

One Water One Plan (OWOP): Making Connections Between Professional Disciplines

Eileen Takata, Board Member
California Resource Connections, Inc.

June 17, 2009
Sacramento, CA
*SWRCB & Water-Energy
Climate Action Team*
**Climate Change Scoping Plan
Implementation Workshop
Measure W-4: Urban Water Reuse**

6/18/2009

California Resource



Inland Empire Sustainable Watershed

capacity-building CALFED grant

- watershed management atlas
- green places map
- model land use ordinance
- green development initiative
- Watershed forums
- think river! santa ana

planning team

- Cal State San Bernardino Water Resources Institute
- GreenInfo Network
- Connective Issue
- Cal Poly Pomona
- NPS Rivers, Trails, and Conservation Assistance Program



VISION: An Integrated General Plan



WATER-SHED

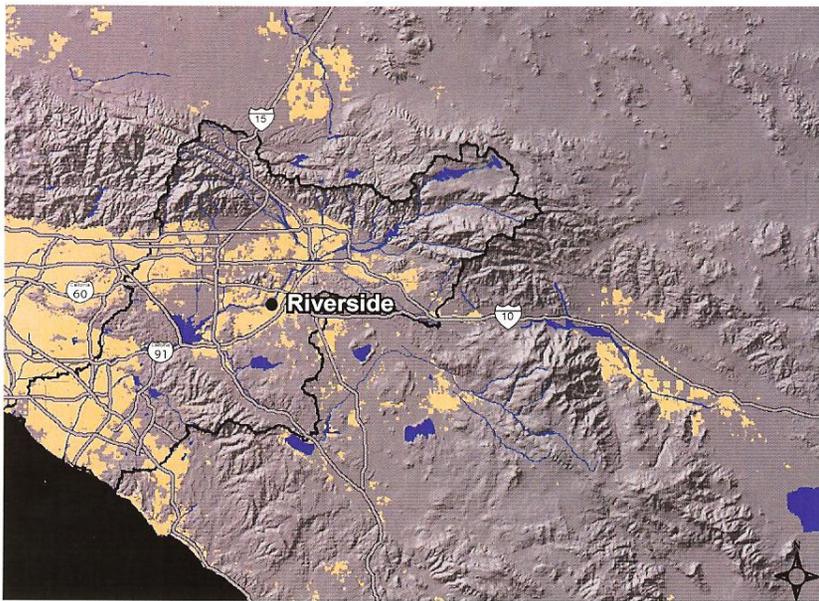
- Stormwater harvesting for urban water reuse
- Water quality
- Peak flow attenuation
- Open space/floodplain protection

URBAN PLANNING/TRANSPORTATION

- Thriving mixed-use districts
- Infill development
- Transit-oriented development (TOD)
- Walkable/bikeable communities
- Alternative transportation

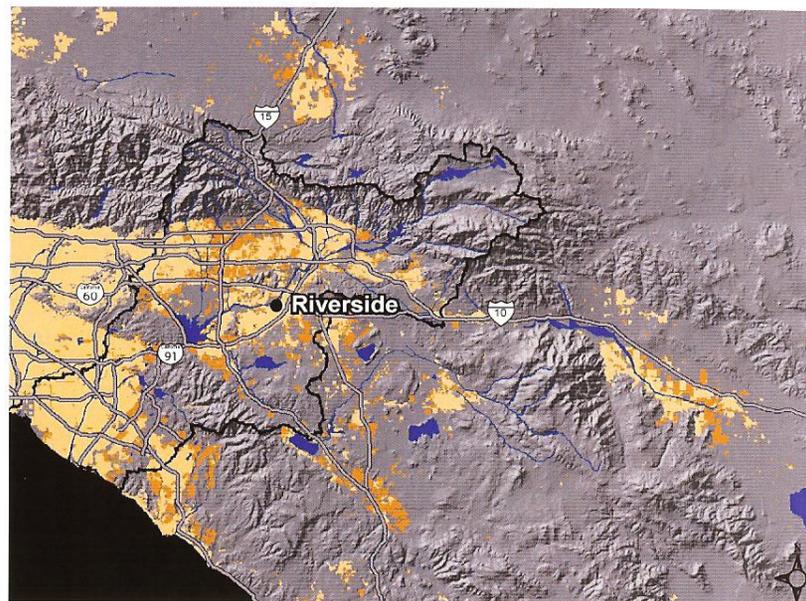
SUSTAINABILITY

- Zero carbon/zero waste developments
- Green buildings
- Water-efficient landscapes
- Local food production

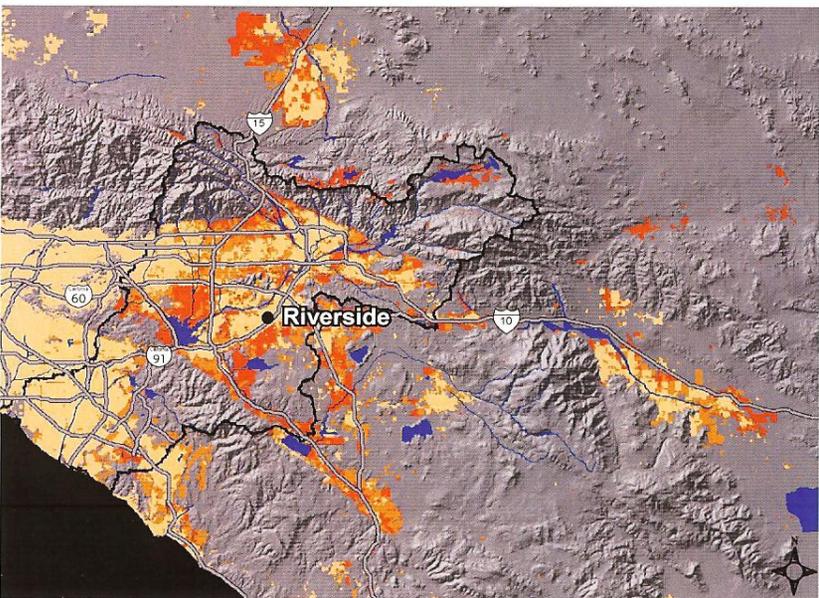


1984 development pattern

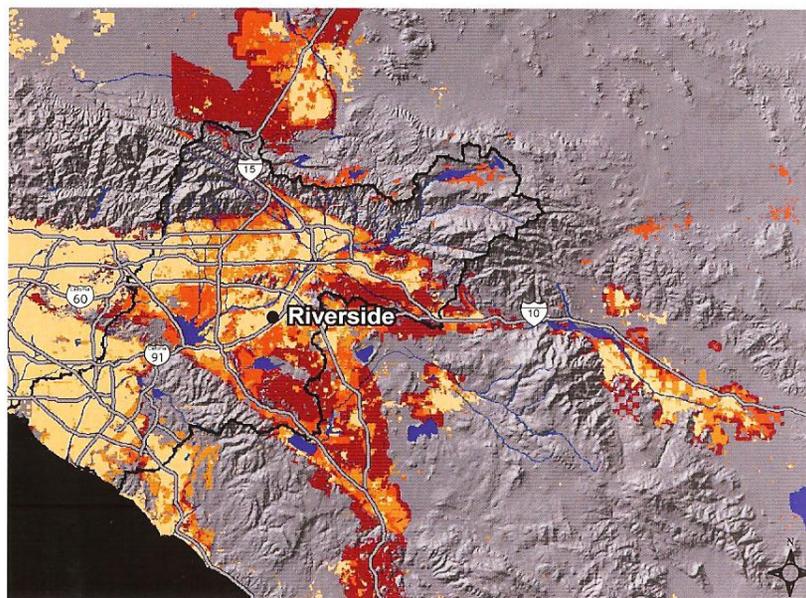
GIS Sources: Landis, SAWPA, CDC FMMP



2004 development pattern



2020 projected development pattern



2050 projected development pattern

Figure 2.36: Historical and projected development patterns.

Copyrighted Material

DESIGN WITH NATURE



IAN L. MCHARG

Copyrighted Material

25th
anniversary
edition



Layers

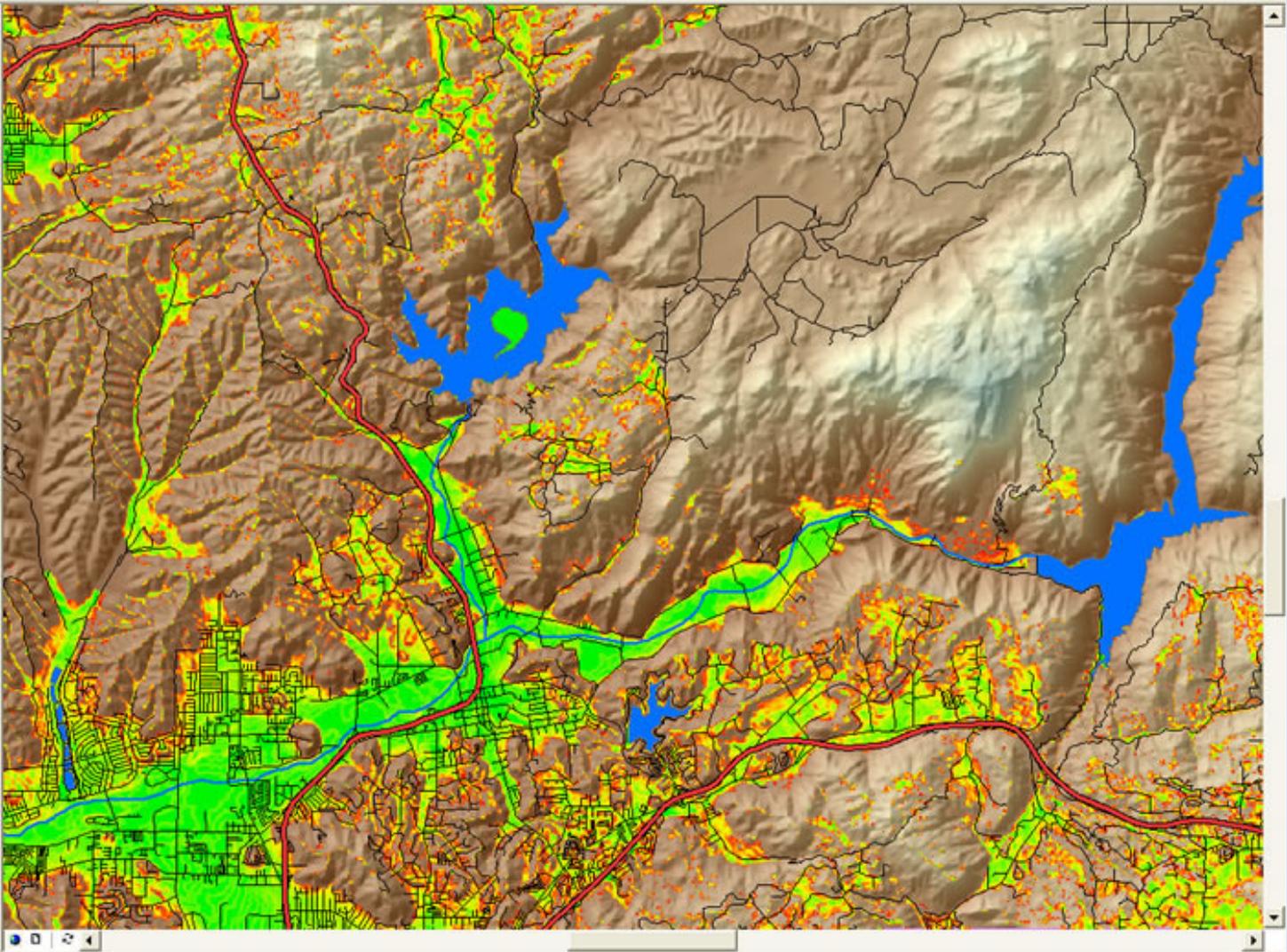
- Freeway
- Roads
- Lakes
- Streams
- Site Suitability Result
 - Value
 - High : 7.973233
 - Low : 0.000000
- study_boundary
- Elevation
- Hillshade

Display Source Selection

ArcToolbox

- 3D Analyst Tools
- Analysis Tools
- Conversion Tools
- Data Management Tools
- Spatial Analyst Tools
- SuitabilityToolbox
 - Site Suitability
- Toolbox

