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Tree Management Using GIS

GIS for Tree Management

Public & Community Service

Textual Tree Attributes and Photos

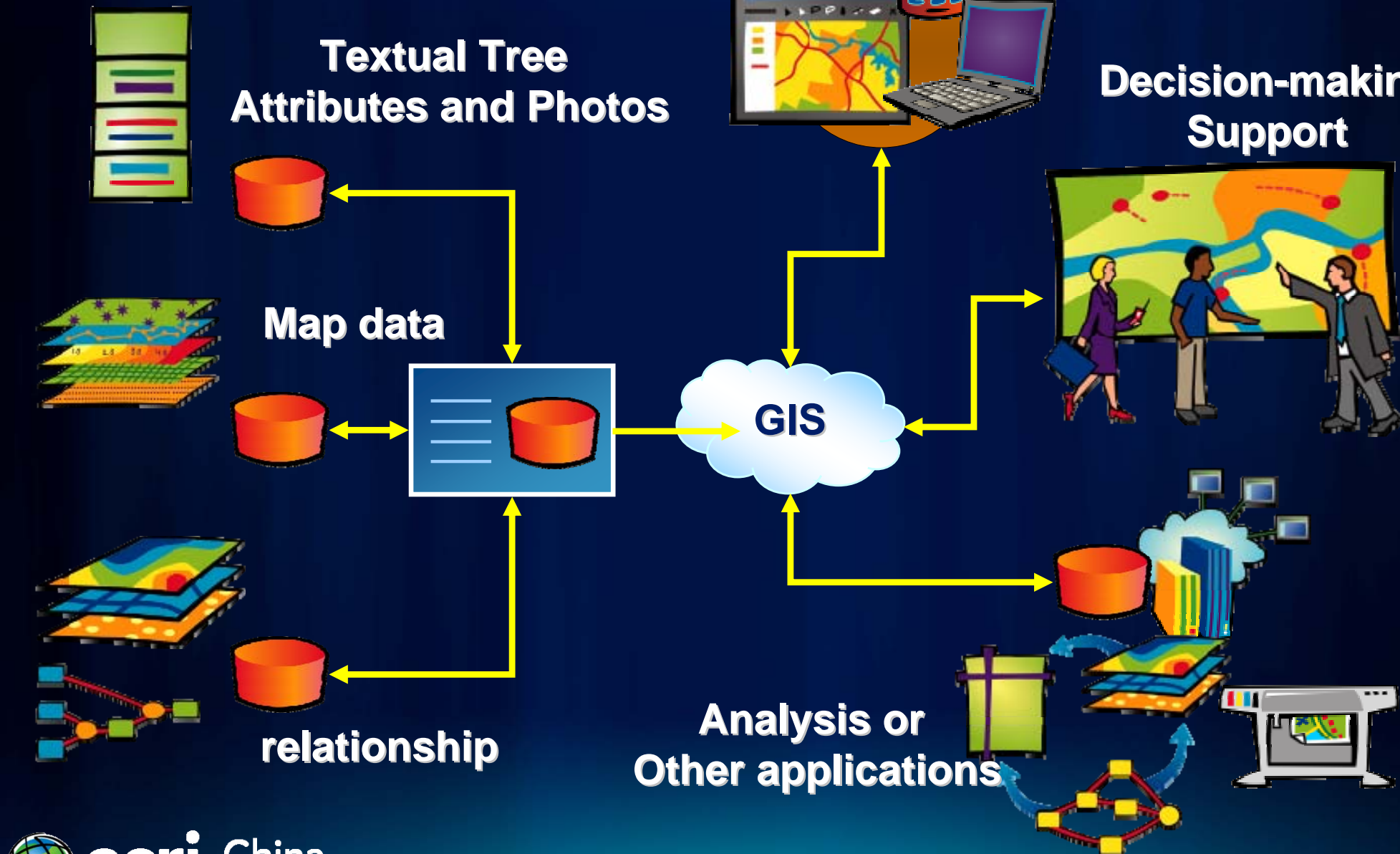
Decision-making Support

Map data

GIS

relationship

Analysis or Other applications





GIS Applications for Tree Management

Buffalo, New York, Urban Tree Management Evolves from Surprise Storm

- "City of Trees," the city of Buffalo has maintained a complete urban forest inventory since 2001
- 68,000 trees and 108,000 locations included in the tree inventory
- includes the issuance and management of
 - annual trimming, planting, and removal contracts;
 - handling citizen complaints regarding street trees;
 - inspecting contractor work;
 - and inspecting and updating information on each individual street tree in the inventory
- "October 13, 2006, a historic lake-effect snowstorm
 - forest specialists and GIS professionals collaborated to develop a GIS-based tree management program to answer the urgent and comprehensive needs of the city resulting from the weather disaster.





TASKS

- Find Tree
- Find Complaint
- Find Address
- Tree Editor

RESULTS

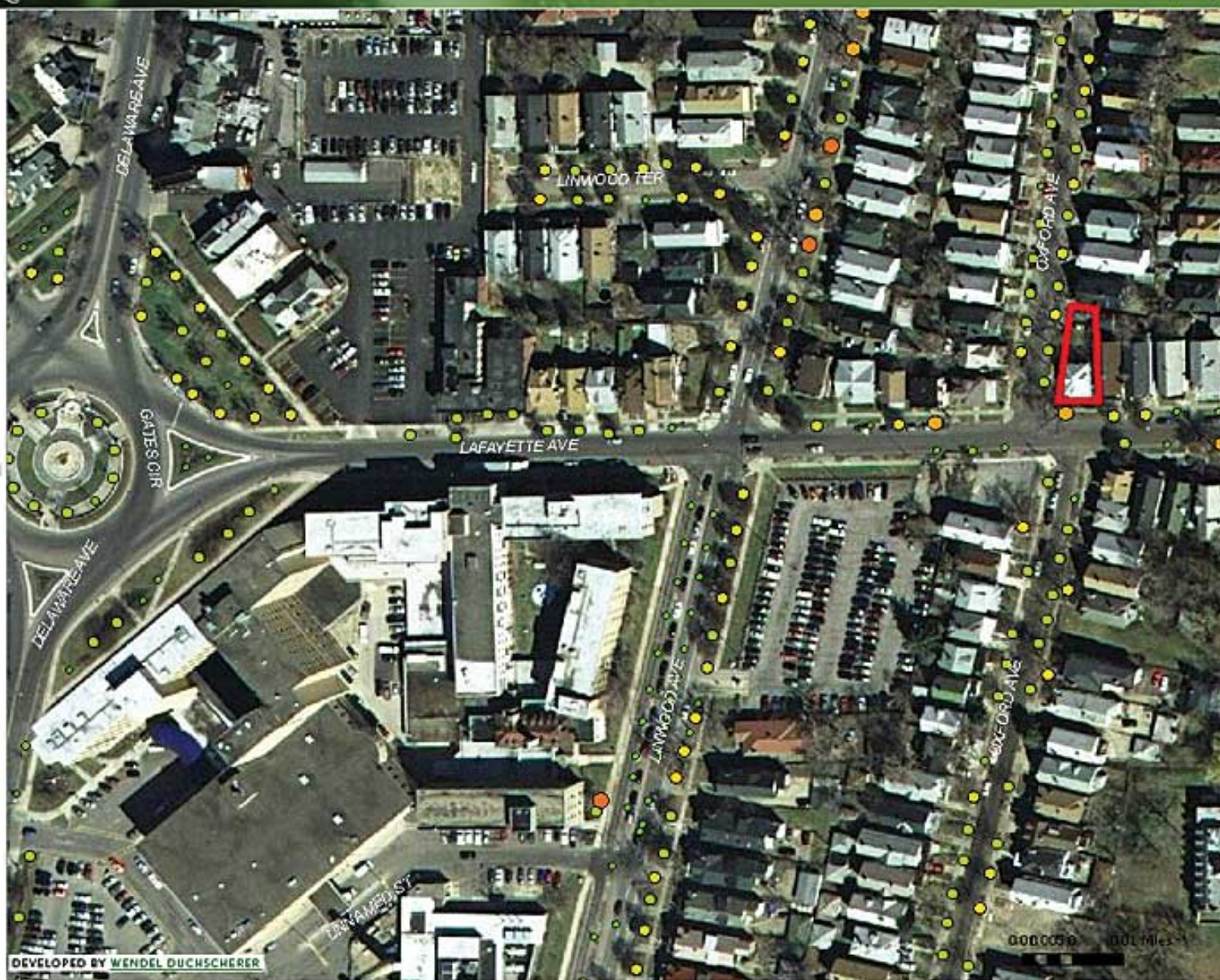
MAP CONTENTS

- Layers
 - Trees on Selected Contract
 - Trees
 - Inventory Errors
 - Road Labels
 - Road Labels
 - Roads
 - All Complaints
 - Inspection Zones
 - Parcels (2004)
 - Council Districts
 - Aerial Photo (GDB)
 - Aerial Photo

NAVIGATION

OVERVIEW

PRINT MAP



DEVELOPED BY WENDEL DUCHSCHERER

000000 0.01 Miles

Done

Local intranet

Detailed view of customized ASP Web forms allowing updates while out in the field.

