The Story of **Scenario Planning** in the Albuquerque Metropolitan Area

Kendra Watkins
Socioeconomic Program Manager
Mid-Region Council of Governments
**AMPO Conference**
October 22, 2014

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Albuquerque MPO

- 3,100 Square Miles
  - 900,000 People
    - 400,000 Jobs
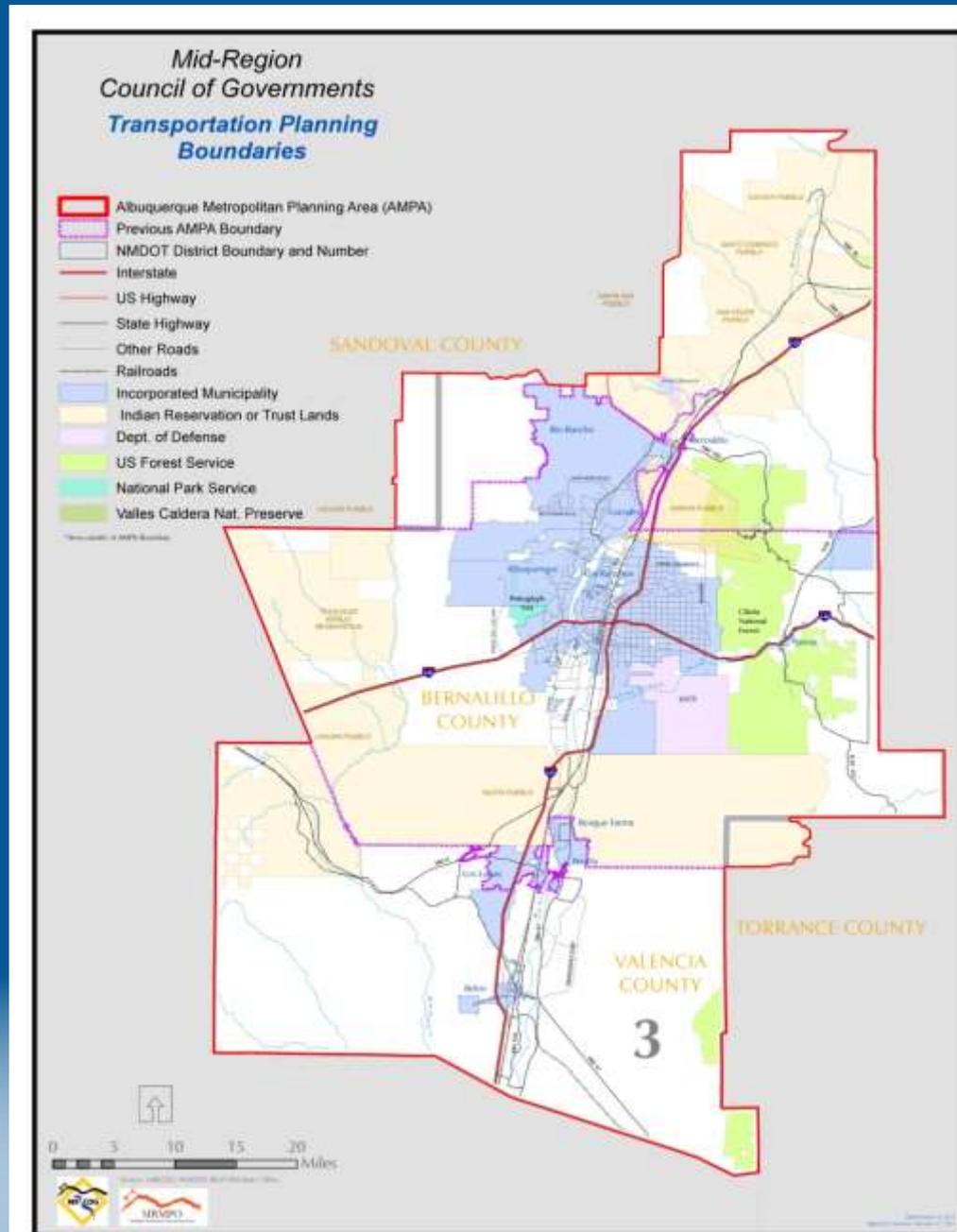
Rapid expansion since 2000

- Population + 20%

- Developed Acres + 20,000
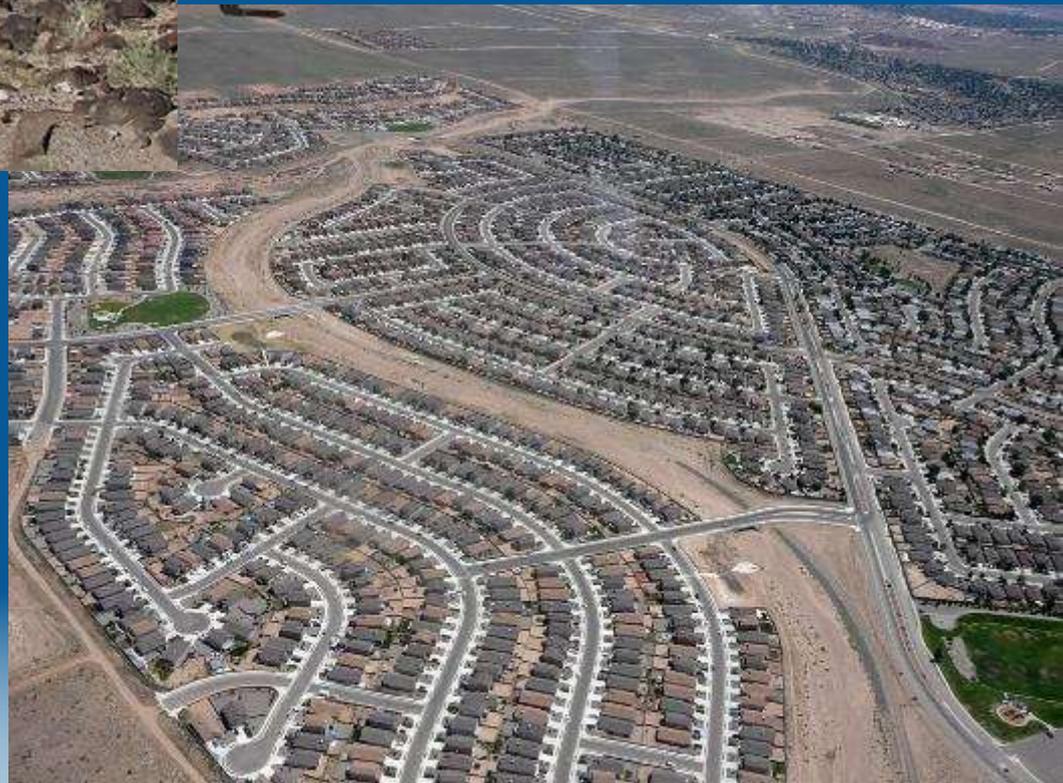
◆ **Much of the growth was single use development west of the Rio Grande**