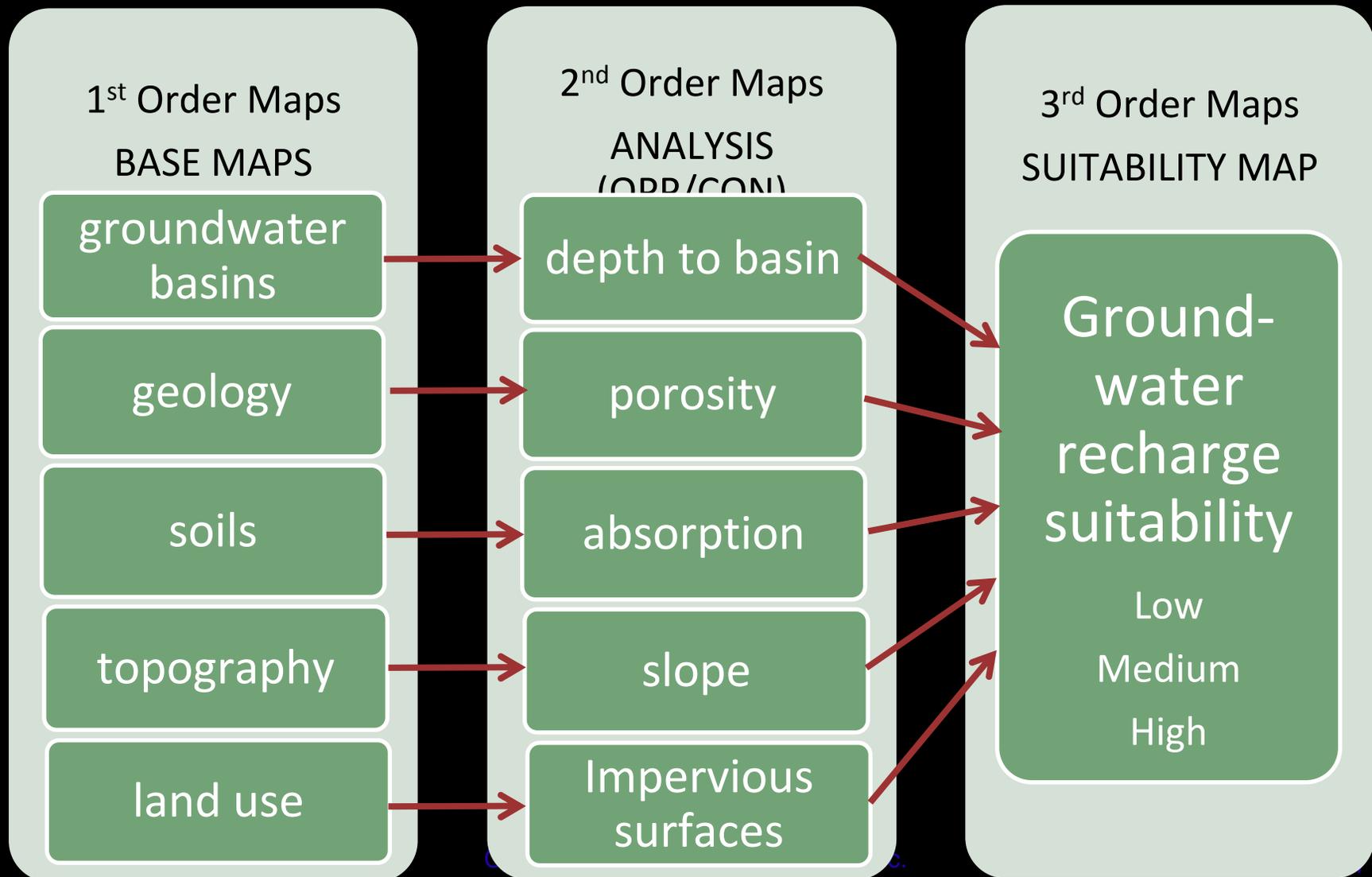
Favorites Index Search



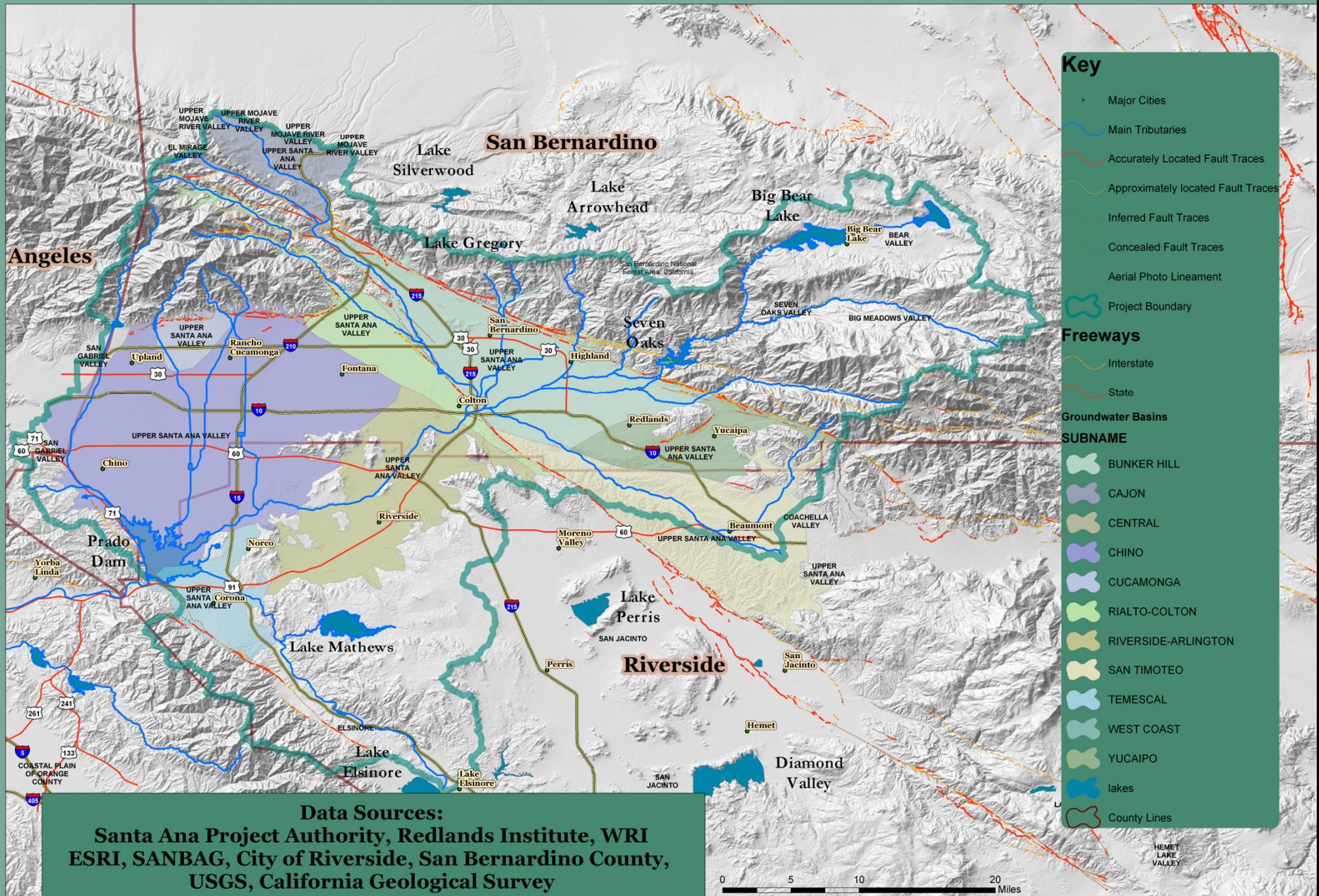
<Enter commands here>

Executed (Con) successfully.
End Time: Thu Jul 15 15:38:52 2004 (Elapsed Time: 1.00 secs)

Suitability Mapping Process: Groundwater Recharge Suitability

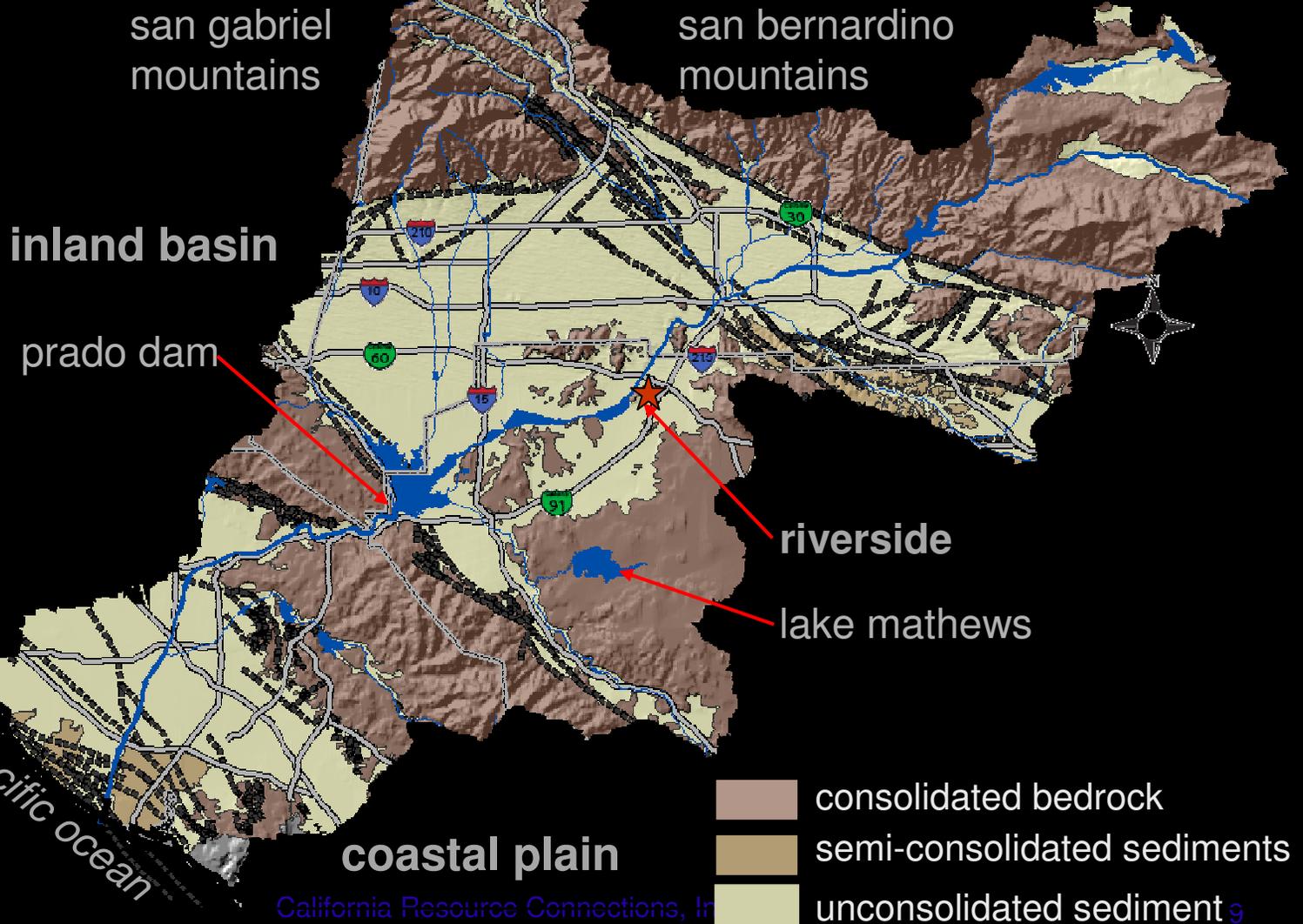


Upper Santa Ana Watershed Groundwater Areas and Faults



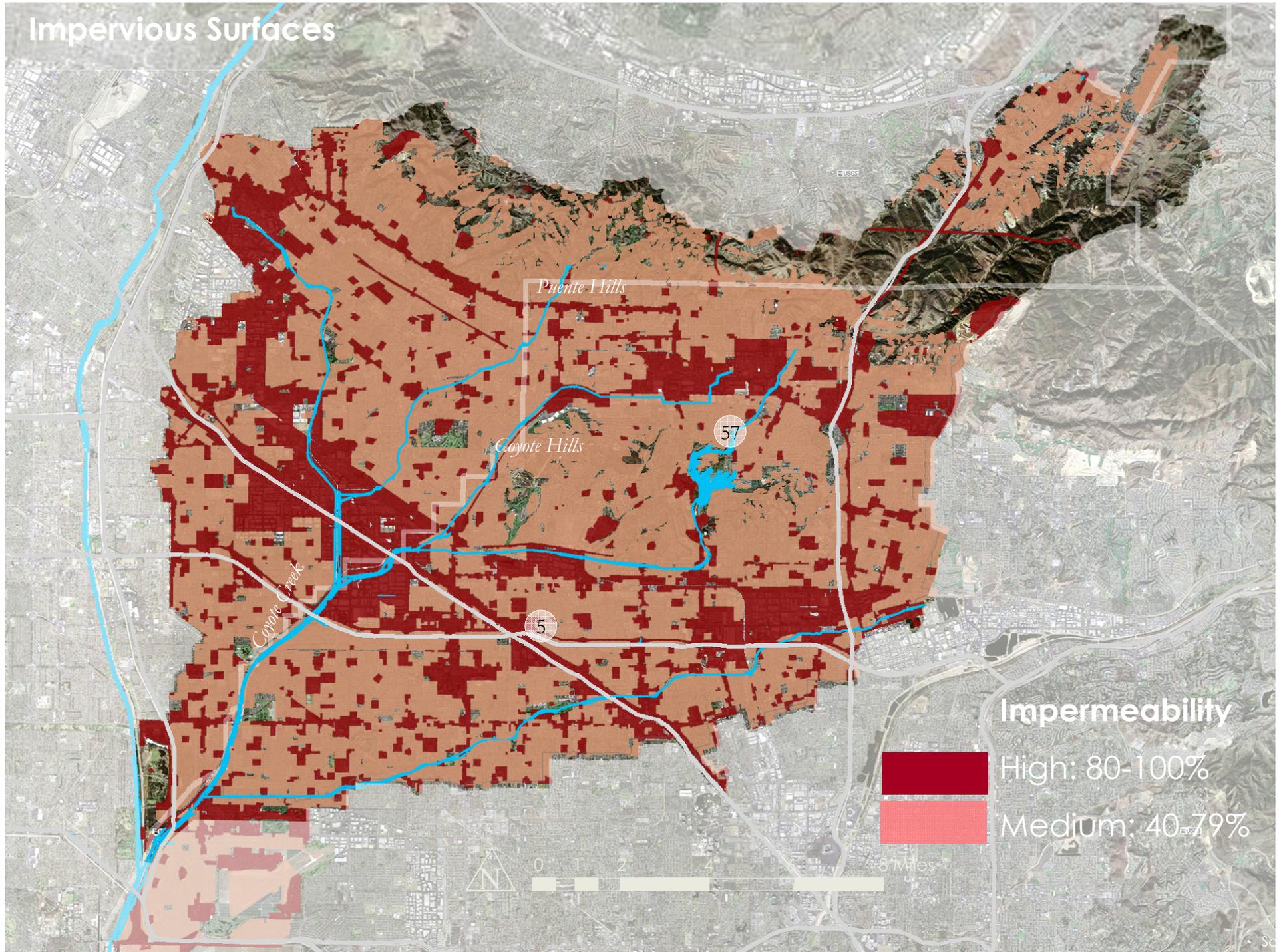
faults & alluvial soils

faulting creates steep mountains, while intense storms deposit sediment creating a vast alluvial plain



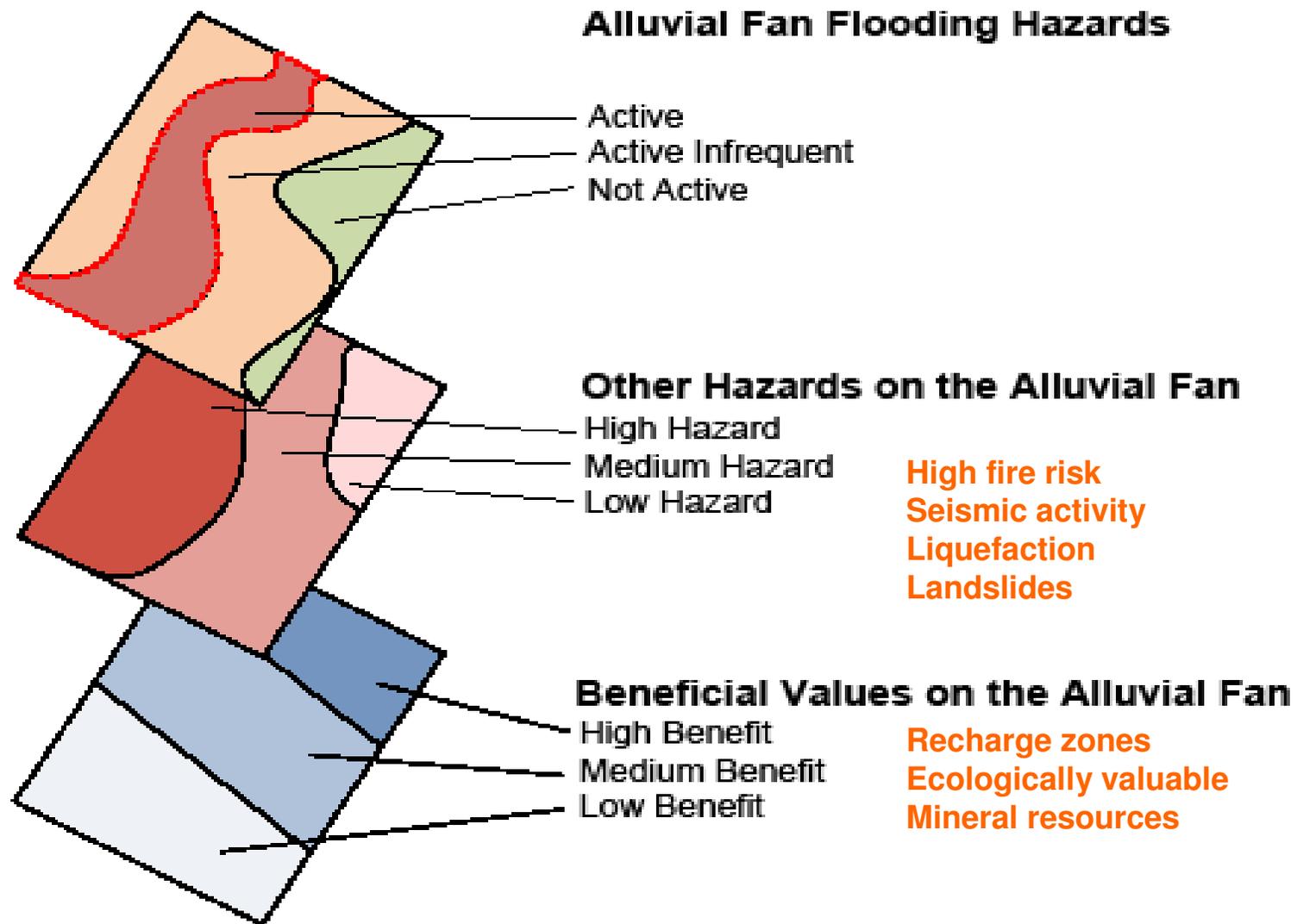
source: us SAWPA; SCWRB 2002,

Impervious Surfaces

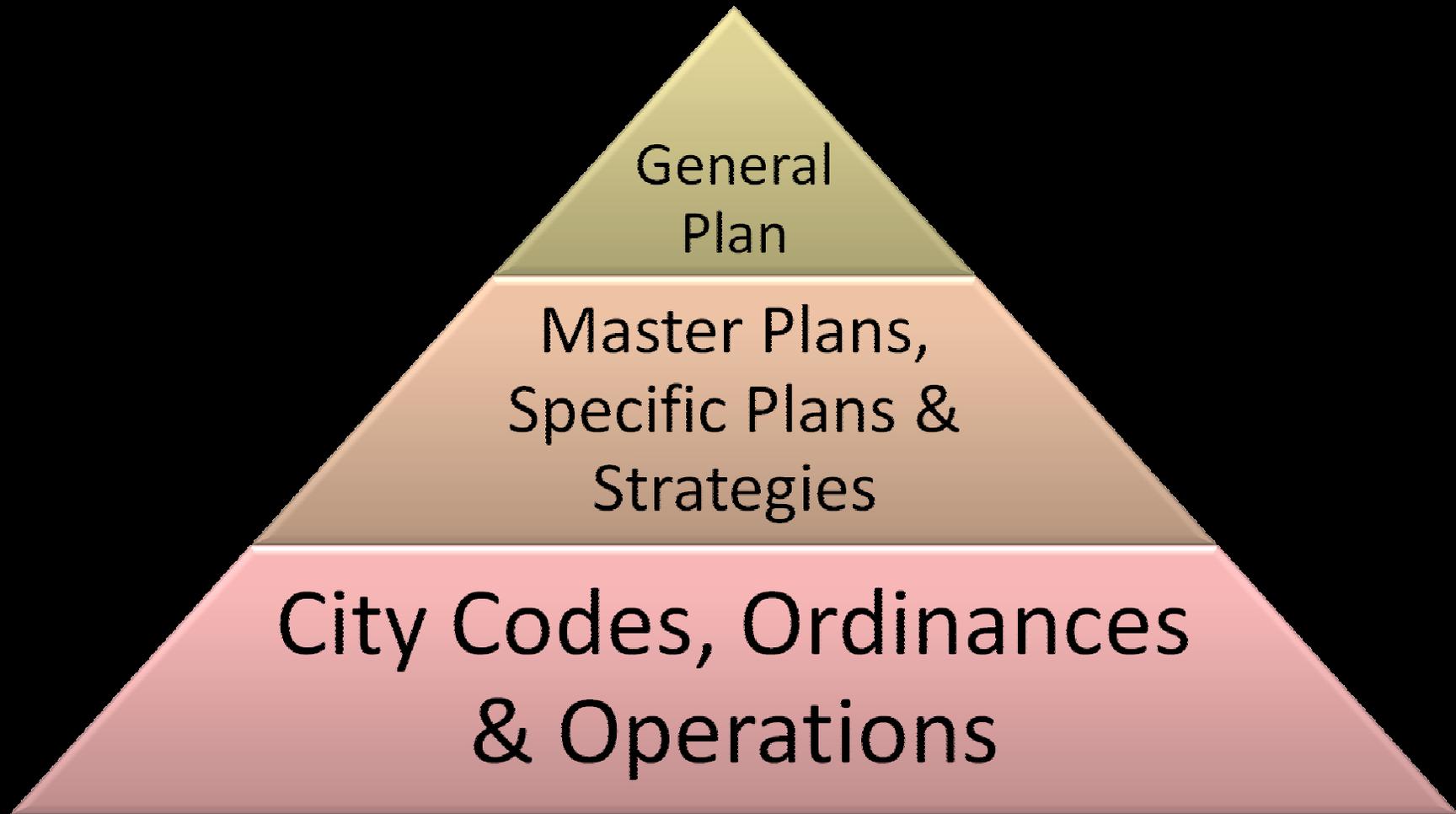


What's a Land Classification Unit?