URBAN FOREST MANAGEMENT FOR THE CITY OF BUFFALO



Tree Information

Existing Tree Information:

Tree ID	51953
House#	14
Street	ABBOTTSFORD PLACE
Side	Front
Tree on Street	ABBOTTSFORD PLACE
Tree Type	STUMP
STATUS	Existing
DBH (in)	8
Condition	Other
Recommendation	Stump Removal
Comments	<input type="text"/>
Last Date Inspected	10/4/2007 1:29:49 PM
Last Information Change	10/4/2007 1:29:49 PM
<input type="button" value="Edit Tree Information"/>	

Tree Photos

Photo / Document	Date
F-51953.pdf	2/5/2007
	2/16/2007
	10/4/2007

Complaints

Tree ID	Complaint ID	Date Inspected	Comments	Status
51953	248348	6/19/2007	PL - The City typically plants trees twice a year, once in spring and once in fall. The season in which your tree will be planted will depend on the type of tree to be planted which best suits the site. Your address will be added to the next appropriate spring or fall planting season.	CLOSED

Contracts

Tree ID	Contract Name	Type	Work Done	Comments	Date Inspected	Voucher Date	Voucher Amount	Status	Inspected	Crew
51953	2008 Planting Spring - COB	Planting						Open	Not Inspected	Delete
51953	2007 Stumps - COB	Stump Removal						Open	Not Inspected	Delete
51953	FEMA Stump Report	Stump Removal						Open	Not Inspected	Delete
51953	2007 Post Storm Removal - DreamCo	Removal	Cat 2 tree removed		6/15/2007	6/22/2007	85	Open	Inspected	Delete

Add Tree to contract

01 audit oddities

Contract Work Inspection

Tree ID	Contract	Desc Work Done	Date	Comments	Voucher_Date	Voucher_Amount
<input type="button" value="Edit"/> 51953	2007 Post Storm Removal - DreamCo	Cat 2 tree removed	6/15/2007		6/22/2007	85

Add Work Inspection

2007 Post Storm Removal - DreamCo

DEVELOPED BY [BENJAMIN DUCHESNEAU](#)

Buffering

"Buffering" helps you to display required facilities / boundaries within a specified distance from selected feature.

Procedures:

Step 1 :	Make the feature for searching visible (i.e. turn on the existing estates layer visible) e.g. existing estates block
Step 2 :	Input the desired distance for searching in the following box, e.g. 500 20
Step 3 :	Select the units from the dropdown list, e.g. meters meters
Step 4 :	Click the following button to select features xy
Step 5 :	Select the desired feature for searching
Step 6 :	A green zone will be generated from the selected estate within 500 meters

Search Statistics View Layer Zoom To Orthophoto OZP Print Report Graph

Shui Fai House

Bicycle Track

FP

CW

P

7 3.5 0 7 Meters

Geo Com

HA Site

C&SD

Calculate Tree Information

Statistics -> Calculation Main Page -> Calculate Tree Information

Please select the district council and existing estates from the drop down list:

District Council District : Estates :

Selected District Council District	Unselect	Selected Estates	Unselect
Yuen Long	X	TIN SHUI (1) ESTATE (PRE)	X
		TIN SHUI (2) ESTATE (PRE)	X

Housing Type	Unselect
PRE	X

Calculation Result

Number of Selected Estates
Number of Trees (Outstanding)
Number of Trees (Notable)
Number of Trees (Required-attention)
Number of Trees (>20m Ht)
Number of Trees (15-20m Ht)
Number of Trees (10-15m Ht)
Number of Trees (5-10m Ht)
Number of Trees (<5m Ht)
Number of Trees (No. of Palms)
Number of Trees (No. of Conifers)
Total Number of Trees (including Palms)
Total Number of Bauhinia Species
Total Number of Species
Species having highest frequency of
Number of trees & percentages of th
Number & Percentage of Evergreen
Number & Percentage of Native

8(1.0%)

Remark

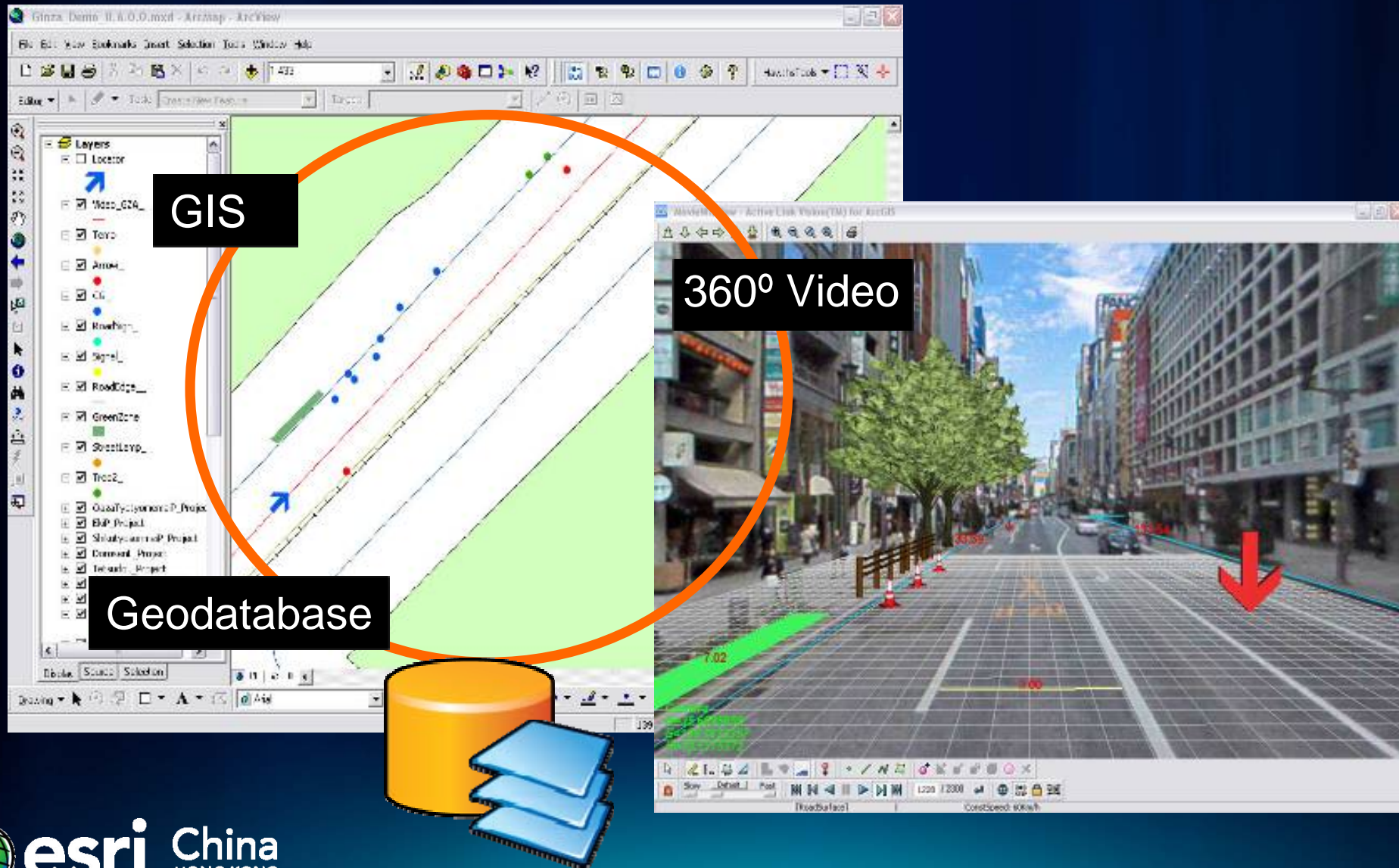
BRO Buy-or-Rent Option
F Factory

Calculate Tree Planted by Year

Statistics -> Calculation Main Page -> Calculate Tree Planted by Year

Year	Estate	Number
1980/81	TIN SHUI (1) ESTATE	1000
1992/93	TIN SHUI (2) ESTATE	1000
	Total	2000

