Memorandum

CITY OF DALLAS

Date December 3, 2008

Thru: Forest E. Turner
Interim Assistant City Manager

To Honorable Members of the Quality of Life Committee: Pauline Medrano, Chair; Vonciel Jones Hill, Vice Chair; Carolyn R. Davis, Angela Hunt, Sheffie Kadane, David A. Neumann, Steve Salazar

Subject Roadmap to Tree Planting Briefing

Attached, is the "Roadmap to Tree Planting" briefing which will be presented to the Quality of Life Committee on December 9, 2008.

If you have any questions, please call me 214-670-4071.

Paul D. Dyer, Director
Park and Recreation Department

c: Honorable Mayor and Members of the City Council
Mary K. Suhm, City Manager
Deborah Watkins, City Secretary
Thomas P. Perkins, Jr., City Attorney
Craig Kinton, City Auditor
Judge C. Victor Lander, Judiciary
Ryan S. Evans, First Assistant City Manager
Ramon F. Miguez, P.E., Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager
A.C. Gonzalez, Assistant City Manager
Dave K. Cook, Chief Financial Officer
Helena Stevens-Thompson, Assistant to the City Manager

Texas Trees Foundation

Urban Renewal

"Roadmap to Tree Planting"

A New Innovative Approach to an Old Problem

Quality of Life Committee
December 9, 2008

Janette Monear, Executive Director
Texas Trees Foundation

Matt Grubisich, Urban Forester
Urban Renewal

Credits: Morgan Grove (USFS), Jarlath O'Neil-Dunne (University of Vermont), Dr. Greg McPherson (Center for Urban Forest Research) , Ian Hanou & Jason San Souci (NCDC Imaging), and David Hitchcock (Houston Advance Research Center), Texas Forest Service.

Key Focus Area
Culture, Arts & Recreation

Texas Trees Foundation

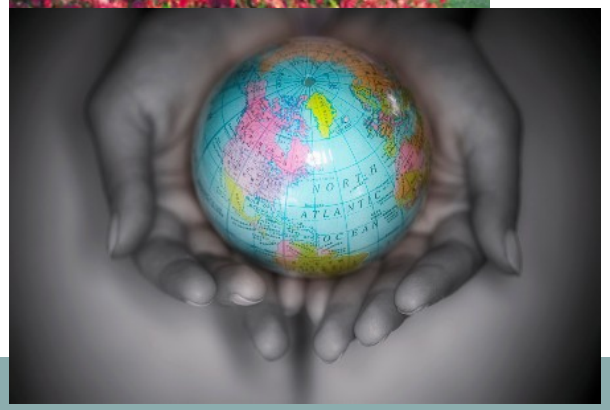
HOT TOPICS !!

Urban Renewal

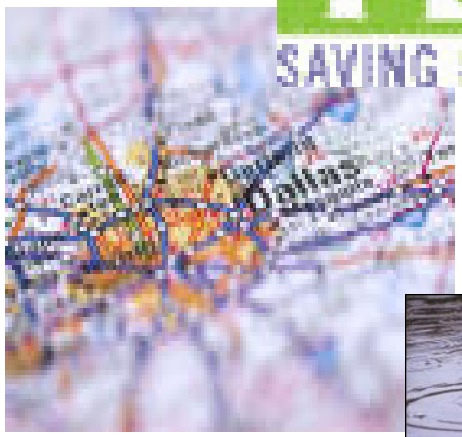
SAVE WATER
NOTHING CAN REPLACE IT™
Click here to view this site in English.

AHORRE AGUA
¡NADA PUEDE REEMPLAZARLA!™
Oprima aquí para ver esta página del web en español.