- It's the mapping of hazards and beneficial values on a landform (anywhere)
- LCU'S help planners identify opportunities for multi-objective outcomes:
 - ▶ For alluvial fans; minimizing risks and conserving beneficial values

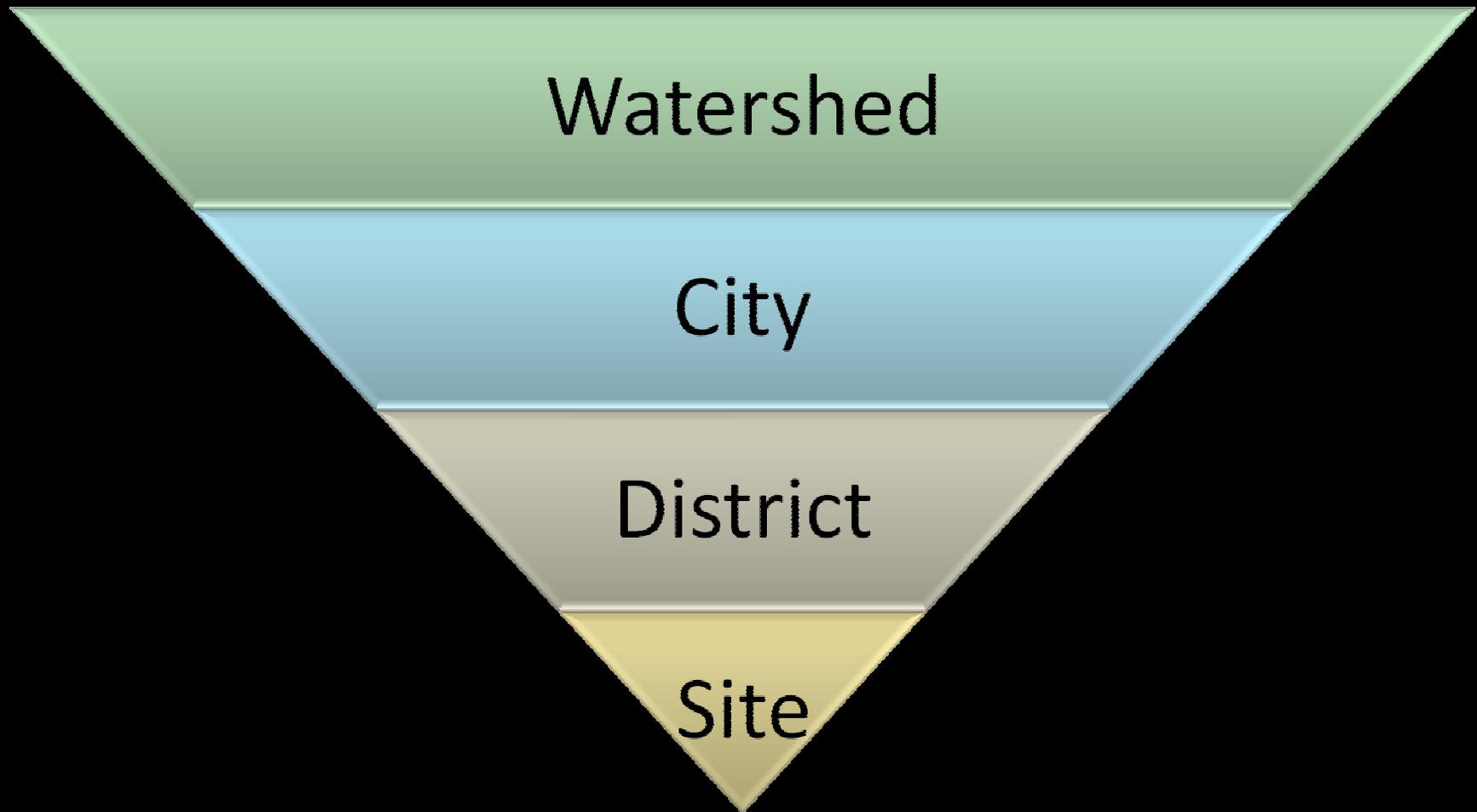


Watershed Integration at All Levels

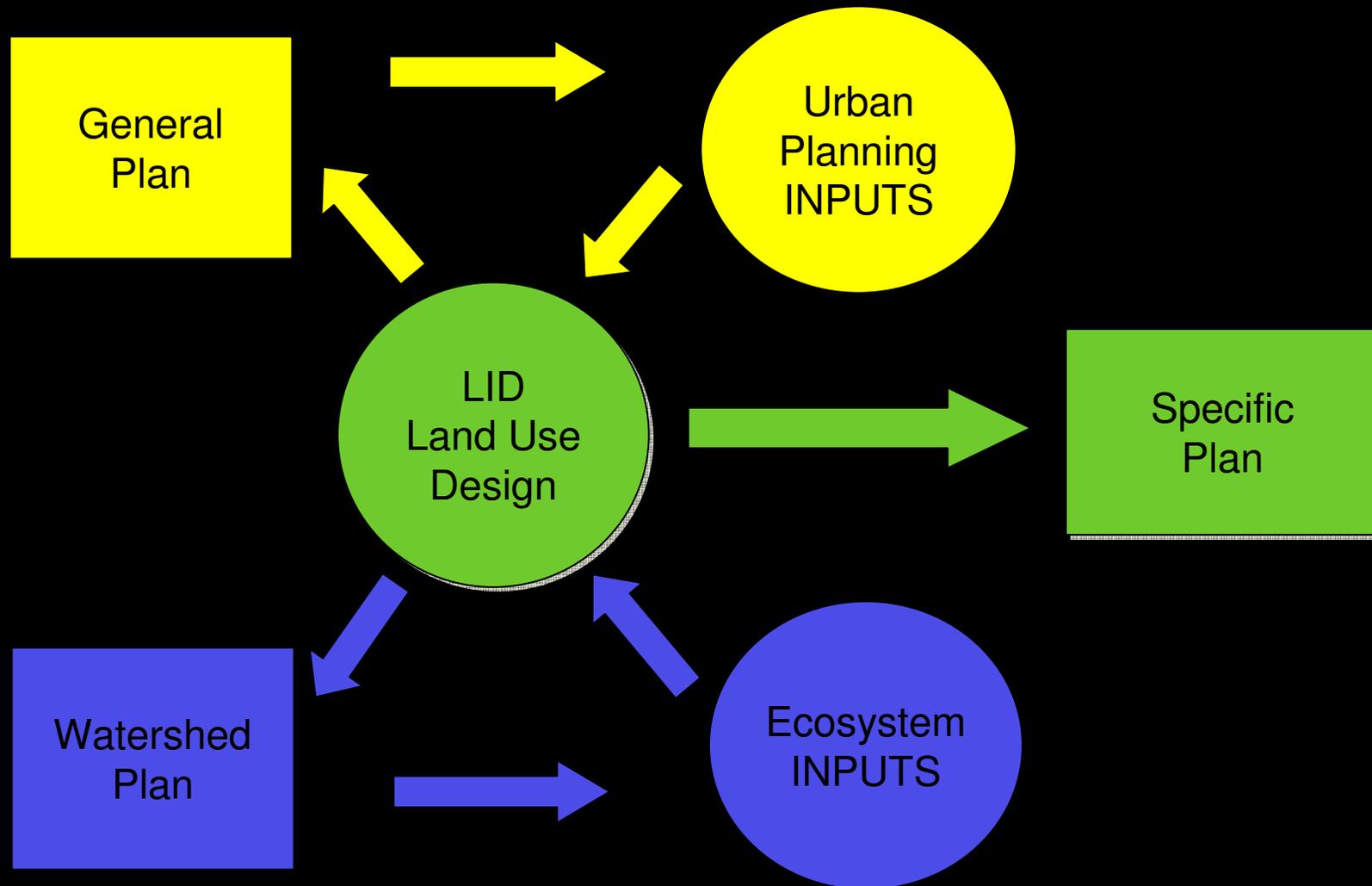


Adopted from "Water Resources & Land Use Planning: Watershed-based Strategies for Ventura County" Local Government Commission, December 2008

Mapping Scales



Plans & Planning Processes



Vision for a Healthy Future

Green Redevelopment Plan for Upper Santa Ana Watershed and Riverside

enhance the urban preserve the natural

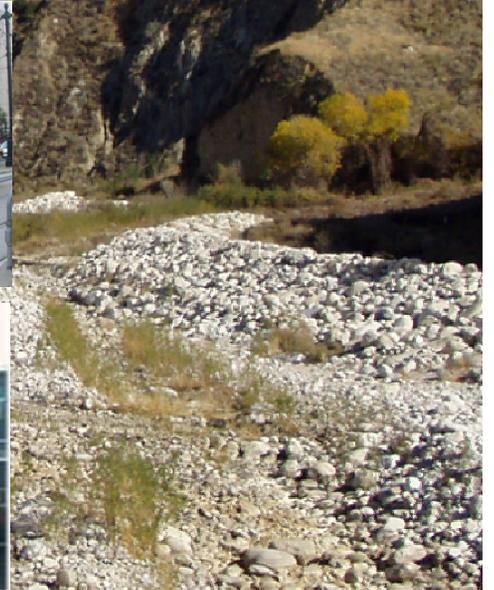


Leighton Cramer • Deborah Enos • Dave McIntosh • Kimberly True • Kim Wehinger
606 Studio • Department of Landscape Architecture • California State Polytechnic University, Pomona • 2007

how we develop matters!

we can IMPACT or ENHANCE through development

- water supply
- habitat
- climate
- open space and recreation
- transportation
- human quality of life