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The River Crossing Issue

Jobs to Housing Ratio = 0.63

Jobs to Housing Ratio = 1.61

Downtown RR

550 Gateway

Central RR

Cabezon Intel Area

Cottonwood

Volcano Heights

I-25 Corridor

Eclipse

West Bluff

Midtown - Industrial

Uptown

Atrisco

CBD UNM

CNM/PRES

West I-40

Sunport

MDS

KAFB Area
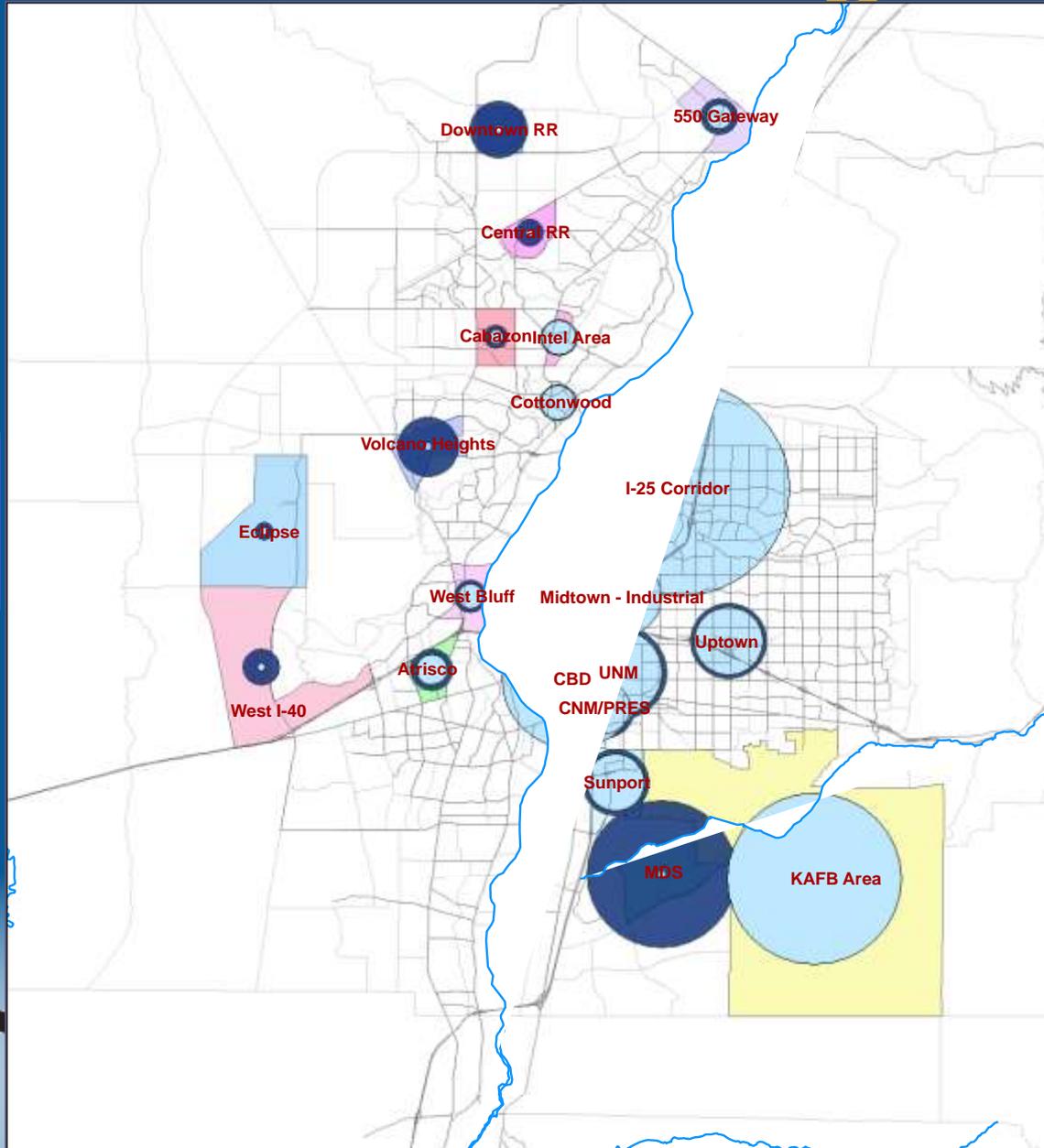
vernments

2040 Regional Population Forecast

$$890{,}000 + 472{,}000 = 1{,}362{,}000$$

1,500,000

1,000,000

500,000

0

2010 2015 2020 2025 2030 2035 2040
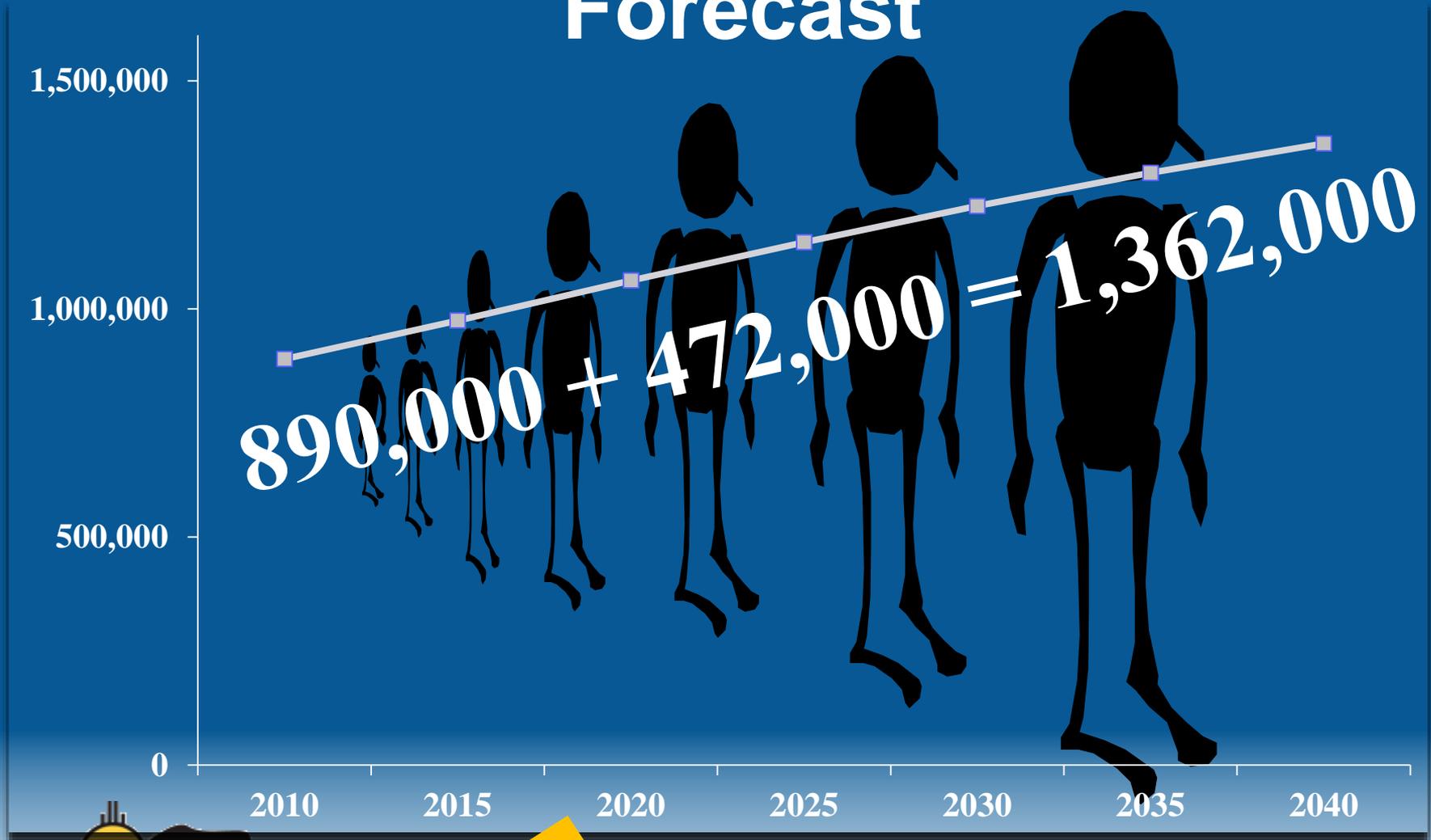
1 Million!

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2008
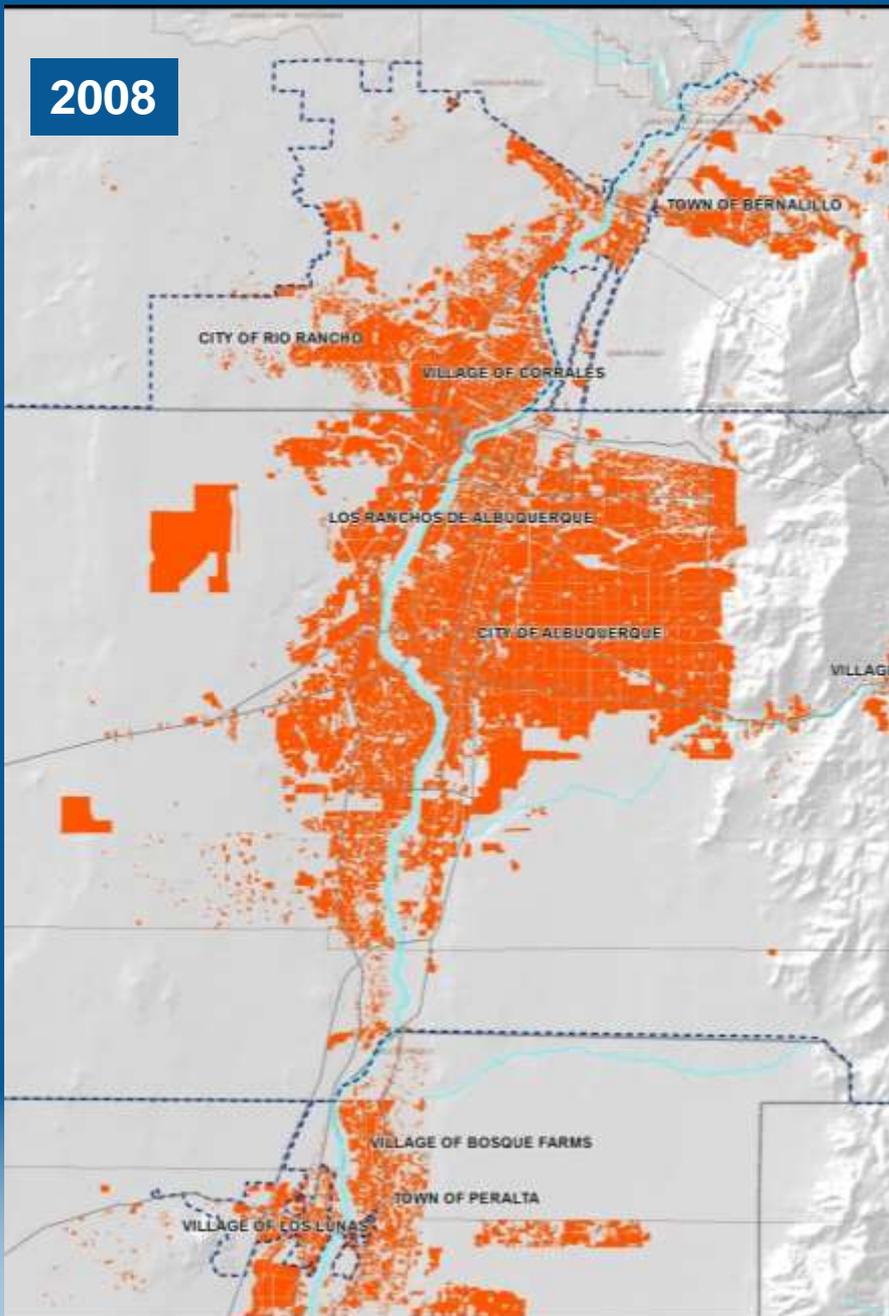
2035
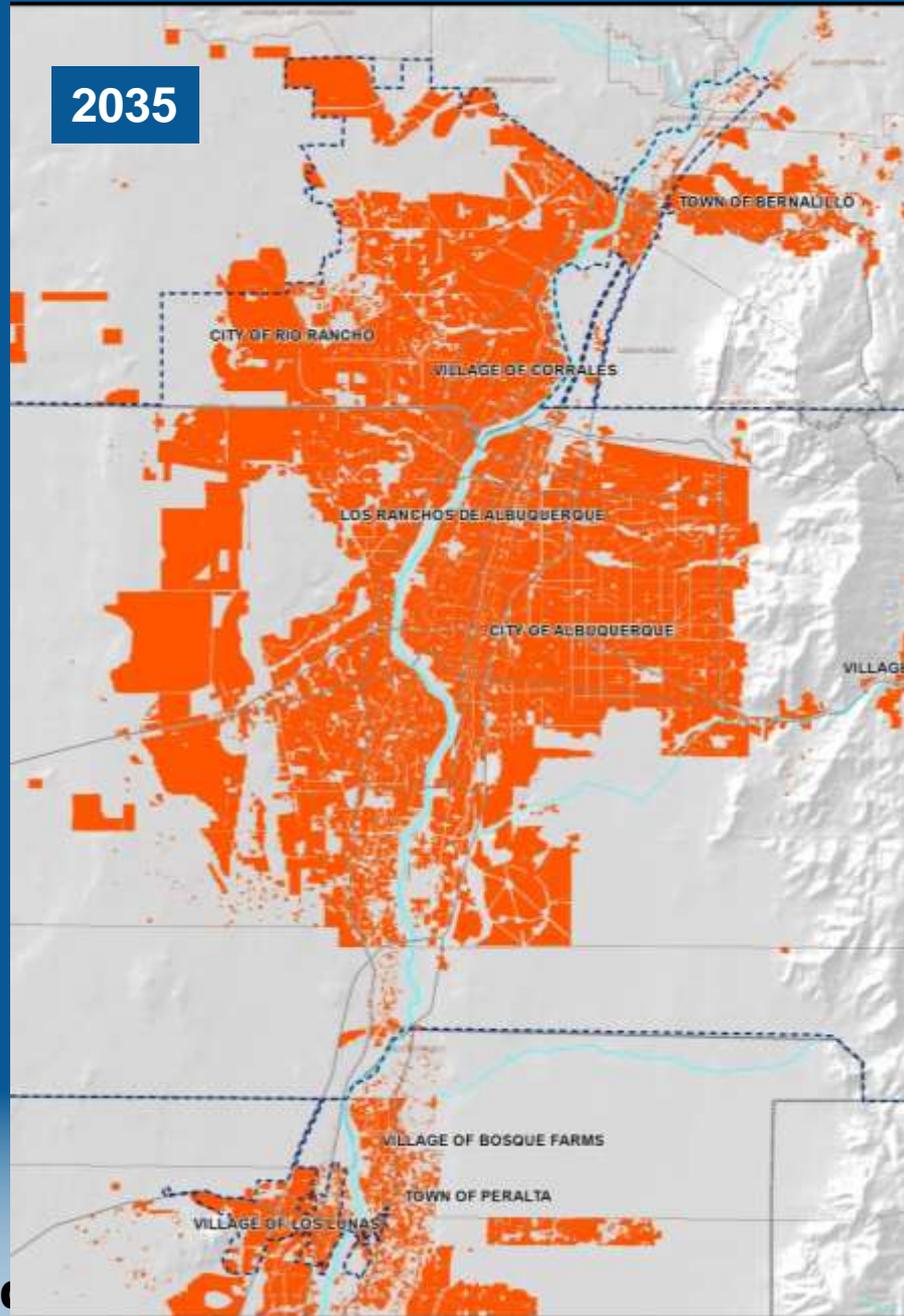
Mic

Volume to Capacity 2008 & 2035

2008 SE Data on 2008 Network
PM Peak Hour V/C
— Acceptable V/C=0 - 0.89
— Approaching Capacity V/C=0.9 - .99
— Over Capacity V/C=1.0 - 1.09
— Severely Congested 1 V/C=1.1 - 1.49
— Severely Congested 2 V/C>1.5
⬛ AMPA Boundary

2035 SE Data on 2035 Partial Build Network
PM Peak Hour V/C
— Acceptable V/C=0 - 0.89
— Approaching Capacity V/C=0.9 - .99
— Over Capacity V/C=1.0 - 1.09
— Severely Congested 1 V/C=1.1 - 1.49
— Severely Congested 2 V/C>1.5
⬛ AMPA Boundary

Source: MRCOG.

Key Findings from 2035 MTP

◆ River crossing congestion is a critical issue and will get much worse (even after $3 billion in projects)

◆ Building our way out of congestion is not realistic

◆ **There is no silver bullet.** A variety of strategies will be necessary to tackle congestion.

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Strategy 1: Transit

◆ Set targets for transit mode share across the river

◆ Set aside funds to reach transit goals
- ◆ 25% of federal sub-allocation from STP-U & CMAQ
- ◆ $5-6 million per year beginning in 2016

◆ $20+ million towards Bus Rapid Transit

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Strategy 2: Land Use

◆ Land Use Transportation Integration Committee

◆ Share land use plans and policies

◆ Explore the interaction between transportation and land use

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FHWA Technical Assistance Grant

◆ Conduct a participatory process with our stakeholders

◆ Understand costs and benefits of development patterns

◆ Potentially develop a preferred scenario

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Metropolitan Planning Organization