DALLAS WATER UTILITIES



TAKE A LOAD OFF, TEXAS
SAVING ENERGY MAKES CENTS



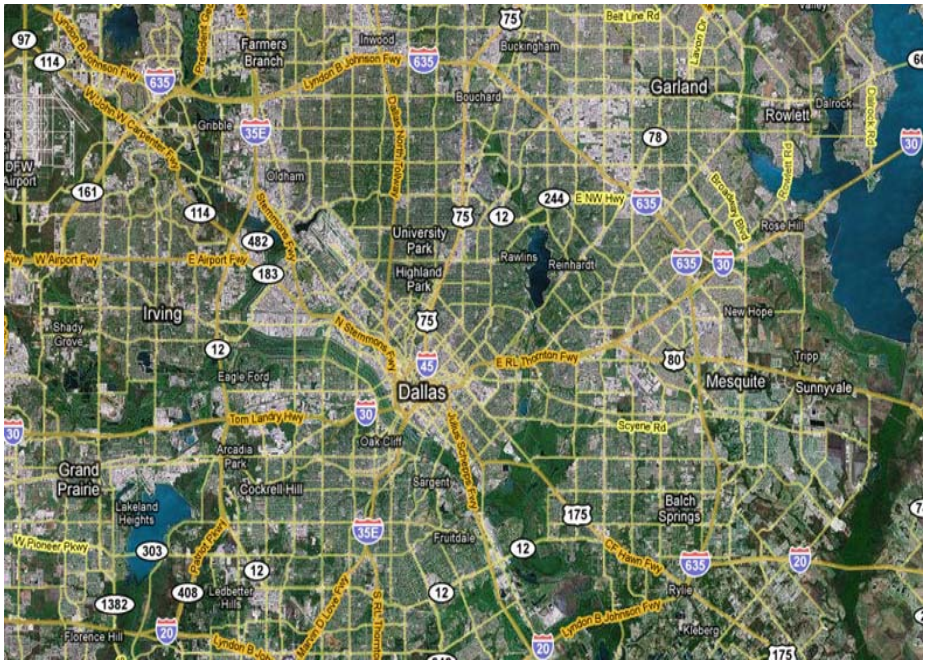
CITY of DALLAS
STORM WATER MANAGEMENT
IT GOES WITH THE FLOW
KEEP IT CLEAN

THE TRINITY

Green Dallas
...building a greener city
www.GreenDallas.net

Urban Tree Canopy

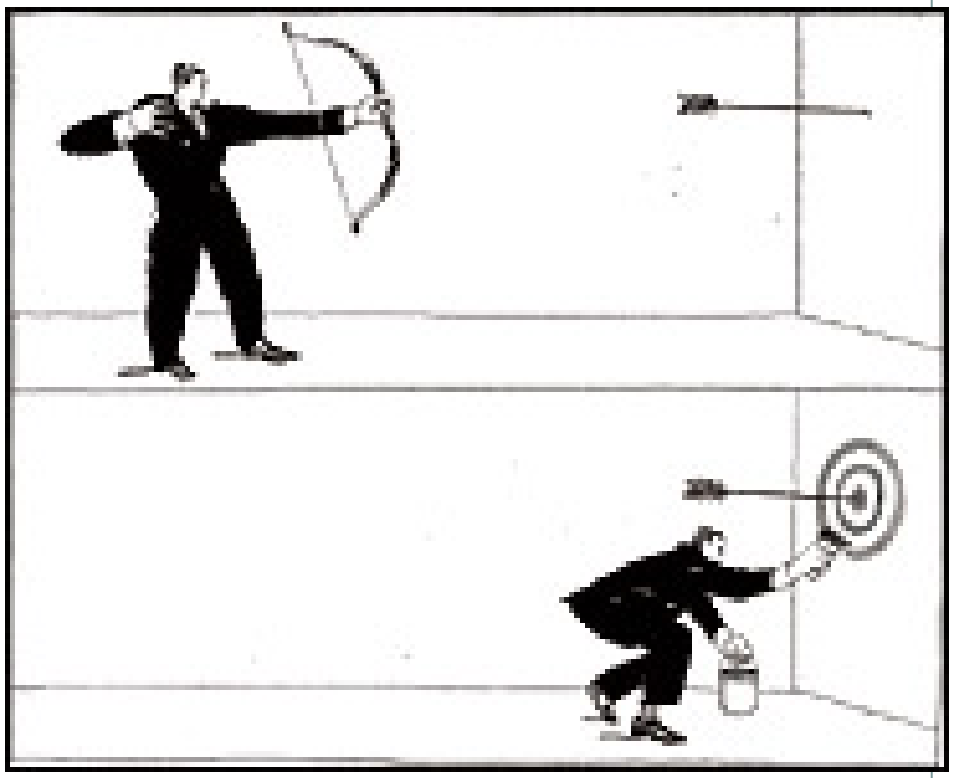
Urban Renewal



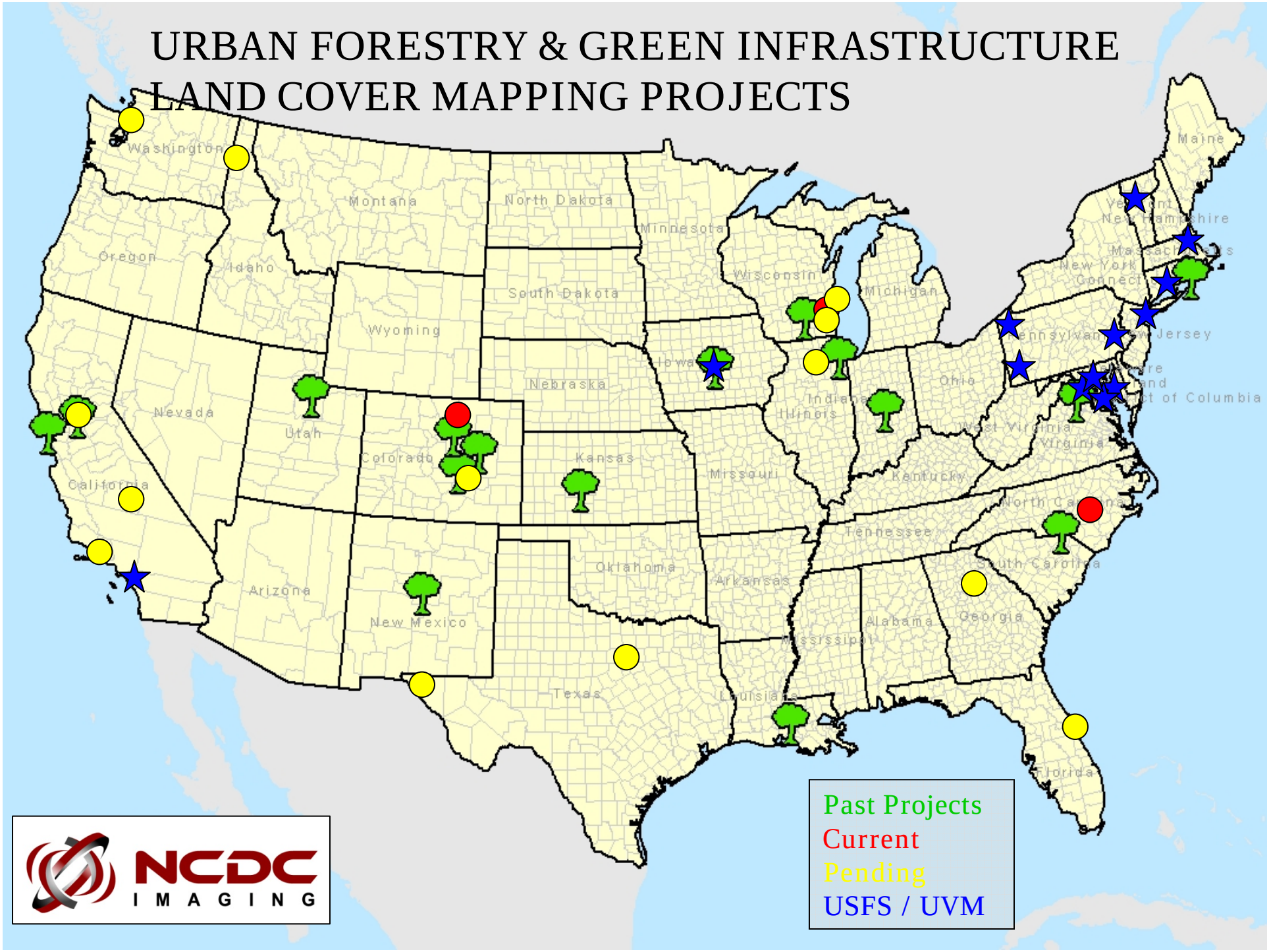
Texas Trees Foundation

The Need for UTC Modeling

- What was the target?
- Need for high-resolution data and analysis
- A million trees?
  - Salt Lake County, Denver, Los Angeles, Indianapolis
- Air & Water Quality
  - NYC, Chesapeake Bay Program (Baltimore, Annapolis, Washington, D.C.)



URBAN FORESTRY & GREEN INFRASTRUCTURE LAND COVER MAPPING PROJECTS



NCDC IMAGING

Los Angeles Study (CUFR)

Goal: determine if there is space for 1 million plantings

Data Sources: LU/LC, QuickBird satellite imagery and aerial photography

Assumptions: no planting within 2-ft of impervious surfaces, 50% of spaces eliminated, minimum planting area needed for small, medium and large trees

Outcome: Yes, 1.3M in fact!

USFS Center for Urban Forest Research (CUFR) and University of California at Davis

CUFR Los Angeles Study

Focus on # of trees and less on area

Core land use and land cover (LULC) data very similar

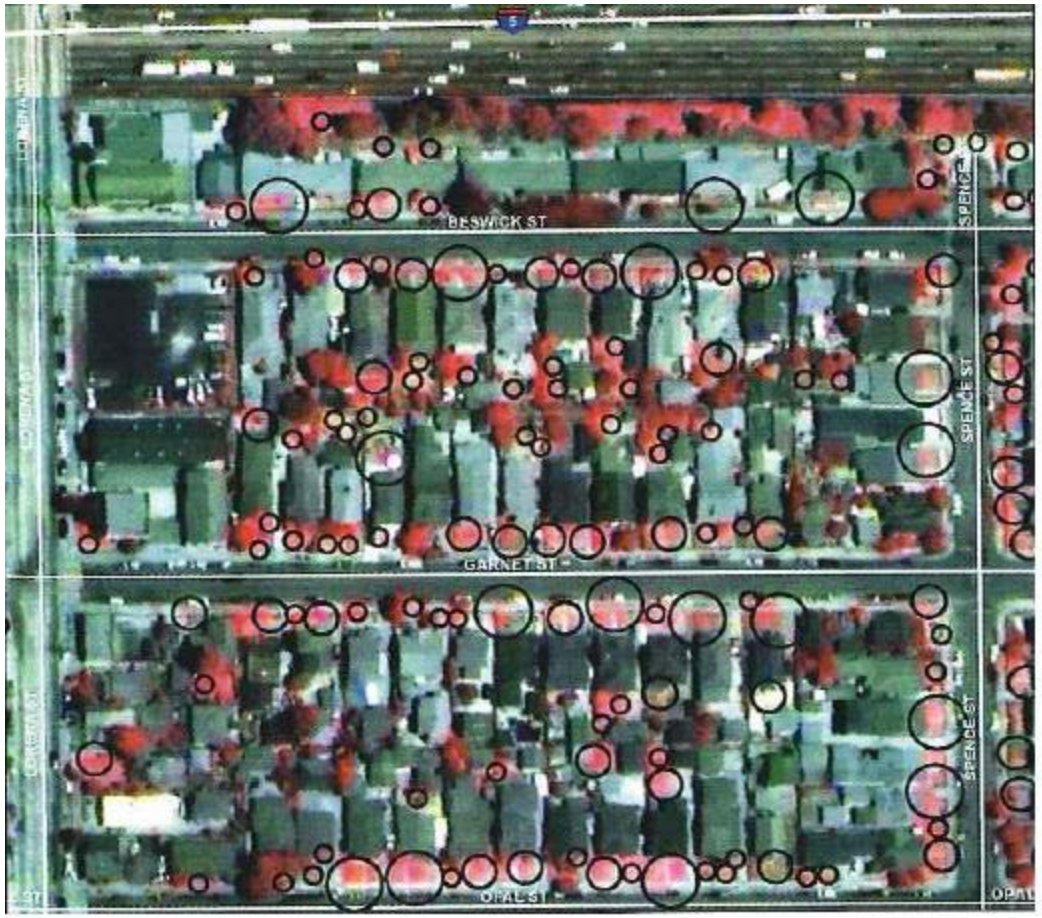
<u>Tree Size at Maturity</u>

Small (15’ diameter)