Mobile Mapping System with GIS for Tree Planting Planning



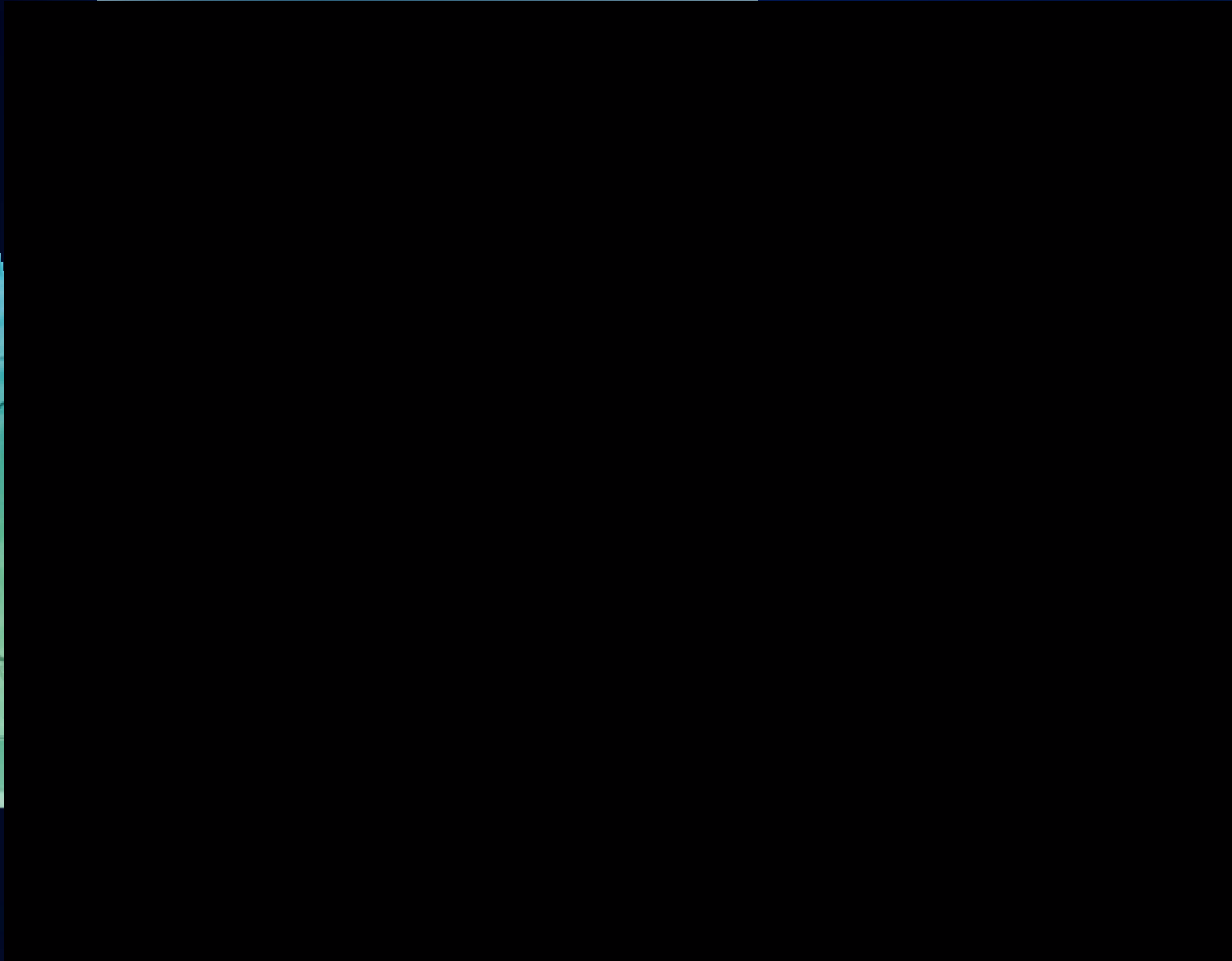
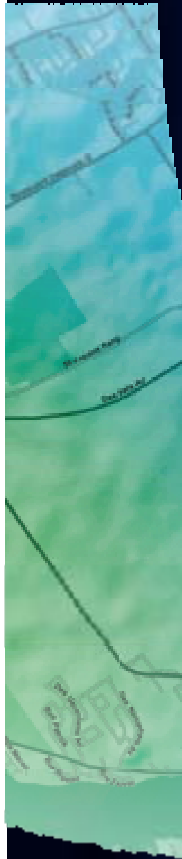


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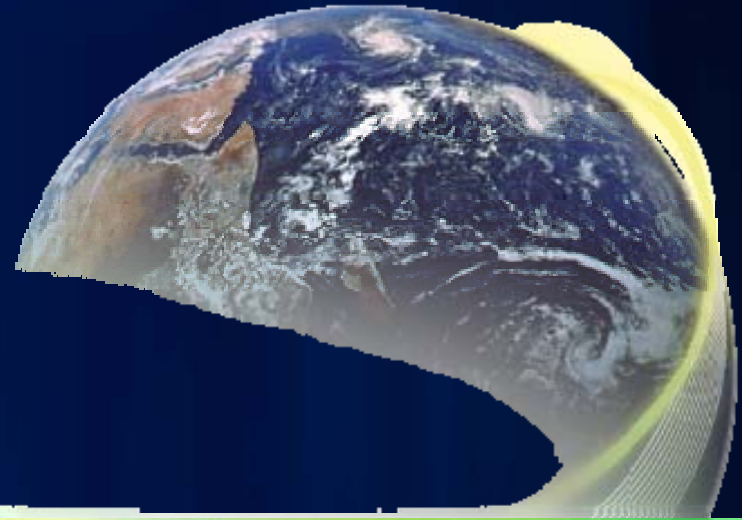


Demonstration

*Mobile Mapping System with GIS
for Tree Planting Planning*



GIS Technology



Different GIS Platform for Tree Management

Lets you use geographic information everywhere



Making Desktop GIS easier and more productive

The screenshot displays the ArcMap 9.4 interface with several toolboxes and panels open. The main map area shows a topographic map with various data layers overlaid. The 'Add Data...' menu is open, showing options like 'New Group Layer' and 'New Basemap Layer'. The 'Search' panel shows results for 'buffer'. The 'Symbol Selector' panel shows various fire-related symbols. The 'Table' panel displays a table of tax lot data.

Search Results:

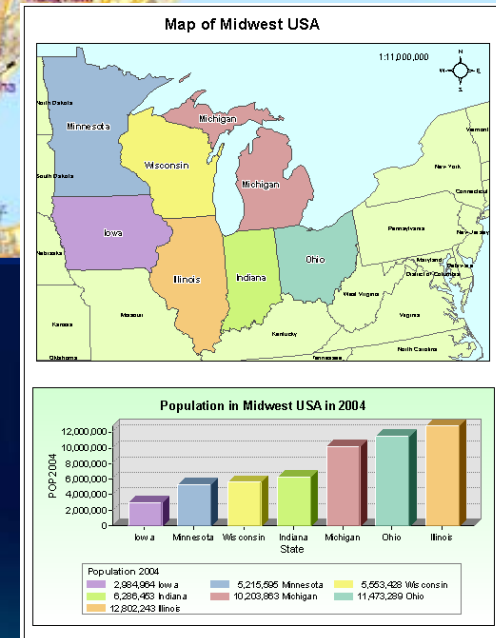
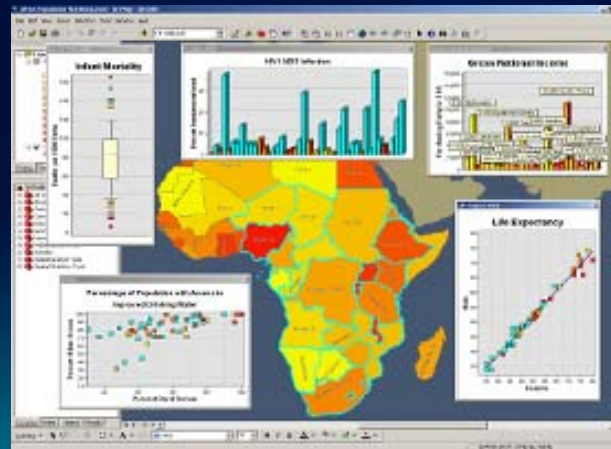
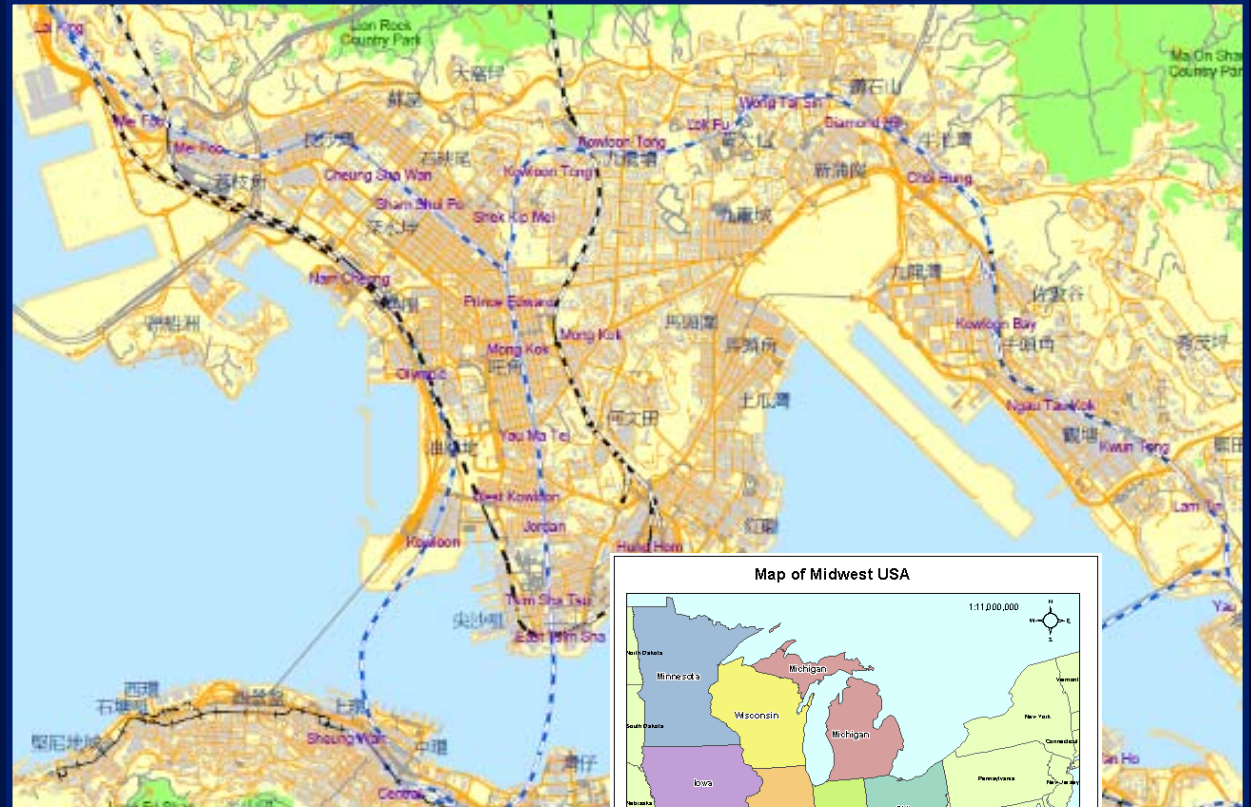
- Buffer (Analysis)**
Creates **buffer** polygons around input features to a spe...
toolboxes\system toolboxes\analysis tools.tbx\proximit...
- Multiple Ring Buffer (Analysis)**
Creates multiple **buffers** at specified distances around ...
toolboxes\system toolboxes\analysis tools.tbx\proximit...
- Analysis**
Summary: not available.
toolboxes\system toolboxes\analysis tools.tbx
- Select Layer By Location (Data Management)**
Adds, updates, and deletes features based on location.
toolboxes\system toolboxes\data management tools.tbx\select_layer_by_location.tbx

Table: Tax Lots

TLID	Land Value	Building value	Improved Value	Building SQFT	Year Built	Tax Code
1N1W06C 008	\$13,400.00	\$283,000.00	\$296,400.00	3,530	1985	278
1N1W06D 009	\$152,600.00	\$96,400.00	\$249,000.00	1,110	1973	391
1N1W06D 007	\$23,500.00	\$153,300.00	\$176,800.00	1,168	1940	391
1N1W06D 006	\$14,100.00	\$54,300.00	\$68,400.00	1,250	1933	391

Desktop GIS *Author Data and Advanced Analysis*

- Built-in Read and Write for HK Lands Dept Topographic Map Data
- Ad hoc GIS Tasks
 - Create, integrate and edit
 - Analyze and model
 - Map and visualize
- Charting and Reporting
- Productivity tools for GIS professionals



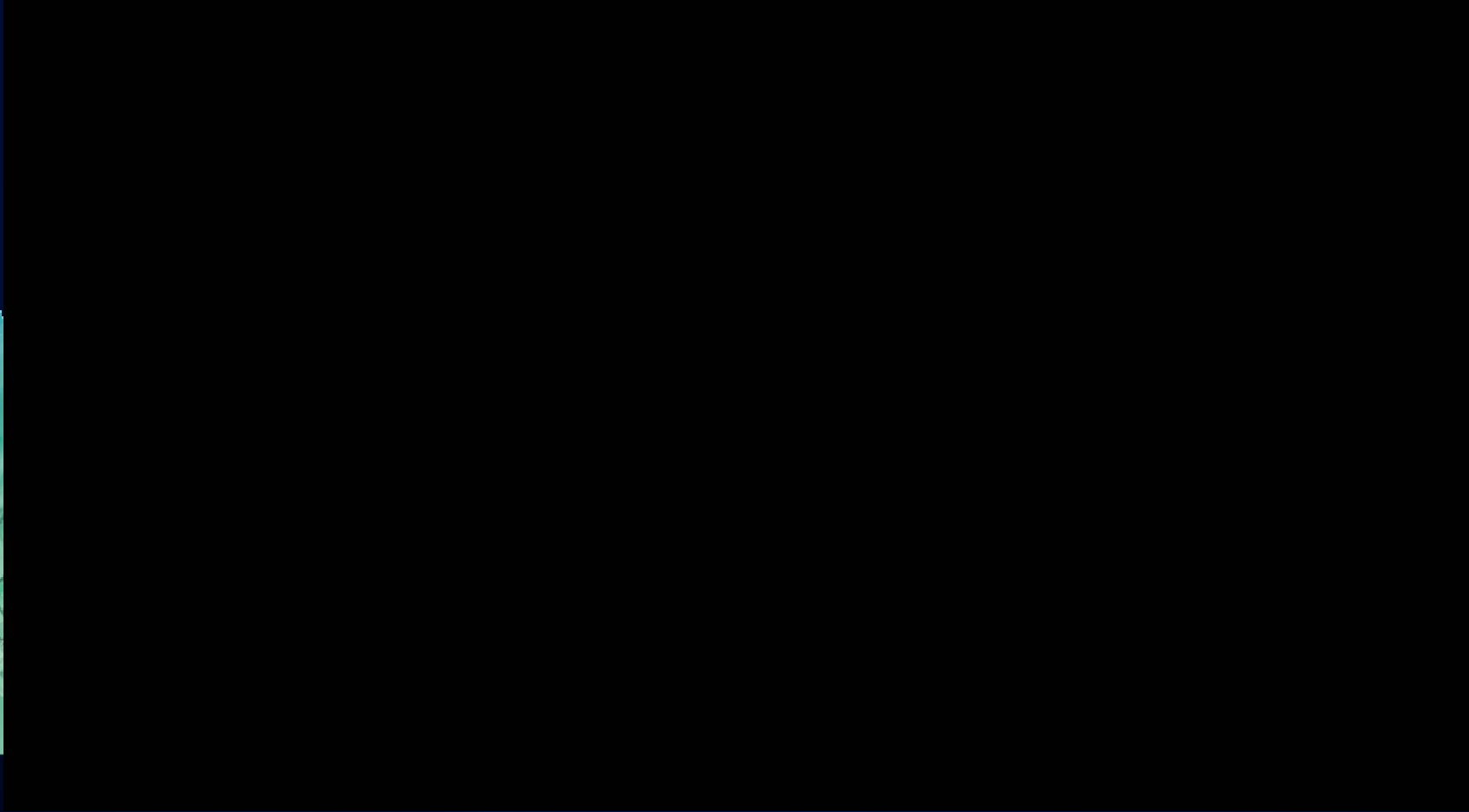
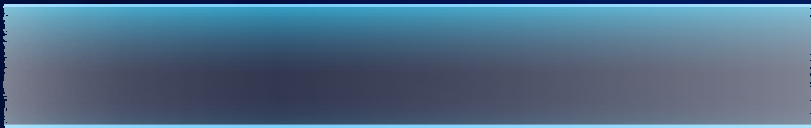


