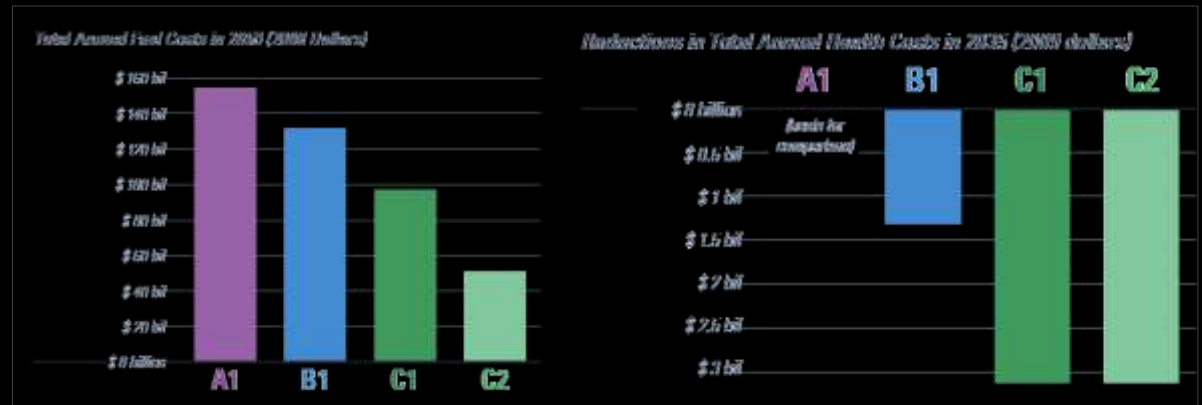


Making Measured Choices...



*...Modeling for
the Fresno
General Plan*



Joe DiStefano
joed@calthorpe.com

New Partners for Smart Growth 08 Feb 2013

Vision California



California in 2050

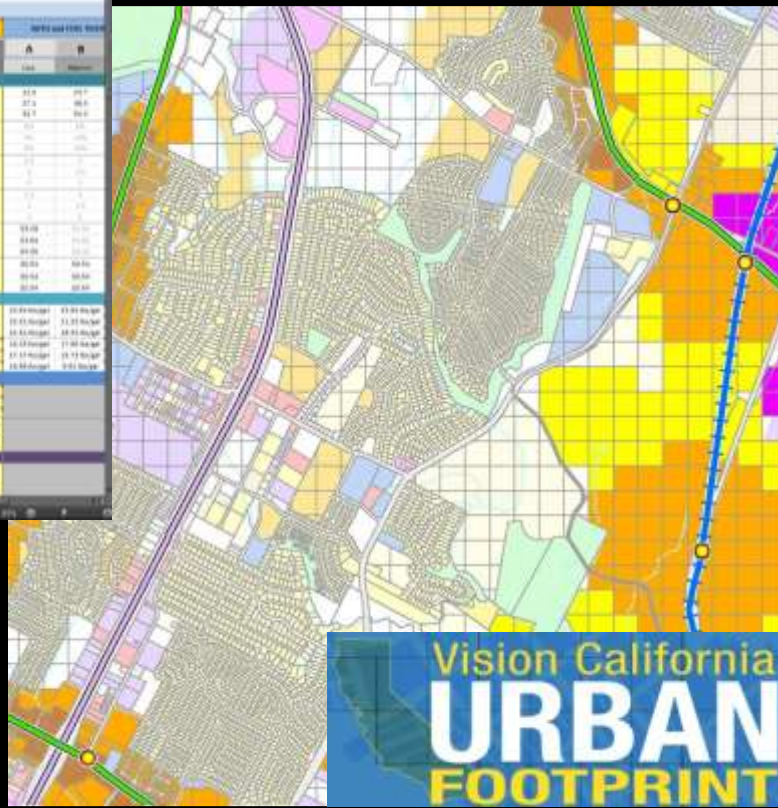


Trend



Compact Future

Next Generation Sketch Models



RapidFire

- ✓ Programmatic Model
- ✓ Quick Testing of Options
- ✓ Handshake to Other Models
- ✓ Multi-Scale and Policy-Sensitive
- ✓ Peer Reviewed

UrbanFootprint

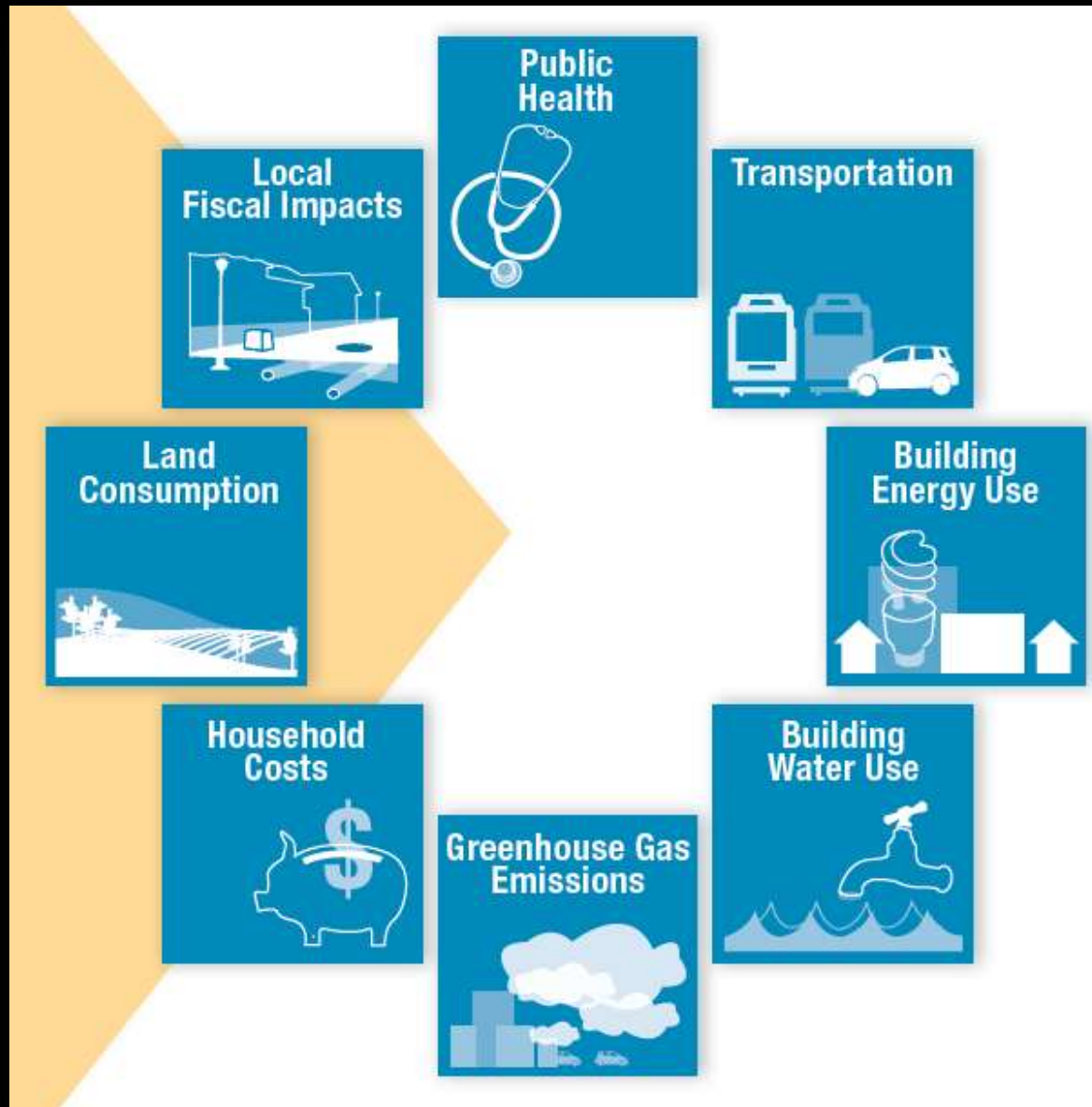
- ✓ Data & Scenarios Platform
- ✓ Multi-Scale, Multi-Geography
- ✓ Web-Based, Open Source

Sketch Futures...

The screenshot displays a web-based urban planning application. The main map shows an aerial view of Makakilo City with various colored placetypes overlaid. The placetypes are color-coded according to the legend on the right. The legend lists 35 placetypes, each with a unique color and a corresponding PTID. The map shows a mix of colors, including red, orange, yellow, green, and purple, indicating different land use zones. Several areas are circled in black, highlighting specific features or zones. The interface includes a toolbar at the top with options like 'Apply Placetype', 'Erase', 'Revert to Original PT', 'Undo Last Edits', 'Clear Paint Action', and 'Placetypes Menu'. A legend on the right lists the following placetypes:

PTID	Placetype Name	Color
1	Urban Mixed Use	Dark Red
2	Urban Residential	Red
3	Urban Commercial	Orange-Red
4	City Mixed Use	Orange
5	City Residential	Light Orange
6	City Commercial	Yellow-Orange
7	Town Mixed Use	Yellow
8	Town Residential	Light Yellow
9	Town Commercial	Yellow-Green
10	Village Mixed Use	Light Green
11	Village Residential	Green
12	Village Commercial	Light Green
13	Neighborhood Residential	Light Green
14	Neighborhood Low	Light Green
15	Office Focus	Light Purple
16	Mixed Office and RBD	Light Purple
17	Office/Industrial	Light Purple
18	Industrial Focus	Light Purple
19	Low-Density Employment Park	Light Purple
20	High Intensity Activity Center	Pink
21	Mid Intensity Activity Center	Light Pink
22	Low Intensity Retail Centers	Light Pink
23	Retail: Strip Mall/ Big Box	Light Pink
24	Industrial/Office/Res Mixed I	Light Orange
25	Industrial/Office/Res Mixed I	Light Orange
26	Suburban Multifamily	Light Yellow
27	Suburban Mixed Residential	Light Yellow
28	Residential Subdivision	Light Yellow
29	Large Lot Residential Area	Light Yellow
30	Rural Residential	Light Yellow
31	Rural Ranchettes	Light Yellow
32	Rural Employment	Light Yellow
33	Campus/ University	Light Blue
34	Institutional	Light Blue
35	Parks & Open Space	Light Green

...Test Impacts



RapidFire Model

Programmatic Modeling

Scenario Definition: Land Use Options & Policy Package Selection

1 DEFINE LAND USE OPTIONS

a. LAND USE OPTION DEFINITIONS

restore default scenario definitions.