Medium (30’ diameter)

Large (50’ diameter)

Small, Medium & Large Tree Planting Spaces



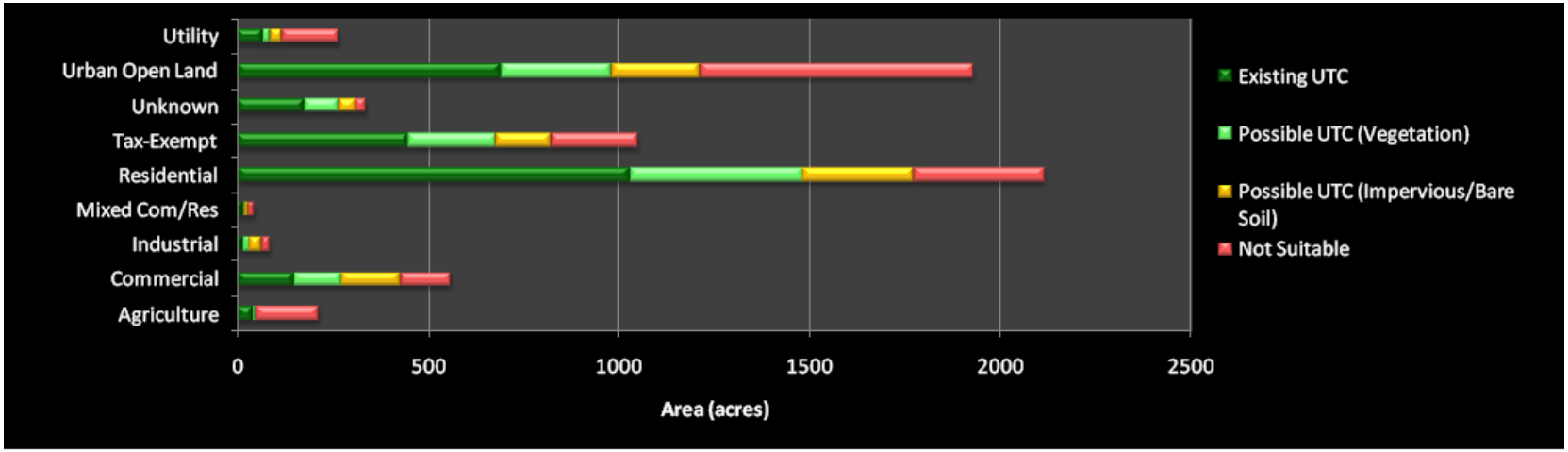
A Report on the City of Burlington's Existing and Possible Urban Tree Canopy

Urban Renewal

Goal: Provide detailed information on the community's urban forest.

Outcomes:

- **43% tree cover**
- **32% of land cover could conceivably support tree cover**
- **Of the 32% the majority falls into residential**



Green Infrastructure, Denver, CO

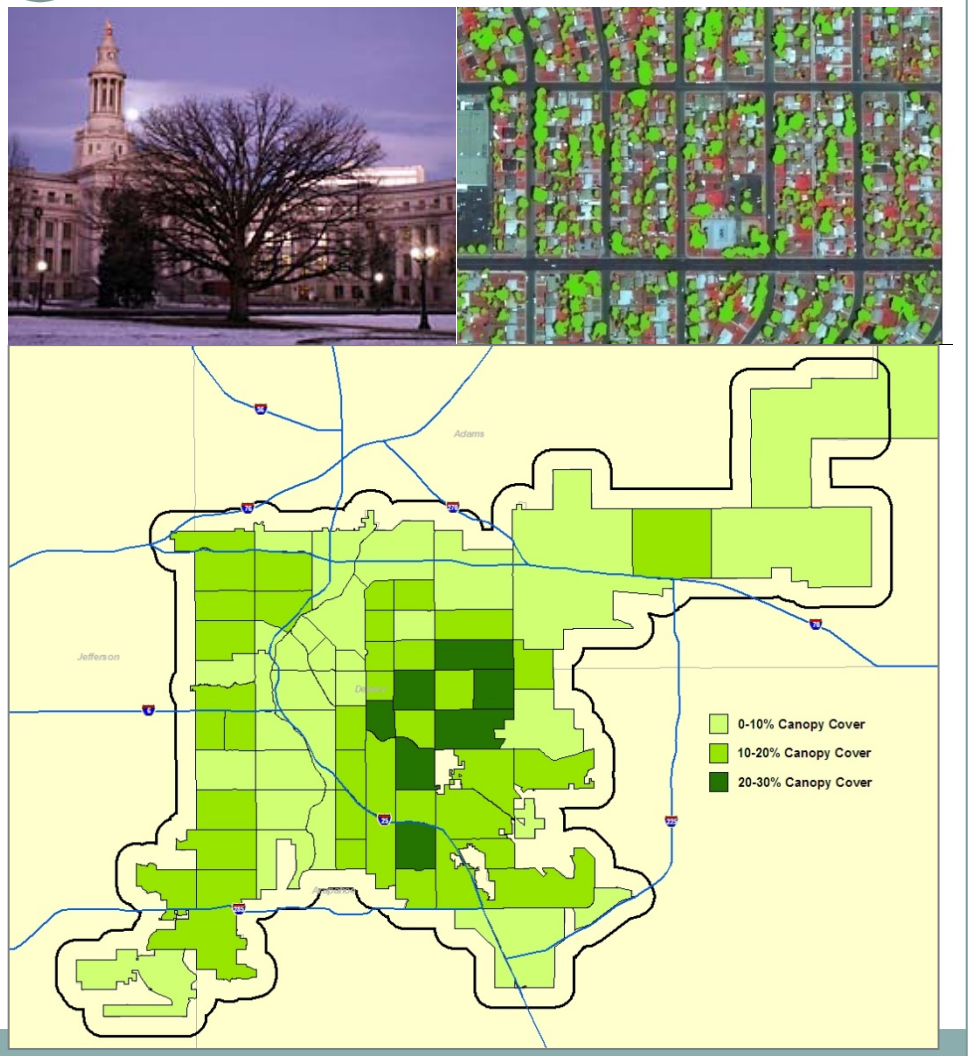
Features

Map urban tree canopy by neighborhood, conifer vs. deciduous composition, all in GoogleEarth environment

