North Texas Alternative Futures Environmental Assets White Paper

Vision North Texas
Understanding Our Options for Growth

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Irving, Texas

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White Paper Using Water/Natural Assets Key Indicators to Compare Scenarios

When polled at the 2008 VNT Regional Summit, participants ranked conserving the region's water supply as the most essential issue to evaluate as we assess alternative scenarios. Protecting water quality in lakes and streams was ranked as the next most essential issue to evaluate.

The Research Team has identified eight key indicators for water and natural assets. These are –
- Water use
- Waterworks, represented by water & wastewater service areas and associated major infrastructure
- Imperviousness & Runoff, intended to address impacts on stream quality and flooding
- Lake water quality, recognizing that they serve as our major water supplies
- Agricultural working lands
- Habitat diversity
- Tree canopy
- Parks & trails

Findings

The Research Team held several meetings where information collected by the participants was shared. The resulting comparison tables are attached (noting that we used a two-plus scale to represent great improvement). The format is based on similar efforts for Chicago Go to 2040 (http://www.goto2040.org/).

The first table is a summary of the overall findings. First the anticipated change between the years 2000 to 2030 under Business-As-Usual is described for each key indicator. For example, water/wastewater service areas would greatly expand, with associated substantial capital costs (Waterworks). The region's impervious area would double, impacting stream quality and increasing the chance of flooding. More than half of all new households would be built in watersheds to our lakes, stressing their quality. About 900,000 acres of current agricultural working lands would be lost. Many thousands of old trees would be bulldozed. Parks and trails would likely not keep up with this growth. And outdoor water use would continue to grow rapidly.

All four of the alternative scenarios improve on Business-As-Usual.

Connected Centers

This scenario envisions many human-scale, moderate intensity mixed use centers located throughout the region, similar to projects near DART light rails stations.

All eight water/natural asset key indicators would improve from Business-As-Usual. Higher intensity development would require less outdoor water use per capita and provide more opportunity to protect and enhance nearby "green" infrastructure. Smaller "impervious" footprints would result in smaller service areas & fewer pipes for waterworks, and could employ more innovative onsite BMP's such as porous pavements to address runoff.

Less development in lake watersheds would result in less opportunity for pollution of water supply lakes, less disturbance of habitat, and less loss of agricultural working lands. Interconnections of trails, sidewalks and sustainable public rights-of-way would greatly improve on Business-As-Usual, and would be key components of connectivity for living, working and playing.

Return on Investment

This scenario envisions that existing neighborhoods and business areas are maintained, and underutilized properties are revitalized, within the current urban service area through reinvestment in existing infrastructure. Urban development is generally not extended into currently undeveloped areas.

Four water/natural asset key indicators improve, and four improve greatly, upon Business-As-Usual. Redevelopment at higher intensity would require less outdoor water use per capita, and would replace demolished structures with those employing much more efficient indoor water devices. Less development in lake watersheds would result in less opportunity for pollution of water supply lakes. As demolition occurs, there would be much more tree replanting with many benefits to the environment, not the least of which is significant reduction in current heat island effects.

Great improvements over Business-As-Usual would be expected for waterworks, since this scenario maximizes the use of current water/wastewater facilities. Using current waterworks with more customers would provide more revenue for maintenance and rehab, and better assure the financial stability of current providers. There could be less development speculation on working agricultural lands on the fringes of the region since this scenario stresses reinvestment and infill. More investment in current city capital infrastructure would provide real opportunities for innovative approaches to water quality improvement and flood risk reduction. All cities in the urbanized area of the region, numbering more than 100, have state storm water permits.

Diverse Distinct Communities

This scenario supports revitalization and investment in the downtowns of large and small communities around the region. It creates places with a mix of housing and jobs, with infrastructure efficiently clustered rather than extending to large areas of low intensity development.

All eight water/natural asset key indicators would improve from Business-As-Usual. Each community would have its own vision for the future, with many expected to incorporate parks and trails as well as tree planting as part of preserving its unique identity.

Clustered "gray" infrastructure would provide more opportunity to protect and enhance undeveloped "green" infrastructure. Water/wastewater services would likely be provided by "community" systems rather than multi-city regional systems. Less demand for low intensity development would provide more opportunities to retain agricultural working lands and to better protect lake water quality.