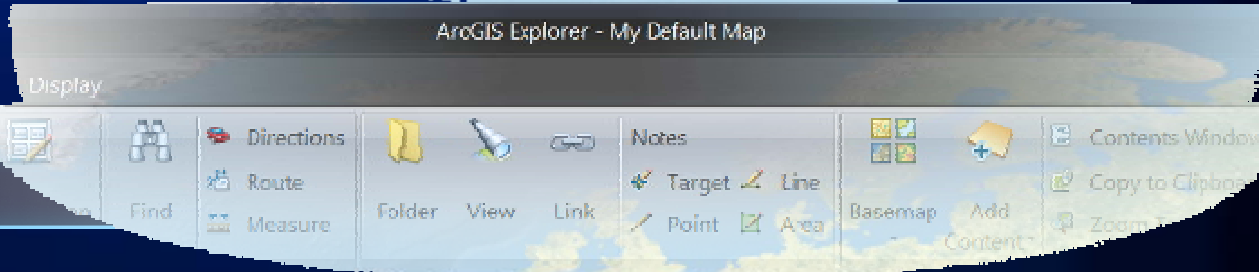
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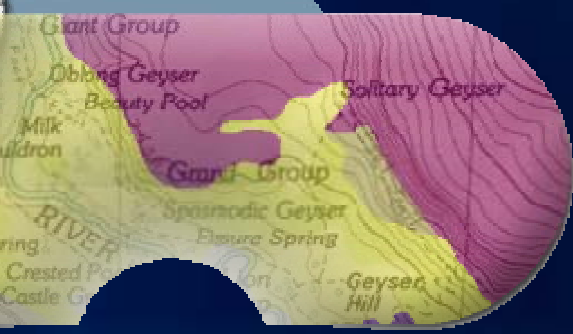
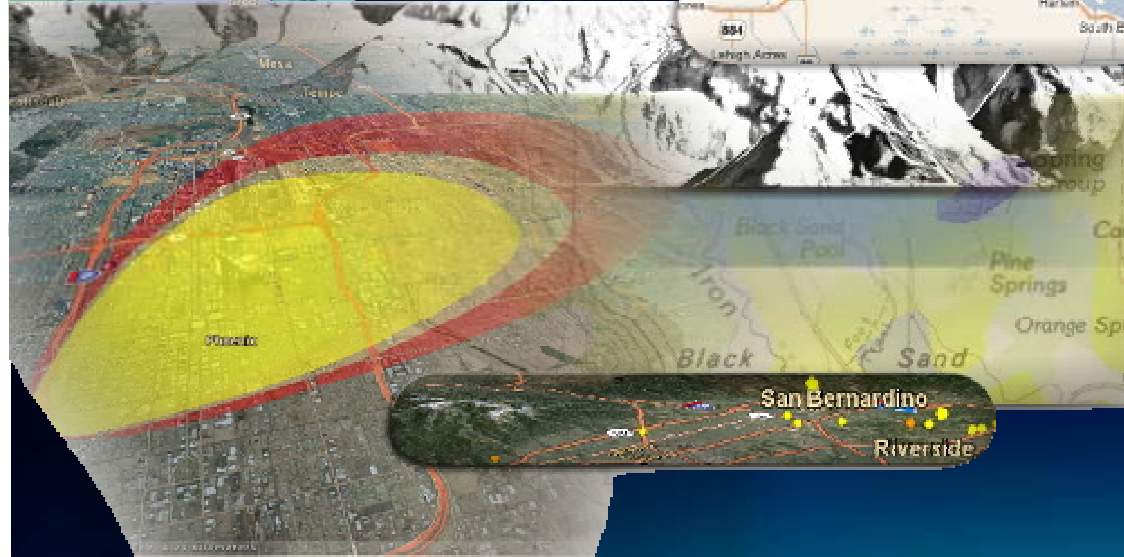
Demonstration

*Using the GIS System to help on Tree Inspection
(Create the Map Document using Desktop GIS)*



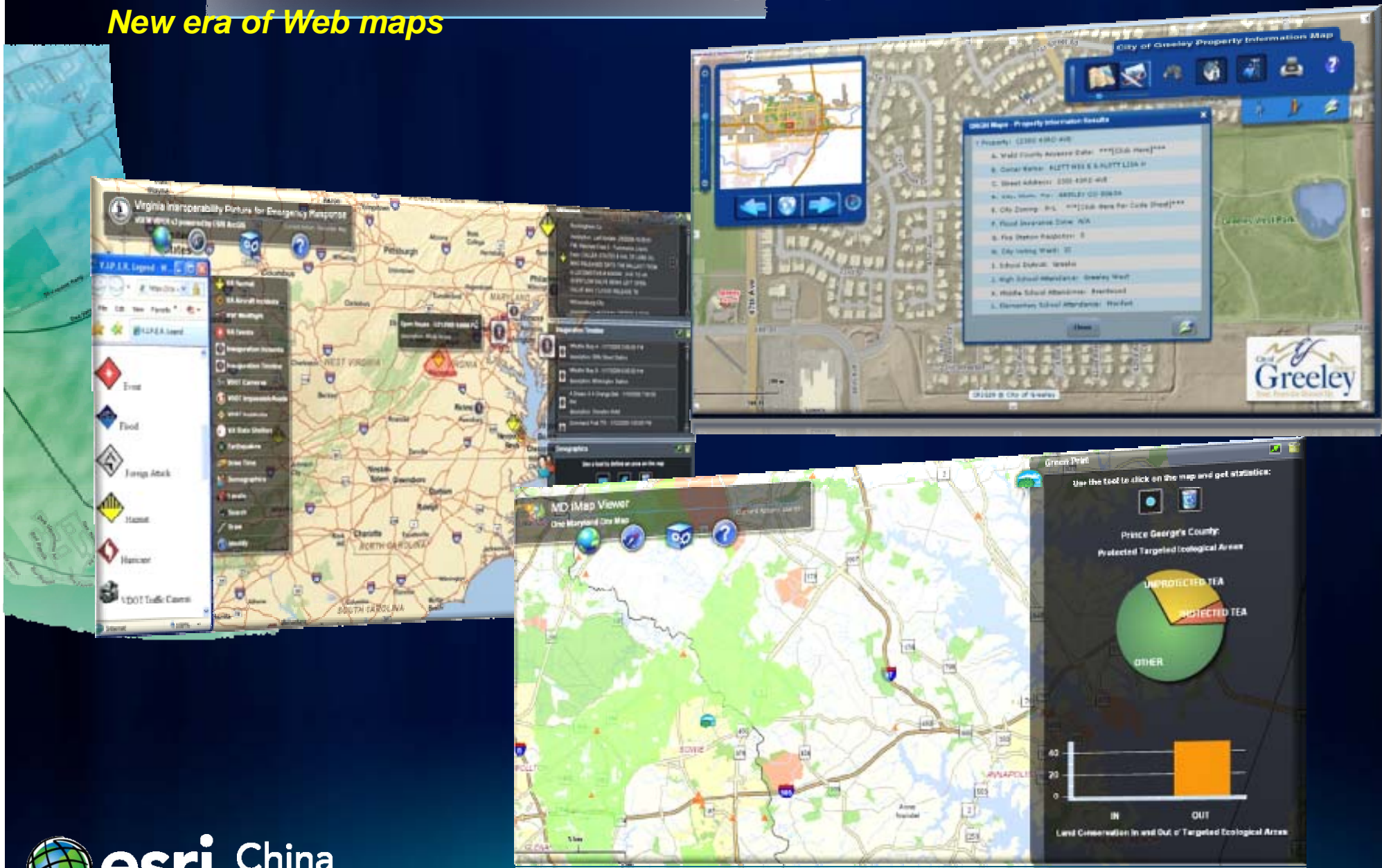


Server GIS



Rich Internet Applications (RIA)