		Urban		Compact		Standard		% refill growth
		Scenario %	Refill %	Scenario %	Refill %	Scenario %	Refill %	
		1. RAU	2005-2020	5%	100%	25%	25%	
	2020-2035	5%	100%	25%	25%	70%	0%	9%
	2035-2050	5%	100%	25%	25%	70%	0%	9%
2. Mixed Growth	2005-2020	10%	100%	40%	20%	50%	0%	18%
	2020-2035	10%	100%	40%	20%	50%	0%	22%
	2035-2050	10%	100%	40%	20%	50%	0%	26%
3. Smart Growth	2005-2020	25%	100%	55%	40%	20%	0%	47%
	2020-2035	30%	100%	55%	30%	15%	0%	58%
	2035-2050	35%	100%	55%	20%	10%	0%	68%
4. Ultra Smart Growth	2005-2020	55%	100%	55%	70%	10%	0%	74%
	2020-2035	55%	100%	60%	60%	5%	0%	83%
	2035-2050	55%	100%	60%	20%	5%	0%	85%

Load Scenarios
Restore Default Scenarios

b. LAND DEVELOPMENT CATEGORY (LDC) PROPORTIONS

Enter values in cells below, or click button to restore default LDC proportions.

REFILL					GREENFIELD				
Scenario 1 Refill	SF Large Lot	SF Small Lot	Townhome	Multifamily	Scenario 1 Greenfield	SF Large Lot	SF Small Lot	Townhome	Multifamily
Urban	0%	0%	30%	70%	Urban	0%	0%	30%	70%
Compact	5%	40%	30%	25%	Compact	5%	40%	30%	25%
Standard	75%	8%	10%	7%	Standard	75%	8%	10%	7%

Restore Default LDC Proportions

2 SELECT POLICY PACKAGE(S)

Click buttons to load policy group options:

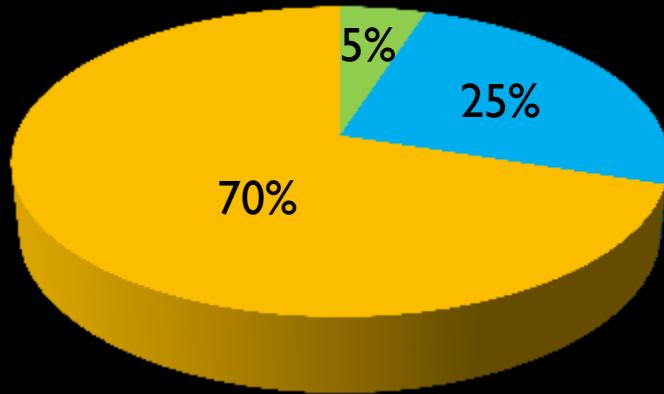
		FULL POLICY GROUPS			AUTO and FUEL TECH	
		A	B	C	A	B
		EMFAC Straight	EMFAC Fuel	Green	Low	Medium
TRANSPORTATION						
ICE vehicle efficiency (mpg)	2020	19.33	23.7	24.7	22.5	24.7
	2035	19.14	27.0	30.3	27.1	38.3
	2050	19.18	27.0	54.2	33.7	54.2
% Alternative/retrofit vehicles	2020	0%	0%	0%	0%	0%
	2035	0%	10%	10%	0%	10%
	2050	0%	0%	10%	0%	10%
Battery Electric Vehicle efficiency (mi/kWh)	2020	3.5	3.5	4	2.5	4
	2035	4	4	4.5	4	4.5
	2050	4	4	5	4	5
Plug-in Hybrid Vehicle efficiency (mi/kWh)	2020	3.5	3.5	4	2.5	4
	2035	4	4	4.5	4	4.5
	2050	4	4	5	4	5
Fuel price (\$/gal, 2005 dollars)	2020	\$4.74	\$3.92	\$3.92	\$3.28	\$3.92
	2035	\$5.24	\$5.60	\$5.80	\$3.64	\$5.80
	2050	\$5.74	\$8.00	\$8.00	\$4.06	\$8.00
Auto ownership and maintenance (\$/mile, 2005 dollars)	2020	\$0.24	\$0.24	\$0.24	\$0.54	\$0.54
	2035	\$0.24	\$0.24	\$0.24	\$0.54	\$0.54
	2050	\$0.24	\$0.24	\$0.24	\$0.54	\$0.54
TRANSPORTATION FUEL EMISSION RATES						
Well-to-Wheels Fuel Emissions (lbs CO ₂ e/gal)	2020				24.64 lbs/gal	23.34 lbs/gal
	2035				23.31 lbs/gal	21.20 lbs/gal
	2050				22.52 lbs/gal	18.54 lbs/gal
Tank-to-Wheels Fuel Emissions	2020	19.82 lbs/gal	17.66 lbs/gal	17.66 lbs/gal	18.25 lbs/gal	17.66 lbs/gal
	2035	19.82 lbs/gal	17.66 lbs/gal	13.73 lbs/gal	17.27 lbs/gal	13.73 lbs/gal
	2050	19.82 lbs/gal	17.66 lbs/gal	9.81 lbs/gal	16.68 lbs/gal	9.81 lbs/gal
CO₂e EMISSION RATES						
Residential & commercial building electricity emissions (lbs CO ₂ e/kWh)	2020	0.81 lbs/kWh	0.690 lbs/kWh	0.58 lbs/kWh		
	2035	0.81 lbs/kWh	0.623 lbs/kWh	0.48 lbs/kWh		
	2050	0.81 lbs/kWh	0.581 lbs/kWh	0.35 lbs/kWh		
Residential & commercial building natural gas emissions (lbs CO ₂ e/therm)	2020	11.66 lbs/therm	11.66 lbs/therm	11.66 lbs/therm		
	2035	11.66 lbs/therm	11.66 lbs/therm	11.66 lbs/therm		
	2050	11.66 lbs/therm	11.66 lbs/therm	11.66 lbs/therm		
BUILDINGS						
New residential energy efficiency (% reduction from 2005)	2020	10%	10%	30%		
	2035	20%	20%	55%		
	2050	30%	30%	80%		

Spreadsheet-Based Sketch Model (State, Region, County, Corridor, Jurisdiction)

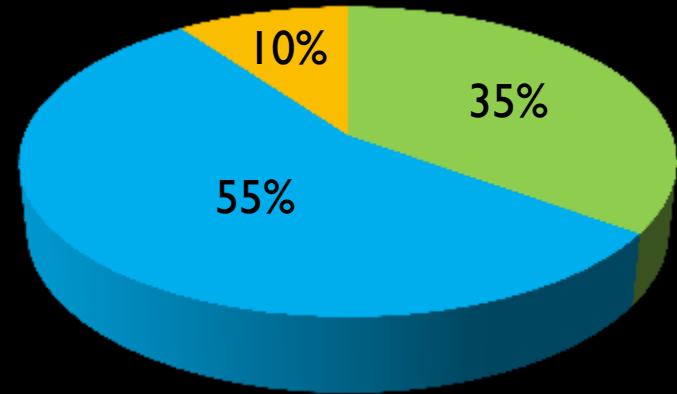
California **Rapid**Fire Scenarios

Land Use Mix for Growth Increment (2005-2050)

■ Urban ■ Compact ■ Standard



Business As Usual



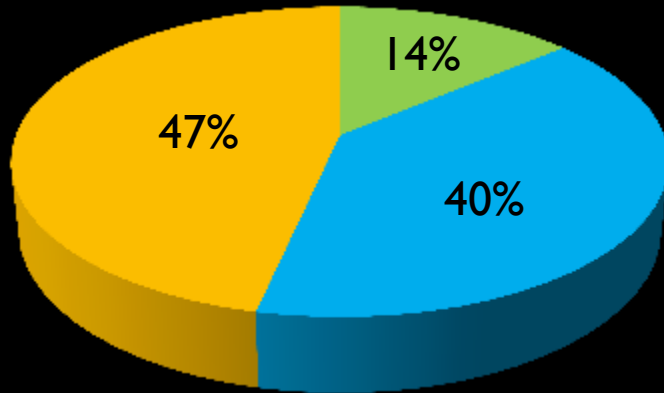
Growing Smart



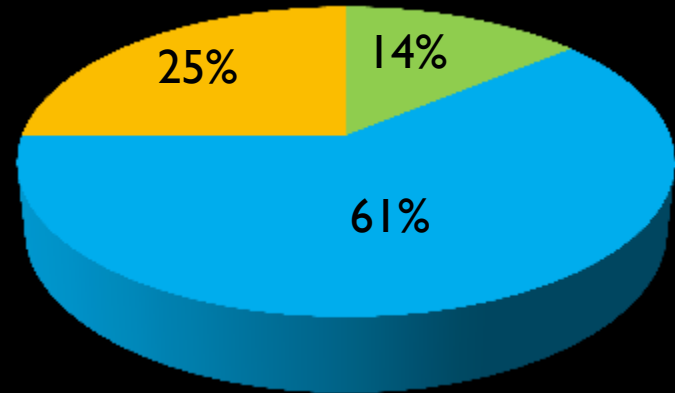
Fresno **RapidFire** Scenarios

Land Use Mix for Growth Increment (2010-2035)

