Developing Tools for Suitability and Community Values

Approaches to land use opportunity identification using the Land Use Conflict Identification Strategy

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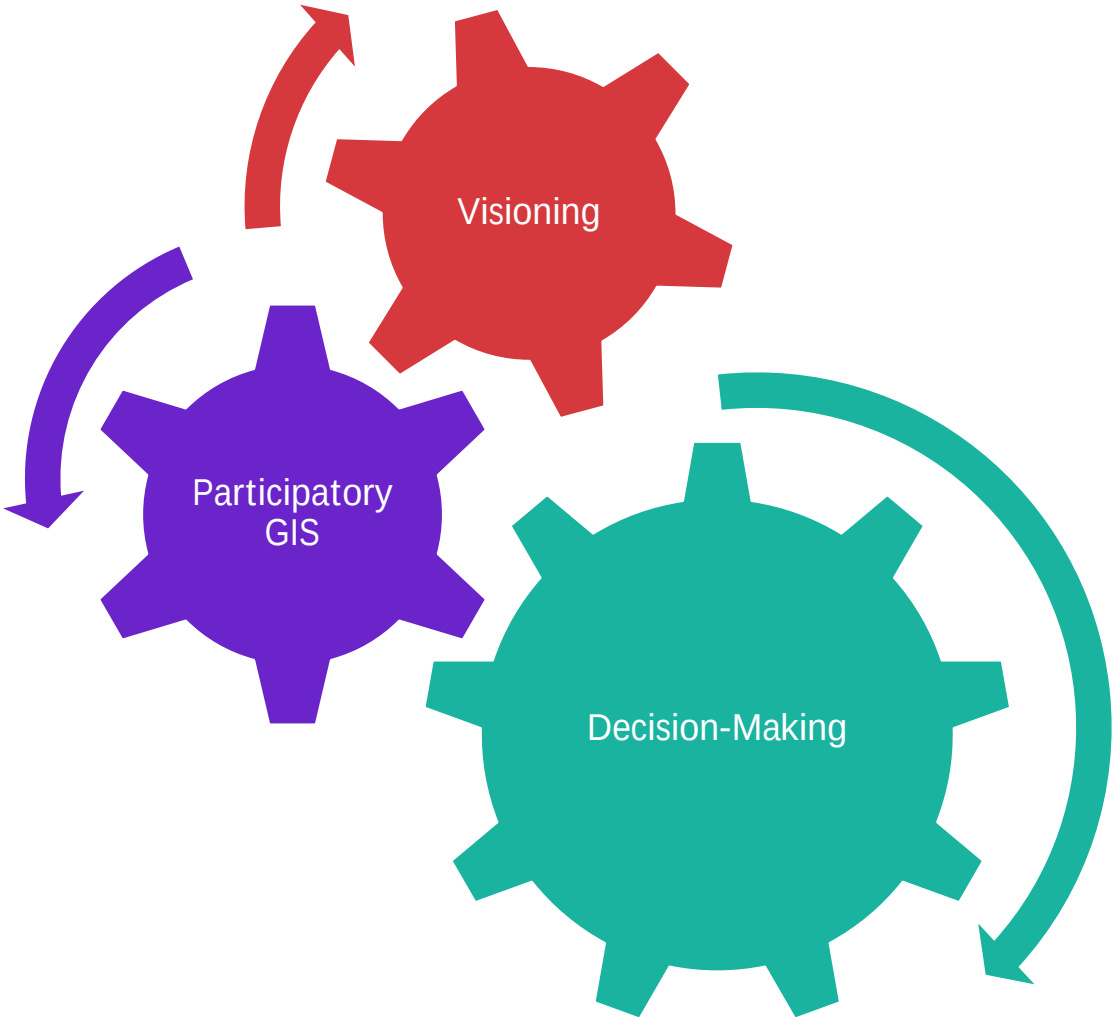
How do we use land use tools to become a possiblist?



Visioning

Phase 1 Accomplishments

6500 **Community Members Connected**

4500 **Participants in Phase I**

2515 **Self-Selected Surveys**

750 **Youth Surveys**

600 **Random Sample Surveys**

736 **Community Conversation Participants**

Approximately 33,000 Comments Received

Phase 1 Participation

Online Survey

Race/Ethnicity	Number	Percentage
White	1742	78.0%
Latino/Hispanic	275	12.3%
African-American	52	2.3%
Native-American	25	1.1%
Asian-American	41	1.8%
Other	97	4.3%

Occupation Type	Number	Percentage
Self-Employed	309	13.6%
Professional	1229	54.1%
Non-Professional	176	7.7%
Student	160	7.0%
Retired	291	12.8%
Homemaker	46	2.0%
Unemployed	60	2.6%

In-Person Community Conversation

Race/Ethnicity	Number	Percentage
White	369	78.2%
Latino/Hispanic	60	12.8%
African-American	10	2.2%
Native-American	3	0.6%
Asian-American	14	3.0%
Other	16	3.4%

IMAGINE GREATER TUCSON
Shaping our future together

Regional Values

T-we:m Hihim c Cipkan

Walking and Working Together

TON Application

For proposed development (Realty)

- NEPA review
  - Cultural resources (exclude)
  - Sensitive habitat (e.g., endangered species, 404 permitting for washes)
- Streams
  - In floodplain (IMPORTANT!)
    - Can we mitigate?
- What roads are planned
- Who is travelling on roads (Rocky Point, w… …erce and industrial

…or culture into project?
…? What are demands?
…istance to services?
…s different by age?