Green Region

This scenario begins with the preservation of important open spaces and environmental assets. It emphasizes the inclusion of natural areas in the development pattern of all parts of the region, supports green jobs, and reduces the region's carbon footprint.

Thus it is not surprising that the Green region scenario greatly improves on Business-As-Usual for most key indicators for water/natural assets. The investment framework associated with this scenario includes an initial design of "green" infrastructure to retain natural areas onsite and to minimize imperviousness and associated impacts on water quality & flooding. It would preserve and restore vital ecosystems especially along natural corridors; seek innovative technology for low-moderate intensity development; and restore urban forests. It would maximize opportunities to preserve agricultural working lands.

It recognizes that the majority of today's residents are in cities that have signed onto climate change protocols designed to significantly reduce the region's carbon footprint. It anticipates that the nation will become less dependent on foreign oil, and will seek to build a strong economy on green jobs. Green and gray infrastructure would be planned together.

Action Tools

(work underway)

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Comparison of Scenarios by Key Indicators

Key Indicators	Change between 2000-2030 under Business As Usual	Scenario Change from Business As Usual			
		Connected Centers	Return on Investment	Diverse Distinct Communities	Green Region
FORMAT USING TRANSPORTATION EXAMPLES					
Vehicle miles traveled	VMT would increase by ...	+ Improves	+ Improves	++ Improves the most	+ Improves
Rail transit	Rail transit use ...	++ Improves greatly	- Improves slightly	- Improves slightly	- Same
WATER/NATURAL ASSETS					
Water use	Outdoor water use continues to increase	+ Improves	+ Improves	+ Improves	++ Improves greatly
Waterworks	Water/wastewater service area expands significantly	+ Improves	++ Improves greatly	+ Improves	+ Improves
Imperviousness & Runoff	Region doubles the area of impervious surfaces, impacting stream quality & floodplains	+ Improves	++ Improves greatly	+ Improves	++ Improves greatly
Lake water quality	More than half of new households into watersheds of water supply lakes, impacting their quality	+ Improves	+ Improves	+ Improves	++ Improves greatly
Ag working lands	Region loses 900,000 acres of current ag working lands	+ Improves	++ Improves greatly	+ Improves	+ Improves
Habitat diversity	Lose valued habitat as expand outward , conditions worsen	+ Improves	+ Improves	+ Improves	++ Improves greatly
Tree canopy	Lose thousands of old trees	- Improves slightly	+ Improves	- Improves slightly	++ Improves greatly

Parks & trails	Protected open spaces not keeping up with growth	++ Improves greatly	++ Improves greatly	+ Improves	++ Improves greatly

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Connected Centers Key Indicators

This scenario envisions many human-scale, moderate intensity mixed use centers located throughout the region, similar to projects near DART light rails stations.

Key Indicators	How would Connected Centers change from Business As Usual?	Degree of change	What strategies/tools in this scenario caused the change?
Water Use	+ Improves	Less use per capita	Higher intensity development would require less outdoor water use per capita
Waterworks	+ Improves	Less facilities	Smaller service areas for new water/wastewater, fewer pipes
Imperviousness & Runoff	+ Improves	Less increase	Smaller increase in imperviousness; use standard, acceptable BMP's onsite to reduce water quality/flood impacts, such as pervious concretes
Lake water quality	+ Improves	30% new HH in lake watersheds	Less development in watersheds to lakes, less opportunity for pollution of water supply lakes
Ag working lands	+ Improves	475,000 acres lost	Opportunities to preserve ag land with conservation easements, Incentives; less demand for low intensity development
Habitat diversity	+ Improves	Less land disturbed	Clustered "gray" infrastructure provides more opportunity to protect and enhance "green" infrastructure
Tree canopy	- Improves slightly	Conditions same	Some improvement in tree ordinances for connected centers
Parks & trails	++ Improves greatly	More facilities	Trails, sidewalks, sustainable public rights of way as key components of connectivity for living, working, playing; more pocket parks

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Return on Investment Key Indicators

This scenario envisions that existing neighborhoods and business areas are maintained, and underutilized properties are revitalized, within the current urban service area through reinvestment in existing infrastructure. Urban development is generally not extended into currently undeveloped areas.