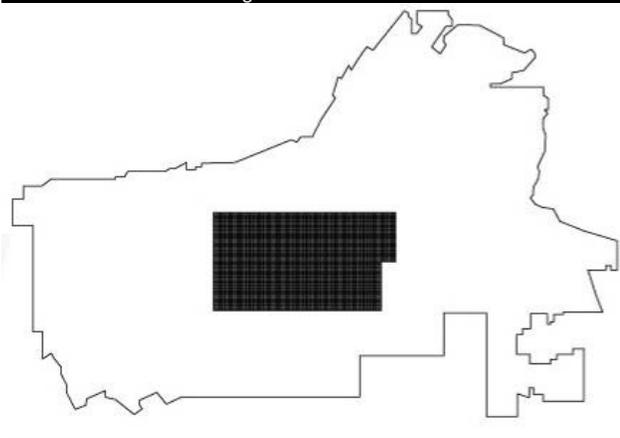




6 units per acre



supports auto culture
congress for new urbanism



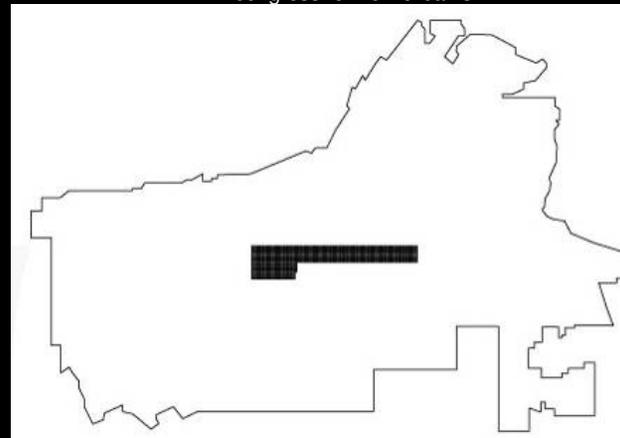
6333 acres consumed



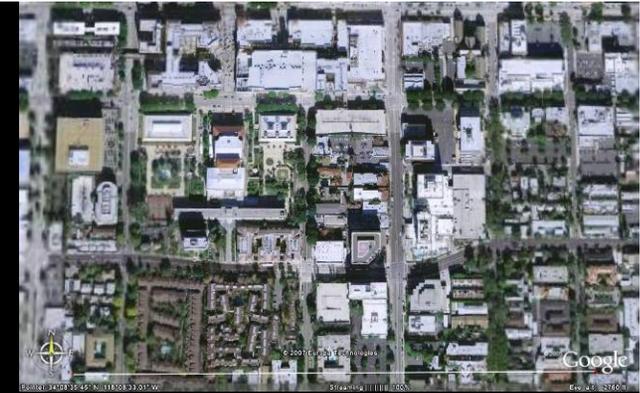
30 units per acre



supports premium bus
congress for new urbanism



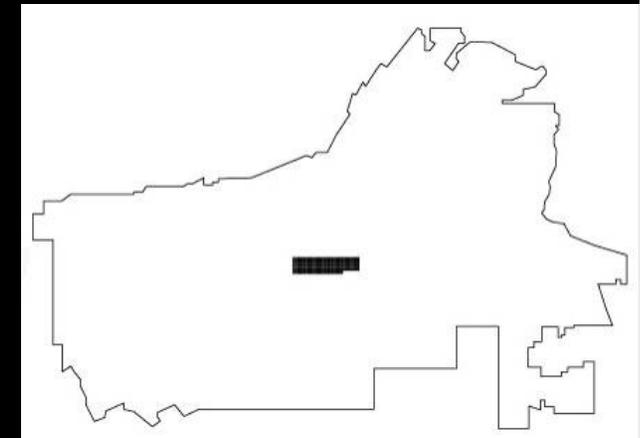
1266 acres consumed



100 units per acre



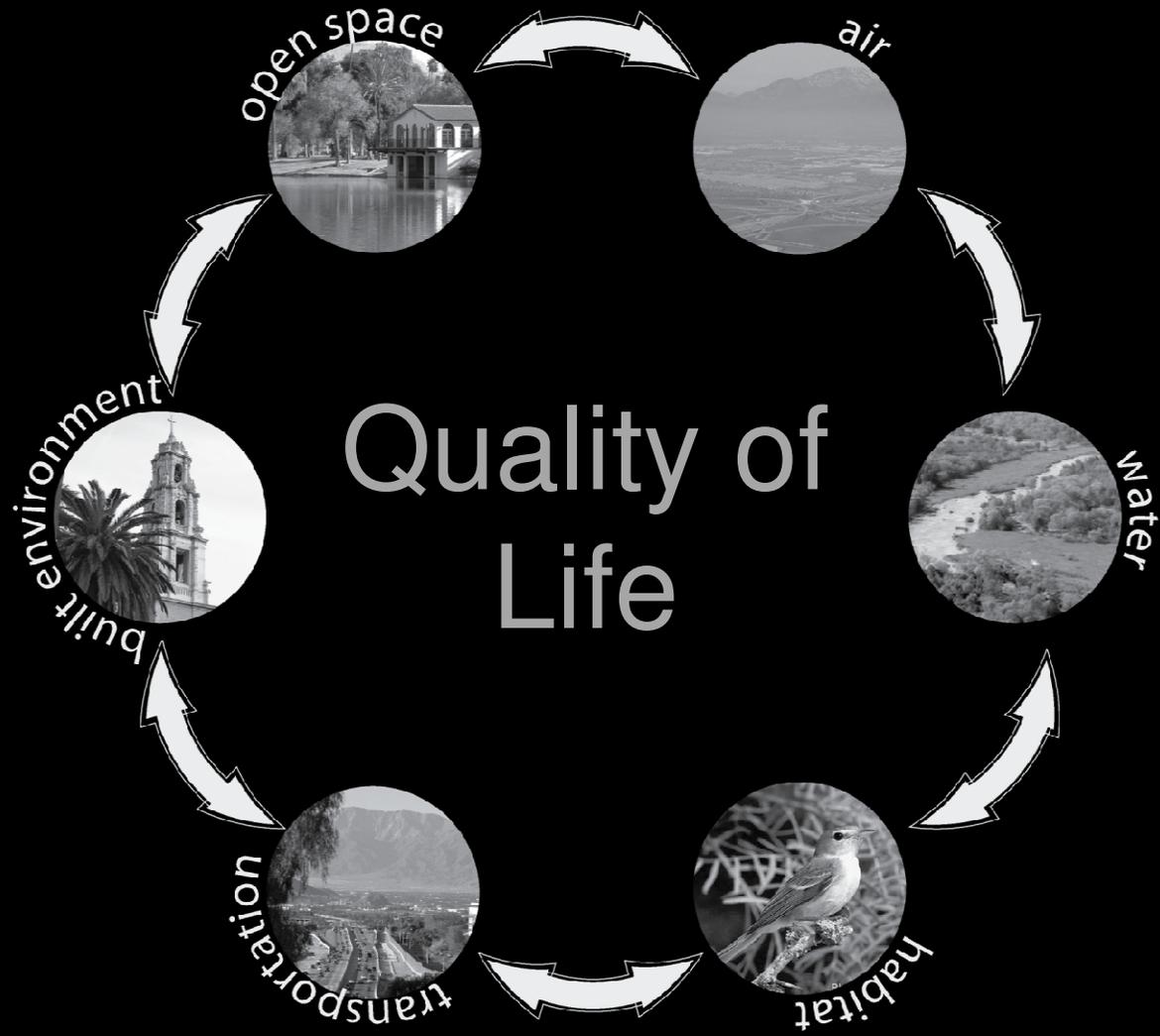
supports full transit
j. jacobs, 1967



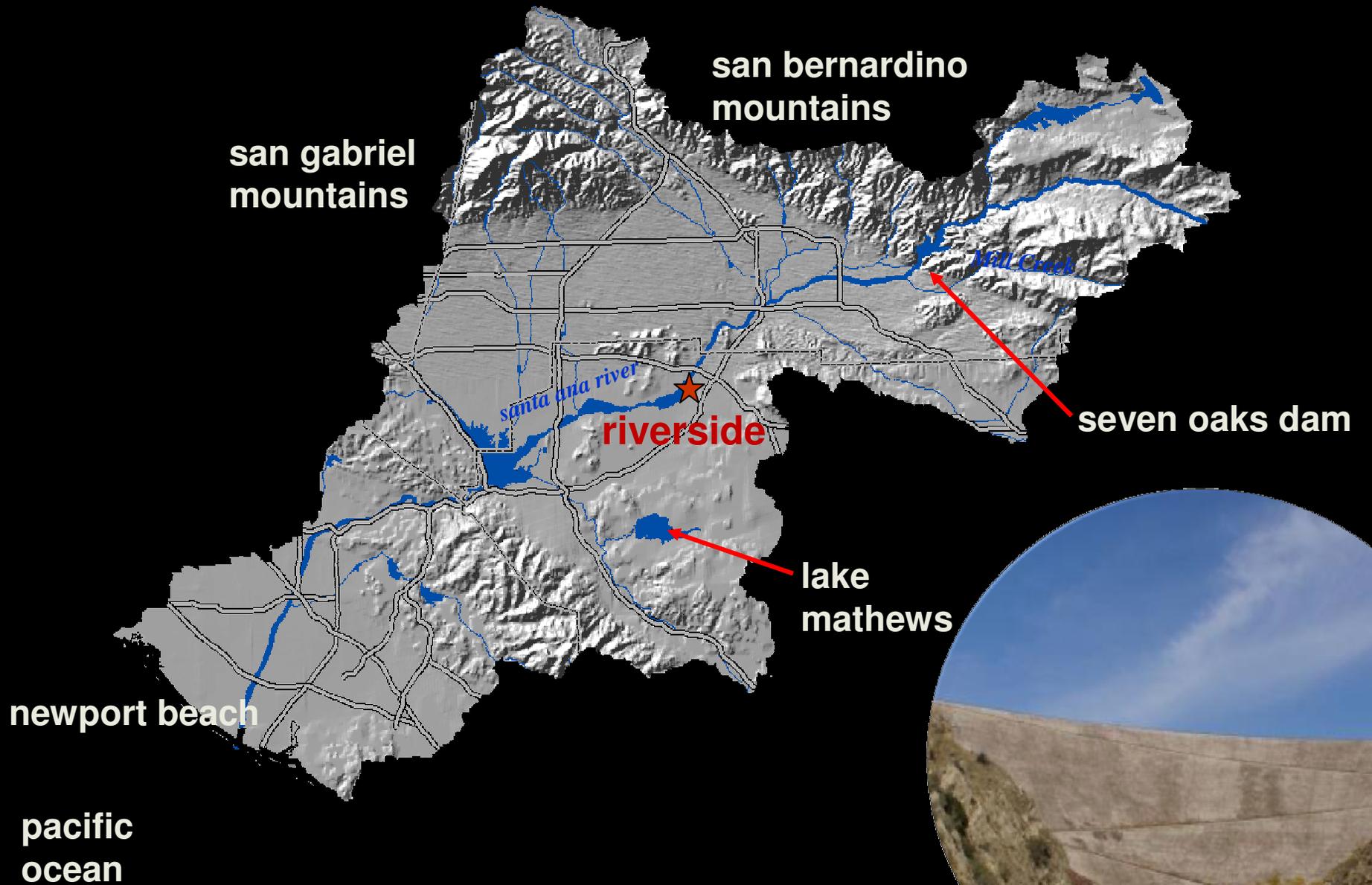
380 acres consumed¹⁷

presentation format

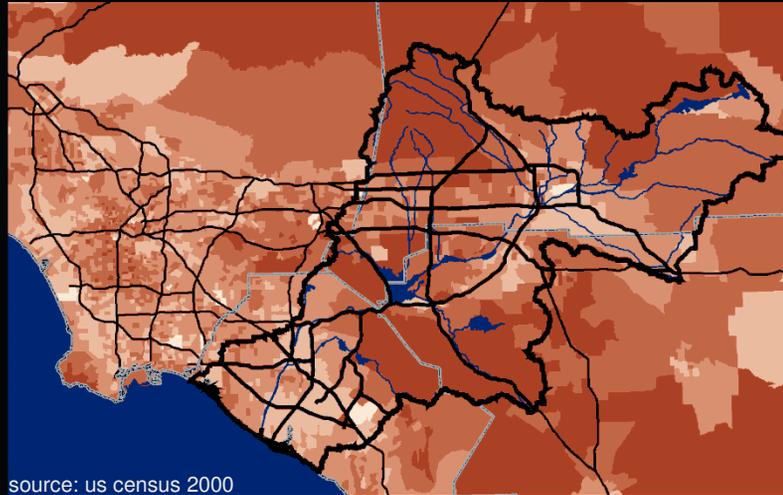
URBAN eco[tone]



santa ana river watershed

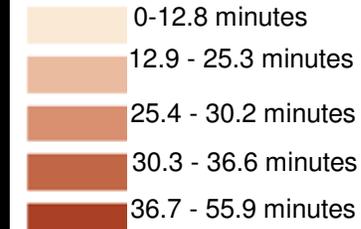


regional comparison commute times

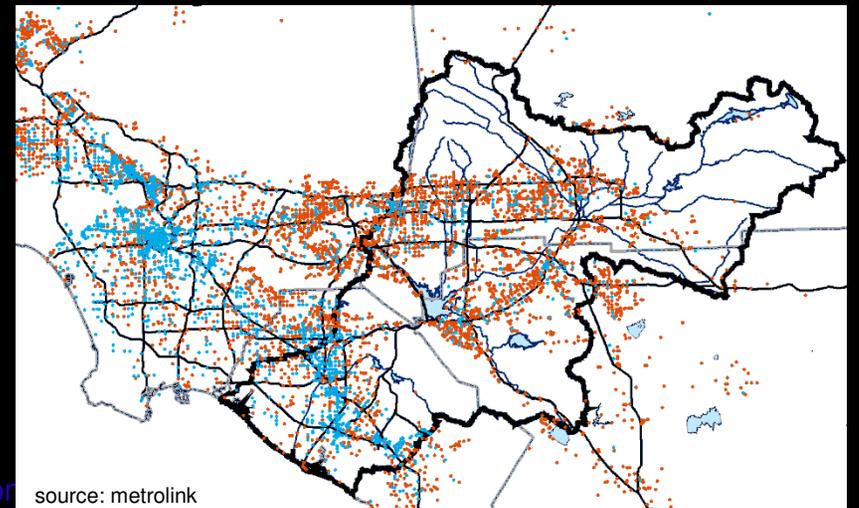
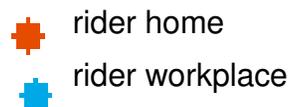


source: us census 2000

average commute

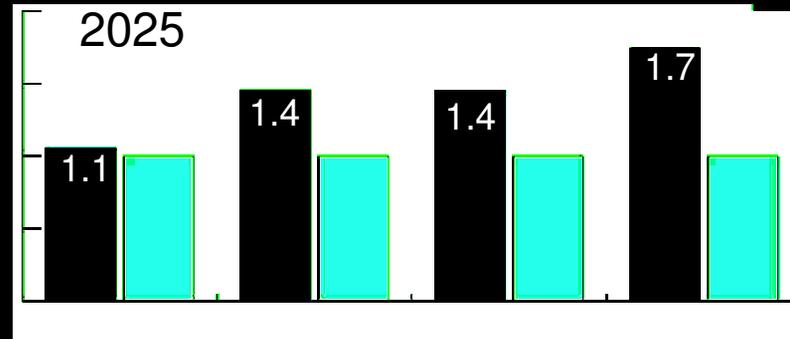
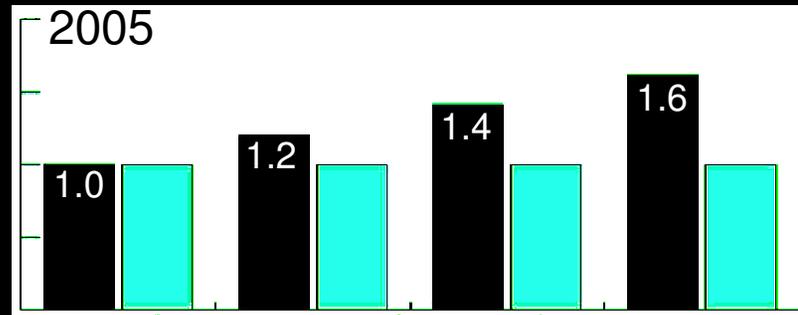


metrolink ridership



source: metrolink

regional comparison jobs/housing



western riverside county
 sw san bernardino county
 metro los angeles county
 orange county



faults & alluvial soils

faulting creates steep mountains, while intense storms deposit sediment creating a vast alluvial plain



san gabriel mountains

san bernardino mountains

inland basin

prado dam

riverside

lake mathews

pacific ocean

coastal plain

- consolidated bedrock
- semi-consolidated sediments
- unconsolidated sediment

California Resource Connections, Inc.

source: us SAWPA; SCWRB 2002,

aquifers & faults

22 aquifers partitioned by faulting and geology store groundwater used for public water supply



inland basin

prado dam

riverside

pacific ocean

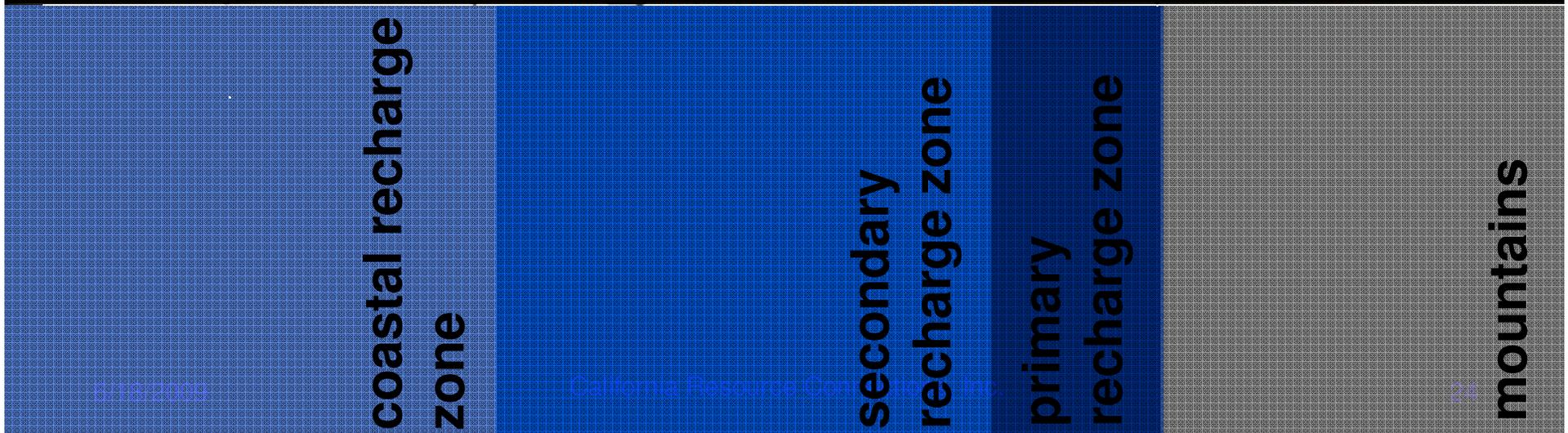
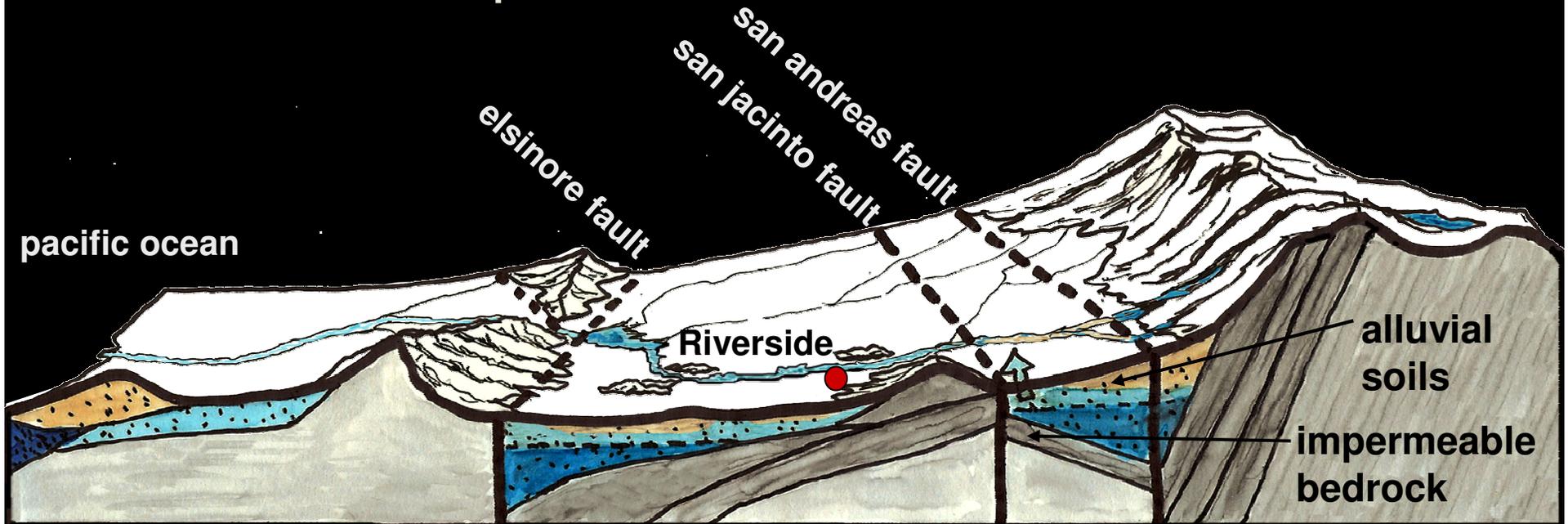
coastal plain

