



Region C Water Planning Group Meeting

TRA Central
Wastewater Treatment Plant
April 25, 2005

Agenda

- Action Items
 - Additional Wholesale Water Providers
 - Action on Unique Stream Segments
 - Action on Policy Topics
 - Proposed Strategies to Meet Water Needs

Action Item

Additional Wholesale
Water Providers

Additional Wholesale Providers

- Definition: any entity who has sold or is expected to sell 1,000 acre-feet per year of water wholesale during the planning period.

Add:

- City of Arlington -
- City of Grand Prairie -
- East Cedar Creek FWSD -
- Rockett SUD -
- West Cedar Creek MUD -

Additional Wholesale Providers

- RCWPG Action
 - Add City of Arlington, City of Grand Prairie, East Cedar Creek FWSD, Rockett SUD, and West Cedar Creek MUD as Wholesale Water Providers

Action Item

Unique Stream Segments

Action Item

Policy Topics

Action Item

Proposed Strategies to Meet
Water Needs

Proposed Strategies to Meet Water Needs

- Memoranda for Counties
 - All completed
- Completed Memoranda for Wholesale Water Providers
 - Tarrant Regional Water District
 - North Texas Municipal Water District
 - Greater Texoma Utility Authority
 - Corsicana
 - Weatherford
 - Athens Municipal Water Authority
 - Walnut Creek Special Utility District
 - Other WWPs (without individual memos)

Proposed Strategies to Meet Water Needs

- Memoranda in progress for WWP's
 - Dallas Water Utilities
 - Trinity River Authority
 - Upper Trinity Regional Water District
 - Denton
 - Fort Worth
 - Gainesville
 - Waxahachie

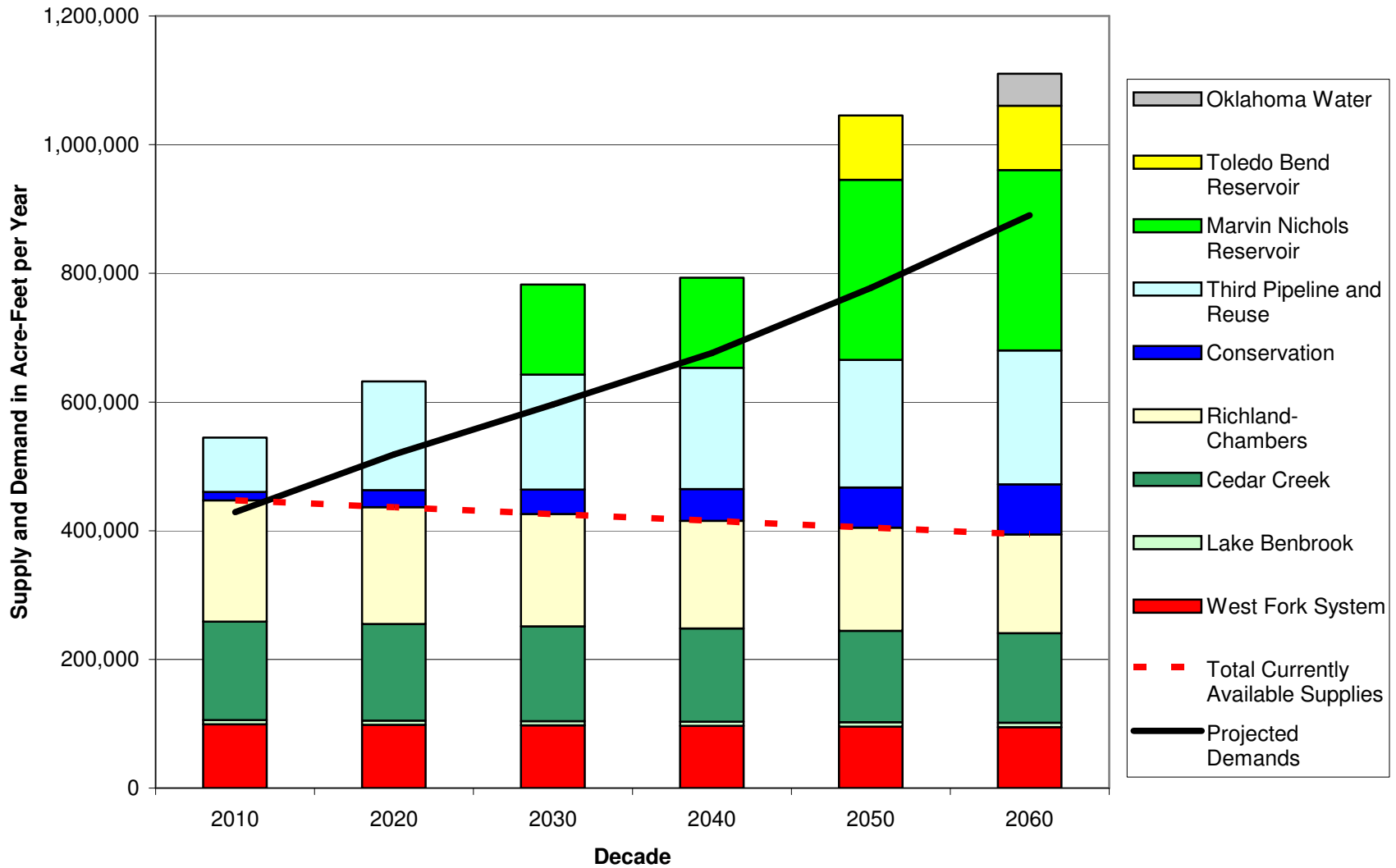
Strategies for Wholesale Water Providers – Tarrant Regional WD

- Current supplies are West Fork Reservoirs, Lake Benbrook, Cedar Creek Lake, Richland-Chambers Lake
- Recommended Strategies
 - Water conservation
 - Eagle Mountain Connection
 - Reuse & Third Pipeline from East Texas
 - Marvin Nichols Reservoir
 - Toledo Bend Reservoir
 - Oklahoma Water

