

REVISITING PAST DFW STREAM STABILIZATION PROJECTS

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Urban Riparian
Symposium



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Agenda

- Jackson Creek – Colleyville
- Lorean Branch – Hurst
- Kirby Creek – Grand Prairie
- Lennox Lane – Arlington

Stream Erosion in DFW

- Increased development over time in urban watersheds
- Higher stream flows
- Channel Evolution Process
 - Downcutting
 - Meandering
 - Widening



Stream Erosion in DFW

- New infrastructure being built within urban riparian corridors
- Development pushing the limits along floodplains and erosion hazard areas
- Resulting stream erosion over time is a threat to properties and infrastructure



Jackson Creek - Colleyville

- Study - 1999
- Construction – 2001
- Revisited - 2009
- Revisited – 2018

Jackson Creek - Colleyville

- Overview



Jackson Creek - Colleyville

- Challenges

Approx. 600 LF of natural channel downstream of U-shaped concrete-lined flume



Jackson Creek - Colleyville

- Post-Construction 2001



Gabion & Riprap
Protection at CLC outfall

Gabion mattress
side slopes



Box culverts @ Sherwood Lane
= 100-yr flood protection

Slopes laid back & TRM
and pretty trees!

Jackson Creek - Colleyville

HOW HAS IT CHANGED OVER TIME?

Jackson Creek - Colleyville



Jackson Creek - Colleyville

- 2009

- 2018



Jackson Creek - Colleyville Wildlife!



Lorean Branch - Hurst

- Design & Construction – 2000 - 2001
- Revisited - 2009
- Revisited – 2018

Lorean Branch - Hurst

- Overview



Lorean Branch - Hurst

- Challenges



Approx. 2,000 LF of natural, eroded channel



Lorean Branch - Hurst

- Challenges



Approx. 2,000 LF of natural, eroded channel



Lorean Branch - Hurst

- Post-Construction – 2001



Gabion
mattress
side slopes



Notice 3'x3' toe wall
(only top is exposed)

Lorean Branch - Hurst

HOW HAS IT CHANGED OVER TIME?

Lorean Branch - Hurst



Lorean Branch - Hurst



Lorean Branch - Hurst

- 2009



- 2018



Lorean Branch - Hurst Wildlife!