New era of Web maps



Sophisticated Web Editing

Report your crops - Mozilla Firefox
http://184.72.245.153/Cafeteros/

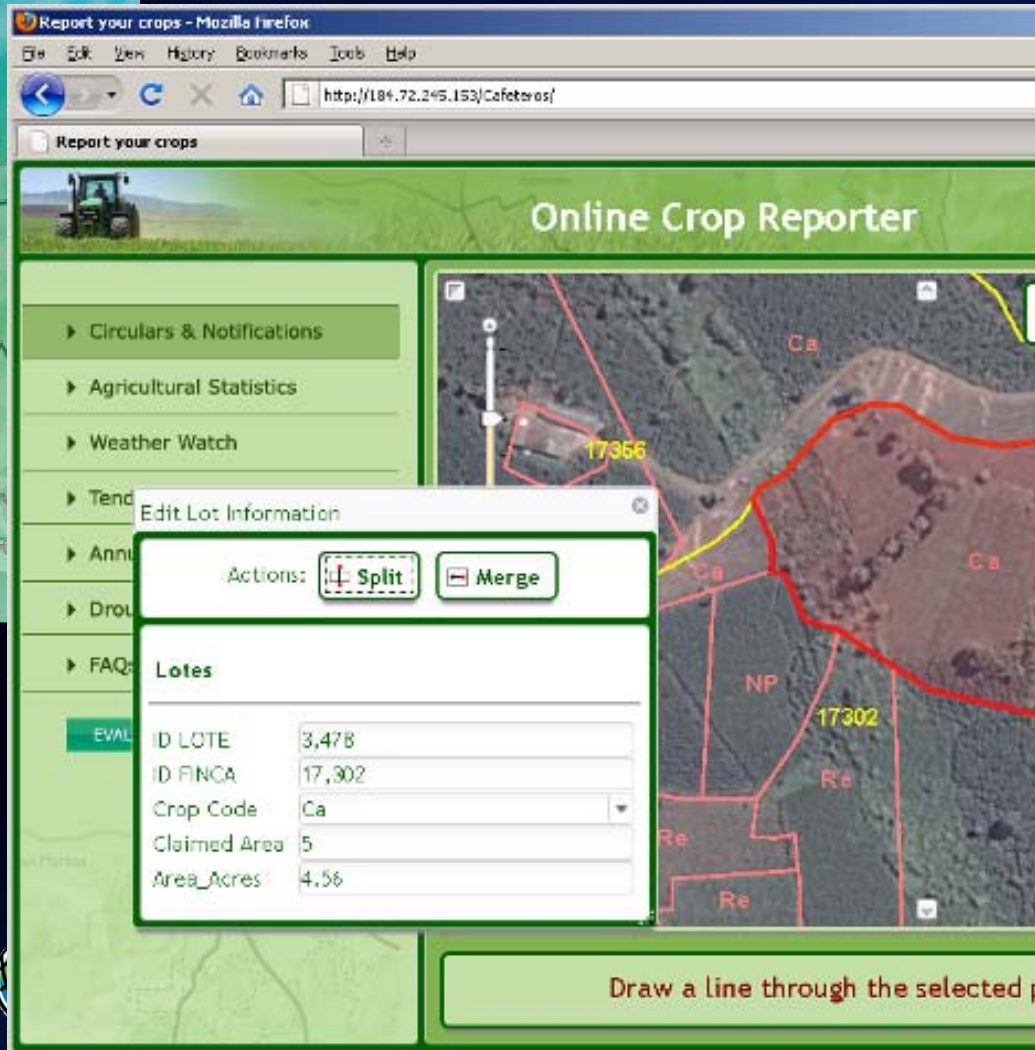
Online Crop Reporter

- Circulars & Notifications
- Agricultural Statistics
- Weather Watch
- Tend
- Ann
- Drou
- FAQ
- EVAL

Edit Lot Information

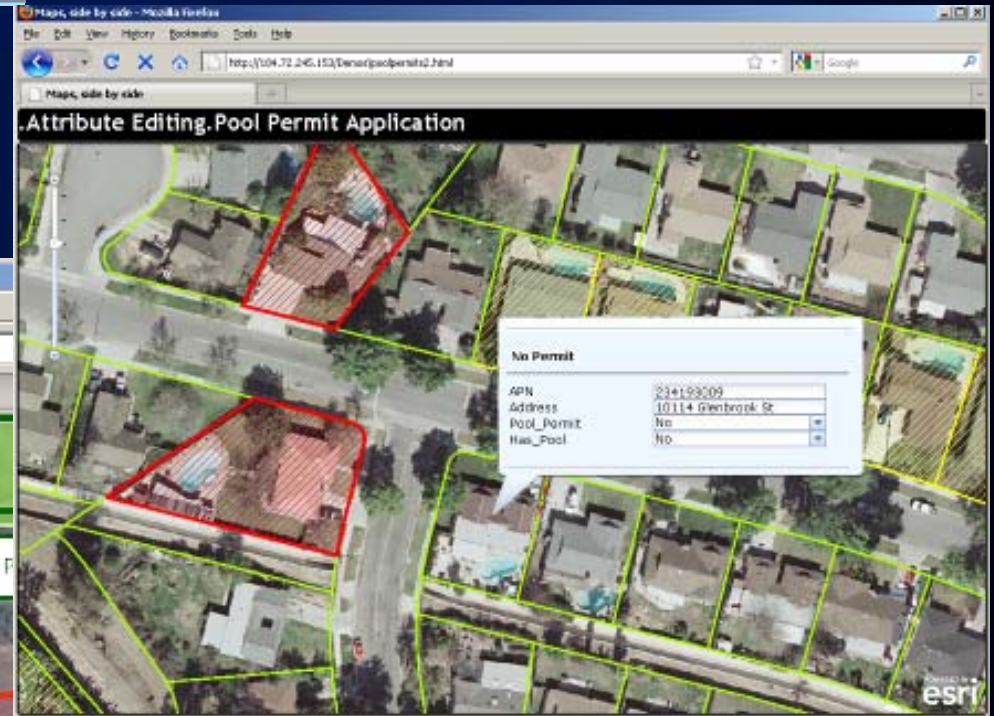
Actions:

Lots	
ID_LOTE	3,478
ID_FINCA	17,302
Crop Code	Ca
Claimed Area	5
Area_Acres	4.56



Maps, side by side - Mozilla Firefox
http://104.72.245.153/Default.aspx?app=2.html

Attribute Editing: Pool Permit Application

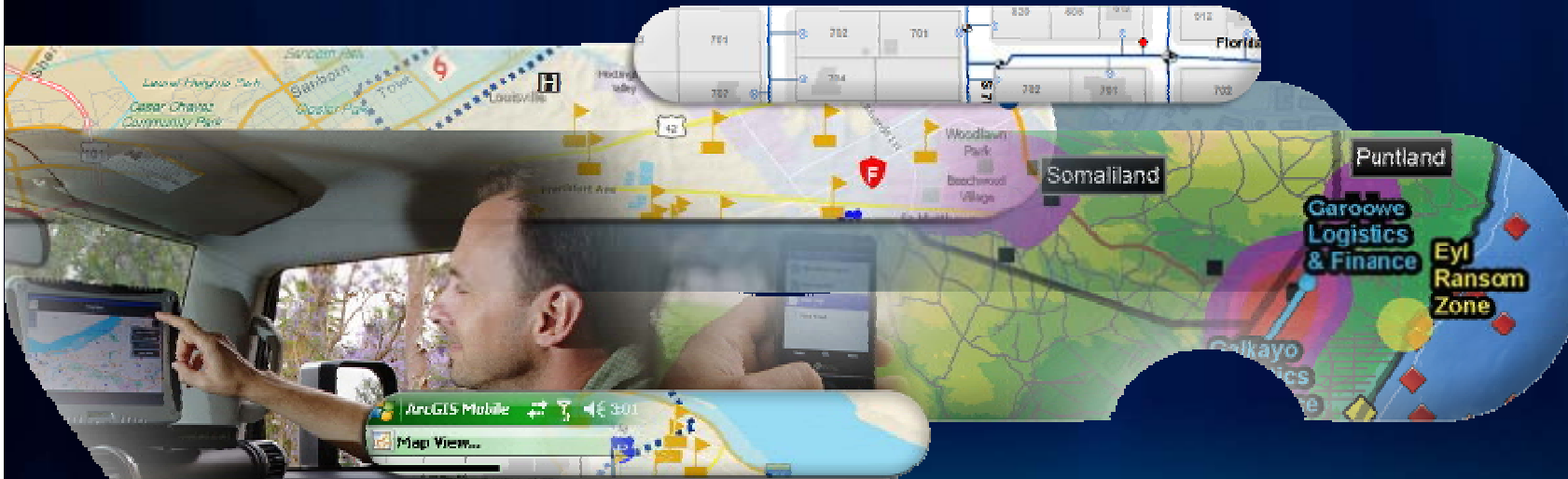


No Permit	
APN	231193009
Address	10114 Greenbrook St
Pool_Permit	No
Has_Pool	No

Draw a line through the selected parcel to split it.



