

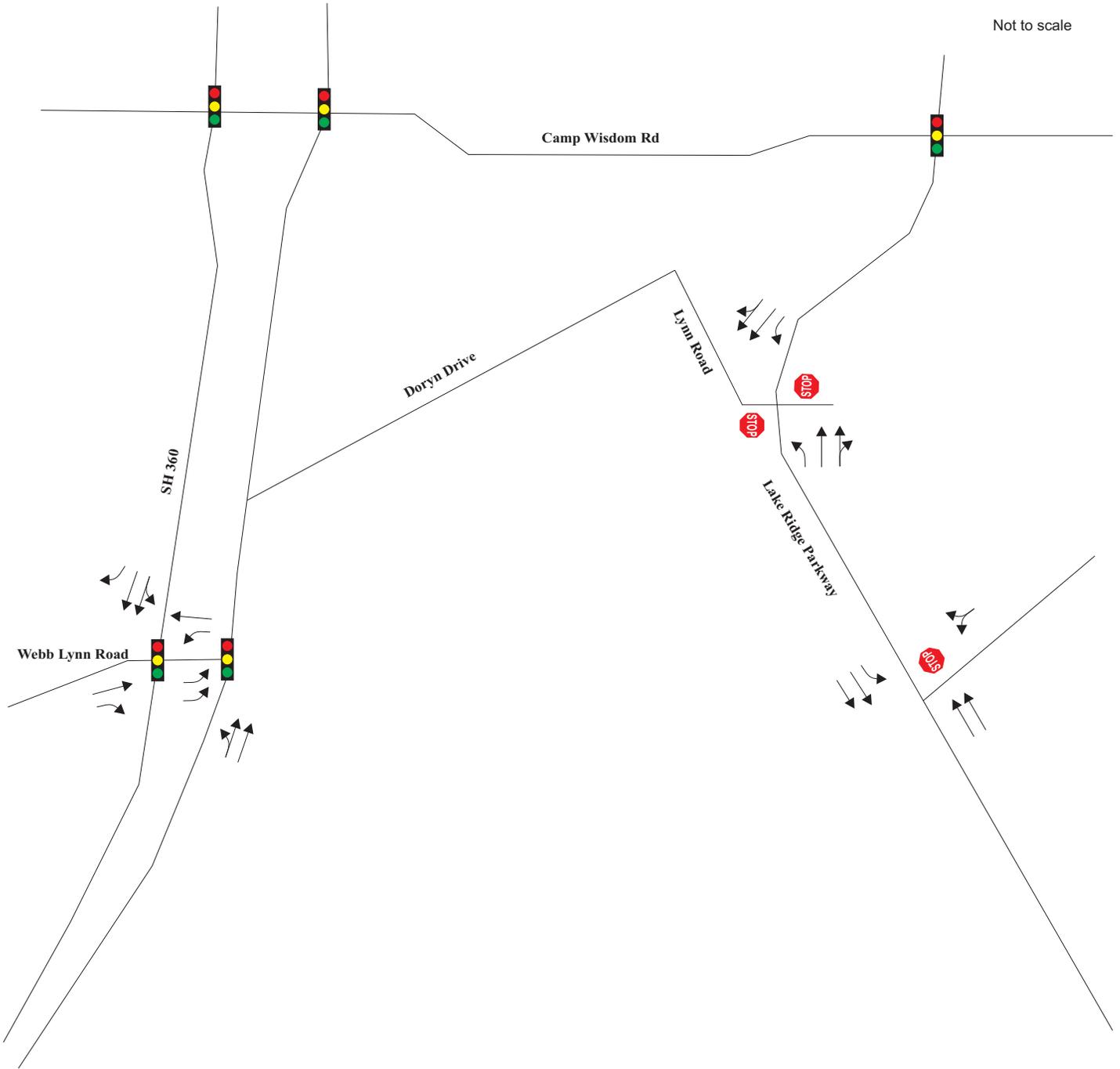
Lake Ridge Parkway – Lake Ridge Parkway is currently a four-lane divided roadway that extends approximately six miles in a north-south orientation. Lake Ridge Parkway begins north of Polo Road in Grand Prairie and extends to the south into the City of Cedar Hill where it becomes Mansfield Road. Lake Ridge Parkway is shown on the City of Grand Prairie Thoroughfare Plan as a future six-lane divided roadway. The expansion of Lake Ridge Parkway from four lanes to six lanes near the intersection of Lynn Creek parkway is anticipated to occur during the same time period that Lynn Creek Parkway is under construction. The posted speed limit of Lake Ridge Parkway in the study area is 50 mph. Future design plans call for Lake Ridge Parkway to extend to IH 20, connecting to the future SH 161 frontage road system.

Lynn Creek Park entrance – Lynn Creek Park entrance is currently operating as a driveway for Lynn Creek Park. The Park entrance is gated by the City of Grand Prairie when the park is not open to the public.

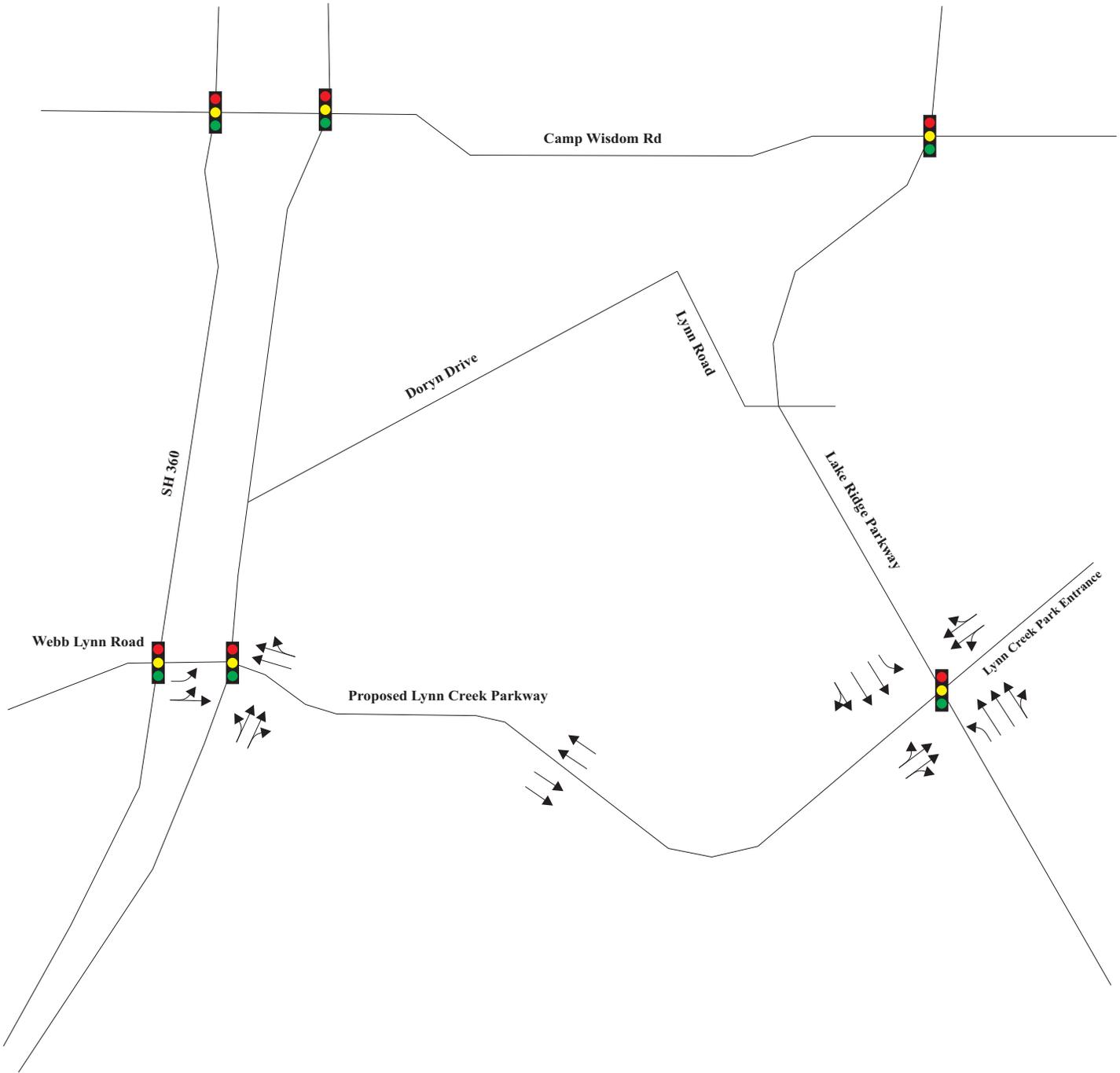
The initial proposed intersection and roadway lane configurations in the study area are provided in **Figure 4**.



Not to scale



Existing Roadway and Intersection Lane Configurations **Figure 3**



Proposed Roadway and Intersection Lane Configurations

Figure 4

FUTURE STUDY AREA DEVELOPMENTS

Future developments in this area include the construction of two commercial developments on the future southeast and northeast corners of the SH 360 northbound frontage road and Lynn Creek Parkway. The proposed development on the southeast corner of the SH 360 northbound frontage road and Lynn Creek Parkway includes retail stores, a discount superstore, and two restaurant sites. The proposed development on the northeast corner includes a service station with convenience market and a retail development. For purposes of this analysis, it was assumed that the build-out of the proposed developments at the intersection of SH 360 northbound frontage road and Lynn Creek Parkway would occur in 2009.

The number of vehicle trips generated by the proposed developments at build-out were estimated based on the trip generation rates and equations provided in the publication entitled *Trip Generation, Seventh Edition*, by the Institute of Transportation Engineers (ITE). Estimates of the number of trips generated by the site were made for the AM and PM peak hours, as well as on a daily basis. The number of trips generated by the development is a function of the type and quantity of the land use of the development. The trip generation rates for this development and the resulting number of trips generated by this development are shown in **Tables 1, 2, and 3**.

The City of Grand Prairie is also preparing a business plan for the future development west of Lake Ridge parkway. Trips generated by this developed were not included in the study, as the park development will not be complete by the analysis year (2009) of this study.

DIRECTIONAL DISTRIBUTION

For Lynn Creek Parkway, the directional distribution of traffic entering and leaving the proposed developments were developed based on the layout of the development, locations of principal roadways, and a review of existing traffic counts in the vicinity of the study location. The background trip distribution for the AM Peak on Lynn Creek Parkway is assumed to be 60% westbound and 40% eastbound. The PM Peak distribution is assumed to be 40% westbound and 60% eastbound. The intersection distribution assumed for the study area developments under build-out conditions with Lynn Creek Parkway in place is shown in **Figure 5**.

SITE TRAFFIC VOLUMES

The estimated site generated traffic volumes for the AM and PM peak hours under build-out conditions were assigned to the area roadways and site access points based on the directional distribution identified in Figure 5. **Figure 6** shows only the projected site traffic volumes at the intersections on Lynn Creek Parkway for the proposed study area developments resulting from this distribution and does not include the site traffic volumes at the SH 360 northbound frontage road access locations.

Table 1. Trip Generation Rates for Proposed Developments

Land Use		Equation/Rates ¹		
Land Use	ITE Code	AM Peak Hour	PM Peak Hour	Avg. Weekday
Shopping Center	820	$\ln(T) = 0.60 * \ln(X) + 0.29$	$\ln(T) = 0.66 * \ln(X) + 3.40$	$\ln(T) = 0.65 * \ln(X) + 5.83$
Service Station with Convenience Market	945	$T = 77.68(X)$	$T = 96.37(X)$	N/A

¹T = Trip Ends; X = 1000 Sq Ft Gross Leasable Area

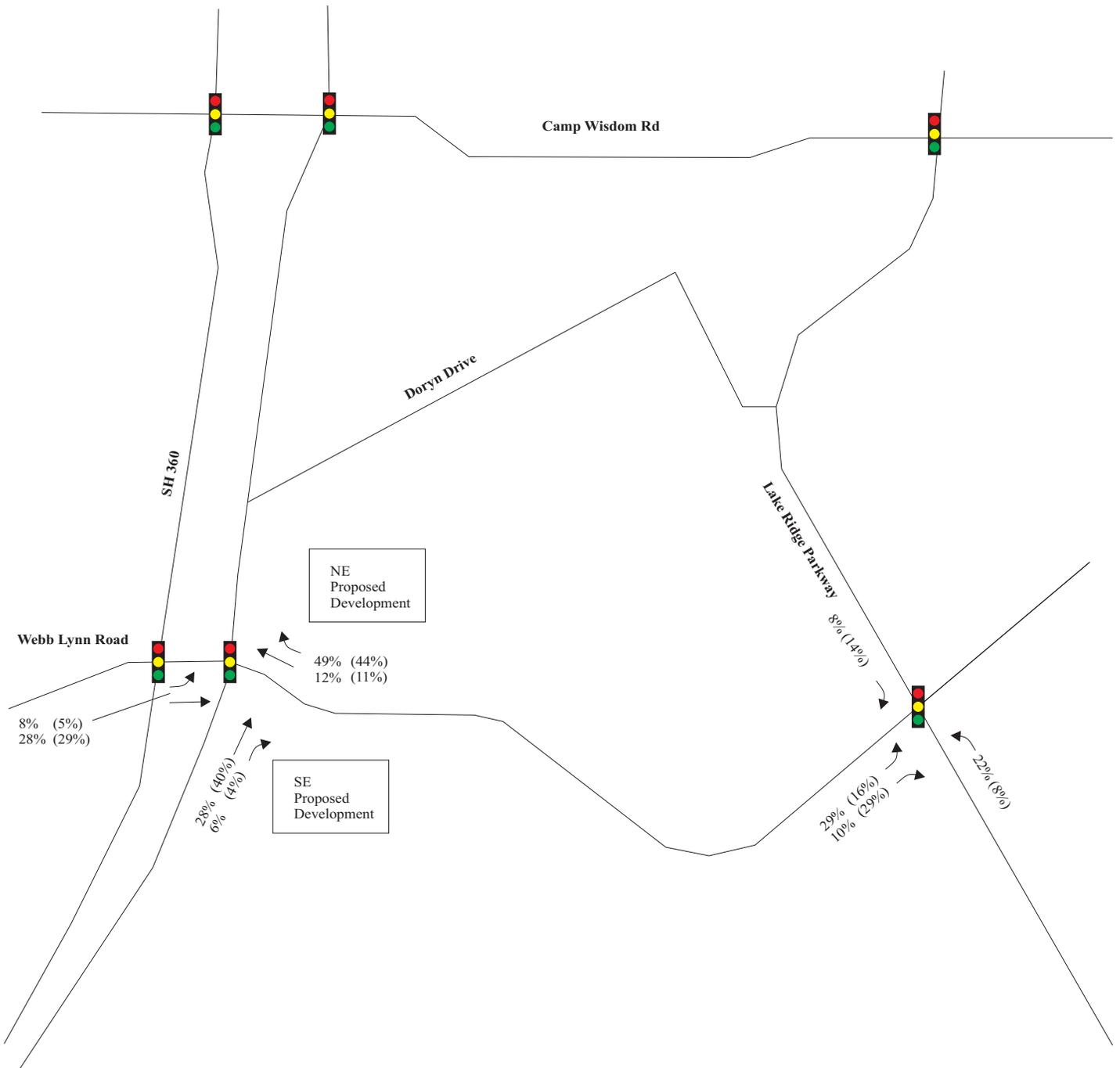
Table 2. Directional Splits for Proposed Developments

Land Use		Directional Split ¹		
Land Use	ITE Code	AM Peak Hour	PM Peak Hour	Avg. Weekday
Shopping Center	820	61 / 39	48 / 52	50 / 50
Service Station with Convenience Market	945	50 / 50	50 / 50	50 / 50

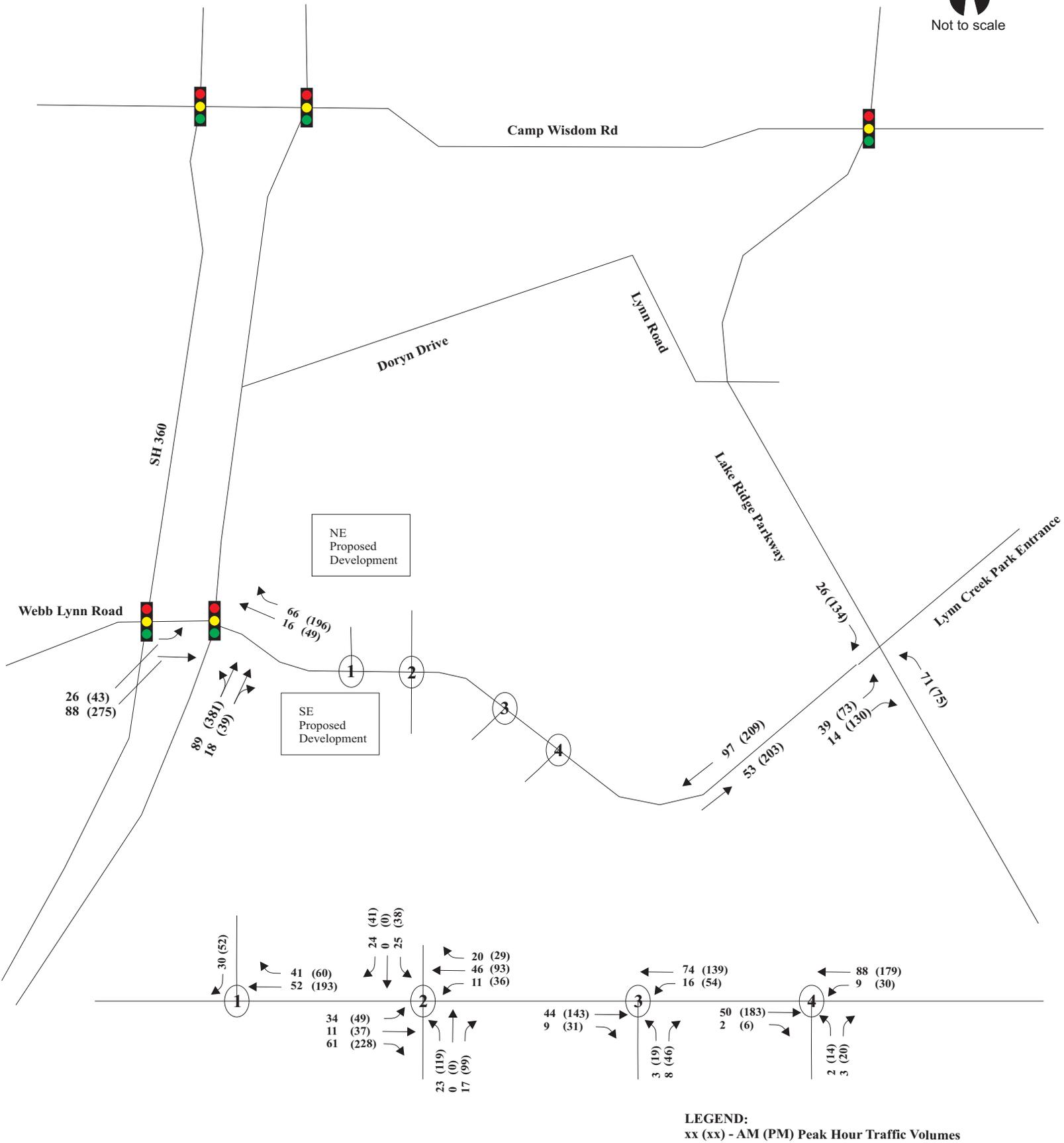
¹XX / YY = % entering vehicles / % exiting vehicles

Table 3: Estimated Trip Generation for Proposed Developments

Development	Land Use	Size	AM Peak Hour			PM Peak Hour			Avg. Weekday
			Enter	Exit	Total	Enter	Exit	Total	
NE corner	Service Station with Convenience Market	4,400 ft ²	174	167	341	212	212	424	3480
	Shopping Center	13,400 ft ²	29	18	47	80	86	166	1840
SE corner	Shopping Center	288,500 ft ²	180	115	295	605	655	1260	13522
TOTAL			383	300	683	897	953	1850	18842



LEGEND:
xx (xx) - AM (PM) Peak Hour Distribution Percentage



Site Generated Peak Hour Traffic Volumes

Figure 6

TRAFFIC VOLUMES

EXISTING TRAFFIC VOLUMES

Existing daily volumes were collected on the northbound and eastbound approaches to the Webb Lynn Road and SH 360 northbound frontage road intersection and the northbound, eastbound, and southbound approaches to the Lake Ridge Parkway and Lynn Road intersection. In addition, AM (6:30 – 8:30 AM) and PM (4:00 – 6:00 PM) peak hour turning movement counts were collected at these two intersections. These traffic volumes were collected on Wednesday, December 5, 2007. Turning movement counts were not collected at the Webb Lynn Road and SH 360 southbound frontage road intersection. Traffic volumes leaving this intersection are accounted for at the Webb Lynn Road and SH 360 northbound frontage road intersection

It should be noted the intersection of Lake Ridge Parkway and the Lynn Creek Park entrance was not counted. Due to the ongoing “Prairie Lights” seasonal lighting show within Lynn Creek Park, the gate entrance was closed to the public before 6:00 PM. The intersection of Lynn Road and Lake Ridge Parkway was counted to assist in estimating directional distribution. The existing (2007) peak hour traffic volumes are summarized in **Figure 7**. Raw count volumes are included in the Appendix.

PROJECTED BACKGROUND TRAFFIC VOLUMES

Historical traffic volumes were gathered from available TxDOT District count maps and the City of Grand Prairie traffic count list and compared with the existing traffic count volumes collected. The traffic volumes collected from the available sources are shown in **Table 4**.

Table 4. Historical Daily Traffic Volumes

Historical and Existing Traffic Volumes (vehicles/day)		
YEAR	Lake Ridge Parkway	SH 360 NBFR
2003	6,449	16,900
2004	---	---
2005	8,385	20,870
2006	---	---
2007	10,917 ¹ / 15,426 ²	---

¹City of Grand Prairie Counts (10/07)

²Lee Engineering Counts (11/07)

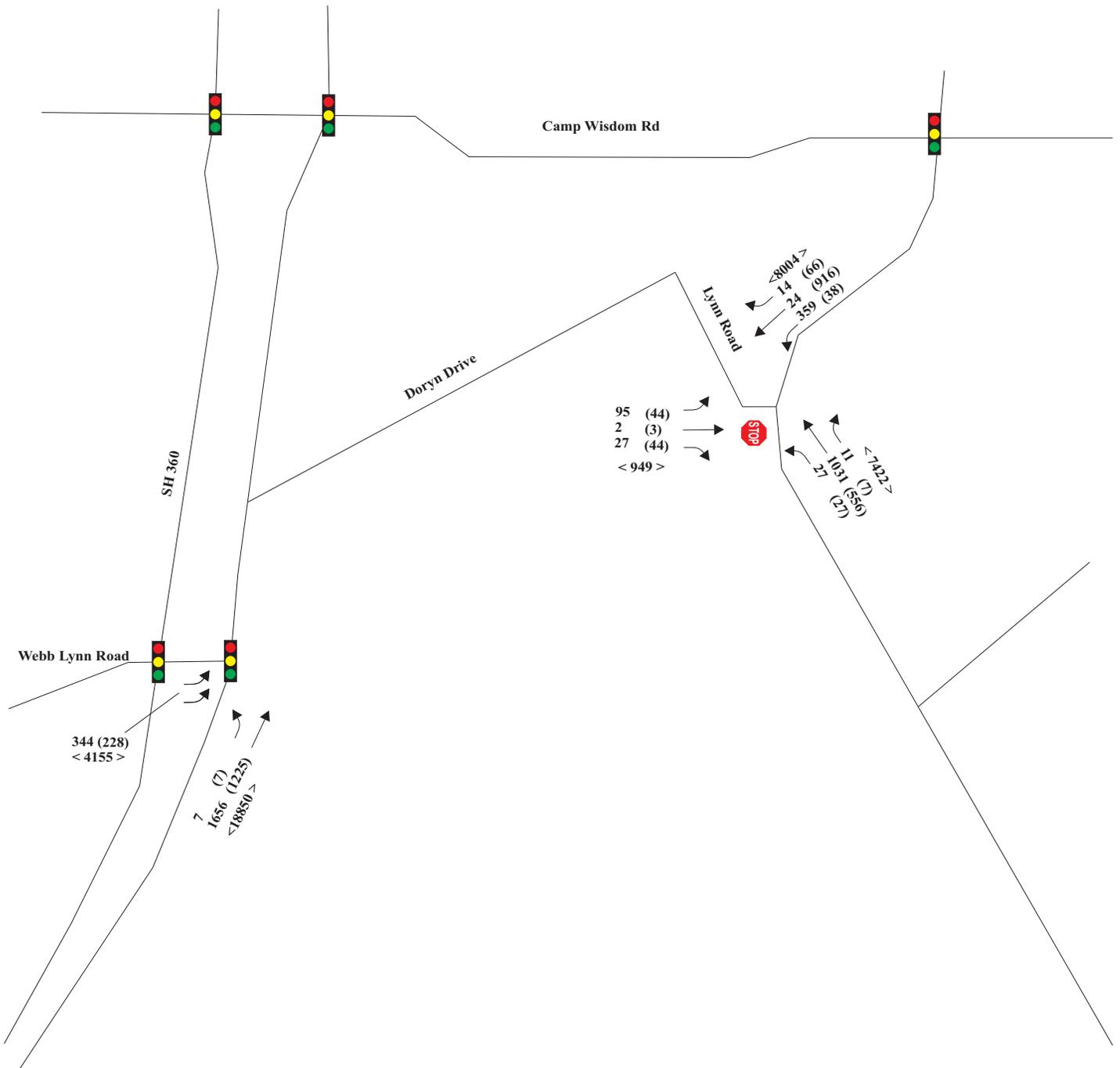
The City of Grand Prairie requires that developers use a minimum standard annual growth rate of 4.5 percent; however, historical traffic counts show a background growth rate between 14 and 24 percent on Lake Ridge Parkway over the past four years. City Staff and LEE discussed the growth rate options and City Staff requested that LEE utilize an 11 percent growth rate for the next two

years. The growth rate was then applied to the existing approach counts in order to grow the traffic from the existing (2007) condition to the analysis year (2009). The background traffic volume for the analysis year is shown in **Figure 8**.

Based on the 2025 traffic model developed by the North Central Texas Council of Governments (NCTCOG), Lynn Creek Parkway is projected to carry 11,000 vehicles on a daily basis. To determine analysis year (2009) volumes for turning movements to and from Lynn Creek Parkway, LEE reduced the 2025 projected traffic volumes to accommodate an annual average growth rate of 4.5 percent from 2009 to 2025. This reduction resulted in an estimated daily traffic count volume of 5,439 vehicles in the analysis year (2009). Assuming a peak hour factor of 10 percent, the directional distribution of background traffic volumes on Lynn Creek Parkway were developed. The analysis year (2009) directional distribution used is shown in **Figure 9**. The projected background traffic volumes on the proposed Lynn Creek Parkway are shown in **Figure 10**.

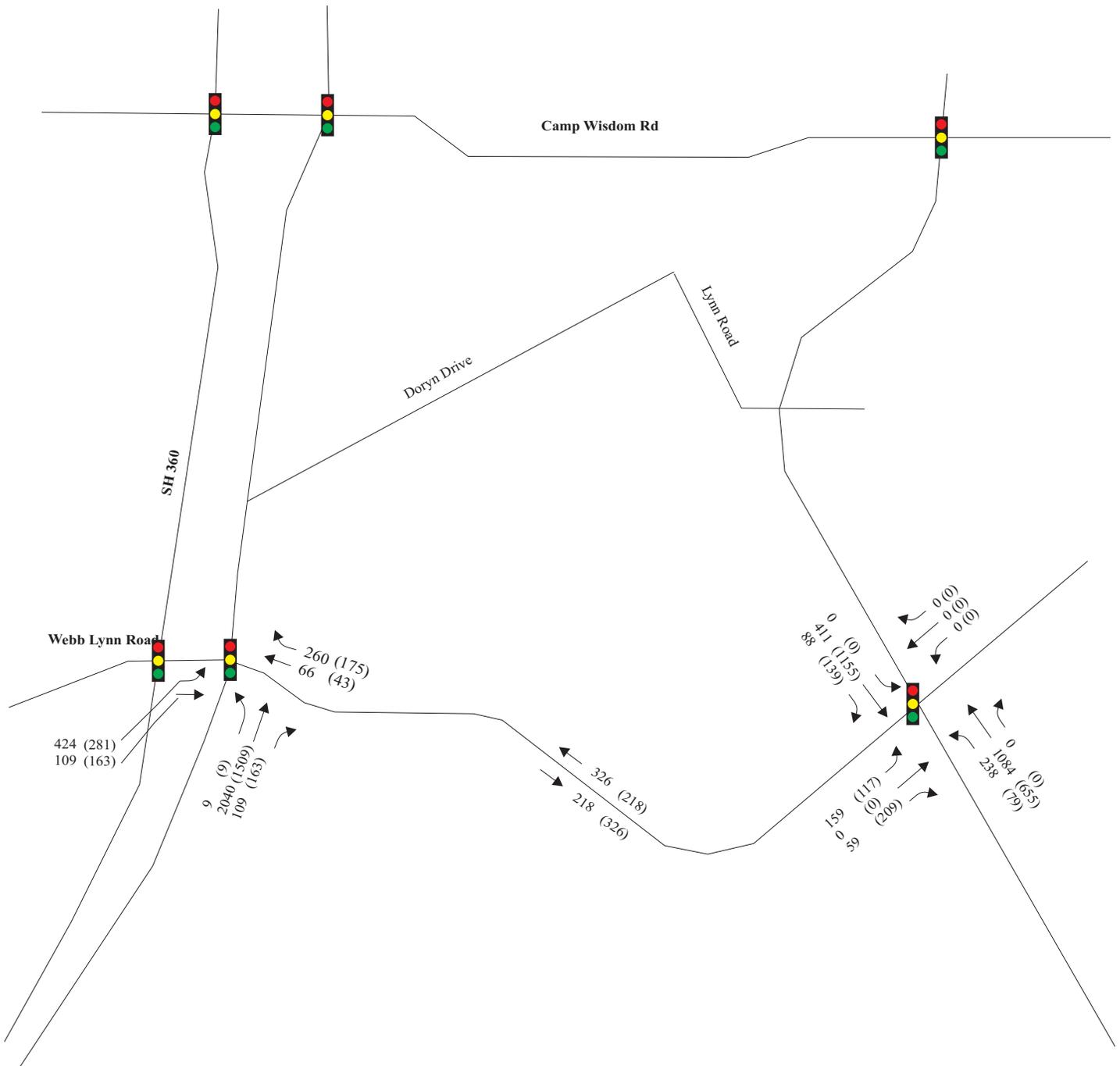
The traffic volumes generated by the proposed developments on the northeast and southeast corners of SH 360 northbound frontage road and Lynn Creek Parkway (Figure 6) are assumed to be included in the analysis year (2009) background traffic volumes (Figure 8). The traffic volumes generated by the proposed developments were used as a measure of comparison against the projected background traffic volumes as calculated from NCTCOG 2025 traffic model projection.

The total projected analysis year (2009) traffic volumes within the study area include the existing traffic volumes grown out to the analysis year (Figure 8) and the projected background traffic volumes in the analysis year with Lynn Creek Parkway in place (Figure 10). The total projected analysis year (2009) traffic volumes for Lynn Creek Parkway are shown in **Figure 11**.