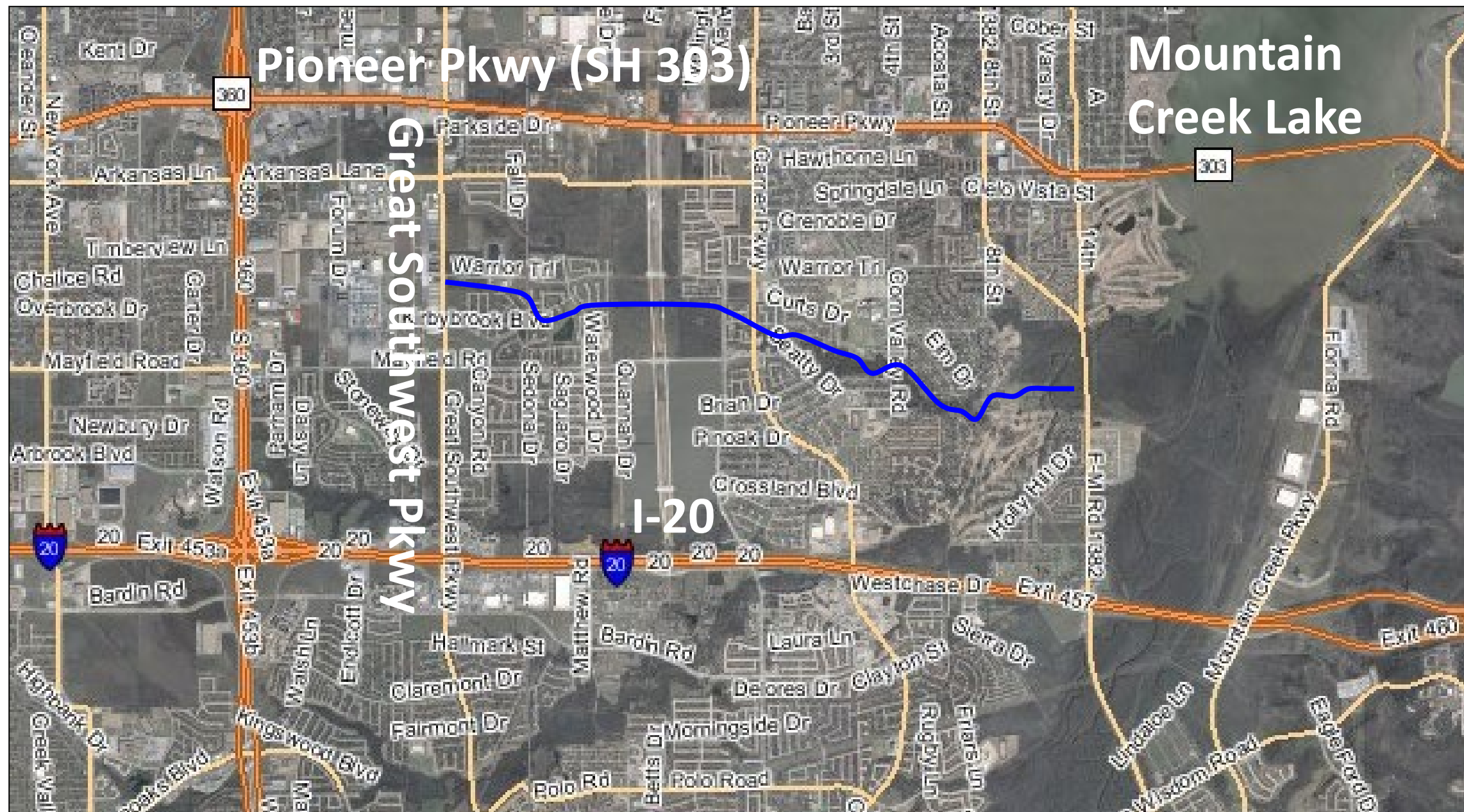


Kirby Creek – Grand Prairie

- Overview
- Channel Stability Assessment – 2004
- Construction – 2007
- Revisited – 2009
- Revisited – 2018