- ISSUE…
  …ure
  → lends to decision-making

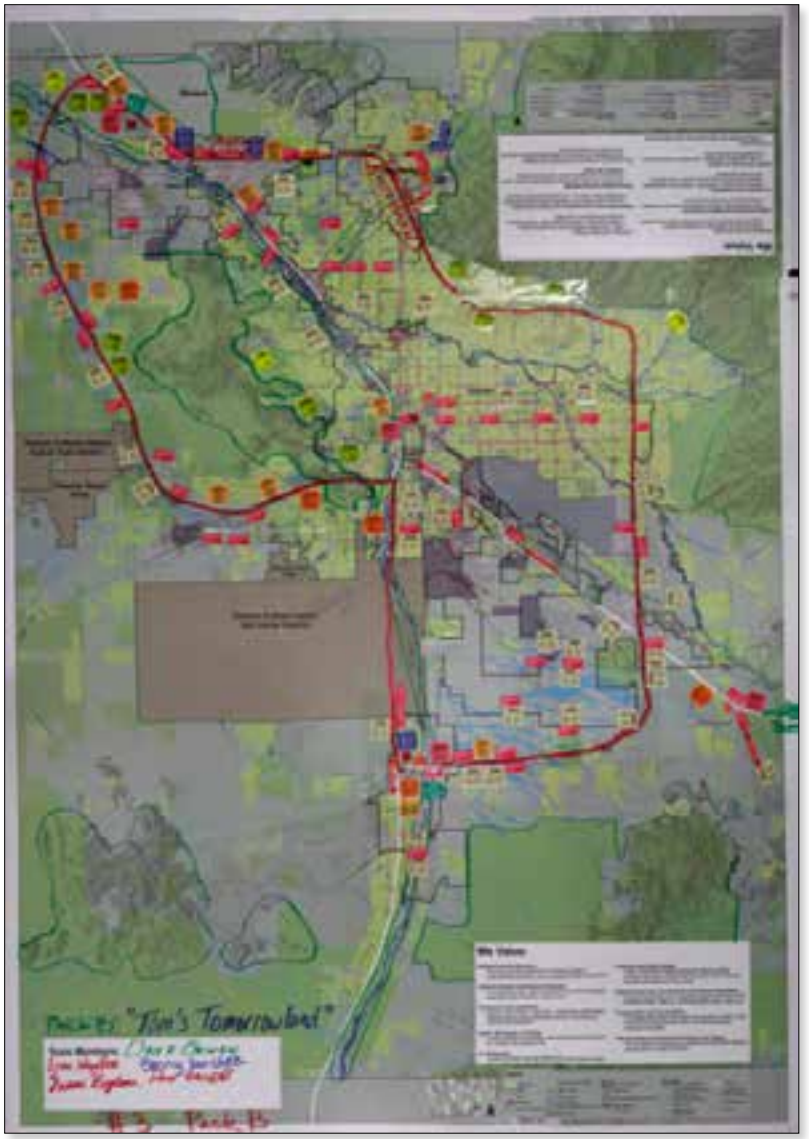
Land is LIFE

Infrastructure (Basic) for development

- Septic/sewer (community vs. individual home)
  - IHS has
- Potable water
  - Look at water settlement (surface v. groundwater)
    - Zero-sum: replacing one use elsewhere to accommodate another
- Electricity
- Roads (paved and unpaved)
- Cell phone/internet service
- Geotech/soil survey
- Slope

Participatory GIS


9


Packet "This's Tomorrow!"

Social Media & Online Tools

- Social M 

- Online Public Participation
  - Mindmixer (http://www.mindmixer.com/)
  - Crowdbrite (http://crowdbrite.com/)
  - Open Town Hall (http://www.opentownhall.com/)

Decision-Making

Science in Decision-Making

Science and values provide completely different guides to decision-making.

Values

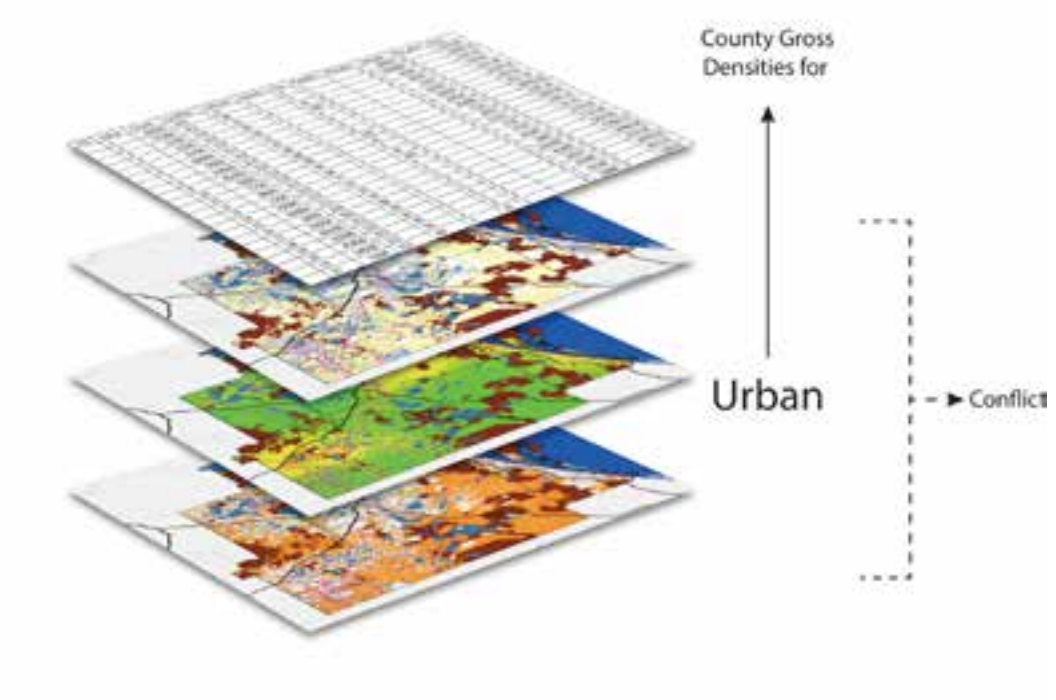
- Emotional connections between individuals
- Most societal controversies that take place are based on differing values among individuals within the society

Science

- Value neutral
- Attempts to minimize the influence of values, because they introduce biases into decisions
- Scientists strive to be dispassionate observers to prevent personal values from influencing the decision-making process
- Deliberate, rational process

Land Use Conflict Identification Strategy (LUCIS)

- "What if" Land Use Scenario Model
- Suitability Analysis Approach
- Analyzes historical patterns and their relationship to how suitable land is for certain uses



Goals & Objectives

- Hierarchical statements that define:
  - What is to be accomplished (goal)
  - How to achieve the goal (objectives)
- Tailored to given project
- Goals address broad themes
- Objectives address specifics (subordinate to goals)
- Dynamic, subject to change
- Developed through research & expert input

Modeling Approach

- Step 1: Goals & Objectives
- Step 2: Data Inventory
- Step 3: Suitability
- Step 4: Preference
- Step 5: Conflict