■ Urban ■ Compact ■ Standard



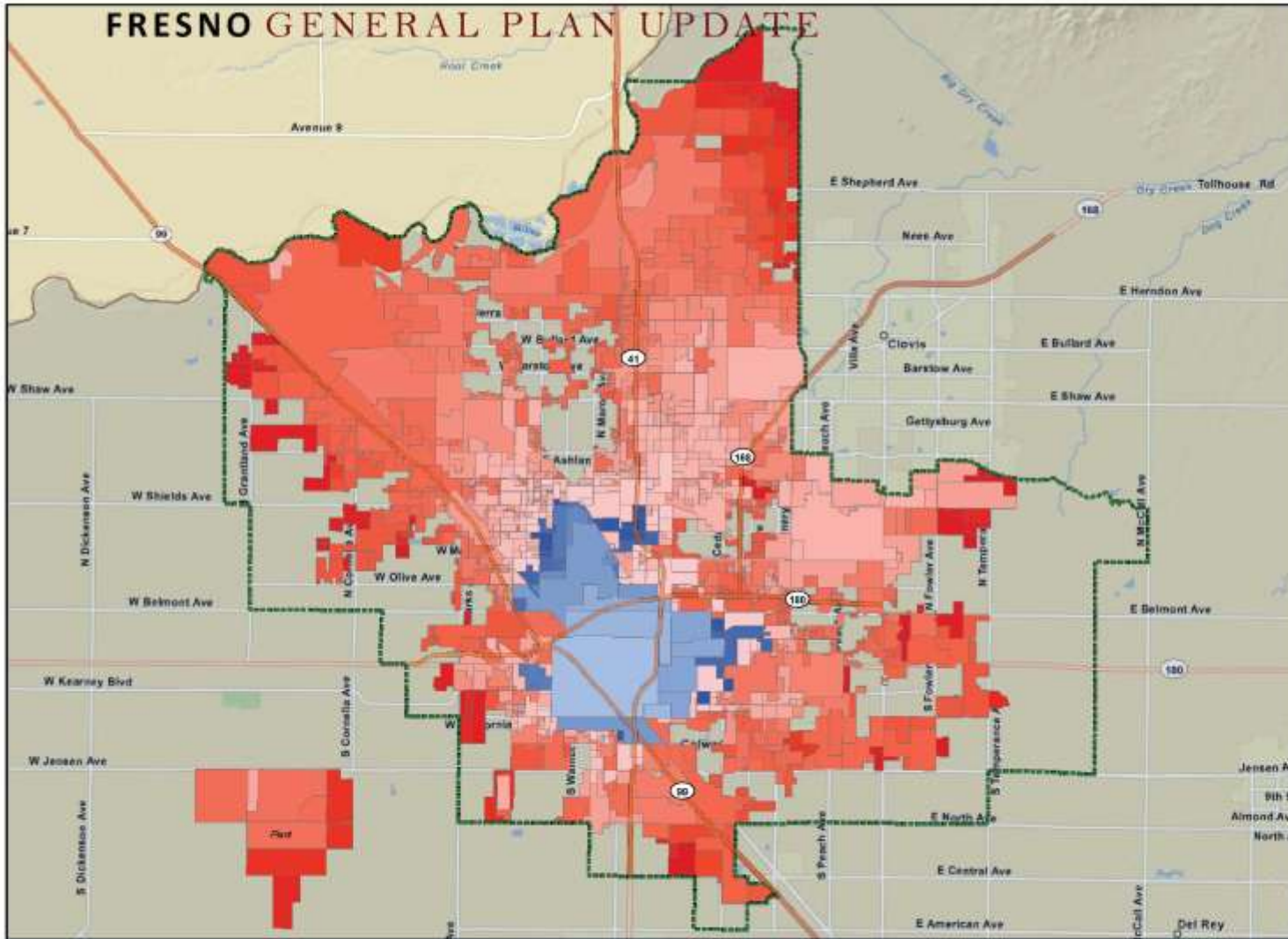
Status Quo



Alternative A



FRESNO GENERAL PLAN UPDATE



Local Setting





Boundaries

-  Sphere Of Influence
-  Fresno City Limits
-  Fresno County

Historic Growth Patterns

-  Post 1945 Growth
-  Pre 1945 Growth

Circulation

-  99 State Highway
-  41 State Highway
-  168 State Highway
-  180 State Highway

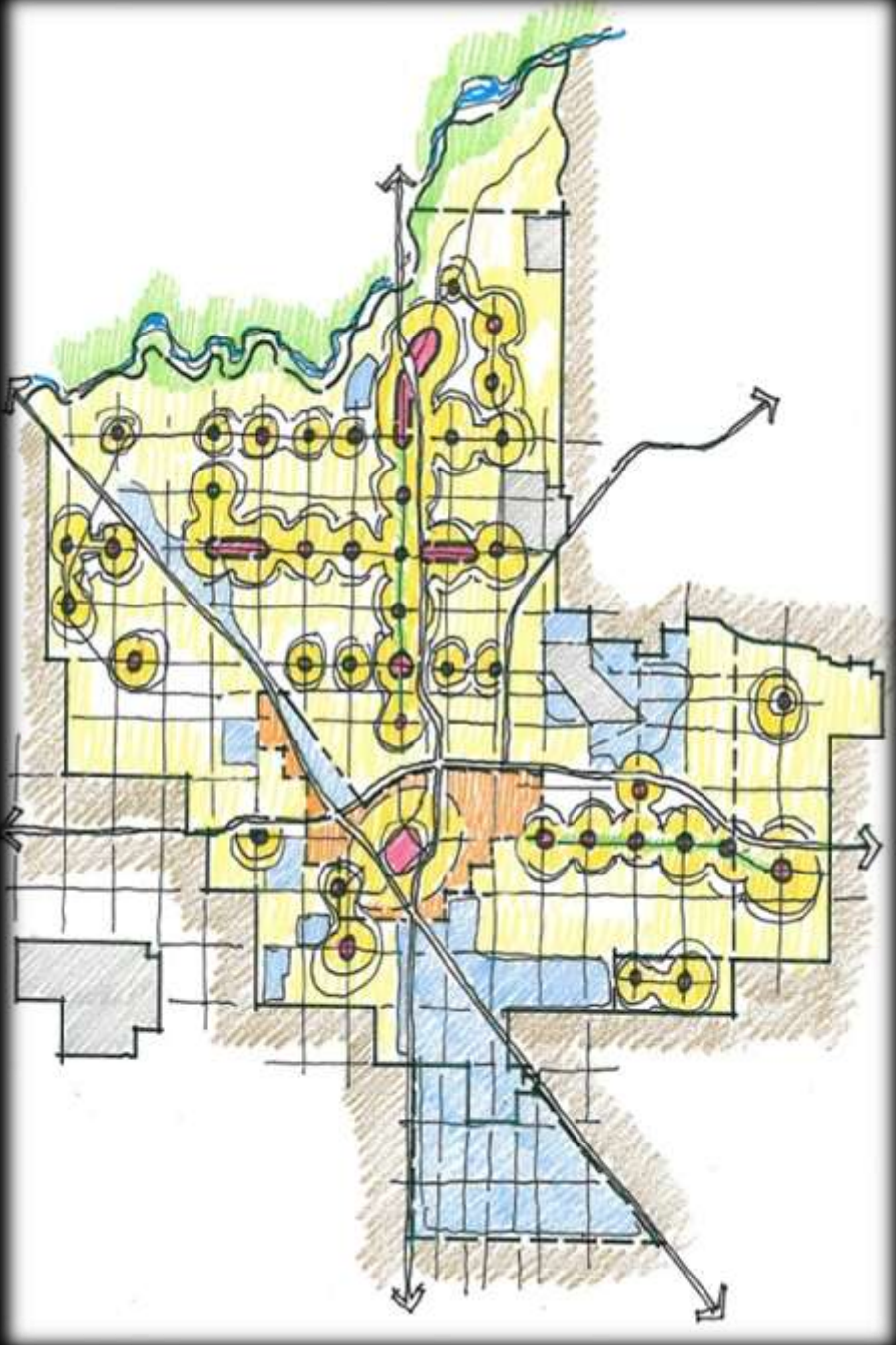


0 0.45 0.9 1.8 2.7 Miles

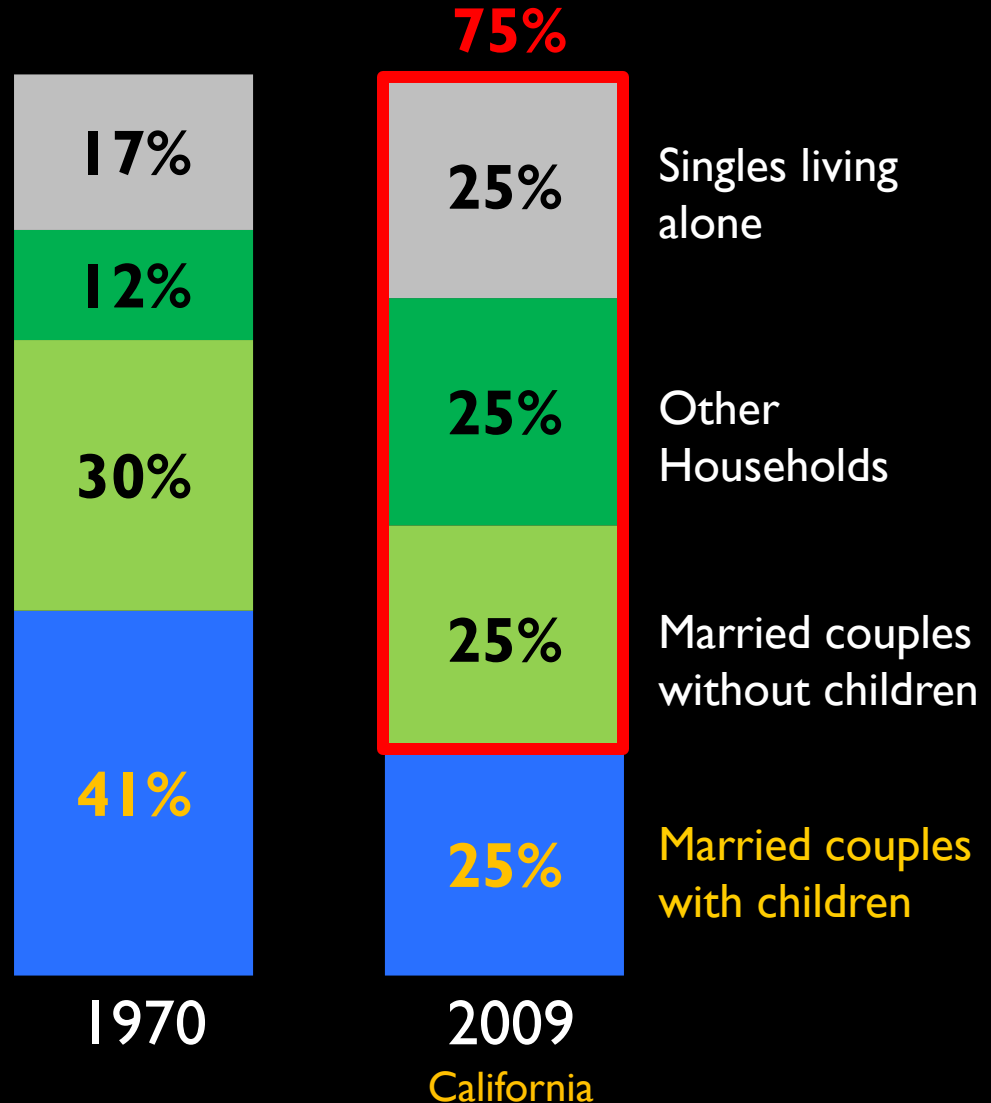
Source: Boundary and circulation information, City of Fresno Development and Resource Management Department, 2010; World Street Map, developed by Esri using DeLorme basemap layers, Autodesk Navigation Data, USGS, UNEP-WCMC, Tele Atlas Dynamics, 2000, City Boundaries, CA Department of Transportation, 2006