Scenario Planning Peer Exchange Workshop

Albuquerque, New Mexico

June 27 - 28, 2013

Sponsored by the

Federal Highway Administration

U.S. Department of Transportation
Federal Highway Administration

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# Workshop Goals

- Introduction to scenario planning

- Peer exchange with Fresno COG and Nashville MPO

- Dot exercise

Challenges


Water Resources — 7

Economic Development — 6

Diverse Housing and Transportation Options — 5

Balance of Jobs and Housing — 4

Target Growth in Activity Centers — 3

Collaborative and Equitable Process — 2

Historic and Rural Preservation — 1

x-axis: 0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800

Composite Score
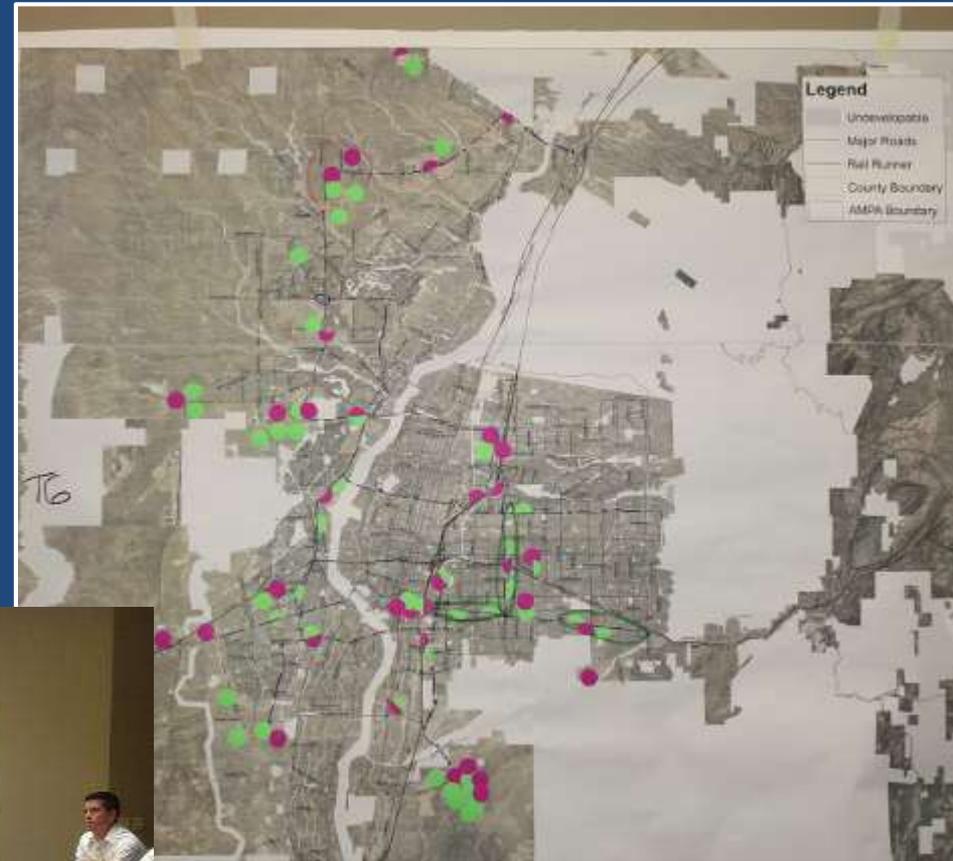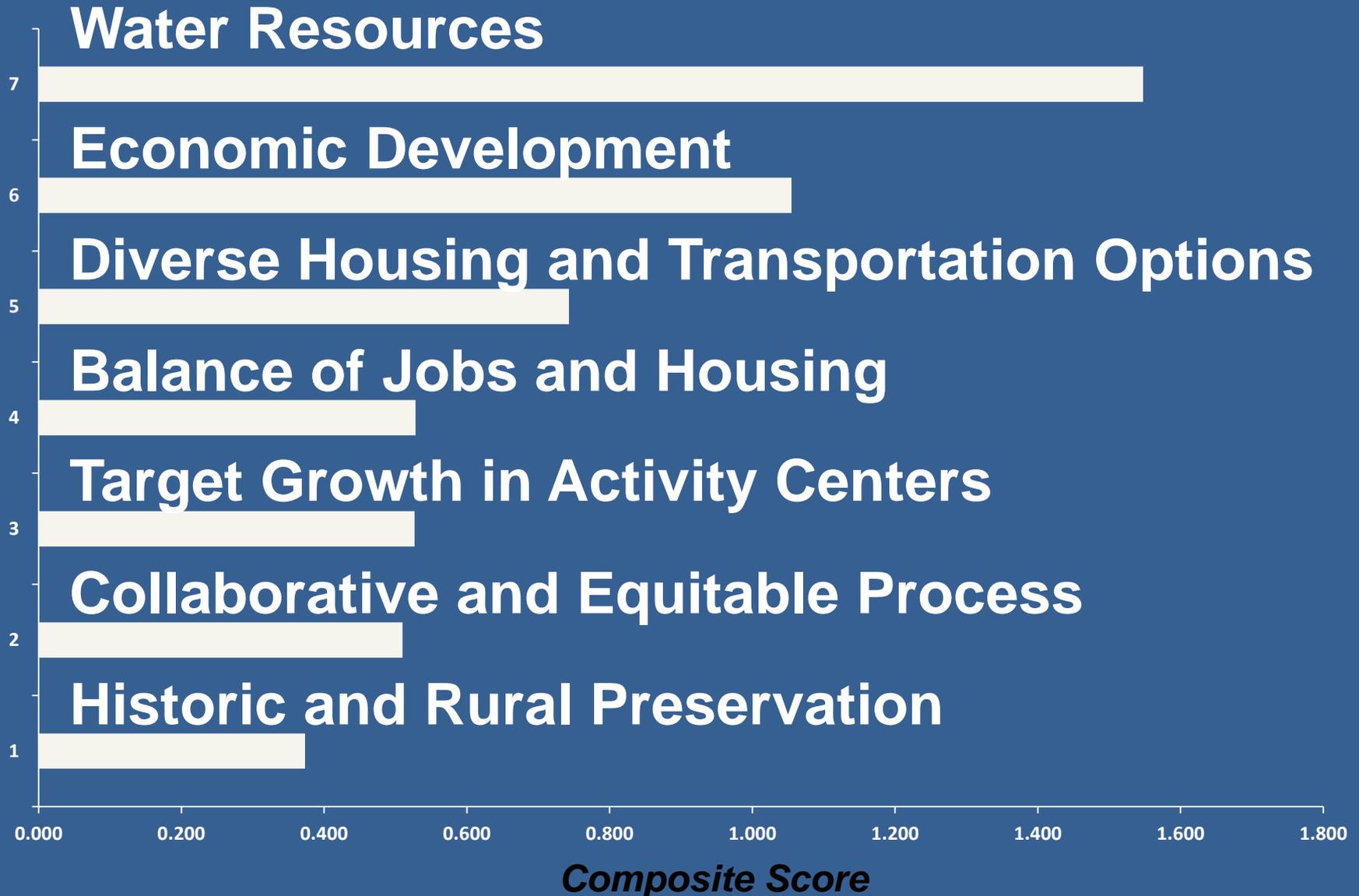
2040 MTP: Scenario Planning

June 2013

Identify Challenges | Scenario Concepts | Preliminary Scenarios | Scenario Evaluation | Refined Scenarios

Spring 2014

Summer 2014

Fall 2014

LUTI Meetings / Workshops / Focus Groups

Spring 2015

Futures 2040
Metropolitan Transportation Plan

Futures 2040
Recommendations
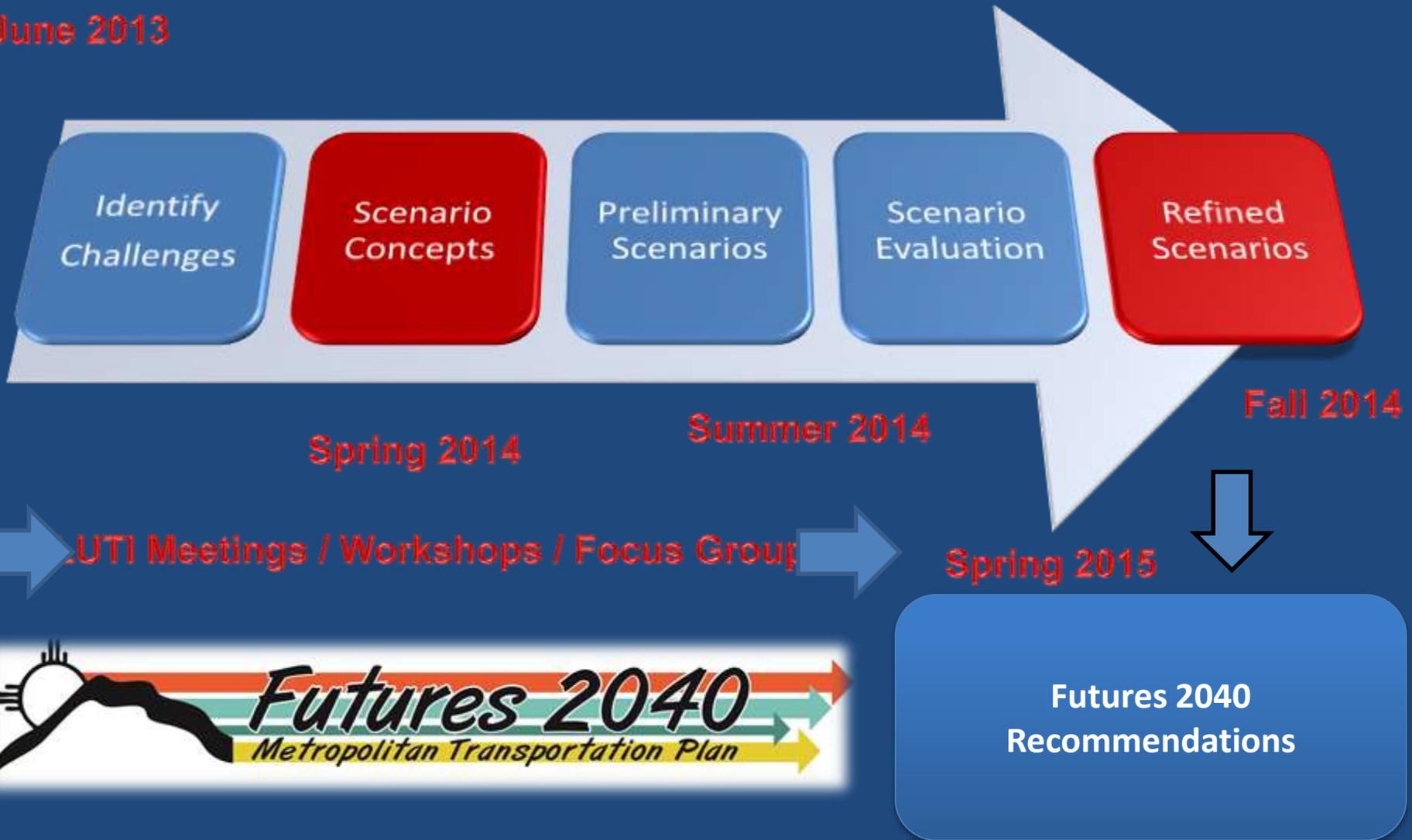
Climate Change & Scenario Planning FHWA Grant

- FHWA, US DOT Volpe Center, Partnerships with range of federal agencies

- Investigate interaction between growth, transportation & climate change

- Bring in new stakeholders
  – Mitigation Committee
  – Adaptation Committee

- Bring in new performance measures
  – High Flood Risk Areas
  – Forest Fire Risk Areas
  – Crucial Habitat Areas
  – Water Consumption

Central New Mexico Scenario Planning Project:
An Inter-agency Transportation, Land Use, and Climate Change Initiative
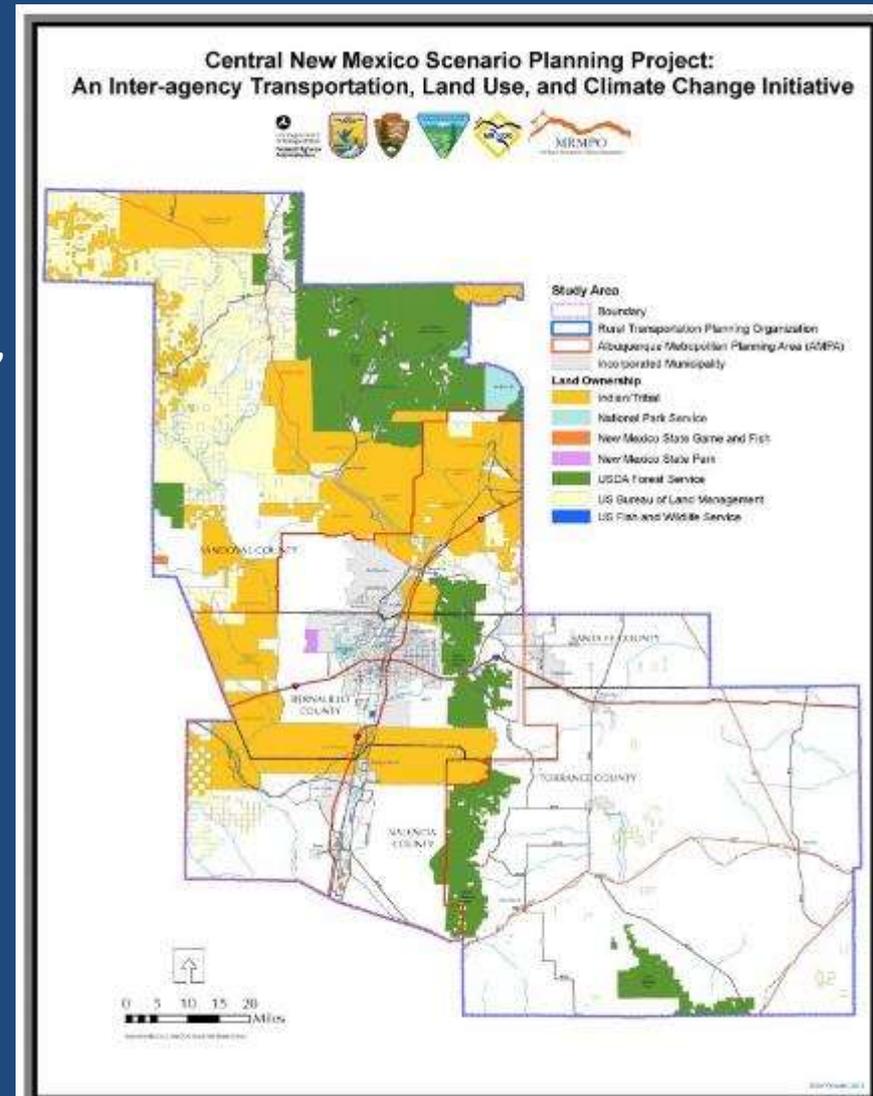
Challenges

