

Using Envision Tomorrow for Scenario Planning

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Outline

- My Envision Tomorrow Background
- Envision Tomorrow Overview
- Tool Comparison Topics
 - Purpose
 - Related planning processes
 - General technical requirements
 - Cost, time and skills
- ET & Scenario Planning

Background

- My Envision Tomorrow experience:
 - *Studied* its real-world use intensively as part of my research
 - *Installed & tested* it for a professional agency (MAPC)
 - *Use* it within a graduate scenario planning class

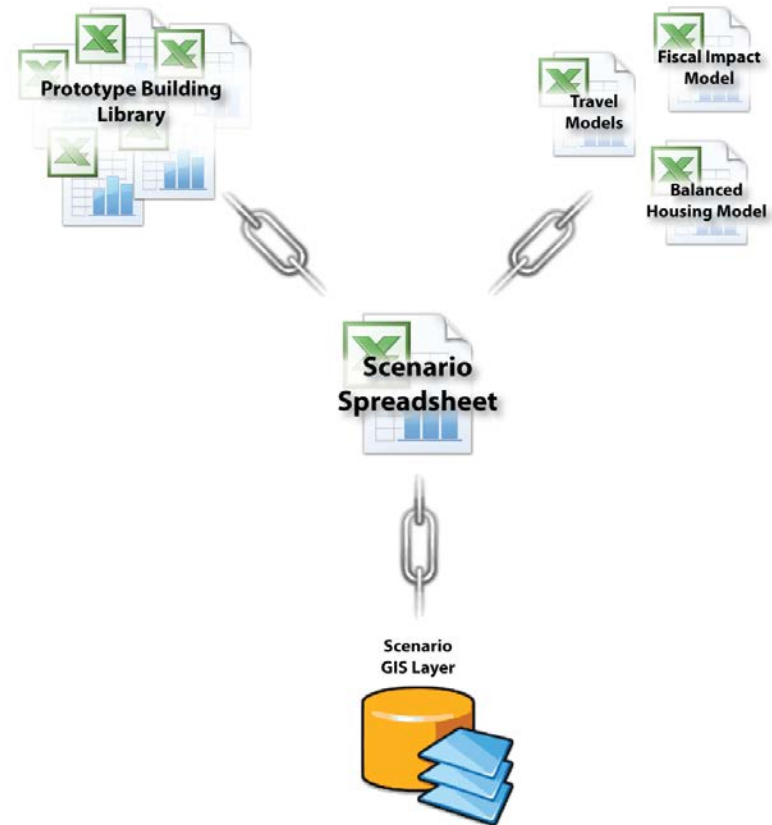
ET was developed by Fregonese Associates, and now the University of Utah.

It is not “my” tool and I don’t consider myself an expert ... yet I can explain it to you and (to a certain extent) use it. ***Crazy, huh?***

What is Envision Tomorrow?

- A suite of planning tools which allow you to sketch and analyze alternative urban development patterns. Often used to plan for mixed use & smart growth.
- *In the same family as set of tools based on place types (SACOG's iPlace(3)s, Calthorpe/Calif. UrbanFootprint)*

ET Does:	ET Does Not:
Utilize flexible spreadsheets & simple ArcGIS extension	Require faith in a costly black box .
Facilitate analysis of travel behavior sensitive to detailed urban form missed by four-step models	Simulate journey-to-work/activities travel using discrete choice theory
Allow for detailed analysis of financial feasibility & fiscal impact	Simulate regional real estate market dynamics
Allow for the consideration of alternatives (maybe scenarios)	Purport to predict or forecast the future