Strategies for Wholesale Water Providers – Tarrant Regional WD

- Alternative strategies
 - Toledo Bend Reservoir Phase 2 (accelerated to occur before 2060)
 - Wright Patman Lake
 - Sam Rayburn/B.A. Steinhagen
 - Lake Tehuacana
 - Lake Livingston
 - System operation
 - Paluxy groundwater wells near Eagle Mountain Lake

Recommended Water Management Strategies for Tarrant Regional Water District



Strategies for Wholesale Water Providers – Tarrant Regional WD

- Total supplies in 2060 = 1,110,000 acre-feet per year
- New supplies by 2060 = 716,000 acre-feet per year
- In 2060, 286,000 acre-feet per year (26%) from conservation and reuse
- TRWD share of capital cost = \$ 3.6 billion
- Unit costs for new supplies:
 - With debt service = \$0.98 to \$1.92 per 1,000 gallons
 - After debt service = \$0.30 to \$0.77 per 1,000 gallons

Strategies for Wholesale Water Providers – North Texas MWD

- Current supplies are Lake Lavon, Lake Texoma, Lake Chapman, Wilson Creek reuse, Lake Bonham
- Recommended Strategies
 - Water conservation
 - Water treatment plant and distribution system expansions
 - Interim treated DWU supply

Strategies for Wholesale Water Providers – North Texas MWD

- Recommended Strategies (continued)
 - Additional Wilson Creek reuse
 - East Fork reuse
 - Additional Lake Lavon yield
 - Interim GTUA/Sherman supply (Lake Texoma)
 - Upper Sabine Basin
 - New Lake Texoma (with blending)

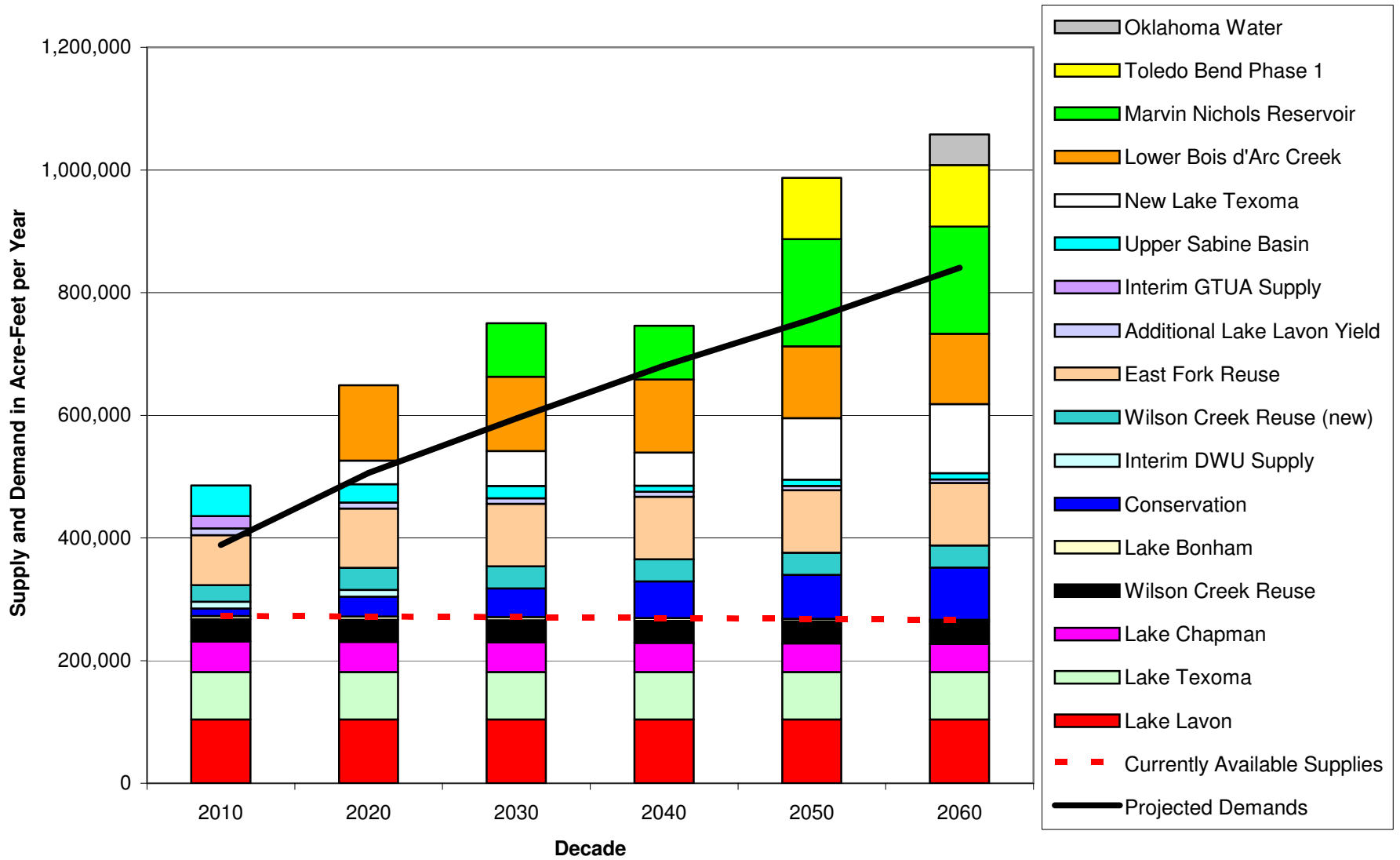
Strategies for Wholesale Water Providers – North Texas MWD

- Recommended Strategies (continued)
 - Lower Bois d'Arc Creek Reservoir
 - Fannin County Water Supply System
 - Marvin Nichols Reservoir
 - Toledo Bend Reservoir
 - Oklahoma Water

Strategies for Wholesale Water Providers – North Texas MWD

- Alternative strategies
 - Toledo Bend Reservoir Phase 2 (accelerated to occur before 2060)
 - Lake O' the Pines
 - Wright Patman Lake
 - Lake Texoma with desalination rather than blending
 - Ogallala groundwater in Roberts County (Region A)
 - Carrizo-Wilcox groundwater in Brazos County Area (Region G)
 - George Parkhouse North Reservoir
 - Lake Livingston