Benefits

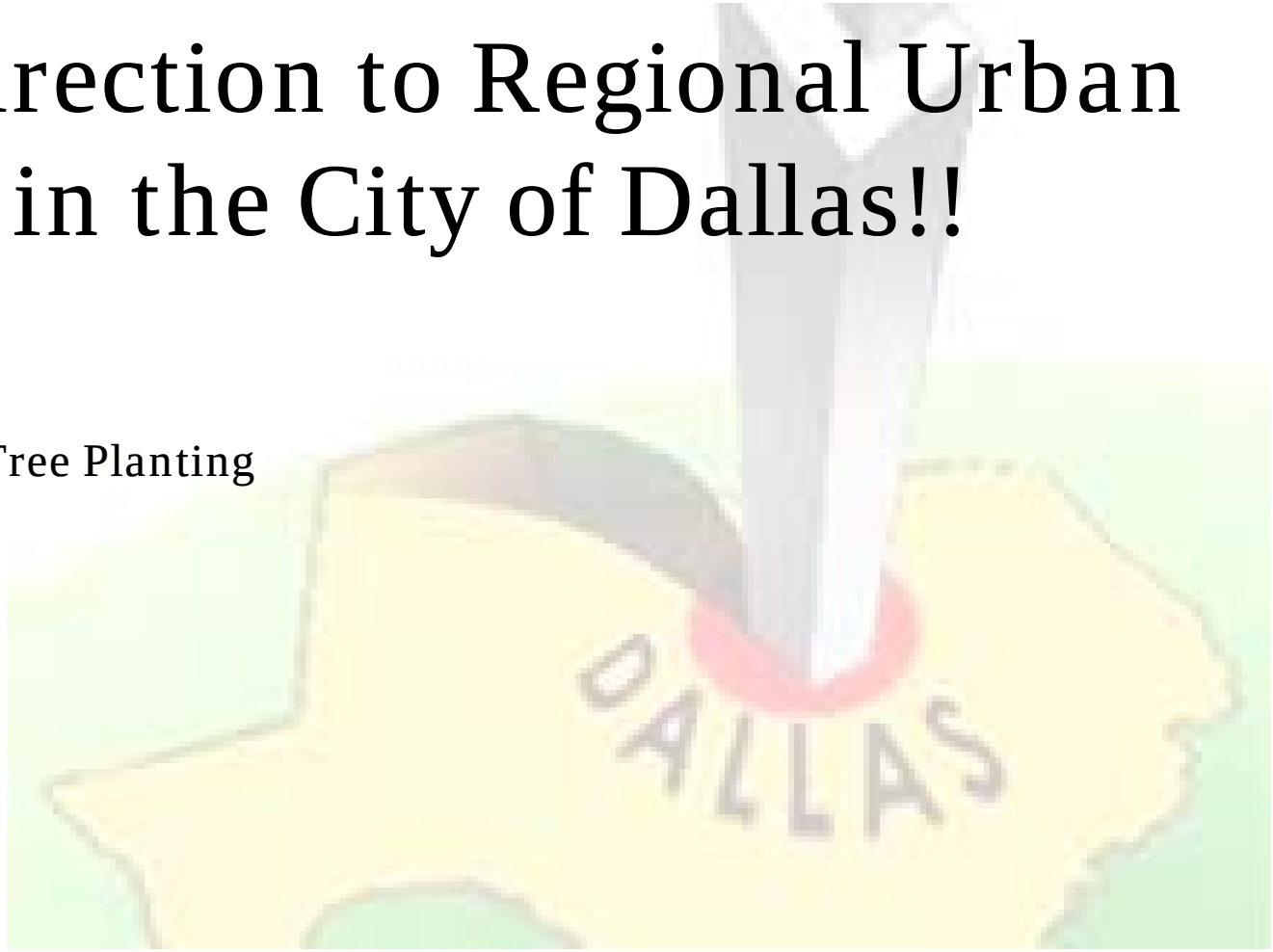
First “green data layer” in City’s GIS database, easily communicable tool to engage the public participation and education process

Area: 120 sq mi



A New Direction to Regional Urban Planning in the City of Dallas!!

1. Partnerships
2. “Roadmap” to Tree Planting
3. Data Sources
4. Outcomes
5. What’s Next



Successful Partnerships Was Key!

Dallas
Serving you!

Roadmap to Tree Planting

Texas Trees Foundation

Step 1:
Where are there no Trees?

Step 2:
Where can we plant Trees?

Step 3:
Where is the ***best*** place to plant the trees?

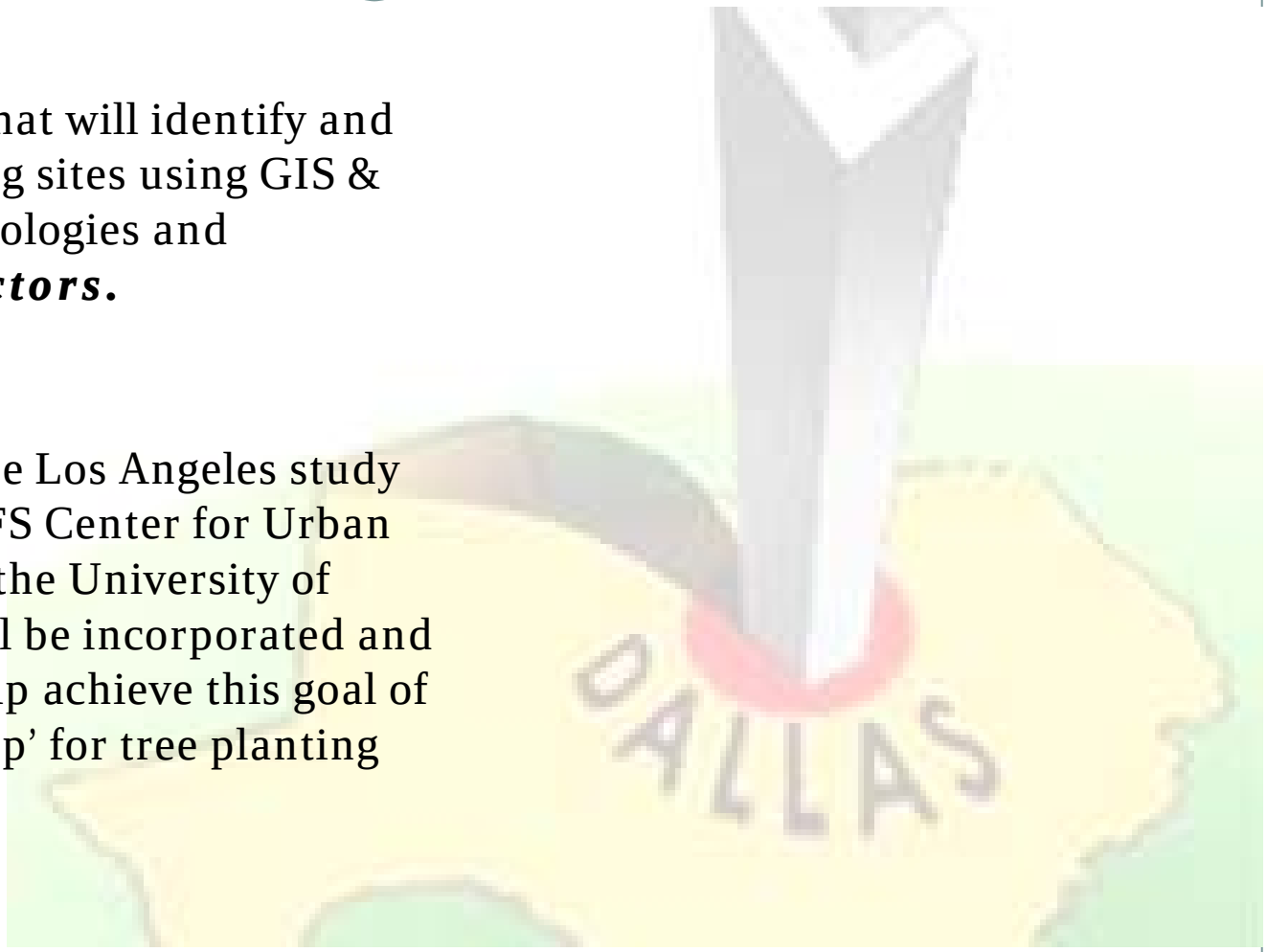
Roadmap to Tree Planting

Goal:

To develop a model that will identify and prioritize tree planting sites using GIS & remote sensing technologies and ***environmental factors.***

How:

Functionality from the Los Angeles study developed by the USFS Center for Urban Forest Research and the University of California - Davis will be incorporated and expanded upon to help achieve this goal of developing a 'roadmap' for tree planting success in Dallas.