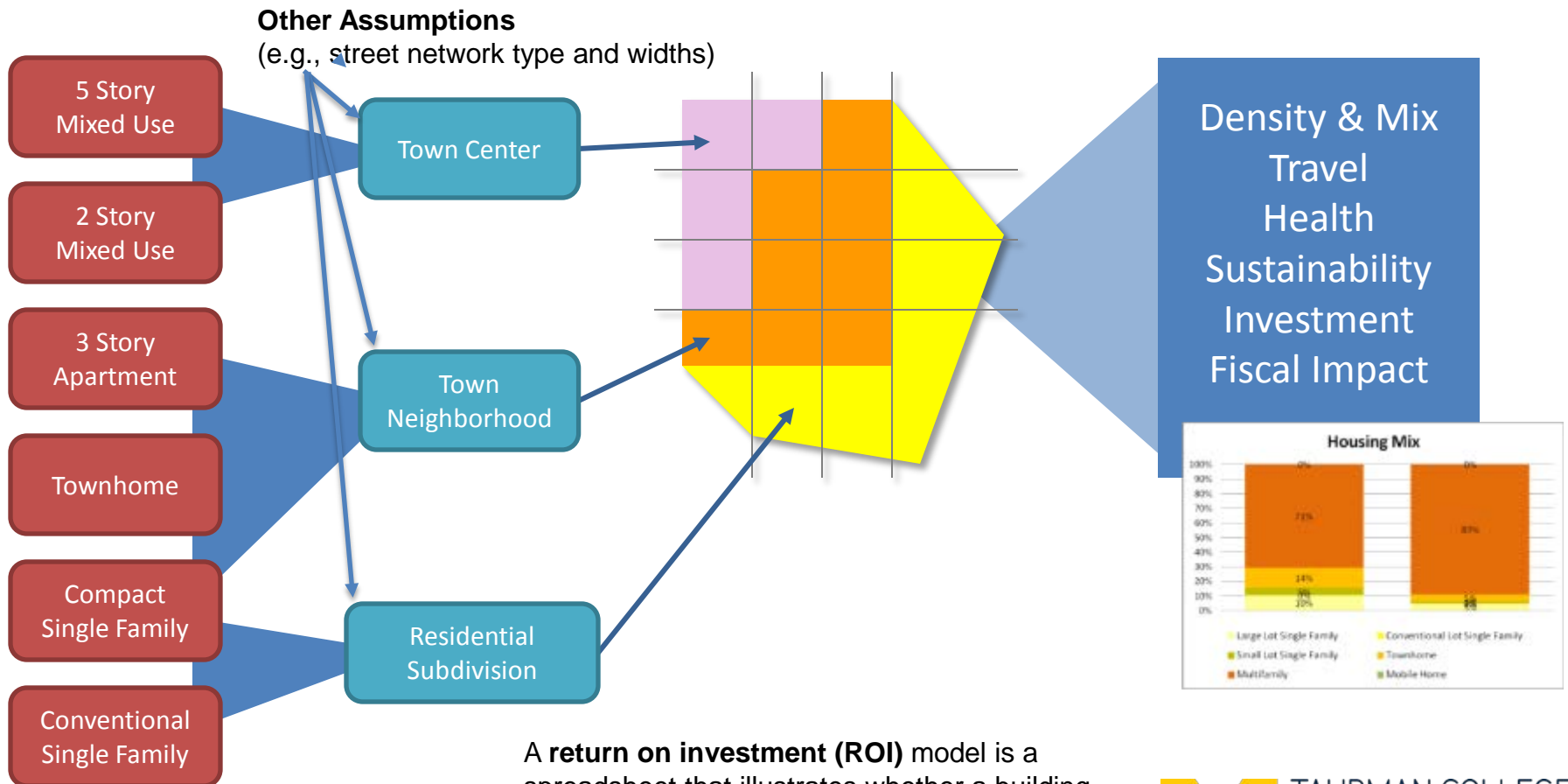
Overview of Envision Tomorrow Tool

Buildings
ROI Model

Development Types
Scenario Spreadsheet

GIS
Painting
ArcGIS

Evaluation Criteria
Scenario Spreadsheet



Slide Source: Fregonese Associates

A **return on investment (ROI)** model is a spreadsheet that illustrates whether a building makes financial sense given existing rents, cost of construction, public subsidies, and other financial factors.

Development/Place Types Composed of Regionally Calibrated Prototype Buildings

Mix of Buildings

Development Type Name	Single Family Large Lot	Single Family Standard Lot	Single Family Compact Lot	Townhomes Market Rate	Multi-Family Affordable	Multi-Family Mixed Income	Multi-Family Market Rate
Downtown Commercial Core							
Business / Commerce District							
Transit Oriented District				10%		20%	10%
Medical / Institutional Center							
Western Reserve Town Center			20%			20%	
University / College Town District							15%
New Town Center				25%			25%
Neighborhood Main Street						20%	
Arterial Commercial District							
Lifestyle Center / Mall District							15%
Corporate Campus							
Light Industrial Business Park							
Heavy Industrial Development							