Modeling Approach

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Goals & Objectives

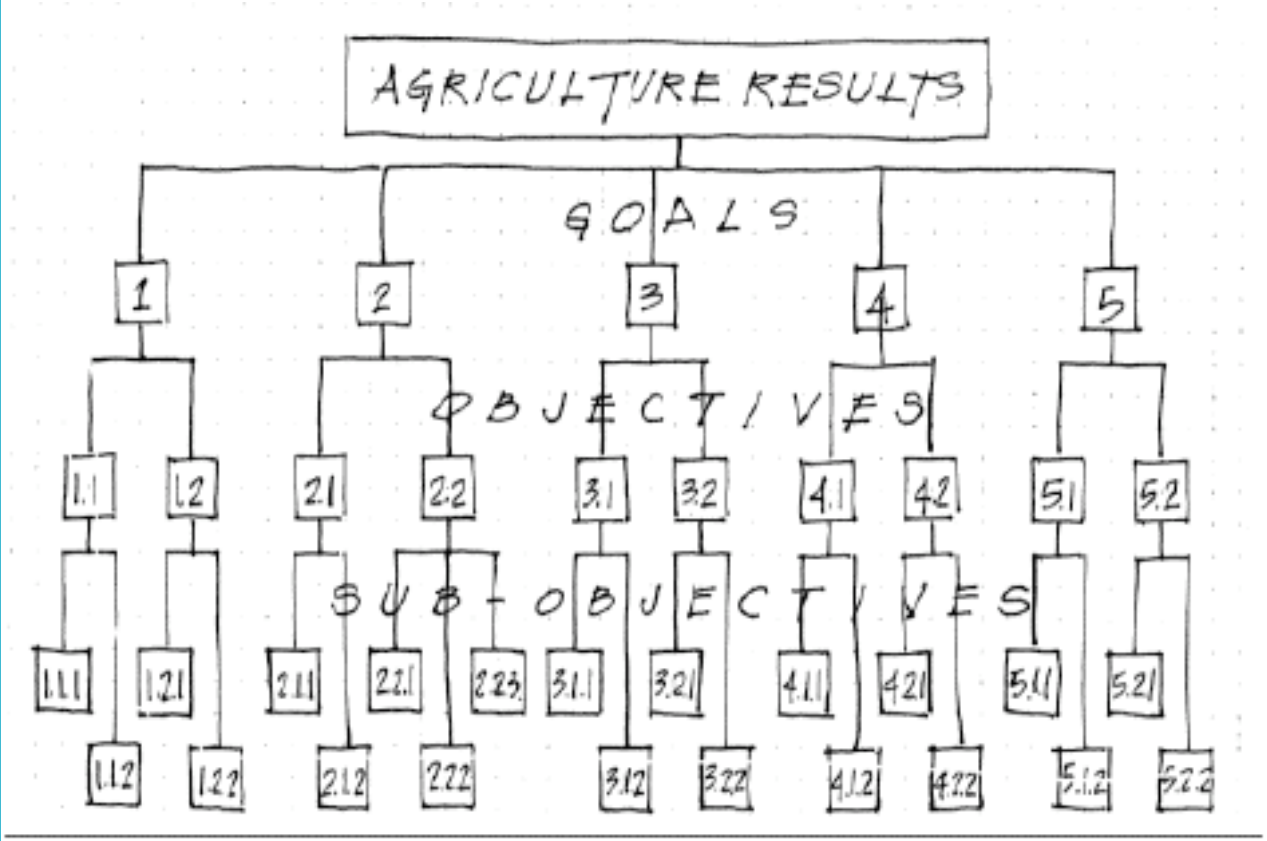

Figure from Carr and Zwick, 2007

Example LUCIS Goals & Objectives

(Land Use Model)

Agriculture Goals and Objectives

Row Crops

- Physical Suitability
  - Suitable soils
  - Suitable land uses
- Economic Suitability
  - Suitable land values
  - Proximity to markets

Conservation Goals and Objectives

Native Biodiversity

- Lands important for protecting native focal species
  - Species hotspots
  - Areas important for protecting viable populations of focal species
- Identify areas important for protecting natural species

Example LUCIS Goals & Objectives

(Land Use Model)

Urban Goals and Objectives

Residential

- Physical
  - Suitable soils for development
  - Avoid flood prone areas
- Economic
  - Areas near existing infrastructure
  - Areas near existing retail and shopping

Urban Goals and Objectives

Commercial/Office

- Physical
  - Suitable soils for development
  - Avoid flood prone areas
- Economic
  - Areas near existing infrastructure
  - Areas near existing retail shopping

Modeling Approach

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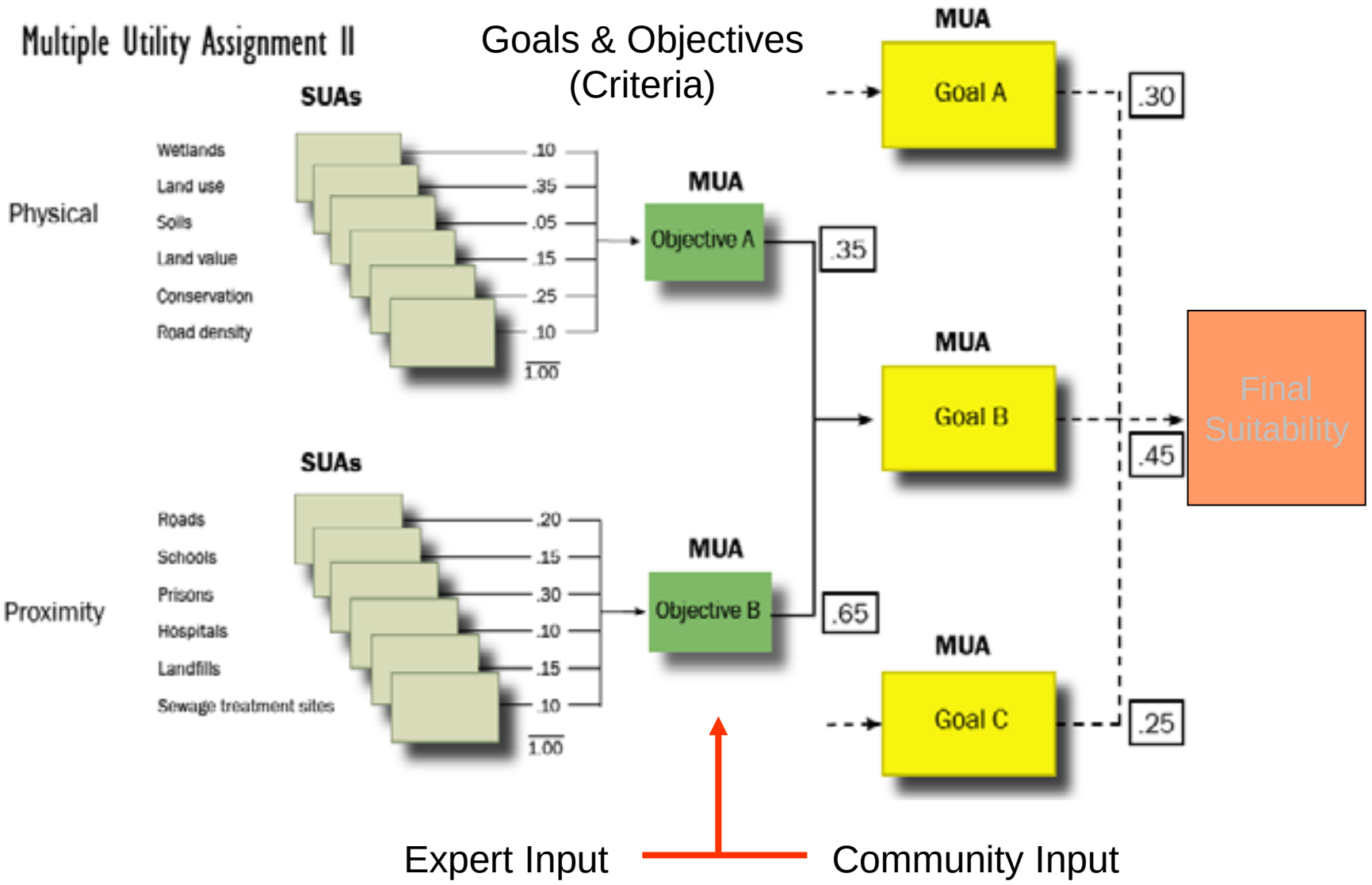
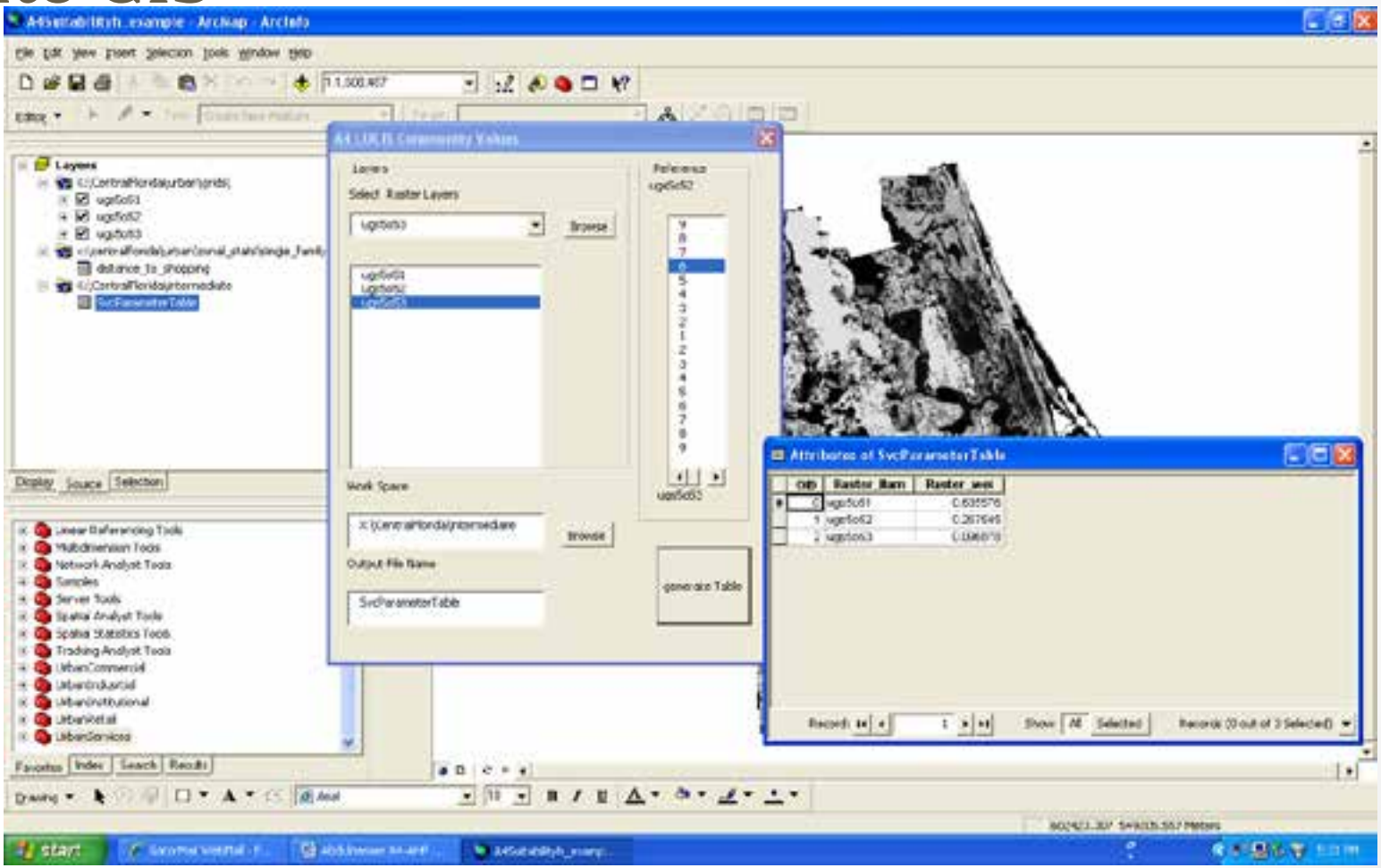