Scenarios

1. **Water Sustainability and Reduced Emissions**

2. **Economic Competitiveness**

3. **Balance of Jobs and Housing**

4. **Diverse Housing and Transportation Options**

5. **Focus on Unique Activity Centers**

6. **Historic and Rural Preservation**

Balanced Scenario

- Target additional jobs on Westside

Emerging Lifestyles / Transit Rich

- Increased density along transit corridors

Historical Trend

- Based on previous development patterns
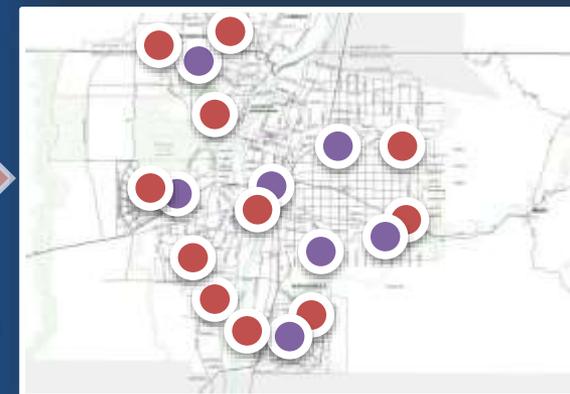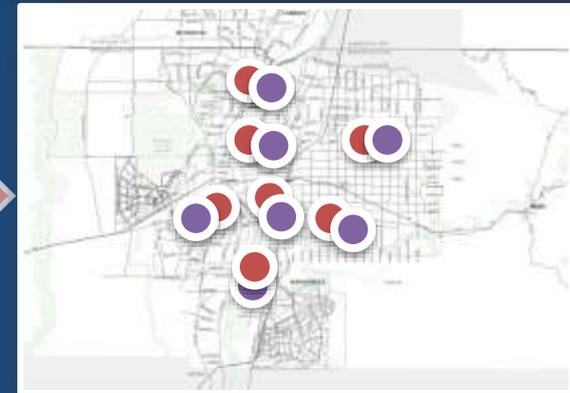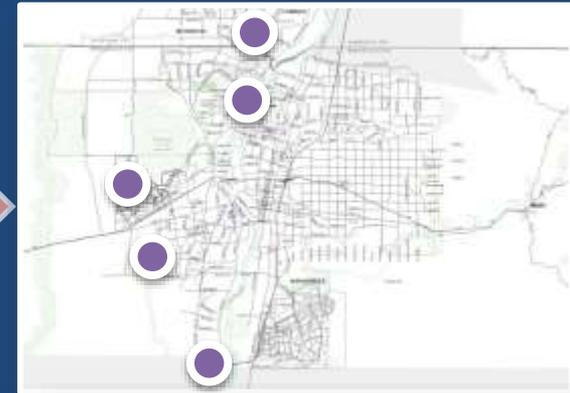
Housing 🔴

Jobs 🟣

Modeling Framework

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Workshop 2: July 2014

Identify Challenges | Scenario Concepts | Preliminary Scenarios | Scenario Evaluation | Refined Scenarios

June 2013   **Spring 2014**   **Summer 2014**   **Fall 2014**

LUTI Meetings / Workshops / Focus Groups

Spring 2015

Futures 2040
Metropolitan Transportation Plan

**Mid-Region**

Futures 2040 Recommendations

Modeled Scenarios

◆ One regional projection

◆ One roadway network

◆ **Different Zoning Assumptions**

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Zoning: Trend

Conceptual Scenario

☆ 2025 Activity Centers

- High Density Mixed Use
- Medium Density Mixed Use
- High Intensity Commercial
- Medium Intensity Commercial
- Med/High Density Residential
- Low/Medium Density Residential
- Low Density Residential
- Very Low Density Residential
- Irrigated Ag Land

SAN FELIPE PUEBLO

BLM

NM 165

NORTHERN BLVD

SANDIA PUEBLO

SOUTHERN BLVD

PASEO DEL NORTE

NM State Park

Petroglyph NM

Cibola National Forest

KAFB

Valle de Oro NWR

ISLETA PUEBLO

0 1 2 3 4 Miles

Zoning: Emerging Lifestyles

Conceptual Scenario

- ▲ High Frequency Transit Service
- High Density Mixed Use
- Medium Density Mixed Use
- High Intensity Commercial
- Medium Intensity Commercial
- Med/High Density Residential
- Low/Medium Density Residential
- Low Density Residential
- Very Low Density Residential
- Irrigated Ag Land
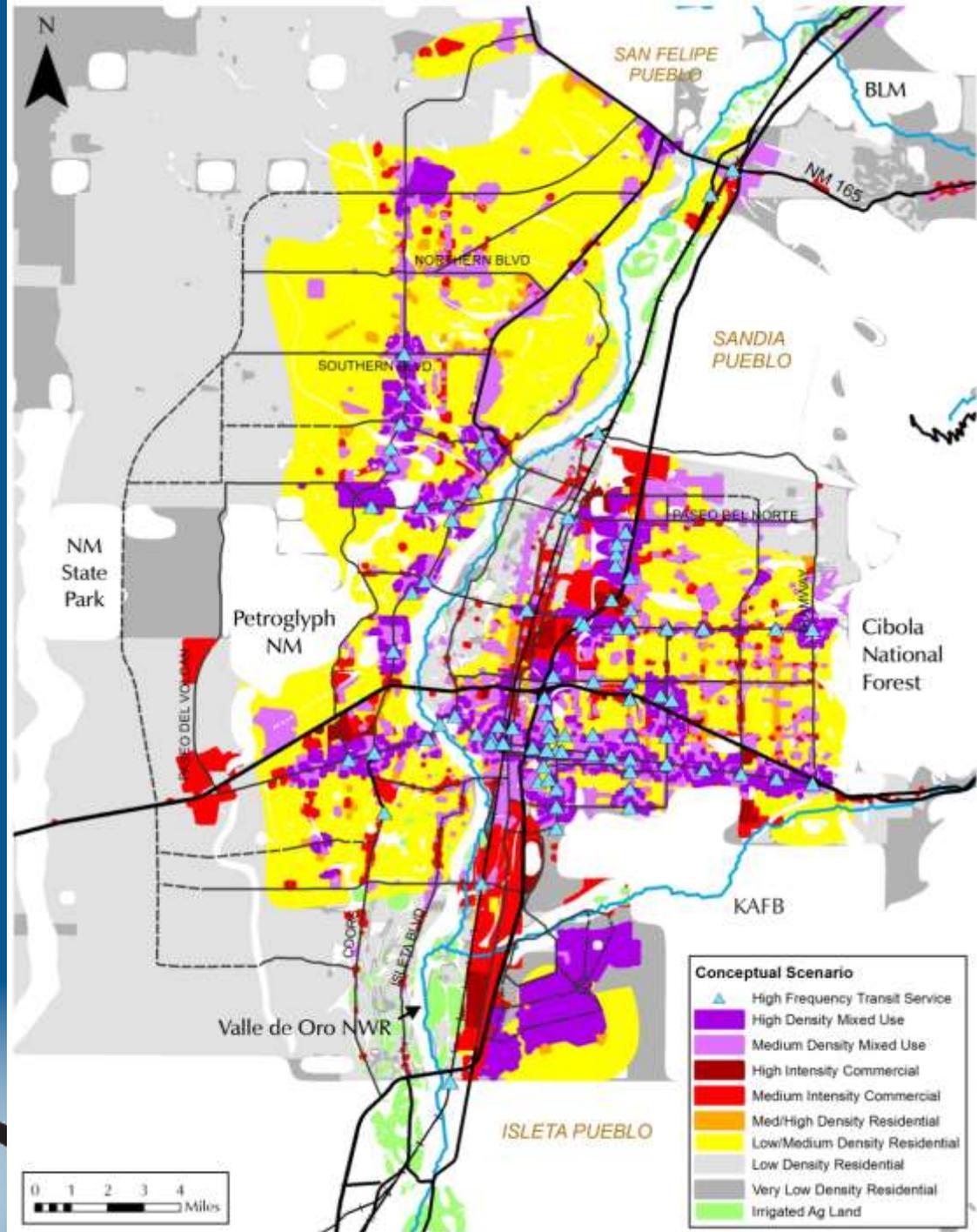
Zoning: Balancing Housing & Jobs

Conceptual Scenario
- Housing Locations
- Employment Locations
- High Density Mixed Use
- Medium Density Mixed Use
- High Intensity Commercial
- Medium Intensity Commercial
- Med/High Density Residential
- Low/Medium Density Residential
- Low Density Residential
- Very Low Density Residential
- Irrigated Ag Land
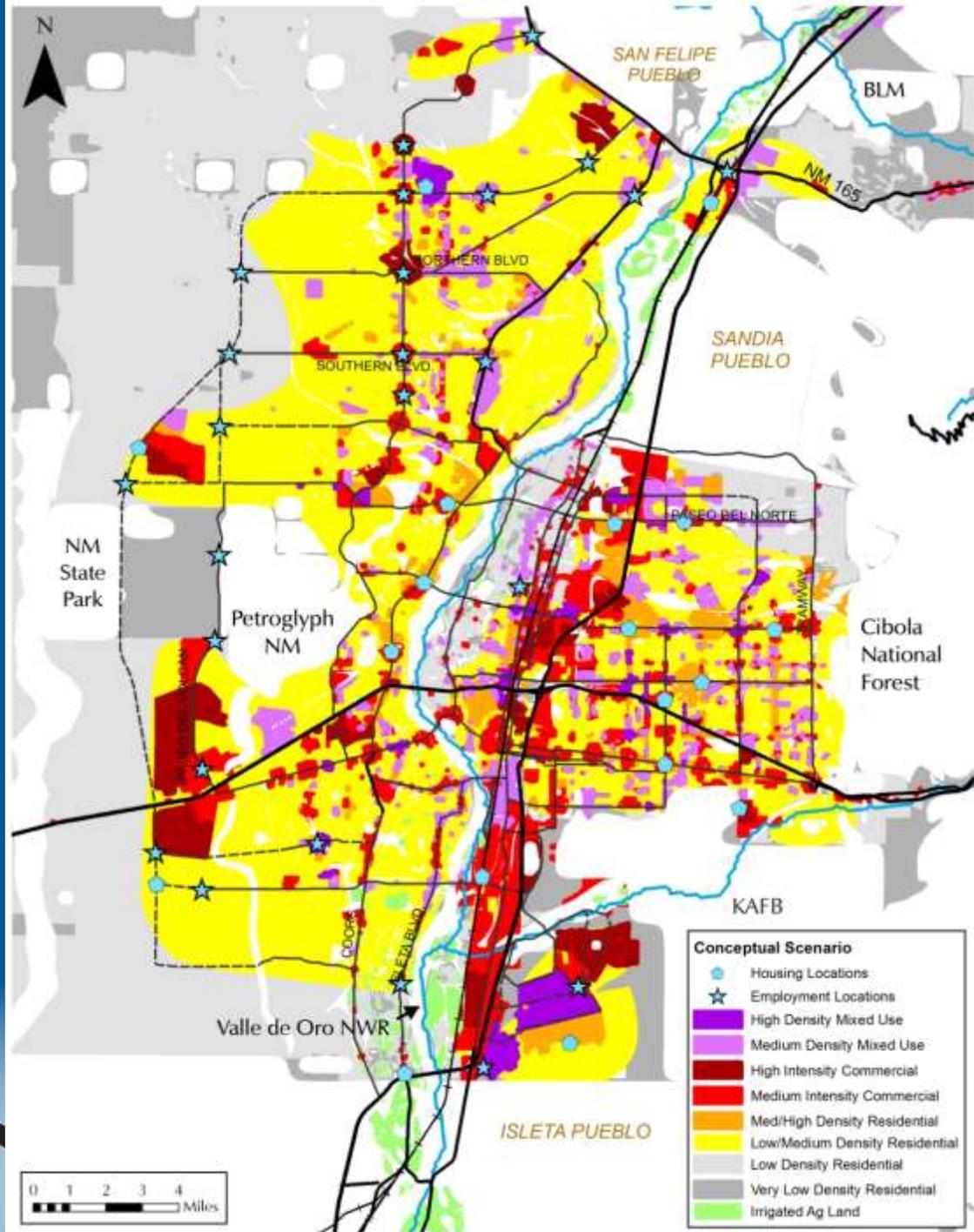
Round 1: Evaluation
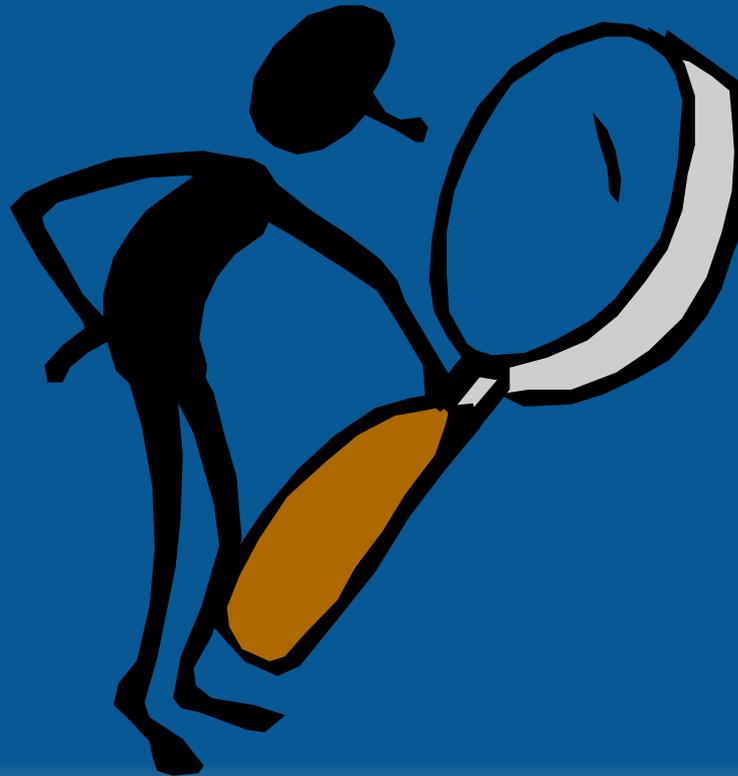
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Performance Measures