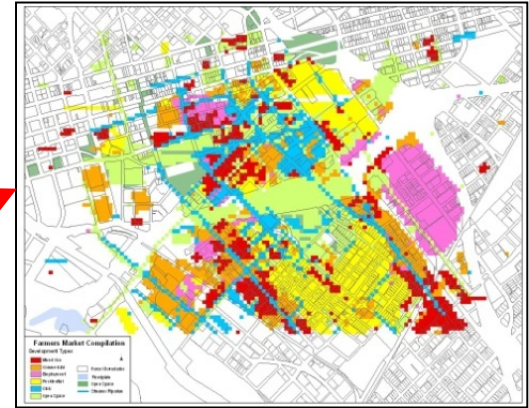
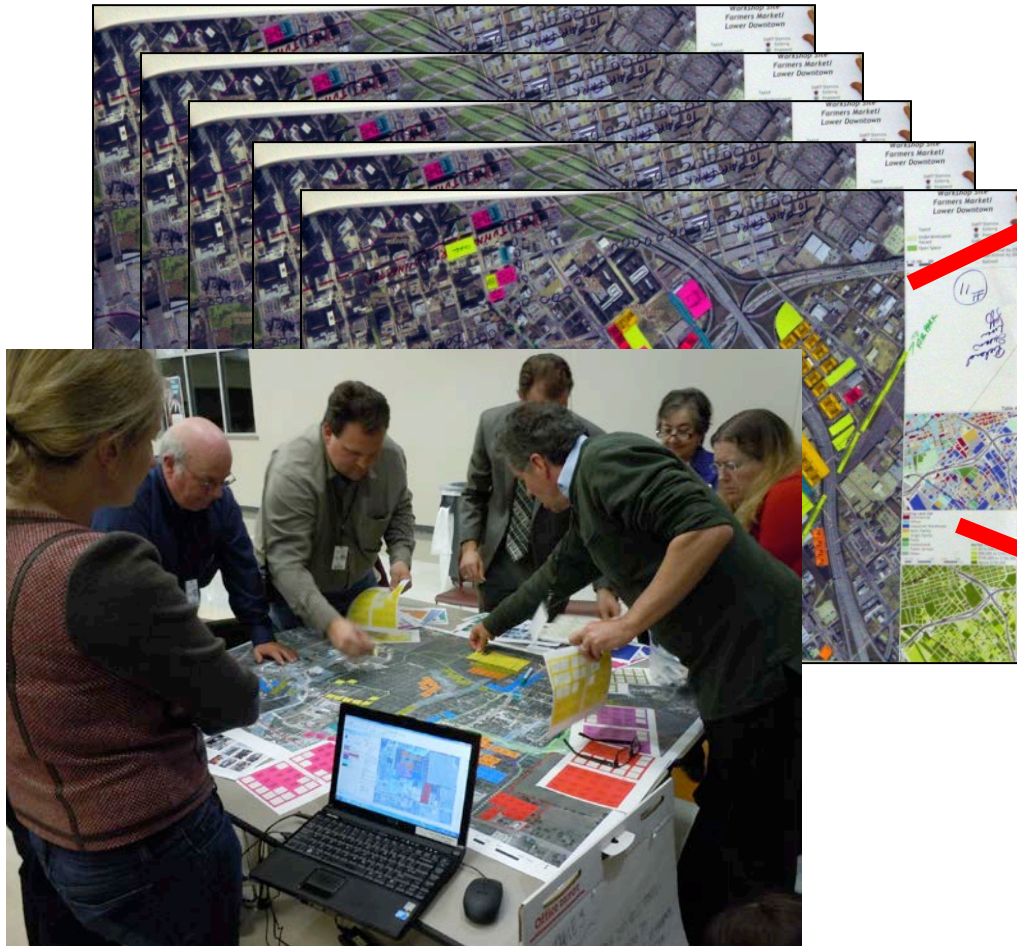
Slide Source: Fregonese Associates