Alternative A

The Boulevard Plan



Who We Are (Really)

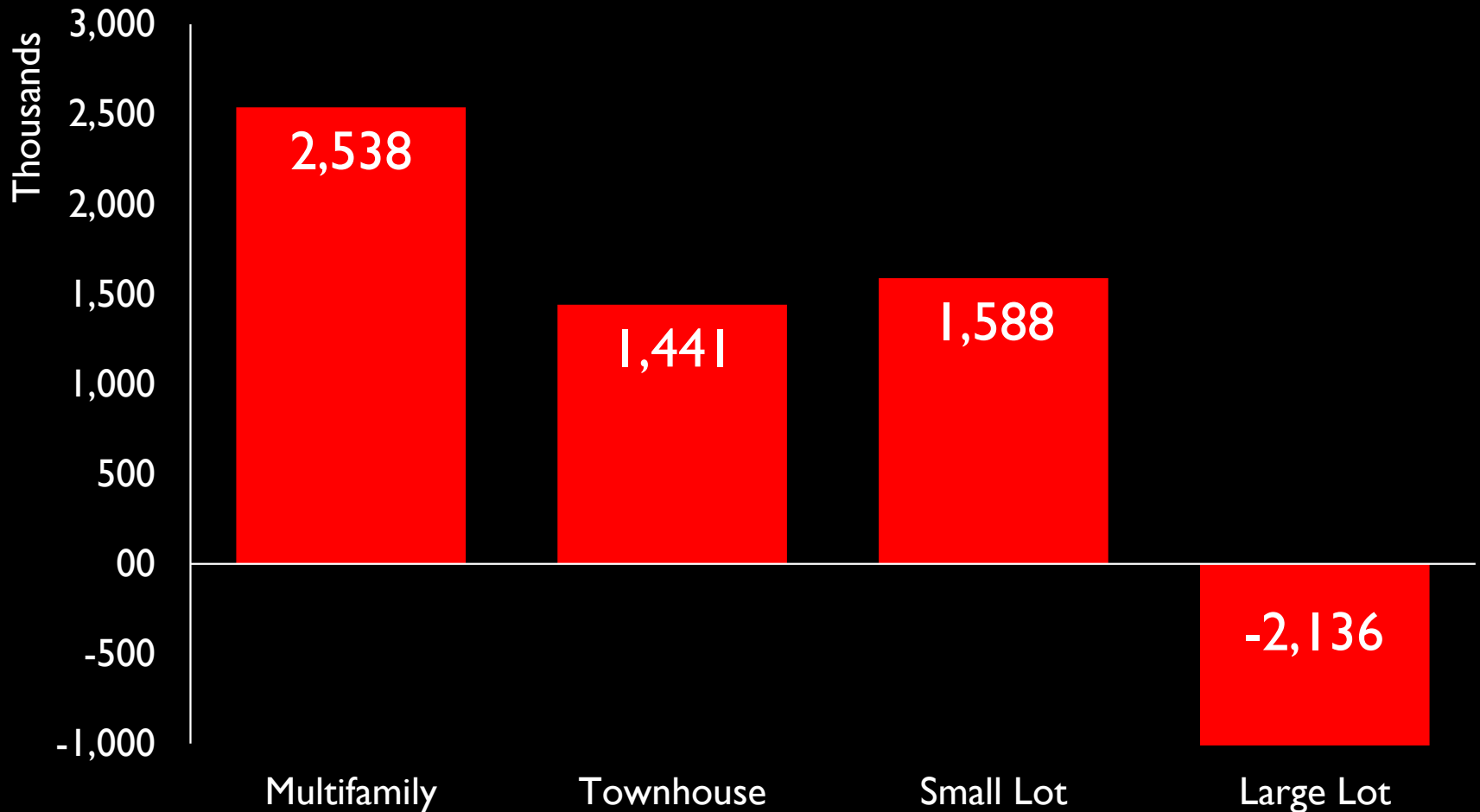


Source: US Census Bureau, American Community Survey 2005-2009

California Housing Demand 2035

■ New Units Needed by 2035

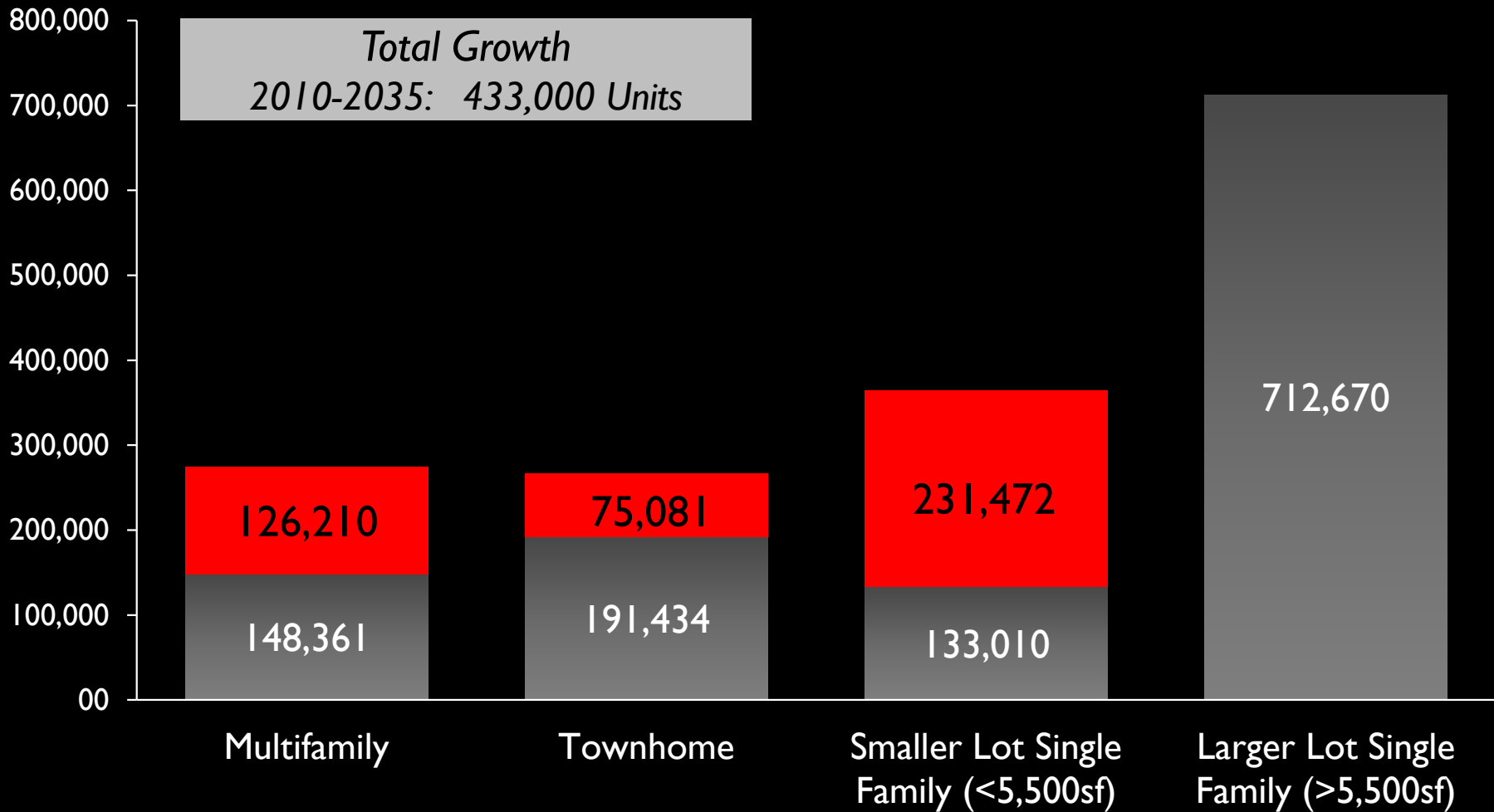
Four Largest MPOs Only – SCAG, SANDAG, MTC, SACOG