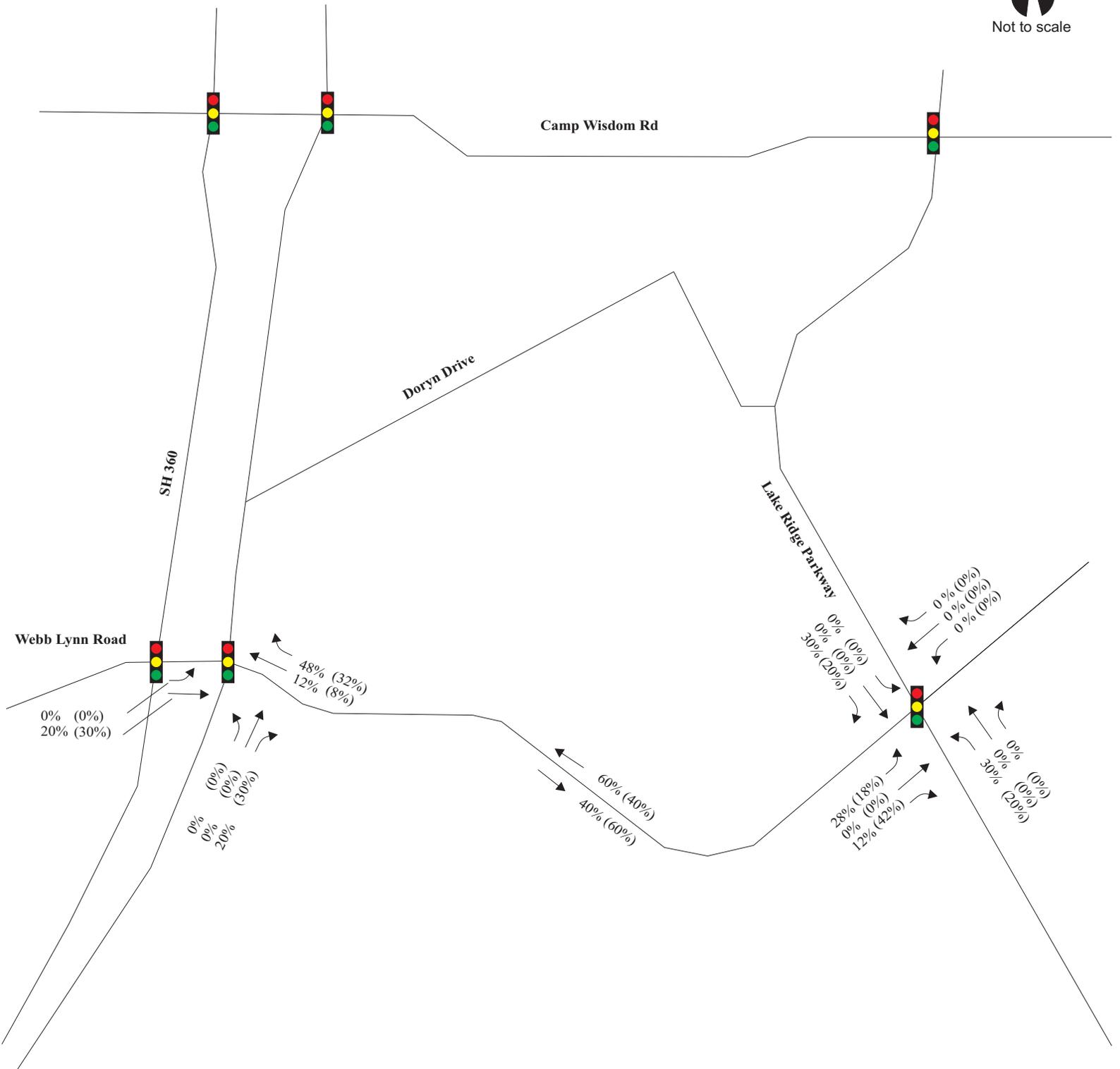


LEGEND:
 xx (xx) - AM (PM) Peak Hour Traffic Volumes
 < xx > 24-hour approach traffic volumes

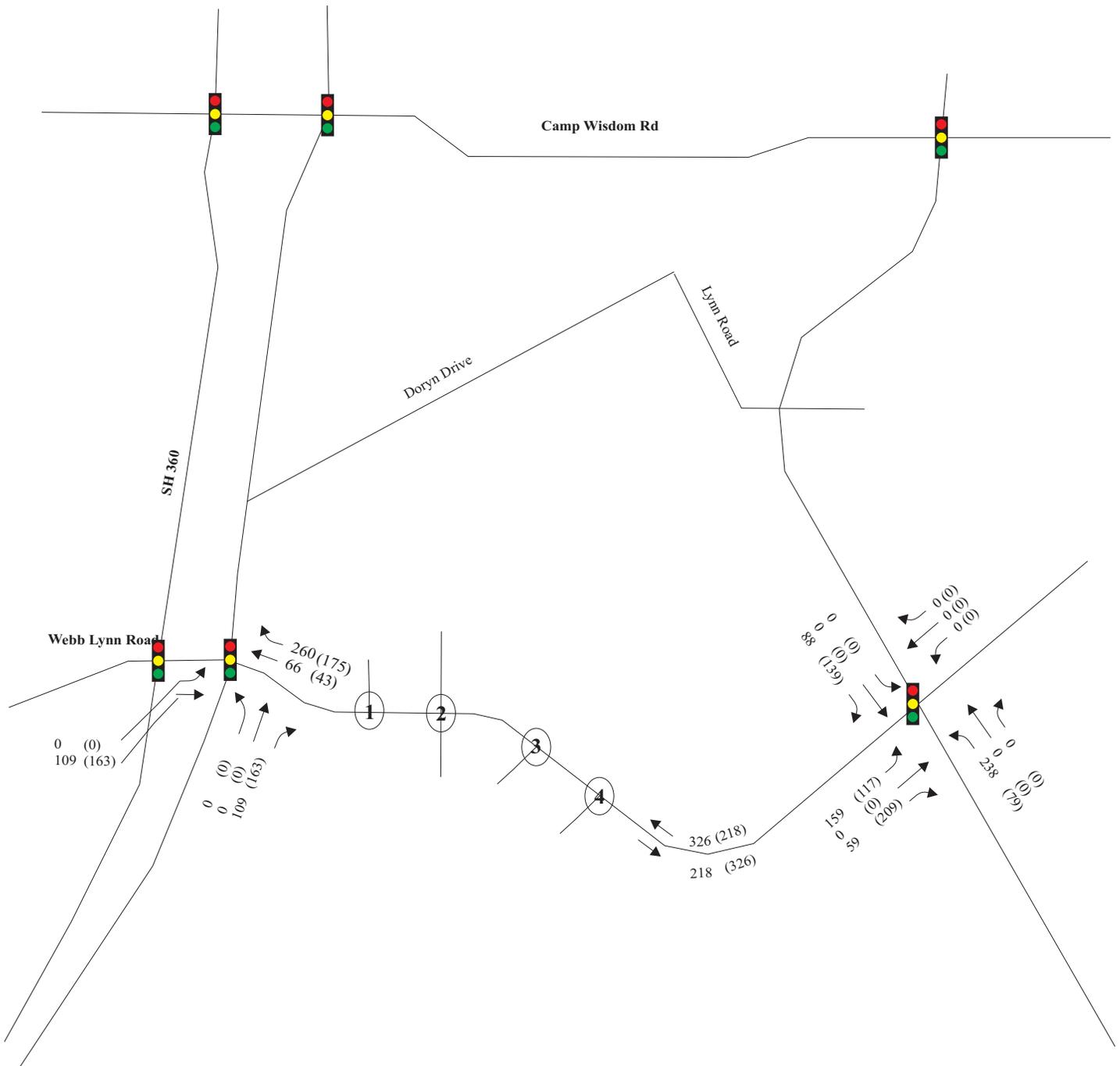
Traffic data collected on Wednesday, December 5, 2007



LEGEND:
xx (xx) - AM (PM) Peak Hour Traffic Volumes



LEGEND:
 xx (xx) - AM (PM) Peak Hour Directional Percentage



LEGEND:
xx (xx) - AM (PM) Peak Hour Traffic Volumes

AUXILIARY LANE ANALYSIS

An auxiliary lane is defined as the portion of the roadway adjoining the traveled way for speed change, turning, storage for turning, weaving, truck climbing, and other purposes supplementary to through-traffic movement. For the purposes of this analysis, auxiliary lanes are defined as right turn lanes, left turn lanes, and acceleration lanes. Each intersection was evaluated based on the projected traffic volume for the analysis year (2009) using TxDOT’s table for Auxiliary Lane Thresholds (Table 2-3 from TxDOT’s *Access Management Manual*), which is provided in the Appendix.

Right Turn Lane

The intersection of the SH 360 northbound frontage road and Lynn Creek Parkway and the intersection of Lake Ridge Parkway and Lynn Creek Parkway were evaluated to determine the necessity of right turn lanes at each intersection. Based on guidelines contained in TxDOT’s *Access Management Manual*, right turn deceleration lanes should be considered for right turn volumes greater than 50 vehicles per hour (vph) on roadways with speed limits of 50 mph or more. Total approaching volumes, number of through lanes, and amount of heavy vehicular traffic are also typically considered. The estimated right turn volume for each approach is summarized in **Table 5**.

Table 5. Right Turn Lane Volumes

Roadway	Approach	Volume (vph)		Exceed Threshold	
		AM	PM	AM	PM
SH 360 NBFR and Lynn Creek Parkway					
SH 360 NBFR	NB	109	163	Y	Y
Lynn Creek Pkwy	WB	260	174	Y	Y
Lake Ridge Parkway and Lynn Creek Parkway					
Lynn Creek Pkwy	EB	59	209	Y	Y
Lake Ridge Pkwy	SB	88	139	Y	Y

Based on the projected traffic volumes in the area, all roadway approaches exceed TxDOT’s threshold for a separate right turn lane.

Acceleration Lanes

Acceleration lanes are lanes provided to vehicular traffic for the primary purpose of allowing vehicles to “accelerate” to the speed of adjacent through movements. The construction of an acceleration lane for right turn traffic coming from westbound Lynn Creek Parkway to SH 360 northbound frontage road was evaluated. Based on guidelines contained in TxDOT’s *Access Management Manual*, and provided in the Appendix, right turn acceleration lanes should be provided when the right turn egress volumes exceed 200 vph. TxDOT’s *Access Management*

Manual also states that “The distance from the end of the acceleration lane taper to the next unsignalized downstream access connection should be equal to or greater than the distances found in Table 2-2.” A review of Table 2-2 in TxDOT’s *Access Management Manual* shows that the access spacing on a highway with a posted speed limit greater than or equal to 50 mph, should be a minimum of 425 feet. TxDOT’s table for Other State Highway Connection Spacing Criteria (Table 2-2) is provided in the Appendix.

A preliminary site plan has been developed for the northeast corner of SH 360 northbound frontage road and Lynn Creek Parkway. The proposed development has a driveway which would be located within or near the end of the acceleration lane. Due to the limited distance between the proposed access driveway and the possible need for a deceleration lane into the driveway, an acceleration lane is not recommended. As traffic continues to grow, future improvements may be necessary on Lynn Creek Parkway (i.e., dual right turn lane) to accommodate the projected right turn volume.

Left Turn Lane

The construction of separate left turn lanes for the intersection of Lake Ridge Parkway and Lynn Creek Parkway was also evaluated. TxDOT’s *Access Management Manual* recommends a left turn deceleration lane at all intersections with a raised median. The *Highway Capacity Manual* recommends installation of a dedicated left turn lane when exclusive left turn volumes exceed 100 vph and dual left turn lanes should be considered when exclusive left turn volumes exceed 300 vph. The estimated left turn volumes for the northbound and eastbound approaches to the future Lake Ridge Parkway and Lynn Creek Parkway intersection is summarized in **Table 6**.

Table 6. Left Turn Lane Volumes

Intersection	Approach	Volume (vph)		Exceed Criteria	
		AM	PM	AM	PM
Lynn Creek Pkwy @ Lake Ridge Pkwy	EB	158	117	Y	Y
	NB	238	78	Y	N

Based on the analysis year (2009) traffic volumes, the left turn volumes will exceed the recommended volumes for an exclusive left turn lane in both the eastbound and northbound directions and a left turn lane is warranted in both directions. A northbound left turn lane is recommended at this intersection. Due to intersection configurations and traffic volumes (little to none peak hour eastbound through volumes), the eastbound left turn movement can operate from a shared left/through lane.

RECOMMENDED LANE CONFIGURATIONS

Lynn Creek Parkway and Lake Ridge Parkway

Because Lynn Creek Park is a very low traffic generator, the intersection of Lynn Creek Parkway and Lake Ridge Parkway will function primarily as a “T” intersection during normal daily conditions. The proposed four-lane geometric configuration will allow for two eastbound lanes, which will allow for one eastbound lane to operate as a shared through/left turn lane and the other eastbound lane to operate as a shared through/right turn lane on Lynn Creek Parkway at its intersection with Lake Ridge Parkway. Since very little eastbound through traffic is expected on a daily basis during the peak hours, the two eastbound lanes will function as exclusive left and right turn lanes for the greatest percentage of the time. This lane assignment should accommodate the proposed traffic volumes in the analysis year (2009). The projected eastbound PM peak hour volume is 326 vph (209 right turns). The capacity of an exclusive turn lane is approximately 300 vph. As traffic continues to grow, the eastbound right turn lane will exceed 300 vph and dual right turn lanes may be necessary. The westbound approach of Lynn Creek Parkway at Lake Ridge Parkway should be designed to mirror the eastbound approach.

Lake Ridge Parkway is assumed to be expanded to a six-lane section in the analysis year (2009). The projected southbound right turn volumes (88 AM, 139 PM) exceed TxDOT’s threshold for right turn lanes. While TxDOT’s threshold is estimated to be exceeded, the low right turn traffic volumes and the widened six-lane cross section should allow the southbound right turn from the outside through lane without adversely impacting the estimated peak hour southbound through traffic volumes (411 AM peak hour and 1155 PM peak hour). The construction of an exclusive southbound right turn lane may be necessary in the future as background traffic volumes grow.

The projected northbound left turn volume on Lake Ridge Parkway (238 AM, 78 PM) exceeds *Highway Capacity Manual’s* minimum recommended vehicular volume for a separate left turn lane. A northbound left turn lane is recommended at this intersection.

Lynn Creek Parkway and SH 360 Northbound Frontage

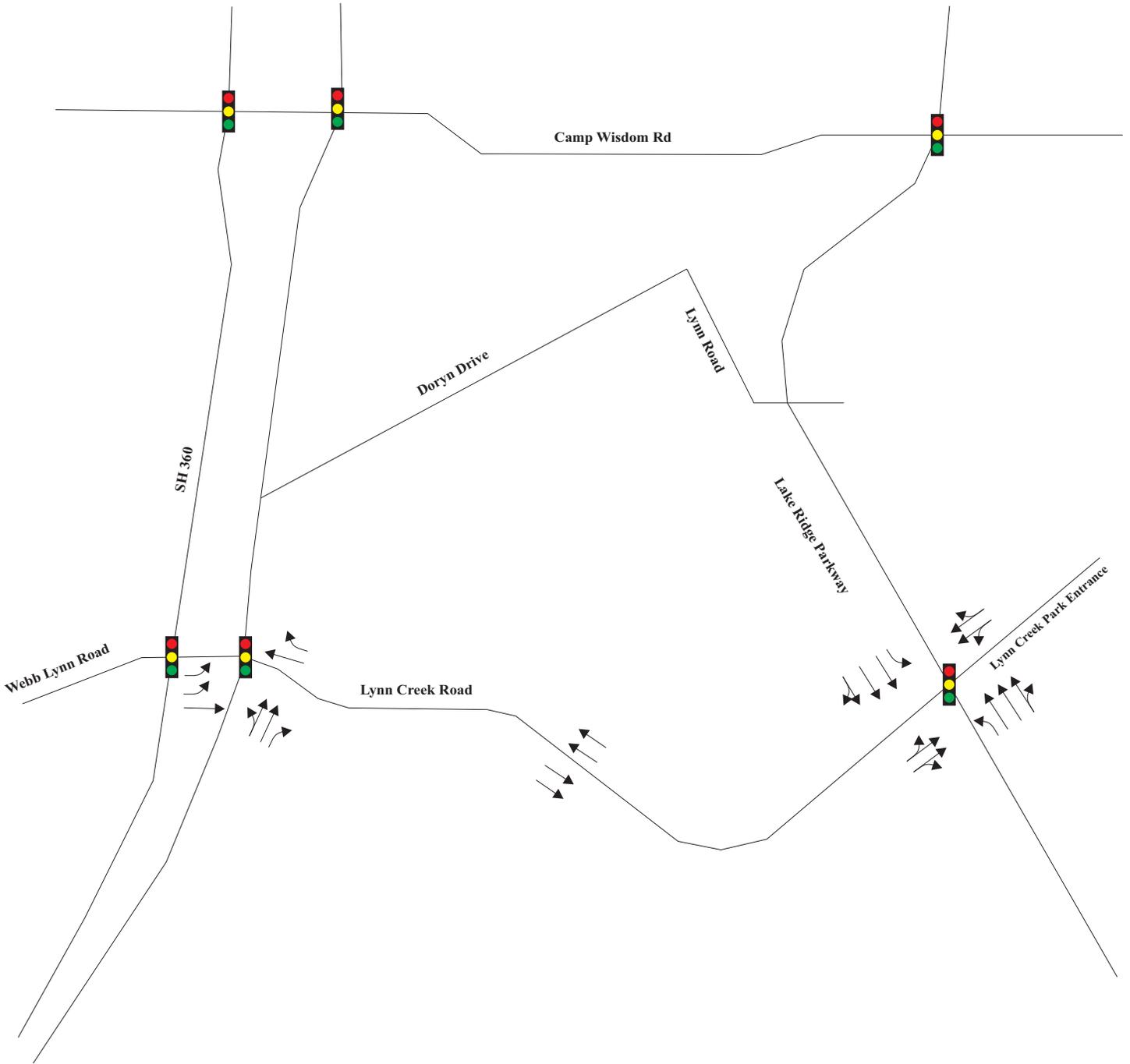
The construction of a right turn lane for the northbound approach at the SH 360 northbound frontage road and Lynn Creek Parkway intersection should be considered with the construction of Lynn Creek Parkway. The capacity of two through lanes at a signalized intersection is approximately 1,600 vph. The northbound approach is at capacity under existing conditions (2007) with 1,663 vph entering the intersection. The projected traffic volume in the northbound approach during the analysis year (2009) is 2,158 vph in the AM peak hour. The construction of a northbound right turn will remove the right turning movements from the through traffic volumes and improve the efficiency of the intersection.

The recommended lane designation for the westbound approach on Lynn Creek Parkway at the SH 360 northbound frontage road intersection is one through lane and one right only lane. Since the projected westbound AM peak hour volume is 326 vph (260 right turns), the proposed lane designation should meet the traffic needs in the analysis year (2009). A single westbound through lane will match the existing number of departure lanes west of SH 360 northbound frontage road on Webb Lynn Road. Because the capacity of an exclusive turn lane is approximately 300 vph and the right turn volume during the analysis year (2009) is approaching that volume, the Lynn Creek Parkway and SH 360 northbound frontage road intersection should be designed to provide a separate westbound right turn lane in the future so that, as the right turn traffic volume on Lynn Creek Parkway approaches 300 vph, an additional right turn lane can be provided.

The eastbound approach on Lynn Creek Parkway at the SH 360 northbound frontage road should be restriped to accommodate two left turn only lanes and one through movement. The existing eastbound approach has the lane configuration shown in Figure 3 (two eastbound left turn lanes) and also has a ten foot paved shoulder. With the construction of the eastern leg of this intersection and the need to accommodate the existing heavy eastbound left turn volumes (344 left turns during the AM peak hour and 228 left turns during the PM peak hour), the use of the paved shoulder as a through lane should be considered for the analysis year (2009).

Figure 12 shows the recommended lane configurations for the analysis year (2009).

Although outside the scope of this project, design consideration should be given to the ultimate lane configuration at the SH 360 frontage road intersections. The lane configurations assumed in the analysis year (2009) will change when the SH 360 main lanes are constructed. At least two westbound departure lanes are expected to be provided between the SH 360 frontage roads at the time of construction. Since one departure lane for westbound traffic was assumed from Lynn Creek Parkway in the analysis year (2009), the ultimate configuration of the westbound approach on Lynn Creek Parkway should be designed such that it will be compatible with the future westbound departure lanes from this intersection. One eastbound approach lane is assumed in the analysis year (2009) at the NBFR intersection. Similar to the westbound departure lanes, it can be assumed that the future design of the eastbound approach lanes will accommodate one additional eastbound through lane. The eastbound departure lanes on Lynn Creek Parkway at SH 360 NBFR should align with the future approach configuration.



Recommended Roadway and Intersection Lane Configurations Figure 12

CONCLUSIONS AND RECOMMENDATIONS

Based on this analysis of the future Lynn Creek Parkway, the following conclusions and recommendations are made:

- The construction of Lynn Creek Parkway is expected to be completed in 2009. The roadway is expected to generate approximately 11,000 daily trips in the build out year (2025). Analysis year (2009) traffic volumes are estimated to be 5,439 daily trips.
- Commercial developments in the study area are expected to be completed in 2009 and are expected to generate a total of 18,841 daily trips (386 AM peak hour trips and 1,850 PM peak hour trips). These trips were included as part of the 5,439 background traffic volumes.
- Existing traffic volumes for the study area are approximately:
 - Lake Ridge Parkway – 15,426 vehicles per day
 - SH 360 NBFR – 18,850 vehicles per day
 - Eastbound Webb Lynn Road – 4,155 vehicles per day
- Based on available historical traffic counts and discussions with the City of Grand Prairie, an annual growth rate of 11 percent was used from 2007 to 2009.
- The recommended lane configurations for the area intersections are provided in **Figure 12**.
- The construction of an acceleration lane for westbound to northbound traffic at the SH 360 northbound frontage and Lynn Creek Parkway intersection is not recommended.
- Design consideration should be given to future intersection improvements for the following movements if conditions warrant:
 - Dual eastbound right turn lanes at the Lynn Creek Parkway and Lake Ridge Parkway intersection; and
 - Dual westbound right turn lanes at the Lynn Creek Parkway and SH 360 northbound frontage road intersection.

APPENDIX

Table 2- 2: Other State Highways Connection Spacing Criteria	
Other State Highways Minimum Connection Spacing⁽¹⁾⁽²⁾⁽³⁾	
Posted Speed (mph)	Distance (ft)
≤ 30	200
35	250
40	305
45	360
≥ 50	425

(1) Distances are for passenger cars on level grade. These distances may be adjusted for downgrades and/or significant truck traffic. Where present or projected traffic operations indicate specific needs, consideration may be given to intersection sight distance and operational gap acceptance measurement adjustments.

(2) When these values are not attainable, refer to the deviation process as described in Chapter 3, Section 1 or Chapter 2, Section 2.

(3) Access spacing values shown in this table do not apply to rural highways outside of metropolitan planning organization boundaries where there is little, if any, potential for development with current ADT levels below 2000. Access connection spacing below the values shown in this table may be approved based on safety and operational considerations as determined by TxDOT.

SOURCE: TxDOT *Access Management Plan*

Table 2-3: Auxiliary Lane Thresholds

Median Type	Left Turn to or from Property		Right Turn to or from Property ⁽⁵⁾	
	Acceleration	Deceleration	Acceleration	Deceleration
Non-Traversable (Raised median)	(2)	All	Right turn egress > 200vph ⁽⁴⁾	<ul style="list-style-type: none"> ◆ > 45mph where right turn volume is > 50vph⁽³⁾ ◆ ≤ 45 where right turn volume is > 60vph⁽³⁾
Traversable (Undivided Road)	(2)	(1)	Same as above	Same as above

(1) Refer to Table 3-11, *TxDOT Roadway Design Manual*, for alternative left-turn-bay operational considerations.

(2) A left-turn acceleration lane may be required if it would provide a benefit to the safety and operation of the roadway. A left-turn acceleration lane is generally not required where the posted speed is 40 mph or less, or where the acceleration lane would interfere with the left-turn ingress movements to any other access connection.

(3) Additional right-turn considerations:

- ◆ Conditions for providing an exclusive right-turn lane when the right-turn traffic volume projections are less than indicated in Table 2-3:
 - High crash experience
 - Heavier than normal peak flow movements on the main roadway
 - Large volume of truck traffic
 - Highways where sight distance is limited
- ◆ Conditions for NOT requiring a right-turn lane where right-turn volumes are more than indicated in Table 2-3:
 - Dense or built-out corridor where space is limited
 - Where queues of stopped vehicles would block the access to the right turn lane
 - Where sufficient length of property width is not available for the appropriate design

(4) The acceleration lane should not interfere with any downstream access connection.

- ◆ The distance from the end of the acceleration lane taper to the next unsignalized downstream access connection should be equal to or greater than the distances found in Table 2-2.
- ◆ Additionally, if the next access connection is signalized, the distance from the end of the acceleration lane taper to the back of the 90th percentile queue should be greater than or equal to the distances found in Table 2-2.

(5) Continuous right-turn lanes can provide mobility benefits both for through movements and for the turning vehicles.¹ Access connections within a continuous right turn lane should meet the spacing requirements found in Table 2-2. However, when combined with crossing left in movements, a continuous right-turn lane can introduce additional operational conflicts.

SOURCE: TxDOT *Access Management Plan*

Site Name WEBB-LYNN EB APPROACH TO SH 360 NB
 Jurisdiction GRAND PRAIRIE
 Study Type Volume (ch1 & ch2)
 Location Code 31
 Direction None
 Date 12/4/2007
 Real Time 09:45
 Start Date 12/4/2007
 Start Time 10:00
 Sample Time 00:15
 Operator Number 0
 Machine Number 31

Wednesday, December 05, 2007

HR Begin	Channel 1					Channel 2					Channel 1 + Channel 2 *				
	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00
00	24	11	7	2	4	0	0	0	0	0	24	11	7	2	4
01	31	9	6	7	9	0	0	0	0	0	31	9	6	7	9
02	17	4	2	6	5	0	0	0	0	0	17	4	2	6	5
03	15	1	4	8	2	0	0	0	0	0	15	1	4	8	2
04	60	4	10	22	24	0	0	0	0	0	60	4	10	22	24
05	164	24	37	55	48	0	0	0	0	0	164	24	37	55	48
06	321	78	70	85	88	0	0	0	0	0	321	78	70	85	88
07	364	87	90	88	99	0	0	0	0	0	364	87	90	88	99
08	286	67	87	57	75	0	0	0	0	0	286	67	87	57	75
09	234	68	53	64	49	0	0	0	0	0	234	68	53	64	49
10	212	41	40	73	58	0	0	0	0	0	212	41	40	73	58
11	210	42	44	71	53	0	0	0	0	0	210	42	44	71	53
12	257	51	62	62	82	0	0	0	0	0	257	51	62	62	82
13	225	48	54	60	63	0	0	0	0	0	225	48	54	60	63
14	208	49	55	52	52	0	0	0	0	0	208	49	55	52	52
15	211	57	62	44	48	0	0	0	0	0	211	57	62	44	48
16	207	54	52	48	53	0	0	0	0	0	207	54	52	48	53
17	236	71	56	57	52	0	0	0	0	0	236	71	56	57	52
18	251	48	72	64	67	0	0	0	0	0	251	48	72	64	67
19	214	74	47	43	50	0	0	0	0	0	214	74	47	43	50
20	159	36	37	42	44	0	0	0	0	0	159	36	37	42	44
21	137	31	39	31	36	0	0	0	0	0	137	31	39	31	36
22	76	25	22	14	15	0	0	0	0	0	76	25	22	14	15
23	36	12	7	9	8	0	0	0	0	0	36	12	7	9	8
	4155	Total				0	Total				4155	Total			

Channel 1

AM Peak Hour Start 07:00
 AM Peak Hour Total 364
 AM Peak Hour Factor 91.92 %
 PM Peak Hour Start 18:15
 PM Peak Hour Total 277
 PM Peak Hour Factor 93.58 %

Channel 2

AM Peak Hour Start
 AM Peak Hour Total
 AM Peak Hour Factor
 PM Peak Hour Start
 PM Peak Hour Total
 PM Peak Hour Factor

Channel 1 + 2

AM Peak Hour Start 07:00
 AM Peak Hour Total 364
 AM Peak Hour Factor 91.92 %
 PM Peak Hour Start 18:15
 PM Peak Hour Total 277
 PM Peak Hour Factor 93.58 %

Site Name SH 360 NB APPROACH TO WEBB-LYNN
 Jurisdiction GRAND PRAIRIE
 Study Type Volume (ch1 & ch2)
 Location Code 39
 Direction None
 Date 12/4/2007
 Real Time 09:45
 Start Date 12/4/2007
 Start Time 10:00
 Sample Time 00:15
 Operator Number 0
 Machine Number 39

Wednesday, December 05, 2007

HR Begin	Channel 1					Channel 2					Channel 1 + Channel 2 *				
	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00
00	97	23	28	30	16	0	0	0	0	0	97	23	28	30	16
01	64	16	20	12	16	0	0	0	0	0	64	16	20	12	16
02	84	16	16	27	25	0	0	0	0	0	84	16	16	27	25
03	115	24	27	31	33	0	0	0	0	0	115	24	27	31	33
04	310	39	76	101	94	0	0	0	0	0	310	39	76	101	94
05	1159	179	278	344	358	0	0	0	0	0	1159	179	278	344	358
06	1628	412	416	396	404	0	0	0	0	0	1628	412	416	396	404
07	1599	429	418	402	350	0	0	0	0	0	1599	429	418	402	350
08	1455	365	388	341	361	0	0	0	0	0	1455	365	388	341	361
09	1126	296	307	278	245	0	0	0	0	0	1126	296	307	278	245
10	945	217	253	245	230	0	0	0	0	0	945	217	253	245	230
11	885	232	204	217	232	0	0	0	0	0	885	232	204	217	232
12	940	233	259	236	212	0	0	0	0	0	940	233	259	236	212
13	842	212	205	214	211	0	0	0	0	0	842	212	205	214	211
14	1042	231	217	304	290	0	0	0	0	0	1042	231	217	304	290
15	1133	253	282	293	305	0	0	0	0	0	1133	253	282	293	305
16	1051	228	276	267	280	0	0	0	0	0	1051	228	276	267	280
17	1250	292	325	316	317	0	0	0	0	0	1250	292	325	316	317
18	1035	274	257	272	232	0	0	0	0	0	1035	274	257	272	232
19	707	199	167	173	168	0	0	0	0	0	707	199	167	173	168
20	530	127	116	147	140	0	0	0	0	0	530	127	116	147	140
21	454	129	116	120	89	0	0	0	0	0	454	129	116	120	89
22	306	81	101	65	59	0	0	0	0	0	306	81	101	65	59
23	93	47	46	0	0	0	0	0	0	0	93	47	46	0	0
	18850	Total				0	Total				18850	Total			

Channel 1

AM Peak Hour Start 06:45
 AM Peak Hour Total 1653
 AM Peak Hour Factor 96.33 %
 PM Peak Hour Start 17:00
 PM Peak Hour Total 1250
 PM Peak Hour Factor 96.15 %

Channel 2

AM Peak Hour Start
 AM Peak Hour Total
 AM Peak Hour Factor
 PM Peak Hour Start
 PM Peak Hour Total
 PM Peak Hour Factor

Channel 1 + 2

AM Peak Hour Start 06:45
 AM Peak Hour Total 1653
 AM Peak Hour Factor 96.33 %
 PM Peak Hour Start 17:00
 PM Peak Hour Total 1250
 PM Peak Hour Factor 96.15 %

Site Name LYNN RD EB APPROACH TO LAKE RIDGE PKWY
 Jurisdiction GRAND PRAIRIE
 Study Type Volume (ch1 & ch2)
 Location Code 3
 Direction None
 Date 12/4/2007
 Real Time 09:44
 Start Date 12/4/2007
 Start Time 10:00
 Sample Time 00:15
 Operator Number 0
 Machine Number 3