California Resource Connections, Inc.

source: sawpa; Calwater

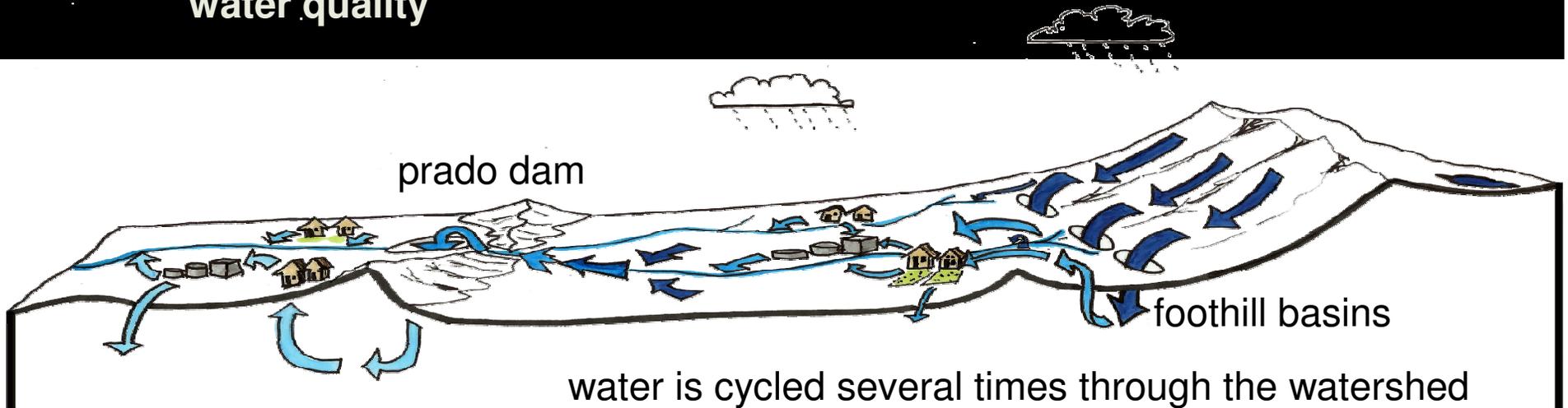
aquifers: water supply

63% more water is extracted than recharged, leading to a future of external water dependence (SAWPA)



water resource management

only clean water should enter the river to preserve regional drinking water quality



river becomes drinking water

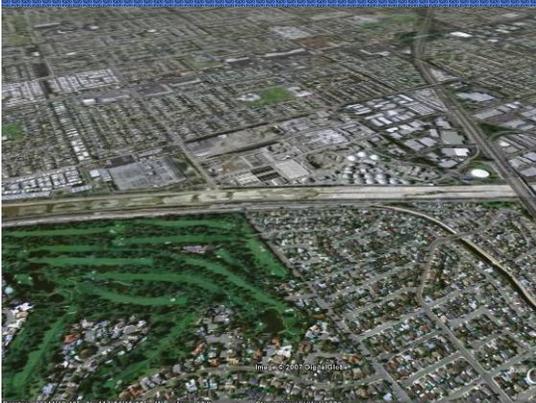
urban pollutants and wastewater effluent enter river

clean mountain water fills aquifers

coastal plain

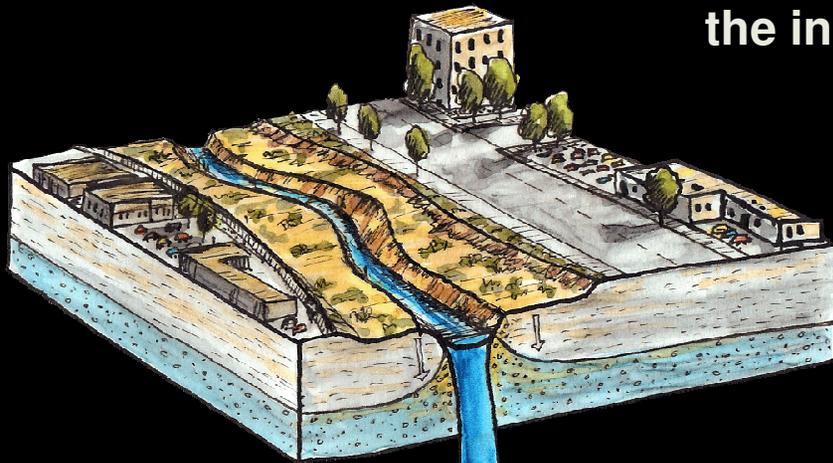
inland valley

mountains



urbanization impacts water quality

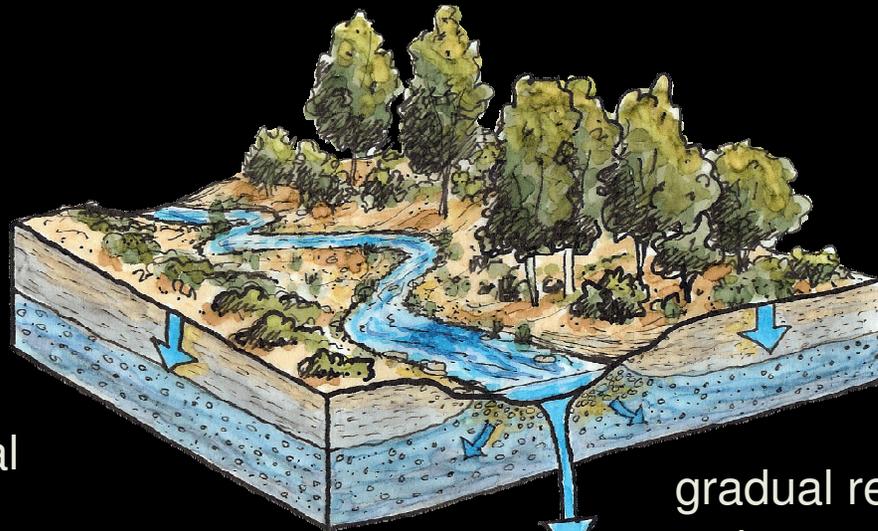
the inland basin could lose its wild river



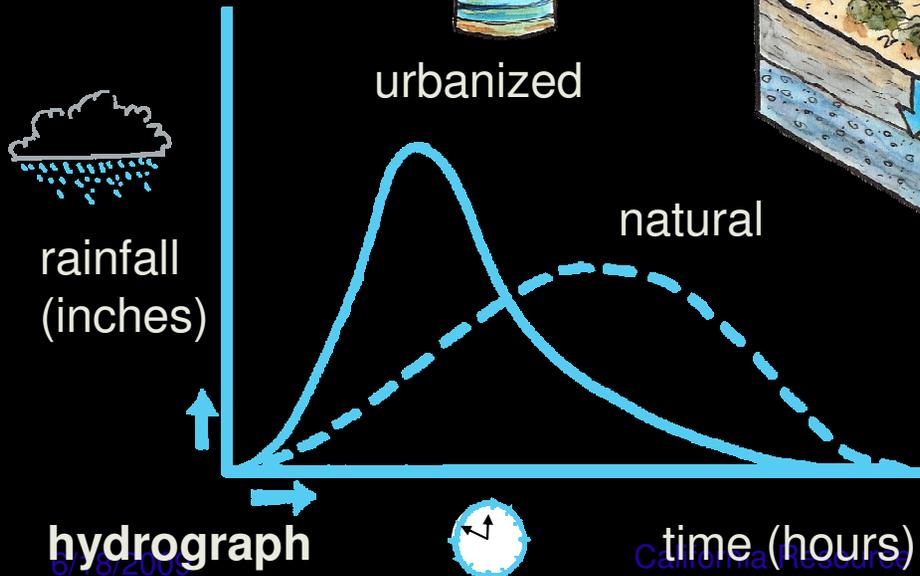
impervious surfaces increase runoff, pollution, and water velocity, erode banks, and decrease recharge



urbanized



gradual release of water, recharge, lower velocity water allows vegetation



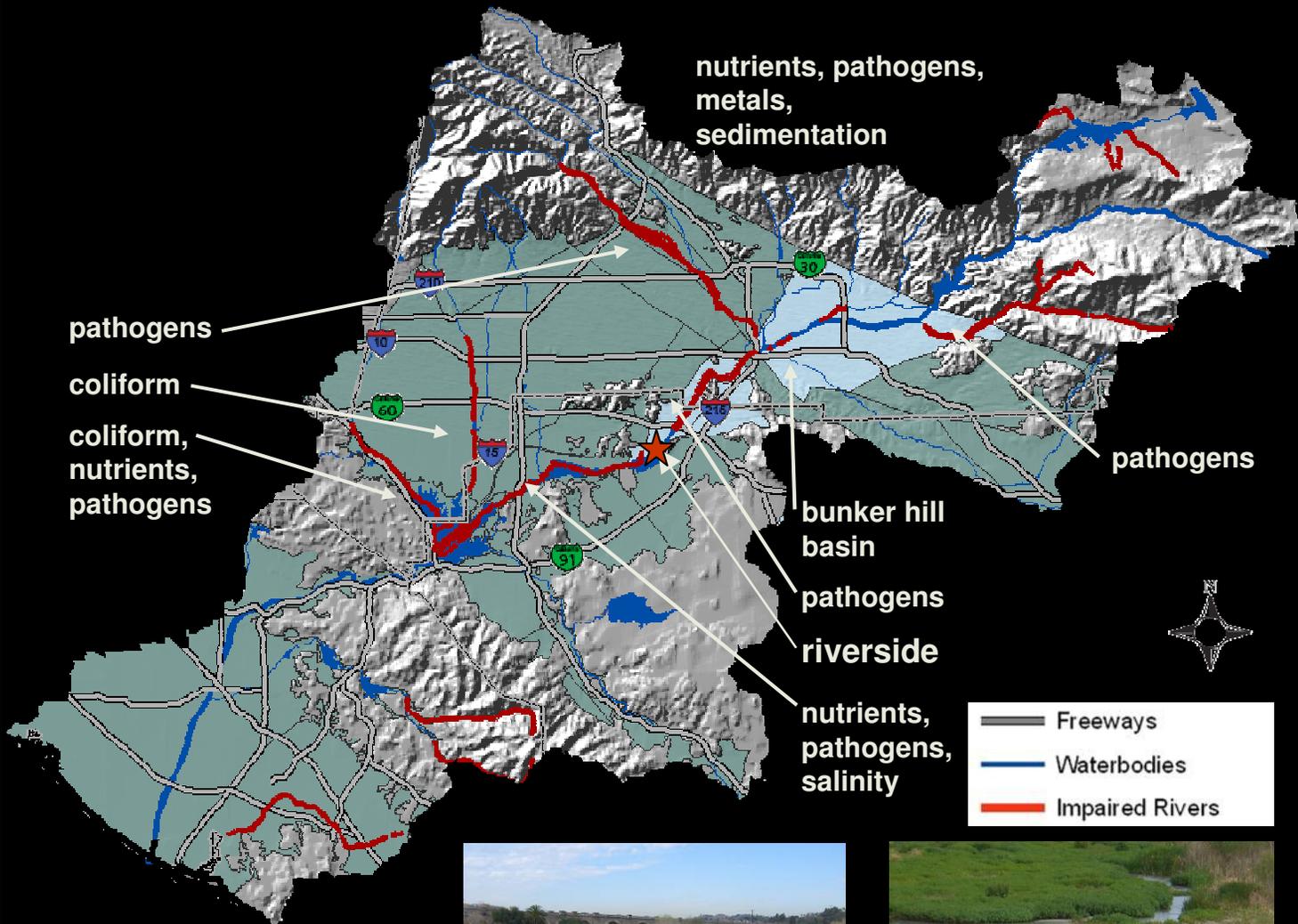
6/16/2005

California Resource Connections, Inc.

26

Adapted from city of emeryville guidelines for dense, green redevelopment

impacted water resources



polluted tributary



polluted tributary



wastewater discharge

Source: SAWPA; SCRWQCB 2002

Ground Water Quality

- Improved since 1995
- Declined since 1995



santa ana river



santa ana river



storm drain discharge

critical resource conservation

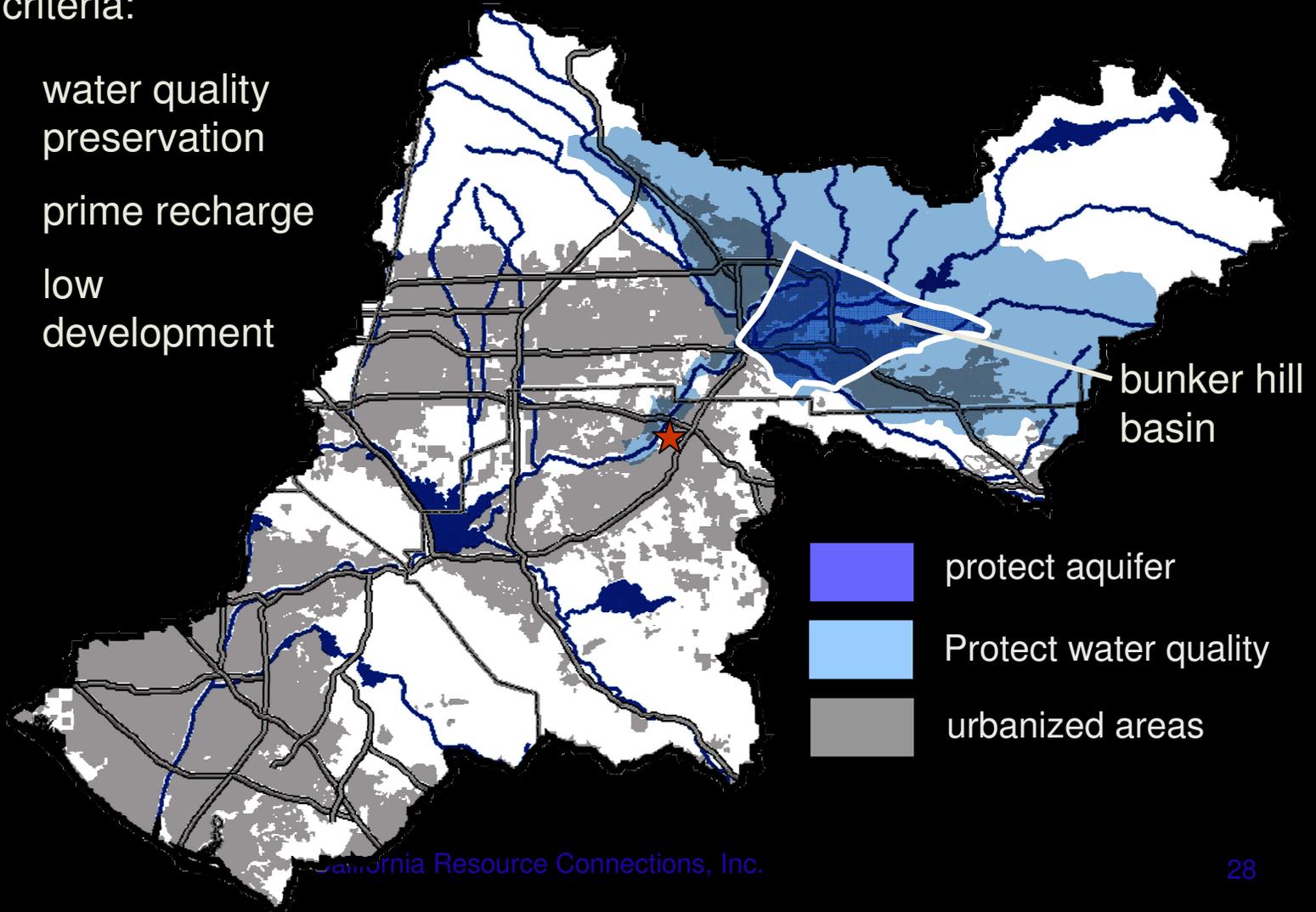
preserving the areas identified will help ensure long-term water quality and security

criteria:

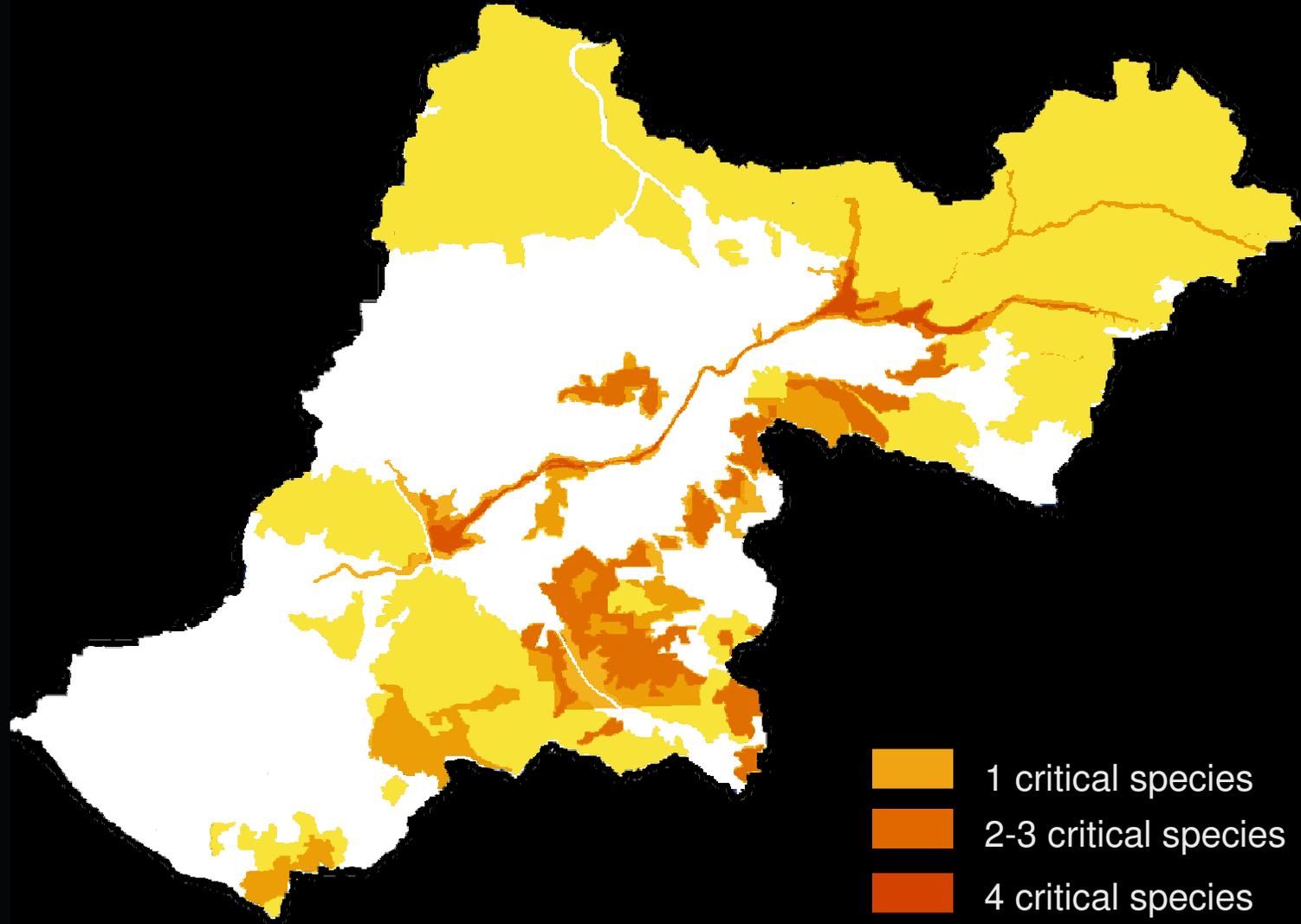
water quality preservation

prime recharge

low development

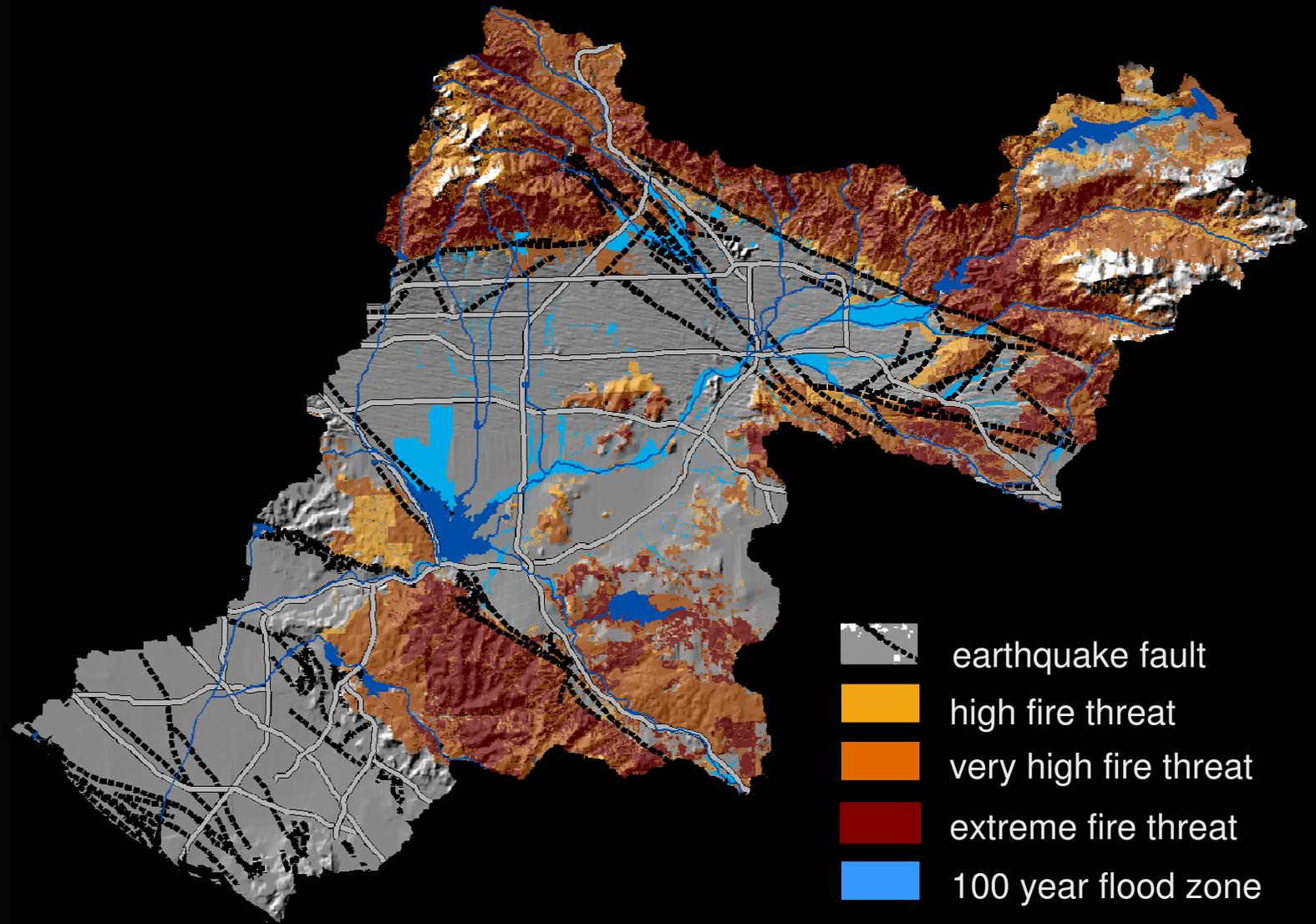


critical species and conservation habitat



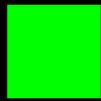
-  1 critical species
-  2-3 critical species
-  4 critical species
-  bobcat habitat

natural hazards



California Resource Connections, Inc.

critical conservation areas



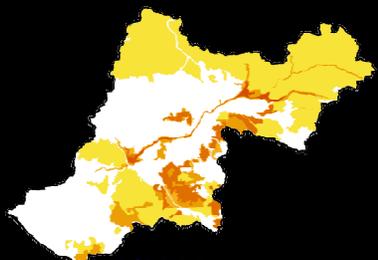
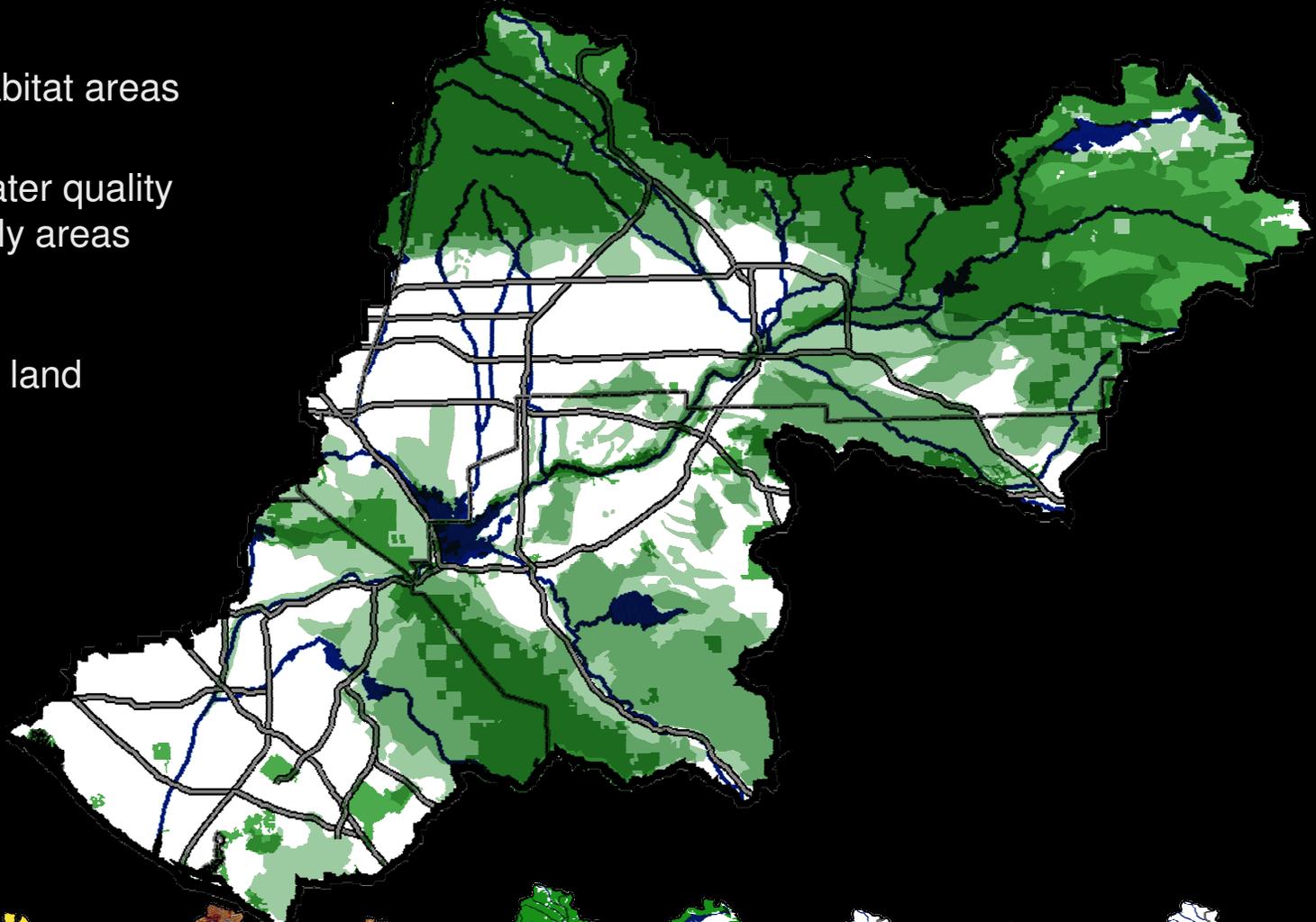
critical habitat areas



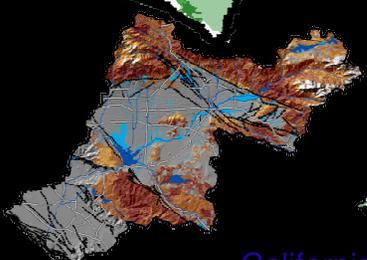
critical water quality
and supply areas



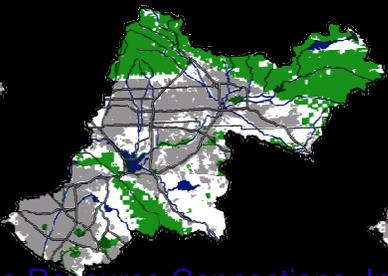
currently
protected land



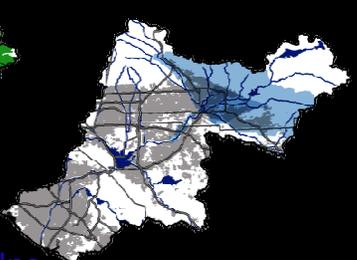
6/18/2009
prime habitat



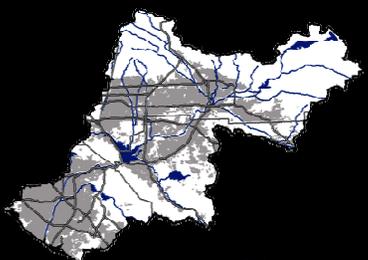
hazards



protected land



water quality

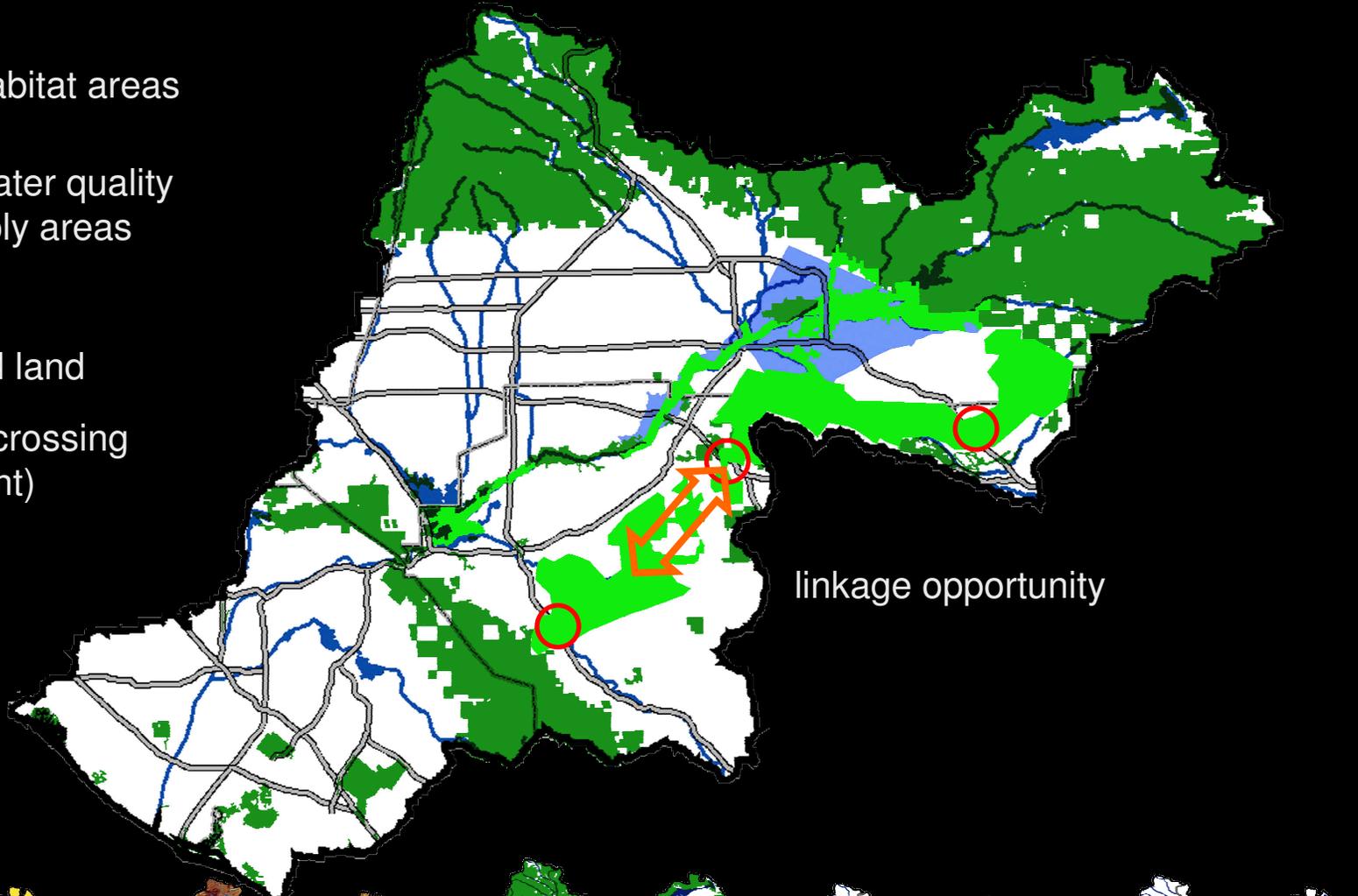


urbanized

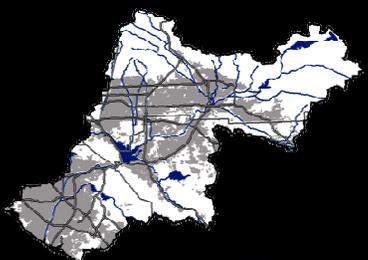
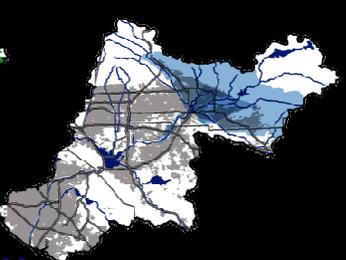
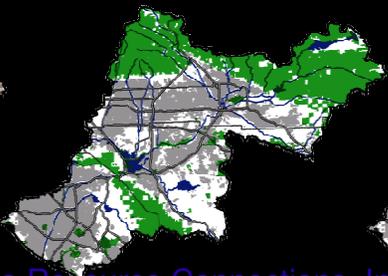
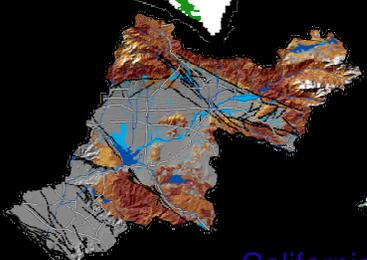
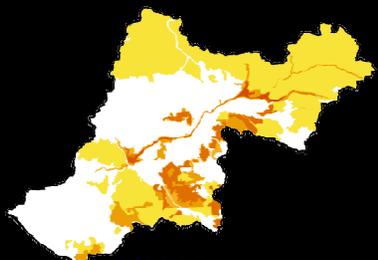
California Resource Connections, Inc.