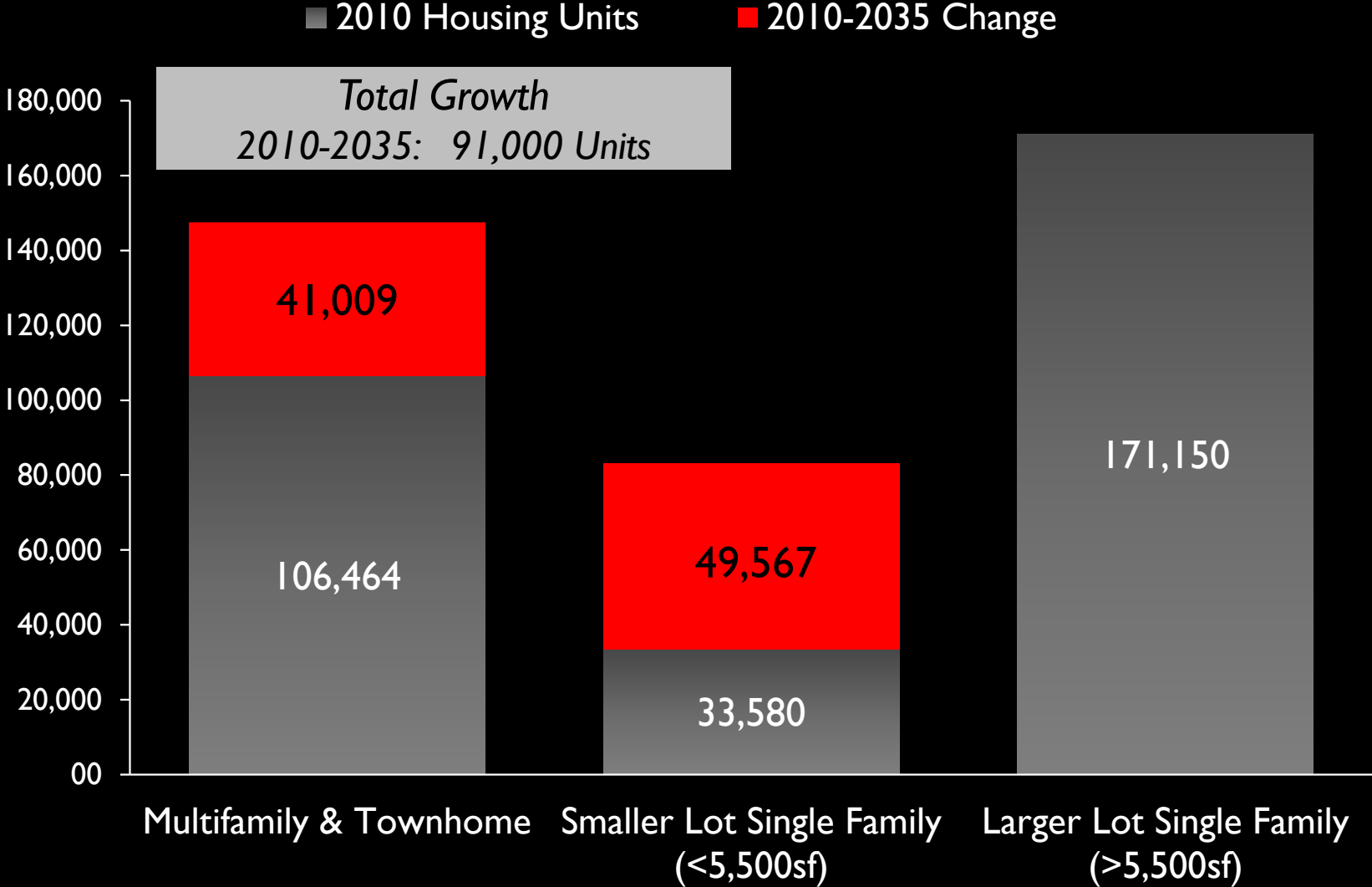
SJV Housing Profile & Demand

■ 2010 Housing Units

■ 2010-2035 Change



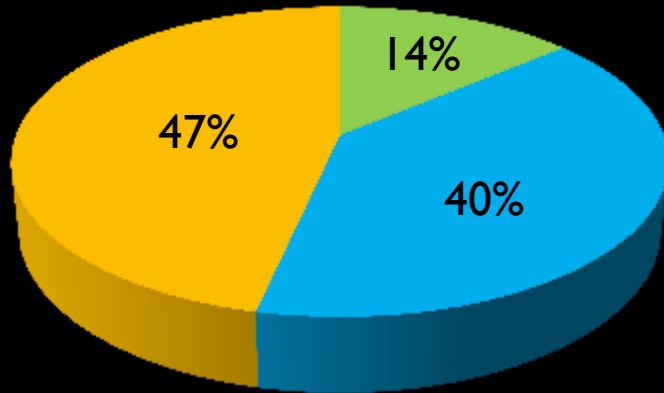
Fresno County Housing Profile & Demand



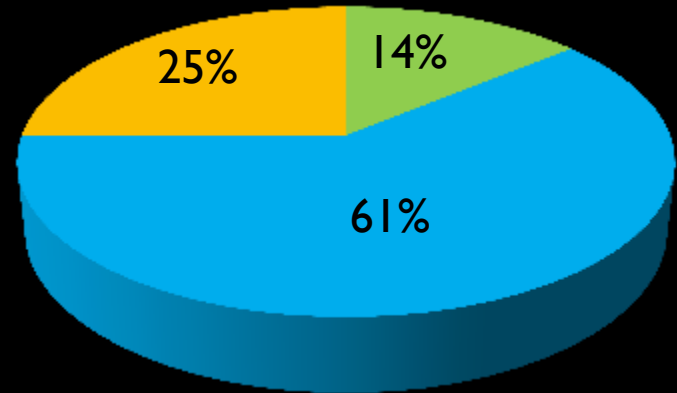
Fresno **RapidFire** Scenarios

Land Use Mix for Growth Increment (2010-2035)