North Texas Municipal Water District



Strategies for Wholesale Water Providers – North Texas MWD

- Total supplies in 2060 = 1,053,000 acre-feet per year
- New supplies by 2060 = 840,000 acre-feet per year
- In 2060, 254,000 acre-feet per year (24%) from conservation and reuse
- NTMWD share of capital cost = \$ 3.9 billion
- Unit costs for new supplies:
 - With debt service = \$0.06 to \$1.96 per 1,000 gallons
 - After debt service = \$0.00 to \$0.72 per 1,000 gallons

Strategies for Wholesale Water Providers – Dallas Water Utilities

- Current supplies are Lake Lewisville/Lake Ray Roberts System, Lake Ray Hubbard, Lake Tawakoni, Lake Grapevine, direct reuse
- Recommended Strategies
 - Water conservation
 - Contract for return flows
 - Additional direct reuse
 - Connect Lake Fork
 - Lake Ray Hubbard indirect reuse

Strategies for Wholesale Water Providers – Dallas Water Utilities

- Recommended Strategies (continued)
 - Connect Lake Palestine
 - Lake Lewisville indirect reuse
 - Lake Wright Patman
 - Lake Fastrill
- Alternative Strategies
 - Additional water conservation
 - Lake Texoma
 - Toledo Bend Reservoir

Strategies for Wholesale Water Providers – Dallas Water Utilities

- Alternative Strategies (Continued)
 - Lake O' the Pines
 - Lake Livingston
 - Lake Sam Rayburn/Lake B.A. Steinhagen
 - Ogallala groundwater in Roberts County (Region A)
 - Marvin Nichols Reservoir
 - Lake Columbia
 - George Parkhouse North Reservoir
 - Oklahoma Water

Strategies for Wholesale Water Providers – Dallas Water Utilities

- Total supplies in 2060 = 1,203,000 acre-feet per year
- New supplies by 2060 = 765,000 acre-feet per year
- In 2060, 311,000 acre-feet per year (26%) from conservation and reuse
- DWU share of capital cost = \$ 2.8 billion
- Unit costs for new supplies:
 - With debt service = \$0.10 to \$1.50 per 1,000 gallons
 - After debt service = \$0.10 to \$0.36 per 1,000 gallons

Strategies for Wholesale Water Providers – Trinity River Authority

- Current supplies are TRWD, Joe Pool Lake, Lake Navarro Mills, Lake Livingston (upstream diversion), reuse
- Recommended Strategies
 - Water conservation
 - Additional water from TRWD and expanding the Tarrant County Water Project
 - Ellis County project
 - Additional water from TRWD for Freestone County Steam Electric Power

Strategies for Wholesale Water Providers – Trinity River Authority

- Recommended Strategies (continued)
 - Expansion of Dallas County direct reuse
 - Reuse for Steam Electric Power Generation in Dallas, Ellis, Freestone, and Kaufman Counties
 - Reuse from the Denton Creek WWTP for irrigation and municipal use in Denton and Tarrant Counties
 - Reuse through Joe Pool Lake
 - Additional Reuse through Joe Pool Lake for Johnson County SUD (Region G)
 - Reuse for irrigation in Ellis and Dallas Counties
 - Contract for reuse by Irving

Strategies for Wholesale Water Providers – Trinity River Authority

- New supplies by 2060 = 166,000 acre-feet per year
- 75% of new supplies from reuse
- TRA share of capital cost = \$ 393 million

Strategies for Wholesale Water Providers – Upper Trinity RWD

- Current supplies are Lake Chapman, Dallas Water Utilities, and reuse
- Recommended Strategies
 - Water conservation
 - Additional DWU supply (current contract)
 - Reuse of Lake Chapman supplies
 - Additional DWU supply associated with Chapman return flows
 - Lake Ralph Hall

Strategies for Wholesale Water Providers – Upper Trinity RWD

- Recommended Strategies (continued)
 - Indirect reuse associated with Ralph Hall
 - Marvin Nichols Reservoir
 - Additional DWU supplies
 - Oklahoma water
 - Treatment plant and distribution improvements

Strategies for Wholesale Water Providers – Upper Trinity RWD

- Alternative strategies
 - Toledo Bend Reservoir
 - Lake Wright Patman
 - Lake Texoma
 - Additional reuse

Strategies for Wholesale Water Providers – Upper Trinity RWD

- Total supplies in 2060 = 196,000 acre-feet per year
- New supplies by 2060 = 155,000 acre-feet per year
- In 2060, 53,000 acre-feet per year (27%) from conservation and reuse

Strategies for Wholesale Water Providers – Fort Worth

- Current supplies are TRWD
- Recommended Strategies
 - Water conservation
 - Additional water from TRWD
 - Water treatment plant and raw water transmission expansions

Strategies for Wholesale Water Providers – Fort Worth

- Total supplies in 2060 = 682,000 acre-feet per year
- New supplies by 2060 = 433,000 acre-feet per year
- In 2060, 176,000 acre-feet per year (26%) from conservation and reuse
- Fort Worth capital cost = \$ 657 million

Strategies for Wholesale Water Providers – Denton

- Current supplies are Lake Lewisville, Lake Ray Roberts, and reuse
- Recommended Strategies
 - Water conservation
 - Additional DWU supplies
 - Water treatment plant expansions