critical conservation areas

-  critical habitat areas
-  critical water quality and supply areas
-  currently protected land
-  freeway crossing (constraint)



linkage opportunity



6/18/2009
prime habitat

hazards

California Resource Connections, Inc.

protected land

water quality

urbanized

built environment: impacts



open space



air



water

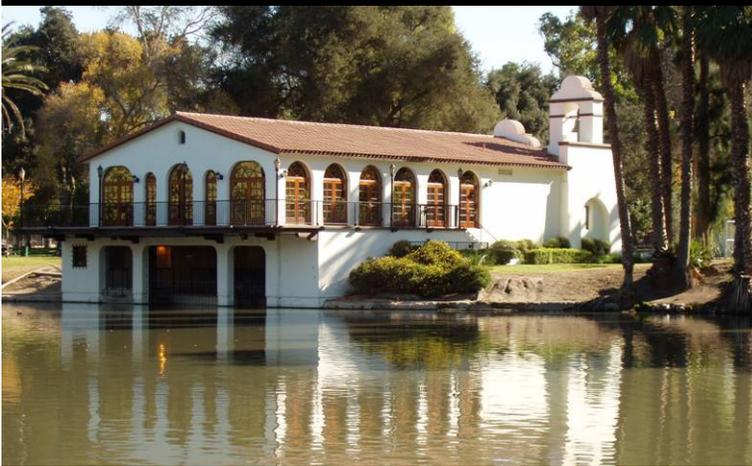


habitat



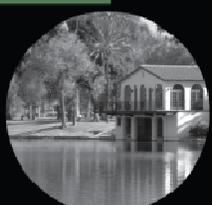
transportation





community assets

leverage assets to increase vibrancy in all neighborhoods of the city



-  community services and public facilities
-  universities and colleges
-  natural areas and parks
-  infill opportunities

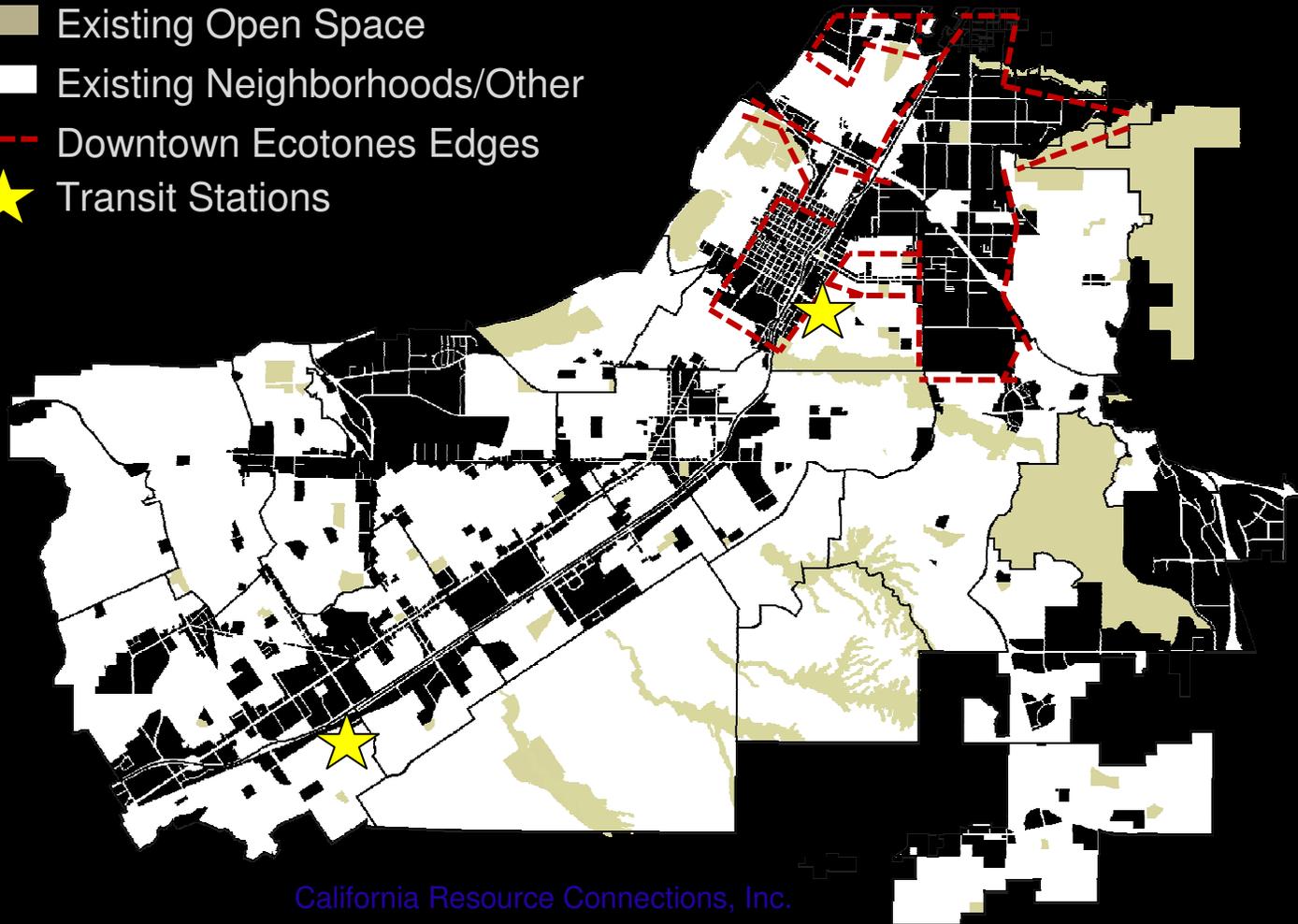


infill opportunity sites



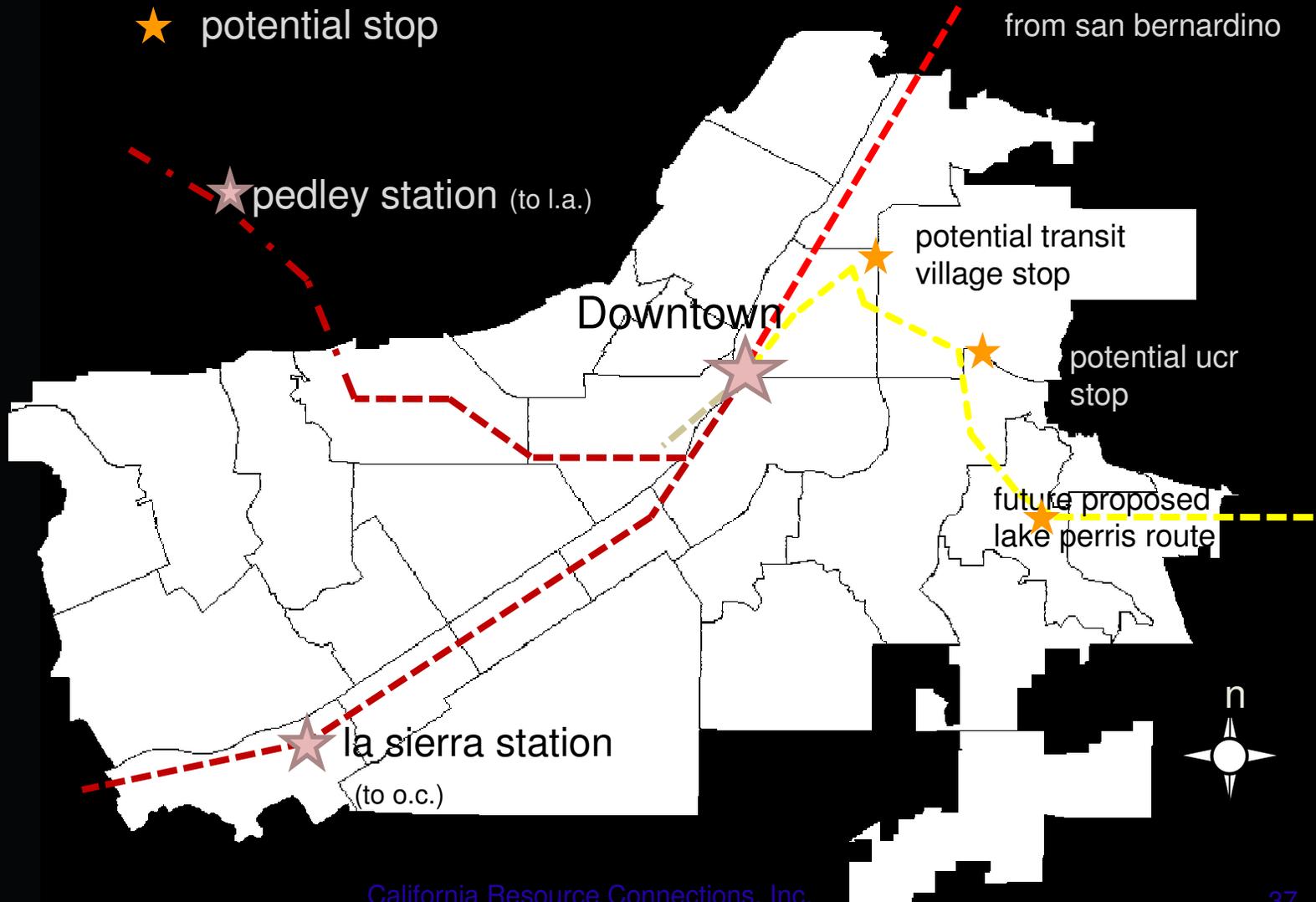
- Underutilized/Barrier Land Uses
Industrial/Business Parks/Vacant/Abandoned
Universities/Large Park/Airport

Underutilized Commercial/ Transitional MFR
- Existing Open Space
- Existing Neighborhoods/Other
- - - Downtown Ecotones Edges
- ★ Transit Stations



commuter rail connections

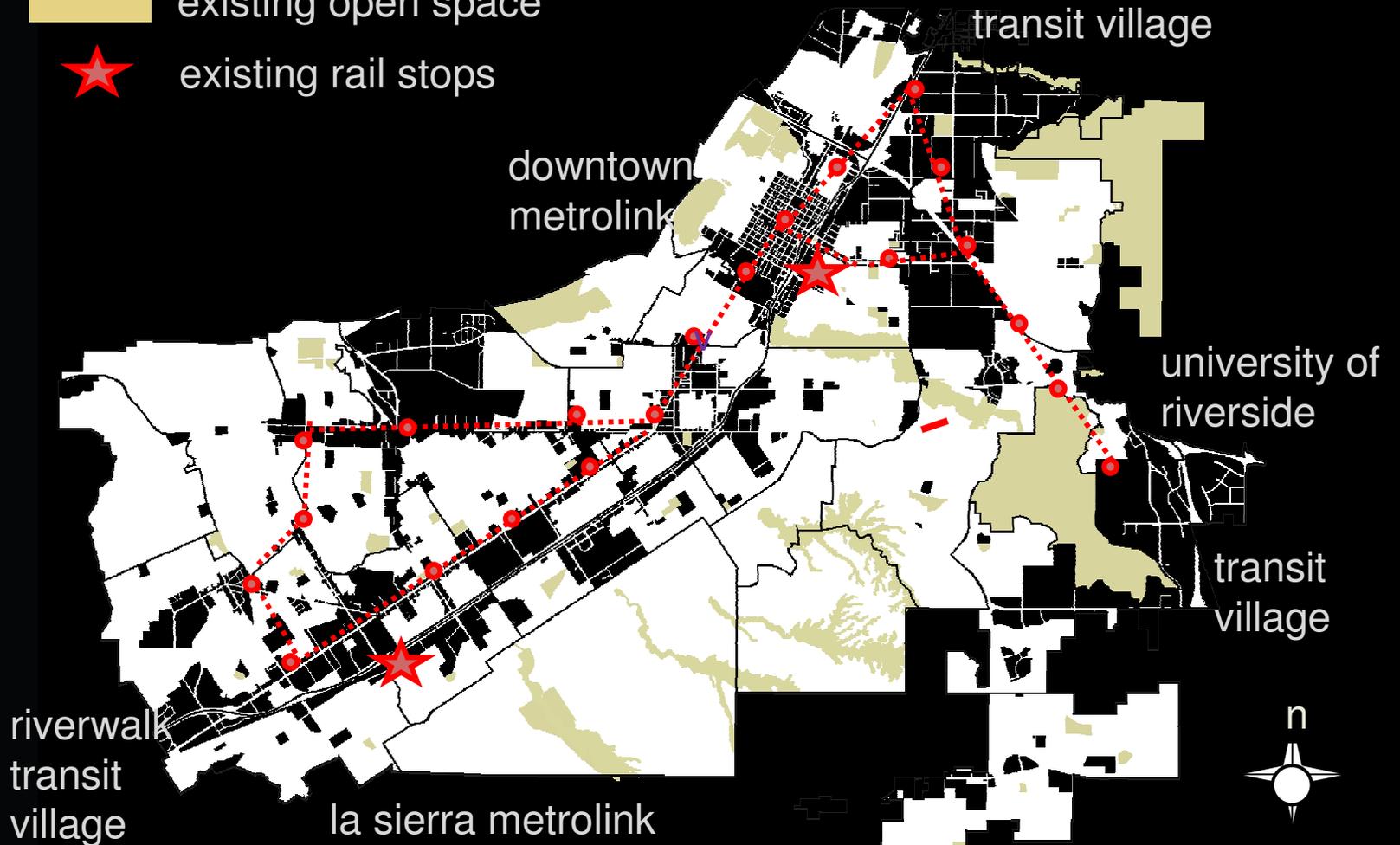
- - - existing
- - - proposed
- ★ potential stop



intra city transit opportunity



-  local transit opportunity
-  infill opportunity sites
-  existing open space
-  existing rail stops