Development Types Include Street Characteristics

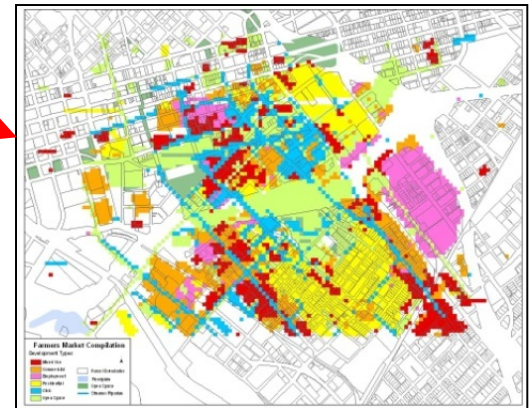
2. Enter Development Type Names Clear Streets	Block Size					Street Characteristics									Percentage
	Block Width 1 (ft)	Block Width 2 (ft)	Buildable Block Area (Sq Ft)	Total block Area (to center line) (Sq Ft)	Total Block Area (Acres)	Number of Drive Lanes	Drive Lane Width	On-street Parking Width	Bike Lane Width	Sidewalk Width	Total Landscaping Width	Total Street Width	Cul-de-sac as percent of all intersections		
New Town Center	800	400	320,000	436,100	10.0	4	11	8	-	10	10	90	30%		
Neighborhood Main Street	400	400	160,000	219,024	5.0	2	10	8	4	12	-	68	0%		
Arterial Commercial District	800	350	280,000	391,600	9.0	4	11	8	-	10	10	90	10%		
Lifestyle Center / Mall District	900	600	540,000	648,261	14.9	4	11	-	-	10	5	69	35%		
Corporate Campus	900	900	810,000	906,304	20.8	2	11	-	-	10	10	52	35%		
Light Industrial Business Park	900	900	810,000	887,364	20.4	2	11	-	-	5	10	42	35%		
Heavy Industrial Development	1,200	1,200	1,440,000	1,560,001	35.8	3	11	8	-	-	-	49	0%		
Downtown Residential Neighborhood	350	350	122,500	176,400	4.0	2	10	8	5	12	-	70	0%		
Suburban Multi-Family Neighborhood	600	300	180,000	245,824	5.6	3	9	8	4	6	5	68	15%		
Senior Living Community	400	400	160,000	221,841	5.1	2	9	8	4	12	5	71	15%		
Mixed-Income Neighborhood	600	300	180,000	248,941	5.7	3	9	8	4	10	-	71	10%		
Compact Residential Neighborhood	400	300	120,000	167,244	3.8	2	9	8	4	10	-	62	10%		
Suburban Subdivision	600	600	360,000	408,321	9.4	2	9	8	-	-	5	39	50%		
Rural Residential Development	1,400	350	490,000	528,984	12.1	2	11	-	-	-	-	22	60%		
Abandonment 55%			-	-	-	-	-	-	-	-	-	-	0%		
Abandonment 35% (+10%)			-	-	-	-	-	-	-	-	-	-	0%		
Vacancy 20%			-	-	-	-	-	-	-	-	-	-	0%		
Open Space			-	-	-	-	-	-	-	-	-	-	0%		
HHLD Growth 20%			-	-	-	-	-	-	-	-	-	-	0%		

Slide Source: Fregonese Associates

ET Can be Used to Create Multiple Scenarios in Collaborative Workshops



Compilation Scenario A



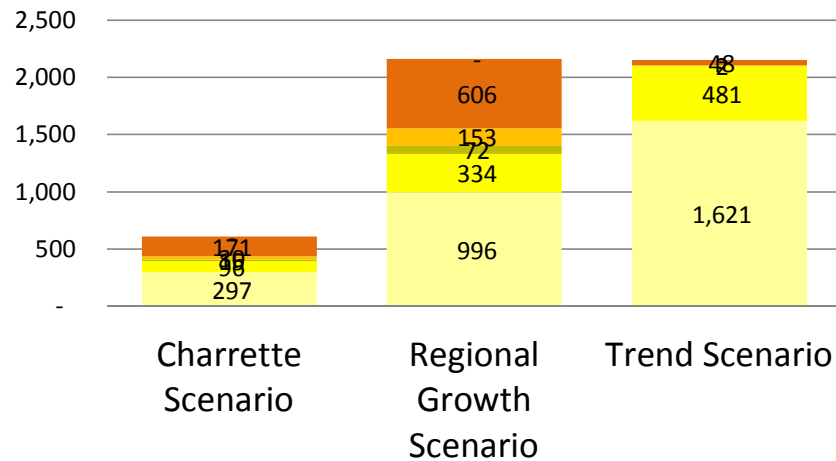
Compilation Scenario B

Photo Source: Goodspeed (2013), also (2015); Other slide images: Austin Sustainable Places Project. Lockhart Community Design Workshop: Scenario Planning Charrette. Presented at Lockhart Demonstration Site, January 31, 2013.