Roadmap to Tree Planting

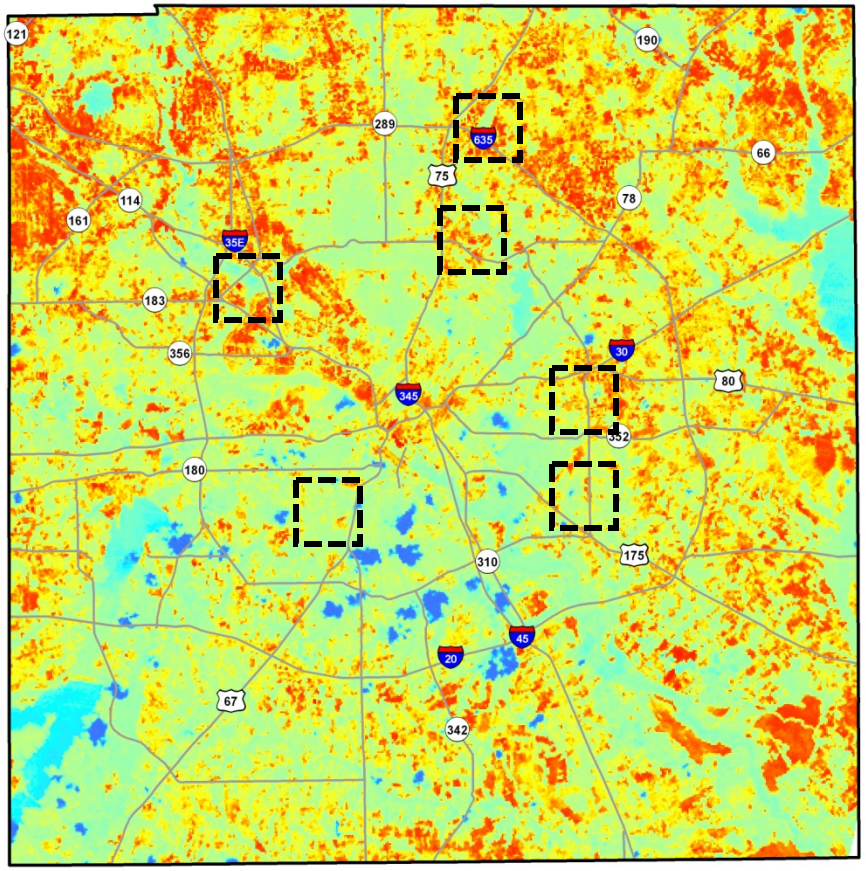
Texas Trees Foundation

Phase 1: Sample Sites

1)Too expensive to get initial funding for entire city.

2)Five 1 square mile sample sites where chosen to show the benefits of the 'Roadmap'.

3) Sites chosen based on:
- •Location
- •Land use type
- •Hot spot data



Data Sources

GIS Data

Land Use / Land Cover (LULC) – LU readily available, not LC

Planimetrics –parcels, building footprints, streets, public ROW, utilities, parking lots

Target Geographies – neighborhoods, districts

Inventories – wetlands, floodplains, tree/forest, natural area sites, soils

Other – GPS, survey data, City of Dallas and NCTCOG

Remotely Sensed

Aerial –

FSA NAIP, City/County, hyperspectral (HSI)

Satellite –

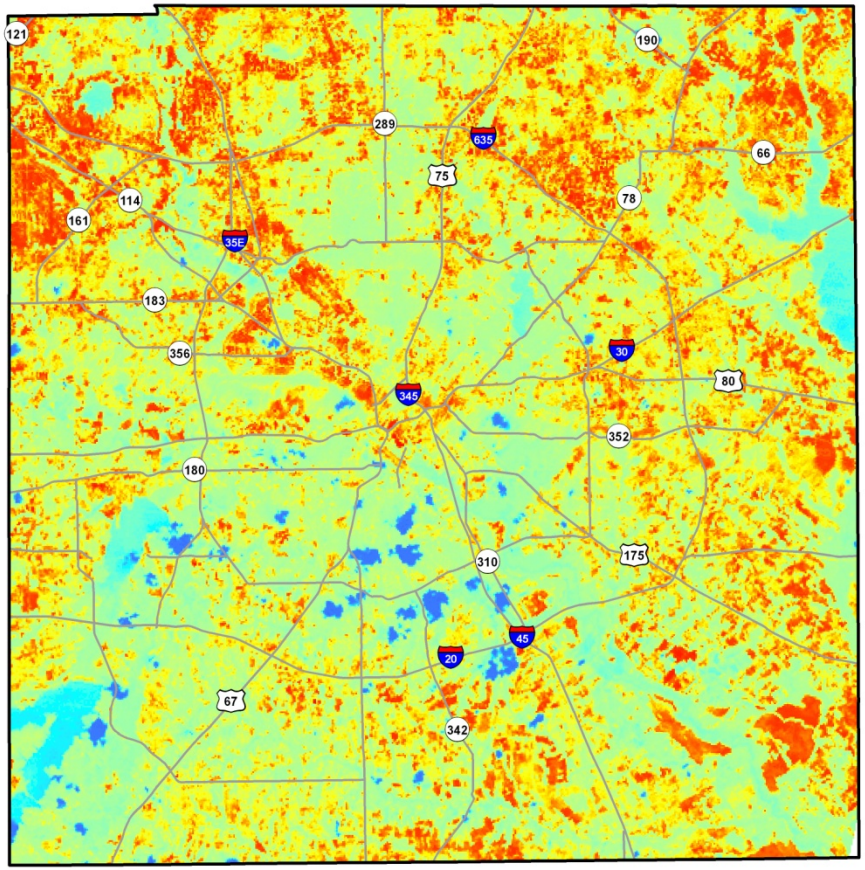
DigitalGlobe; QuickBird (2-ft)

Landsat / SPOT (2.5m – 30m)

Elevation –

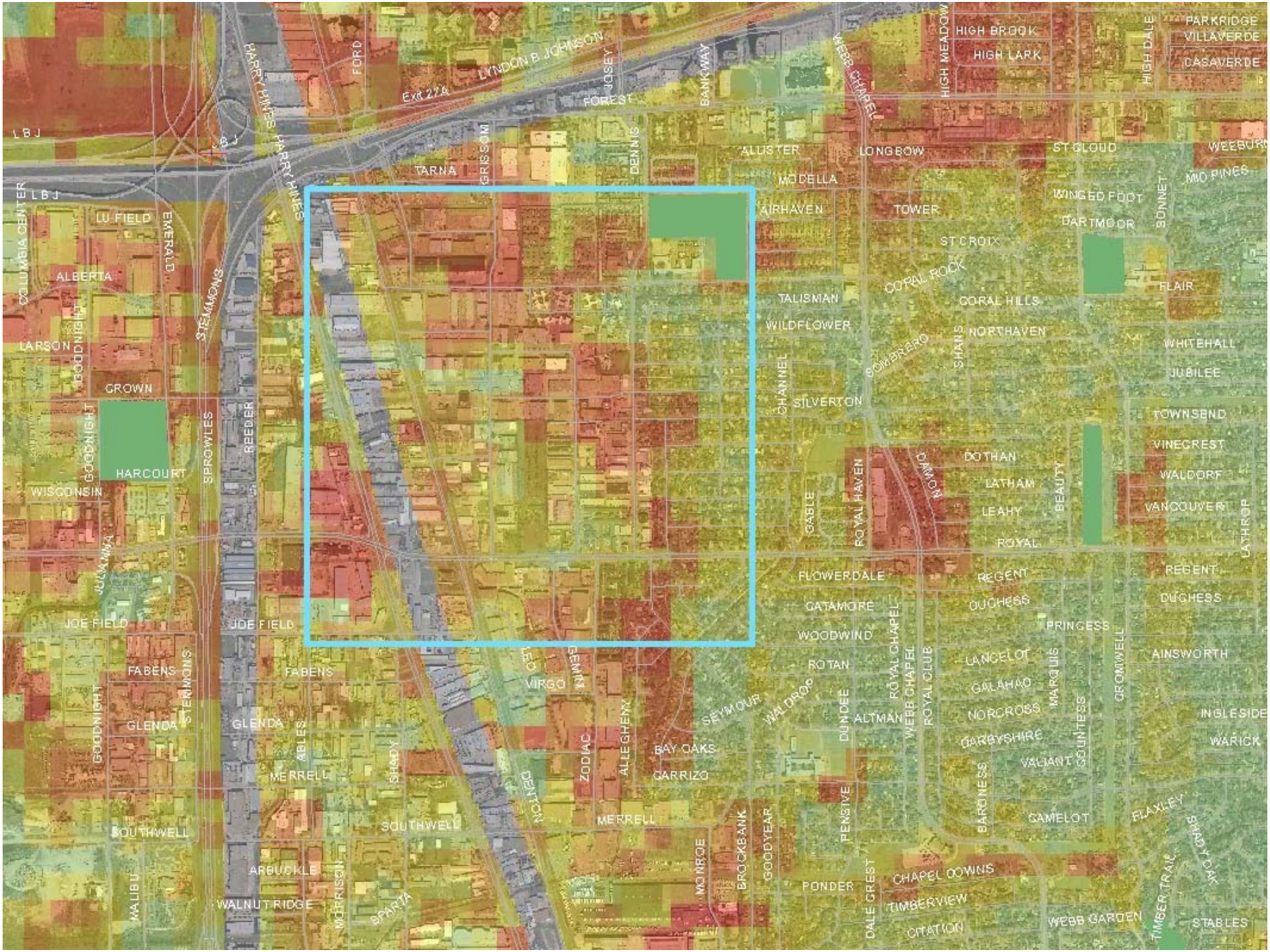
LiDAR

Data Sources



Hot Spot Data

- City of Dallas Office of Environmental Quality (OEQ)
- Houston Advanced Research Center (HARC)
- Funding through EPA
- Big Piece of the Puzzle!!!