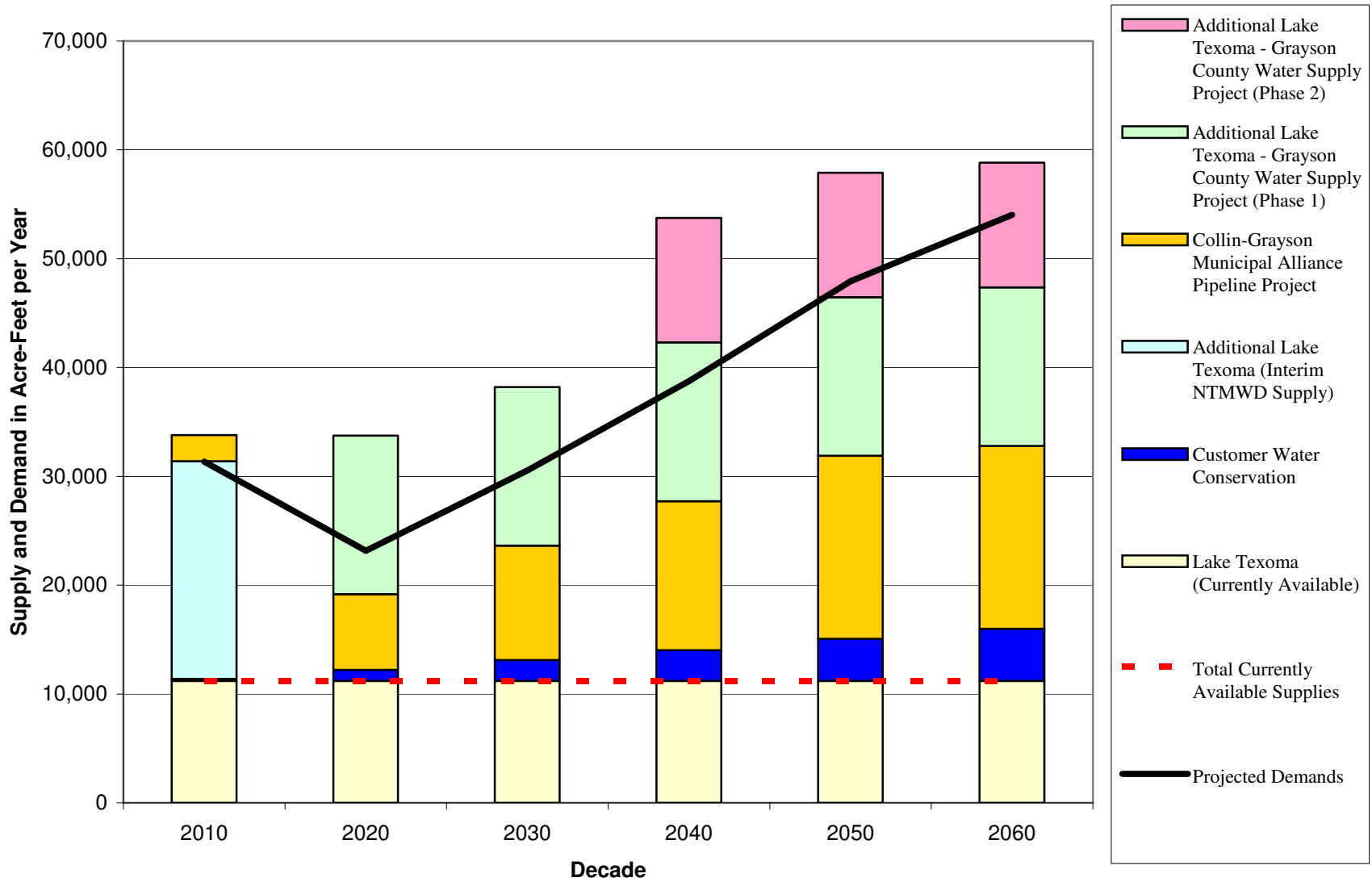
Strategies for Wholesale Water Providers – Denton

- Total supplies in 2060 = 111,000 acre-feet per year
- New supplies by 2060 = 48,000 acre-feet per year
- In 2060, 32,000 acre-feet per year (29%) from conservation and reuse
- Denton capital cost = \$ 175 million

Strategies for Wholesale Water Providers – GTUA

- Current supplies are Lake Texoma
- Recommended Strategies
 - Customer water conservation
 - Make Lake Texoma permitted use Municipal or Industrial
 - Additional Lake Texoma
 - Collin-Grayson Municipal Alliance Pipeline Project
 - Additional Lake Texoma-Grayson County Water Supply Project (Phase 1 and Phase 2)

Recommended Water Management Strategies for the Greater Texoma Utility Authority



Strategies for Wholesale Water Providers – Greater Texoma UA

- Total supplies in 2060 = 59,000 acre-feet per year
- New supplies by 2060 = 48,000 acre-feet per year
- In 2060, 5,000 acre-feet per year (8%) from conservation and reuse
- GTUA share of capital cost = \$ 256 million
- Unit costs for new supplies:
 - With debt service = \$0.18 to \$4.55 per 1,000 gallons
 - After debt service = \$0.00 to \$1.96 per 1,000 gallons

Strategies for Wholesale Water Providers – Waxahachie

- Current supplies are Lake Waxahachie, Lake Bardwell, and reuse
- Recommended Strategies
 - Water conservation
 - Purchase from Dallas Water Utilities
 - Purchase from TRA (TRWD)
 - Additional reuse
 - Water treatment plant expansions