Wednesday, December 05, 2007

HR Begin	Channel 1					Channel 2					Channel 1 + Channel 2 *				
	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00
00	2	0	1	1	0	0	0	0	0	0	2	0	1	1	0
01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0
04	3	0	2	1	0	0	0	0	0	0	3	0	2	1	0
05	11	2	2	4	3	0	0	0	0	0	11	2	2	4	3
06	62	8	17	20	17	0	0	0	0	0	62	8	17	20	17
07	123	38	26	37	22	0	0	0	0	0	123	38	26	37	22
08	62	19	10	16	17	0	0	0	0	0	62	19	10	16	17
09	43	7	17	10	9	0	0	0	0	0	43	7	17	10	9
10	40	10	9	12	9	0	0	0	0	0	40	10	9	12	9
11	35	6	12	10	7	0	0	0	0	0	35	6	12	10	7
12	54	10	20	13	11	0	0	0	0	0	54	10	20	13	11
13	43	7	11	17	8	0	0	0	0	0	43	7	11	17	8
14	62	9	11	24	18	0	0	0	0	0	62	9	11	24	18
15	60	13	19	9	19	0	0	0	0	0	60	13	19	9	19
16	68	17	19	19	13	0	0	0	0	0	68	17	19	19	13
17	93	19	23	30	21	0	0	0	0	0	93	19	23	30	21
18	75	15	19	16	25	0	0	0	0	0	75	15	19	16	25
19	47	13	12	12	10	0	0	0	0	0	47	13	12	12	10
20	31	10	10	7	4	0	0	0	0	0	31	10	10	7	4
21	20	5	6	6	3	0	0	0	0	0	20	5	6	6	3
22	7	2	1	1	3	0	0	0	0	0	7	2	1	1	3
23	7	2	3	2	0	0	0	0	0	0	7	2	3	2	0
	949	Total				0	Total				949	Total			

Channel 1

AM Peak Hour Start 07:00
 AM Peak Hour Total 123
 AM Peak Hour Factor 80.92 %
 PM Peak Hour Start 17:00
 PM Peak Hour Total 93
 PM Peak Hour Factor 77.50 %

Channel 2

AM Peak Hour Start
 AM Peak Hour Total
 AM Peak Hour Factor
 PM Peak Hour Start
 PM Peak Hour Total
 PM Peak Hour Factor

Channel 1 + 2

AM Peak Hour Start 07:00
 AM Peak Hour Total 123
 AM Peak Hour Factor 80.92 %
 PM Peak Hour Start 17:00
 PM Peak Hour Total 93
 PM Peak Hour Factor 77.50 %

Site Name LAKE RIDGE PKWY SB APPROACH TO LYNN RD
 Jurisdiction GRAND PRAIRIE
 Study Type Volume (ch1 & ch2)
 Location Code 9
 Direction None
 Date 12/4/2007
 Real Time 09:51
 Start Date 12/4/2007
 Start Time 10:00
 Sample Time 00:15
 Operator Number 0
 Machine Number 9

Wednesday, December 05, 2007

HR	Channel 1					Channel 2					Channel 1 + Channel 2 *				
	HR	00-15	15-30	30-45	45-00	HR	00-15	15-30	30-45	45-00	HR	00-15	15-30	30-45	45-00
00	54	11	11	22	10	0	0	0	0	0	54	11	11	22	10
01	27	11	5	4	7	0	0	0	0	0	27	11	5	4	7
02	16	4	2	4	6	0	0	0	0	0	16	4	2	4	6
03	20	6	10	3	1	0	0	0	0	0	20	6	10	3	1
04	15	5	1	3	6	0	0	0	0	0	15	5	1	3	6
05	53	6	10	17	20	0	0	0	0	0	53	6	10	17	20
06	183	25	35	58	65	0	0	0	0	0	183	25	35	58	65
07	390	63	98	120	109	0	0	0	0	0	390	63	98	120	109
08	318	75	101	85	57	0	0	0	0	0	318	75	101	85	57
09	269	47	69	67	86	0	0	0	0	0	269	47	69	67	86
10	286	78	71	56	81	0	0	0	0	0	286	78	71	56	81
11	285	72	67	70	76	0	0	0	0	0	285	72	67	70	76
12	320	87	81	88	64	0	0	0	0	0	320	87	81	88	64
13	346	74	85	96	91	0	0	0	0	0	346	74	85	96	91
14	454	105	93	113	143	0	0	0	0	0	454	105	93	113	143
15	537	136	111	123	167	0	0	0	0	0	537	136	111	123	167
16	849	163	170	246	270	0	0	0	0	0	849	163	170	246	270
17	1019	230	256	250	283	0	0	0	0	0	1019	230	256	250	283
18	925	261	239	226	199	0	0	0	0	0	925	261	239	226	199
19	597	173	156	146	122	0	0	0	0	0	597	173	156	146	122
20	441	131	104	103	103	0	0	0	0	0	441	131	104	103	103
21	327	107	87	69	64	0	0	0	0	0	327	107	87	69	64
22	176	54	52	39	31	0	0	0	0	0	176	54	52	39	31
23	97	32	26	19	20	0	0	0	0	0	97	32	26	19	20
	8004	Total				0	Total				8004	Total			

Channel 1

AM Peak Hour Start 07:30
 AM Peak Hour Total 405
 AM Peak Hour Factor 84.38 %
 PM Peak Hour Start 17:15
 PM Peak Hour Total 1050
 PM Peak Hour Factor 92.76 %

Channel 2

AM Peak Hour Start
 AM Peak Hour Total
 AM Peak Hour Factor
 PM Peak Hour Start
 PM Peak Hour Total
 PM Peak Hour Factor

Channel 1 + 2

AM Peak Hour Start 07:30
 AM Peak Hour Total 405
 AM Peak Hour Factor 84.38 %
 PM Peak Hour Start 17:15
 PM Peak Hour Total 1050
 PM Peak Hour Factor 92.76 %

Site Name LAKE RIDGE PKWY NB APPROACH TO LYNN RD
 Jurisdiction GRAND PRAIRIE
 Study Type Volume (ch1 & ch2)
 Location Code 36
 Direction None
 Date 12/4/2007
 Real Time 09:43
 Start Date 12/4/2007
 Start Time 10:00
 Sample Time 00:15
 Operator Number 0
 Machine Number 36

Wednesday, December 05, 2007

HR Begin	Channel 1					Channel 2					Channel 1 + Channel 2 *				
	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00	HR Total	00-15	15-30	30-45	45-00
00	23	9	4	4	6	0	0	0	0	0	23	9	4	4	6
01	7	1	3	1	2	0	0	0	0	0	7	1	3	1	2
02	16	5	1	6	4	0	0	0	0	0	16	5	1	6	4
03	8	2	3	2	1	0	0	0	0	0	8	2	3	2	1
04	59	13	11	14	21	0	0	0	0	0	59	13	11	14	21
05	210	32	39	69	70	0	0	0	0	0	210	32	39	69	70
06	678	100	145	211	222	0	0	0	0	0	678	100	145	211	222
07	1073	254	281	270	268	0	0	0	0	0	1073	254	281	270	268
08	616	217	138	130	131	0	0	0	0	0	616	217	138	130	131
09	384	98	119	84	83	0	0	0	0	0	384	98	119	84	83
10	351	94	80	82	95	0	0	0	0	0	351	94	80	82	95
11	318	80	77	69	92	0	0	0	0	0	318	80	77	69	92
12	323	72	83	73	95	0	0	0	0	0	323	72	83	73	95
13	303	64	77	77	85	0	0	0	0	0	303	64	77	77	85
14	317	82	71	83	81	0	0	0	0	0	317	82	71	83	81
15	411	73	122	108	108	0	0	0	0	0	411	73	122	108	108
16	425	86	95	119	125	0	0	0	0	0	425	86	95	119	125
17	583	112	153	152	166	0	0	0	0	0	583	112	153	152	166
18	457	132	107	124	94	0	0	0	0	0	457	132	107	124	94
19	280	93	66	62	59	0	0	0	0	0	280	93	66	62	59
20	238	75	55	56	52	0	0	0	0	0	238	75	55	56	52
21	204	65	60	42	37	0	0	0	0	0	204	65	60	42	37
22	92	24	32	12	24	0	0	0	0	0	92	24	32	12	24
23	46	14	12	10	10	0	0	0	0	0	46	14	12	10	10
	7422	Total				0	Total				7422	Total			

Channel 1

AM Peak Hour Start 07:00
 AM Peak Hour Total 1073
 AM Peak Hour Factor 95.46 %
 PM Peak Hour Start 17:15
 PM Peak Hour Total 603
 PM Peak Hour Factor 90.81 %

Channel 2

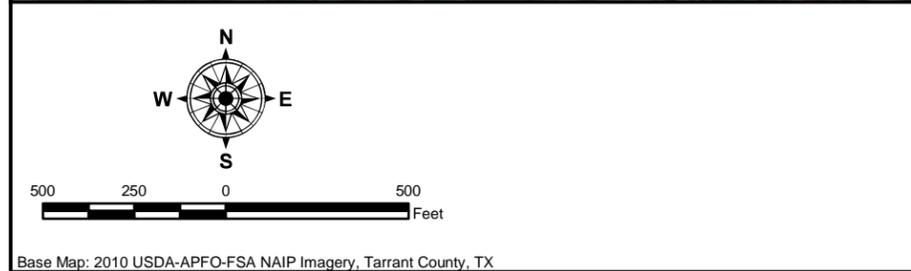
AM Peak Hour Start
 AM Peak Hour Total
 AM Peak Hour Factor
 PM Peak Hour Start
 PM Peak Hour Total
 PM Peak Hour Factor

Channel 1 + 2

AM Peak Hour Start 07:00
 AM Peak Hour Total 1073
 AM Peak Hour Factor 95.46 %
 PM Peak Hour Start 17:15
 PM Peak Hour Total 603
 PM Peak Hour Factor 90.81 %

Appendix I

WHAP Determination



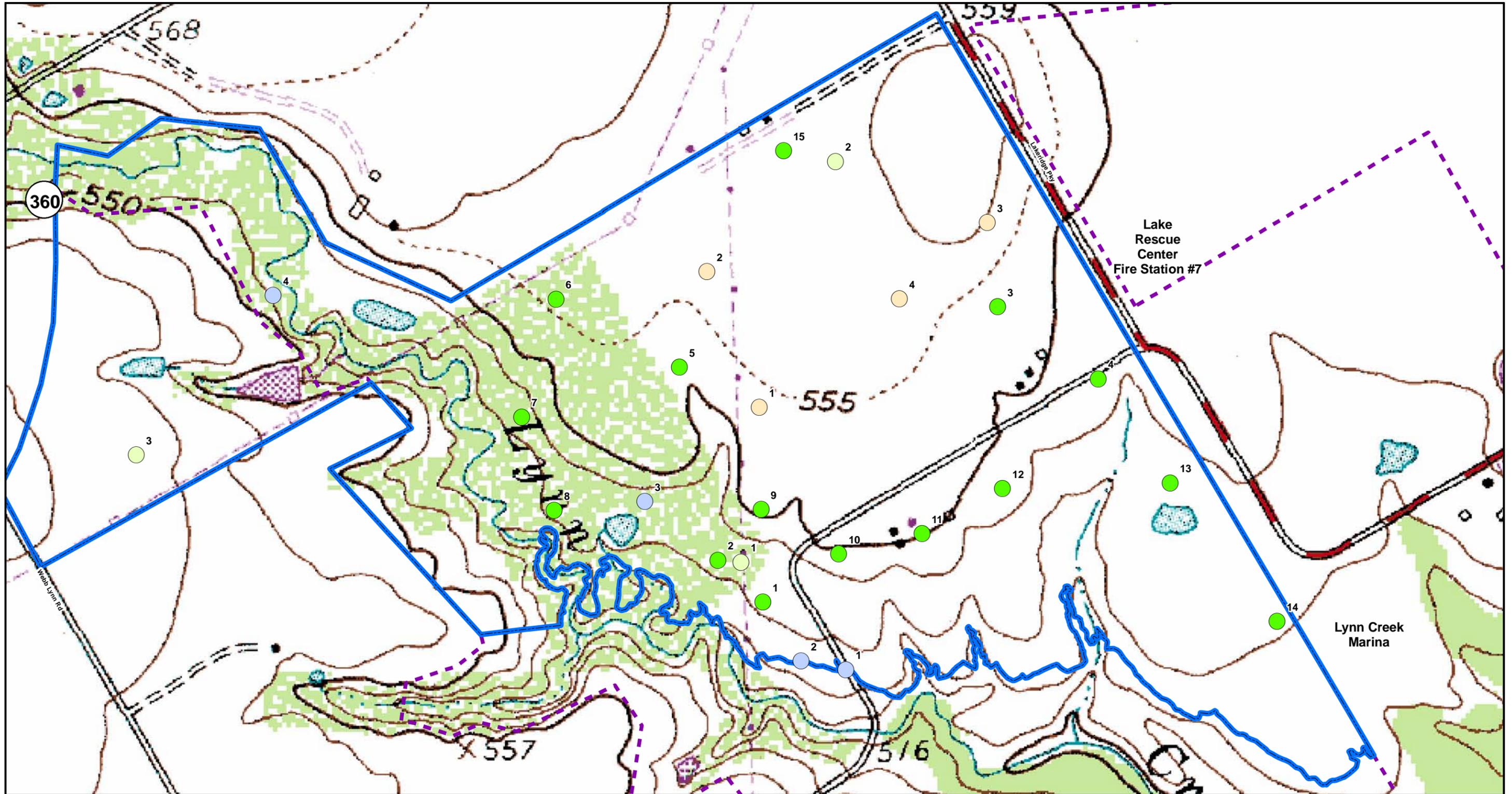
PBS
an Atkins company

FIGURE 1
LYNN CREEK WEST PARKWAY
RECREATIONAL DEVELOPMENT PLAN
WHAP POINTS
TARRANT COUNTY, TX

100002496 NOVEMBER 8, 2010

Base Map: 2010 USDA-APFO-FSA NAIP Imagery, Tarrant County, TX

File Path: N:\100002496\projects\WHAP\WHAP_fig1_110810.mxd



	<p align="center">Legend</p> <ul style="list-style-type: none"> GRASSLAND MIXED HARDWOOD SAVANNAH RIPARIAN WOODS UPLAND WOODS PROJECT BOUNDARY USACE PROPERTY 	 <p align="center"> FIGURE 2 LYNN CREEK WEST PARKWAY RECREATIONAL DEVELOPMENT PLAN WHAP POINTS TARRANT COUNTY, TX </p>
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Base Map: USGS 7.5' Topographic Map, Arlington Quadrangle, Tarrant County, TX

File Path: N:\100002496\projects\WHAP\WHAP_fig2_110810.mxd

100002496 NOVEMBER 8, 2010

Appendix J

Mitigation Plan – Lynn Creek Parkway

***Mitigation Plan for Phase I of the
Lynn Creek West
Recreational Development Plan
Tarrant County, Texas***

Document No. 100159
PBS&J Job No. 100002496

**MITIGATION PLAN FOR PHASE I OF THE
LYNN CREEK WEST
RECREATIONAL DEVELOPMENT PLAN
TARRANT COUNTY, TEXAS**

Prepared for:

U.S. Army Corps of Engineers
Joe Pool Lake Office
P.O. Box 872
Cedar Hill, Texas 75106

Prepared by:

PBS&J
18383 Preston Road
Suite 500
Dallas, TX 75252

September 2010
Revised May 2011

Contents

	Page
1.0 INTRODUCTION	1-1
1.1 BACKGROUND.....	1-1
1.2 PURPOSE AND NEED	1-1
1.3 ALTERNATIVE 1 (PREFERRED ALTERNATIVE)	1-2
1.4 CONCLUSION	1-7
2.0 MITIGATION PLAN	2-1
2.1 PHASE I MITIGATION EFFORTS	2-1
2.1.1 Species Selection.....	2-2
2.1.2 Planting Dates.....	2-2
2.1.3 Planting Rates, Spacing and Installation	2-2
2.1.4 Invasive and Undesirable Species	2-3
2.2 ECOLOGICAL BENEFITS	2-3
3.0 PERFORMANCE STANDARDS	3-1
3.1 SUCCESS CRITERIA.....	3-1
3.2 PERFORMANCE STANDARDS.....	3-1
4.0 LONG-TERM MANAGEMENT AND MONITORING.....	4-1
4.1 LONG-TERM MANAGEMENT.....	4-1
4.2 MONITORING AND REPORTING.....	4-1
5.0 CONTINGENCY PLAN.....	5-1
6.0 PROJECT SUCCESS/RESPONSIBLE PARTIES	6-1
6.1 PROJECT SUCCESS.....	6-1
6.2 RESPONSIBLE PARTIES	6-1
7.0 PHASE II-IV MITIGATION EFFORTS.....	7-1
Appendices	
A Project Maps	
B Approved Species	

Tables

	Page
1-1 Proposed Phasing	1-6
2-1 Suggested Tree, Shrub, and Grass Plantings.....	2-2

1.0 INTRODUCTION

1.1 BACKGROUND

In 1994, United States Army Corps of Engineers (USACE) and the Trinity River Authority (TRA) entered into a contract giving TRA operational responsibility for Lynn Creek Park, Lloyd Park, Britton Park, Estes Park and Pleasant Valley Park. In 2000, Congress passed legislation allowing the contract and lease to be transferred from TRA to the City of Grand Prairie (City). The City currently holds the 784 acre public recreation lease for Lynn Creek Park from the USACE. The City is proposing to begin development of a currently undeveloped portion of Lynn Creek Park located on federal land at Joe Pool Lake. The plan of development is referred to in this document as Lynn Creek West Recreational Development Plan (LCWRDP). The federal land in question is owned by the USACE, but is leased by the City. This type of park development would be compatible with the federal land classifications in the USACE Master Plan for Joe Pool Lake, Design Memorandum No. 11 dated February 1981. This document is being prepared to address impacts to the environment that would result from implementing the proposed development being considered by the City, in accordance with the National Environmental Policy Act of 1969, as amended, and as defined in federal regulations at 40 CFR Parts 1500-1508. This Environmental Assessment (EA) publicly discloses the environmental consequences of the USACE approving the plans for construction of the proposed action.

1.2 PURPOSE AND NEED

Joe Pool Lake is located in the mid-cities area of the Dallas-Fort Worth Metropolitan Statistical Area. Federal land surrounding the lake is located within the corporate city limits of several cities including Grand Prairie, Cedar Hill, and Dallas. The City of Mansfield also borders federal land on the south side of the lake. All of these cities have experienced a very high population growth rate over the past ten years. According to the U.S. Census Bureau the City of Grand Prairie, now the 16th largest city in Texas, grew from a population of 127,427 in 2000 to approximately 175,396 in 2010. During the same period, the City of Mansfield grew from a population of 28,031 to 56,368 and Cedar Hill grew from a population of 32,093 to 45,028. This high growth rate has led to high demand for recreational open space.

The population increase for the City and surrounding areas has placed a demand on existing recreational facilities and the need for additional recreational open space. Existing facilities located at Lynn Creek Park received 119,145 visitors while Lynn Creek Marina received 375,632 visitors in 2007 (USACE, 2008). Popular recreational activities include picnicking, boating, fishing, and sightseeing. The park and marina routinely reach maximum capacity during weekends over spring and summer months, especially during holiday weekends. During the past three years, the City has produced “Prairie Lights,” a holiday drive through festival drawing over 100,000 visitors during its 40-day run annually. The *City of Grand Prairie 2008 Parks, Recreation & Open Space Master Plan* (Master Plan) identified five high priority items for the residents of the City. The five priority items include: 1) aquatic based passive recreation and spray parks; 2) hike/bike/job/running and nature trails; 3) expansion of the Senior Center; 4) playgrounds;

and 5) lake parks. At the lake parks, camping facilities, including cabins; trails for hiking, biking, running, and nature walks; fishing piers; water recreation facilities; swimming beaches; and extreme sports venues were identified as development opportunities. The development of the LCWRDP would help the City to meet several of their high priority items identified in their Master Plan.

1.3 ALTERNATIVE 1 (PREFERRED ALTERNATIVE)

Under the Preferred Alternative, the LCWRDP would be a multi-phase construction assignment that would benefit surrounding community activities and growth. Planned recreational development within the project study area would be designed to facilitate multi-function recreation that would be accessed by the proposed Lynn Creek Parkway. The recreational development plan would include an interpretive trail system, nature center, adventure sporting areas, practice fields, group lodging, pavilions, swimming areas, an amphitheater and a restaurant. In addition to the recreational uses, land north of the planned practice fields and themed special events area would be protected as a no development zone and include a native landscape buffer.

It is anticipated that the Preferred Alternative would increase recreational activities, and provide the greatest amount of recreational opportunities by design. The recreational developments would occur in phases as funding becomes available and include the following.

PHASE I

TRAILS: Up to 10,000 linear feet of natural surface trails are proposed to encircle the improved recreational improvements within the proposed development. The trails would avoid demolition of native hardwood trees, but would include grubbing of weedy vegetation and utilization of chipped trees as surfacing for portions of the trail. The trail layout would provide a variety of trail loops to meet varying levels of ability, as well as opportunities for native flora and fauna interpretation.

NATIVE AREA: Native areas are interspersed throughout the recreational improvements to maintain the natural woodland cover. Weedy vegetation and exotic species would be properly managed to encourage a greater diversity of native plant species.

NO DEVELOPMENT ZONE: A No Development Zone, extending from approximately 50 feet south of the toe of the dam to the northern park boundary, would be reserved to protect the dam. This area would be managed under the direction of the USACE.

NATIVE LANDSCAPE BUFFER: An approximately 200-foot wide area adjacent to existing residential development would be preserved as a no development buffer zone and would be planted with native trees. This naturalized forest would provide a noise and landscape buffer for the residential developments and would discourage vehicular access from the USACE's levee into the park.

PHASE II

LARGE GROUP PAVILION: This pavilion was previously approved as a part of the Pavilion and BBQ support restaurant plan. The pavilion is planned to be up to 6,600 square feet of covered shelter located immediately west of Lake Ridge Parkway with an entrance drive aligning with the existing marina entrance. A park restroom and storage room of approximately 2,000 square feet would provide support to the pavilion. A 12,550 square foot restaurant is also planned for this site to provide support to the pavilion users. Approximately 300 parking spaces are planned to serve the pavilion and restaurant. A courtesy boat dock is also planned for temporary access to the pavilion and restaurant.

CABIN LOOP "B": Cabin loop 'B' is proposed to be a combination of one-bedroom cabin units, two-bedroom cabin units, and four-bedroom cabin units along a looped paved road. Cabins would include individual parking spaces at each location sufficient for each unit. The cabins would be interspersed along the loop road to blend in with the existing natural landscape. One-bedroom cabins would be approximately 500 square feet in size and up to 10 units are proposed. Two-bedroom cabins would be approximately 600 square feet in size and up to 10 units are proposed. Four-bedroom cabins would be approximately 1,700 square feet in size and up to five units are proposed.

PRACTICE FIELDS: Up to 15 acres of the site is planned to be developed into general open space for use as community practice fields. Because this area would be grubbed, graded, and seeded with a turf grass species designed for general recreation use, a site with an existing stand of invasive cedar trees was intentionally selected.

PHASE III

RUSTIC LODGE: The Rustic Lodge would be developed as a 79,000 square foot hotel-style lodge facility with up to 200 hotel rooms, conference and meeting rooms, support restaurant and bar, outdoor concession kiosk, outdoor pool and spa area, landscape, and parking.

RESORT ENTRANCE: Decorative native and adaptive landscape, entrance signage, and a gatehouse kiosk are planned at the entrance to the lodge off of Lynn Creek Parkway.

SWIMMING AREA: Portions of the existing shoreline near the resort and group pavilion would be grubbed and cleared of debris to form a beach. Beach sand would be hauled to the site to create a public beach approximately 25,000 square feet in size. Up to 20 shade shelters, with benches and picnic tables, would be installed on the beach to provide additional shade for users. A bathhouse with restroom facilities and showers would also be installed. This facility is estimated to be approximately 1,000 square feet with additional 45,000 square feet of parking space.

COURTESY BOAT DOCK: A courtesy boat dock is planned along the lake shore, adjacent to the Lodge and Group Lodging area, for temporarily holding rental canoes, kayaks, and paddleboats. The courtesy dock would

only be for temporary day-use rental of non-motorized personal watercraft and would not be used for long-term storage.

PHASE IV

GROUP LODGING “C”: The group lodging area is planned for larger groups as “bunkhouse” style dormitory facilities with group sleeping bunks and central shower facilities. Chaperone sleeping quarters would be constructed adjacent to the bunk areas. Up to six bunkhouse dormitories are proposed and each unit is estimated to be 5,000 square feet in size. A central dining hall is proposed with kitchen, enclosed dining area, and service yard to serve the dormitories. Approximately 200 parking spaces would also be constructed to service the dormitories.

LARGE GROUP PAVILION: A community group pavilion of approximately 3,500 square feet, with picnic tables and barbecue grills, is planned for general public usage. A 1,000 square foot restroom and a 5,000 square foot maintenance/storage building for maintenance supplies and materials are also proposed. A 75-space parking lot is planned to service the pavilion.

CABIN LOOP “A”: Cabin loop ‘A’ is proposed to be a combination of two-bedroom cabin units and four-bedroom cabin units along a looped paved road. Cabins would include individual parking spaces at each location sufficient for each unit. The cabins would be interspersed along the loop road to blend in with the existing natural landscape. Two-bedroom cabins would be approximately 600 square feet in size and up to 30 units are proposed. Four-bedroom cabins would be approximately 1,700 square feet in size and up to 10 units are proposed.

SUPPORT RESTAURANT: As other park improvements are constructed, the need for additional support facilities would be required to serve basic user needs. At the southwest quadrant of the intersection of Lynn Creek Parkway and Lake Ridge Parkway, a planned support restaurant is proposed. This facility would be similar in size to the restaurant at the large group pavilion and would not be constructed until other park improvements that increase demand for support are completed. The restaurant would be up to 12,500 square feet in size with an additional 8,000 square feet of patio dining and two 1,000 square foot shelters. Approximately 250 parking spaces are also planned within this area.

ADVENTURE SPORTS AREA: The adventure sports area would consist of an open field with a variety of outdoor adventure activities. A meeting room of approximately 2,400 square feet is planned to serve as meeting and orientation space for the activities. Approximately 4,000 square feet would be allocated to a ropes course and an open games area for free play. Organized activities would be centrally located in the sports area. A restroom of approximately 800 square feet would be located near the meeting room.

TRAILS: Up to 10,000 linear feet of natural surface trails are proposed to encircle the improved recreational improvements within the proposed development. The trails would avoid demolition of native hardwood trees, but would include grubbing of weedy vegetation and utilization of chipped trees as surfacing for portions of the

trail. The trail layout would provide a variety of trail loops to meet varying levels of ability, as well as opportunities for native flora and fauna interpretation. Up to 2,500 linear feet of paved trails would also be constructed to provide access to recreational facilities and prevent undue compaction of soils.

AMPHITHEATER: The amphitheater is proposed to be up to 3,200 square feet of covered stage with a 3,000-square foot support building, concession building of up to 2,000 square feet, and restrooms of approximately 2,000 square feet. Service kiosks would be dispersed within the 25,000 square feet of seating area with up to 225 shade structures. A 400-space parking lot is planned to serve the amphitheater.

EQUESTRIAN AREA: The equestrian area is composed of a 50-space horse trailer parking lot, an 800 square foot restroom, and a 2,000-square foot concession to serve approximately 10,000 linear feet of non-paved natural surface horse trails.

THEMED SPECIAL EVENTS AREA: This special-use area is planned for general usage during the active months, but can be rented for special events and larger groups. The events area would include up to 5,000 square feet of meeting room space, a 3,000 square foot playground consisting of a playscape within a safe fall zone, and a 5,000 square foot splash pad with spray fountains and a drain system. Up to eight large group pavilions of up to 3,200 square feet are planned for general usage and an additional 10 small picnic shelters of 400 square feet would be constructed around the play activities. Eight acres of playfields would be centrally located within the complex. Approximately 52,800 square feet of paved walking trail surrounding the perimeter would provide fitness and leisure exercise. Up to 300 parking spaces are planned off of an entrance drive from Lynn Creek Parkway. Portions of this improvement would be fenced to protect the improvements and prevent unauthorized entry during non-public usage periods.

The Preferred Alternative also includes the construction of a new roadway (Lynn Creek Parkway). Lynn Creek Parkway would be a 50-foot wide four-lane undivided arterial roadway extending approximately 6,116 linear feet from SH 360 to Lake Ridge Parkway. The portion of roadway extending across the USACE property would be approximately 4,813 linear feet. Although this alignment would cross a greater length of USACE property, it would remain a further distance from existing nearby residences, and potentially allow for fewer disturbances during park use. Other project improvements would include reconstruction of approximately 750 feet of the Lynn Creek Park access road on the east side of Lake Ridge Parkway, construction of a new 12-inch water pipeline from Lake Ridge Parkway to SH 360, and approximately 955 feet of bridge spanning Lynn Creek and the adjacent low areas. The maximum design speed for Lynn Creek Parkway would be 45 miles per hour (mph) and the arterial would be designed to accommodate two eastbound and two westbound lanes. Although the maximum design speed for Lynn Creek Parkway would be 45 mph, the final speed limit would adhere to USACE guidelines and recommended speed limits of typical recreational area service roads. Additional turn lanes may be necessary at the intersections at Lake Ridge Parkway and SH 360 to accommodate turning traffic. The City would also plan to include a 10-foot wide hike-and-bike trail in the roadway's south parkway along

with street lighting and landscaping. This Alternative would provide the safest travel route throughout the project area, and would allow for the City to utilize the property to the greatest extent possible.

The bridge required to span Lynn Creek would be a four-lane undivided concrete roadway and would include a 10-foot wide walkway. The total estimated bridge width including the walkway and railing would be approximately 67 feet. The proposed sidewalk would provide a non-vehicular transportation connection from nearby residential subdivisions located west of the existing park. The City’s future hike-and-bike trail would tie into the bridge walkway.

The development of the Preferred Alternative would occur in phases, beginning with the proposed roadway (Lynn Creek Parkway) and soft trails, as the other phases of development cannot occur (be utilized by the public) without the existence of the road. In order to assure accurate mitigation measures, the mitigation for future phases of construction would need to be recalculated and revised (as detailed plans are implemented), and performed in phases as well (**Table 1-1**). Phasing timelines of future development would be contingent upon approved funding.

Table 1-1, Proposed Phasing

Legend	Improvement	Approximate Size (acres)	Proposed Phasing
Phase I			
N	Trails (Phase I)	1.72	2011-2015
T	No Development Zone		2011-2015
P	Native Landscape Buffer		
	Roadway	5.52	2011-2015
Phase II			
E	Large Group Pavilion	3.08	2011-2015
C	Cabin Loop ‘B’	2.32	2011-2015
R	Practice Fields	10.41	2011-2015
Phase III			
A	Rustic Lodge	2.94	2016–2020
M	Resort Entrance	0.07	2016–2020
G	Swimming Area	0.99	2016–2020
J	Boat Dock	0.29	2016–2020
Phase IV			
D	Group Lodging	4.24	2021–2025
I	Large Group Pavilion	0.78	2021–2025
B	Cabin Loop ‘A’	4.08	2021–2025
F	Support Restaurant	2.24	2021–2025

L	Adventure Sports	10.43	2021–2025
N/O	Remaining Trails	1.61	2021–2025
H	Amphitheater	3.66	2021–2025
K	Equestrian Area	0.93	2021–2025
S	Themed Special Events Area	11.29	2021–2025

1.4 CONCLUSION

Over the next fifteen years, the City will develop Lynn Creek Park. This mitigation plan will focus on the impacts and required mitigation for Phase I (construction of walking/jogging trails and Lynn Creek Parkway) on USACE property.

The trails will provide users of the park a safe place to walk/jog, view wildlife, and ride bicycles. The east-west arterial road through the undeveloped portion of Lynn Creek Park is needed to accomplish the multiple purposes of relieving traffic congestion, providing improved emergency access, improving traffic flow during special events in Lynn Creek Park and providing a signature park entrance to all of Lynn Creek Park as well as access to the undeveloped portion of the park in a way that will be compatible with future park development. The proposed Lynn Creek Parkway and off-street parking design would permanently impact approximately 11.24 acres of habitat, including 8.69 acres of Upland Woods habitat, 1.08 acres of Riparian Woods habitat, and 1.47 acres of Grassland habitat.