LBJ
LYNDON B JOHNSON
Exit 27A
HARRY HINES
FORD
JOSEY
FOREST
BANKWAY
DENNIS
GRISSOM
TARNA
ALLISTER
LONGBOW
MODELLA
AIRHAVEN
TOWER
HIGH MEADOW
HIGH BROOK
HIGH LARK
HIGH DALE
PARKRIDGE
VILLAVERDE
CASAVERDE
ST CLOUD
WEEBURN
MID PINES
WINGED FOOT
DARTMOOR
SONNET
ST CROIX
CORAL ROCK
CORAL HILLS
FLAIR
TALISMAN
WILDFLOWER
SOMBRERO
SHANS
NORTHAVEN
WHITEHALL
JUBILEE
TOWNSEND
VINECREST
WALDORF
VANCOUVER
LATHROP
CHANNEL
SILVERTON
GABLE
ROYAL HAVEN
DOWN
DOTHAN
LATHAM
LEAHY
BEAUTY
ROYAL
REGENT
DUCHESS
PRINCESS
AINSWORTH
INGLESIDE
WARICK
FLOWERDALE
GATAMORE
WOODWIND
ROTAN
LANCELOT
GALAHAD
NORCROSS
DERBYSHIRE
VALIANT
COUNTESS
MARQUIS
CROMWELL
ROYAL CHAPEL
WEBB CHAPEL
ROYAL CLUB
DUNDEE
ALTMAN
WALDROP
SEYMOUR
BAY OAKS
GARRIZO
ZODIAC
ALLEGHENY
VIRGO
DENTON
BENT
PENSIVE
BARONESS
CAMELOT
BLAXLEY
SHADY OAK
TIMBER TRAIL
STABLES
DALE CREST
CHAPEL DOWNS
TIMBERVIEW
CITATION
PONDER
WEBB GARDEN
BROCKBANK
GOODYEAR
MONROE
MERRELL
SOUTHWELL
ARBUCKLE
WALNUT RIDGE
MORRISON
SPARTA
MALIBU
ABLES
SHADY
GLENDA
FABENS
STEMMONS
GOODNIGHT
JOE FIELD
JUANITA
HARCOURT
WISCONSIN
LARSON
ALBERTA
LU FIELD
EMERALD
COLUMBIA CENTER
SPROWLES
REEDER
CROWN

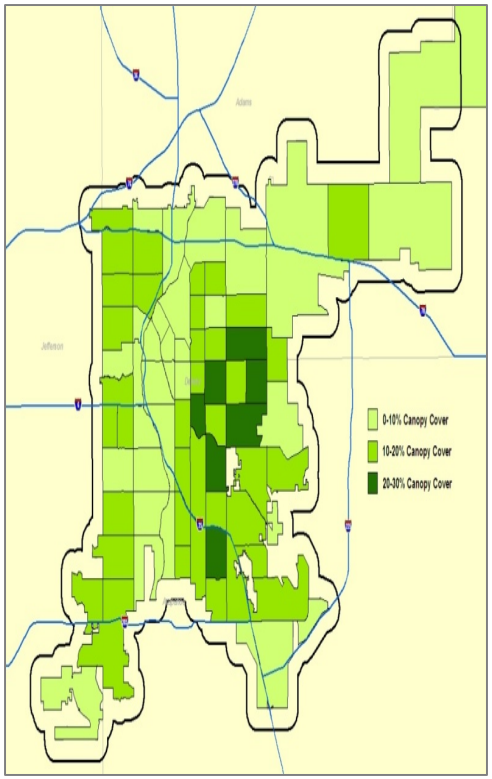
Outcomes

Outcome 1:

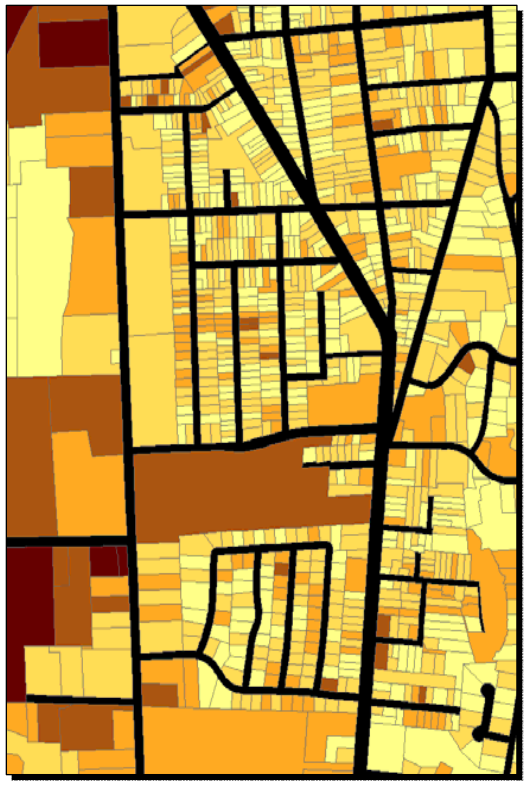
1.Using Land Cover data an Analysis of the Existing Urban Tree Canopy (UTC).

2.Determine & illustrate the Existing, Possible & Potential tree canopy and planting space for individual parcels, land use and as a whole for each of the five 1 - square mile areas.

3.Portions of this model are based on tools developed by the U.S. Forest Service.



Existing UTC



Possible UTC

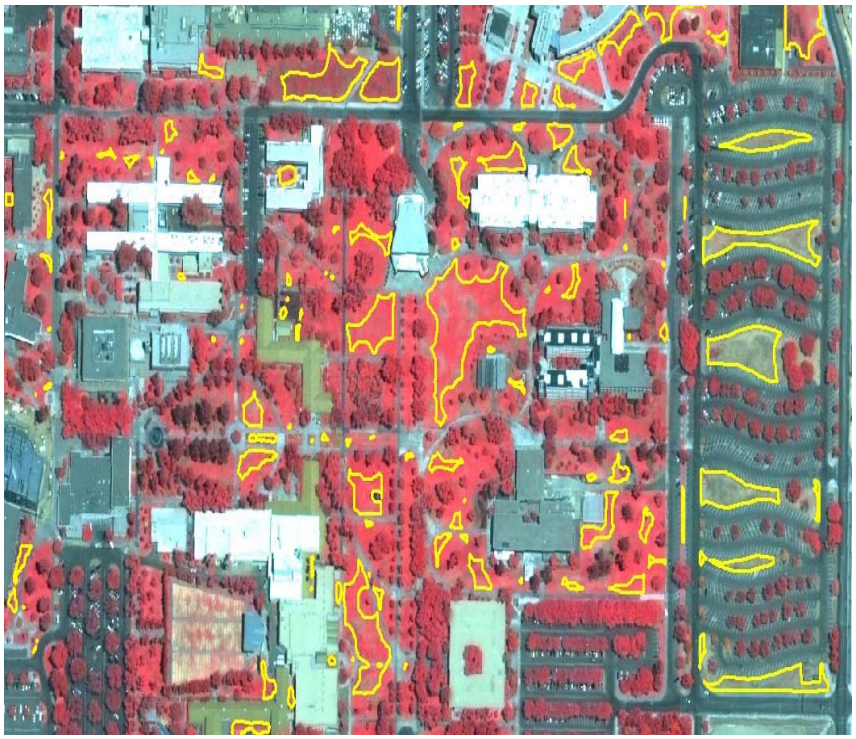
Outcomes

Urban Renewal

Outcome 2:

1.Locating, quantifying and assessing potential tree planting sites.