Multiple Utility Assignment II
Goals & Objectives (Criteria)
MUA
Goal A
.30
SUAs
Physical
Wetlands
Land use
Soils
Land value
Conservation
Road density
.10
.35
.05
.15
.25
.10
1.00
MUA
Objective A
.35
MUA
Goal B
.45
Final Suitability
SUAs
Proximity
Roads
Schools
Prisons
Hospitals
Landfills
Sewage treatment sites
.20
.15
.30
.10
.15
.10
1.00
MUA
Objective B
.65
MUA
Goal C
.25
Expert Input
Community Input

Planning Support System Technologies

Integrating Structured Decision-Making Into GIS



Modeling Approach

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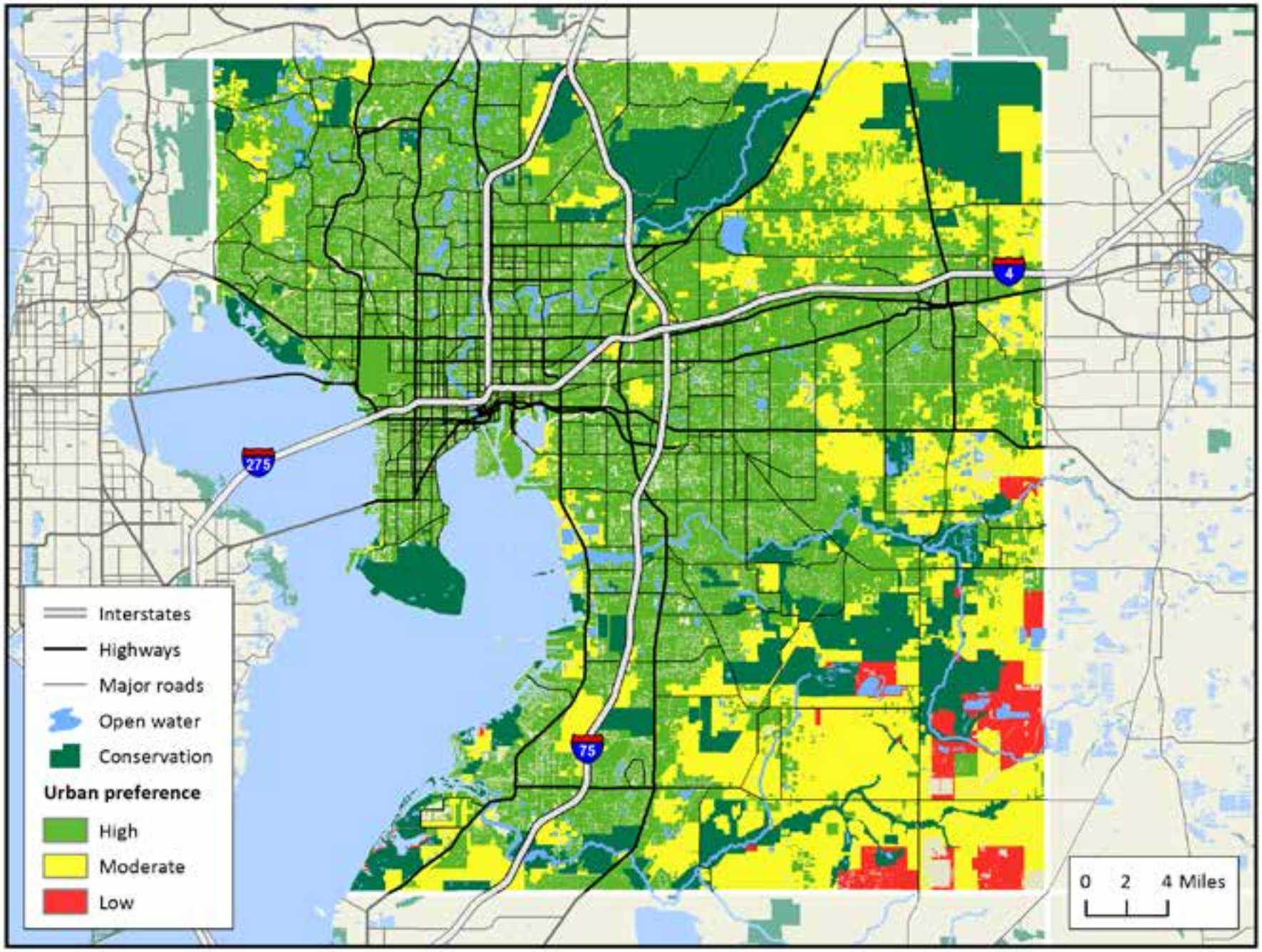
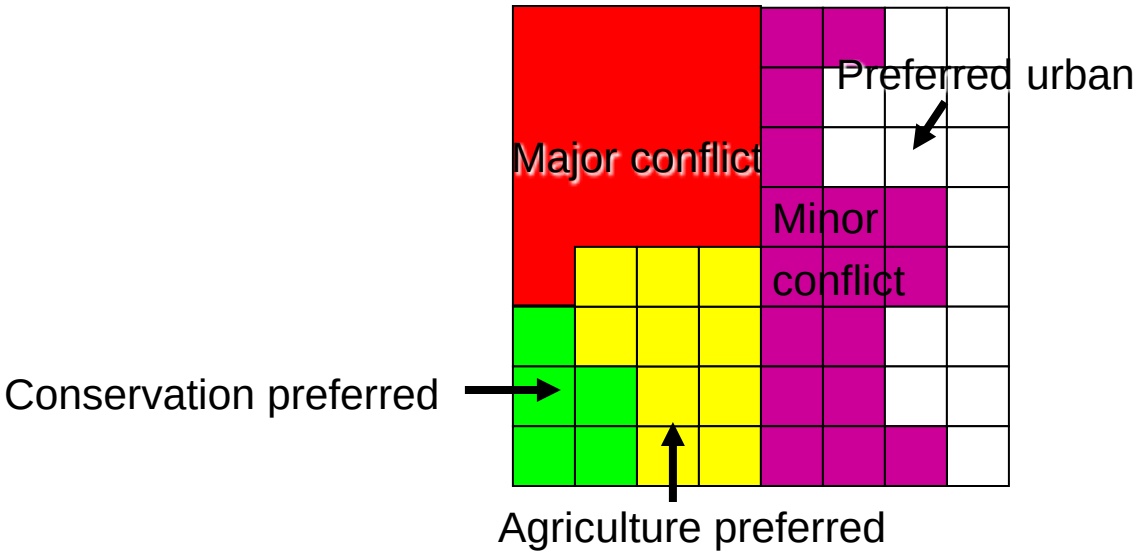
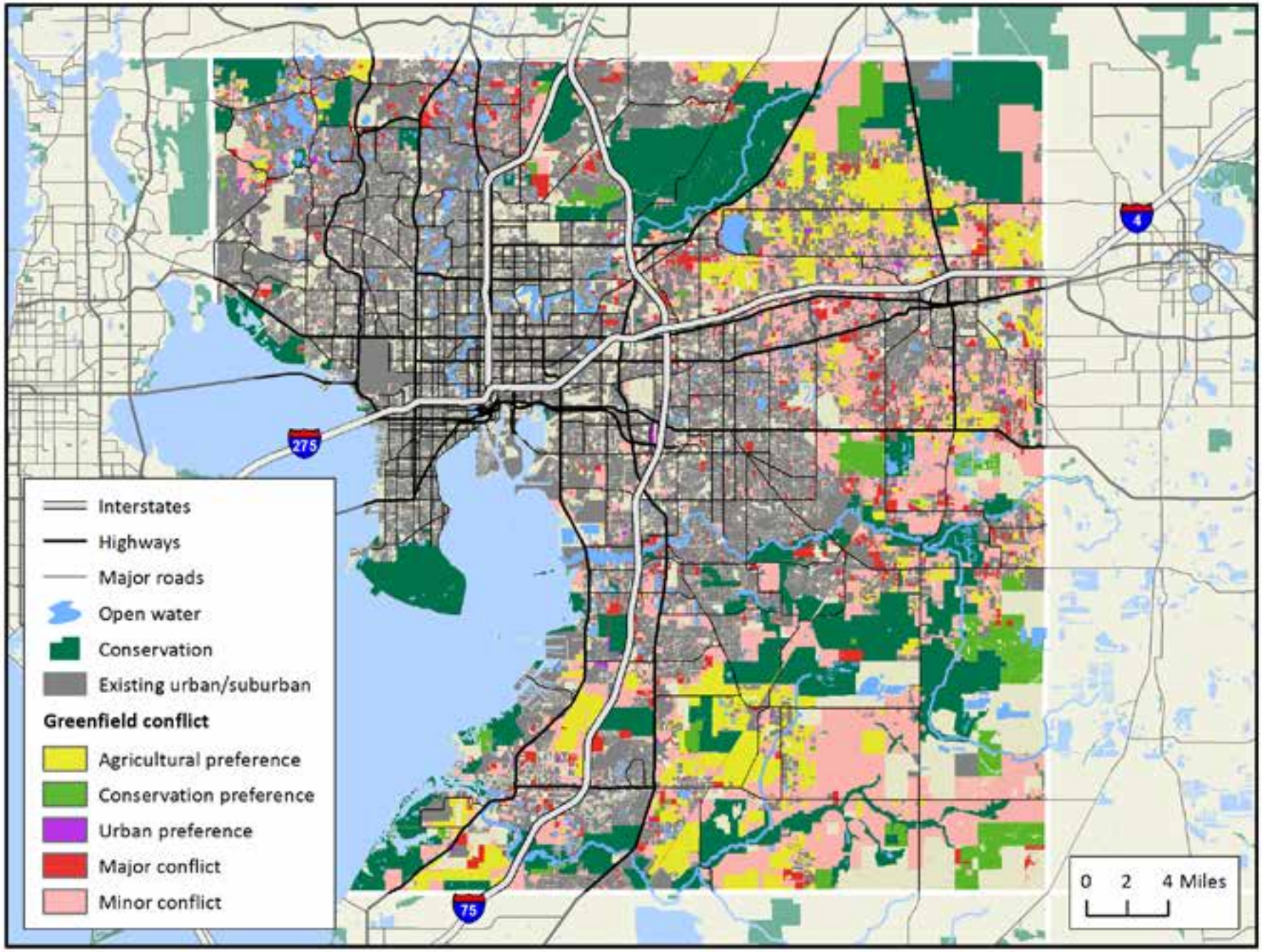

Interstates
Highways
Major roads
Open water
Conservation
Urban preference
High
Moderate
Low
275
75
4
0 2 4 Miles

LUCIS preference and conflict

The computer model detects conflict, based on which lands are most appropriate (based on their characteristics) for each stakeholder.