■ Urban ■ Compact ■ Standard



Status Quo



Alternative A



Urban Oakland Uptown







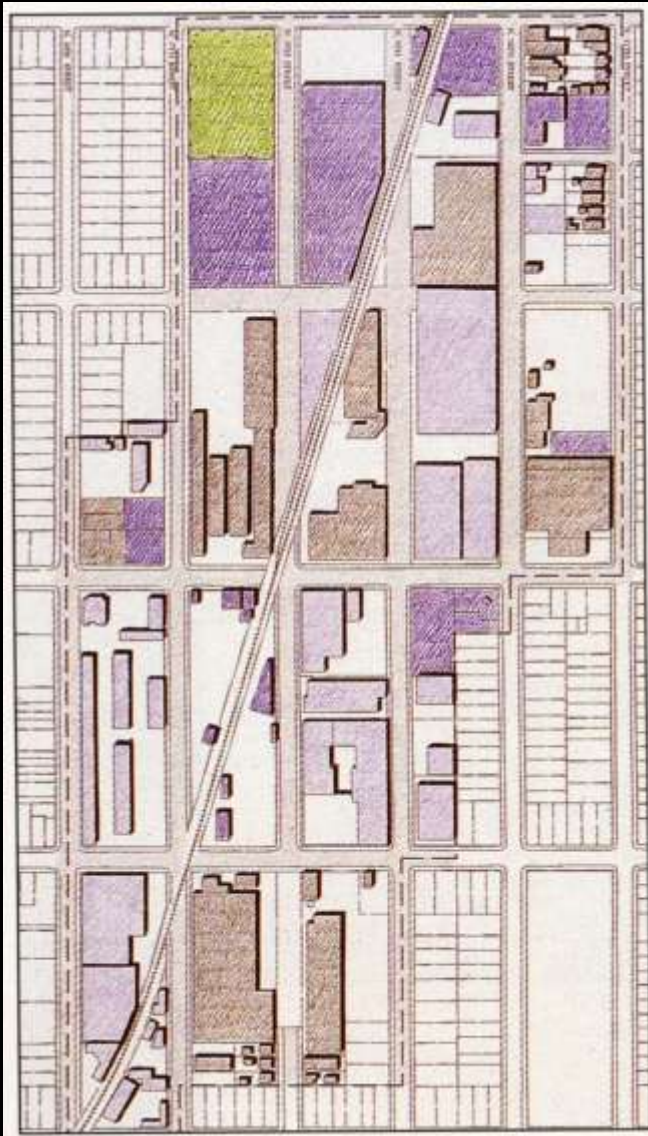
500 WILLIAM

NEPTUNE

WELCOME
TO NEPTUNE

DOWN
COME
TER

Urban Jackson Taylor Neighborhood





Before





1999

Compact Stapleton

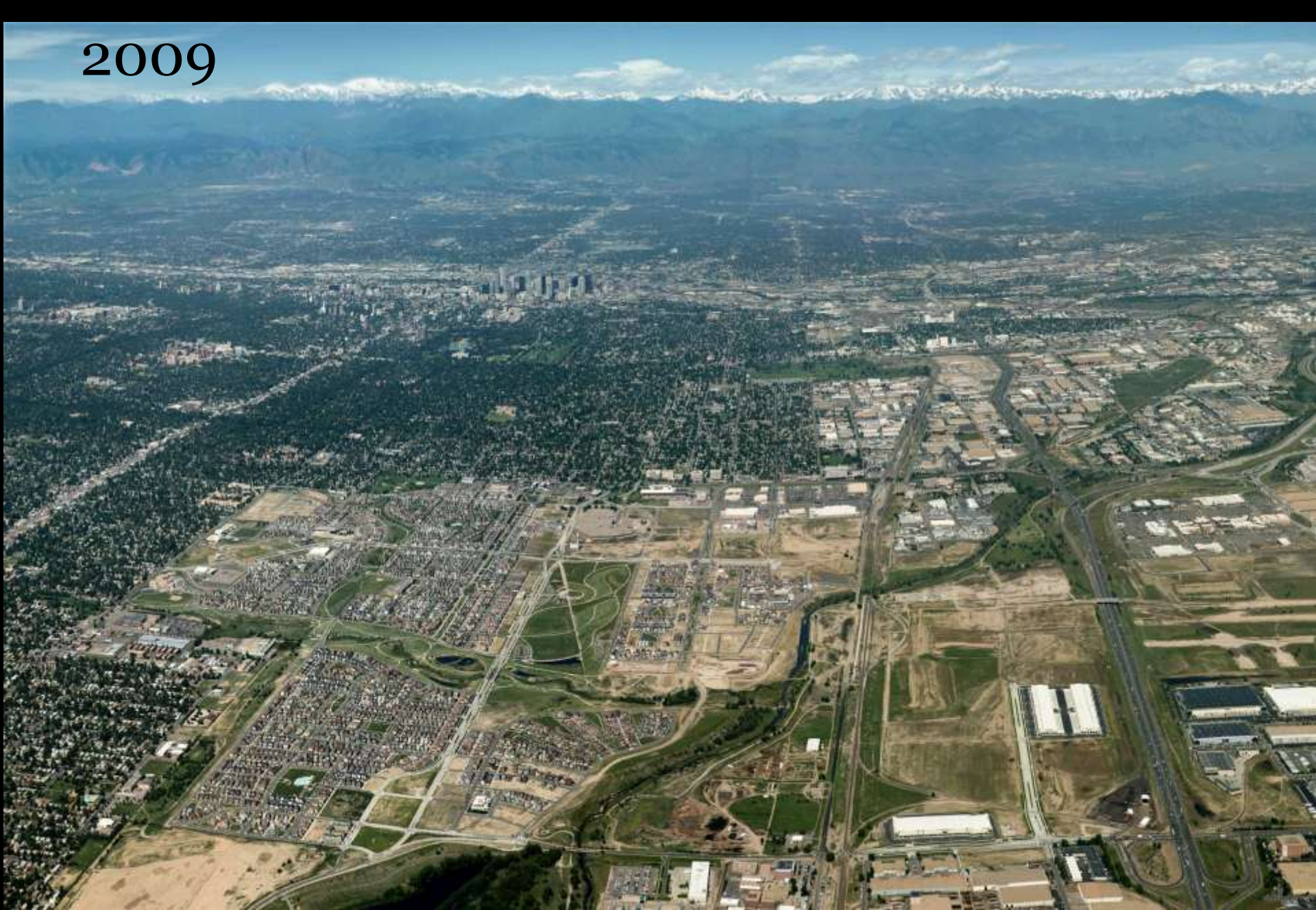
Downtown Denver

25

70

270

2009











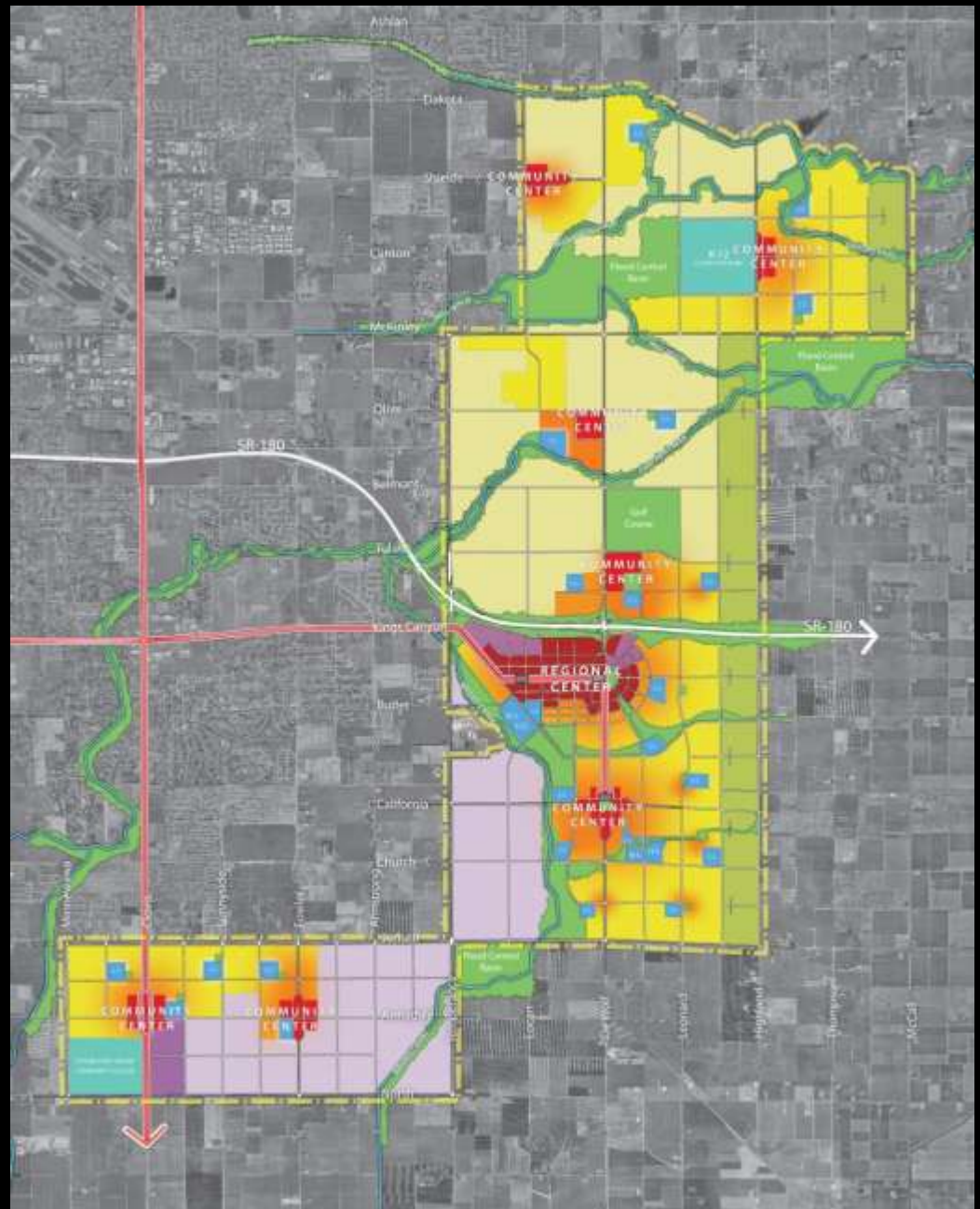
Compact



Fresno, CA

44,000 Homes

36,000 Jobs



Compact

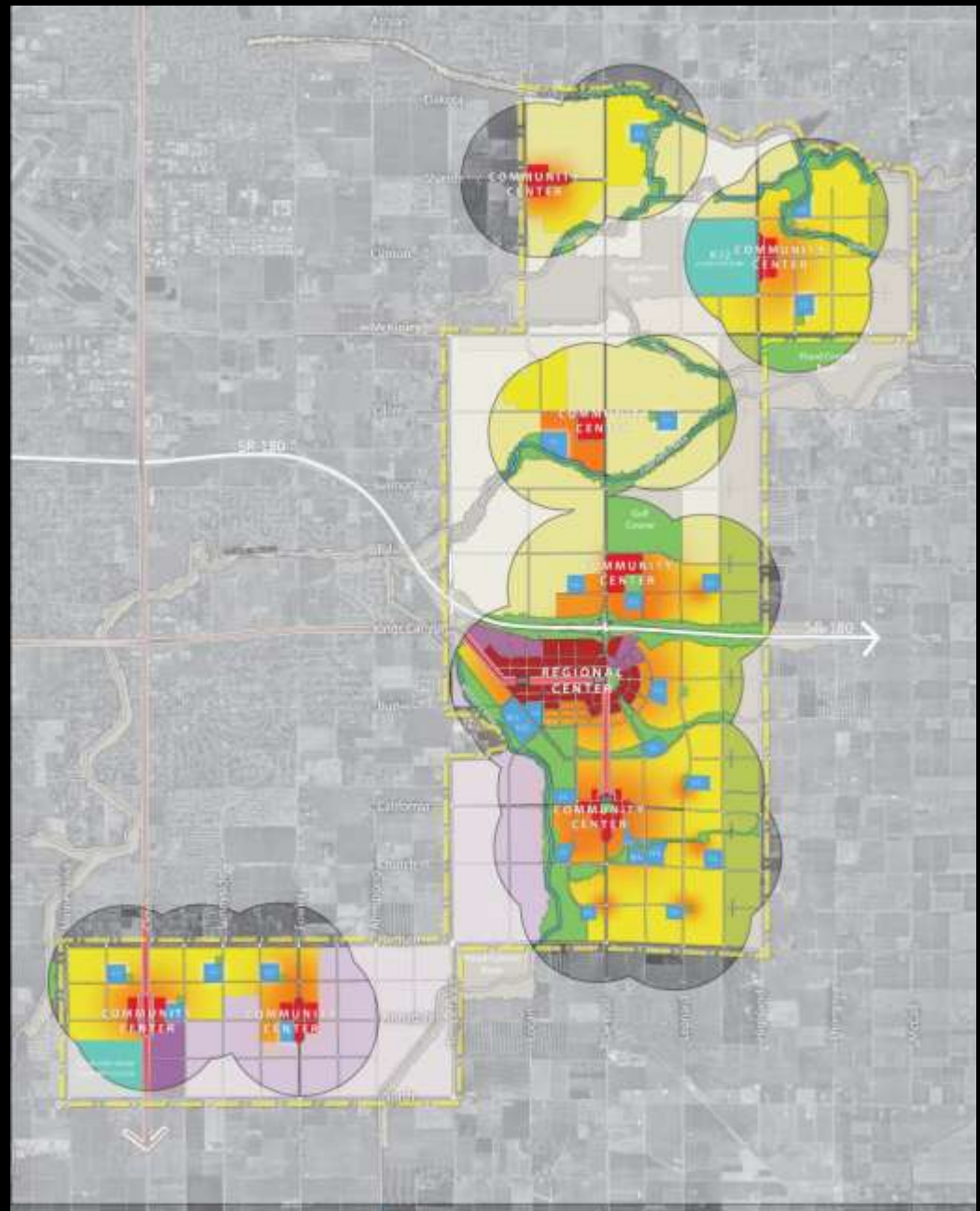


10 Min Walk To
Schools and Centers

92% Homes
73% Jobs

\$9,000 per
Household Savings

55% per Capita
GHG Reduction



Standard

Antioch



Valencia



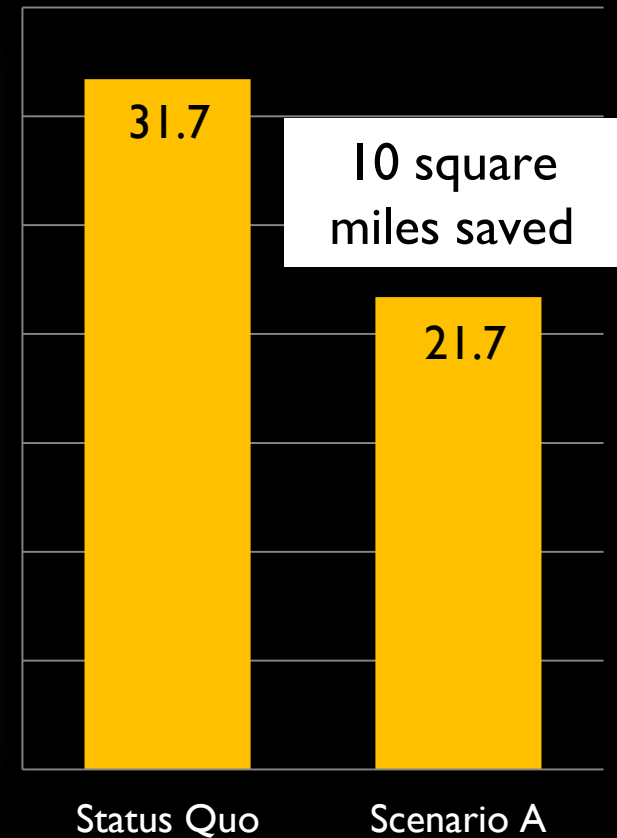
Valencia, California - 4 November 2005
photograph by Matt Jalbert - www.exuberance.com

Source: Matt Jalbert, www.exuberance.com

Land Consumed

For New Growth to 2035 (mi²)

Protects More Than 7,000 Acres of Farmland



Infrastructure Cost for New Growth