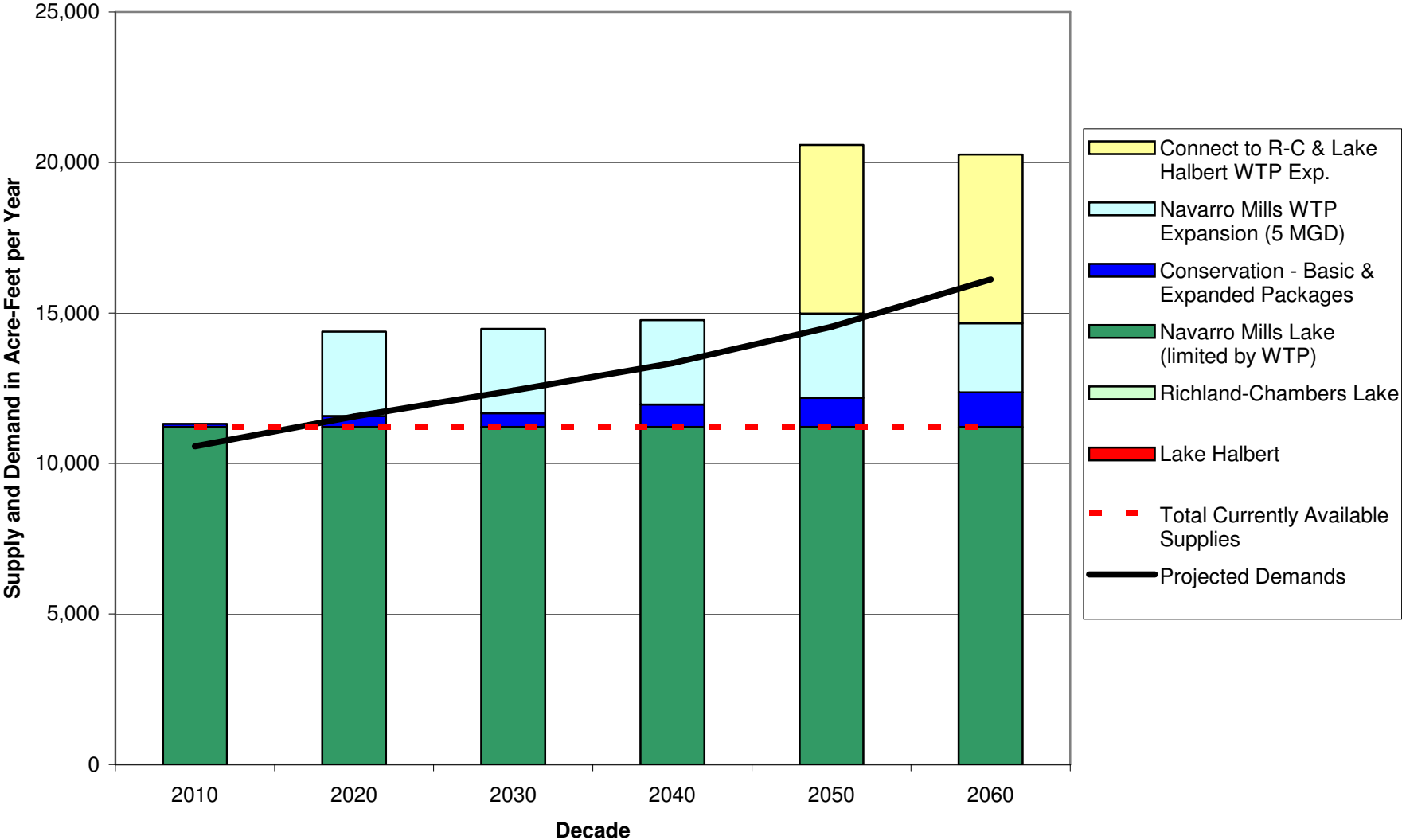
Strategies for Wholesale Water Providers – Waxahachie

- Total supplies in 2060 = 25,000 acre-feet per year
- New supplies by 2060 = 16,000 acre-feet per year
- In 2060, 9,300 acre-feet per year (38%) from conservation and reuse
- Waxahachie share of capital cost = \$ 51 million

Strategies for Wholesale Water Providers - Corsicana

- Current supply is Navarro Mills Lake and Lake Halbert (no yield)
- Recommended Strategies
 - Water conservation
 - Expand Navarro Mills Water Treatment Plant by 5 MGD
 - Expand Lake Halbert Water Treatment Plant by 10 MGD
 - Connect to Richland-Chambers Reservoir

Recommended Water Management Strategies for Corsicana



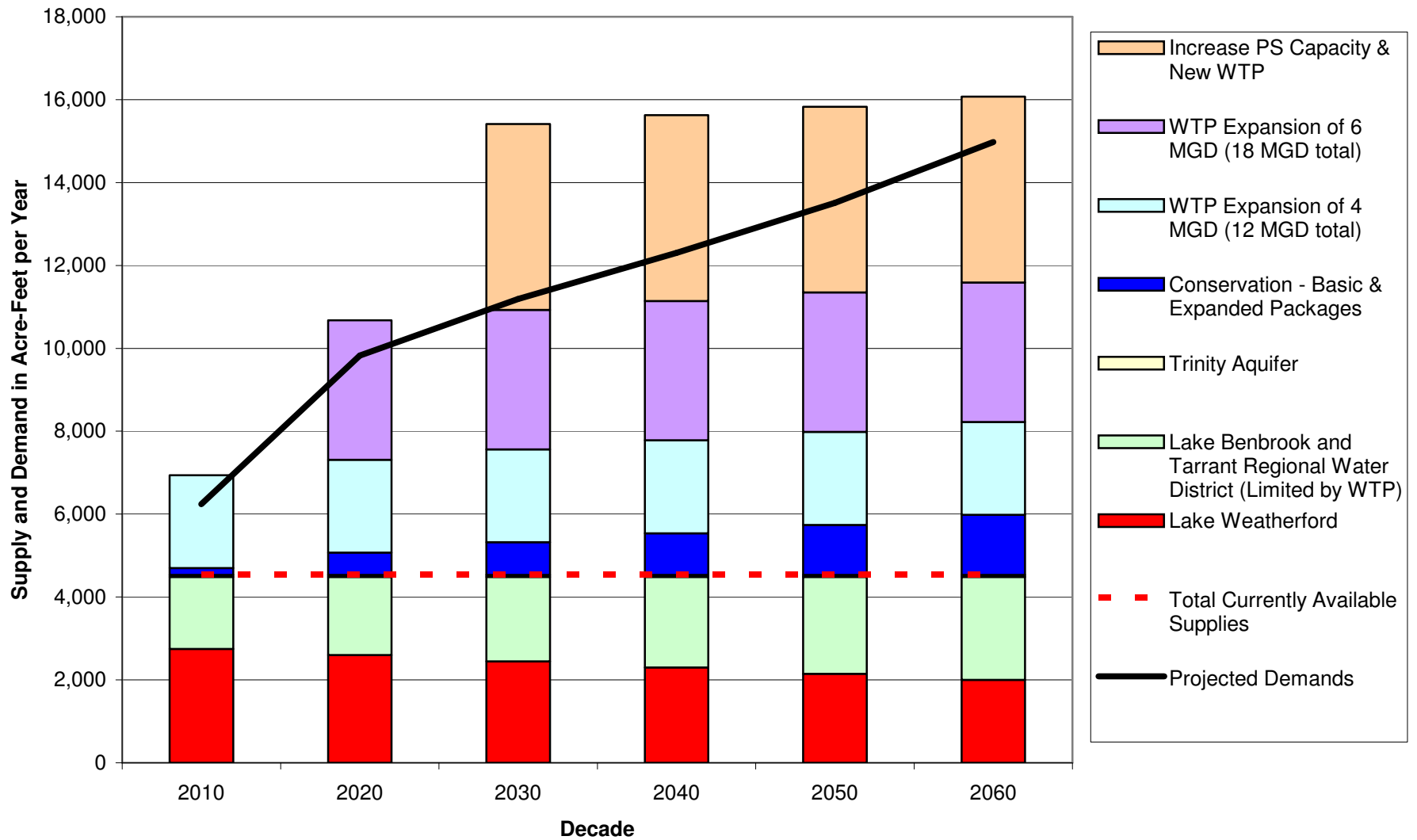
Strategies for Wholesale Water Providers – Corsicana