2.0 MITIGATION PLAN

2.1 PHASE I MITIGATION EFFORTS

The City proposes to mitigate on-site for unavoidable impacts to USACE land in association with Phase I of the proposed LCWRDP (**Appendix A, Exhibit 1**). Immediate permanent impacts would be associated with the proposed Lynn Creek Parkway and off-street parking. Under the proposed Phase I design, 11.24 acres of habitat would be permanently impacted, including 8.69 acres of Upland Woods habitat, 1.08 acres of Riparian Woods habitat, and 1.47 acres of Grassland habitat.

Mitigation for Phase I would occur in the form of on-site habitat restoration and enhancement activities. Approximately 19.73 acres of existing Mixed Hardwood Savannah and Upland Woods would be restored and enhanced to recreate a prairie/grassland setting with groupings of mixed native trees (mottes). Refer to **Appendix A, Exhibit 2** for location of restoration area.

Tree Mottes: Managing woodlands in a way that is ecosystem-based relies heavily on five general principles. These include maintaining the natural growth patterns of native tree species; maintaining a healthy layer of understory vegetation; keeping leaf litter on the forest floor intact; maintaining a diverse community of trees including young, mature, declining, and dead trees; and the elimination of non-native species.

Specific management actions for the proposed project that are designed to enhance or maintain forested communities would include:

- Allowing lower limbs of trees to grow to the ground and prevent landscape-oriented pruning, which provides protection and feeding opportunities wildlife species,
- Allowing leaf litter to remain on the forest floor to fulfill a vital nutrient cycling role in the ecological integrity of the woodland,
- Allowing dead trees (snags) to remain, which may provide valuable nesting or roosting habitat for wildlife and/or sources of nutrients through decomposition of the plant tissues,
- Inter-planting of container-grown native canopy-forming trees to restore a healthy diversity of tree species,
- Inter-planting of the understory community with native plant species that may be absent from the community,
- Removal or thinning of overly aggressive vine growth and invasive species, and
- Supplemental watering of newly planted species until they are well established.

Prairie/grassland: Prairie and grassland communities are ecologically complex plant and animal communities once found throughout the Texas landscape. In an undisturbed setting, these habitats often provide extremely valuable wildlife habitat and serve as strong forces in preventing soil erosion. Prairie/grasslands generally have diverse plant communities with grasses typically dominating the

landscape. Planting a diverse mixture of grass species is better than a couple of species for restoration purposes.

2.1.1 Species Selection

The City will plant a variety of native trees, shrubs and grasses. Table 2-1 lists the primary species proposed for planting on the property. Additional species, suited to the location, may be planted depending upon commercial availability and with USACE approval. See **Appendix B** for additional species approved by the USACE. Trees with diameter breast height (DBH) of one or two inch or 2–3-year old containerized trees will be planted on the site. The species will be planted, across the landscape, according to their tolerance for hydric conditions, and commercial availability from year to year.

Table 2-1, Suggested Tree, Shrub, and Grass Plantings

Common Name	Scientific Name
Pecan	<i>Carya illinoensis</i>
Black hickory	<i>Carya texana</i>
Eastern redbud	<i>Cercis canadensis</i>
Black walnut	<i>Juglans nigra</i>
Bur oak	<i>Quercus macrocarpa</i>
Post oak	<i>Quercus stellata</i>
Texas buckeye	<i>Aesculus arguta</i>
Reverchon hawthorn	<i>Crataegus reverchonii</i>
Mexican plum	<i>Prunus mexicana</i>
Big Bluestem	<i>Andropogon gerardi</i>
Canada Wildrye	<i>Elymus Canadensis</i>
Sideoats Grama	<i>Bouteloua curtipendula</i>
Indiangrass	<i>Sorghastrum nutans</i>

Note: Species listed in Table 2-1 are proposed species suitable for planting in North Central Texas. Due to commercial availability, some species may not be available to plant during some years.

2.1.2 Planting Dates

The time of planting is critical to the initial survival of the desired plant species. With this in mind, planting will be conducted during the dormant season (October through March) while the ground is not frozen.

2.1.3 Planting Rates, Spacing and Installation

The recommended tree and shrub species will be planted at a rate of no more than 90 (30 large trees and 60 small trees/shrubs) per acre within the mitigation site. Trees will be randomly planted in small mottes

within the prairie/grassland. Multiple species should be planted within each motte to ensure maximum site diversity.

When planting, to the extent possible, each tree will be placed vertical to the soil surface with the epidermal surface of the roots planted approximately one inch below ground surface. Root surfaces should not show after the tree has been planted. When planting trees, all roots will be pointing down and not curled up or around each other.

Seeding rates for grasses should follow dealer recommendations. Seeds can be planted by mechanical seed drills, broadcast spreaders, or by hand. The site should be prepped several months prior to planting. Site preparation will help to reduce weed competition, provide a suitable seedbed, and promote seedling growth. Herbicides, mowing, and disking are typically the methods used to prepare the seedbed.

2.1.4 Invasive and Undesirable Species

Invasive and undesirable species including, but are not limited to sugarberry (*Celtis laevigata*), honey mesquite (*Prosopis glandulosa*), yaupon (*Ilex vomitoria*), Chinese privet (*Ligustrum sinense*), cedar (*Juniperus* spp.) Johnsongrass (*Sorghum halepense*), Bermuda grass (*Cynodon dactylon*) and King Ranch bluestem (*Festuca arundinacea*), can be detrimental to the success of enhancement and restoration activities. The removal of these species is imperative to the success of the enhancement and restoration activities. Trees, shrubs, vines, and grasses of undesirable species should be removed by herbicide application, chipping, or mulching. However, not all undesirable trees, shrubs, vines, and grasses of undesirable species should be removed to allow for variety in the mitigation sites. Large trees, 12-inch DBH or greater, should be left standing. Vines and shrubs do provide wildlife habitat and left in small quantities is good for the overall ecological system. Thickets of invasive and undesirable plants may be removed to create large openings or may be done on an individual basis to create small openings. However, the removal of these species should be done in a way that will enhance the overall ecological system.

2.2 ECOLOGICAL BENEFITS

The proposed mitigation site contains many positive aspects that are ecologically beneficial to the local area and contribute to the regional watershed. Some of these aspects will be enhanced and/or restored to provide additional benefits. Ecological benefits include: (1) reducing the potential for erosion and sediment loss; (2) maintaining/providing canopy cover for wildlife; (3) minimizing landscape fragmentation that keeps larger landscape sized blocks of land intact for wildlife, (4) eliminating potential future clearing operations, to ensure that functional values remain within these areas, and (5) providing contiguous forested areas across a wide expanse of landscape.

3.0 PERFORMANCE STANDARDS

3.1 SUCCESS CRITERIA

A three year reporting/monitoring program will be designed and implemented to determine whether a minimum survival of 50 percent of the stems planted per acre or naturally regenerated species has been attained. During each monitoring period, a survey of living and dead trees will be conducted in each planted area. For best results, the survey will be conducted at or near the end of each growing season following planting of the area. Photographs showing all representative areas of the mitigation sites will be taken after initial planting and during each monitoring exercise. The City will replant until the minimum survival rate, as stated above, is achieved. In some areas, naturally regenerating trees of desired species will be included in stem counts and will be included with data that fulfills the success criteria.

Should monitoring indicate that tree survivability is less than that required; corrective actions will be implemented as soon as possible. Corrective actions may include, (1) determining the cause of tree mortality (e.g., poor planting stock, drought, or excess water), (2) correcting, if possible, the cause of tree mortality, and (3) re-planting trees to meet the approved performance standards.

Prairie/grasslands will be generally free of invasive species. Random sample plots should be used to determine percentage of native species against invasive species. After three years, native species should makeup at least 70% of the sample plots. Invasive species will be controlled by mowing, selective use of herbicides, and hand pulling.

3.2 PERFORMANCE STANDARDS

The following criteria shall be used to determine the minimum level of success of the mitigation effort:

1. Forested areas will be enhanced (planted) with appropriate trees and survival must be a minimum of 50 percent of the stems planted per acre or naturally regenerated desired species.
2. Removal of a majority of invasive and/or less desirable species to create large and small openings that will allow for successful survivability of native trees, shrubs, and grasses.
3. Grass stands will exhibit a majority of native grasses and provide sufficient ground cover to reduce soil erosion and provide habitat for wildlife.

The City shall be responsible for maintaining the mitigation areas to comply with conditions above until such time as the City provides documentation to, and receives verification from the USACE, that areas within the property (designated as compensatory mitigation) meet the above requirements.

4.0 LONG-TERM MANAGEMENT AND MONITORING

4.1 LONG-TERM MANAGEMENT

Long-term management practices, conducted by the City, following attainment of the performance standards may include such activities as:

1. Mechanical vegetation control,
2. Selective herbicide treatments,
3. Use of selected prescribed fire,
4. Planting native herbaceous vegetation,
5. Selective tree removal to control insect-damaged, diseased or storm-felled trees is generally discouraged; however, these activities may be conducted in coordination with the USACE. In some instances, felling trees in place and leaving them on the ground will be the preferred method, if acceptable to the USACE.
6. Water regime management, and
7. Visual monitoring of unauthorized activities (i.e. off-road vehicles, trash dumping, etc) on the mitigation sites.

4.2 MONITORING AND REPORTING

A three year monitoring/reporting program will be implemented to monitor the mitigation site for ecological sustainability. During each monitoring period, a visual inspection will be made of the current condition of the mitigation site. Photographs showing all representative areas of the mitigation site will be taken during each monitoring exercise. For best results, the monitoring will be conducted at or near the end of each growing season.

The City will provide an annual report to the USACE by January 31st of each year for the three years after the Finding of No Significance is issued or until the minimum success criteria are met. Reports will document the following:

1. The number of surviving stems or naturally regenerating tree species on a per acre basis compared to the success standard of 150 stems per acre.
2. The general condition of the area, the general vigor of the vegetation, survivability of planted species, and the vegetative communities developing within the site.

-
3. Any additional information concerning soils, vegetation, wildlife use of the site, or any other pertinent or anecdotal information or events that occurred on the area, such as unusual weather, flooding, or activities at the tract.
 4. Proposals for any additional contingency or remedial measures.

Representatives of the City will monitor unauthorized activities on the mitigation site in order to ensure that no acts of negligence occur. In the event the City is found to be noncompliant with the compensatory mitigation plan due to vandalism, natural disasters, accidental negligence, etc., the City will take appropriate actions to bring the mitigation site into compliance in a timely manner.

5.0 CONTINGENCY PLAN

The mitigation site is vulnerable to acts of nature such as wildfires, climatic instability, and disease as well as unauthorized human activities that may cause the site to become noncompliant with the guidelines established within this compensatory mitigation plan. Occurrence of such acts of nature following attainment of performance standards may require changes to the compensatory mitigation plan to allow for maintenance activities to offset and counteract negative impacts. Depending upon the circumstances, however, it may be appropriate to let nature take its course, particularly when vegetation is expected to reestablish due to continued existence of seed tree sources and restrictions on incompatible land uses. As appropriate, the City will discuss decisions on such issues with the USACE.

6.0 PROJECT SUCCESS/RESPONSIBLE PARTIES

6.1 PROJECT SUCCESS

In order for the mitigation sites to be considered a success, the City shall ensure that the site exhibits characteristics of a viable prairie/grassland setting with groupings of mixed native trees (mottes) in accordance with the purpose and goals of the mitigation site as described above. The mitigation site will be diverse with tree and grass species present in various stages of succession. After three growing seasons, if small problem areas exist not meeting the success criteria, the USACE will evaluate the impact on diversity that these areas may provide to the overall uniqueness of the tract.

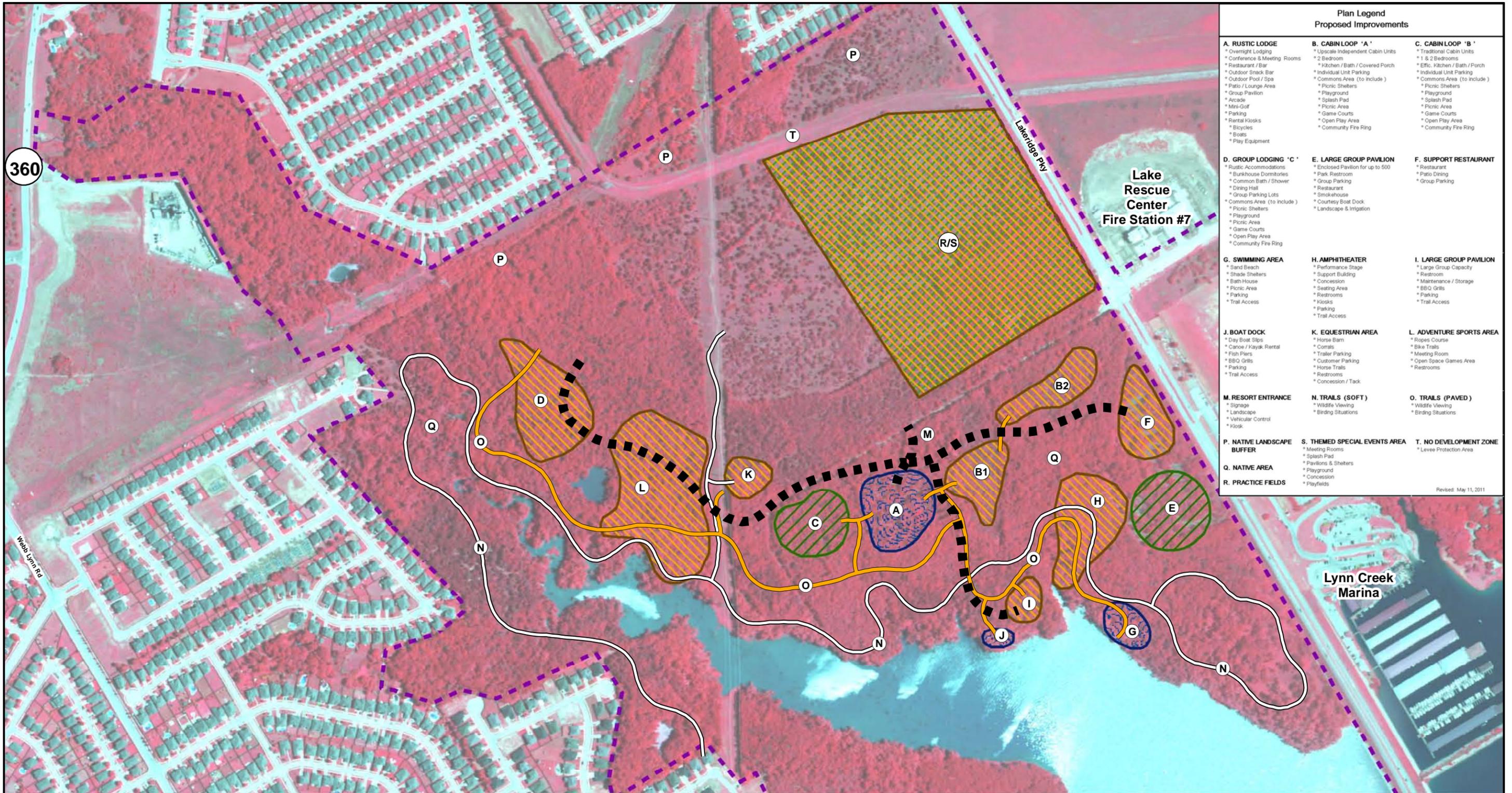
6.2 RESPONSIBLE PARTIES

The City will be solely responsible for accomplishing, maintaining, monitoring, and managing all of the short and long-term mitigation plan provisions.

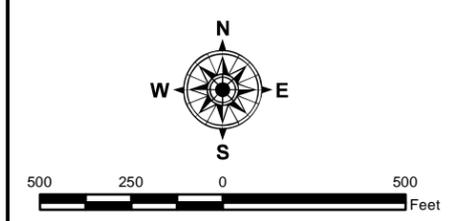
7.0 PHASE II-IV MITIGATION EFFORTS

Mitigation for the proposed Phase II-IV developments (**Appendix A, Exhibit 1**) would also preferably occur in the form of on-site habitat restoration or enhancement activities. The methods for enhancing these communities would be similar to those outlined for the Phase I and would be determined following the final recreational development design, as needed. However, because there may be an insufficient amount of suitable habitat within the project area that is suitable for protection, restoration, or enhancement, alternative habitat improvement sites may need to be located within the overall project area. For example, appropriate habitat improvement sites, which match the type and function of the habitats within the proposed project site, may be available at other City parks or open spaces around Joe Pool Lake. Potential locations for implementing mitigation requirements are located in **Appendix A, Exhibit 2**.

Appendix A
Project Maps



Plan Legend Proposed Improvements		
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Snack Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
D. GROUP LODGING 'C' * Rustic Accommodations * Bunkhouse Dormitories * Common Bath / Shower * Dining Hall * Group Parking Lots * Commons Area (to include) * Picnic Shelters * Playground * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	E. LARGE GROUP PAVILION * Enclosed Pavilion for up to 500 * Park Restroom * Group Parking * Restaurant * Bunkhouse * Courtesy Boat Dock * Landscape & Irrigation	F. SUPPORT RESTAURANT * Restaurant * Patio Dining * Group Parking
G. SWIMMING AREA * Sand Beach * Shade Shelters * Bath House * Picnic Area * Parking * Trail Access	H. AMPHITHEATER * Performance Stage * Support Building * Concession * Seating Area * Restrooms * Kiosks * Parking * Trail Access	I. LARGE GROUP PAVILION * Large Group Capacity * Restroom * Maintenance / Storage * BBQ Grills * Parking * Trail Access
J. BOAT DOCK * Day Boat Slips * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Parking * Trail Access	K. EQUESTRIAN AREA * Horse Barn * Corral * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area
Q. NATIVE AREA	Revised: May 11, 2011	
R. PRACTICE FIELDS		



■ ■ ■ Maintenance/Access Roadway (Phase III) — Trails - Soft (Phase IV) — Trails - Paved (Phase IV) ■ ■ ■ USACE Property	Proposed Improvements by Phase ■ ■ ■ Phase II ■ ■ ■ Phase III ■ ■ ■ Phase IV ■ ■ ■ Phase II & IV
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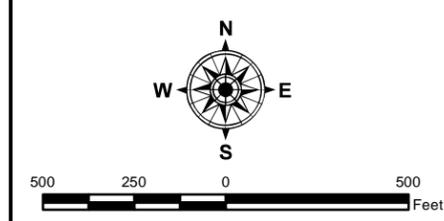
ATKINS

EXHIBIT 1: PHASE II-IV
 LYNN CREEK WEST PARKWAY
 RECREATIONAL DEVELOPMENT PLAN
 TARRANT COUNTY, TX



Plan Legend Proposed Improvements		
A. RUSTIC LODGE * Overnight Lodging * Conference & Meeting Rooms * Restaurant / Bar * Outdoor Snack Bar * Outdoor Pool / Spa * Patio / Lounge Area * Group Pavilion * Arcade * Mini-Golf * Parking * Rental Kiosks * Bicycles * Boats * Play Equipment	B. CABIN LOOP 'A' * Upscale Independent Cabin Units * 2 Bedroom * Kitchen / Bath / Covered Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	C. CABIN LOOP 'B' * Traditional Cabin Units * 1 & 2 Bedrooms * Eff. Kitchen / Bath / Porch * Individual Unit Parking * Commons Area (to include) * Picnic Shelters * Playground * Splash Pad * Picnic Area * Game Courts * Open Play Area * Community Fire Ring
D. GROUP LODGING 'C' * Rustic Accommodations * Bunkhouse Dormitories * Common Bath / Shower * Dining Hall * Group Parking Lots * Commons Area (to include) * Picnic Shelters * Playground * Picnic Area * Game Courts * Open Play Area * Community Fire Ring	E. LARGE GROUP PAVILION * Enclosed Pavilion for up to 500 * Park Restroom * Group Parking * Restaurant * Bunkhouse * Courtesy Boat Dock * Landscape & Irrigation	F. SUPPORT RESTAURANT * Restaurant * Patio Dining * Group Parking
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J. BOAT DOCK * Day Boat Slips * Horse Barn * Canoe / Kayak Rental * Fish Piers * BBQ Grills * Customer Parking * Horse Trails * Restrooms * Concession / Tack	K. EQUESTRIAN AREA * Horse Barn * Corrals * Trailer Parking * Customer Parking * Horse Trails * Restrooms * Concession / Tack	L. ADVENTURE SPORTS AREA * Ropes Course * Bike Trails * Meeting Room * Open Space Games Area * Restrooms
M. RESORT ENTRANCE * Signage * Landscape * Vehicular Control * Kiosk	N. TRAILS (SOFT) * Wildlife Viewing * Birding Situations	O. TRAILS (PAVED) * Wildlife Viewing * Birding Situations
P. NATIVE LANDSCAPE BUFFER Q. NATIVE AREA R. PRACTICE FIELDS	S. THEMED SPECIAL EVENTS AREA * Meeting Rooms * Splash Pad * Pavilions & Shelters * Playground * Concession * Playfields	T. NO DEVELOPMENT ZONE * Levee Protection Area

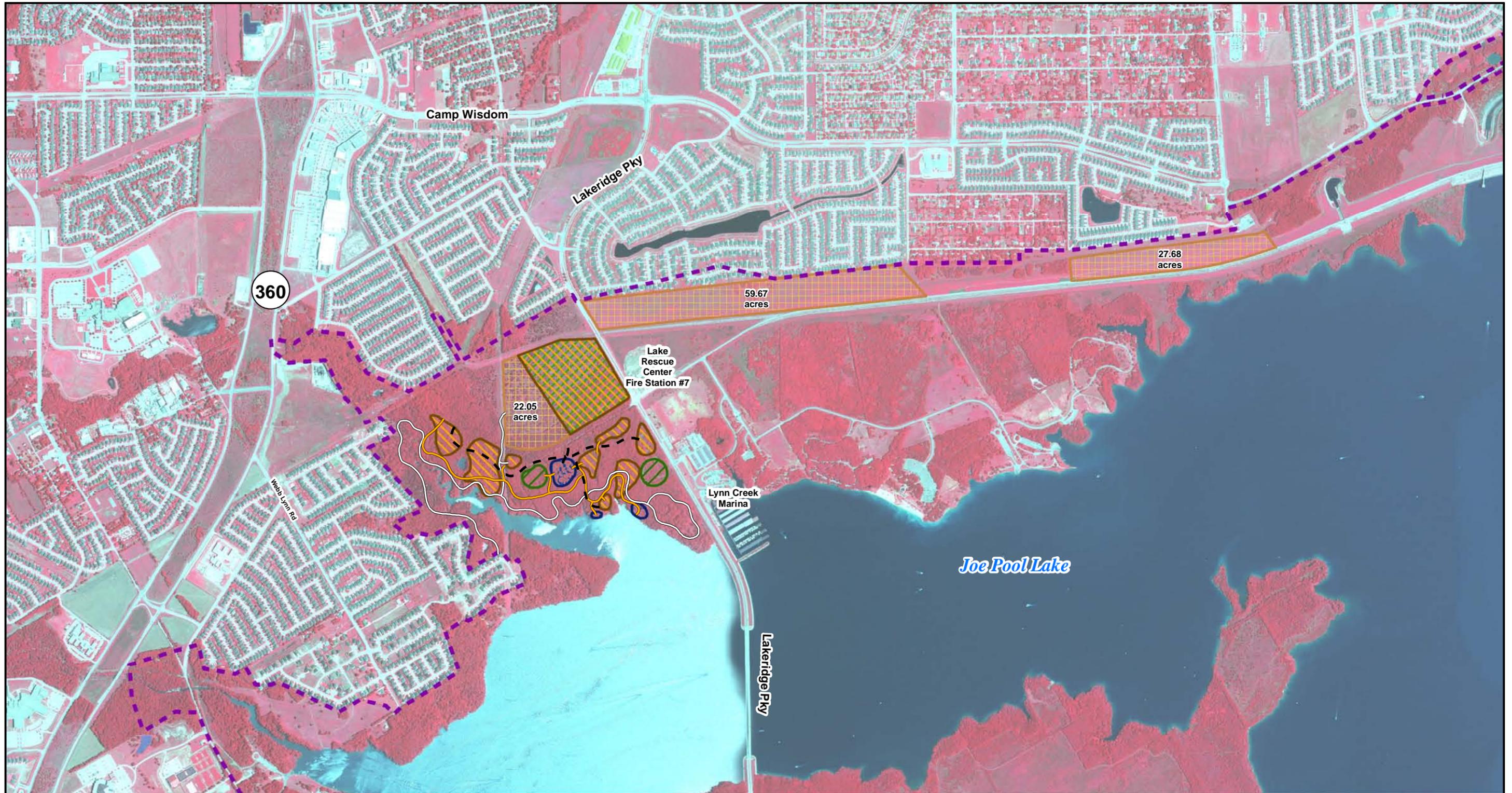
Revised: May 11, 2011



- Trails - Soft
- Lynn Creek Parkway
- Prairie Grass (11.30 acres)
- USACE Property
- Off-Street Parking (20 Spaces)
- Tree Motte (8.43 acres)

ATKINS

EXHIBIT 2: PHASE I
 LYNN CREEK WEST PARKWAY
 MITIGATION PLANTING SITES
 TARRANT COUNTY, TX



	<p>--- Maintenance/Access Roadway (Phase III)*</p> <p>— Trails - Soft (Phase IV)*</p> <p>— Trails - Paved (Phase IV)*</p> <p>⋯ USACE Property</p>	<p>Proposed Improvements by Phase*</p> <p> Phase II</p> <p> Phase III</p> <p> Phase IV</p> <p> Phase II & IV</p>	<p>Future Mitigation</p> <p> Upland Woods-future</p>
	<p>ATKINS</p> <p>EXHIBIT 2: PHASE II-IV LYNN CREEK WEST PARKWAY POTENTIAL FUTURE MITIGATION TARRANT COUNTY, TX</p> <p>*See Exhibit 1: Phase II-IV for proposed improvement details.</p>		

Base Map: 2010 USDA-APFO-FSA NAIP Imagery, Tarrant County, TX

File Path: N:\10002496\projects\MP\MP_exhibit2_2_20110511.mxd

10002496

MAY 11, 2011

Appendix B

Approve Species



Texas Agricultural Extension Service

The Texas A&M University System

NATIVE PLANTS TO USE FOR ENHANCING WILDLIFE HABITAT

by John Cooper,
Denton County Extension Horticulturist

Wildscaping is the practice of creating wildlife habitat in the urban landscape. The three essential elements required for wildlife habitat are food, water and shelter. Plants provide two of these, food and shelter. Native plants provide these elements in the seasonal abundance and quality wildlife in the area require. The following woody plants are native to the area inside a 50-mile radius of Denton, Texas and are recommended for planting in Denton County wildscapes.

THE TREES

<i>Aesculus arguta</i>	Texas Buckeye
<i>Bumelia lanuginosa</i>	Chittimwood
<i>Carya illinoensis</i>	Pecan
<i>Carya texana</i>	Black Hickory
<i>Cersis canadensis</i> var. <i>candensis</i>	Eastern Redbud
<i>Cersis canadensis</i> var. <i>texensis</i>	Texas Redbud
<i>Cornus florida</i>	Flowering Dogwood ?
<i>Crataegus reverchonii</i>	Reverchon Hawthorn
<i>Diospyros virginiana</i>	Common Persimmon
<i>Forestiera acuminata</i>	Swamp Privet
<i>Fraxinus americana</i>	White Ash NO
<i>Fraxinus pennsylvanica</i>	Green Ash
<i>Fraxinus texensis</i>	Texas Ash
<i>Ilex decidua</i>	Deciduous Holly
<i>Juglans nigra</i>	Black Walnut
<i>Maclura pomifera</i>	Bois d'arc
<i>Morus microphylla</i>	Texas Mulberry
<i>Morus rubra</i>	Red Mulberry
<i>Prunus mexicana</i>	Mexican Plum
<i>Prunus munsoniana</i>	Munson Plum
<i>Ptelea trifoliata</i>	Wafer-ash
<i>Quercus fusiformis</i>	Escarpment Live Oak NO
<i>Quercus macrocarpa</i>	Bur Oak
<i>Quercus marilandica</i>	Blackjack Oak
<i>Quercus muhlenbergii</i>	Chinkapin Oak NO
<i>Quercus nigra</i>	Water Oak NO
<i>Quercus shumardii</i>	Shumard Red Oak
<i>Quercus sinuata</i>	Bigelow Oak NO
<i>Quercus stellata</i>	Post Oak
<i>Quercus velutina</i>	Black Oak
<i>Rhamnus caroliniana</i>	Carolina Buckthorn
<i>Rhus copallina</i>	Shining Sumac
<i>Rhus lanceolata</i>	Prairie Flameleaf Sumac
<i>Salix interior</i>	Sandbar Willow NO
<i>Sapindus drumondii</i>	Western Soapberry
<i>Sophora affinis</i>	Eve's Necklace
<i>Ulmus americana</i>	American Elm NO
<i>Ulmus crassifolia</i>	Cedar Elm
<i>Ulmus rubra</i>	Slippery Elm
<i>Zanthoxylum clava-hercules</i>	Hercules Club
<i>Zanthoxylum hirsutum</i>	Tickle Tongue

THE SHRUBS

<i>Aloysia gratissima</i>	Whitebrush
<i>Amorpha fruticosa</i>	Wild Indigo
<i>Baccharis neglecta</i>	New Deal Weed
<i>Berberis trifoliolata</i>	Agarito
<i>Callicarpa americana</i>	American Beauty Bush
<i>Ceanothus americanus</i>	New Jersey Tea
<i>Ceanothus herbaceus</i>	Redroot
<i>Cephalanthus occidentalis</i>	Buttonbush
<i>Cornus drummondii</i>	Roughleaf Dogwood
<i>Dalea frutescens</i>	Black Dalea
<i>Euonymus atropurpureus</i>	Wahoo
<i>Forestiera pubescens</i>	Spring Herald
<i>Lonicera albiflora</i>	White Honeysuckle
<i>Nolina lindheimeri</i>	Devil's Shoestring
<i>Prunus angustifolia</i>	Chickasaw Plum
<i>Prunus gracilis</i>	Oklahoma Plum
<i>Prunus rivularis</i>	Creek Plum
<i>Rhus aromatica</i>	Fragrant Sumac
<i>Rhus glabra</i>	Smooth Sumac
<i>Rosa foliolos</i>	White Prairie Rose
<i>Rosa setigera</i>	Climbing Prairie Rose
<i>Sabal minor</i>	Dwarf palmetto
<i>Sambucus canadensis</i>	Elderberry
<i>Symphoricarpos orbiculatus</i>	Coralberry
<i>Ungnadia speciosa</i>	Mexican Buckeye
<i>Viburnum rufidulum</i>	Rusty Blackhaw
<i>Yucca arkansana</i>	Arkansas Yucca
<i>Yucca constricta</i>	Buckley Yucca
<i>Yucca pallida</i>	Pale Yucca

THE VINES

<i>Ampelopsis cordata</i>	Heartleaf Ampelopsis
<i>Campsis radicans</i>	Trumpet Creeper
<i>Cissus incisa</i>	Ivy Treebine
<i>Cocculus carolinus</i>	Snailseed
<i>Ibervillea lindheimeri</i>	Balsam Gourd
<i>Lonicera sempervirens</i>	Coral Honeysuckle
<i>Parthenocissus quinquefolia</i>	Virginia Creeper
<i>Vitis</i> spp.....	Grape (many species)

Not all native plants are adapted to all site and soil conditions and a field or growing guide should be consulted before planting any plant with which you are unfamiliar. Many exotic plants are well-adapted to our area and provide food and/or shelter for wildlife as well. Planting a wide variety of native and adapted plants affords you a good chance of attracting and supporting a wide variety of wildlife. Available food sources can be supplemented by planting wildflowers and native grasses that are allowed to mature their seeds and fruits. Bird feeders are especially helpful during the winter months when caloric demand is high and available food stocks may be limited. Water may be supplied by setting up and maintaining a small bird bath or creating other landscape water features such as reflecting pools or water gardens. Niches for shelter can be developed in the landscape with grove plantings, masses of shrubbery, and tall grass prairie meadows. Nesting boxes can be constructed and placed in the landscape to provide artificial shelter for certain birds and mammals with special needs. Acquainting your neighbors with the principles and methods of wildscaping will not only help them appreciate what you are doing but may encourage them to do some of the same things. Wildscaping is entirely compatible with contemporary landscape objectives, but remember, neighbors and future prospective buyers of your property may be more concerned about the aesthetics of your landscape so good design sense should always be applied.