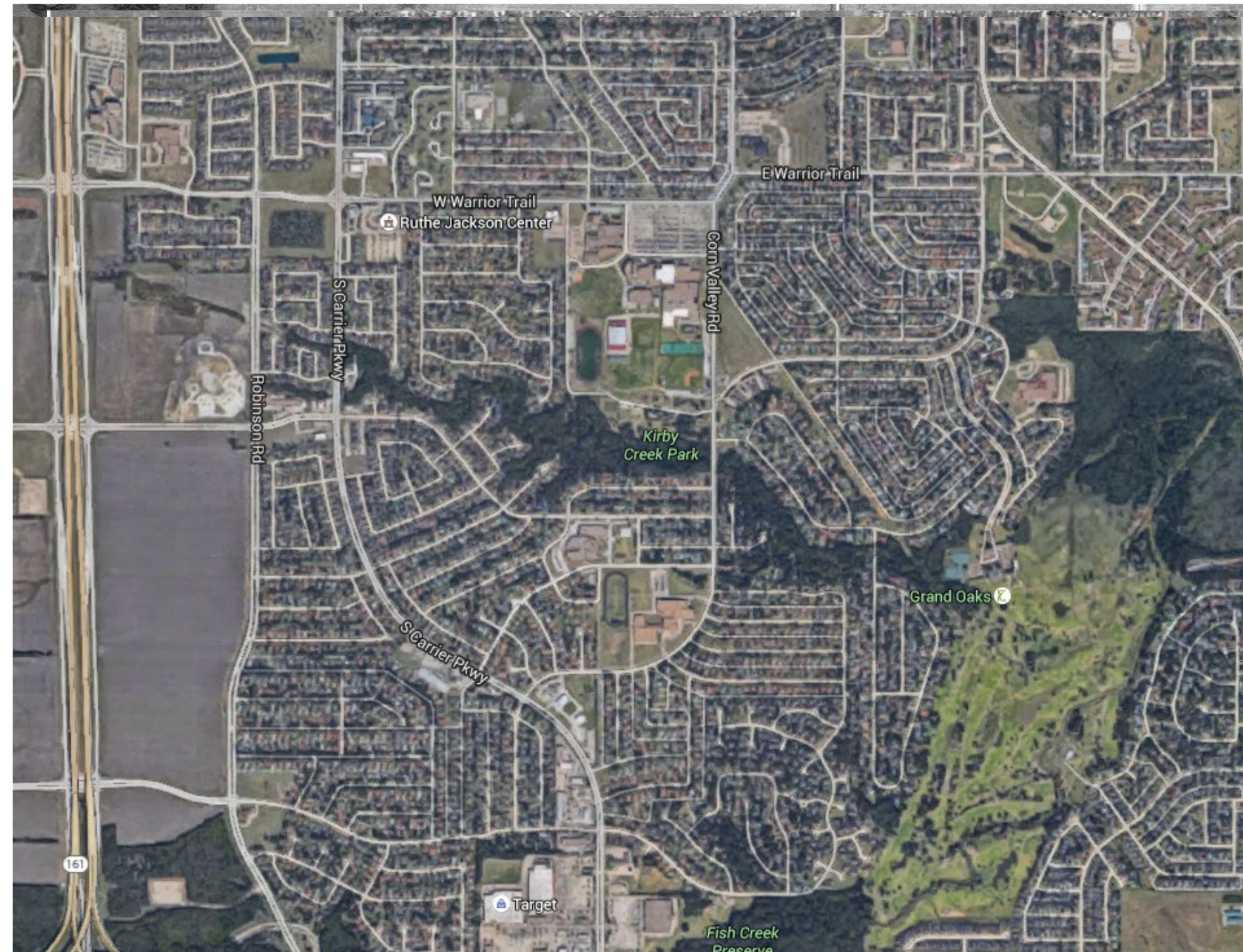
Kirby Creek – Grand Prairie

- Overview



Kirby Creek – Grand Prairie

- Overview



Kirby Creek – Grand Prairie

- Channel Stability Assessment - 2004



Toe Failures



Downcutting



Knickpoints

Kirby Creek – Grand Prairie

- Channel Stability Assessment - 2004



Severe Scour



Toe Failures



Downcutting

Kirby Creek – Grand Prairie

- Channel Stability Assessment - 2004



Windhurst Drive –
Natural Root Protection!



96" RCP Outfall near
Christopher Drive (Pipe
separated from headwall)

Kirby Creek – Grand Prairie

- Construction - 2007



Kirby Creek – Grand Prairie

- Construction - 2007



At 96" RCP Outfall near Christopher Drive



Kirby Creek – Grand Prairie

HOW HAS IT CHANGED OVER TIME?

Kirby Creek – Grand Prairie



At 96" RCP Outfall near Christopher Drive

Kirby Creek – Grand Prairie

- 2018



At 96" RCP Outfall near Christopher Drive

Kirby Creek – Grand Prairie

- 2018



At 96" RCP Outfall near Christopher Drive

Kirby Creek – Grand Prairie

- 2018



At 96" RCP Outfall near Christopher Drive

Kirby Creek – Grand Prairie Wildlife!



Lennox Lane - Arlington

- Overview
- Erosion after May-June 2015 floods
- Temporary rock riprap protection
- Gabion MSE wall construction
- Relocation of sanitary sewer line

Lennox Lane – Challenges



Lennox Lane – Challenges



Lennox Lane – Challenges



Lennox Lane – June 2015



Lennox Lane – Jan 2016



Lennox Lane – Jan 2016



Lennox Lane – Jan 2016



Lennox Lane – Jan 2016



Lennox Lane – May 2016



Lennox Lane – 2018



CLOSING THOUGHTS FROM AN ENGINEER

- Variety of Solutions available
 - Gabions / Rock Riprap
 - Pre-Cast Block Walls
 - TRMs / Reinforced Earth Structures
 - Rock chutes, vanes, riffle pools
- Important things:
 - Contractor experience is important
 - Geotechnical Recommendations
 - Geomorphologic Analysis
 - Environmental Permitting
 - Construction Access/Easements
- “Green” can overtake hard armor
- Plan Ahead
 - Consider public versus private
 - Establish erosion hazard setbacks for new development
 - Consider how streams change when placing new infrastructure near them
- **Many challenges but we have the tools to solve them!**

Questions?

Future Urban Riparian Enthusiasts!