Preliminary Scenarios - Performance Measures
July 10, 2014

| Cluster		Performance Measure	Unit of Analysis	2012 Base Year	Allowable Uses	Emerging Lifestyles	Balancing Jobs & Housing
Access	1	Proximity to Activity Centers	Households within 1 mile	50,616	89,053	87,679	90,338
	2	Proximity to Transit	Households within 1/4-mile	1,358	10,800	12,876	9,579
	3	Proximity to Bicycle Facilities	Households within 1/4-mile	110,421	151,309	153,955	155,286
	4	Proximity to Schools	Households within 1/2-mile	129,487	168,253	164,939	163,565
Land Use	5	Jobs/Housing Mix in Activity Centers	Employment divided by households	2.76	2.49	2.46	2.21
	6	Proximity to Key Corridors	Employment within 500'	46,705	54,520	56,699	60,377
	7	Lane Miles	Estimated total lane miles in 2040		24,609	24,623	24,791
	8	New Land Developed	Total acres of developed land	162,788	245,378	241,224	245,321
Roadway System Performance	9	Systemwide Speed	PM peak hour average speeds (miles per hour)	36.44	19.21	23.11	21.44
	10	VHD - Vehicle Hours of Delay	PM peak hour delay (model speed vs. posted speed) for all roadways	12,927	88,264	59,664	72,450
	11	VHT - Vehicle Hours Traveled	Total driving time for all roadway users during pm peak hour	50,778	149,555	118,007	133,254
	12	VMT - Vehicle Miles Traveled	Daily value for all roadway vehicle travel	20,335,265	31,807,335	30,295,936	31,984,758
	13	Percentage of Network in Congested Conditio	Percentage of total network with V/C > 1.0 during PM peak hour	5.7%	20.9%	18.7%	19.2%
	14	Congested Conditions along Freight Corridors	Percentage of freight network with V/C > 1.0 during PM peak hour	1.0%	25.0%	24.1%	23.3%
Transit System Performance	15	Transit Ridership	Percent increase over base year	- na -	31.2%	36.2%	28.6%
	16	Transit Passenger Miles Traveled	Percent increase over base year	- na -	90.5%	92.4%	85.3%
River Crossing Conditions	17	River Crossing - Volume to Capacity Ratio	PM peak hour volumes relative to lane capacity	0.76	1.20	1.15	1.12
	18	River Crossing Trips	Daily value for all roadway vehicle travel across the Rio Grande	592,609	873,122	831,338	817,189
Economic Competitiveness	19	Proximity to Employment Sites	Households within 1 mile	33,729	46,998	53,711	47,870
	20	Average Commute Time	Travel time for work trips from home to work (minutes)	17.43	35.32	25.03	28.38
	21	Estimated Gross Regional Product	Relative differences reflect the value of increased network efficiency	$38.41 Bil	$73.04 Bil	$73.11 Bil	$72.99 Bil
Safety	22	Safety - High Crash Risk Locations	Percent increase in crashes per 100 million vehicle miles traveled over base ye	- na -	86.1%	87.5%	86.6%
Sustainability & Resiliency	23	Emissions Levels	CO_2 tonnes per day / Change in CO2 per Capita (kg/day/person)	11,282	16,200 / -5.2%	14,752 / -13.7%	15,906 / -7.0%
	24	Water Consumption	*Under development*				
	25	Development in High Flood-Risk Areas	Emp + Housing in FEMA 100-Year Floodplains	34,190	66,924	69,770	53,321
	26	Development in Forest Fire Risk Areas	Weighted value based on emp + housing in wildland-urban interface areas	3.11	4.47	4.55	4.68
	27	Develoment in Crucial Habitat Areas	Weighted value based on emp + housing in priority ranking areas	5.73	7.46	7.57	7.30

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Proximity to Premium Transit

Households within 1/4-mile

12,900
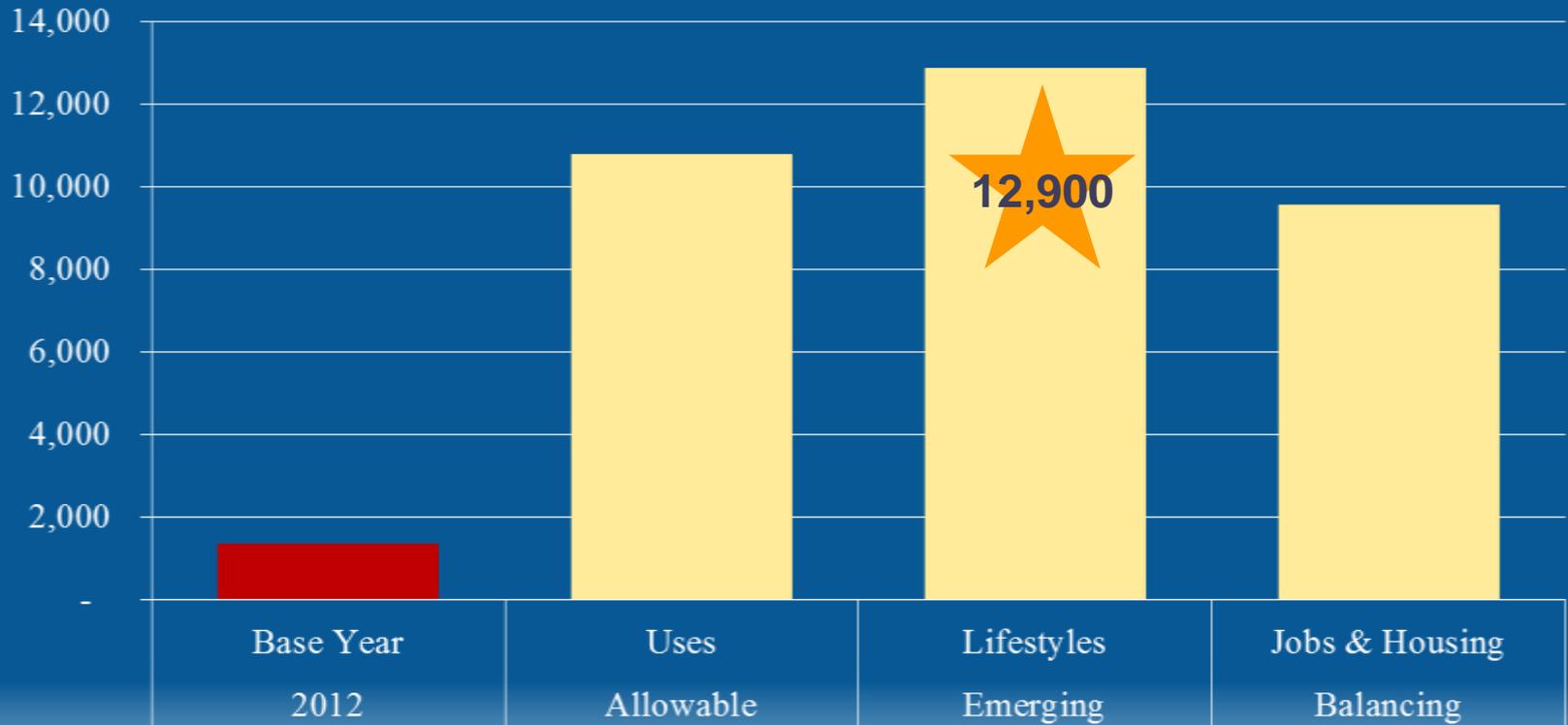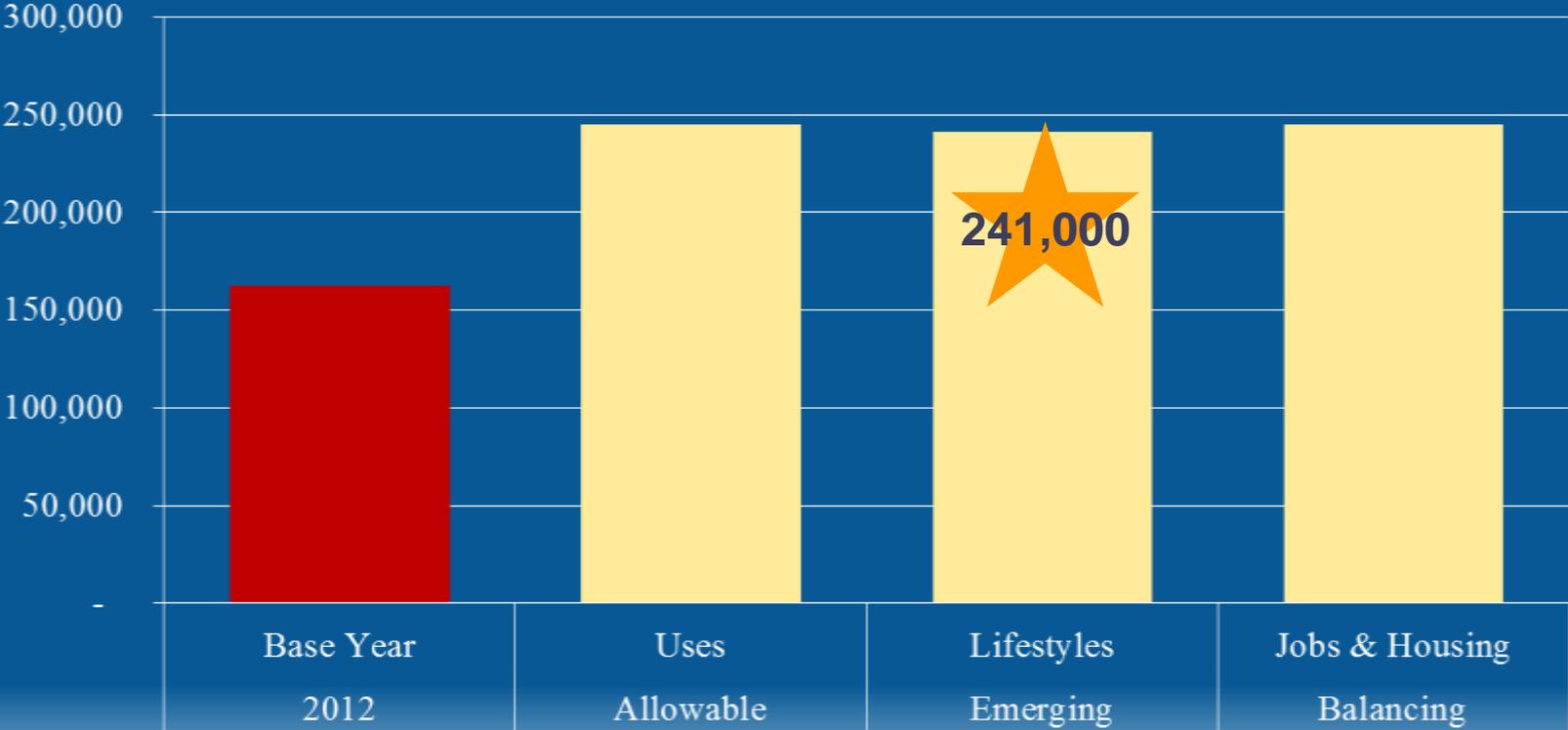
Vehicle Hours of Delay