Capital & Operations (O&M) Costs for New Growth to 2035

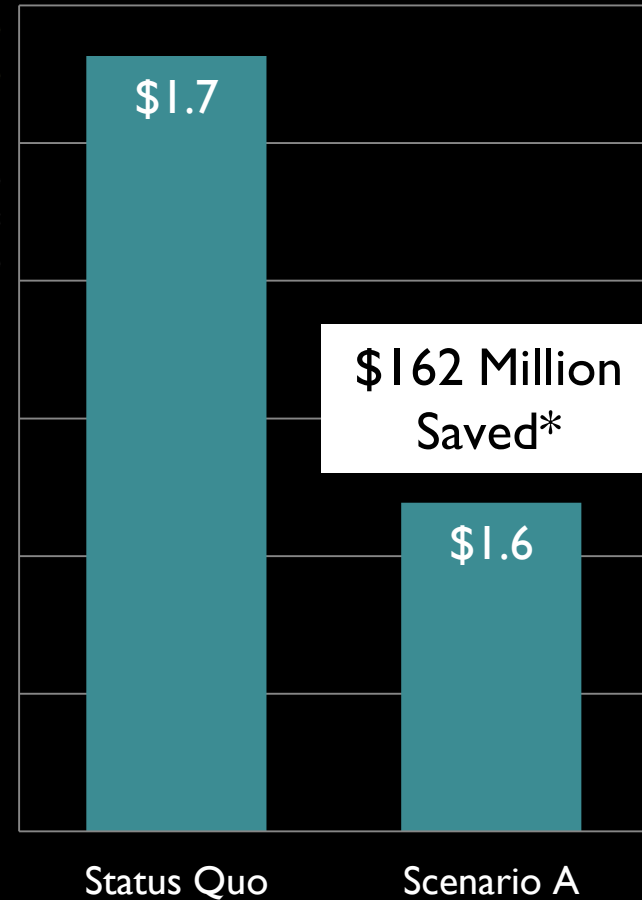
\$2,000 Saved per New Housing Unit : \$6.5 Million/Year



Flickr: sl-engineer

*Includes local roads, waste water and sanitary sewer, water supply, and parks & recreation

Dollars Billions



Revenues from New Growth

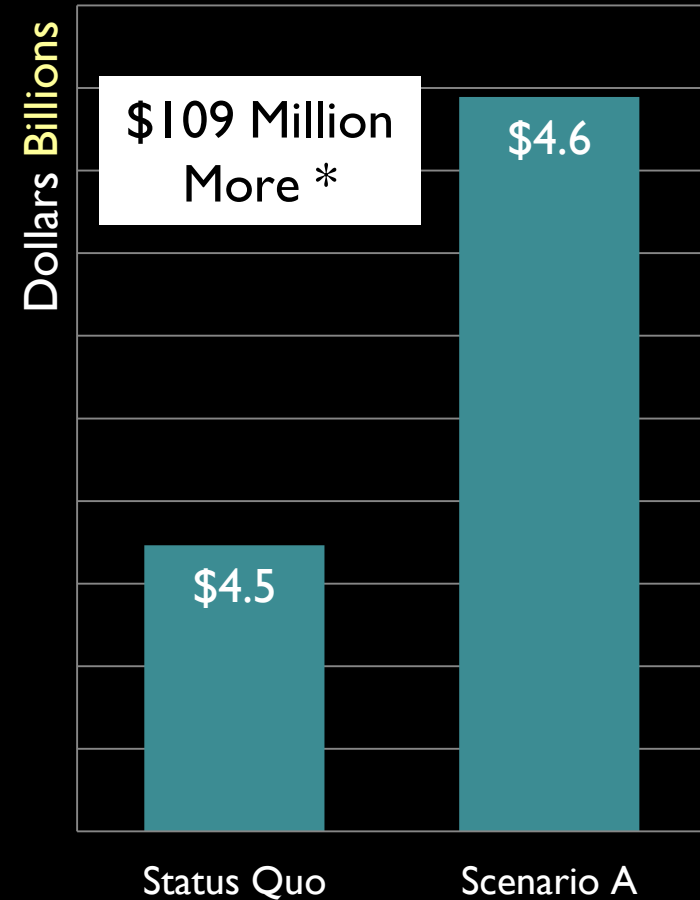
City Tax and Fee Revenue from New Growth to 2035

\$4.3 Million/Year in Additional Revenue to Fresno



www.livinginplainfield.com

*Includes City revenues from Vehicle License Fees, Property Tax, and Sales Tax



Vehicle Miles Traveled (VMT)

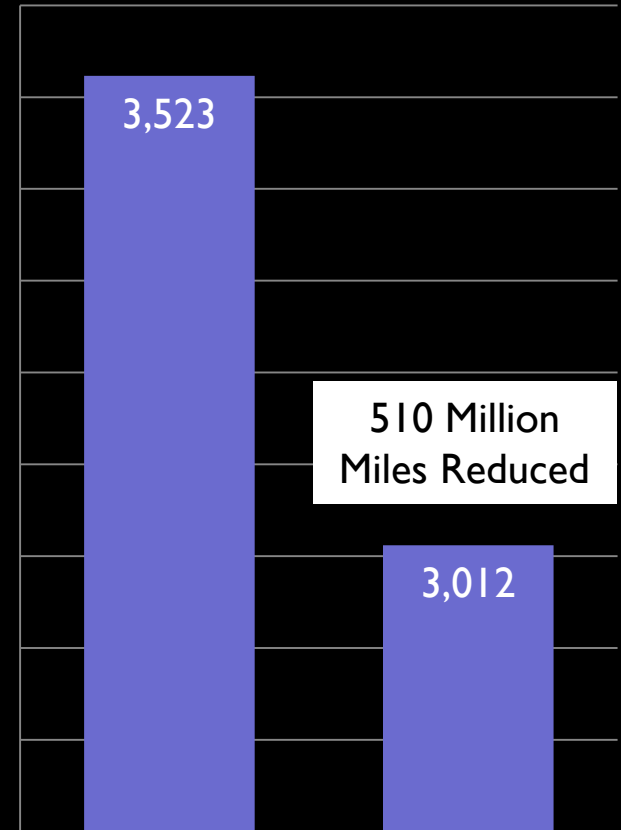
Annual in 2035

Equivalent to taking 40,000 cars off Fresno roads



Flickr: trash-photography

Millions



Status Quo

Scenario A

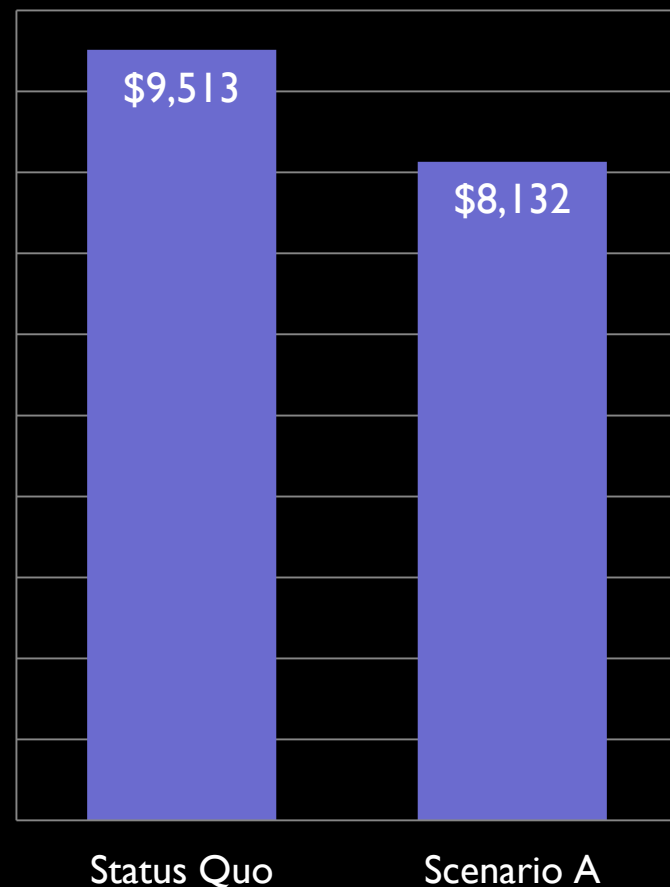
Auto Fuel Cost

Cost Per Household in 2035

\$1,400 Annual Savings Per Household in 2035



Flickr: TheTruthAbout...