2.This utilizes a new model developed for the Los Angeles study to intelligently map available tree planting space in urban settings using high - resolution remotely sensed data and geospatial rule sets.



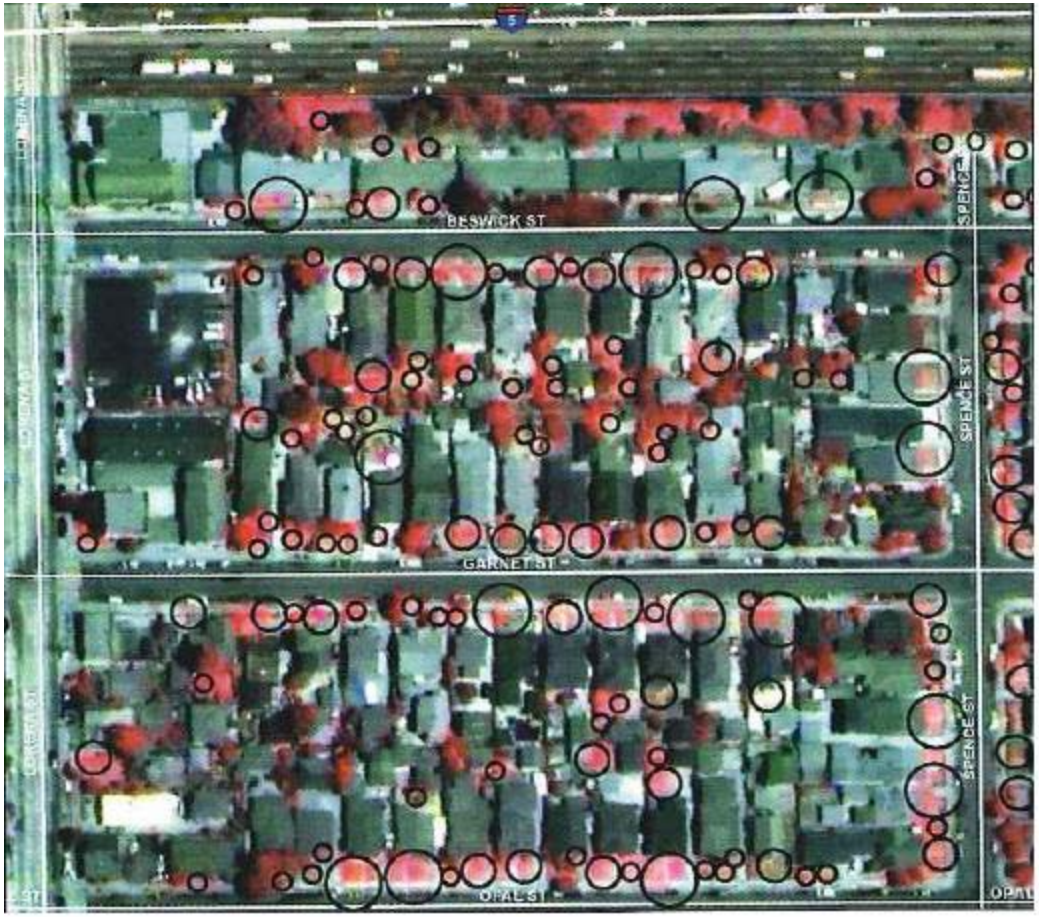
The model involves a computer program created by the Center for Urban Forest Research (CUFR) and Qingfu Xiao of the University of California at Davis.

Outcomes

Outcome 3:

1.The model also identifies small, medium and large planting space.

2.This is critical to realistic planting scenarios, and starts by allocating spaces for large trees, then medium and lastly small trees.



Outcomes

Criteria for Tree Planting in Model

•The crown size diameter at maturity for small, medium and large trees will be 15', 30, and 50' respectively

• A 2 - ft buffer around impervious surfaces will be applied to avoid conflicts with sidewalks, driveways and buildings

• The minimum size requirement for small, medium and large tree planting spaces will be 16ft^2, 36ft^2 and 100ft^2 respectively

• Various percent reduction scenarios can be applied to eliminate planting sites (e.g. 10%, 25%, 50%) due to social, functional, economic and other constraints

• Using power lines (if available), we will exclude medium and large trees from inclusion in these areas to avoid conflict with the power lines as trees grow

Outcomes

Outcome 4: Prioritize Potential Tree Planting Sites

1.A series of data overlays will be incorporate.

2.Each tree planting site or area will be attributed by the level or presence / absence of heat islands, watershed boundaries, transportation corridors, parks, soils and other data.

3.Each site can now be queried to determine the optimum planting area by a mix of environmental factors associated with it.

Outcomes

Outcome 4: Prioritize Potential Tree Planting Sites

For example, the data set can be queried for proximity to a building for energy conservation benefits.

- To a stream for riparian values.
- By land use type (public, private, governmental, etc).
- By soil classification for species selection.

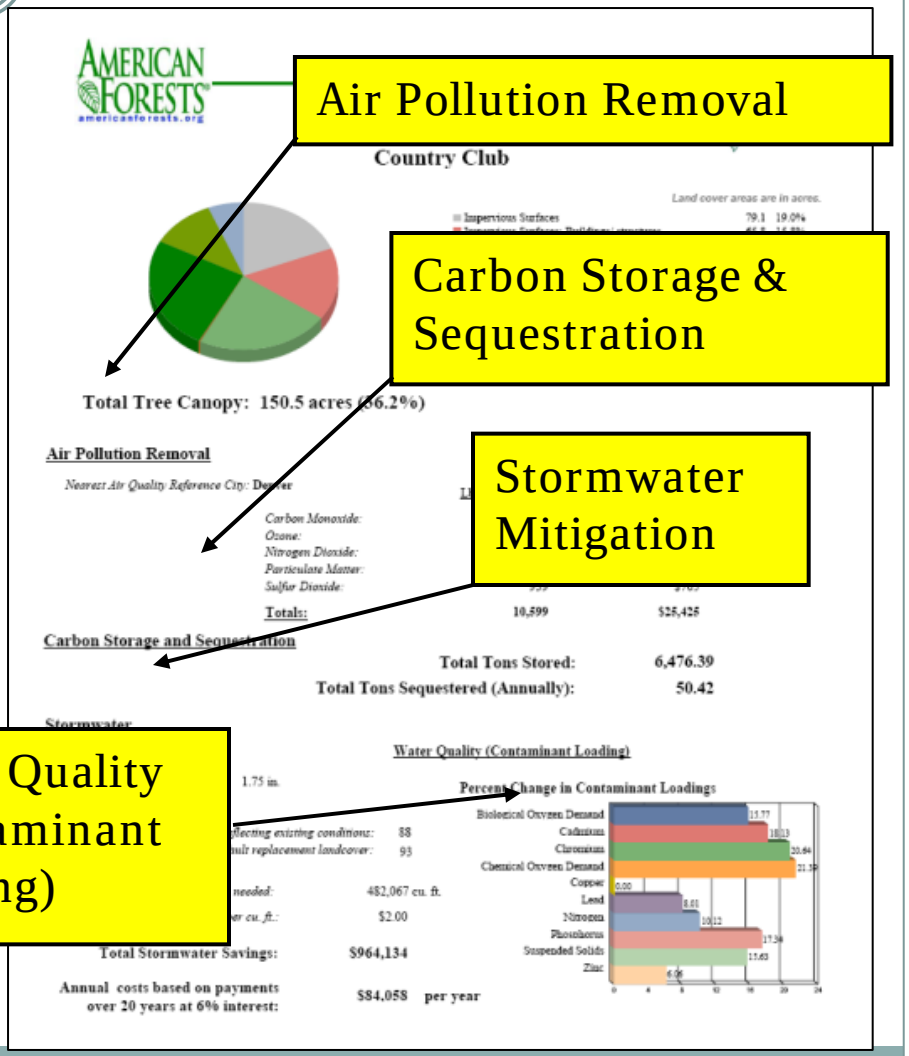
Example query: planting sites on commercial property with less than 10% tree cover, is within an urban heat island zone, is within a priority watershed and could support at least one small, medium and large sized tree.