Recommended Species for Enhancement of Grassland Areas in North Central Texas

Texas Parks and Wildlife Department, Urban Fish and Wildlife Program

Common Name	Scientific name	Type & Height	Moisture Requirements	Sunlight
GRASSES				
Big Bluestem	<i>Andropogon gerardi</i>	Grass 3' - 6'	Dry to moist	Full sun
Canada Wildrye	<i>Elymus canadensis</i>	Grass 3' - 5'	Dry to moist	Full sun, part shade, dappled shade
Eastern Gammagrass	<i>Tripsacum dactyloides</i>	Grass 3' - 8'	Moist to wet	Full sun, part shade, dappled shade
Indiangrass	<i>Sorghastrum nutans</i>	Grass 3' - 8'	Dry to moist	Full sun, some shade O.K.
Inland Sea-Oats	<i>Chesmanthium latifolium</i>	Grass 2' - 4'	Moist to wet	Part shade, dappled shade, full shade
Little Bluestem	<i>Schizachyrium scoparium</i>	Grass 2' - 5'	Dry	Full sun, part shade
Sideoats Grama	<i>Bouteloua curtipendula</i>	Grass 2' - 6'	Dry to moist	Full sun, part shade, dappled shade
Switchgrass	<i>Panicum virgatum</i>	Grass 3' - 6'	Dry to wet	Full sun, part shade
WILDFLOWERS				
American Basketflower	<i>Centaurea americana</i>	Spring Wildflower 2-5'	Dry to moist	Full sun
Brown-Eyed Susan	<i>Rudbeckia hirta</i>	Summer Fall Wildflower 1' - 2'	Dry to moist	Full sun, part shade, dappled shade
Butterfly Weed	<i>Asclepias tuberosa</i>	Summer Wildflower 1-2'	Dry	Full sun, part shade
Cardinal Flower	<i>Lobelia cardinalis</i>	Summer Wildflower to 4'	Moist to wet	Sun, part shade
Gayfeather	<i>Liatris mucronata</i>	Fall Wildflower to 2 1/2'	Dry	Full sun
Giant Foxglove	<i>Penstemon cobaea</i>	Spring Wildflower 1' - 2 1/2'	Dry to moist	Full sun, part shade
Illinois Bundleflower	<i>Desmanthus illinoensis</i>	Spring Summer Wildflower 1-3'	Moist	Full sun, part shade
Indian Paintbrush	<i>Castilleja indivisa</i>	Spring Wildflower 6" - 12"	Dry to moist	Full sun, a little shade O.K.
Lemon Mint	<i>Monarda punctata</i>	Summer Fall Wildflower to 3'	Dry to moist	Full sun
Mealy Blue Sage	<i>Salvia farinacea</i>	Spring Wildflower 1-3'	Dry	Full sun, part shade
Partridge Pea	<i>Chamaecrista fasciculata</i>	Summer Wildflower to 3 1/2'	Dry to moist	Full sun
Prairie Verbena	<i>Verbena bipinnatifida</i>	Spring Summer Fall Wildflower to 1ft.	Dry to moist	Full sun, part shade
Purple Coneflower	<i>Echinacea purpurea</i>	Summer Wildflower 1' - 2'	Dry to moist	Full sun, part shade
Spring Obedient Plant	<i>Physostegia intermedia</i>	Spring Wildflower 1-3'	Moist (tolerates dry)	Full sun, part shade
Standing Cypress	<i>Ipomopsis rubra</i>	Summer Wildflower to 6'	Dry	Sun, part shade
Texas Bluebells	<i>Eustoma grandiflora</i>	Summer Wildflower to 3'	Moist to wet	Full sun

Recommended Species for Enhancement of Wooded Areas in North Central Texas

Texas Parks and Wildlife Department, Urban Fish and Wildlife Program

Common Name	Scientific name	Type & Height	Sunlight
Canada wildrye	<i>Elymus canadensis</i>	Grass 3' - 5'	Full sun, part shade, dappled shade
Island sea-oats	<i>Chasmanthium latifolium</i>	Grass 2' - 4'	Part shade, dappled shade, full shade
Wild columbine	<i>Aquilegia canadensis</i>	Wildflower 1' - 3'	Part shade, dappled shade, full shade
Purple coneflower	<i>Echinacea purpurea</i>	Wildflower 1' - 2'	Full sun, part shade
Turk's cap	<i>Malvastrum drummondii</i>	Wildflower, shrub in South TX 4' - 9'	Part shade, dappled shade, shade
Scarlet sage	<i>Salvia coccinea</i>	Wildflower 2' - 4'	Full sun, part shade, dappled shade
Brown-eyed Susan	<i>Rudbeckia hirta</i>	Wildflower 1' - 2'	Full sun, part shade, dappled shade
Passionflower	<i>Passiflora incarnata</i>	Vine Climber to 6', also ground cover	Full sun, part shade, dappled shade
Coral honeysuckle	<i>Lonicera sempervirens</i>	Vine Climber to 40'	Full sun, part shade
Coralberry	<i>Symphoricarpos orbiculata</i>	Shrub 1 1/2' - 6'	Dappled shade, part shade
Flowerbush	<i>Forestiera pubescens</i>	Shrub 5' - 10'	Full sun, part shade, dappled shade
American beauty-berry	<i>Callicarpa americana</i>	Shrub 3' - 9'	Part shade, dappled shade.
Rusty black-haw viburnum	<i>Viburnum rufidulum</i>	Ornamental tree or large shrub 20' - 30'	Full sun, part shade
Mexican plum	<i>Prunus mexicana</i>	Ornamental tree 15' - 35'	Full sun, part shade
Eastern redbud	<i>Cercis canadensis v. canadensis</i>	Ornamental tree 10' - 40'	Full sun, part shade, dappled shade
Red buckeye	<i>Aesculus pavia</i>	Ornamental tree or shrub 10' - 35'	Part shade, dappled shade, shade
Carolina buckthorn	<i>Rhamnus caroliniana</i>	Ornamental tree, 12' - 20'	Full sun, part shade, shade

**NATIVE PLANT LISTS AND RELATED INFORMATION
COURTESY OF THE FOLLOWING ORGANIZATIONS**

Texas Parks & Wildlife Department

Texas Agricultural Extension Service, Denton County Office

Native Plant Society of Texas – Trinity Forks Chapter



Little Bluestem Pocket Prairie at Grapevine Lake

Appendix K
Public Involvement

Grand Prairie
— T E X A S —

RECEIVED

MAY 07 2010

TEXAS HISTORICAL COMMISSION

April 26, 2010

Mr. Bill Martin, Archeologist
Texas Historical Commission
P. O. Box 12276
Austin, Texas 78711-2276

Re: Wilson Cemetery, (41TR57), regarding "An Archaeological Survey of the Proposed Grand Prairie Lynn Creek Park Development Project, Tarrant County, Texas".

Dear Mr. Martin:

This letter serves as public documentation for how the City of Grand Prairie will protect, preserve, and maintain the abandoned Wilson Cemetery, (41TR57), in accordance with section 711.010 of Texas Health and Safety Code. This plan will be implemented during the construction phase of future development and portions will be maintained after the development is open to the public.

During the construction phase, no earth disturbing activities will take place within 100 feet in all directions from the external chain link fence. Temporary construction fencing or silt fencing will mark this perimeter, to ensure no disturbance. Once construction of the development is finished, the City will insure that trees, shrubs, and vines will be kept clear of the cemetery, using care not to disturb markers or surrounding fences. The city will maintain the existing wrought iron fence and chain link fence and keep them in good working order. Additionally, the city would provide a paved pedestrian walkway to the cemetery as part of an Interpretive Trail. The walkway would approach the front of the cemetery to allow viewing of markers and Texas Historical Marker. This crushed stone pedestrian walkway would be installed on the existing ground surface. It is the intent of the City of Grand Prairie to protect this cemetery as part of the park development and to maintain it in perpetuity.

Sincerely,


Duane Strawn, RLA, ASLA,
Manager of Parks and Lake

CONCUR	
by	
	for Mark Wolfe State Historic Preservation Officer
Date	5/7/10
Track#	

AR Consultants, Inc.

Archaeological and Environmental Consulting
11020 Audelia Road, Suite C105, Dallas, TX 75243
Phone: (214) 368-0478
Fax: (214) 221-1519
E-mail: aradba@aol.com

March 7, 2009

Mr. Bill Martin, Archeologist
Texas Historical Commission
P. O. Box 12276
Austin, Texas 78711-2276

Dear Bill:

Enclosed is a copy of the draft report titled *An Archaeological Survey of the Proposed Grand Prairie Lynn Creek Park Development Project, Tarrant County, Texas*. The City of Grand Prairie is proposing to develop a 180-acre tract along the shore of Joe Pool Lake in Tarrant County, Texas into a recreational park. The property is situated on the west side of Lake Ridge Parkway and 2400 feet east of SH 360. All of the property proposed to be developed is owned by the US Army Corps of Engineers.

AR Consultants, Inc. conducted a pedestrian survey of the study area in March of 2010 and recorded one new historic site and revisited two historic sites. The first revisited site was 41TR57, a historic cemetery that dates to the last half of the 19th century. The Wilson Cemetery (41TR57) should be avoided by development and no construction should take place within 100 feet of the chain link fence boundary. The second site revisited was 41TR220, which was recorded during the Lynn Creek Parkway study. The site dates to the mid 20th century and the site boundaries were expanded by the recording of several additional features. The new historic site 41TR237 was recorded on the south side of the abandoned Mansfield Road that bisects the study area. The site contained two foundations, a well, a concrete trough and trash scatters, all of which dated to the mid 20th century.

Due to poor contextual integrity, sites 41TR220 and 41TR237, are not recommended for listing on the National Register of Historic Places. Based upon the survey results, AR Consultants, Inc. recommends that further cultural resource investigations are unwarranted and that the City of Grand Prairie be allowed to proceed with the park development. If cultural resources are encountered during construction, work should immediately cease in that area and the Fort Worth District of the US Army Corps of Engineers should be notified. Work should not continue until discussions with the proper agency have been concluded. We request that the Archeology Division of the Texas Historical Commission agree with our recommendations.

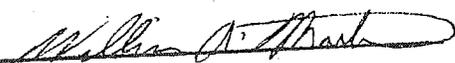
If you have any questions, please contact me at 214-368-0478 or 817-791-6493.

Sincerely,



Cody S. Davis, MA
Project Archaeologist

CC: Romin Khavari, Grand Prairie
Tim Shinogle, Grand Prairie
Sol Stigall, Teague Nall and Perkins

CONCUR	
by	
for	Mark Wolfe
	State Historic Preservation Officer
Date	5/7/10
Track#	



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

Aug 16, 2011

NOTICE OF AVAILABILITY

**DRAFT ENVIRONMENTAL ASSESSMENT
LYNN CREEK PARKWAY RECREATION AREA DEVELOPMENT
LEWISVILLE LAKE, TARRANT AND DALLAS COUNTIES, TEXAS**

The public is hereby notified of the availability of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the proposed Lynn Creek Parkway Recreation Area Development Project for the City of Grand Prairie at Joe Pool Lake, Texas.

This EA addresses the potential impacts to the environment that may result from the proposed Lynn Creek Recreation Area Development project in Lynn Creek Park leased by the City of Grand Prairie at Joe Pool Lake. The City of Grand Prairie has leased the 784-acre Lynn Creek Park from the U.S. Army Corps of Engineers (USACE) since 2000 for public park and recreation purposes. The proposed project involves the construction of a roadway through the undeveloped Lynn Creek West Park connecting SH 360 to Lake Ridge Parkway as well as the development of multiple recreational features for public use including a 200 room rustic lodge, 2 cabin loops, group lodging, a group pavilion, restaurant, amphitheater, adventure sports area, trails, practice fields and numerous areas with native landscaping and habitat restoration components.

The Draft EA will be available for review at the following locations:

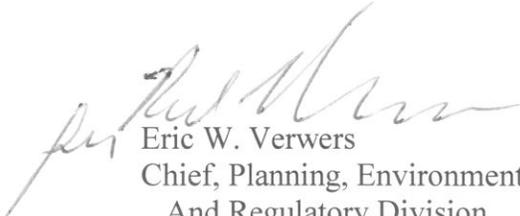
Joe Pool Lake Office
6399 FM 1382
Dallas, Texas 75249
972-299-2227

Parks & Recreation Dept.
326 West Main Street
Grand Prairie, Texas 75053
972-237-8100

Main Library
901 Conover Drive
Grand Prairie, Texas 75053
972-237-5700

The Draft EA can also be viewed via the Internet on the Fort Worth District website at the following address: www.swf.usace.army.mil/

The 30-day public comment period begins with publication of this Notice of Availability. Please address any comments to Ms. Hope Pollmann, CESWF-PER-EE, Post Office Box 17300, Fort Worth, Texas 76102-0300.


Eric W. Verwers
Chief, Planning, Environmental,
And Regulatory Division

Appendix L

Air Analysis

LCWRDP Emissions Summary					
Total Direct and Indirect Emissions (TPY)					
Year	NO_x	VOC	CO	SO₂	PM
2011	7.9717	1.2146	6.9611	0.1910	0.7098
2012	26.7259	4.5417	25.6435	0.6550	2.3358
2013	13.5543	3.4914	19.5748	0.2620	0.8467
2014	20.0244	13.6321	125.3126	0.2786	0.8635
2015	17.5062	13.8804	130.5652	0.2306	0.8078
2016	22.8553	15.6241	139.5089	0.3596	0.9716
2017	26.5329	17.3290	148.3079	0.4374	1.1229
2018	29.3059	19.8186	171.6571	0.6449	1.6157
2019	18.2248	16.2373	152.2561	0.3170	0.7313
2020	10.8949	13.5834	139.2191	0.0556	0.1266
2021	19.8700	17.2264	158.2412	0.3329	0.7215
2022	20.9346	19.4580	181.8770	0.3296	0.6881
2023	15.7912	18.5791	187.3914	0.1860	0.3633
2024	27.4044	23.9532	215.3426	0.4856	0.9279
2025	23.8483	23.1780	217.0038	0.3417	0.6475
Threshold	50	50	250	250	250

Phase I
Improvement-Roadway & Associated Improvements
Duration-12 Months (3 Months 2011 / 9 Months 2012)

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Crawler Tractor/Dozers	136.1	300	7.08E-04	5.99E-05	6.64E-04	2.19E-05	9.06E-05	0.2123	0.0180	0.1992	0.0066	0.0272
Crane	145.2	150	6.01E-04	5.16E-05	3.42E-04	1.68E-05	5.72E-05	0.0902	0.0077	0.0513	0.0025	0.0086
Pavers	221.1	400	8.48E-04	6.53E-05	3.39E-04	2.65E-05	7.81E-05	0.3393	0.0261	0.1356	0.0106	0.0312
Bore/Drill Rigs	239.2	100	5.41E-04	4.19E-05	1.68E-04	1.06E-05	3.42E-05	0.0541	0.0042	0.0168	0.0011	0.0034
Scrapers	422.5	400	1.51E-03	1.12E-04	5.19E-04	5.22E-05	1.12E-04	0.6043	0.0448	0.2075	0.0209	0.0448
Concrete Placer (Paving Equipment)	230.2	400	7.05E-04	5.39E-05	2.76E-04	1.96E-05	5.98E-05	0.2818	0.0215	0.1104	0.0078	0.0239
Rollers	132.2	450	5.84E-04	5.29E-05	5.27E-04	1.71E-05	7.50E-05	0.2627	0.0238	0.2370	0.0077	0.0338
Trenchers	134.3	200	4.95E-04	4.85E-05	4.33E-04	1.37E-05	6.45E-05	0.0989	0.0097	0.0866	0.0027	0.0129
Soil Reclaimer (Trencher)	414.6	1,000	1.23E-03	8.91E-05	4.14E-04	3.48E-05	8.59E-05	1.2273	0.0891	0.4138	0.0348	0.0859
Rubber Tire Loaders	85.48	1,200	4.21E-04	3.82E-05	3.37E-04	1.25E-05	4.51E-05	0.5050	0.0458	0.4046	0.0150	0.0541
Tractors/Loaders/Backhoes	200	3,500	6.03E-04	9.41E-05	3.90E-04	1.36E-05	7.00E-05	2.1103	0.3295	1.3667	0.0476	0.2451
Concrete/Industrial Saws	57.85	100	2.44E-04	1.72E-05	1.16E-04	6.67E-06	2.18E-05	0.0244	0.0017	0.0116	0.0007	0.0022
Air Compressor/Generator (Other Construction Equipment)	15	600	4.49E-05	6.33E-06	5.54E-05	1.27E-06	5.76E-06	0.0270	0.0038	0.0332	0.0008	0.0035
Graders	140.8	1,500	6.93E-04	5.83E-05	6.54E-04	2.16E-05	8.88E-05	1.0398	0.0875	0.9803	0.0323	0.1332
Total								6.8774	0.7133	4.2547	0.1910	0.7098

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	92	25	30	69,000	8.824	2.024	12.052	0.0022	0.6711	0.1539	0.9167
Light Duty Diesel Vehicles	92	25	30	69,000	1.484	0.964	1.884	0.0022	0.1129	0.0733	0.1433
Heavy Duty Gasoline Vehicles	92	25	30	69,000	4.080	3.604	21.648	0.0022	0.3103	0.2741	1.6465
Total									1.0943	0.5014	2.7065

^bAP-42, Appendix H, June 1995

Phase I
Improvement-Roadway & Associated Improvements
Duration-12 Months (3 Months 2011 / 9 Months 2012)

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Crawler Tractor/Dozers	136.1	800	6.40E-04	5.26E-05	5.94E-04	2.11E-05	8.24E-05	0.5118	0.0420	0.4753	0.0169	0.0660
Crane	145.2	400	5.53E-04	4.65E-05	3.12E-04	1.63E-05	5.30E-05	0.2211	0.0186	0.1247	0.0065	0.0212
Pavers	221.1	1,200	7.63E-04	5.98E-05	3.04E-04	2.57E-05	7.39E-05	0.9151	0.0718	0.3645	0.0308	0.0887
Bore/Drill Rigs	239.2	400	5.12E-04	3.95E-05	1.56E-04	1.04E-05	3.26E-05	0.2046	0.0158	0.0623	0.0042	0.0131
Scrapers	422.5	1,500	1.36E-03	1.03E-04	4.59E-04	5.05E-05	1.07E-04	2.0378	0.1539	0.6884	0.0757	0.1600
Concrete Placer (Paving Equipment)	230.2	1,200	6.48E-04	5.00E-05	2.50E-04	1.91E-05	5.69E-05	0.7778	0.0600	0.3001	0.0229	0.0683
Rollers	132.2	1,500	5.37E-04	4.74E-05	4.79E-04	1.66E-05	6.92E-05	0.8054	0.0711	0.7183	0.0250	0.1037
Trenchers	134.3	500	4.62E-04	4.43E-05	3.99E-04	1.34E-05	6.02E-05	0.2309	0.0222	0.1996	0.0067	0.0301
Soil Reclaimer (Trencher)	414.6	3,200	1.13E-03	8.30E-05	3.73E-04	3.39E-05	8.13E-05	3.6247	0.2657	1.1935	0.1086	0.2601
Rubber Tire Loaders	85.48	3,200	4.00E-04	3.47E-05	3.24E-04	1.25E-05	4.15E-05	1.2812	0.1110	1.0366	0.0400	0.1327
Tractors/Loaders/Backhoes	200	11,000	5.64E-04	8.69E-05	3.57E-04	1.34E-05	6.63E-05	6.2044	0.9564	3.9238	0.1470	0.7294
Concrete/Industrial Saws	57.85	150	2.44E-04	1.61E-05	1.07E-04	6.67E-06	1.97E-05	0.0366	0.0024	0.0160	0.0010	0.0030
Air Compressor/Generator (Other Construction Equipment)	15	1,800	4.39E-05	6.03E-06	5.25E-05	1.27E-06	5.18E-06	0.0790	0.0109	0.0945	0.0023	0.0093
Graders	140.8	5,000	6.26E-04	5.11E-05	5.84E-04	2.08E-05	8.09E-05	3.1292	0.2553	2.9192	0.1040	0.4046
Total								20.0599	2.0572	12.1169	0.5915	2.0902

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	273	25	30	204,750	7.944	2.012	11.964	0.0022	1.7929	0.4541	2.7002
Light Duty Diesel Vehicles	273	25	30	204,750	1.444	0.964	1.884	0.0022	0.3259	0.2176	0.4252
Heavy Duty Gasoline Vehicles	273	25	30	204,750	3.920	3.576	20.800	0.0022	0.8847	0.8071	4.6945
Total									3.0036	1.4788	7.8199

^bAP-42, Appendix H, June 1995

Phase I
Improvement-Trails (Soft)
Duration-30 Months (12 Months 2012 / 12 Months 2013 / 6 Months 2014)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Scrapers	246.9	548	9.69E-04	7.61E-05	3.94E-04	3.40E-05	9.80E-05	0.5305	0.0416	0.2156	0.0186	0.0537
Graders	140.8	548	6.26E-04	5.11E-05	5.84E-04	2.08E-05	8.09E-05	0.3427	0.0280	0.3197	0.0114	0.0443
Rough Terrain Forklifts	61.42	180	2.91E-04	1.86E-05	1.22E-04	7.94E-06	2.21E-05	0.0524	0.0033	0.0219	0.0014	0.0040
Tractors/Loaders/Backhoes	200	800	5.64E-04	8.69E-05	3.57E-04	1.34E-05	6.63E-05	0.4512	0.0696	0.2854	0.0107	0.0530
Crawler Tractor/Dozers	136.1	800	6.40E-04	5.26E-05	5.94E-04	2.11E-05	8.24E-05	0.5118	0.0420	0.4753	0.0169	0.0660
Dumpers/Tenders	109.7	365	2.21E-04	4.59E-05	2.41E-04	5.25E-06	4.02E-05	0.0805	0.0168	0.0881	0.0019	0.0147
Other Construction Equipment	15	1,825	4.39E-05	6.03E-06	5.25E-05	1.27E-06	5.18E-06	0.0801	0.0110	0.0958	0.0023	0.0095
Total								2.0491	0.2123	1.5016	0.0633	0.2451

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	7.944	2.012	11.964	0.0022	0.9589	0.2429	1.4441
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.920	3.576	20.800	0.0022	0.4732	0.4316	2.5106
Total									1.6063	0.7908	4.1821

^bAP-42, Appendix H, June 1995

Phase II
Improvement-Large Group Pavilion & Restaurant
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	600	6.91E-04	5.48E-05	2.71E-04	2.49E-05	7.02E-05	0.4146	0.0329	0.1625	0.0149	0.0421
Tampers/Rammers	4.2	400	2.32E-03	1.31E-04	9.30E-04	7.13E-05	1.53E-04	0.9266	0.0526	0.3721	0.0285	0.0612
Rollers	132.2	400	4.93E-04	4.23E-05	4.33E-04	1.62E-05	6.34E-05	0.1970	0.0169	0.1733	0.0065	0.0254
Scrapers	422.5	1,000	1.22E-03	9.40E-05	4.04E-04	4.88E-05	1.02E-04	1.2216	0.0940	0.4035	0.0488	0.1017
Paving Equipment	230.2	750	5.95E-04	4.65E-05	2.26E-04	1.86E-05	5.41E-05	0.4463	0.0349	0.1697	0.0140	0.0406
Trenchers	134.3	200	4.31E-04	4.04E-05	3.67E-04	1.30E-05	5.60E-05	0.0862	0.0081	0.0735	0.0026	0.0112
Bore/Drill Rigs	131.8	75	3.16E-04	3.31E-05	1.67E-04	7.38E-06	3.27E-05	0.0237	0.0025	0.0126	0.0006	0.0025
Excavators	137.6	300	6.68E-04	5.17E-05	6.22E-04	2.46E-05	9.13E-05	0.2003	0.0155	0.1866	0.0074	0.0274
Cement & Mortar Mixers	83.46	500	1.37E-04	1.41E-05	7.15E-05	3.10E-06	1.24E-05	0.0685	0.0071	0.0358	0.0015	0.0062
Cranes	145.2	250	5.07E-04	4.18E-05	2.83E-04	1.58E-05	4.90E-05	0.1268	0.0104	0.0708	0.0040	0.0122
Graders	140.8	1,000	5.67E-04	4.52E-05	5.17E-04	2.01E-05	7.48E-05	0.5669	0.0452	0.5171	0.0201	0.0748
Rough Terrain Forklifts	61.42	1,000	2.76E-04	1.67E-05	1.02E-04	7.59E-06	1.93E-05	0.2758	0.0167	0.1022	0.0076	0.0193
Tractors/Loaders/Backhoes	200	1,000	5.27E-04	8.01E-05	3.24E-04	1.31E-05	6.27E-05	0.5267	0.0801	0.3242	0.0131	0.0627
Crawler Tractor/Dozers	136.1	1,000	5.80E-04	4.66E-05	5.27E-04	2.04E-05	7.62E-05	0.5803	0.0466	0.5272	0.0204	0.0762
Dumpers/Tenders	109.7	800	2.10E-04	4.35E-05	2.31E-04	5.17E-06	3.81E-05	0.1680	0.0348	0.1848	0.0041	0.0305
Other Construction Equipment	15	5,000	4.34E-05	5.85E-06	5.00E-05	1.27E-06	4.67E-06	0.2172	0.0292	0.2499	0.0064	0.0233
Total								6.0465	0.5275	3.5656	0.2004	0.6173

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	25	30	273,750	7.944	2.012	11.964	0.0022	2.3971	0.6071	3.6102
Light Duty Diesel Vehicles	365	25	30	273,750	1.444	0.964	1.884	0.0022	0.4357	0.2909	0.5685
Heavy Duty Gasoline Vehicles	365	25	30	273,750	3.920	3.576	20.800	0.0022	1.1829	1.0791	6.2765
Total									4.0158	1.9771	10.4552

^bAP-42, Appendix H, June 1995

Phase I
Improvement-Trails (Soft)
Duration-30 Months (12 Months 2012 / 12 Months 2013 / 6 Months 2014)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Scrapers	246.9	548	8.72E-04	6.91E-05	3.49E-04	3.29E-05	9.30E-05	0.4775	0.0378	0.1910	0.0180	0.0509
Graders	140.8	548	5.67E-04	4.52E-05	5.17E-04	2.01E-05	7.48E-05	0.3104	0.0248	0.2831	0.0110	0.0409
Rough Terrain Forklifts	61.42	180	2.76E-04	1.67E-05	1.02E-04	7.59E-06	1.93E-05	0.0496	0.0030	0.0184	0.0014	0.0035
Tractors/Loaders/Backhoes	200	800	5.27E-04	8.01E-05	3.24E-04	1.31E-05	6.27E-05	0.4214	0.0641	0.2594	0.0105	0.0501
Crawler Tractor/Dozers	136.1	800	5.80E-04	4.66E-05	5.27E-04	2.04E-05	7.62E-05	0.4642	0.0373	0.4218	0.0163	0.0609
Dumpers/Tenders	109.7	365	2.10E-04	4.35E-05	2.31E-04	5.17E-06	3.81E-05	0.0766	0.0159	0.0843	0.0019	0.0139
Other Construction Equipment	15	1,825	4.34E-05	5.85E-06	5.00E-05	1.27E-06	4.67E-06	0.0793	0.0107	0.0912	0.0023	0.0085
Total								1.8790	0.1935	1.3492	0.0614	0.2289

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	7.944	2.012	11.964	0.0022	0.9589	0.2429	1.4441
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.920	3.576	20.800	0.0022	0.4732	0.4316	2.5106
Total									1.6063	0.7908	4.1821

^bAP-42, Appendix H, June 1995

Phase II
Improvement-Cabin Loop B
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	500	5.98E-04	5.01E-05	2.40E-04	2.41E-05	6.66E-05	0.2991	0.0250	0.1200	0.0121	0.0333
Tampers/Rammers	4.2	400	2.08E-03	1.25E-04	8.33E-04	6.97E-05	1.46E-04	0.8312	0.0499	0.3332	0.0279	0.0585
Rollers	132.2	500	4.32E-04	3.77E-05	3.89E-04	1.57E-05	5.80E-05	0.2162	0.0188	0.1946	0.0079	0.0290
Scrapers	422.5	1,200	1.04E-03	8.63E-05	3.51E-04	4.72E-05	9.69E-05	1.2455	0.1036	0.4214	0.0566	0.1163
Paving Equipment	230.2	800	5.29E-04	4.32E-05	2.04E-04	1.82E-05	5.14E-05	0.4232	0.0346	0.1636	0.0145	0.0411
Trenchers	134.3	600	3.90E-04	3.69E-05	3.37E-04	1.28E-05	5.21E-05	0.2339	0.0221	0.2022	0.0077	0.0312
Bore/Drill Rigs	131.8	540	2.96E-04	3.11E-05	1.58E-04	7.27E-06	3.11E-05	0.1600	0.0168	0.0852	0.0039	0.0168
Excavators	137.6	400	5.58E-04	4.53E-05	5.35E-04	2.37E-05	8.39E-05	0.2231	0.0181	0.2139	0.0095	0.0335
Cement & Mortar Mixers	83.46	400	1.32E-04	1.33E-05	6.77E-05	3.05E-06	1.18E-05	0.0530	0.0053	0.0271	0.0012	0.0047
Cranes	145.2	45	4.46E-04	3.74E-05	2.56E-04	1.54E-05	4.51E-05	0.0201	0.0017	0.0115	0.0007	0.0020
Graders	140.8	1,200	4.84E-04	4.00E-05	4.53E-04	1.94E-05	6.90E-05	0.5808	0.0480	0.5437	0.0233	0.0828
Rough Terrain Forklifts	61.42	400	2.61E-04	1.51E-05	8.44E-05	7.26E-06	1.67E-05	0.1045	0.0061	0.0338	0.0029	0.0067
Tractors/Loaders/Backhoes	200	1,200	4.84E-04	7.35E-05	2.93E-04	1.29E-05	5.92E-05	0.5809	0.0882	0.3518	0.0155	0.0710
Crawler Tractor/Dozers	136.1	1,200	4.97E-04	4.12E-05	4.63E-04	1.97E-05	7.03E-05	0.5964	0.0495	0.5558	0.0237	0.0843
Dumpers/Tenders	109.7	1,000	1.98E-04	4.09E-05	2.20E-04	5.10E-06	3.62E-05	0.1978	0.0409	0.2199	0.0051	0.0362
Other Construction Equipment	15	10,000	4.33E-05	5.74E-06	4.78E-05	1.27E-06	4.21E-06	0.4329	0.0574	0.4778	0.0127	0.0421
Total								6.1984	0.5860	3.9554	0.2251	0.6896

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	25	30	273,750	7.944	2.012	11.964	0.0022	2.3971	0.6071	3.6102
Light Duty Diesel Vehicles	365	25	30	273,750	1.444	0.964	1.884	0.0022	0.4357	0.2909	0.5685
Heavy Duty Gasoline Vehicles	365	25	30	273,750	3.920	3.576	20.800	0.0022	1.1829	1.0791	6.2765
Total									4.0158	1.9771	10.4552

^bAP-42, Appendix H, June 1995

Phase I

Improvement-Trails (Soft & Paved)