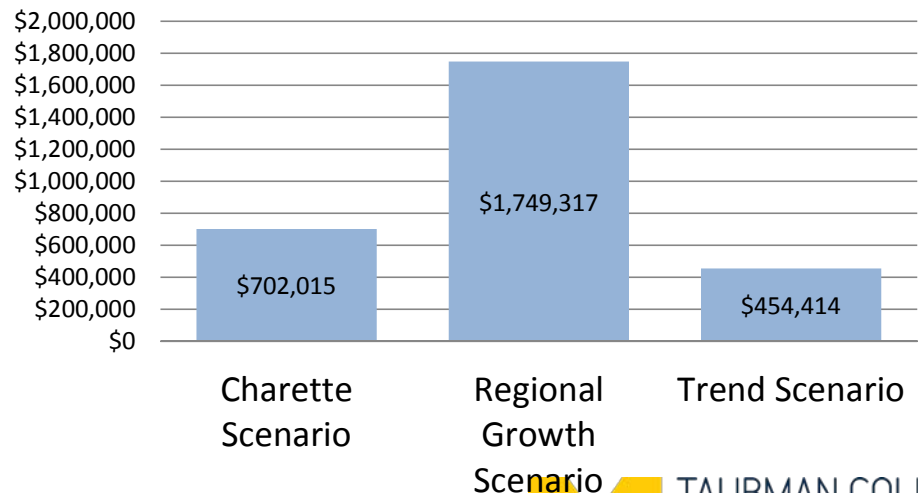
Real-Time Scenario Planning Indicators

1. Developed Acres
2. Rate of Redevelopment/Infill
3. Housing by Type
4. Housing Mix
5. Population
6. Employment by Type
7. Employment Mix
8. Jobs-Housing Balance
9. Housing Units per Net Acre
10. Jobs per Net Acre
11. Property Tax Revenue
12. Sales Tax Revenue
13. Fiscal Impact

Housing by Type



Sales Tax Revenue



Available Analysis “Apps”

Before Sketching

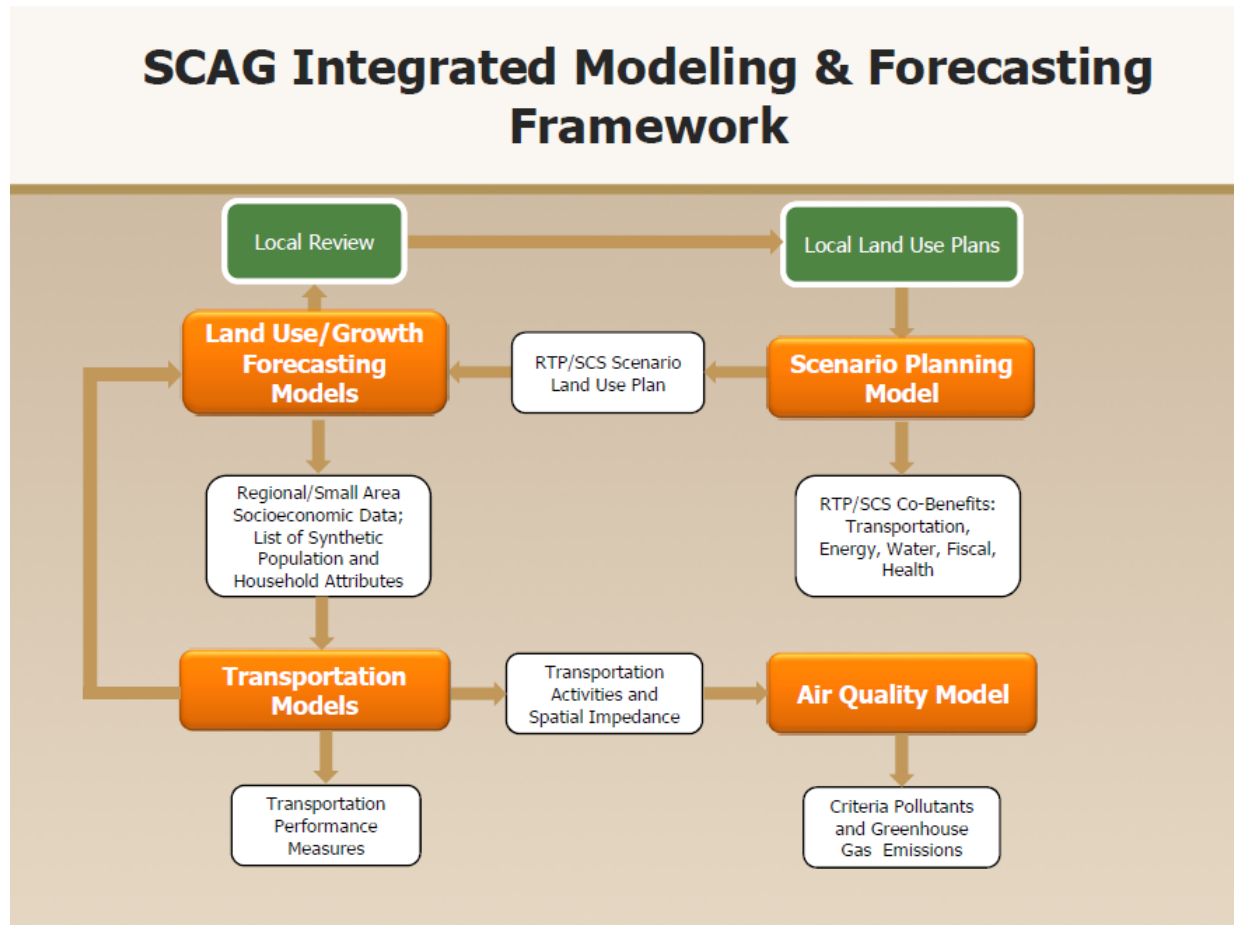
- **Location Efficiency Tool:** Facilitates a raster suitability analysis
- **Redevelopment Candidate App:** Estimates which properties are candidates for redevelopment through a financial analysis (requires improvement value, land value, building year built)
- **Workforce Housing Model:** Identifies areas with an imbalance between housing and jobs, and income and worker wages
- **Balanced Housing Model:** Analyzing housing supply and identify mismatches