Peak hour delay for all roadways

59,000

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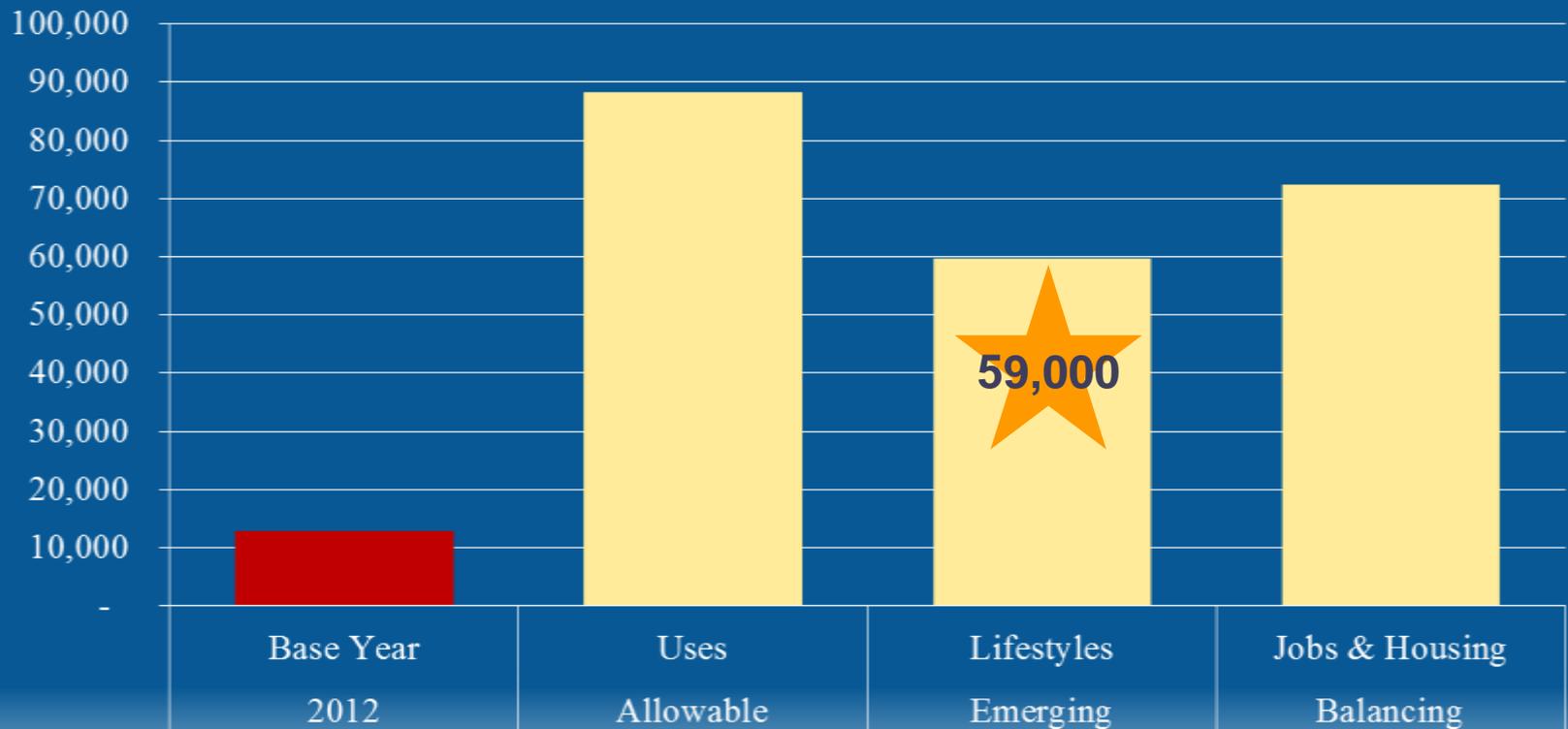
Transit Ridership

Ridership increase over base year

Category	Value
Uses Allowable	~31.2%
Lifestyles Emerging	36.2 %
Jobs & Housing Balancing	~28.5%
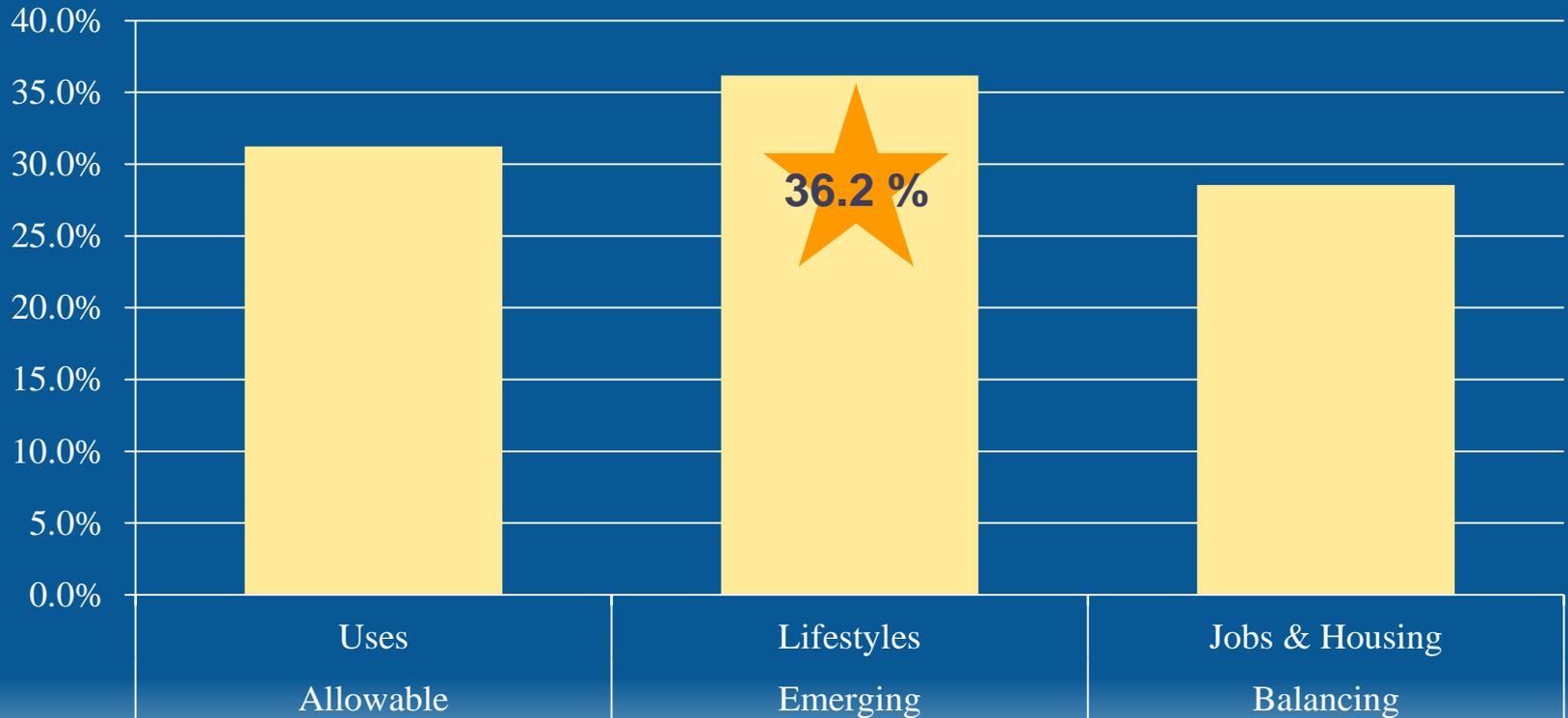
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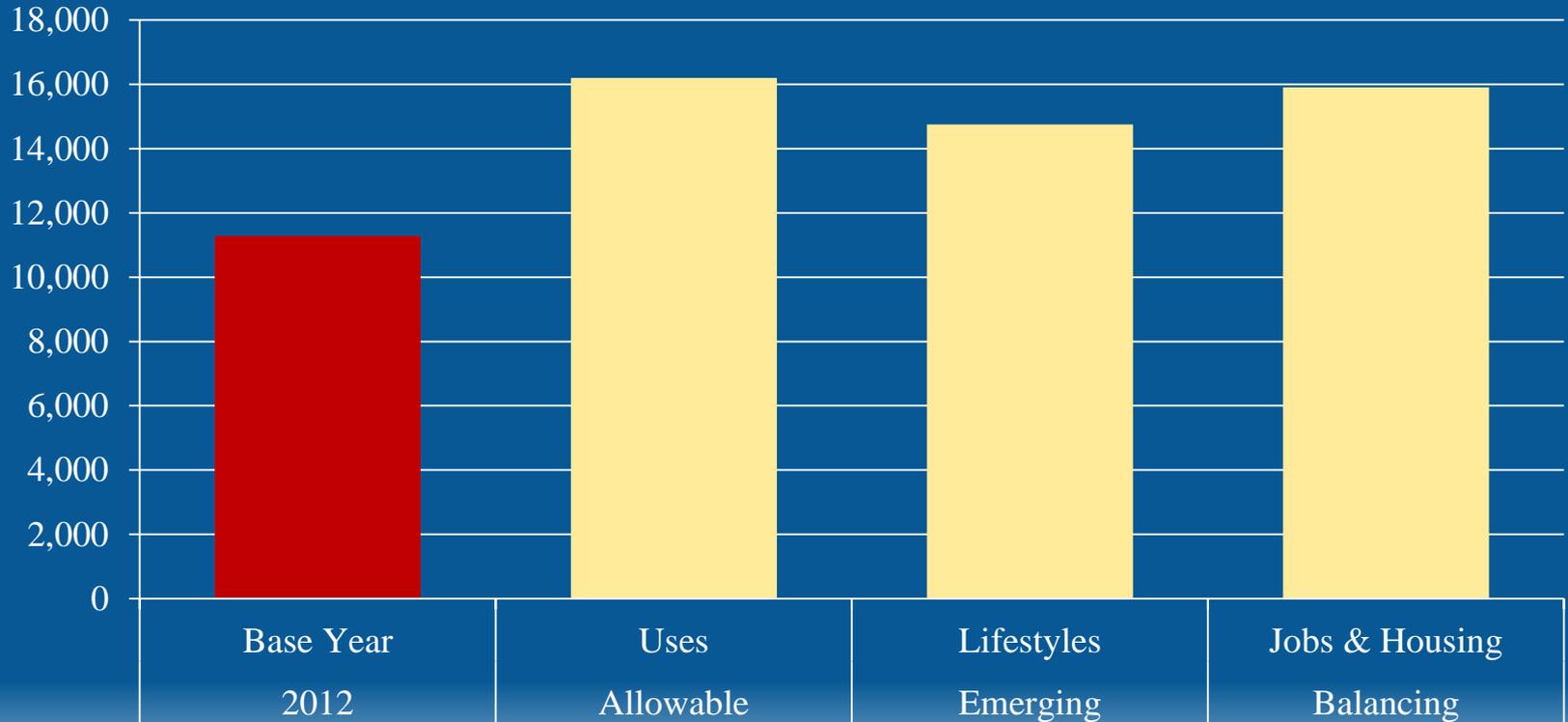
Participant Feedback

◆ Emerging Lifestyles was the clear choice (but bring more jobs to the Westside too)

◆ Zoning changes are not enough (Do more!)

◆ Emphasize activity centers and transit corridors more

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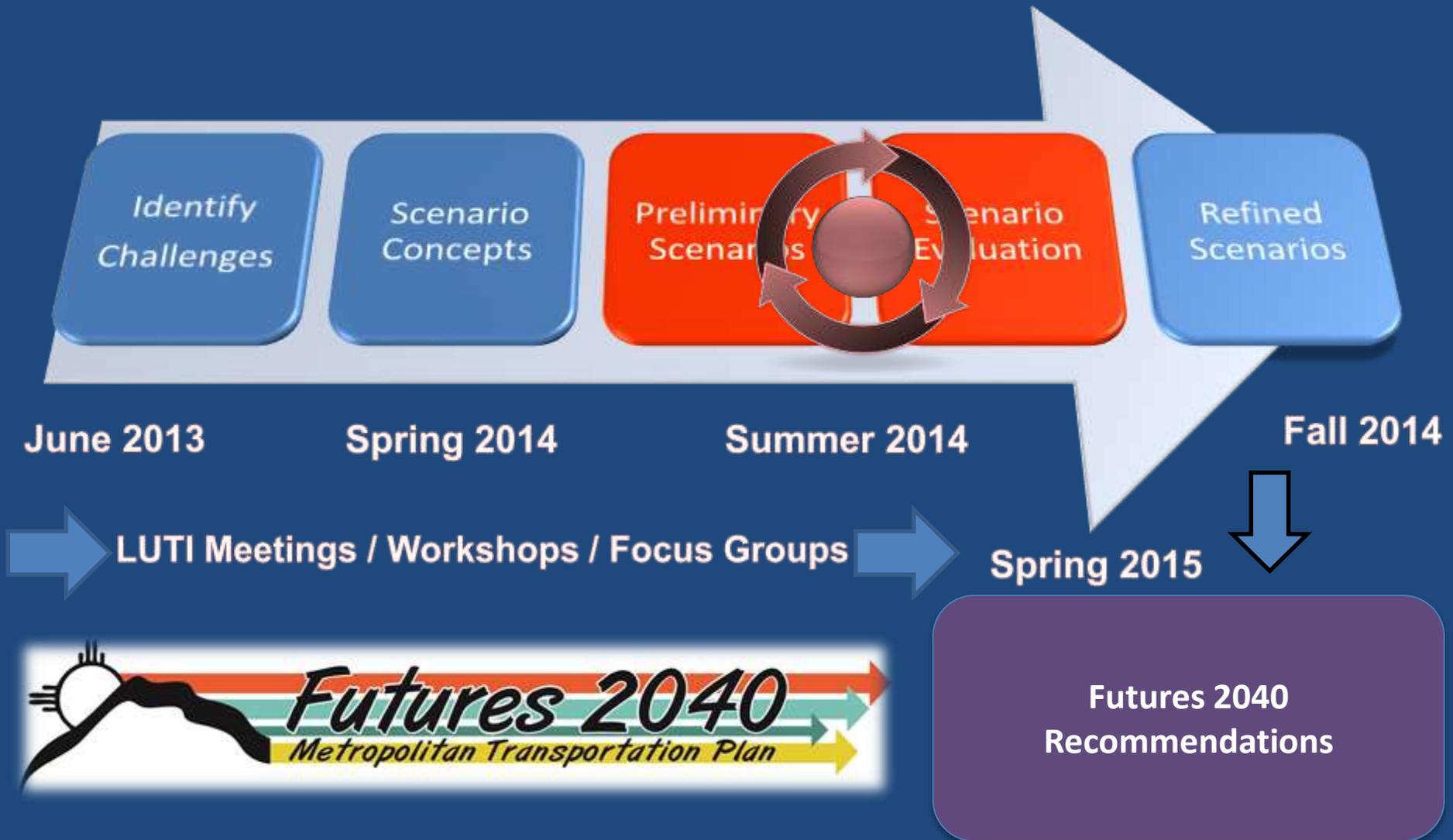
Modified Scenarios: Round 2