- Total supplies in 2060 = 20,000 acre-feet per year
- New supplies by 2060 = 9,000 acre-feet per year
- In 2060, 1,100 acre-feet per year (6%) from conservation and reuse
- Corsicana share of capital cost = \$ 38 million
- Unit costs for new supplies:
 - With debt service = \$0.27 to \$1.14 per 1,000 gallons
 - After debt service = \$0.06 to \$0.35 per 1,000 gallons

Strategies for Wholesale Water Providers – Weatherford

- Current supplies are Lake Weatherford, Lake Benbrook and TRWD, Groundwater
- Recommended Strategies
 - Water conservation
 - Supplemental Wells
 - Expansion of WTP (to 18 MGD)
 - Increase pump station capacity
 - Construct new WTP

Recommended Water Management Strategies for Weatherford



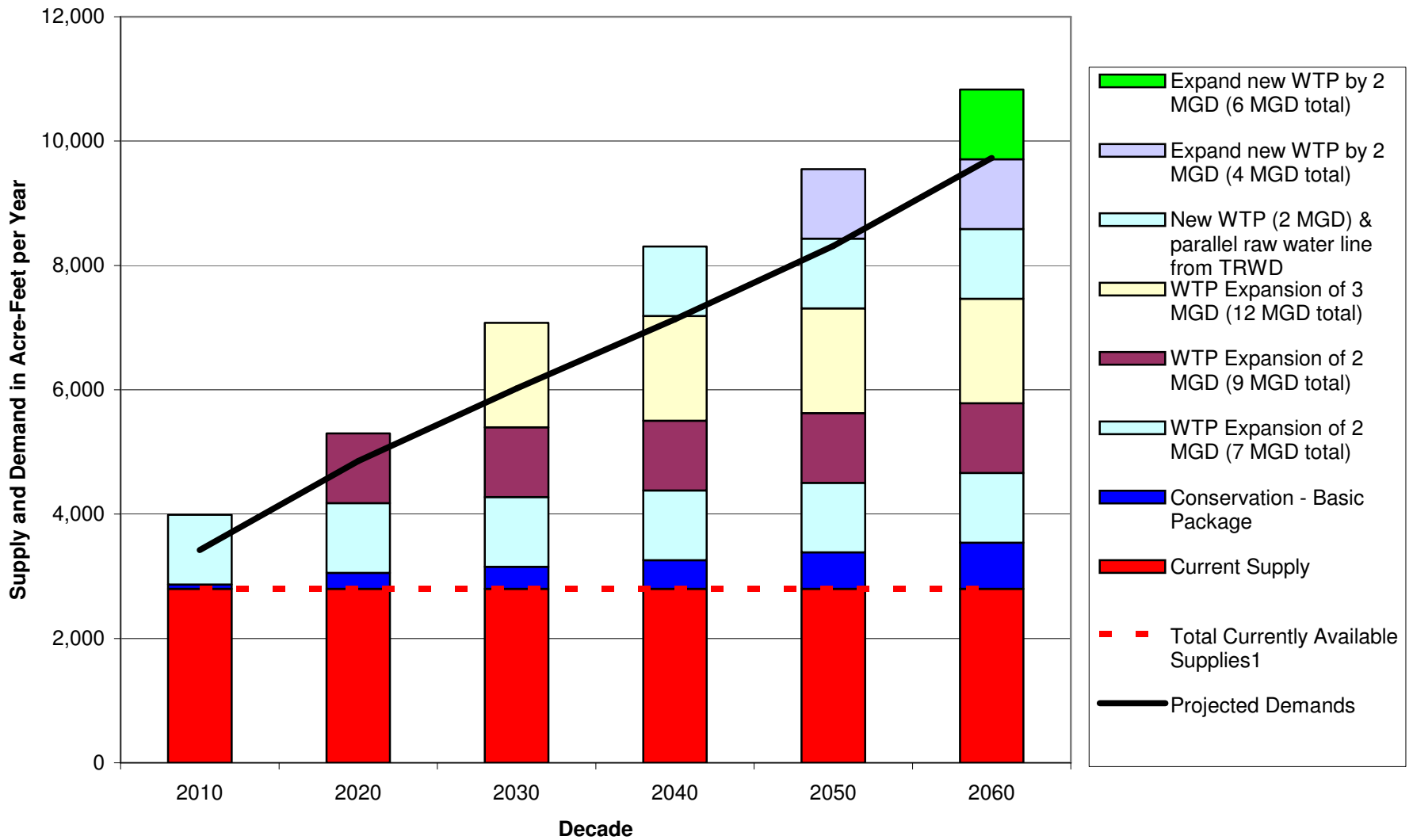
Strategies for Wholesale Water Providers – Weatherford

- Total supplies in 2060 = 16,000 acre-feet per year
- New supplies by 2060 = 11,500 acre-feet per year
- In 2060, 4,400 acre-feet per year (27%) from conservation and reuse
- Weatherford share of capital cost = \$ 39 million
- Unit costs for new supplies:
 - With debt service = \$0.52 to \$1.28 per 1,000 gallons
 - After debt service = \$0.35 per 1,000 gallons