Duration-30 Months (12 Months 2012 / 12 Months 2013 / 6 Months 2014)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	183	5.98E-04	5.01E-05	2.40E-04	2.41E-05	6.66E-05	0.1095	0.0092	0.0439	0.0044	0.0122
Tampers/Rammers	4.2	100	2.08E-03	1.25E-04	8.33E-04	6.97E-05	1.46E-04	0.2078	0.0125	0.0833	0.0070	0.0146
Rollers	132.2	100	4.32E-04	3.77E-05	3.89E-04	1.57E-05	5.80E-05	0.0432	0.0038	0.0389	0.0016	0.0058
Scrapers	246.9	350	7.45E-04	6.28E-05	3.07E-04	3.18E-05	8.80E-05	0.2606	0.0220	0.1075	0.0111	0.0308
Paving Equipment	230.2	183	5.29E-04	4.32E-05	2.04E-04	1.82E-05	5.14E-05	0.0968	0.0079	0.0374	0.0033	0.0094
Graders	140.8	350	4.84E-04	4.00E-05	4.53E-04	1.94E-05	6.90E-05	0.1694	0.0140	0.1586	0.0068	0.0241
Rough Terrain Forklifts	61.42	95	2.61E-04	1.51E-05	8.44E-05	7.26E-06	1.67E-05	0.0248	0.0014	0.0080	0.0007	0.0016
Tractors/Loaders/Backhoes	200	450	4.84E-04	7.35E-05	2.93E-04	1.29E-05	5.92E-05	0.2178	0.0331	0.1319	0.0058	0.0266
Crawler Tractor/Dozers	136.1	450	4.97E-04	4.12E-05	4.63E-04	1.97E-05	7.03E-05	0.2237	0.0186	0.2084	0.0089	0.0316
Dumpers/Tenders	109.7	200	1.98E-04	4.09E-05	2.20E-04	5.10E-06	3.62E-05	0.0396	0.0082	0.0440	0.0010	0.0072
Other Construction Equipment	15	1,830	4.33E-05	5.74E-06	4.78E-05	1.27E-06	4.21E-06	0.0792	0.0105	0.0874	0.0023	0.0077
Total								1.4724	0.1410	0.9494	0.0529	0.1717

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	183	15	30	82,350	7.944	2.012	11.964	0.0022	0.7211	0.1826	1.0860
Light Duty Diesel Vehicles	183	15	30	82,350	1.444	0.964	1.884	0.0022	0.1311	0.0875	0.1710
Heavy Duty Gasoline Vehicles	183	15	30	82,350	3.920	3.576	20.800	0.0022	0.3558	0.3246	1.8881
Total									1.2080	0.5948	3.1452

^bAP-42, Appendix H, June 1995

Phase II
Improvement-Practice Fields
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Scrapers	246.9	2,500	6.27E-04	5.70E-05	2.67E-04	3.07E-05	8.28E-05	1.5679	0.1426	0.6687	0.0768	0.2070
Graders	140.8	2,500	4.07E-04	3.55E-05	3.92E-04	1.87E-05	6.35E-05	1.0177	0.0887	0.9797	0.0468	0.1587
Rough Terrain Forklifts	61.42	600	2.47E-04	1.37E-05	7.01E-05	6.95E-06	1.52E-05	0.1480	0.0082	0.0420	0.0042	0.0091
Tractors/Loaders/Backhoes	200	1,200	4.43E-04	6.73E-05	2.64E-04	1.27E-05	5.57E-05	0.5319	0.0807	0.3163	0.0153	0.0669
Crawler Tractor/Dozers	136.1	2,000	4.20E-04	3.66E-05	4.02E-04	1.91E-05	6.48E-05	0.8393	0.0732	0.8037	0.0381	0.1295
Dumpers/Tenders	109.7	3,000	1.86E-04	3.84E-05	2.09E-04	5.03E-06	3.43E-05	0.5584	0.1152	0.6267	0.0151	0.1030
Other Construction Equipment	15	4,000	4.32E-05	5.66E-06	4.65E-05	1.27E-06	3.95E-06	0.1726	0.0227	0.1861	0.0051	0.0158
Total								4.8358	0.5314	3.6232	0.2014	0.6900

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	20	30	219,000	6.976	2.000	11.920	0.0022	1.6840	0.4828	2.8775
Light Duty Diesel Vehicles	365	20	30	219,000	1.444	0.964	1.884	0.0022	0.3486	0.2327	0.4548
Heavy Duty Gasoline Vehicles	365	20	30	219,000	3.684	3.524	20.816	0.0022	0.8893	0.8507	5.0251
Total									2.9220	1.5662	8.3574

^bAP-42, Appendix H, June 1995

Phase II
Improvement-Prairie Restoration
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Graders	140.8	800	4.07E-04	3.55E-05	3.92E-04	1.87E-05	6.35E-05	0.3257	0.0284	0.3135	0.0150	0.0508
Tractors/Loaders/Backhoes	200	800	4.43E-04	6.73E-05	2.64E-04	1.27E-05	5.57E-05	0.3546	0.0538	0.2108	0.0102	0.0446
Dumpers/Tenders	109.7	500	1.86E-04	3.84E-05	2.09E-04	5.03E-06	3.43E-05	0.0931	0.0192	0.1045	0.0025	0.0172
Other Construction Equipment	15	800	4.32E-05	5.66E-06	4.65E-05	1.27E-06	3.95E-06	0.0345	0.0045	0.0372	0.0010	0.0032
Total								0.8079	0.1059	0.6660	0.0287	0.1157

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	6.976	2.000	11.920	0.0022	0.8420	0.2414	1.4388
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.684	3.524	20.816	0.0022	0.4447	0.4254	2.5125
Total									1.4610	0.7831	4.1787

^bAP-42, Appendix H, June 1995

Phase III
Improvement-Rustic Lodge
Duration-24 Months (12 Months 2016 / 12 Months 2017)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	1,200	4.35E-04	4.19E-05	1.85E-04	2.27E-05	5.93E-05	0.5215	0.0503	0.2215	0.0272	0.0712
Tampers/Rammers	4.2	800	1.66E-03	1.14E-04	6.67E-04	6.69E-05	1.35E-04	1.3253	0.0910	0.5332	0.0535	0.1077
Rollers	132.2	80	3.26E-04	3.04E-05	3.07E-04	1.48E-05	4.95E-05	0.0261	0.0024	0.0245	0.0012	0.0040
Scrapers	422.5	2,000	7.43E-04	7.65E-05	2.50E-04	4.42E-05	8.56E-05	1.4852	0.1529	0.4995	0.0884	0.1712
Paving Equipment	230.2	1,500	4.12E-04	3.73E-05	1.65E-04	1.73E-05	4.64E-05	0.6178	0.0560	0.2474	0.0260	0.0695
Trenchers	134.3	400	3.13E-04	3.05E-05	2.80E-04	1.22E-05	4.45E-05	0.1252	0.0122	0.1122	0.0049	0.0178
Bore/Drill Rigs	131.8	150	2.59E-04	2.73E-05	1.39E-04	7.07E-06	2.81E-05	0.0389	0.0041	0.0209	0.0011	0.0042
Excavators	137.6	600	3.72E-04	3.61E-05	3.68E-04	2.19E-05	6.63E-05	0.2234	0.0217	0.2207	0.0131	0.0398
Cement & Mortar Mixers	83.46	800	1.24E-04	1.19E-05	6.04E-05	2.97E-06	1.08E-05	0.0992	0.0095	0.0483	0.0024	0.0086
Cranes	145.2	300	3.38E-04	3.04E-05	2.04E-04	1.46E-05	3.89E-05	0.1015	0.0091	0.0611	0.0044	0.0117
Graders	140.8	2,000	3.36E-04	3.15E-05	3.32E-04	1.81E-05	5.77E-05	0.6721	0.0630	0.6647	0.0362	0.1154
Rough Terrain Forklifts	61.42	2,000	2.33E-04	1.23E-05	5.70E-05	6.66E-06	1.38E-05	0.4656	0.0247	0.1141	0.0133	0.0277
Tractors/Loaders/Backhoes	200	2,000	4.05E-04	6.15E-05	2.36E-04	1.25E-05	5.25E-05	0.8092	0.1229	0.4723	0.0250	0.1049
Crawler Tractor/Dozers	136.1	2,000	3.48E-04	3.25E-05	3.43E-04	1.84E-05	5.91E-05	0.6957	0.0650	0.6855	0.0369	0.1182
Dumpers/Tenders	109.7	1,200	1.75E-04	3.60E-05	1.98E-04	4.97E-06	3.25E-05	0.2099	0.0432	0.2377	0.0060	0.0390
Other Construction Equipment	15	15,000	4.31E-05	5.62E-06	4.58E-05	1.27E-06	3.83E-06	0.6459	0.0843	0.6877	0.0191	0.0575
Total								8.0623	0.8123	4.8515	0.3585	0.9683

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	50	30	547,500	6.976	2.000	11.920	0.0022	4.2101	1.2070	7.1938
Light Duty Diesel Vehicles	365	50	30	547,500	1.444	0.964	1.884	0.0022	0.8715	0.5818	1.1370
Heavy Duty Gasoline Vehicles	365	50	30	547,500	3.684	3.524	20.816	0.0022	2.2233	2.1268	12.5626
Total									7.3049	3.9156	20.8935

^bAP-42, Appendix H, June 1995

Phase III
Improvement-Rustic Lodge
Duration-24 Months (12 Months 2016 / 12 Months 2017)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	1,200	3.69E-04	3.94E-05	1.59E-04	2.20E-05	5.49E-05	0.4430	0.0473	0.1903	0.0264	0.0659
Tampers/Rammers	4.2	800	1.47E-03	1.09E-04	5.96E-04	6.55E-05	1.30E-04	1.1779	0.0876	0.4767	0.0524	0.1040
Rollers	132.2	80	2.78E-04	2.74E-05	2.68E-04	1.44E-05	4.57E-05	0.0223	0.0022	0.0215	0.0012	0.0037
Scrapers	422.5	2,000	6.14E-04	7.25E-05	2.02E-04	4.28E-05	7.98E-05	1.2276	0.1449	0.4046	0.0857	0.1595
Paving Equipment	230.2	1,500	3.61E-04	3.47E-05	1.47E-04	1.69E-05	4.41E-05	0.5417	0.0520	0.2206	0.0254	0.0661
Trenchers	134.3	400	2.77E-04	2.76E-05	2.54E-04	1.19E-05	4.10E-05	0.1110	0.0110	0.1016	0.0048	0.0164
Bore/Drill Rigs	131.8	150	2.42E-04	2.56E-05	1.31E-04	6.97E-06	2.66E-05	0.0363	0.0038	0.0196	0.0010	0.0040
Excavators	137.6	600	2.96E-04	3.32E-05	2.89E-04	2.11E-05	5.65E-05	0.1775	0.0199	0.1735	0.0127	0.0339
Cement & Mortar Mixers	83.46	800	1.20E-04	1.12E-05	5.70E-05	2.93E-06	1.03E-05	0.0960	0.0089	0.0456	0.0023	0.0082
Cranes	145.2	300	2.90E-04	2.75E-05	1.80E-04	1.42E-05	3.62E-05	0.0869	0.0082	0.0539	0.0043	0.0109
Graders	140.8	2,000	2.77E-04	2.89E-05	2.74E-04	1.75E-05	5.07E-05	0.5534	0.0579	0.5485	0.0350	0.1015
Rough Terrain Forklifts	61.42	2,000	2.20E-04	1.11E-05	4.51E-05	6.38E-06	1.26E-05	0.4396	0.0223	0.0901	0.0128	0.0252
Tractors/Loaders/Backhoes	200	2,000	3.71E-04	5.68E-05	2.16E-04	1.23E-05	4.97E-05	0.7417	0.1136	0.4327	0.0246	0.0993
Crawler Tractor/Dozers	136.1	2,000	2.88E-04	2.98E-05	2.85E-04	1.78E-05	5.22E-05	0.5754	0.0597	0.5695	0.0357	0.1044
Dumpers/Tenders	109.7	1,200	1.64E-04	3.36E-05	1.87E-04	4.90E-06	3.08E-05	0.1969	0.0403	0.2250	0.0059	0.0369
Other Construction Equipment	15	15,000	4.30E-05	5.59E-06	4.54E-05	1.27E-06	3.75E-06	0.6450	0.0838	0.6806	0.0191	0.0562
Total								7.0721	0.7636	4.2541	0.3492	0.8961

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	50	30	547,500	6.976	2.000	11.920	0.0022	4.2101	1.2070	7.1938
Light Duty Diesel Vehicles	365	50	30	547,500	1.444	0.964	1.884	0.0022	0.8715	0.5818	1.1370
Heavy Duty Gasoline Vehicles	365	50	30	547,500	3.684	3.524	20.816	0.0022	2.2233	2.1268	12.5626
Total									7.3049	3.9156	20.8935

^bAP-42, Appendix H, June 1995

Phase III
Improvement-Resort Entrance
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	300	3.69E-04	3.94E-05	1.59E-04	2.20E-05	5.49E-05	0.1107	0.0118	0.0476	0.0066	0.0165
Tampers/Rammers	4.2	300	1.47E-03	1.09E-04	5.96E-04	6.55E-05	1.30E-04	0.4417	0.0328	0.1788	0.0197	0.0390
Rollers	132.2	300	2.78E-04	2.74E-05	2.68E-04	1.44E-05	4.57E-05	0.0835	0.0082	0.0805	0.0043	0.0137
Scrapers	422.5	500	6.14E-04	7.25E-05	2.02E-04	4.28E-05	7.98E-05	0.3069	0.0362	0.1011	0.0214	0.0399
Paving Equipment	230.2	300	3.61E-04	3.47E-05	1.47E-04	1.69E-05	4.41E-05	0.1083	0.0104	0.0441	0.0051	0.0132
Trenchers	134.3	200	2.77E-04	2.76E-05	2.54E-04	1.19E-05	4.10E-05	0.0555	0.0055	0.0508	0.0024	0.0082
Bore/Drill Rigs	131.8	50	2.42E-04	2.56E-05	1.31E-04	6.97E-06	2.66E-05	0.0121	0.0013	0.0065	0.0003	0.0013
Excavators	137.6	100	2.96E-04	3.32E-05	2.89E-04	2.11E-05	5.65E-05	0.0296	0.0033	0.0289	0.0021	0.0057
Cement & Mortar Mixers	83.46	200	1.20E-04	1.12E-05	5.70E-05	2.93E-06	1.03E-05	0.0240	0.0022	0.0114	0.0006	0.0021
Cranes	145.2	100	2.90E-04	2.75E-05	1.80E-04	1.42E-05	3.62E-05	0.0290	0.0027	0.0180	0.0014	0.0036
Graders	140.8	300	2.77E-04	2.89E-05	2.74E-04	1.75E-05	5.07E-05	0.0830	0.0087	0.0823	0.0052	0.0152
Rough Terrain Forklifts	61.42	150	2.20E-04	1.11E-05	4.51E-05	6.38E-06	1.26E-05	0.0330	0.0017	0.0068	0.0010	0.0019
Tractors/Loaders/Backhoes	200	400	3.71E-04	5.68E-05	2.16E-04	1.23E-05	4.97E-05	0.1483	0.0227	0.0865	0.0049	0.0199
Crawler Tractor/Dozers	136.1	400	2.88E-04	2.98E-05	2.85E-04	1.78E-05	5.22E-05	0.1151	0.0119	0.1139	0.0071	0.0209
Dumpers/Tenders	109.7	500	1.64E-04	3.36E-05	1.87E-04	4.90E-06	3.08E-05	0.0821	0.0168	0.0937	0.0025	0.0154
Other Construction Equipment	15	2,000	4.30E-05	5.59E-06	4.54E-05	1.27E-06	3.75E-06	0.0860	0.0112	0.0907	0.0025	0.0075
Total								1.7488	0.1876	1.0416	0.0872	0.2239

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	20	30	219,000	6.976	2.000	11.920	0.0022	1.6840	0.4828	2.8775
Light Duty Diesel Vehicles	365	20	30	219,000	1.444	0.964	1.884	0.0022	0.3486	0.2327	0.4548
Heavy Duty Gasoline Vehicles	365	20	30	219,000	3.684	3.524	20.816	0.0022	0.8893	0.8507	5.0251
Total									2.9220	1.5662	8.3574

^bAP-42, Appendix H, June 1995

Phase III
Improvement-Swimming Area
Duration-18 Months (12 Months 2018 / 6 Months 2019)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	500	3.10E-04	3.73E-05	1.33E-04	2.14E-05	5.04E-05	0.1549	0.0186	0.0667	0.0107	0.0252
Tampers/Rammers	4.2	500	1.30E-03	1.06E-04	5.31E-04	6.42E-05	1.25E-04	0.6505	0.0529	0.2653	0.0321	0.0627
Rollers	132.2	500	2.34E-04	2.47E-05	2.31E-04	1.41E-05	4.20E-05	0.1171	0.0124	0.1157	0.0070	0.0210
Scrapers	422.5	5,000	5.00E-04	6.91E-05	1.58E-04	4.16E-05	7.42E-05	2.5007	0.3457	0.7880	0.2079	0.3708
Paving Equipment	230.2	500	3.14E-04	3.22E-05	1.30E-04	1.65E-05	4.18E-05	0.1571	0.0161	0.0651	0.0083	0.0209
Trenchers	134.3	300	2.45E-04	2.52E-05	2.28E-04	1.17E-05	3.81E-05	0.0735	0.0076	0.0685	0.0035	0.0114
Bore/Drill Rigs	131.8	100	2.25E-04	2.39E-05	1.22E-04	6.88E-06	2.52E-05	0.0225	0.0024	0.0122	0.0007	0.0025
Excavators	137.6	5,000	2.28E-04	3.11E-05	2.16E-04	2.04E-05	4.72E-05	1.1421	0.1555	1.0796	0.1020	0.2358
Cement & Mortar Mixers	83.46	300	1.16E-04	1.05E-05	5.36E-05	2.89E-06	9.78E-06	0.0349	0.0031	0.0161	0.0009	0.0029
Cranes	145.2	400	2.44E-04	2.49E-05	1.56E-04	1.39E-05	3.37E-05	0.0978	0.0099	0.0626	0.0055	0.0135
Graders	140.8	5,000	2.23E-04	2.68E-05	2.19E-04	1.69E-05	4.38E-05	1.1131	0.1341	1.0957	0.0847	0.2189
Rough Terrain Forklifts	61.42	400	2.08E-04	1.01E-05	3.42E-05	6.13E-06	1.15E-05	0.0832	0.0040	0.0137	0.0025	0.0046
Tractors/Loaders/Backhoes	200	5,000	3.39E-04	5.26E-05	1.99E-04	1.21E-05	4.70E-05	1.6952	0.2628	0.9933	0.0606	0.2350
Crawler Tractor/Dozers	136.1	5,000	2.33E-04	2.76E-05	2.29E-04	1.73E-05	4.53E-05	1.1643	0.1380	1.1468	0.0864	0.2264
Dumpers/Tenders	109.7	5,000	1.54E-04	3.13E-05	1.77E-04	4.84E-06	2.90E-05	0.7683	0.1563	0.8851	0.0242	0.1451
Other Construction Equipment	15	2,500	4.30E-05	5.57E-06	4.50E-05	1.27E-06	3.69E-06	0.1074	0.0139	0.1126	0.0032	0.0092
Total								9.8825	1.3335	6.7870	0.6401	1.6061

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	75	30	821,250	6.772	2.000	11.916	0.0022	6.1304	1.8105	10.7871
Light Duty Diesel Vehicles	365	75	30	821,250	1.444	0.964	1.884	0.0022	1.3072	0.8727	1.7055
Heavy Duty Gasoline Vehicles	365	75	30	821,250	3.588	3.460	20.812	0.0022	3.2481	3.1322	18.8404
Total									10.6857	5.8154	31.3330

^bAP-42, Appendix H, June 1995

Phase III
Improvement-Swimming Area
Duration-18 Months (12 Months 2018 / 6 Months 2019)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	250	2.57E-04	3.55E-05	1.10E-04	2.08E-05	4.57E-05	0.0643	0.0089	0.0274	0.0052	0.0114
Tampers/Rammers	4.2	250	1.14E-03	1.02E-04	4.70E-04	6.30E-05	1.21E-04	0.2851	0.0256	0.1174	0.0157	0.0303
Rollers	132.2	250	1.97E-04	2.30E-05	1.96E-04	1.37E-05	3.76E-05	0.0492	0.0058	0.0489	0.0034	0.0094
Scrapers	422.5	2,500	3.99E-04	6.63E-05	1.17E-04	4.05E-05	6.90E-05	0.9965	0.1659	0.2935	0.1011	0.1725
Paving Equipment	230.2	250	2.71E-04	3.00E-05	1.14E-04	1.62E-05	3.96E-05	0.0677	0.0075	0.0286	0.0040	0.0099
Trenchers	134.3	150	2.14E-04	2.31E-05	2.04E-04	1.14E-05	3.55E-05	0.0322	0.0035	0.0306	0.0017	0.0053
Bore/Drill Rigs	131.8	50	2.09E-04	2.22E-05	1.14E-04	6.78E-06	2.38E-05	0.0105	0.0011	0.0057	0.0003	0.0012
Excavators	137.6	2,500	1.70E-04	2.95E-05	1.54E-04	1.98E-05	3.92E-05	0.4246	0.0737	0.3854	0.0495	0.0980
Cement & Mortar Mixers	83.46	150	1.13E-04	9.82E-06	5.04E-05	2.86E-06	9.30E-06	0.0169	0.0015	0.0076	0.0004	0.0014
Cranes	145.2	200	2.06E-04	2.30E-05	1.34E-04	1.35E-05	3.11E-05	0.0412	0.0046	0.0268	0.0027	0.0062
Graders	140.8	2,500	1.75E-04	2.52E-05	1.68E-04	1.64E-05	3.72E-05	0.4369	0.0631	0.4197	0.0411	0.0930
Rough Terrain Forklifts	61.42	200	1.98E-04	9.15E-06	2.50E-05	5.91E-06	1.05E-05	0.0395	0.0018	0.0050	0.0012	0.0021
Tractors/Loaders/Backhoes	200	2,500	3.09E-04	4.86E-05	1.82E-04	1.19E-05	4.44E-05	0.7721	0.1214	0.4558	0.0298	0.1111
Crawler Tractor/Dozers	136.1	2,500	1.84E-04	2.60E-05	1.77E-04	1.68E-05	3.86E-05	0.4605	0.0649	0.4437	0.0419	0.0966
Dumpers/Tenders	109.7	2,500	1.44E-04	2.90E-05	1.67E-04	4.78E-06	2.73E-05	0.3590	0.0725	0.4170	0.0119	0.0683
Other Construction Equipment	15	1,500	4.30E-05	5.57E-06	4.48E-05	1.27E-06	3.65E-06	0.0645	0.0083	0.0672	0.0019	0.0055
Total								4.1206	0.6301	2.7803	0.3121	0.7223

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	183	75	30	411,750	6.772	2.000	11.916	0.0022	3.0736	0.9077	5.4083
Light Duty Diesel Vehicles	183	75	30	411,750	1.444	0.964	1.884	0.0022	0.6554	0.4375	0.8551
Heavy Duty Gasoline Vehicles	183	75	30	411,750	3.588	3.460	20.812	0.0022	1.6285	1.5704	9.4460
Total									5.3575	2.9157	15.7094

^bAP-42, Appendix H, June 1995

Phase III
Improvement-Boat Dock
Duration-9 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	50	2.09E-04	3.40E-05	8.70E-05	2.03E-05	4.12E-05	0.0105	0.0017	0.0043	0.0010	0.0021
Tampers/Rammers	4.2	50	9.92E-04	9.94E-05	4.12E-04	6.18E-05	1.17E-04	0.0496	0.0050	0.0206	0.0031	0.0058
Rollers	132.2	50	1.63E-04	2.16E-05	1.62E-04	1.34E-05	3.33E-05	0.0081	0.0011	0.0081	0.0007	0.0017
Scrapers	422.5	250	3.26E-04	6.49E-05	9.93E-05	3.99E-05	6.67E-05	0.0816	0.0162	0.0248	0.0100	0.0167
Paving Equipment	230.2	50	2.34E-04	2.84E-05	9.94E-05	1.58E-05	3.71E-05	0.0117	0.0014	0.0050	0.0008	0.0019
Trenchers	134.3	100	1.86E-04	2.11E-05	1.81E-04	1.12E-05	3.29E-05	0.0186	0.0021	0.0181	0.0011	0.0033
Bore/Drill Rigs	131.8	300	1.94E-04	2.06E-05	1.06E-04	6.70E-06	2.24E-05	0.0581	0.0062	0.0318	0.0020	0.0067
Excavators	137.6	500	1.30E-04	2.87E-05	1.30E-04	1.96E-05	3.62E-05	0.0651	0.0143	0.0651	0.0098	0.0181
Cement & Mortar Mixers	83.46	250	1.09E-04	9.19E-06	4.73E-05	2.82E-06	8.83E-06	0.0273	0.0023	0.0118	0.0007	0.0022
Cranes	145.2	500	1.72E-04	2.16E-05	1.13E-04	1.32E-05	2.84E-05	0.0861	0.0108	0.0563	0.0066	0.0142
Graders	140.8	100	1.33E-04	2.40E-05	1.25E-04	1.60E-05	3.16E-05	0.0133	0.0024	0.0125	0.0016	0.0032
Rough Terrain Forklifts	61.42	100	1.94E-04	8.80E-06	2.14E-05	5.83E-06	1.02E-05	0.0194	0.0009	0.0021	0.0006	0.0010
Tractors/Loaders/Backhoes	200	500	2.80E-04	4.48E-05	1.67E-04	1.17E-05	4.20E-05	0.1400	0.0224	0.0835	0.0059	0.0210
Crawler Tractor/Dozers	136.1	200	1.41E-04	2.46E-05	1.32E-04	1.63E-05	3.28E-05	0.0282	0.0049	0.0264	0.0033	0.0066
Dumpers/Tenders	109.7	250	1.34E-04	2.68E-05	1.57E-04	4.72E-06	2.57E-05	0.0335	0.0067	0.0392	0.0012	0.0064
Other Construction Equipment	15	2,000	4.30E-05	5.56E-06	4.47E-05	1.27E-06	3.63E-06	0.0860	0.0111	0.0894	0.0025	0.0073
Total								0.7371	0.1096	0.4991	0.0508	0.1181

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	6.636	2.000	11.908	0.0022	0.8010	0.2414	1.4373
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.532	3.420	20.808	0.0022	0.4263	0.4128	2.5116
Total									1.4016	0.7706	4.1763

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Group Lodging
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	500	1.67E-04	3.27E-05	6.67E-05	1.98E-05	3.70E-05	0.0833	0.0163	0.0333	0.0099	0.0185
Tampers/Rammers	4.2	400	8.68E-04	9.69E-05	3.59E-04	6.06E-05	1.12E-04	0.3471	0.0388	0.1434	0.0242	0.0449
Rollers	132.2	500	1.32E-04	2.05E-05	1.30E-04	1.30E-05	2.91E-05	0.0662	0.0102	0.0649	0.0065	0.0146
Scrapers	422.5	1,200	2.66E-04	6.39E-05	8.67E-05	3.96E-05	6.51E-05	0.3191	0.0767	0.1040	0.0475	0.0781
Paving Equipment	230.2	800	2.01E-04	2.72E-05	8.53E-05	1.55E-05	3.45E-05	0.1607	0.0217	0.0683	0.0124	0.0276
Trenchers	134.3	600	1.59E-04	1.94E-05	1.58E-04	1.10E-05	3.05E-05	0.0955	0.0117	0.0949	0.0066	0.0183
Bore/Drill Rigs	131.8	540	1.79E-04	1.92E-05	9.85E-05	6.61E-06	2.12E-05	0.0965	0.0104	0.0532	0.0036	0.0114
Excavators	137.6	400	9.91E-05	2.82E-05	1.13E-04	1.94E-05	3.41E-05	0.0396	0.0113	0.0453	0.0078	0.0136
Cement & Mortar Mixers	83.46	400	1.06E-04	8.58E-06	4.43E-05	2.78E-06	8.37E-06	0.0423	0.0034	0.0177	0.0011	0.0033
Cranes	145.2	45	1.42E-04	2.05E-05	9.22E-05	1.29E-05	2.59E-05	0.0064	0.0009	0.0042	0.0006	0.0012
Graders	140.8	1,200	1.05E-04	2.34E-05	1.07E-04	1.58E-05	2.94E-05	0.1256	0.0281	0.1282	0.0190	0.0353
Rough Terrain Forklifts	61.42	400	1.91E-04	8.56E-06	1.91E-05	5.77E-06	9.97E-06	0.0764	0.0034	0.0076	0.0023	0.0040
Tractors/Loaders/Backhoes	200	1,200	2.53E-04	4.13E-05	1.53E-04	1.16E-05	3.96E-05	0.3031	0.0495	0.1834	0.0139	0.0475
Crawler Tractor/Dozers	136.1	1,200	1.11E-04	2.39E-05	1.13E-04	1.61E-05	3.04E-05	0.1337	0.0287	0.1354	0.0194	0.0365
Dumpers/Tenders	109.7	1,000	1.24E-04	2.47E-05	1.47E-04	4.66E-06	2.41E-05	0.1245	0.0247	0.1471	0.0047	0.0241
Other Construction Equipment	15	10,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.62E-06	0.4300	0.0556	0.4463	0.0127	0.0362
Total								2.4502	0.3915	1.6772	0.1921	0.4151

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	20	30	219,000	6.636	2.000	11.908	0.0022	1.6020	0.4828	2.8746
Light Duty Diesel Vehicles	365	20	30	219,000	1.444	0.964	1.884	0.0022	0.3486	0.2327	0.4548
Heavy Duty Gasoline Vehicles	365	20	30	219,000	3.532	3.420	20.808	0.0022	0.8526	0.8256	5.0231
Total									2.8032	1.5411	8.3526

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Large Group Pavilion
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	360	1.67E-04	3.27E-05	6.67E-05	1.98E-05	3.70E-05	0.0600	0.0118	0.0240	0.0071	0.0133
Tampers/Rammers	4.2	200	8.68E-04	9.69E-05	3.59E-04	6.06E-05	1.12E-04	0.1736	0.0194	0.0717	0.0121	0.0224
Rollers	132.2	200	1.32E-04	2.05E-05	1.30E-04	1.30E-05	2.91E-05	0.0265	0.0041	0.0260	0.0026	0.0058
Scrapers	422.5	500	2.66E-04	6.39E-05	8.67E-05	3.96E-05	6.51E-05	0.1330	0.0319	0.0433	0.0198	0.0325
Paving Equipment	230.2	360	2.01E-04	2.72E-05	8.53E-05	1.55E-05	3.45E-05	0.0723	0.0098	0.0307	0.0056	0.0124
Trenchers	134.3	150	1.59E-04	1.94E-05	1.58E-04	1.10E-05	3.05E-05	0.0239	0.0029	0.0237	0.0016	0.0046
Bore/Drill Rigs	131.8	50	1.79E-04	1.92E-05	9.85E-05	6.61E-06	2.12E-05	0.0089	0.0010	0.0049	0.0003	0.0011
Excavators	137.6	200	9.91E-05	2.82E-05	1.13E-04	1.94E-05	3.41E-05	0.0198	0.0056	0.0227	0.0039	0.0068
Cement & Mortar Mixers	83.46	300	1.06E-04	8.58E-06	4.43E-05	2.78E-06	8.37E-06	0.0318	0.0026	0.0133	0.0008	0.0025
Cranes	145.2	180	1.42E-04	2.05E-05	9.22E-05	1.29E-05	2.59E-05	0.0256	0.0037	0.0166	0.0023	0.0047
Graders	140.8	500	1.05E-04	2.34E-05	1.07E-04	1.58E-05	2.94E-05	0.0523	0.0117	0.0534	0.0079	0.0147
Rough Terrain Forklifts	61.42	200	1.91E-04	8.56E-06	1.91E-05	5.77E-06	9.97E-06	0.0382	0.0017	0.0038	0.0012	0.0020
Tractors/Loaders/Backhoes	200	500	2.53E-04	4.13E-05	1.53E-04	1.16E-05	3.96E-05	0.1263	0.0206	0.0764	0.0058	0.0198
Crawler Tractor/Dozers	136.1	500	1.11E-04	2.39E-05	1.13E-04	1.61E-05	3.04E-05	0.0557	0.0120	0.0564	0.0081	0.0152
Dumpers/Tenders	109.7	600	1.24E-04	2.47E-05	1.47E-04	4.66E-06	2.41E-05	0.0747	0.0148	0.0883	0.0028	0.0145
Other Construction Equipment	15	3,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.62E-06	0.1290	0.0167	0.1339	0.0038	0.0109
Total								1.0515	0.1703	0.6891	0.0858	0.1832