Mobile GIS



es

When Choosing your Mobile GIS Device...

Capabilities

GPS
Camera
Range Finder
Bluetooth



3G



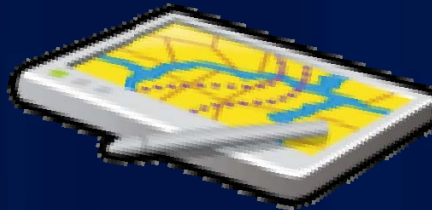
Connectivity

Always connected
Sometimes connected
Offline

Form Factor

Phone
Handheld
Tablet
Laptop

GPS

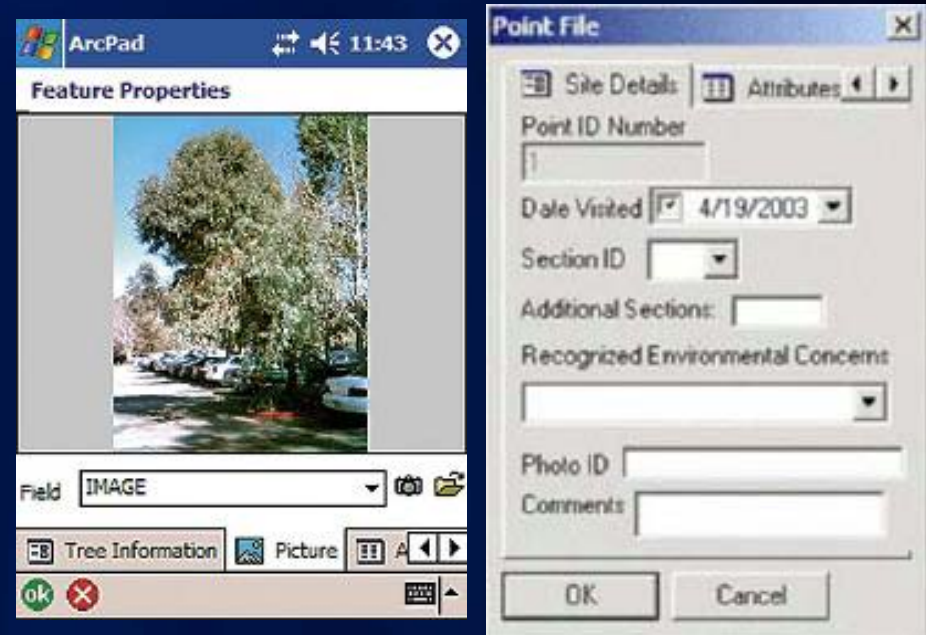


Platforms

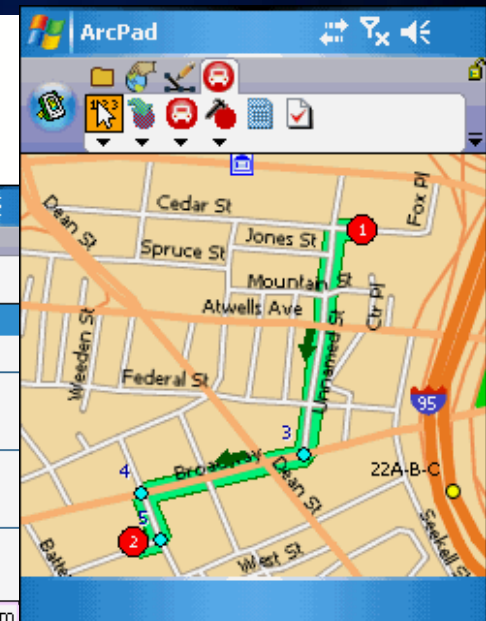
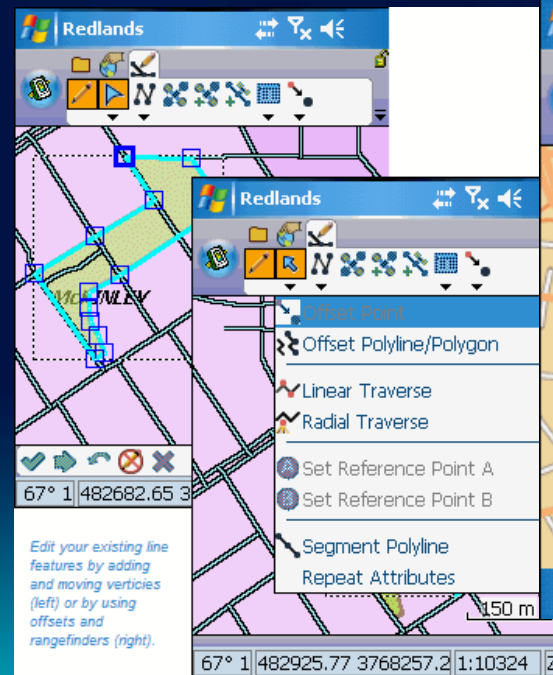
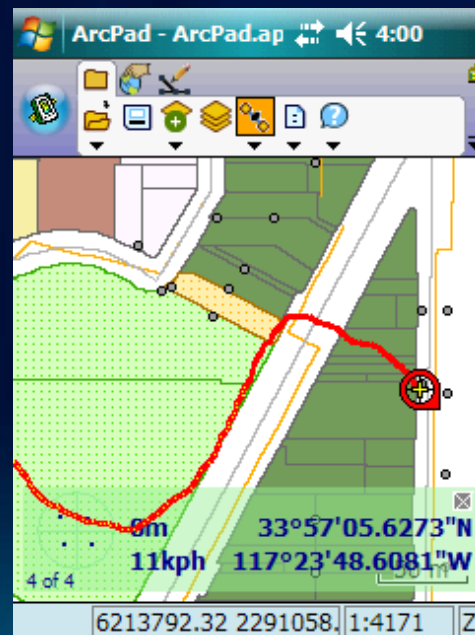
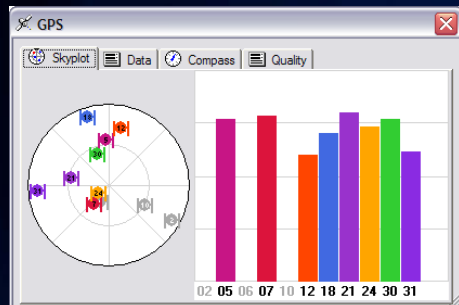
Windows
Windows Mobile
Apple iOS
Android