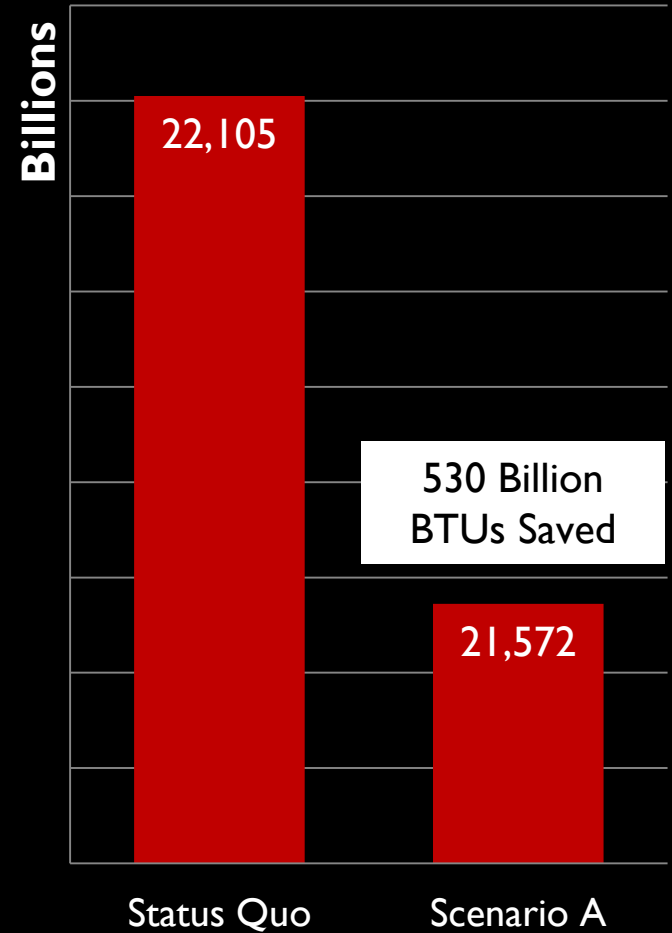
Building Energy

Annual in 2035

Annual Savings Could Power 10,000 Fresno Homes



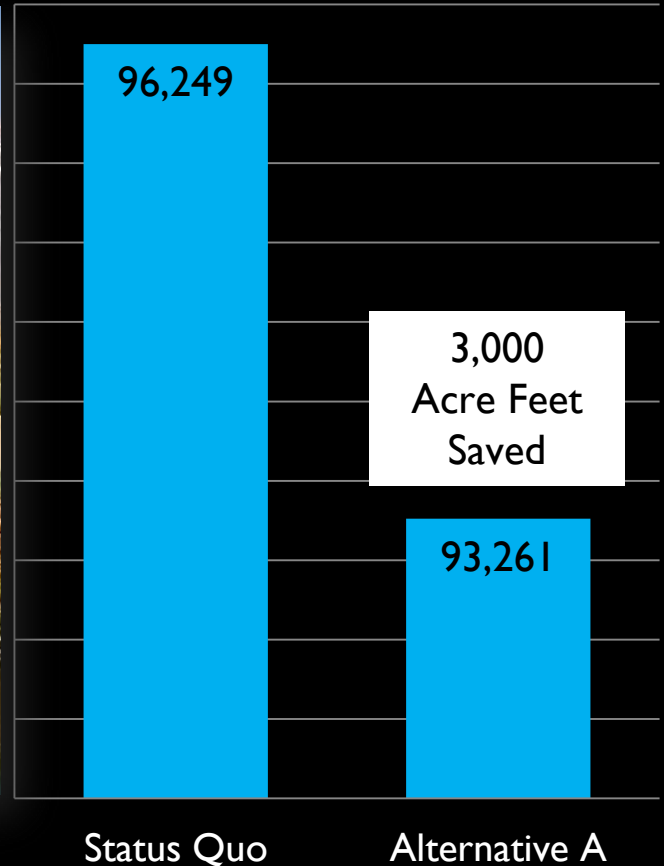
Flickr: arbyreed



Residential Water Use

Annual in 2035

Annual Savings Can Serve 7,500 Fresno Homes



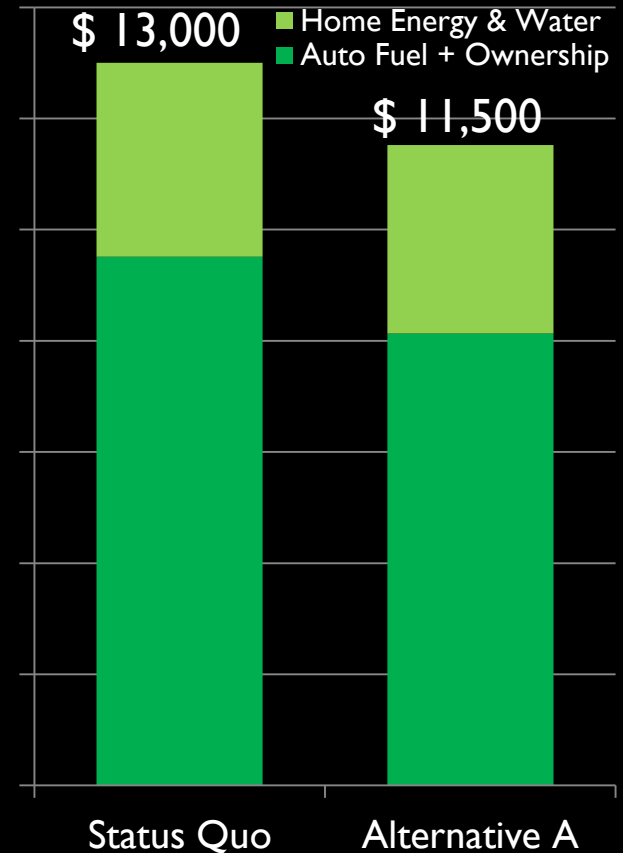
Annual Household Costs

Per Household Annual in 2035

\$1,500/Year Savings Per Household



Flickr: Diablo_Solar



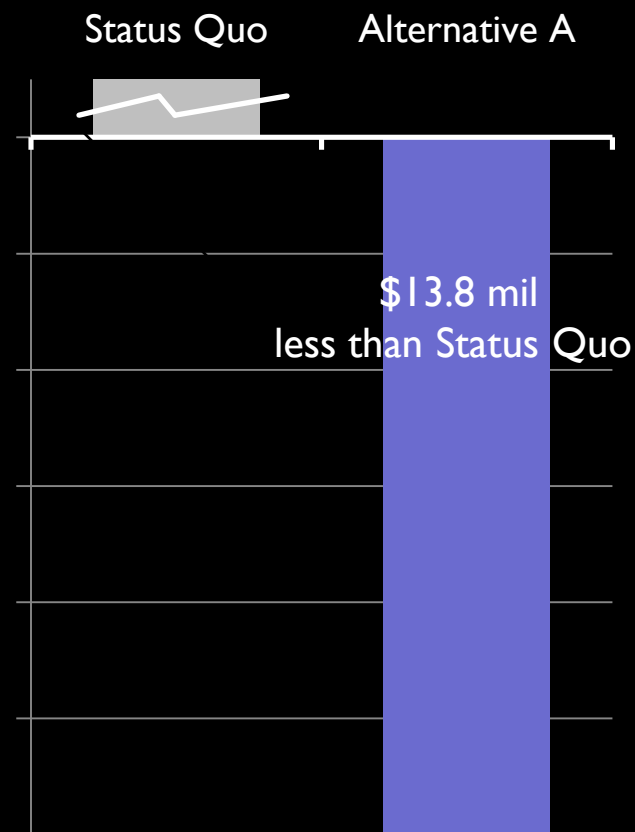
Respiratory Health Costs

Total Annual in 2035

1,000 Fewer Health Incidences/Year
Saves \$14 million annually by 2035



Flickr: Lance Page



Based on Analysis of Vision CA Results by TIAx, LLC

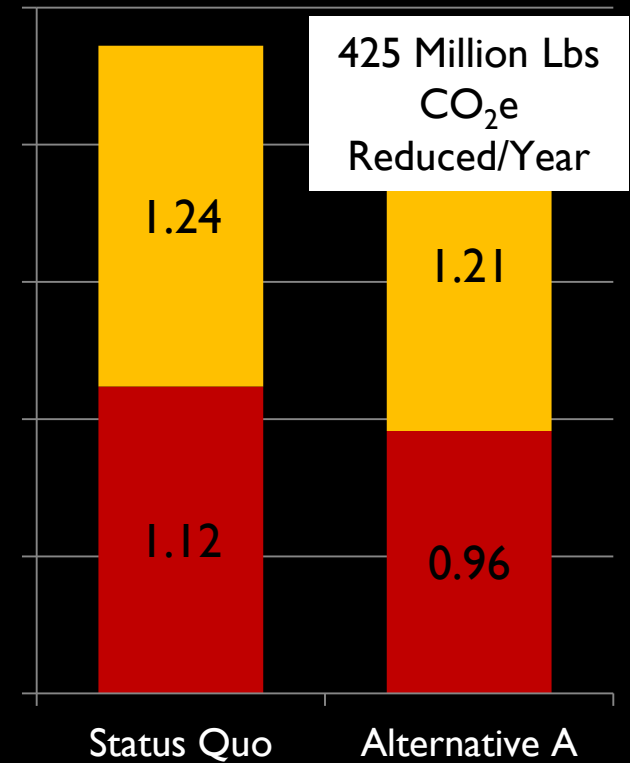
Greenhouse Gas Emissions

Annual in 2035

Emissions offset by 57,000 acres of trees in a year
A forest covering 1/2 of Fresno



■ Passenger Vehicles ■ Buildings



Making Measured Choices...



*...Modeling for
the Fresno
General Plan*



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joed@calthorpe.com

New Partners for Smart Growth 08 Feb 2013