Key Indicators	How would Return on Investment change from Business As Usual?	Degree of change	What strategies/tools in this scenario caused the change?
Water Use	+ Improves	Less use per capita	Redevelopment at higher intensity would require less outdoor water use per capita, replace less efficient indoor water devices
Waterworks	++ Improves greatly	Much fewer facilities	Maximizes use of current water/wastewater facilities; rehabs deteriorating pipelines; assures $ stability of current providers
Imperviousness & Runoff	++ Improves greatly	Least additional imperviousness	More investment in current city infrastructure, with more innovative approaches to reduce wq & flooding problems; cities in the urbanized area have state storm water permits
Lake water quality	+ Improves	26% new HH in lake watersheds	Less development in watersheds to lakes, less opportunity for pollution of water supply lakes
Ag working lands	++ Improves greatly	420,000 acres lost	Maximizes redevelopment/infill on lands already urbanized; less speculation on ag lands outside current urban services
Habitat diversity	+ Improves	Less land disturbed	Seeks opportunities to restore habitat when addressing current Flooding; disturbs much less land outside urban service areas
Tree canopy	+ Improves	Less heat island, more env protection	Strengthen tree ordinances; replant public rights of way; make a higher priority for regional investment as infrastructure ages
Parks & trails	++ Improves greatly	Many more facilities in urban area	Green infrastructure is given much higher priority in funding decisions; paved-over streams are day-lighted; trails are linked

Diverse Distinct Communities Key Indicators

This scenario supports revitalization and investment in the downtowns of large and small communities around the region. It creates places with a mix of housing and jobs, with infrastructure efficiently clustered rather than extending to large areas of low intensity development.

Key Indicators	How would Distinct Communities change from Business As Usual?	Degree of change	What strategies/tools in this scenario caused the change?
Water Use	+ Improves	Less increase	Higher intensity development would require less outdoor water use per capita
Waterworks	+ Improves	Less facilities	Smaller service areas for water/wastewater, fewer pipes for community water/wastewater systems
Imperviousness & Runoff	+ Improves	Less increase	Clustered infrastructure and avoiding floodplains would reduce flood risks; opportunities to use cost-effective BMP's beyond standard
Lake water quality	+ Improves	26% new HH in lake watersheds	Less development in watersheds to lakes, less opportunity for pollution of water supply lakes
Ag working lands	+ Improves	390,000 acres lost	Opportunities to preserve ag land with conservation easements, Incentives; less demand for low intensity development
Habitat diversity	+ Improves	Less land disturbed	Clustered "gray" infrastructure provides more opportunity to protect and enhance "green" infrastructure
Tree canopy	- Improves slightly	Somewhat better	More attention to trees as part of community identity
Parks & trails	+ Improves	More facilities	Each community incorporates its vision for parks and trails as part of its unique identity

Green Region Key Indicators

This scenario begins with the preservation of important open spaces and environmental assets. It emphasizes the inclusion of natural areas in the development pattern of all parts of the region, supports green jobs, and reduces the region's carbon footprint.

Key Indicators	How would Green Region change from Business As Usual?	Degree of change	What strategies/tools in this scenario caused the change?
Water Use	++ Improves greatly	Much less use	Reducing per capita water use is a high priority; a wide range of action tools would be employed, from pricing incentives to innovative BMPs to stronger regulations to max reuse to more efficient agricultural prctices
Waterworks	+ Improves	Less facilities	Smaller service areas for water/wastewater, fewer pipes; seek innovative technology for low-moderate intensity development
Imperviousness & Runoff	++ Improves greatly	Stabilizes flood risks	All new development recognizes importance of mininizing imperviousness; creative BMP's, EPA green infrastructure
Lake water quality	++ Improves greatly	27% new HH in lake watersheds	Employs iSWM integrated site design practices to the max; retains natural areas onsite, connecting greenways along stream corridors
Ag working lands	+ Improves	Up to 380,000 ac lost	Maximize opportunities to preserve ag land with conservation easements, incentives; grow more food locally
Habitat diversity	++ Improves greatly	Conditions improve	Significant attention placed on preserving and restoring habitat, esp along natural corridors, in both existing & new urban areas
Tree canopy	++ Improves greatly	Many more trees, urban forests	Restore urban forests; preserve trees as a priority in new development
Parks & trails	++ Improves greatly	Integral to green	Primary green region concept of interlinked parks & trails; maximum attention to green infrastructure