Strategies for Wholesale Water Providers – Walnut Creek SUD

- Current supply is raw water from TRWD
- Recommended Strategies
 - Water conservation
 - WTP Expansion of 2 MGD (2010)
 - WTP Expansion of 2 MGD (2020)
 - Second Pipeline to Boyd/Rhome
 - WTP Expansion of 3 MGD (2030)
 - New WTP (2 MGD) & parallel raw water line from TRWD
 - Expansion of new WTP by 2 MGD (2050)
 - Expansion of new WTP by 2 MGD (2060)

Recommended Water Management Strategies for Walnut Creek SUD



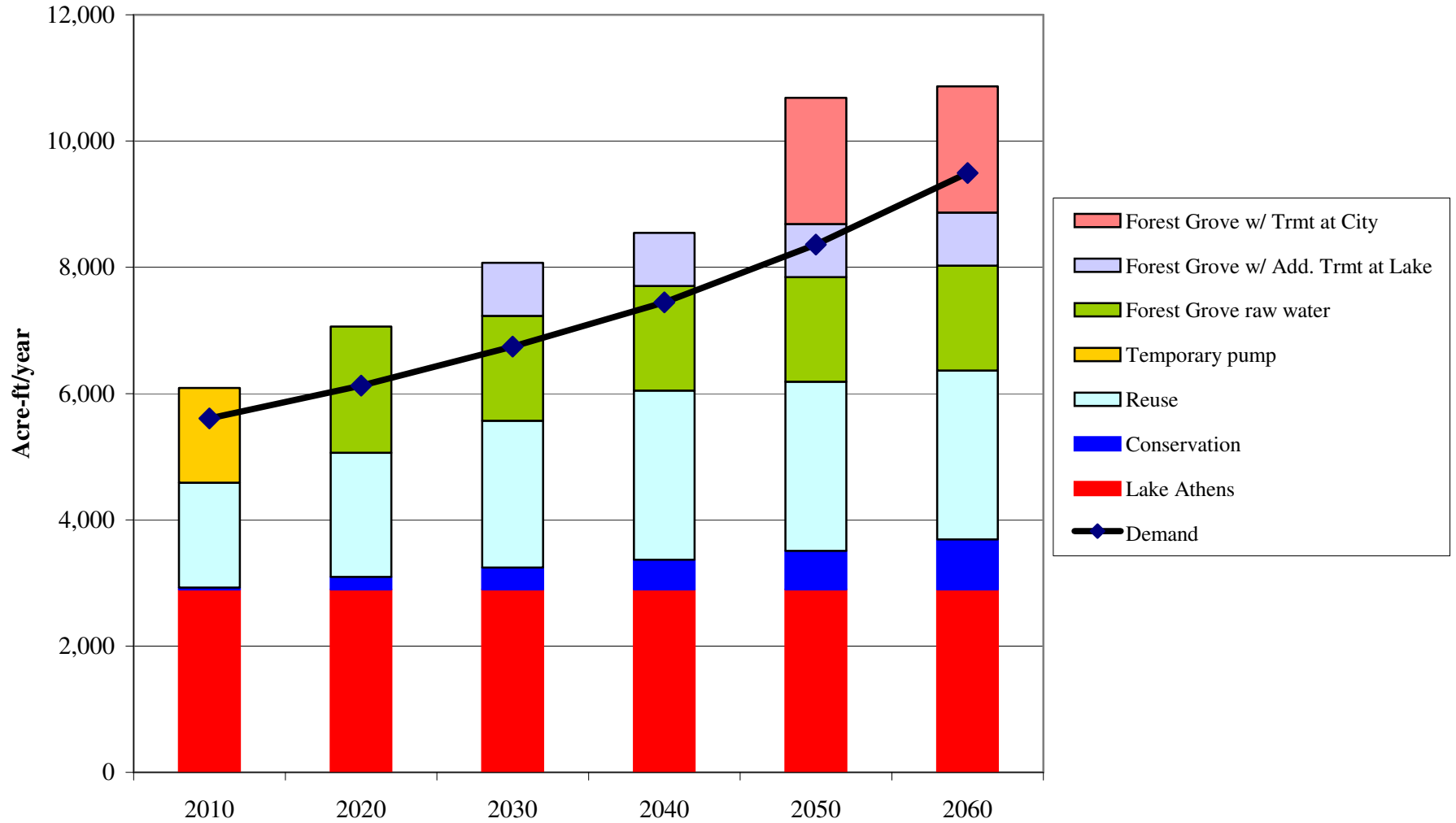
Strategies for Wholesale Water Providers – Walnut Creek SUD

- Total supplies in 2060 = 10,800 acre-feet per year
- New supplies by 2060 = 8,000 acre-feet per year
- In 2060, 2,800 acre-feet per year (26%) from conservation and reuse
- Walnut Creek SUD share of capital cost = \$ 53 million
- Unit costs for new supplies:
 - With debt service = \$1.31 to \$1.94 per 1,000 gallons
 - After debt service = \$0.35 per 1,000 gallons

Strategies for Wholesale Water Providers – Athens MWA

- Current supply is Lake Athens
- Recommended Strategies
 - Water conservation
 - Reuse through Lake Athens from the City of Athens
 - Raw water from Forest Grove Reservoir
 - Expansion of existing water treatment facilities at Lake Athens by 1.5 MGD
 - Construction of a new 3.5 MGD water treatment facility near the City of Athens
 - Temporary pumping of Lake Athens below 431 msl (in 2010) for Fish Hatchery
- Costs in 2002 Dollars - \$11,423,800

Recommended Water Management Strategies for Athens MWA



Strategies for Wholesale Water Providers – Athens MWA

- Total supplies in 2060 = 10,900 acre-feet per year
- New supplies by 2060 = 8,000 acre-feet per year
- In 2060, 3,500 acre-feet per year (32%) from conservation and reuse
- Athens MWA share of capital cost = \$ 25 million
- Unit costs for new supplies = \$1.38 to \$1.65 per 1,000 gallons

Strategies for Wholesale Water Providers – Gainesville

- Current supplies are Moss Lake and groundwater
- Recommended Strategies
 - Water conservation
 - Additional Moss Lake
 - Supplemental wells
 - Cooke County Water Supply Project
 - Reuse
 - Bed and banks authorization