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	20	30	219,000	6.636	2.000	11.908	0.0022	1.6020	0.4828	2.8746
Light Duty Diesel Vehicles	365	20	30	219,000	1.444	0.964	1.884	0.0022	0.3486	0.2327	0.4548
Heavy Duty Gasoline Vehicles	365	20	30	219,000	3.532	3.420	20.808	0.0022	0.8526	0.8256	5.0231
Total									2.8032	1.5411	8.3526

^bAP-42, Appendix H, June 1995

Phase IV

Improvement-Trails (Soft)

Duration-30 Months (12 Months 2021 / 12 Months 2022 / 6 Months 2023)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Scrapers	246.9	548	1.84E-04	4.23E-05	7.61E-05	2.60E-05	4.67E-05	0.1006	0.0232	0.0417	0.0142	0.0256
Graders	140.8	548	1.05E-04	2.34E-05	1.07E-04	1.58E-05	2.94E-05	0.0573	0.0128	0.0585	0.0087	0.0161
Rough Terrain Forklifts	61.42	180	1.91E-04	8.56E-06	1.91E-05	5.77E-06	9.97E-06	0.0344	0.0015	0.0034	0.0010	0.0018
Tractors/Loaders/Backhoes	200	800	2.53E-04	4.13E-05	1.53E-04	1.16E-05	3.96E-05	0.2020	0.0330	0.1222	0.0093	0.0317
Crawler Tractor/Dozers	136.1	800	1.11E-04	2.39E-05	1.13E-04	1.61E-05	3.04E-05	0.0891	0.0191	0.0902	0.0129	0.0243
Dumpers/Tenders	109.7	365	1.24E-04	2.47E-05	1.47E-04	4.66E-06	2.41E-05	0.0454	0.0090	0.0537	0.0017	0.0088
Other Construction Equipment	15	1,825	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.62E-06	0.0785	0.0102	0.0814	0.0023	0.0066
Total								0.6073	0.1088	0.4512	0.0502	0.1149

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	6.636	2.000	11.908	0.0022	0.8010	0.2414	1.4373
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.532	3.420	20.808	0.0022	0.4263	0.4128	2.5116
Total									1.4016	0.7706	4.1763

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Cabin Loop A
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	500	1.37E-04	3.19E-05	5.73E-05	1.96E-05	3.51E-05	0.0683	0.0160	0.0286	0.0098	0.0175
Tampers/Rammers	4.2	400	7.57E-04	9.47E-05	3.08E-04	5.95E-05	1.08E-04	0.3030	0.0379	0.1234	0.0238	0.0430
Rollers	132.2	500	1.05E-04	1.95E-05	1.02E-04	1.28E-05	2.55E-05	0.0527	0.0098	0.0510	0.0064	0.0127
Scrapers	422.5	1,200	2.15E-04	6.32E-05	7.72E-05	3.93E-05	6.39E-05	0.2579	0.0758	0.0926	0.0472	0.0767
Paving Equipment	230.2	800	1.71E-04	2.61E-05	7.22E-05	1.52E-05	3.20E-05	0.1371	0.0209	0.0577	0.0121	0.0256
Trenchers	134.3	600	1.37E-04	1.83E-05	1.36E-04	1.07E-05	2.77E-05	0.0819	0.0110	0.0818	0.0064	0.0166
Bore/Drill Rigs	131.8	540	1.65E-04	1.80E-05	9.20E-05	6.53E-06	2.01E-05	0.0892	0.0097	0.0497	0.0035	0.0108
Excavators	137.6	400	8.44E-05	2.79E-05	1.01E-04	1.93E-05	3.25E-05	0.0338	0.0111	0.0404	0.0077	0.0130
Cement & Mortar Mixers	83.46	400	1.03E-04	8.00E-06	4.14E-05	2.75E-06	7.93E-06	0.0411	0.0032	0.0166	0.0011	0.0032
Cranes	145.2	45	1.15E-04	1.96E-05	7.35E-05	1.26E-05	2.36E-05	0.0052	0.0009	0.0033	0.0006	0.0011
Graders	140.8	1,200	8.20E-05	2.29E-05	9.42E-05	1.57E-05	2.79E-05	0.0984	0.0275	0.1131	0.0189	0.0335
Rough Terrain Forklifts	61.42	400	1.89E-04	8.40E-06	1.76E-05	5.74E-06	9.83E-06	0.0757	0.0034	0.0070	0.0023	0.0039
Tractors/Loaders/Backhoes	200	1,200	2.27E-04	3.79E-05	1.39E-04	1.14E-05	3.73E-05	0.2720	0.0455	0.1673	0.0137	0.0448
Crawler Tractor/Dozers	136.1	1,200	8.72E-05	2.34E-05	9.90E-05	1.60E-05	2.87E-05	0.1046	0.0281	0.1188	0.0192	0.0344
Dumpers/Tenders	109.7	1,000	1.15E-04	2.27E-05	1.38E-04	4.61E-06	2.26E-05	0.1154	0.0227	0.1377	0.0046	0.0226
Other Construction Equipment	15	10,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.62E-06	0.4300	0.0556	0.4463	0.0127	0.0362
Total								2.1661	0.3791	1.5353	0.1900	0.3956

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	20	30	219,000	6.636	2.000	11.908	0.0022	1.6020	0.4828	2.8746
Light Duty Diesel Vehicles	365	20	30	219,000	1.444	0.964	1.884	0.0022	0.3486	0.2327	0.4548
Heavy Duty Gasoline Vehicles	365	20	30	219,000	3.532	3.420	20.808	0.0022	0.8526	0.8256	5.0231
Total									2.8032	1.5411	8.3526

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Support Restaurant
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	360	1.37E-04	3.19E-05	5.73E-05	1.96E-05	3.51E-05	0.0491	0.0115	0.0206	0.0070	0.0126
Tampers/Rammers	4.2	200	7.57E-04	9.47E-05	3.08E-04	5.95E-05	1.08E-04	0.1515	0.0189	0.0617	0.0119	0.0215
Rollers	132.2	200	1.05E-04	1.95E-05	1.02E-04	1.28E-05	2.55E-05	0.0211	0.0039	0.0204	0.0026	0.0051
Scrapers	422.5	500	2.15E-04	6.32E-05	7.72E-05	3.93E-05	6.39E-05	0.1075	0.0316	0.0386	0.0197	0.0319
Paving Equipment	230.2	360	1.71E-04	2.61E-05	7.22E-05	1.52E-05	3.20E-05	0.0617	0.0094	0.0260	0.0055	0.0115
Trenchers	134.3	150	1.37E-04	1.83E-05	1.36E-04	1.07E-05	2.77E-05	0.0205	0.0027	0.0204	0.0016	0.0042
Bore/Drill Rigs	131.8	50	1.65E-04	1.80E-05	9.20E-05	6.53E-06	2.01E-05	0.0083	0.0009	0.0046	0.0003	0.0010
Excavators	137.6	200	8.44E-05	2.79E-05	1.01E-04	1.93E-05	3.25E-05	0.0169	0.0056	0.0202	0.0039	0.0065
Cement & Mortar Mixers	83.46	300	1.03E-04	8.00E-06	4.14E-05	2.75E-06	7.93E-06	0.0308	0.0024	0.0124	0.0008	0.0024
Cranes	145.2	180	1.15E-04	1.96E-05	7.35E-05	1.26E-05	2.36E-05	0.0207	0.0035	0.0132	0.0023	0.0042
Graders	140.8	500	8.20E-05	2.29E-05	9.42E-05	1.57E-05	2.79E-05	0.0410	0.0115	0.0471	0.0079	0.0139
Rough Terrain Forklifts	61.42	200	1.89E-04	8.40E-06	1.76E-05	5.74E-06	9.83E-06	0.0379	0.0017	0.0035	0.0011	0.0020
Tractors/Loaders/Backhoes	200	500	2.27E-04	3.79E-05	1.39E-04	1.14E-05	3.73E-05	0.1133	0.0190	0.0697	0.0057	0.0187
Crawler Tractor/Dozers	136.1	500	8.72E-05	2.34E-05	9.90E-05	1.60E-05	2.87E-05	0.0436	0.0117	0.0495	0.0080	0.0143
Dumpers/Tenders	109.7	600	1.15E-04	2.27E-05	1.38E-04	4.61E-06	2.26E-05	0.0692	0.0136	0.0826	0.0028	0.0135
Other Construction Equipment	15	3,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.62E-06	0.1290	0.0167	0.1339	0.0038	0.0109
Total								0.9220	0.1646	0.6245	0.0848	0.1743

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	20	30	219,000	6.636	2.000	11.908	0.0022	1.6020	0.4828	2.8746
Light Duty Diesel Vehicles	365	20	30	219,000	1.444	0.964	1.884	0.0022	0.3486	0.2327	0.4548
Heavy Duty Gasoline Vehicles	365	20	30	219,000	3.532	3.420	20.808	0.0022	0.8526	0.8256	5.0231
Total									2.8032	1.5411	8.3526

^bAP-42, Appendix H, June 1995

Phase IV

Improvement-Trails (Soft)

Duration-30 Months (12 Months 2021 / 12 Months 2022 / 6 Months 2023)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Scrapers	246.9	548	1.48E-04	4.16E-05	6.65E-05	2.58E-05	4.48E-05	0.0808	0.0228	0.0364	0.0141	0.0245
Graders	140.8	548	8.20E-05	2.29E-05	9.42E-05	1.57E-05	2.79E-05	0.0449	0.0126	0.0516	0.0086	0.0153
Rough Terrain Forklifts	61.42	180	1.89E-04	8.40E-06	1.76E-05	5.74E-06	9.83E-06	0.0341	0.0015	0.0032	0.0010	0.0018
Tractors/Loaders/Backhoes	200	800	2.27E-04	3.79E-05	1.39E-04	1.14E-05	3.73E-05	0.1813	0.0303	0.1115	0.0091	0.0299
Crawler Tractor/Dozers	136.1	800	8.72E-05	2.34E-05	9.90E-05	1.60E-05	2.87E-05	0.0697	0.0187	0.0792	0.0128	0.0230
Dumpers/Tenders	109.7	365	1.15E-04	2.27E-05	1.38E-04	4.61E-06	2.26E-05	0.0421	0.0083	0.0503	0.0017	0.0082
Other Construction Equipment	15	1,825	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.62E-06	0.0785	0.0102	0.0815	0.0023	0.0066
Total								0.5314	0.1044	0.4136	0.0497	0.1092

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	6.636	2.000	11.908	0.0022	0.8010	0.2414	1.4373
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.532	3.420	20.808	0.0022	0.4263	0.4128	2.5116
Total									1.4016	0.7706	4.1763

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Adventure Sports Area
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	200	1.12E-04	3.14E-05	5.07E-05	1.94E-05	3.38E-05	0.0224	0.0063	0.0101	0.0039	0.0068
Tampers/Rammers	4.2	200	6.57E-04	9.29E-05	2.62E-04	5.85E-05	1.03E-04	0.1313	0.0186	0.0525	0.0117	0.0206
Rollers	132.2	200	8.61E-05	1.90E-05	8.94E-05	1.26E-05	2.39E-05	0.0172	0.0038	0.0179	0.0025	0.0048
Scrapers	422.5	1,200	1.89E-04	6.27E-05	6.98E-05	3.91E-05	6.30E-05	0.2263	0.0753	0.0838	0.0470	0.0756
Paving Equipment	230.2	200	1.45E-04	2.52E-05	6.00E-05	1.49E-05	2.95E-05	0.0289	0.0050	0.0120	0.0030	0.0059
Trenchers	134.3	150	1.16E-04	1.73E-05	1.16E-04	1.05E-05	2.50E-05	0.0174	0.0026	0.0174	0.0016	0.0037
Bore/Drill Rigs	131.8	150	1.52E-04	1.70E-05	8.59E-05	6.44E-06	1.91E-05	0.0228	0.0025	0.0129	0.0010	0.0029
Excavators	137.6	300	7.45E-05	2.77E-05	9.23E-05	1.92E-05	3.13E-05	0.0223	0.0083	0.0277	0.0058	0.0094
Cement & Mortar Mixers	83.46	300	9.98E-05	7.51E-06	3.87E-05	2.72E-06	7.54E-06	0.0299	0.0023	0.0116	0.0008	0.0023
Cranes	145.2	500	9.39E-05	1.90E-05	6.27E-05	1.24E-05	2.22E-05	0.0470	0.0095	0.0313	0.0062	0.0111
Graders	140.8	1,200	7.05E-05	2.26E-05	8.46E-05	1.56E-05	2.67E-05	0.0846	0.0272	0.1015	0.0188	0.0320
Rough Terrain Forklifts	61.42	500	1.88E-04	8.29E-06	1.65E-05	5.71E-06	9.73E-06	0.0940	0.0041	0.0083	0.0029	0.0049
Tractors/Loaders/Backhoes	200	800	2.04E-04	3.48E-05	1.27E-04	1.12E-05	3.53E-05	0.1628	0.0278	0.1014	0.0090	0.0282
Crawler Tractor/Dozers	136.1	800	7.47E-05	2.31E-05	8.87E-05	1.59E-05	2.74E-05	0.0597	0.0185	0.0710	0.0127	0.0219
Dumpers/Tenders	109.7	800	1.07E-04	2.09E-05	1.29E-04	4.55E-06	2.12E-05	0.0855	0.0168	0.1033	0.0036	0.0169
Other Construction Equipment	15	5,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.2150	0.0278	0.2232	0.0064	0.0181
Total								1.2674	0.2563	0.8859	0.1367	0.2651

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	6.636	2.000	11.908	0.0022	0.8010	0.2414	1.4373
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.532	3.420	20.808	0.0022	0.4263	0.4128	2.5116
Total									1.4016	0.7706	4.1763

^bAP-42, Appendix H, June 1995

Phase IV

Improvement-Trails (Soft & Paved)

Duration-30 Months (12 Months 2021 / 12 Months 2022 / 6 Months 2023)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	183	1.12E-04	3.14E-05	5.07E-05	1.94E-05	3.38E-05	0.0205	0.0057	0.0093	0.0036	0.0062
Tampers/Rammers	4.2	100	6.57E-04	9.29E-05	2.62E-04	5.85E-05	1.03E-04	0.0657	0.0093	0.0262	0.0058	0.0103
Rollers	132.2	100	8.61E-05	1.90E-05	8.94E-05	1.26E-05	2.39E-05	0.0086	0.0019	0.0089	0.0013	0.0024
Scrapers	246.9	350	1.28E-04	4.11E-05	5.92E-05	2.56E-05	4.33E-05	0.0449	0.0144	0.0207	0.0090	0.0151
Paving Equipment	230.2	183	1.45E-04	2.52E-05	6.00E-05	1.49E-05	2.95E-05	0.0265	0.0046	0.0110	0.0027	0.0054
Graders	140.8	350	7.05E-05	2.26E-05	8.46E-05	1.56E-05	2.67E-05	0.0247	0.0079	0.0296	0.0055	0.0093
Rough Terrain Forklifts	61.42	95	1.88E-04	8.29E-06	1.65E-05	5.71E-06	9.73E-06	0.0179	0.0008	0.0016	0.0005	0.0009
Tractors/Loaders/Backhoes	200	450	2.04E-04	3.48E-05	1.27E-04	1.12E-05	3.53E-05	0.0916	0.0156	0.0570	0.0051	0.0159
Crawler Tractor/Dozers	136.1	450	7.47E-05	2.31E-05	8.87E-05	1.59E-05	2.74E-05	0.0336	0.0104	0.0399	0.0072	0.0123
Dumpers/Tenders	109.7	200	1.07E-04	2.09E-05	1.29E-04	4.55E-06	2.12E-05	0.0214	0.0042	0.0258	0.0009	0.0042
Other Construction Equipment	15	1,830	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.0787	0.0102	0.0817	0.0023	0.0066
Total								0.4339	0.0851	0.3118	0.0438	0.0888

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	183	15	30	82,350	6.636	2.000	11.908	0.0022	0.6024	0.1815	1.0809
Light Duty Diesel Vehicles	183	15	30	82,350	1.444	0.964	1.884	0.0022	0.1311	0.0875	0.1710
Heavy Duty Gasoline Vehicles	183	15	30	82,350	3.532	3.420	20.808	0.0022	0.3206	0.3104	1.8888
Total									1.0541	0.5795	3.1408

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Equestrian Area
Duration-24 Months (12 Months 2023 / 12 Months 2024)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	183	1.12E-04	3.14E-05	5.07E-05	1.94E-05	3.38E-05	0.0205	0.0057	0.0093	0.0036	0.0062
Tampers/Rammers	4.2	100	6.57E-04	9.29E-05	2.62E-04	5.85E-05	1.03E-04	0.0657	0.0093	0.0262	0.0058	0.0103
Rollers	132.2	100	8.61E-05	1.90E-05	8.94E-05	1.26E-05	2.39E-05	0.0086	0.0019	0.0089	0.0013	0.0024
Scrapers	246.9	350	1.28E-04	4.11E-05	5.92E-05	2.56E-05	4.33E-05	0.0449	0.0144	0.0207	0.0090	0.0151
Paving Equipment	230.2	183	1.45E-04	2.52E-05	6.00E-05	1.49E-05	2.95E-05	0.0265	0.0046	0.0110	0.0027	0.0054
Graders	140.8	350	7.05E-05	2.26E-05	8.46E-05	1.56E-05	2.67E-05	0.0247	0.0079	0.0296	0.0055	0.0093
Rough Terrain Forklifts	61.42	95	1.88E-04	8.29E-06	1.65E-05	5.71E-06	9.73E-06	0.0179	0.0008	0.0016	0.0005	0.0009
Tractors/Loaders/Backhoes	200	450	2.04E-04	3.48E-05	1.27E-04	1.12E-05	3.53E-05	0.0916	0.0156	0.0570	0.0051	0.0159
Crawler Tractor/Dozers	136.1	450	7.47E-05	2.31E-05	8.87E-05	1.59E-05	2.74E-05	0.0336	0.0104	0.0399	0.0072	0.0123
Dumpers/Tenders	109.7	200	1.07E-04	2.09E-05	1.29E-04	4.55E-06	2.12E-05	0.0214	0.0042	0.0258	0.0009	0.0042
Other Construction Equipment	15	1,830	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.0787	0.0102	0.0817	0.0023	0.0066
Total								0.4339	0.0851	0.3118	0.0438	0.0888

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	183	10	30	54,900	6.636	2.000	11.908	0.0022	0.4016	0.1210	0.7206
Light Duty Diesel Vehicles	183	10	30	54,900	1.444	0.964	1.884	0.0022	0.0874	0.0583	0.1140
Heavy Duty Gasoline Vehicles	183	10	30	54,900	3.532	3.420	20.808	0.0022	0.2137	0.2070	1.2592
Total									0.7027	0.3863	2.0939

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Amphitheater
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	360	9.80E-05	3.10E-05	4.55E-05	1.93E-05	3.27E-05	0.0353	0.0112	0.0164	0.0069	0.0118
Tampers/Rammers	4.2	200	5.64E-04	9.13E-05	2.20E-04	5.75E-05	9.88E-05	0.1129	0.0183	0.0440	0.0115	0.0198
Rollers	132.2	200	7.04E-05	1.86E-05	8.01E-05	1.26E-05	2.27E-05	0.0141	0.0037	0.0160	0.0025	0.0045
Scrapers	422.5	500	1.70E-04	6.24E-05	6.44E-05	3.90E-05	6.23E-05	0.0851	0.0312	0.0322	0.0195	0.0311
Paving Equipment	230.2	360	1.20E-04	2.44E-05	4.89E-05	1.46E-05	2.72E-05	0.0433	0.0088	0.0176	0.0053	0.0098
Trenchers	134.3	150	9.73E-05	1.65E-05	9.67E-05	1.04E-05	2.24E-05	0.0146	0.0025	0.0145	0.0016	0.0034
Bore/Drill Rigs	131.8	50	1.40E-04	1.60E-05	8.01E-05	6.36E-06	1.81E-05	0.0070	0.0008	0.0040	0.0003	0.0009
Excavators	137.6	200	6.75E-05	2.76E-05	8.64E-05	1.91E-05	3.05E-05	0.0135	0.0055	0.0173	0.0038	0.0061
Cement & Mortar Mixers	83.46	300	9.72E-05	7.09E-06	3.63E-05	2.68E-06	7.20E-06	0.0292	0.0021	0.0109	0.0008	0.0022
Cranes	145.2	180	7.70E-05	1.85E-05	5.59E-05	1.23E-05	2.14E-05	0.0139	0.0033	0.0101	0.0022	0.0038
Graders	140.8	500	6.25E-05	2.25E-05	7.75E-05	1.56E-05	2.57E-05	0.0313	0.0112	0.0387	0.0078	0.0129
Rough Terrain Forklifts	61.42	200	1.87E-04	8.22E-06	1.59E-05	5.70E-06	9.68E-06	0.0375	0.0016	0.0032	0.0011	0.0019
Tractors/Loaders/Backhoes	200	500	1.82E-04	3.18E-05	1.15E-04	1.11E-05	3.33E-05	0.0910	0.0159	0.0574	0.0055	0.0167
Crawler Tractor/Dozers	136.1	500	6.57E-05	2.28E-05	8.08E-05	1.58E-05	2.64E-05	0.0328	0.0114	0.0404	0.0079	0.0132
Dumpers/Tenders	109.7	600	9.90E-05	1.94E-05	1.21E-04	4.50E-06	1.99E-05	0.0594	0.0117	0.0729	0.0027	0.0120
Other Construction Equipment	15	3,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.1290	0.0167	0.1339	0.0038	0.0109
Total								0.7497	0.1559	0.5295	0.0833	0.1609

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	20	30	219,000	6.636	2.000	11.908	0.0022	1.6020	0.4828	2.8746
Light Duty Diesel Vehicles	365	20	30	219,000	1.444	0.964	1.884	0.0022	0.3486	0.2327	0.4548
Heavy Duty Gasoline Vehicles	365	20	30	219,000	3.532	3.420	20.808	0.0022	0.8526	0.8256	5.0231
Total									2.8032	1.5411	8.3526

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Equestrian Area
Duration-24 Months (12 Months 2023 / 12 Months 2024)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	360	9.80E-05	3.10E-05	4.55E-05	1.93E-05	3.27E-05	0.0353	0.0112	0.0164	0.0069	0.0118
Tampers/Rammers	4.2	200	5.64E-04	9.13E-05	2.20E-04	5.75E-05	9.88E-05	0.1129	0.0183	0.0440	0.0115	0.0198
Rollers	132.2	200	7.04E-05	1.86E-05	8.01E-05	1.26E-05	2.27E-05	0.0141	0.0037	0.0160	0.0025	0.0045
Scrapers	422.5	500	1.70E-04	6.24E-05	6.44E-05	3.90E-05	6.23E-05	0.0851	0.0312	0.0322	0.0195	0.0311
Paving Equipment	230.2	360	1.20E-04	2.44E-05	4.89E-05	1.46E-05	2.72E-05	0.0433	0.0088	0.0176	0.0053	0.0098
Trenchers	134.3	150	9.73E-05	1.65E-05	9.67E-05	1.04E-05	2.24E-05	0.0146	0.0025	0.0145	0.0016	0.0034
Bore/Drill Rigs	131.8	50	1.40E-04	1.60E-05	8.01E-05	6.36E-06	1.81E-05	0.0070	0.0008	0.0040	0.0003	0.0009
Excavators	137.6	200	6.75E-05	2.76E-05	8.64E-05	1.91E-05	3.05E-05	0.0135	0.0055	0.0173	0.0038	0.0061
Cement & Mortar Mixers	83.46	300	9.72E-05	7.09E-06	3.63E-05	2.68E-06	7.20E-06	0.0292	0.0021	0.0109	0.0008	0.0022
Cranes	145.2	180	7.70E-05	1.85E-05	5.59E-05	1.23E-05	2.14E-05	0.0139	0.0033	0.0101	0.0022	0.0038
Graders	140.8	500	6.25E-05	2.25E-05	7.75E-05	1.56E-05	2.57E-05	0.0313	0.0112	0.0387	0.0078	0.0129
Rough Terrain Forklifts	61.42	200	1.87E-04	8.22E-06	1.59E-05	5.70E-06	9.68E-06	0.0375	0.0016	0.0032	0.0011	0.0019
Tractors/Loaders/Backhoes	200	500	1.82E-04	3.18E-05	1.15E-04	1.11E-05	3.33E-05	0.0910	0.0159	0.0574	0.0055	0.0167
Crawler Tractor/Dozers	136.1	500	6.57E-05	2.28E-05	8.08E-05	1.58E-05	2.64E-05	0.0328	0.0114	0.0404	0.0079	0.0132
Dumpers/Tenders	109.7	600	9.90E-05	1.94E-05	1.21E-04	4.50E-06	1.99E-05	0.0594	0.0117	0.0729	0.0027	0.0120
Other Construction Equipment	15	3,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.1290	0.0167	0.1339	0.0038	0.0109
Total								0.7497	0.1559	0.5295	0.0833	0.1609

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	6.636	2.000	11.908	0.0022	0.8010	0.2414	1.4373
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.532	3.420	20.808	0.0022	0.4263	0.4128	2.5116
Total									1.4016	0.7706	4.1763

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Themed Special Events Area
Duration-24 Months (12 Months 2024 / 12 Months 2025)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	1,200	9.80E-05	3.10E-05	4.55E-05	1.93E-05	3.27E-05	0.1177	0.0372	0.0547	0.0231	0.0393
Tampers/Rammers	4.2	800	5.64E-04	9.13E-05	2.20E-04	5.75E-05	9.88E-05	0.4515	0.0730	0.1762	0.0460	0.0791
Rollers	132.2	80	7.04E-05	1.86E-05	8.01E-05	1.26E-05	2.27E-05	0.0056	0.0015	0.0064	0.0010	0.0018
Scrapers	422.5	2,000	1.70E-04	6.24E-05	6.44E-05	3.90E-05	6.23E-05	0.3405	0.1248	0.1289	0.0780	0.1245
Paving Equipment	230.2	1,500	1.20E-04	2.44E-05	4.89E-05	1.46E-05	2.72E-05	0.1804	0.0367	0.0734	0.0219	0.0408
Trenchers	134.3	400	9.73E-05	1.65E-05	9.67E-05	1.04E-05	2.24E-05	0.0389	0.0066	0.0387	0.0041	0.0090
Bore/Drill Rigs	131.8	150	1.40E-04	1.60E-05	8.01E-05	6.36E-06	1.81E-05	0.0209	0.0024	0.0120	0.0010	0.0027
Excavators	137.6	600	6.75E-05	2.76E-05	8.64E-05	1.91E-05	3.05E-05	0.0405	0.0165	0.0518	0.0115	0.0183
Cement & Mortar Mixers	83.46	800	9.72E-05	7.09E-06	3.63E-05	2.68E-06	7.20E-06	0.0778	0.0057	0.0291	0.0021	0.0058
Cranes	145.2	300	7.70E-05	1.85E-05	5.59E-05	1.23E-05	2.14E-05	0.0231	0.0056	0.0168	0.0037	0.0064
Graders	140.8	2,000	6.25E-05	2.25E-05	7.75E-05	1.56E-05	2.57E-05	0.1251	0.0449	0.1550	0.0311	0.0515
Rough Terrain Forklifts	61.42	2,000	1.87E-04	8.22E-06	1.59E-05	5.70E-06	9.68E-06	0.3746	0.0164	0.0317	0.0114	0.0194
Tractors/Loaders/Backhoes	200	2,000	1.82E-04	3.18E-05	1.15E-04	1.11E-05	3.33E-05	0.3640	0.0636	0.2297	0.0222	0.0667
Crawler Tractor/Dozers	136.1	2,000	6.57E-05	2.28E-05	8.08E-05	1.58E-05	2.64E-05	0.1313	0.0457	0.1616	0.0316	0.0528
Dumpers/Tenders	109.7	1,200	9.90E-05	1.94E-05	1.21E-04	4.50E-06	1.99E-05	0.1188	0.0233	0.1457	0.0054	0.0239
Other Construction Equipment	15	15,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.6450	0.0834	0.6695	0.0191	0.0544
Total								3.0557	0.5874	1.9811	0.3133	0.5963

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	50	30	547,500	6.636	2.000	11.908	0.0022	4.0049	1.2070	7.1866
Light Duty Diesel Vehicles	365	50	30	547,500	1.444	0.964	1.884	0.0022	0.8715	0.5818	1.1370
Heavy Duty Gasoline Vehicles	365	50	30	547,500	3.532	3.420	20.808	0.0022	2.1316	2.0640	12.5578
Total									7.0079	3.8528	20.8814

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Themed Special Events Area
Duration-24 Months (12 Months 2024 / 12 Months 2025)

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Pavers	221.1	1,200	8.82E-05	3.08E-05	4.15E-05	1.92E-05	3.19E-05	0.1058	0.0369	0.0499	0.0230	0.0383
Tampers/Rammers	4.2	800	4.82E-04	9.01E-05	1.84E-04	5.67E-05	9.51E-05	0.3856	0.0721	0.1473	0.0453	0.0761
Rollers	132.2	80	6.15E-05	1.83E-05	7.27E-05	1.25E-05	2.18E-05	0.0049	0.0015	0.0058	0.0010	0.0017
Scrapers	422.5	2,000	1.57E-04	6.22E-05	6.06E-05	3.89E-05	6.18E-05	0.3136	0.1244	0.1213	0.0777	0.1236
Paving Equipment	230.2	1,500	1.02E-04	2.40E-05	4.33E-05	1.45E-05	2.61E-05	0.1534	0.0359	0.0650	0.0217	0.0391
Trenchers	134.3	400	8.07E-05	1.59E-05	8.01E-05	1.02E-05	2.02E-05	0.0323	0.0064	0.0320	0.0041	0.0081
Bore/Drill Rigs	131.8	150	1.28E-04	1.50E-05	7.44E-05	6.29E-06	1.71E-05	0.0191	0.0023	0.0112	0.0009	0.0026
Excavators	137.6	600	6.29E-05	2.75E-05	8.30E-05	1.91E-05	3.01E-05	0.0378	0.0165	0.0498	0.0115	0.0180
Cement & Mortar Mixers	83.46	800	9.48E-05	6.69E-06	3.41E-05	2.65E-06	6.88E-06	0.0758	0.0054	0.0272	0.0021	0.0055
Cranes	145.2	300	6.59E-05	1.82E-05	5.07E-05	1.23E-05	2.07E-05	0.0198	0.0055	0.0152	0.0037	0.0062
Graders	140.8	2,000	5.68E-05	2.24E-05	7.23E-05	1.55E-05	2.50E-05	0.1135	0.0447	0.1446	0.0310	0.0501
Rough Terrain Forklifts	61.42	2,000	1.87E-04	8.20E-06	1.56E-05	5.69E-06	9.65E-06	0.3739	0.0164	0.0312	0.0114	0.0193
Tractors/Loaders/Backhoes	200	2,000	1.62E-04	2.90E-05	1.04E-04	1.09E-05	3.15E-05	0.3238	0.0580	0.2072	0.0219	0.0630
Crawler Tractor/Dozers	136.1	2,000	5.94E-05	2.27E-05	7.50E-05	1.58E-05	2.56E-05	0.1188	0.0454	0.1501	0.0315	0.0513
Dumpers/Tenders	109.7	1,200	9.13E-05	1.80E-05	1.14E-04	4.45E-06	1.87E-05	0.1096	0.0216	0.1368	0.0053	0.0225
Other Construction Equipment	15	15,000	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.6450	0.0834	0.6695	0.0191	0.0544
Total								2.8327	0.5763	1.8641	0.3113	0.5797

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	50	30	547,500	6.636	2.000	11.908	0.0022	4.0049	1.2070	7.1866
Light Duty Diesel Vehicles	365	50	30	547,500	1.444	0.964	1.884	0.0022	0.8715	0.5818	1.1370
Heavy Duty Gasoline Vehicles	365	50	30	547,500	3.532	3.420	20.808	0.0022	2.1316	2.0640	12.5578
Total									7.0079	3.8528	20.8814

^bAP-42, Appendix H, June 1995

Phase IV
Improvement-Prairie Restoration
Duration-12 Months

Nonroad Equipment

Equipment	Average HP	Operating Days	Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Graders	140.8	800	5.68E-05	2.24E-05	7.23E-05	1.55E-05	2.50E-05	0.0454	0.0179	0.0579	0.0124	0.0200
Tractors/Loaders/Backhoes	200	800	1.62E-04	2.90E-05	1.04E-04	1.09E-05	3.15E-05	0.1295	0.0232	0.0829	0.0087	0.0252
Dumpers/Tenders	109.7	500	9.13E-05	1.80E-05	1.14E-04	4.45E-06	1.87E-05	0.0457	0.0090	0.0570	0.0022	0.0094
Other Construction Equipment	15	800	4.30E-05	5.56E-06	4.46E-05	1.27E-06	3.63E-06	0.0344	0.0045	0.0357	0.0010	0.0029
Total								0.2550	0.0546	0.2335	0.0244	0.0575

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all construction equipment.