After Sketching

- **Green Infrastructure App:** Estimates runoff reductions, energy savings, air pollutant reductions, CO2 reductions, open space
- **Fiscal Impact Tool:** Consider fiscal impacts of growth
- **Health Assessment Model:** Analyze health outcomes based on demographic and built environment characteristics
- **Travel Behavior Tools:** Regional, district-level, and site-level models
 - Implement “7D” Household travel analysis, based on extensive empirical research that shows travel activity can be explained by density, diversity of land uses, distance to transit, destination accessibility, urban design, development scale, and demographics.

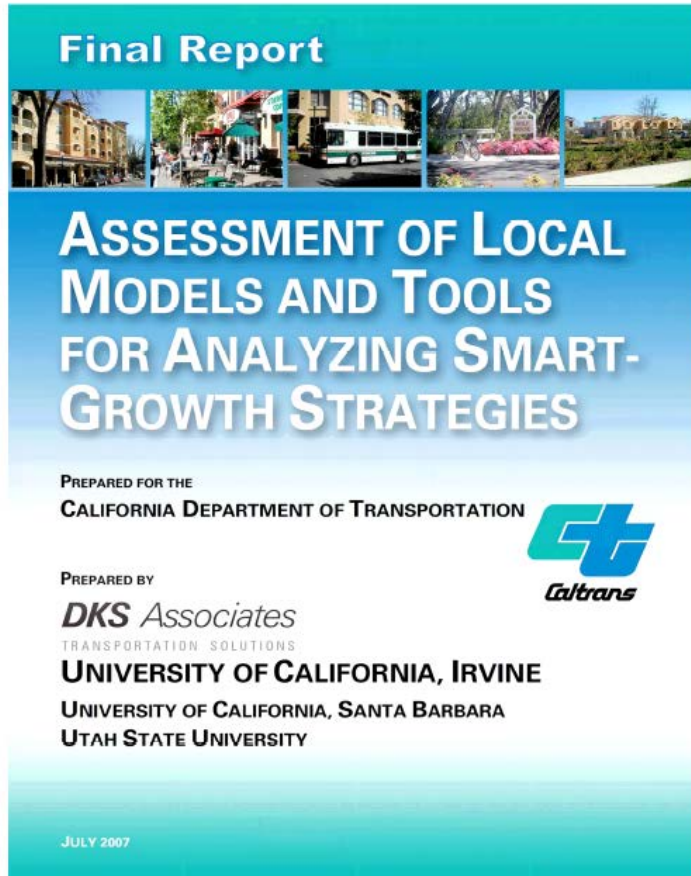
More info & downloads: <http://envisiontomorrow.org/>