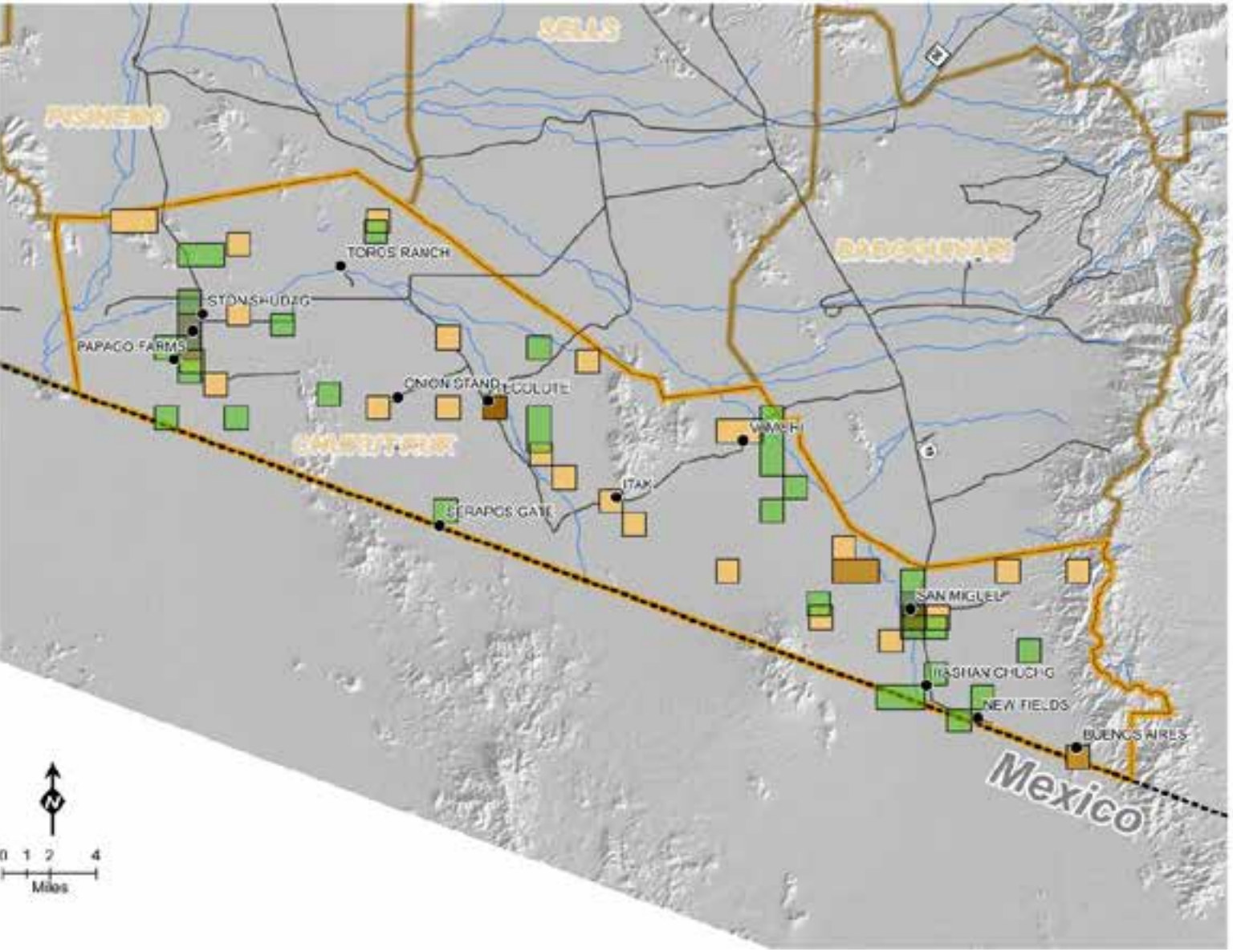



Interstates
Highways
Major roads
Open water
Conservation
Existing urban/suburban
Greenfield conflict
Agricultural preference
Conservation preference
Urban preference
Major conflict
Minor conflict
275
75
4
0 2 4 Miles

Decision-Making

Applications

Tohono O'odham Nation



Chukut Kuk Community Workshop Responses

Housing & Economic Development

- Chukut Kuk Villages
- Major Road
- State Highway
- Major Wash
- International Boundary
- Chukut Kuk
- Nation District