Onroad Vehicles

Equipment	Total Days	Trips per Day	Average Miles per Trip	Total Miles	Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Heavy Duty Diesel Vehicles	365	10	30	109,500	6.636	2.000	11.908	0.0022	0.8010	0.2414	1.4373
Light Duty Diesel Vehicles	365	10	30	109,500	1.444	0.964	1.884	0.0022	0.1743	0.1164	0.2274
Heavy Duty Gasoline Vehicles	365	10	30	109,500	3.532	3.420	20.808	0.0022	0.4263	0.4128	2.5116
Total									1.4016	0.7706	4.1763

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2012

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	0	1.09E-04	9.40E-06	4.38E-05	2.77E-06	8.61E-06	0.0000	0.0000	0.0000	0.0000	0.0000
Commercial Mowers	44.66	0	1.55E-04	1.34E-05	6.25E-05	3.95E-06	1.23E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Commercial Mowers	55.08	11	1.99E-04	2.12E-05	1.14E-04	4.87E-06	1.98E-05	0.0022	0.0002	0.0013	0.0001	0.0002
Commercial Mowers	82.63	0	2.94E-04	3.16E-05	1.63E-04	7.18E-06	3.08E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Lawn & Garden Tractors	80	11	3.13E-04	3.23E-05	1.72E-04	7.86E-06	3.21E-05	0.0035	0.0004	0.0019	0.0001	0.0004
Other Lawn & Garden Equipment	32	0	1.01E-04	9.54E-06	4.27E-05	2.55E-06	8.30E-06	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Highway Trucks	144.7	0	1.39E-03	1.07E-04	6.60E-04	5.96E-05	1.81E-04	0.0000	0.0000	0.0000	0.0000	0.0000
Graders	140.8	0	6.26E-04	5.11E-05	5.84E-04	2.08E-05	8.09E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Crawler Tractor/Dozers	136.1	0	6.40E-04	5.26E-05	5.94E-04	2.11E-05	8.24E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Total								0.0058	0.0006	0.0032	0.0001	0.0006

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	0	30	0	2.202	3.199	33.072	0.0022	0.0000	0.0000	0.0000
Light Duty Gasoline Vehicles-Park Staff-Maintenance	18	30	540	2.202	3.199	33.072	0.0022	0.0013	0.0019	0.0197
Light Duty Gasoline Vehicles-Visitors	0	50	0	2.202	3.199	33.072	0.0022	0.0000	0.0000	0.0000
Total								0.0013	0.0019	0.0197

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2013

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	0	1.09E-04	9.40E-06	4.38E-05	2.77E-06	8.61E-06	0.0000	0.0000	0.0000	0.0000	0.0000
Commercial Mowers	44.66	0	1.55E-04	1.34E-05	6.25E-05	3.95E-06	1.23E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Commercial Mowers	55.08	11	1.93E-04	1.98E-05	1.07E-04	4.79E-06	1.88E-05	0.0022	0.0002	0.0012	0.0001	0.0002
Commercial Mowers	82.63	0	2.94E-04	3.16E-05	1.63E-04	7.18E-06	3.08E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Lawn & Garden Tractors	80	11	2.96E-04	2.99E-05	1.61E-04	7.72E-06	3.03E-05	0.0033	0.0003	0.0018	0.0001	0.0003
Other Lawn & Garden Equipment	32	0	1.01E-04	9.54E-06	4.27E-05	2.55E-06	8.30E-06	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Highway Trucks	144.7	0	1.39E-03	1.07E-04	6.60E-04	5.96E-05	1.81E-04	0.0000	0.0000	0.0000	0.0000	0.0000
Graders	140.8	0	6.26E-04	5.11E-05	5.84E-04	2.08E-05	8.09E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Crawler Tractor/Dozers	136.1	0	6.40E-04	5.26E-05	5.94E-04	2.11E-05	8.24E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Total								0.0055	0.0006	0.0030	0.0001	0.0006

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	0	30	0	2.202	3.199	33.072	0.0022	0.0000	0.0000	0.0000
Light Duty Gasoline Vehicles-Park Staff-Maintenance	18	30	540	2.202	3.199	33.072	0.0022	0.0013	0.0019	0.0197
Light Duty Gasoline Vehicles-Visitors	0	50	0	2.202	3.199	33.072	0.0022	0.0000	0.0000	0.0000
Total								0.0013	0.0019	0.0197

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2014

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	5	9.97E-05	7.52E-06	3.49E-05	2.62E-06	7.50E-06	0.0004	0.0000	0.0002	0.0000	0.0000
Commercial Mowers	44.66	0	1.55E-04	1.34E-05	6.25E-05	3.95E-06	1.23E-05	0.0000	0.0000	0.0000	0.0000	0.0000
Commercial Mowers	55.08	15	1.87E-04	1.86E-05	1.00E-04	4.71E-06	1.79E-05	0.0028	0.0003	0.0015	0.0001	0.0003
Commercial Mowers	82.63	5	2.61E-04	2.77E-05	1.43E-04	6.94E-06	2.78E-05	0.0012	0.0001	0.0006	0.0000	0.0001
Lawn & Garden Tractors	80	11	2.74E-04	2.77E-05	1.49E-04	7.58E-06	2.86E-05	0.0031	0.0003	0.0017	0.0001	0.0003
Other Lawn & Garden Equipment	32	5	9.34E-05	7.62E-06	3.42E-05	2.43E-06	7.24E-06	0.0004	0.0000	0.0002	0.0000	0.0000
Off-Highway Trucks	144.7	0	1.39E-03	1.07E-04	6.60E-04	5.96E-05	1.81E-04	0.0000	0.0000	0.0000	0.0000	0.0000
Graders	140.8	10	4.84E-04	4.00E-05	4.53E-04	1.94E-05	6.90E-05	0.0048	0.0004	0.0045	0.0002	0.0007
Crawler Tractor/Dozers	136.1	10	4.97E-04	4.12E-05	4.63E-04	1.97E-05	7.03E-05	0.0050	0.0004	0.0046	0.0002	0.0007
Total								0.0177	0.0016	0.0133	0.0006	0.0022

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	0	30	0	2.202	3.199	33.072	0.0022	0.0000	0.0000	0.0000
Light Duty Gasoline Vehicles-Park Staff-Maintenance	150	30	4,500	2.202	3.199	33.072	0.0022	0.0109	0.0159	0.1640
Light Duty Gasoline Vehicles-Visitors	58,500	50	2,925,000	2.202	3.199	33.072	0.0022	7.1013	10.3158	106.6302
Total								7.1122	10.3317	106.7942

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2015

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	5	9.57E-05	6.77E-06	3.11E-05	2.55E-06	7.00E-06	0.0004	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	44.66	5	1.37E-04	9.66E-06	4.43E-05	3.65E-06	9.99E-06	0.0006	0.0000	0.0002	0.0000	0.0000
Commercial Mowers	55.08	15	1.81E-04	1.73E-05	9.40E-05	4.63E-06	1.70E-05	0.0027	0.0003	0.0014	0.0001	0.0003
Commercial Mowers	82.63	5	2.44E-04	2.59E-05	1.34E-04	6.83E-06	2.64E-05	0.0011	0.0001	0.0006	0.0000	0.0001
Lawn & Garden Tractors	80	11	2.53E-04	2.56E-05	1.38E-04	7.45E-06	2.69E-05	0.0028	0.0003	0.0016	0.0001	0.0003
Other Lawn & Garden Equipment	32	9	8.98E-05	6.88E-06	3.07E-05	2.37E-06	6.78E-06	0.0008	0.0001	0.0003	0.0000	0.0001
Off-Highway Trucks	144.7	0	1.39E-03	1.07E-04	6.60E-04	5.96E-05	1.81E-04	0.0000	0.0000	0.0000	0.0000	0.0000
Graders	140.8	10	4.07E-04	3.55E-05	3.92E-04	1.87E-05	6.35E-05	0.0041	0.0004	0.0039	0.0002	0.0006
Crawler Tractor/Dozers	136.1	10	4.20E-04	3.66E-05	4.02E-04	1.91E-05	6.48E-05	0.0042	0.0004	0.0040	0.0002	0.0006
Total								0.0167	0.0015	0.0121	0.0006	0.0021

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	730	30	21,900	2.170	3.168	33.074	0.0022	0.0524	0.0765	0.7984
Light Duty Gasoline Vehicles-Park Staff-Maintenance	168	30	5,040	2.170	3.168	33.074	0.0022	0.0121	0.0176	0.1837
Light Duty Gasoline Vehicles-Visitors	61,850	50	3,092,500	2.170	3.168	33.074	0.0022	7.3984	10.7982	112.7457
Total								7.4629	10.8923	113.7279

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2016

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	5	9.19E-05	6.10E-06	2.75E-05	2.49E-06	6.51E-06	0.0004	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	44.66	5	1.31E-04	8.70E-06	3.92E-05	3.55E-06	9.29E-06	0.0006	0.0000	0.0002	0.0000	0.0000
Commercial Mowers	55.08	28	1.75E-04	1.62E-05	8.80E-05	4.56E-06	1.61E-05	0.0049	0.0005	0.0025	0.0001	0.0005
Commercial Mowers	82.63	5	2.27E-04	2.41E-05	1.25E-04	6.73E-06	2.50E-05	0.0010	0.0001	0.0006	0.0000	0.0001
Lawn & Garden Tractors	80	11	2.33E-04	2.36E-05	1.28E-04	7.33E-06	2.53E-05	0.0026	0.0003	0.0014	0.0001	0.0003
Other Lawn & Garden Equipment	32	9	8.65E-05	6.23E-06	2.74E-05	2.32E-06	6.35E-06	0.0008	0.0001	0.0002	0.0000	0.0001
Off-Highway Trucks	144.7	0	1.39E-03	1.07E-04	6.60E-04	5.96E-05	1.81E-04	0.0000	0.0000	0.0000	0.0000	0.0000
Graders	140.8	20	3.36E-04	3.15E-05	3.32E-04	1.81E-05	5.77E-05	0.0067	0.0006	0.0066	0.0004	0.0012
Crawler Tractor/Dozers	136.1	20	3.48E-04	3.25E-05	3.43E-04	1.84E-05	5.91E-05	0.0070	0.0007	0.0069	0.0004	0.0012
Total								0.0240	0.0022	0.0185	0.0010	0.0033

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	730	30	21,900	2.170	3.168	33.074	0.0022	0.0524	0.0765	0.7984
Light Duty Gasoline Vehicles-Park Staff-Maintenance	184	30	5,520	2.170	3.168	33.074	0.0022	0.0132	0.0193	0.2012
Light Duty Gasoline Vehicles-Visitors	61,850	50	3,092,500	2.170	3.168	33.074	0.0022	7.3984	10.7982	112.7457
Total								7.4640	10.8940	113.7454

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2017

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	5	8.85E-05	5.51E-06	2.42E-05	2.43E-06	6.01E-06	0.0004	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	44.66	5	1.26E-04	7.87E-06	3.46E-05	3.47E-06	8.59E-06	0.0006	0.0000	0.0002	0.0000	0.0000
Commercial Mowers	55.08	28	1.70E-04	1.51E-05	8.22E-05	4.49E-06	1.52E-05	0.0048	0.0004	0.0023	0.0001	0.0004
Commercial Mowers	82.63	5	2.11E-04	2.25E-05	1.17E-04	6.63E-06	2.36E-05	0.0009	0.0001	0.0005	0.0000	0.0001
Lawn & Garden Tractors	80	11	2.14E-04	2.17E-05	1.18E-04	7.21E-06	2.37E-05	0.0024	0.0002	0.0013	0.0001	0.0003
Other Lawn & Garden Equipment	32	9	8.34E-05	5.64E-06	2.44E-05	2.26E-06	5.93E-06	0.0008	0.0001	0.0002	0.0000	0.0001
Off-Highway Trucks	144.7	0	1.39E-03	1.07E-04	6.60E-04	5.96E-05	1.81E-04	0.0000	0.0000	0.0000	0.0000	0.0000
Graders	140.8	20	2.77E-04	2.89E-05	2.74E-04	1.75E-05	5.07E-05	0.0055	0.0006	0.0055	0.0003	0.0010
Crawler Tractor/Dozers	136.1	20	2.88E-04	2.98E-05	2.85E-04	1.78E-05	5.22E-05	0.0058	0.0006	0.0057	0.0004	0.0010
Total								0.0212	0.0021	0.0158	0.0010	0.0030

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	730	30	21,900	2.170	3.168	33.074	0.0022	0.0524	0.0765	0.7984
Light Duty Gasoline Vehicles-Park Staff-Maintenance	184	30	5,520	2.170	3.168	33.074	0.0022	0.0132	0.0193	0.2012
Light Duty Gasoline Vehicles-Visitors	61,850	50	3,092,500	2.170	3.168	33.074	0.0022	7.3984	10.7982	112.7457
Total								7.4640	10.8940	113.7454

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2018

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	50	8.53E-05	5.05E-06	2.13E-05	2.37E-06	5.56E-06	0.0043	0.0003	0.0011	0.0001	0.0003
Commercial Mowers	44.66	5	1.22E-04	7.22E-06	3.04E-05	3.38E-06	7.94E-06	0.0005	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	55.08	67	1.64E-04	1.40E-05	7.67E-05	4.42E-06	1.44E-05	0.0111	0.0009	0.0052	0.0003	0.0010
Commercial Mowers	82.63	5	1.96E-04	2.09E-05	1.09E-04	6.53E-06	2.23E-05	0.0009	0.0001	0.0005	0.0000	0.0001
Lawn & Garden Tractors	80	11	1.97E-04	2.02E-05	1.10E-04	7.09E-06	2.23E-05	0.0022	0.0002	0.0012	0.0001	0.0003
Other Lawn & Garden Equipment	32	16	8.05E-05	5.12E-06	2.16E-05	2.21E-06	5.51E-06	0.0012	0.0001	0.0003	0.0000	0.0001
Off-Highway Trucks	144.7	78	2.58E-04	7.36E-05	1.05E-04	4.59E-05	7.74E-05	0.0201	0.0057	0.0082	0.0036	0.0060
Graders	140.8	20	2.23E-04	2.68E-05	2.19E-04	1.69E-05	4.38E-05	0.0045	0.0005	0.0044	0.0003	0.0009
Crawler Tractor/Dozers	136.1	20	2.33E-04	2.76E-05	2.29E-04	1.73E-05	4.53E-05	0.0047	0.0006	0.0046	0.0003	0.0009
Total								0.0495	0.0085	0.0256	0.0048	0.0095

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	5,475	30	164,250	2.148	3.131	33.012	0.0022	0.3889	0.5668	5.9770
Light Duty Gasoline Vehicles-Park Staff-Maintenance	340	30	10,200	2.148	3.131	33.012	0.0022	0.0242	0.0352	0.3712
Light Duty Gasoline Vehicles-Visitors	69,890	50	3,494,500	2.148	3.131	33.012	0.0022	8.2751	12.0591	127.1633
Total								8.6882	12.6611	133.5115

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2019

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	50	8.24E-05	4.65E-06	1.87E-05	2.31E-06	5.14E-06	0.0041	0.0002	0.0009	0.0001	0.0003
Commercial Mowers	44.66	5	1.18E-04	6.65E-06	2.66E-05	3.30E-06	7.34E-06	0.0005	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	55.08	67	1.59E-04	1.30E-05	7.14E-05	4.36E-06	1.36E-05	0.0107	0.0009	0.0048	0.0003	0.0009
Commercial Mowers	82.63	5	1.81E-04	1.94E-05	1.01E-04	6.44E-06	2.10E-05	0.0008	0.0001	0.0005	0.0000	0.0001
Lawn & Garden Tractors	80	11	1.81E-04	1.88E-05	1.02E-04	6.98E-06	2.11E-05	0.0020	0.0002	0.0011	0.0001	0.0002
Other Lawn & Garden Equipment	32	16	7.79E-05	4.71E-06	1.91E-05	2.17E-06	5.12E-06	0.0012	0.0001	0.0003	0.0000	0.0001
Off-Highway Trucks	144.7	78	2.07E-04	7.29E-05	8.96E-05	4.55E-05	7.40E-05	0.0162	0.0057	0.0070	0.0035	0.0058
Graders	140.8	22	1.75E-04	2.52E-05	1.68E-04	1.64E-05	3.72E-05	0.0038	0.0006	0.0037	0.0004	0.0008
Crawler Tractor/Dozers	136.1	22	1.84E-04	2.60E-05	1.77E-04	1.68E-05	3.86E-05	0.0041	0.0006	0.0039	0.0004	0.0008
Total								0.0435	0.0083	0.0223	0.0048	0.0091

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	5,475	30	164,250	2.148	3.131	33.012	0.0022	0.3889	0.5668	5.9770
Light Duty Gasoline Vehicles-Park Staff-Maintenance	553	30	16,590	2.148	3.131	33.012	0.0022	0.0393	0.0573	0.6037
Light Duty Gasoline Vehicles-Visitors	69,890	50	3,494,500	2.148	3.131	33.012	0.0022	8.2751	12.0591	127.1633
Total								8.7033	12.6832	133.7440

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2020

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	50	7.97E-05	4.31E-06	1.62E-05	2.26E-06	4.77E-06	0.0040	0.0002	0.0008	0.0001	0.0002
Commercial Mowers	44.66	5	1.14E-04	6.15E-06	2.31E-05	3.23E-06	6.81E-06	0.0005	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	55.08	67	1.55E-04	1.21E-05	6.64E-05	4.30E-06	1.28E-05	0.0104	0.0008	0.0045	0.0003	0.0009
Commercial Mowers	82.63	5	1.67E-04	1.80E-05	9.37E-05	6.35E-06	1.98E-05	0.0008	0.0001	0.0004	0.0000	0.0001
Lawn & Garden Tractors	80	11	1.65E-04	1.76E-05	9.41E-05	6.88E-06	1.99E-05	0.0019	0.0002	0.0011	0.0001	0.0002
Other Lawn & Garden Equipment	32	16	7.54E-05	4.35E-06	1.68E-05	2.12E-06	4.75E-06	0.0012	0.0001	0.0003	0.0000	0.0001
Off-Highway Trucks	144.7	78	1.79E-04	7.25E-05	8.12E-05	4.53E-05	7.22E-05	0.0140	0.0057	0.0063	0.0035	0.0056
Graders	140.8	22	1.33E-04	2.40E-05	1.25E-04	1.60E-05	3.16E-05	0.0029	0.0005	0.0027	0.0004	0.0007
Crawler Tractor/Dozers	136.1	22	1.41E-04	2.46E-05	1.32E-04	1.63E-05	3.28E-05	0.0031	0.0005	0.0029	0.0004	0.0007
Total								0.0387	0.0081	0.0191	0.0048	0.0086

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	5,475	30	164,250	2.137	3.112	32.972	0.0022	0.3868	0.5634	5.9696
Light Duty Gasoline Vehicles-Park Staff-Maintenance	553	30	16,590	2.137	3.112	32.972	0.0022	0.0391	0.0569	0.6030
Light Duty Gasoline Vehicles-Visitors	70,410	50	3,520,500	2.137	3.112	32.972	0.0022	8.2916	12.0748	127.9521
Total								8.7175	12.6951	134.5247

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2021

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	50	7.71E-05	4.01E-06	1.39E-05	2.21E-06	4.51E-06	0.0039	0.0002	0.0007	0.0001	0.0002
Commercial Mowers	44.66	5	1.10E-04	5.73E-06	1.98E-05	3.16E-06	6.44E-06	0.0005	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	55.08	67	1.51E-04	1.13E-05	6.20E-05	4.24E-06	1.22E-05	0.0101	0.0008	0.0042	0.0003	0.0008
Commercial Mowers	82.63	5	1.54E-04	1.69E-05	8.73E-05	6.27E-06	1.88E-05	0.0007	0.0001	0.0004	0.0000	0.0001
Lawn & Garden Tractors	80	11	1.50E-04	1.64E-05	8.71E-05	6.78E-06	1.88E-05	0.0017	0.0002	0.0010	0.0001	0.0002
Other Lawn & Garden Equipment	32	16	7.32E-05	4.03E-06	1.47E-05	2.08E-06	4.42E-06	0.0011	0.0001	0.0002	0.0000	0.0001
Off-Highway Trucks	144.7	78	1.63E-04	7.24E-05	7.80E-05	4.52E-05	7.16E-05	0.0128	0.0056	0.0061	0.0035	0.0056
Graders	140.8	22	1.05E-04	2.34E-05	1.07E-04	1.58E-05	2.94E-05	0.0023	0.0005	0.0024	0.0003	0.0006
Crawler Tractor/Dozers	136.1	22	1.11E-04	2.39E-05	1.13E-04	1.61E-05	3.04E-05	0.0025	0.0005	0.0025	0.0004	0.0007
Total								0.0355	0.0080	0.0175	0.0048	0.0083

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	5,475	30	164,250	2.137	3.112	32.972	0.0022	0.3868	0.5634	5.9696
Light Duty Gasoline Vehicles-Park Staff-Maintenance	553	30	16,590	2.137	3.112	32.972	0.0022	0.0391	0.0569	0.6030
Light Duty Gasoline Vehicles-Visitors	70,410	50	3,520,500	2.137	3.112	32.972	0.0022	8.2916	12.0748	127.9521
Total								8.7175	12.6951	134.5247

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2022

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	82	7.48E-05	3.75E-06	1.17E-05	2.17E-06	4.27E-06	0.0061	0.0003	0.0010	0.0002	0.0003
Commercial Mowers	44.66	5	1.07E-04	5.36E-06	1.67E-05	3.09E-06	6.10E-06	0.0005	0.0000	0.0001	0.0000	0.0000
Commercial Mowers	55.08	67	1.47E-04	1.07E-05	5.79E-05	4.18E-06	1.16E-05	0.0099	0.0007	0.0039	0.0003	0.0008
Commercial Mowers	82.63	36	1.42E-04	1.59E-05	8.14E-05	6.19E-06	1.79E-05	0.0051	0.0006	0.0029	0.0002	0.0006
Lawn & Garden Tractors	80	11	1.36E-04	1.54E-05	8.03E-05	6.68E-06	1.78E-05	0.0015	0.0002	0.0009	0.0001	0.0002
Other Lawn & Garden Equipment	32	47	7.10E-05	3.76E-06	1.27E-05	2.04E-06	4.18E-06	0.0033	0.0002	0.0006	0.0001	0.0002
Off-Highway Trucks	144.7	78	1.57E-04	7.24E-05	7.80E-05	4.52E-05	7.16E-05	0.0122	0.0056	0.0061	0.0035	0.0056
Graders	140.8	22	8.20E-05	2.29E-05	9.42E-05	1.57E-05	2.79E-05	0.0018	0.0005	0.0021	0.0003	0.0006
Crawler Tractor/Dozers	136.1	22	8.72E-05	2.34E-05	9.90E-05	1.60E-05	2.87E-05	0.0019	0.0005	0.0022	0.0004	0.0006
Total								0.0424	0.0086	0.0197	0.0051	0.0090

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	6,205	30	186,150	2.137	3.112	32.972	0.0022	0.4384	0.6385	6.7656
Light Duty Gasoline Vehicles-Park Staff-Maintenance	639	30	19,170	2.137	3.112	32.972	0.0022	0.0451	0.0658	0.6967
Light Duty Gasoline Vehicles-Visitors	83,060	50	4,153,000	2.137	3.112	32.972	0.0022	9.7812	14.2442	150.9402
Total								10.2648	14.9484	158.4026

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2023

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	82	7.26E-05	3.53E-06	9.77E-06	2.12E-06	4.06E-06	0.0059	0.0003	0.0008	0.0002	0.0003
Commercial Mowers	44.66	14	1.04E-04	5.04E-06	1.39E-05	3.03E-06	5.80E-06	0.0014	0.0001	0.0002	0.0000	0.0001
Commercial Mowers	55.08	71	1.43E-04	1.00E-05	5.41E-05	4.13E-06	1.10E-05	0.0101	0.0007	0.0038	0.0003	0.0008
Commercial Mowers	82.63	36	1.30E-04	1.49E-05	7.57E-05	6.11E-06	1.69E-05	0.0047	0.0005	0.0027	0.0002	0.0006
Lawn & Garden Tractors	80	11	1.23E-04	1.43E-05	7.38E-05	6.59E-06	1.67E-05	0.0014	0.0002	0.0008	0.0001	0.0002
Other Lawn & Garden Equipment	32	56	6.90E-05	3.51E-06	1.09E-05	2.00E-06	3.97E-06	0.0039	0.0002	0.0006	0.0001	0.0002
Off-Highway Trucks	144.7	78	1.54E-04	7.24E-05	7.80E-05	4.52E-05	7.16E-05	0.0120	0.0056	0.0061	0.0035	0.0056
Graders	140.8	32	7.05E-05	2.26E-05	8.46E-05	1.56E-05	2.67E-05	0.0023	0.0007	0.0027	0.0005	0.0009
Crawler Tractor/Dozers	136.1	32	7.47E-05	2.31E-05	8.87E-05	1.59E-05	2.74E-05	0.0024	0.0007	0.0028	0.0005	0.0009
Total								0.0441	0.0091	0.0206	0.0054	0.0095

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	7,665	30	229,950	2.137	3.112	32.972	0.0022	0.5416	0.7887	8.3575
Light Duty Gasoline Vehicles-Park Staff-Maintenance	671	30	20,130	2.137	3.112	32.972	0.0022	0.0474	0.0690	0.7316
Light Duty Gasoline Vehicles-Visitors	93,420	50	4,671,000	2.137	3.112	32.972	0.0022	11.0013	16.0209	169.7669
Total								11.5902	16.8786	178.8560

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2024

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	90	7.07E-05	3.34E-06	7.98E-06	2.08E-06	3.87E-06	0.0064	0.0003	0.0007	0.0002	0.0003
Commercial Mowers	44.66	14	1.01E-04	4.77E-06	1.14E-05	2.97E-06	5.52E-06	0.0014	0.0001	0.0002	0.0000	0.0001
Commercial Mowers	55.08	71	1.40E-04	9.46E-06	5.04E-05	4.08E-06	1.05E-05	0.0099	0.0007	0.0036	0.0003	0.0007
Commercial Mowers	82.63	45	1.19E-04	1.41E-05	7.04E-05	6.03E-06	1.61E-05	0.0053	0.0006	0.0032	0.0003	0.0007
Lawn & Garden Tractors	80	11	1.10E-04	1.35E-05	6.76E-05	6.49E-06	1.59E-05	0.0012	0.0002	0.0008	0.0001	0.0002
Other Lawn & Garden Equipment	32	65	6.72E-05	3.30E-06	9.16E-06	1.96E-06	3.78E-06	0.0043	0.0002	0.0006	0.0001	0.0002
Off-Highway Trucks	144.7	78	1.54E-04	7.24E-05	7.80E-05	4.52E-05	7.16E-05	0.0120	0.0056	0.0061	0.0035	0.0056
Graders	140.8	37	6.25E-05	2.25E-05	7.75E-05	1.56E-05	2.57E-05	0.0023	0.0008	0.0029	0.0006	0.0010
Crawler Tractor/Dozers	136.1	37	6.57E-05	2.28E-05	8.08E-05	1.58E-05	2.64E-05	0.0024	0.0008	0.0030	0.0006	0.0010
Total								0.0453	0.0094	0.0209	0.0057	0.0098

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	7,665	30	229,950	2.137	3.112	32.972	0.0022	0.5416	0.7887	8.3575
Light Duty Gasoline Vehicles-Park Staff-Maintenance	685	30	20,550	2.137	3.112	32.972	0.0022	0.0484	0.0705	0.7469
Light Duty Gasoline Vehicles-Visitors	93,420	50	4,671,000	2.137	3.112	32.972	0.0022	11.0013	16.0209	169.7669
Total								11.5912	16.8801	178.8713

^bAP-42, Appendix H, June 1995

Operations & Maintenance
2025

Nonroad Equipment

Equipment	Average HP	Operating Days	NO _x Emission Factor (tons/day) ^a	Emission Factor (tons/day) ^a	CO Emission Factor (tons/day) ^a	SO ₂ Emission Factor (tons/day) ^a	PM Emission Factor (tons/day) ^a	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)	SO ₂ Emissions (TPY)	PM Emissions (TPY)
Commercial Mowers	31.28	100	6.91E-05	3.19E-06	6.54E-06	2.05E-06	3.71E-06	0.0069	0.0003	0.0007	0.0002	0.0004
Commercial Mowers	44.66	24	9.87E-05	4.56E-06	9.34E-06	2.93E-06	5.30E-06	0.0023	0.0001	0.0002	0.0001	0.0001
Commercial Mowers	55.08	81	1.37E-04	8.90E-06	4.68E-05	4.02E-06	9.93E-06	0.0110	0.0007	0.0038	0.0003	0.0008
Commercial Mowers	82.63	55	1.09E-04	1.32E-05	6.52E-05	5.96E-06	1.53E-05	0.0059	0.0007	0.0036	0.0003	0.0008
Lawn & Garden Tractors	80	21	9.87E-05	1.27E-05	6.16E-05	6.41E-06	1.51E-05	0.0021	0.0003	0.0013	0.0001	0.0003
Other Lawn & Garden Equipment	32	75	6.55E-05	3.12E-06	7.60E-06	1.93E-06	3.61E-06	0.0049	0.0002	0.0006	0.0001	0.0003
Off-Highway Trucks	144.7	78	1.54E-04	7.24E-05	7.80E-05	4.52E-05	7.16E-05	0.0120	0.0056	0.0061	0.0035	0.0056
Graders	140.8	40	5.68E-05	2.24E-05	7.23E-05	1.56E-05	2.50E-05	0.0023	0.0009	0.0029	0.0006	0.0010
Crawler Tractor/Dozers	136.1	40	5.94E-05	2.27E-05	7.50E-05	1.58E-05	2.56E-05	0.0024	0.0009	0.0030	0.0006	0.0010
Total								0.0499	0.0098	0.0221	0.0060	0.0103

^aEPA Nonroad Emissions Model, Version 2008a, July 6, 2009

Note: Diesel fuel was assumed for all operations and maintenance equipment.

Onroad Vehicles

Equipment	Trips per Year	Average Miles per Trip	Total Miles	NO _x Emission Factor (gram/mile) ^b	Emission Factor (gram/mile) ^b	CO Emission Factor (gram/mile) ^b	Conversion Factor (lb/gram)	NO _x Emissions (TPY)	VOC Emissions (TPY)	CO Emissions (TPY)
Light Duty Gasoline Vehicles-Park Staff-Daily	8,213	30	246,375	2.137	3.112	32.972	0.0022	0.5803	0.8450	8.9545
Light Duty Gasoline Vehicles-Park Staff-Maintenance	685	30	20,550	2.137	3.112	32.972	0.0022	0.0484	0.0705	0.7469
Light Duty Gasoline Vehicles-Visitors	99,120	50	4,956,000	2.137	3.112	32.972	0.0022	11.6725	16.9984	180.1252
Total								12.3012	17.9139	189.8265

^bAP-42, Appendix H, June 1995