Tools Like ET Can Be Integrated Into the Broader MPO Toolkit



Source: Southern California Association of Governments, Scenario Planning Model Project

ET Can Provide Sensitivity for Smart Growth Strategies



“However, many local jurisdictions’ models have very little sensitivity to smart-growth land use or transportation strategies. In such cases, the study suggests the appropriate use of a planning tool and/or post-processing application that incorporates “4D elasticities” (e.g., Density, Diversity, Design and Destinations).”

New Apps on the Horizon

The Lincoln Institute of Land Policy is funding the development of a set of related tools and methods, focused on social equity and social vulnerability. Will be (tentatively) presented at APA 2017 in NYC.

My Project (Grant #URG082015):

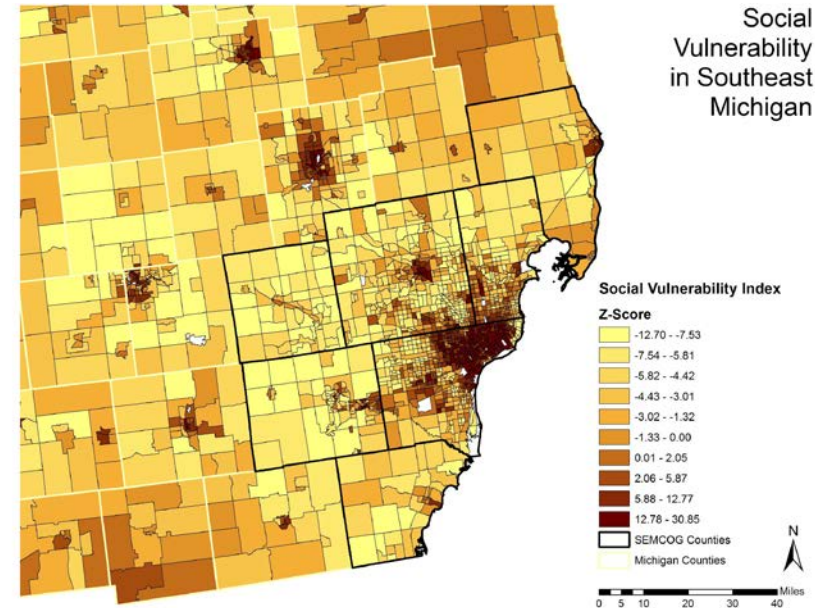
- A **social vulnerability tool** to map out the community before planning has begun
 - The “base map” is typically focused on existing buildings & infrastructure – not social issues
- A **neighborhood effects tool** to allow ET+ users to conduct additional analysis of their land use scenarios
 - Existing analysis focuses on issues such as fiscal impact and travel behavior

Social Vulnerability Tool

Large body of descriptive and theoretical work on social vulnerability, a few validated indices (Lee 2014, Mendes 2009, Cutter et al 2000)

Created a new index, only 1 correlation greater than .3 at the individual level!

- **Demographics**
 - Percentage of non-white residents
 - Percentage of population under age 18 and over age 65
- **Social and economic**
 - Unemployment rate for civilian population in labor force 16 years and over
 - Percentage of households with no vehicles available
- **Wealth and Inequality**
 - Percentage with income in the past 12 months below poverty level
- **Healthcare and Food Access**
 - Percentage of people without health insurance coverage
 - Percentage of population with disability
 - Food desert status (Yes = 1, No = 0) (more than 1 mile away from the nearest supermarket)
- **Education and Language**
 - Percentage of population with less than regular high school diploma
 - Percentage of limited English speaking household
- **Housing**
 - Percentage of Vacant housing units
 - Percentage of households who pay more than 30 % of their income rent
 - Percentage of renter-occupied housing units