Member Responses By Square Mile

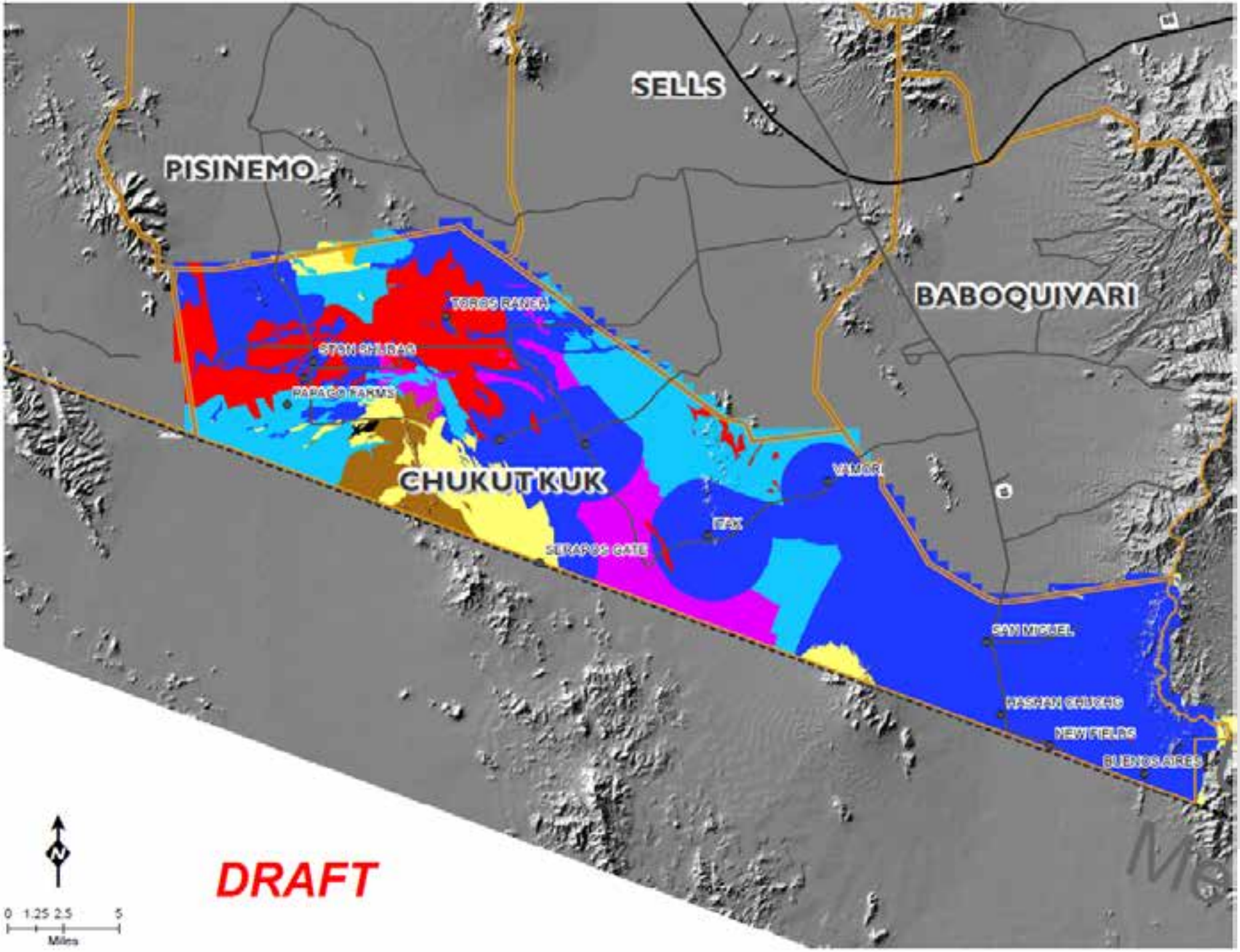
Economic Development
- High
- Low

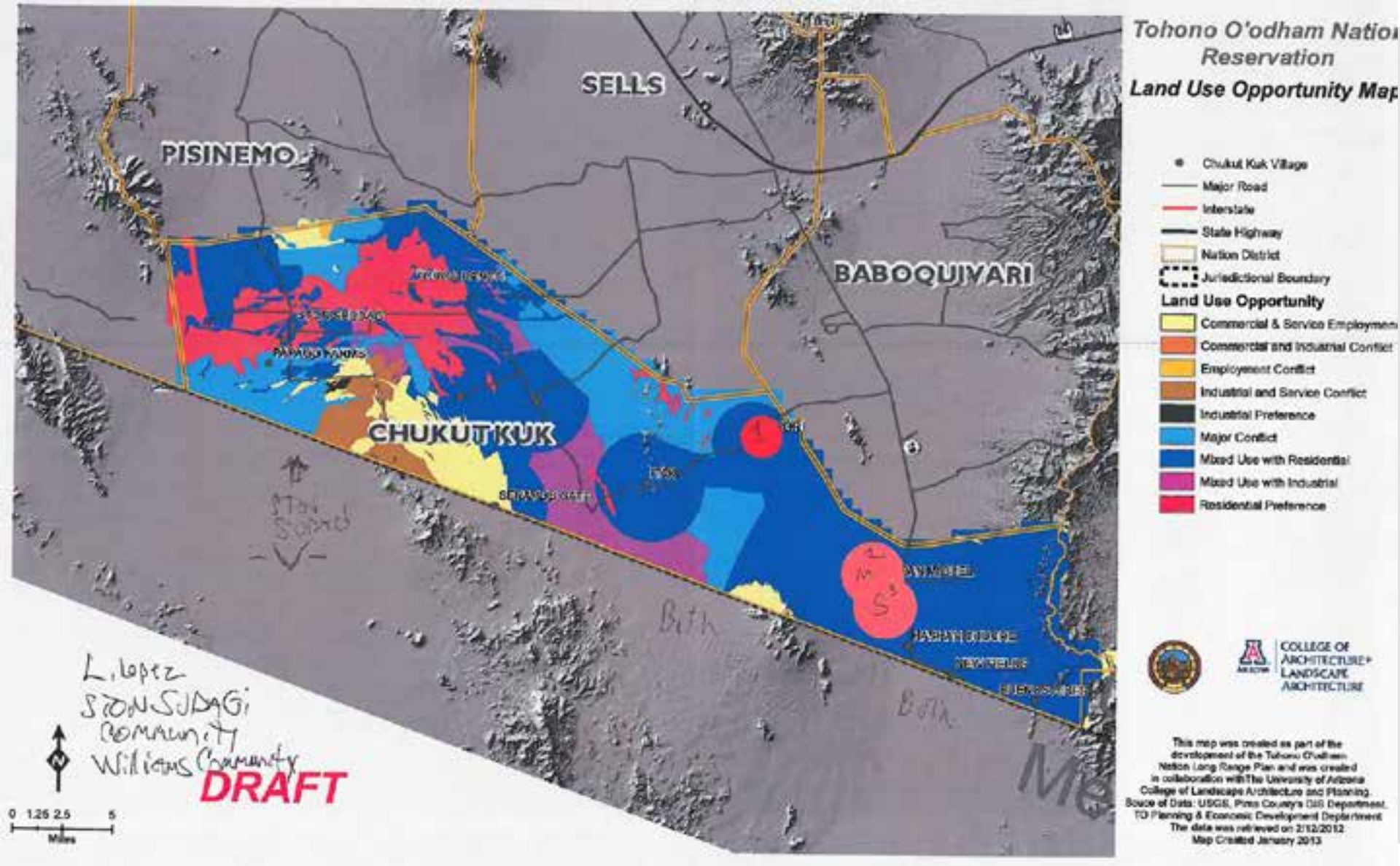
Housing Development
- High
- Low

COLLEGE OF ARCHITECTURE + LANDSCAPE ARCHITECTURE

*The member responses are from the Chukut Kuk Community meeting that was held in January 26, 2012.

This map was created as part of the development of the Tohono O'odham Nation Long Range Plan and was created in collaboration with The University of Arizona College of Landscape Architecture and Planning.
Source of Data: USGS and Pima County's GIS Department.
The GIS data was retrieved on 2/10/2012
Map Created April 2012


SELLS
PISINEMO
BABOQUIVARI
TORRES RANCH
STOCKPILE AS
PAPAGO FARMS
CHUKUT KUK
VAMORI
EAK
SUPAPOS GATE
SAN MIGUEL
NASHAM CHUKUT
NEW FIELDS
BUENOS AIRES