◆ Trend

◆ Preferred

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Trend

◆ Existing zoning

◆ No additional policy incentives

◆ Fiscally constrained roadway network

◆ Fiscally constrained transit service
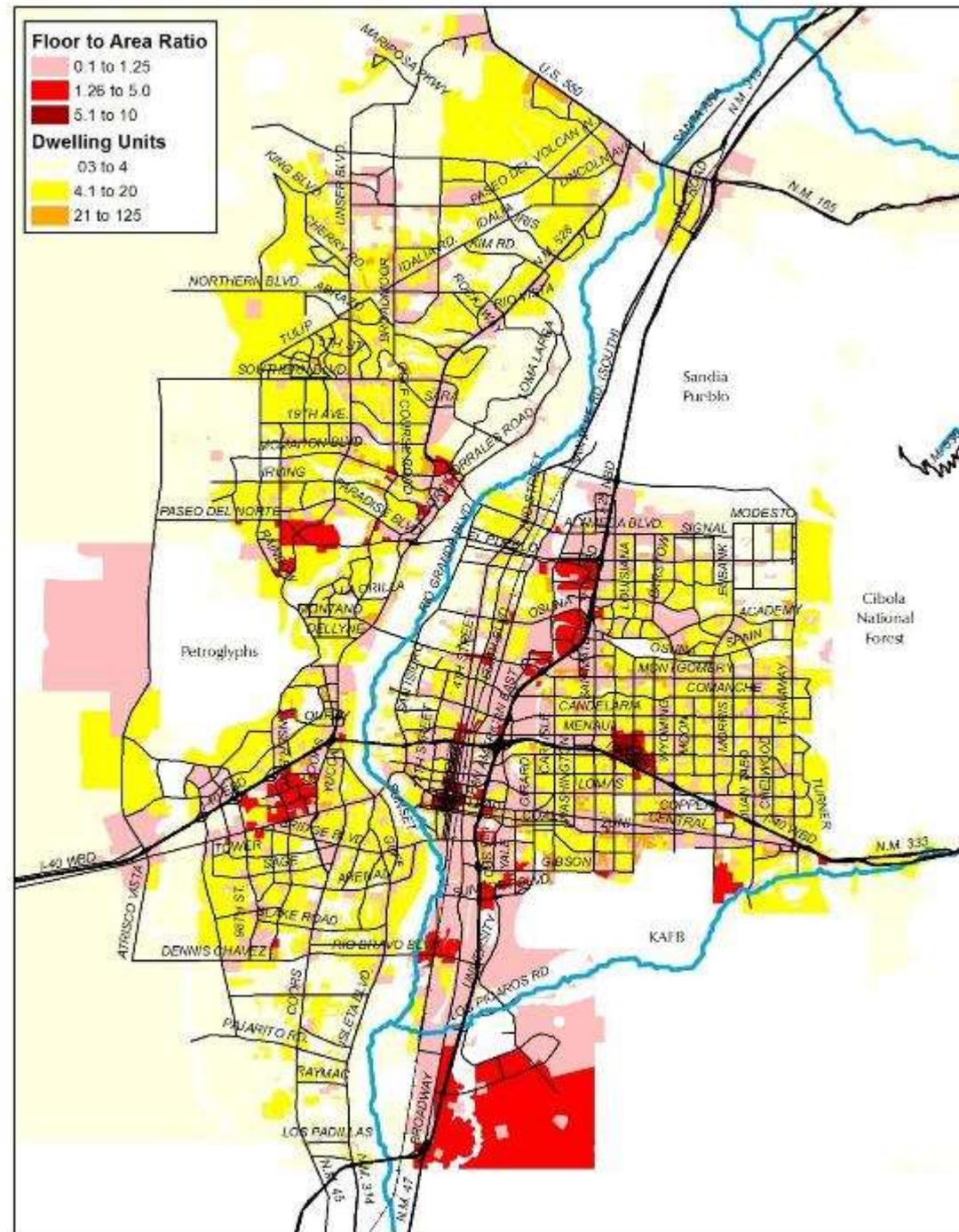
Preferred – Zoning

◆ Intensify mixed use zoning in key centers
and transit nodes

◆ Intensify commercial nodes west of the Rio Grande

◆ Intensify housing options near commercial centers east of the Rio Grand
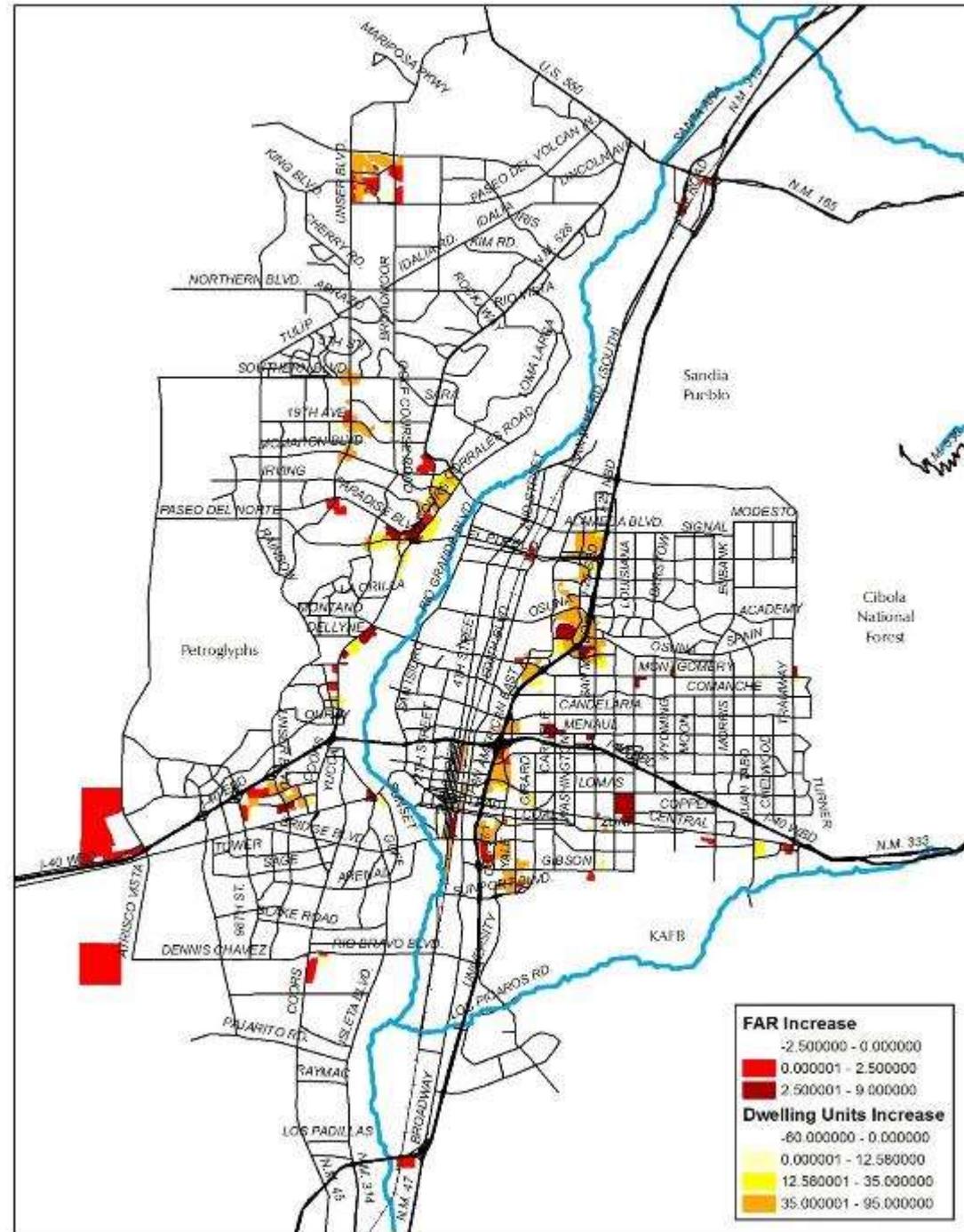
Preferred – Incentives

◆ Key Centers

◆ Key Transit Nodes

◆ Key Corridors

  ◆ Increase Attraction
  ◆ Elevate existing efforts
  ◆ Defined collaboratively

# Preferred – Transit Network

◆ Increased Transit Tax

◆ Increased Frequency

◆ Service Expansion

◆ Bus Rapid Transit Service

2012 vs. 2040 Transit Network Frequency Comparison*

2012 Network
2040 Network

Headway (Minutes)
< 15
15 - 19
20 - 24
25 - 29
30+

*Indicates transit route operating at highest frequency within corridor. Does not account for cumulative effect of overlapping services within same corridor.

RIO METRO

1 in = 3 miles

Model Feedback Loop

UrbanSim
2012 - 2025

Cube
2025

Performance
Measures

Cube
2040

UrbanSim
2025 - 2040

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Round 2: Evaluation

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Performance Measures, Take 2

Cluster		Performance Measure	Unit of Analysis	2012 Base Year	2040 Scenarios	
					Trend	Preferred
Access	1	Proximity to Activity Centers	Households within 1 mile	50,616	88,555	91,694
	2	Proximity to Transit	Households within 1/4-mile	1,358	14,380	17,460
	3	Proximity to Bicycle Facilities	Households within 1/4-mile	110,421	151,360	157,070
	4	Proximity to Schools	Households within 1/2-mile	129,690	168,659	166,444
Land Use	5	Jobs/Housing Mix in Activity Centers	Employment divided by households in Activity Centers	2.76	2.30	2.24
	6	Proximity to Key Corridors	Employment within 1000 feet	92,613	133,409	130,139
	7	New Land Developed	Total acres of developed land	162,788	259,934	245,584
Roadway System Performance	8	Systemwide Speed	PM peak hour average speeds (miles per hour)	35.8	25.6	27.1
	9	VHD - Vehicle Hours of Delay	PM peak hour delay (model speed vs. posted speed) for all roadways	9,648	47,450	21,337
	10	VHT - Vehicle Hours Traveled	Total driving time for all roadway users during pm peak hour	51,876	104,470	94,492
	11	VMT - Vehicle Miles Traveled	Daily value for all roadway vehicle travel	19,722,826	28,055,982	27,006,046
	12	VMT per Capita	Average vehicle miles traveled per person	22.14	20.79	20.01
	13	Percentage of Network in Congested Conditions	Percentage of total network with V/C > 1.0 during PM peak hour	2.0%	6.9%	6.1%
	14	Congested Conditions along Freight Corridors	Percentage of freight network with V/C > 1.0 during PM peak hour	5.0%	17.4%	15.0%
Transit System Performance	15	Transit Ridership	Percent increase over base year	41,033	52,153	83,589
	16	Transit Passenger Miles Traveled	Percent increase over base year	147,369	187,772	262,171
River Crossing Conditions	17	River Crossing - Volume to Capacity Ratio	PM peak hour volumes relative to lane capacity	0.77	0.99	0.97
	18	River Crossing Trips	Daily value for all roadway vehicle travel across the Rio Grande	598,018	770,235	754,444
Economic Competitiveness	19	Proximity to Employment Sites	Households within 1 mile	33,729	49,573	59,886
	20	Average Commute Time	Travel time for work trips from home to work (minutes)	17.48	20.94	19.42
	21	Estimated Gross Regional Product	*Under development*			
Safety	22	Safety - High Crash Risk Locations	Modeled crashes per 100 million vehicle miles traveled	369	373.7	376.4
Sustainability & Resiliency	23	Emissions Levels	CO_2 tonnes per day / Change in CO2 per Capita (kg/day/person)	11,358	14,058 / -18.4%	13352 / -20.8%
	24	Water Consumption	*Under development*			
	25	Development in High Flood-Risk Areas	Emp + Housing in FEMA 100-Year Floodplains	34,470	52,755	50,782
	26	Development in Forest Fire Risk Areas	Weighted value based on emp + housing in wildland-urban interface areas	3.14	4.85	4.53
	27	Develoment in Crucial Habitat Areas	Weighted value based on emp + housing in priority ranking areas	5.73	7.65	7.71

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Greater Land Use Impacts

Land Use Impacts	Round 1	Round 2
New Land Developed	-2%	-6%
Proximity to Centers	1%	3%
Proximity to Transit	19%	21%

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Greater Transportation Impacts

◆ Higher transit ridership

◆ Fewer miles traveled

◆ Reduced systemwide congestion

Participant Feedback

◆ Good job!