Strategies for Wholesale Water Providers – Gainesville

- Total supplies in 2060 = 7,650 acre-feet per year
- New supplies by 2060 = 5,400 acre-feet per year
- In 2060, 1,150 acre-feet per year (15%) from conservation and reuse

Strategies for Wholesale Water Providers – Others

- Arlington
 - Current Supply: Lake Arlington, TRWD
 - Future Strategy: Water Conservation, Increase TRWD; Expand WTP
- Cedar Hill
 - Current Supply: Groundwater, DWU
 - Future Strategy: Water Conservation, Supplemental Wells, Increase DWU

Strategies for Wholesale Water Providers – Others

- Ennis
 - Current Supply: TRA (Lake Bardwell), reclaimed water
 - Future Strategy: Water Conservation, Indirect Reuse (Lake Bardwell), TRWD (Ellis County Project)
- Forney
 - Current Supply: NTMWD, reuse from Garland
 - Future Strategy: Water Conservation, Increase NTMWD, Increase reuse from Garland

Strategies for Wholesale Water Providers – Others

- Garland
 - Current Supply: NTMWD
 - Future Strategy: Water Conservation, Increase NTMWD
- Mansfield
 - Current Supply: TRWD
 - Future Strategy: Water Conservation, Increase TRWD, Expand WTP

Strategies for Wholesale Water Providers – Others

- Midlothian
 - Current Supply: Groundwater, TRA (Joe Pool)
 - Future Strategy: Water Conservation, Supplemental Wells, Increase TRA (Joe Pool), TRA (from TRWD), Expand WTP
- North Richland Hills
 - Current Supply: Groundwater, Fort Worth (TRWD), TRA (TRWD)
 - Future Strategy: Water Conservation, Supplemental Wells, Increase Fort Worth (TRWD) with additional pipeline, Increase TRA (TRWD)

Strategies for Wholesale Water Providers – Others

- Rockwall
 - Current Supply: NTMWD
 - Future Strategy: Water Conservation, Increase NTMWD
- Terrell
 - Current Supply: Lake Terrell, SRA, NTMWD
 - Future Strategy: Water Conservation, Increase NTMWD

Strategies for Wholesale Water Providers – Others

- Dallas County Park Cities MUD
 - Current Supply: Lake Grapevine
 - Future Strategy: Water Conservation

- East Cedar Creek FWSD
 - Current Supply: TRWD
 - Future Strategy: Water Conservation, Increase TRWD, Expand WTP

Strategies for Wholesale Water Providers – Others

- Lake Cities MUA
 - Current Supply: Groundwater, UTRWD
 - Future Strategy: Water Conservation, Supplemental wells, Increase UTRWD
- Mustang SUD
 - Current Supply: Groundwater, UTRWD
 - Future Strategy: Water Conservation, Supplemental wells, Increase UTRWD

Strategies for Wholesale Water Providers – Others

- Parker County Utility District #1
 - Current Supply: Weatherford
 - Future Strategy: Water Conservation, Increase supplies from Weatherford (TRWD sources)
- Rockett SUD
 - Current Supply: Groundwater, Midlothian, Waxahachie
 - Future Strategy: Water Conservation, Supplemental wells, DWU, TRA (Ellis County Water Supply Project)

Strategies for Wholesale Water Providers – Others

- Sabine River Authority
 - Regions D & I are developing strategies
- Sulphur River Water District
 - Region D is developing strategies

Strategies for Wholesale Water Providers – Others

- Upper Neches Municipal Water Authority
 - Region I is developing strategies
- West Cedar Creek MUD
 - Current Supply: TRWD
 - Future Strategy: Water Conservation, Increase TRWD, Expand WTP

Strategies for Wholesale Water Providers – Others

- Wise County WSD
 - Current Supply: TRWD
 - Future Strategy: Water Conservation, Increase TRWD; Expand WTP

Strategies for Water User Groups

- Identified in the county memos
- Strategies include:
 - Supplemental wells (133 user groups)
 - Overdrafting Trinity or Woodbine (20 user groups)
 - Expanded groundwater use and/or re-distribution of groundwater

Strategies for Water User Groups

- Strategies (continued)
 - Connection and/or additional purchase from wholesale water provider
 - TRWD – 123 water user groups
 - DWU – 47 water user groups
 - NTMWD – 83 water user groups
 - UTRWD – 35 water user groups
 - Other Wholesale Water Providers
 - Increased water treatment plant capacities

Agenda

- Discussion Items
 - Presentation by Environmental Group
 - Infrastructure Financing Survey
 - Communications
 - Overall Status and Next Steps

Discussion Item

Presentation by
Environmental Group

Discussion Item

Infrastructure Financing Survey

Infrastructure Financing Survey

- On April 12th, TWDB provided guidance on survey questions
- TWDB determined that Infrastructure Financing Report does not need to be included in the *Initially Prepared Plan* (June 1)
- Schedule
 - Send surveys in June. Allow entities 4 weeks to respond.
 - Follow-up phone calls in July-Aug.
 - Incorporate results into *Region C Water Plan*.

Discussion Item

Communications Update

Discussion Item

Update of Overall Status &
Next Steps

Summary of Speaker Comments- March 15 Meeting

- Summary of speaker comments were posted on the Region C web site in advance of today's meeting
- www.regioncwater.org, see meeting data for 3-15-05

Update on Overall Status and Next Steps

- Incorporate all Recommended Strategies into the chapters of the *Initially Prepared Plan*
- Release chapters of the *Initially Prepared Plan* as they are completed during May
- Compile all chapters into *Initially Prepared Plan* report for submission to the TWDB on June 1, 2005
- Database completion
- Infrastructure Financing Survey & Report

Agenda

- Other Discussion
 - Update from the Chair
 - Report from Regional Liaisons
 - Report from TWDB
 - Confirm Date & Location of Next Meeting
 - Other Discussion
 - Acknowledgement of Guests/Comments

**Thank you
for coming**

**Materials are available at
www.regioncwater.org**