DRAFT
0 1.25 2.5 5
Miles



Tohono O'odham Nation Reservation

Land Use Opportunity Map

- Chukut Kuk Village
- Major Road
- Interstate
- State Highway
- Nation District
- Jurisdictional Boundary

Land Use Opportunity

- Commercial & Service Employment
- Commercial and Industrial Conflict
- Employment Conflict
- Industrial and Service Conflict
- Industrial Preference
- Major Conflict
- Mixed Use with Residential
- Mixed Use with Industrial
- Residential Preference

COLLEGE OF ARCHITECTURE + LANDSCAPE ARCHITECTURE

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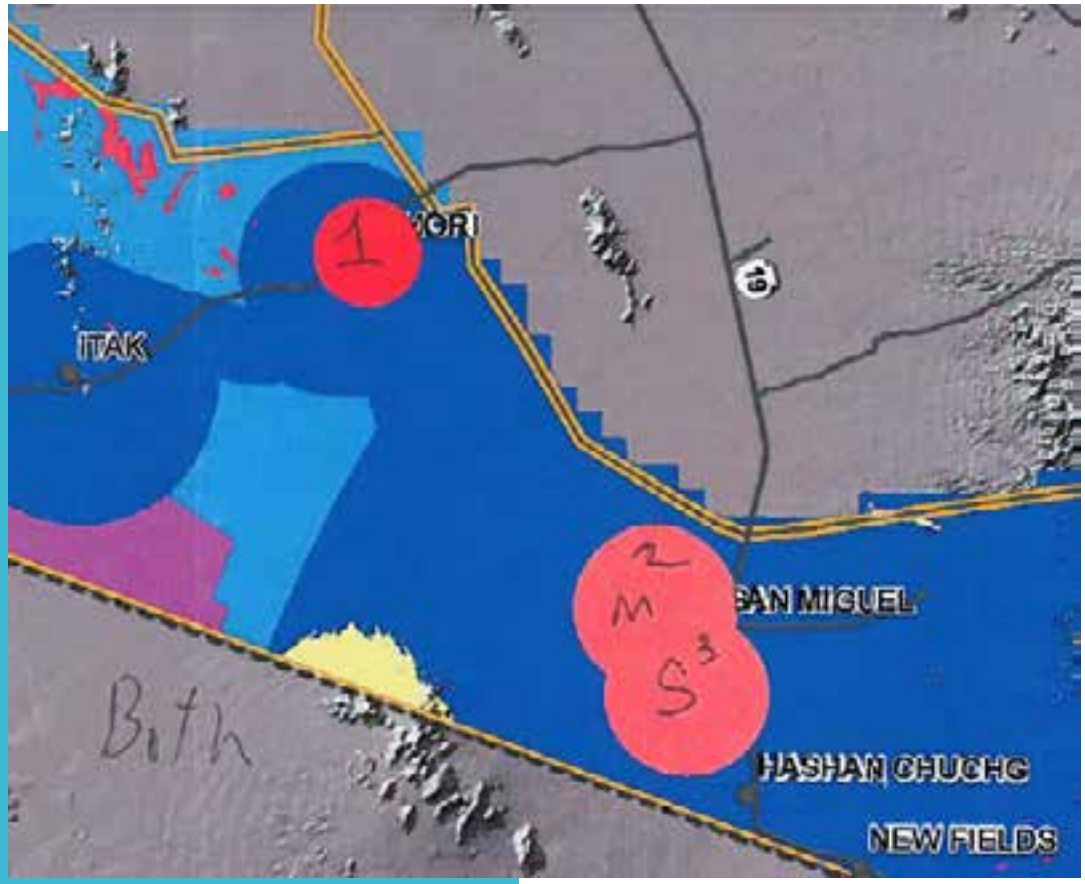
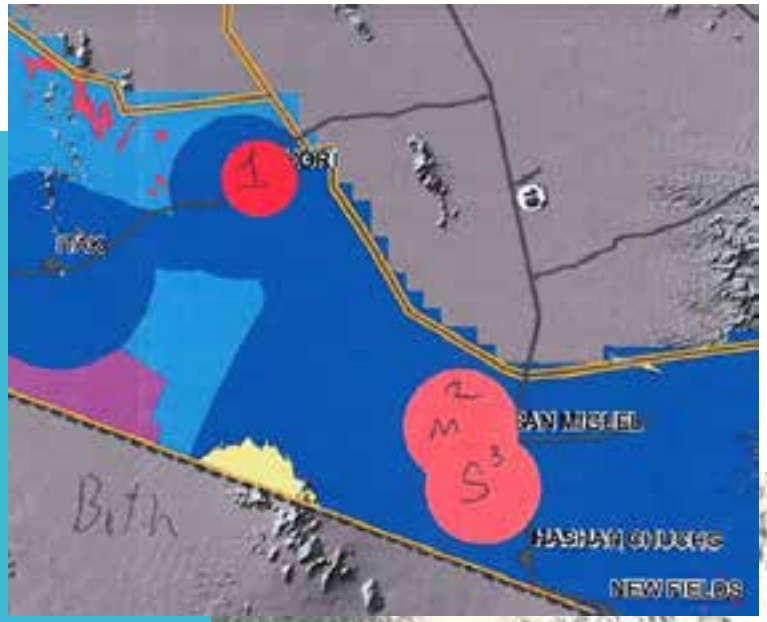
Source of Data: USGS, Pima County GIS Department, TO Planning & Economic Development Department
The data was retrieved on 2/12/2012
Map Created January 2013