◆ It is still not enough…

Futures 2040 MTP

◆ The Trend Scenario will continue to be the MTP Socioeconomic forecast

◆ The Preferred Scenario will serve as a regional target… (implementation is up to the local jurisdictions.)

◆ Both will be adopted as part of 2040 MTP in the Spring of 2015

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Thank You!!

Kendra Watkins

Mid-Region Council of Governments

(505) 724-3601

kwatkins@mrcog-nm.gov

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Trend vs. Preferred
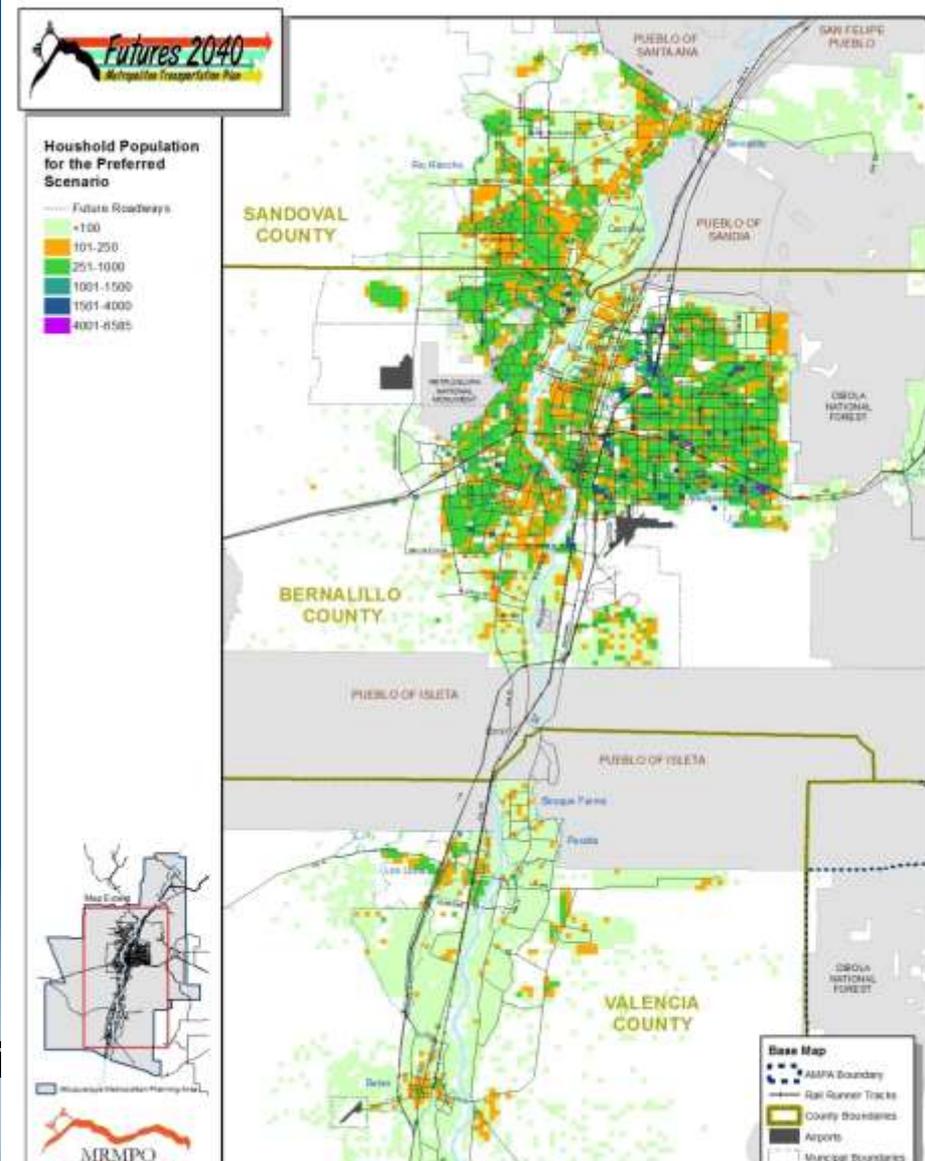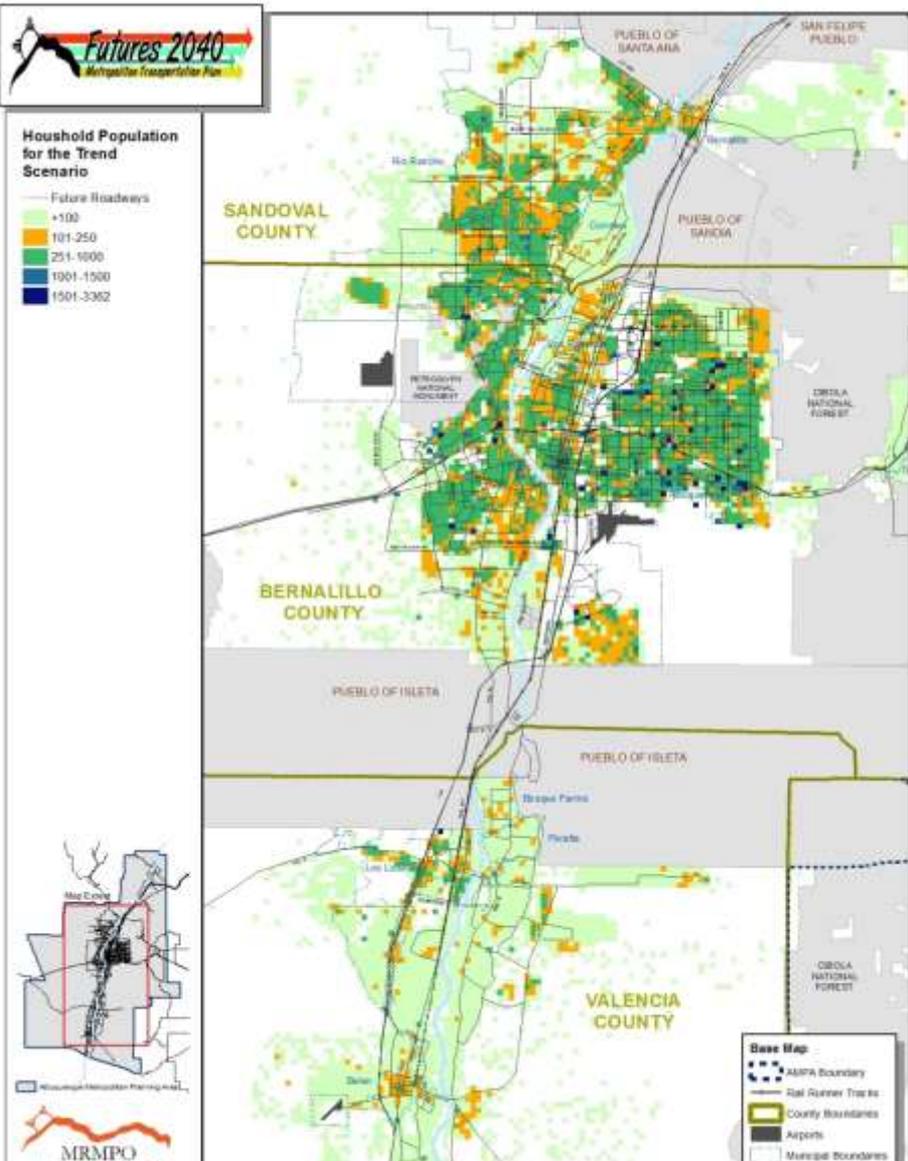
Trend vs. Integrated Trend

◆ **10%** more households near key corridors

◆ **8%** more households in near premium transit

◆ **5%** more households near key centers
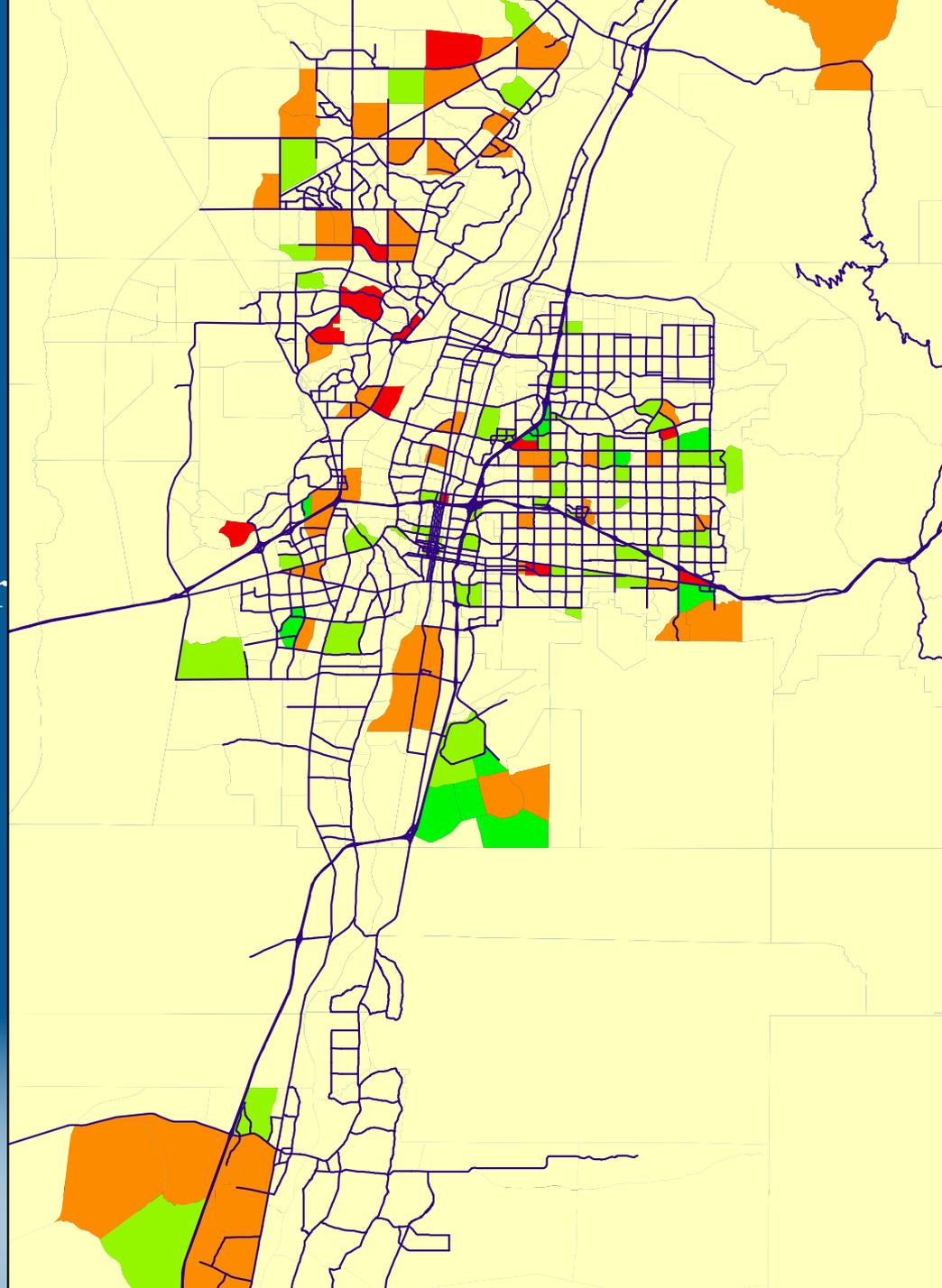
UrbanSim Inputs
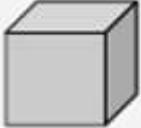
Parcels	Buildings	Households	Persons	Jobs
parcel_id	building_id	household_id	person_id	establishment_id
626,000	329,000	359,000	897,000	396,000

Existing

Assessor Data

Census Data

Employment Data

Known

Zoning / Plans

Scheduled Projects

Undevelopable

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UrbanSim:
Model Estimation

Job Location Choice – *Major Retail*

Access to Activity Centers

Access to Interchange

Average Building Year

Average Non-residential price

Proximity to other Employment

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