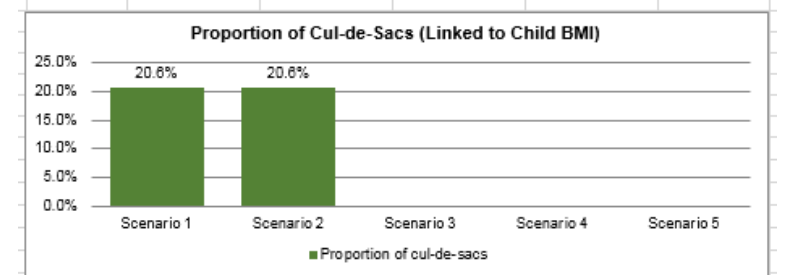
Neighborhood Effects Tool

- A growing body of “neighborhood effects” research has documented the role of neighborhoods in various well-being outcomes. Our tool identifies built environment factors in the tool linked to different outcomes.

Indicators

- **Child BMI** (Grafova 2008)
 - Proportion of cul-de-sacs
- **Adult BMI** (Rundel et al 2007)
 - Land use mix
 - Population density
- **Collective Efficacy** (Cohen, Inahami, Finch 2008)
 - Proportion of open space
- **Upward mobility, adult BMI, heart disease, diabetes** (Ewing, Meakins and Hamidi 2014)
 - Population density
 - Employment density
 - Land use mix
 - Building size mix
 - Intersection density

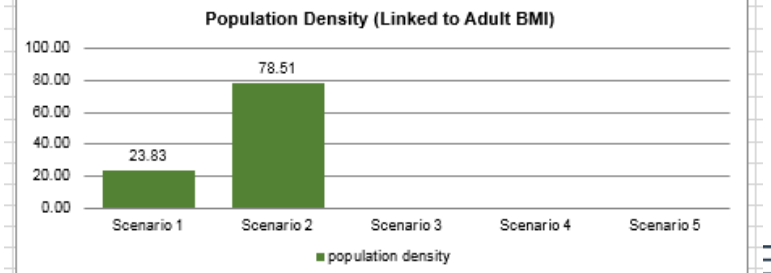
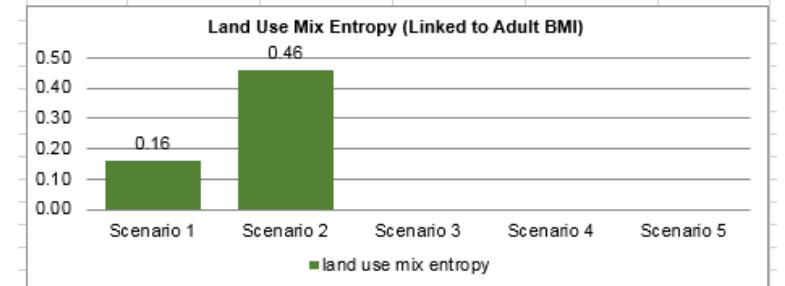
Existing	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	20.6%	20.6%			



Grafova (2008) found a **positive** relationship between living in a neighborhood built after 1969 (used as a proxy for high cul-de-sacs) and Child BMI.

Narrative report: Scenario 2 has characteristics associated with **lower** child BMI than scenario 1.

Existing	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	0.16	0.46			
	23.83	78.51			



Rundel et al (2007) found a **negative** relationship between land use mix and population density and Adult BMI

Scenario 2 has characteristics associated with **lower** adult BMI than scenario 1.

Tool Comparison

Topics	Envision Tomorrow
Purpose and applications	Create & analyze land use scenarios which integrates <i>some</i> transportation aspects, sensitivity to urban form (doesn't tell you where to build the train or highway)
Related processes	Quite flexible, often incorporated into workshops to maximize stakeholder learning
General technical requirements	ArcGIS Desktop, standard GIS layers, Excel
Cost, time and skills	<i>Very</i> easy to tinker, (like all tools) hard to master

ET & Scenario Planning

- Sketching development alternatives is not itself scenario planning! ... but still might be useful.
- ET can be used *within* a scenario planning project to create concrete and specific alternative visions ... or it can be a tool to conduct standard master planning



Images: "Gridlock in Tech Town," UP 529 Final Presentation, 20 April 2016, D. Mihalov, R. Yanke, M. Cupp, T. Marek, S. Landfried

Conclusion

Resources

Tool Home (Univ. Utah): <http://envisiontomorrow.org/>
Consultant Creators: <http://frego.com/envision-tomorrow/>
Community of Practice: <http://scenarioplanning.io/>

Works Cited

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