CURRENT

Housing &
Economic Development




1
2
3
Bath
NEW FIELDS


Development Area
Indian Route
Minor Road
Proposed New Road
Existing Housing
Proposed Mixed-use Building
Proposed Residential
Proposed Recreation Center
Proposed Parking Lot

Decision-Making

Applications

Renewable Energy

Goals & Objectives

Goal	Purpose
1. Solar	Identify areas suitable for photovoltaic (PV) arrays and Concentrating Solar Power (CSP).
2. Wind	Identify areas suitable for utility-scale wind turbine projects.
3. Bio Energy	Identify areas suitable for utility-scale bio-energy development.

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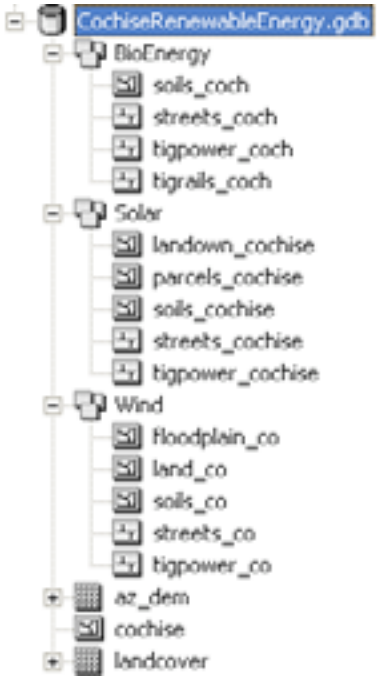
Modeling Approach

- Land, area sizes, urban development (parcels)
- Solar insolation, slope, shading (DEM)
- Soil conditions (soils)
- Major roadways (streets)
- Floodplains
- Avian/bat corridors
- Wind speeds
- Railroads
- Transmission lines



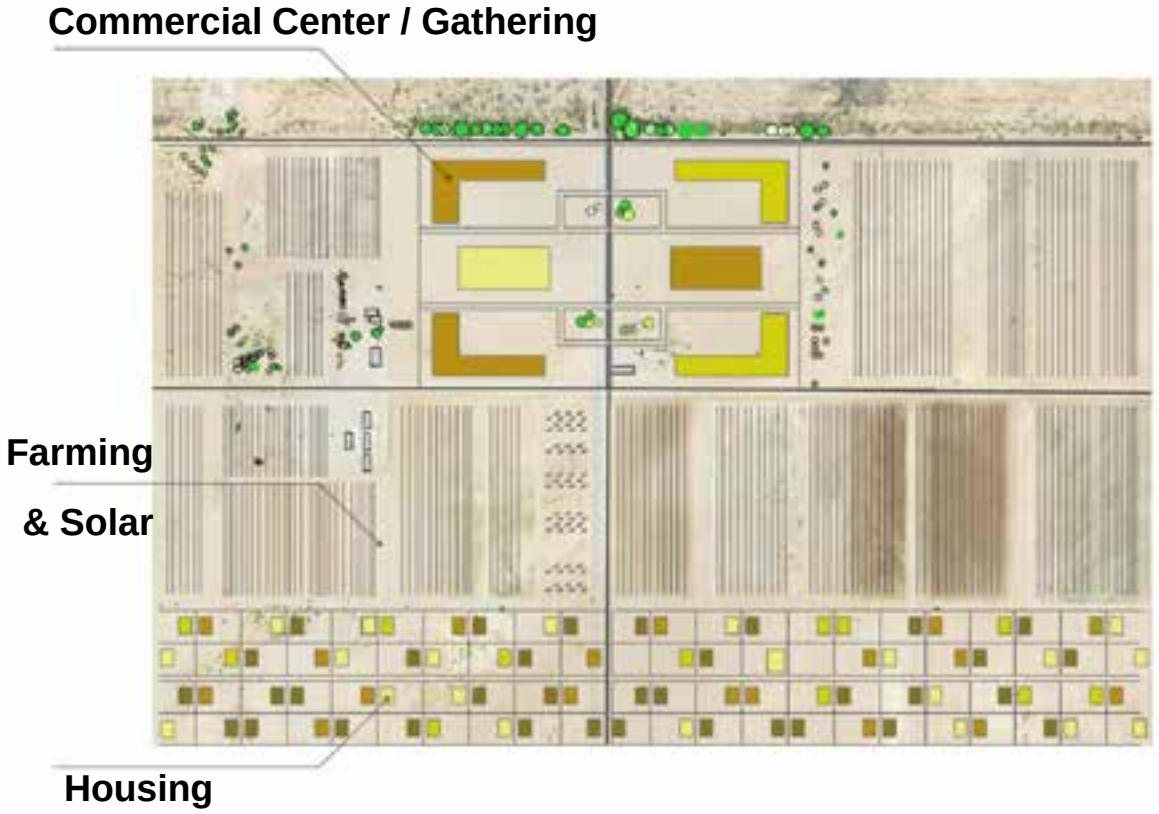
Decision-Making

It’s about the design

CHUKUT KUK District

SITE PLAN & ELEVATION

Papago Farms



Tohono O' odham Nation
Renewable Energy Workshop
July 15 - 16, 2013

Questions?

Thank you!

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