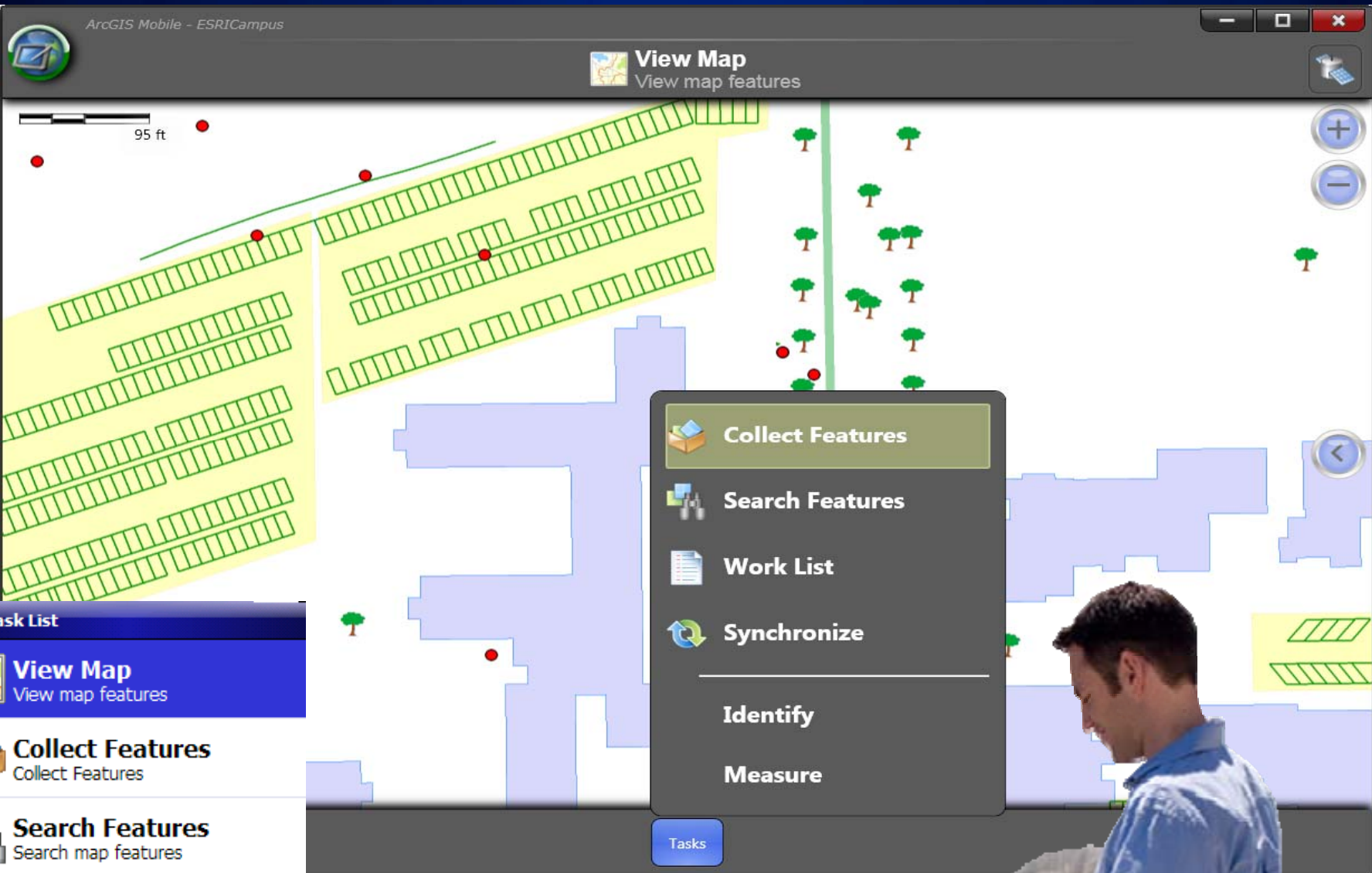
GIS with GPS for Mobile Data Collection

- Data collection utilizing automated date and time stamps
- Forms with data validation - Reduction of errors in field data entry
- NO NEED transcribe handwritten field notes
- Use data capture devices
 - **GPS, rangefinder, and camera**



Mobile GIS





Task List

- View Map**
View map features
- Collect Features**
Collect Features
- Search Features**
Search map features
- Work List**
View and manage inspection list
- Synchronize**
Synchronize with the server

Map Menu

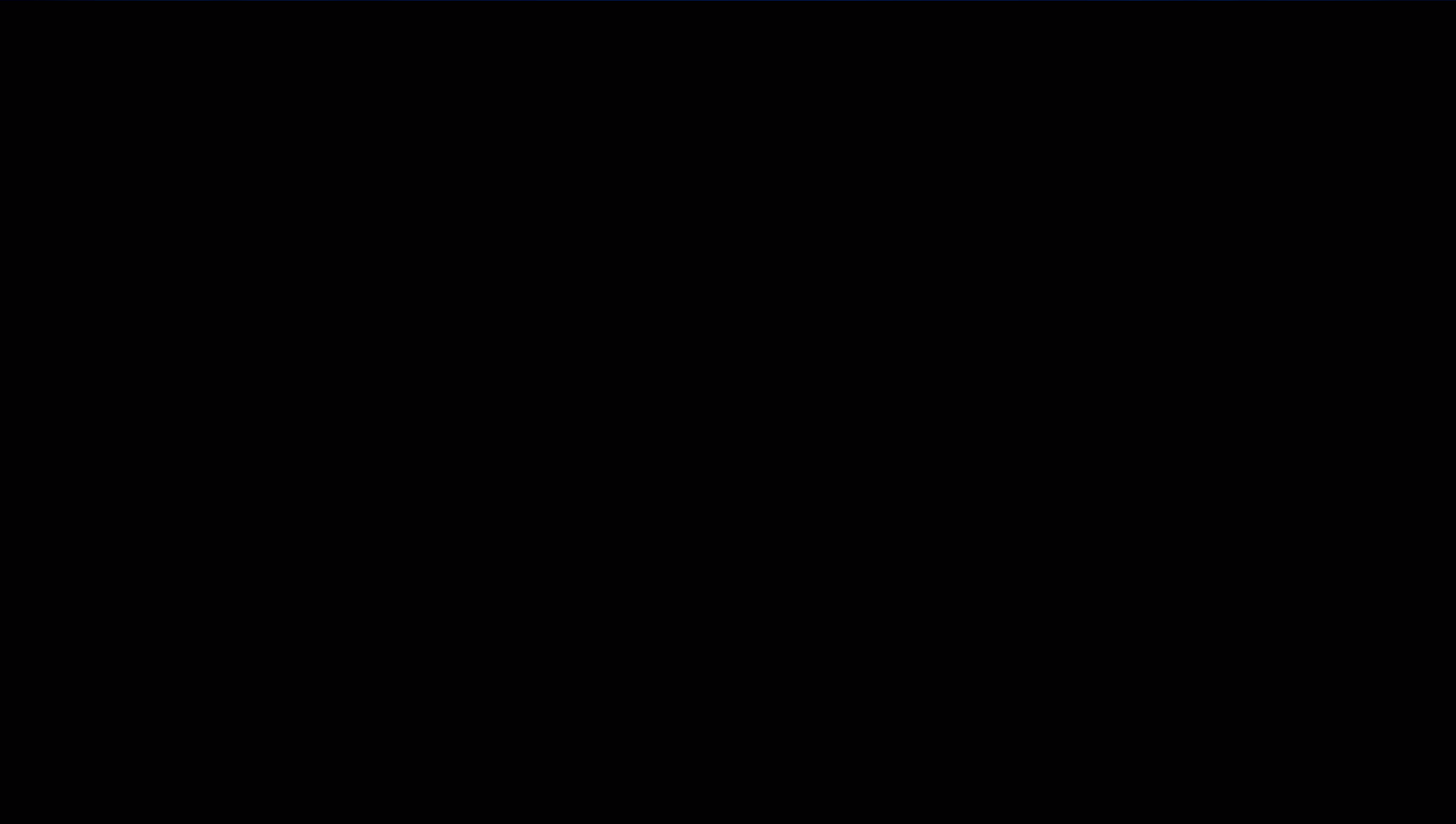




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Demonstration

*Using the GIS System to help on Tree Inspection
(With aid of ArcGIS Mobile and ArcGIS Server)*



GIS on consumer devices - GIS Apps for Smartphones

- iPhone/iPad (iOS) available now
- Access shared maps
- Explore, update, and share

- API for Windows Phone

- API for Android (later this year)





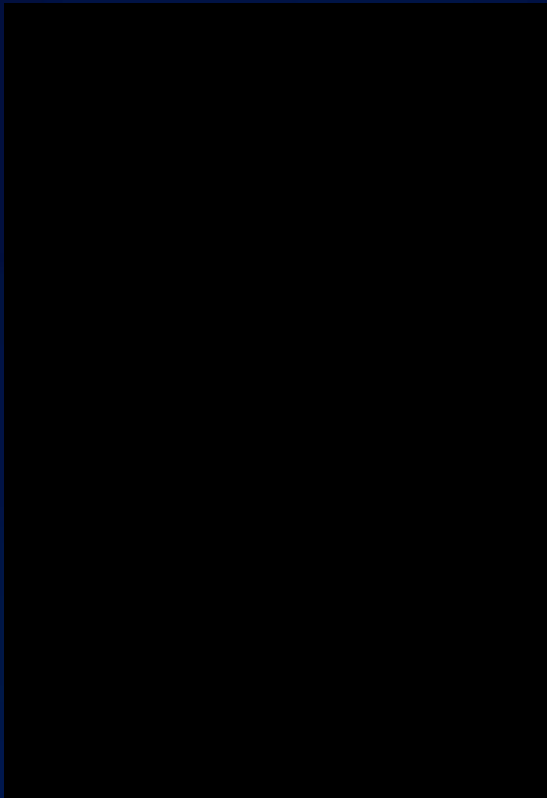
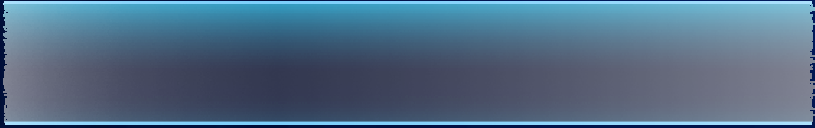
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Demonstration

Tree Print Campaign (樹印計劃)

www.treeprint.hk





esri China
HONG KONG

Thank You!