"I drove to the garden centre for a tree to offset my carbon footprint... so now I've got to go back for another one..."

Outcomes

Urban Renewal

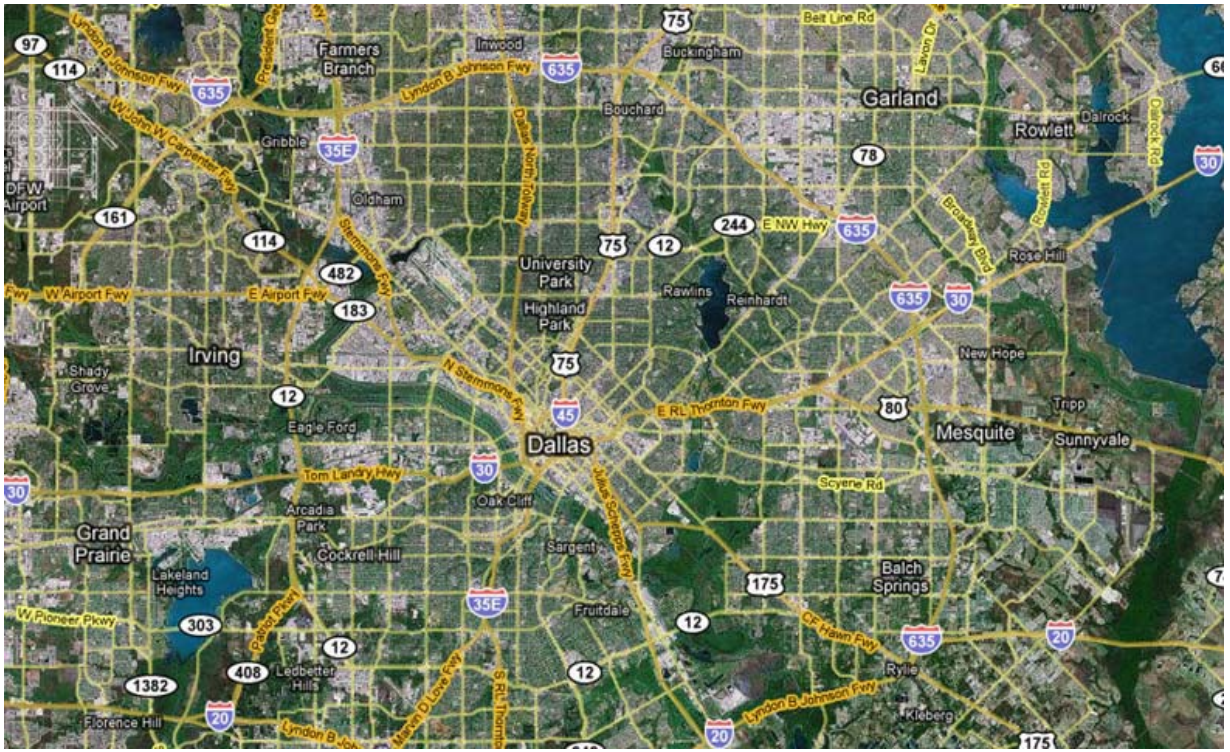
Outcome 5:
CityGreen Report for the 5 sample areas.



Outcomes

Outcome 6:

A ‘map book’ will be provided that acts as an atlas or gazetteer illustrating the location of planting sites by land use type and other criteria.



What's Next

Texas Trees Foundation

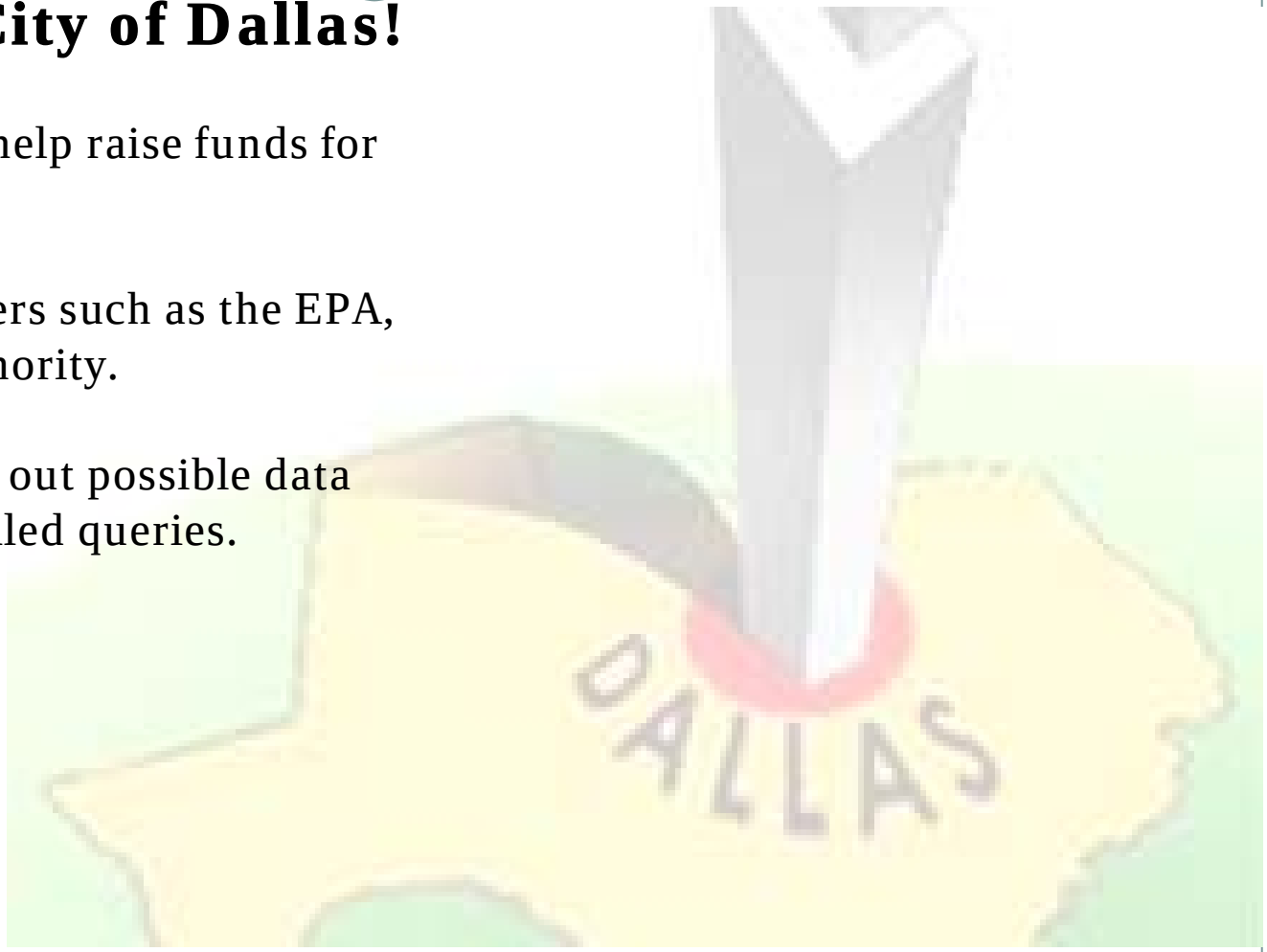
Phase 2: The City of Dallas!

1)Use pilot project to help raise funds for phase 2.

2)Bring on new partners such as the EPA, and Trinity River Authority.

3) Continue to search out possible data sources for more detailed queries.

- •Crime
- •Asthma
- •Water ways
- •Ect..



Thank You
Questions?

A New Innovative Approach to an Old Problem

Quality of Life Committee
December 9, 2008

Janette Monear, Executive Director
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Matt Grubisich, Urban Forester
Urban Renewal
214.500.9557
grubisichm@yahoo.com

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