riverwalk
transit
village

la sierra metrolink

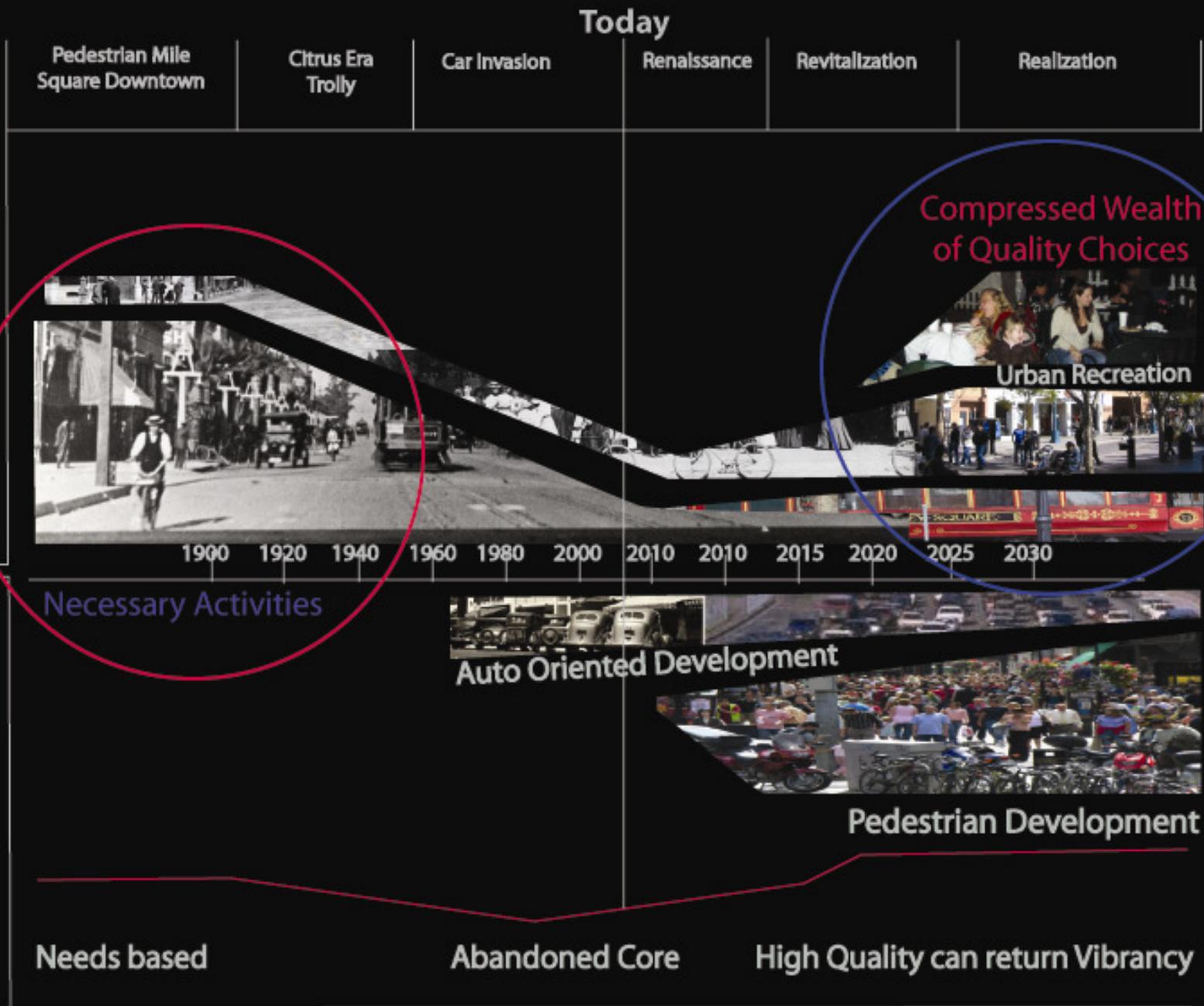
transit village

downtown
metrolink

university of
riverside

transit
village

URBAN eco[tone]



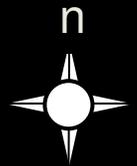
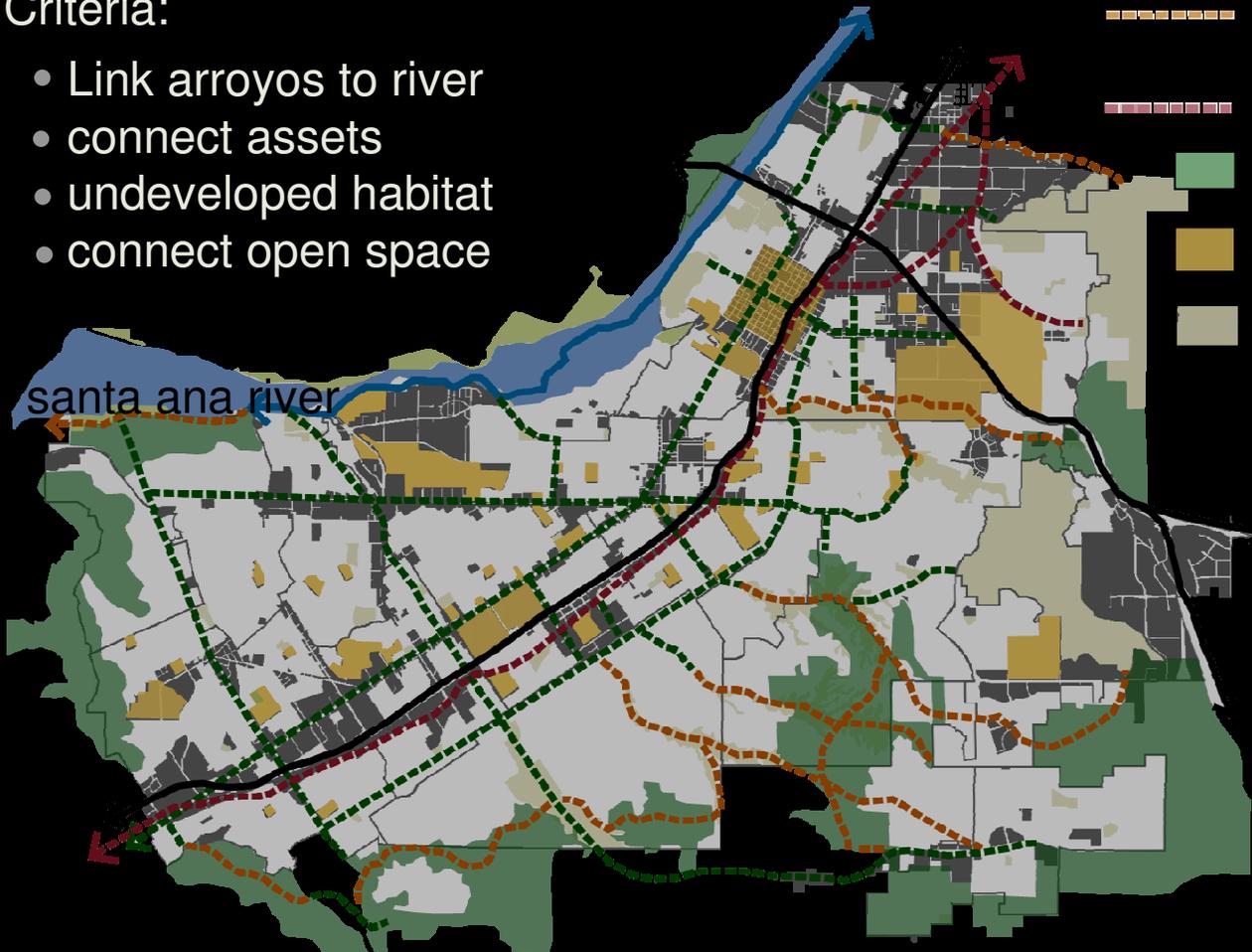
park & trail opportunities

Parks & trails can improve quality of life for people & habitat, preserve watershed permeability, and treat stormwater.

Criteria:

- Link arroyos to river
- connect assets
- undeveloped habitat
- connect open space

- parkway trail
- nature trail
- railroad trail
- park opportunity
- existing assets
- existing parks



California Resource Connections, Inc.

source: city of riverside; SAWPA; FEMA; SCAG 2000; USGS soil survey 1967; google earth

system approach: urban ecotone

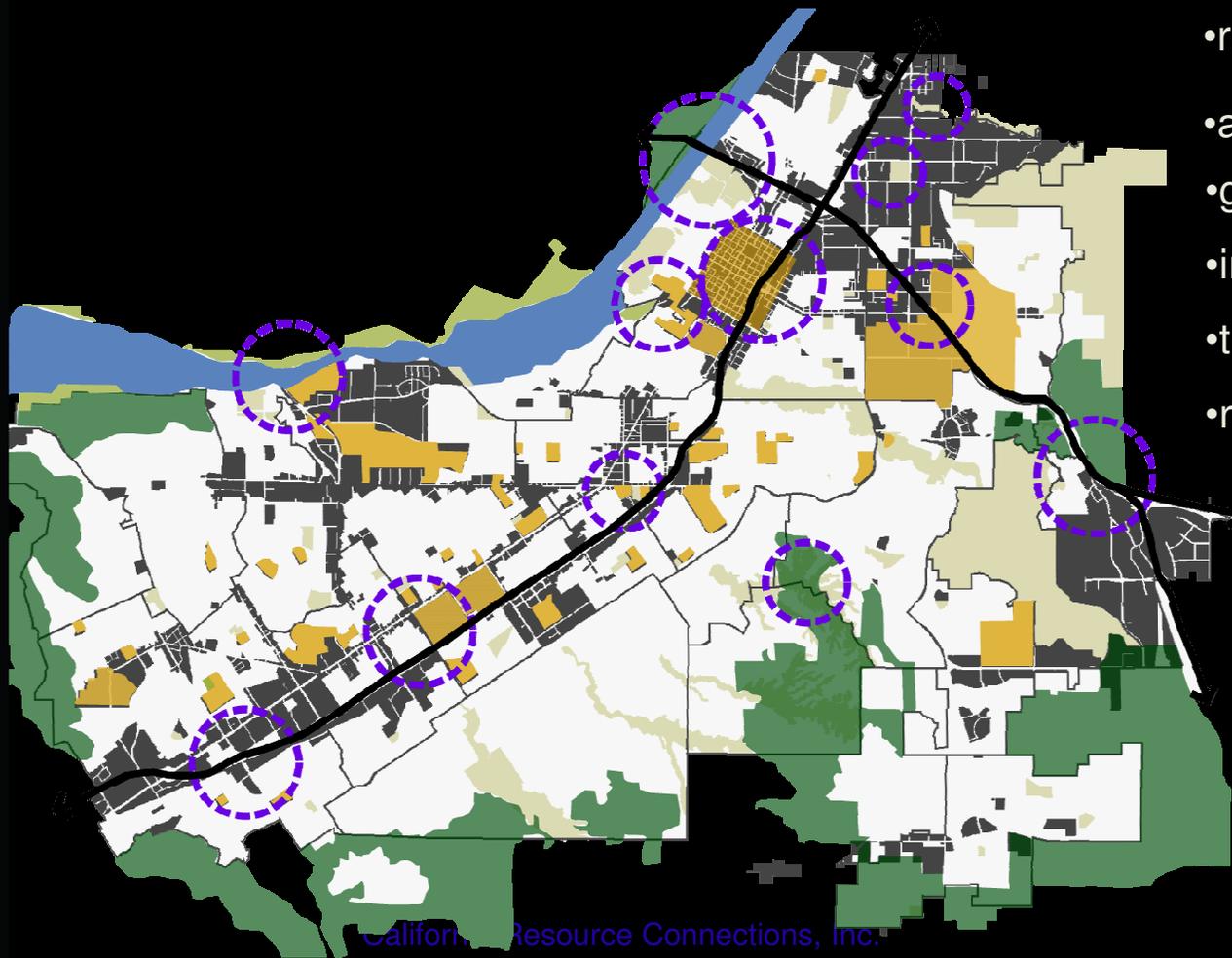


urban ecotone opportunity sites

systems approach to land planning and design



- neighborhoods
- assets
- parks
- railroads
- arroyos
- green spaces
- infill areas
- trail corridors
- river



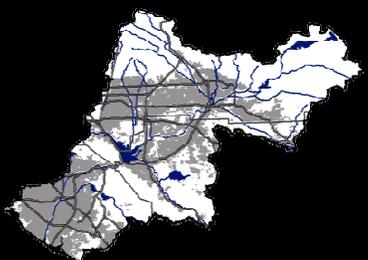
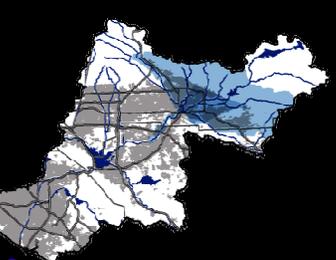
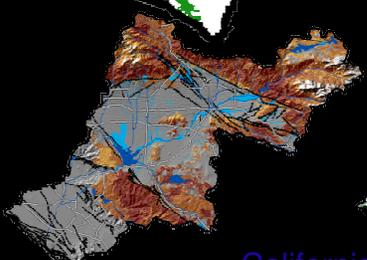
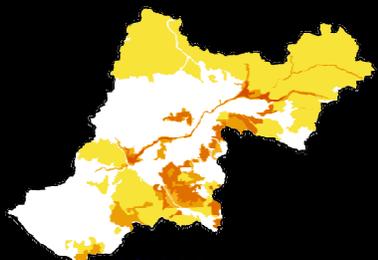
California Resource Connections, Inc.

source: city of riverside; SAWPA; FEMA; SCAG 2000; USGS soil survey 1967; google earth

critical conservation analysis

-  critical habitat areas
-  critical water quality and supply areas
-  currently protected land
-  freeway crossing (constraint)

Prado basin



6/18/2009
prime habitat

hazards

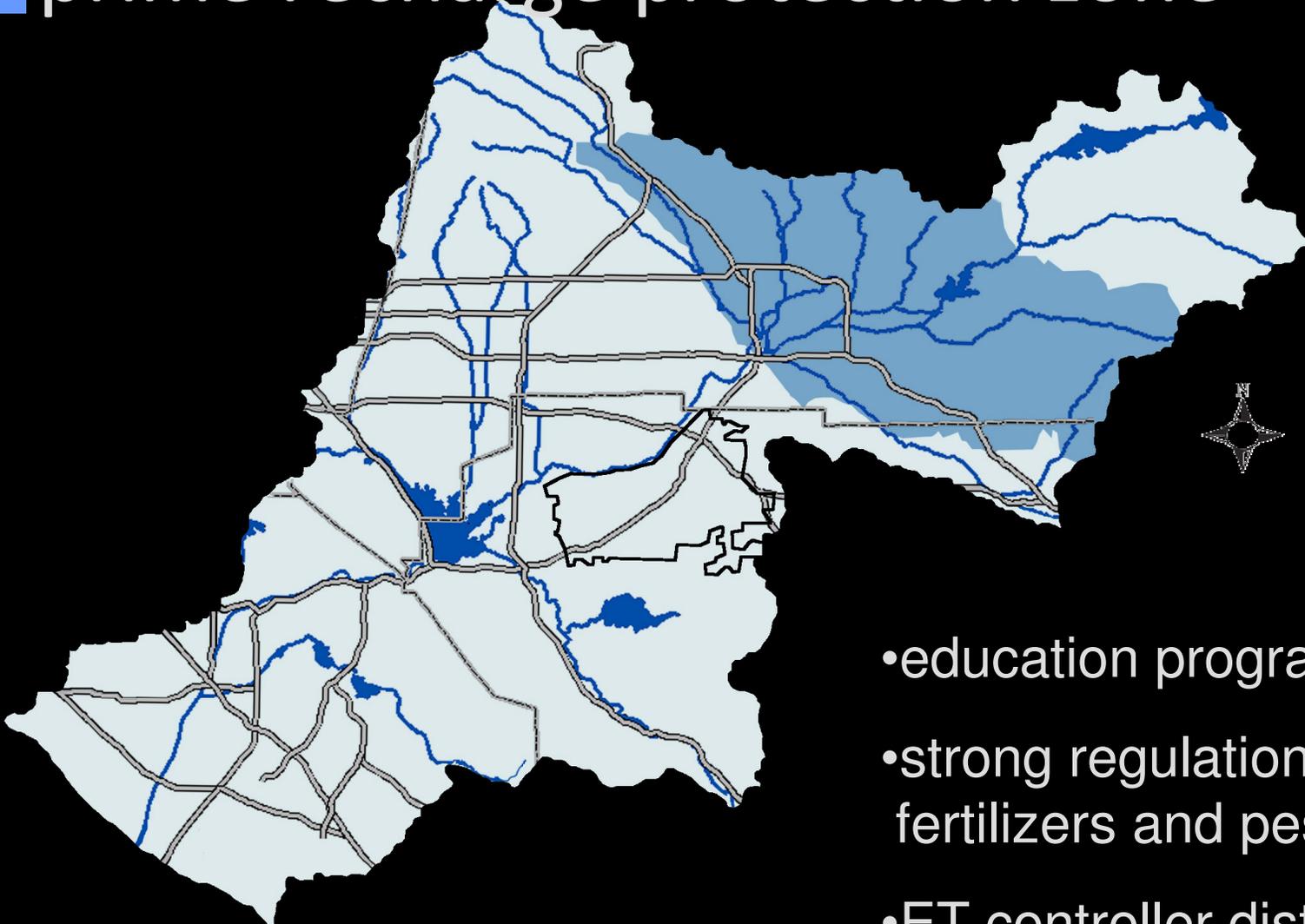
California Resource Connections, Inc.

protected land

water quality

urbanized

■ prime recharge protection zone



strategies

- education programs
- strong regulation of fertilizers and pesticides
- ET controller distribution program to restrict urban runoff

river floodplain conservation



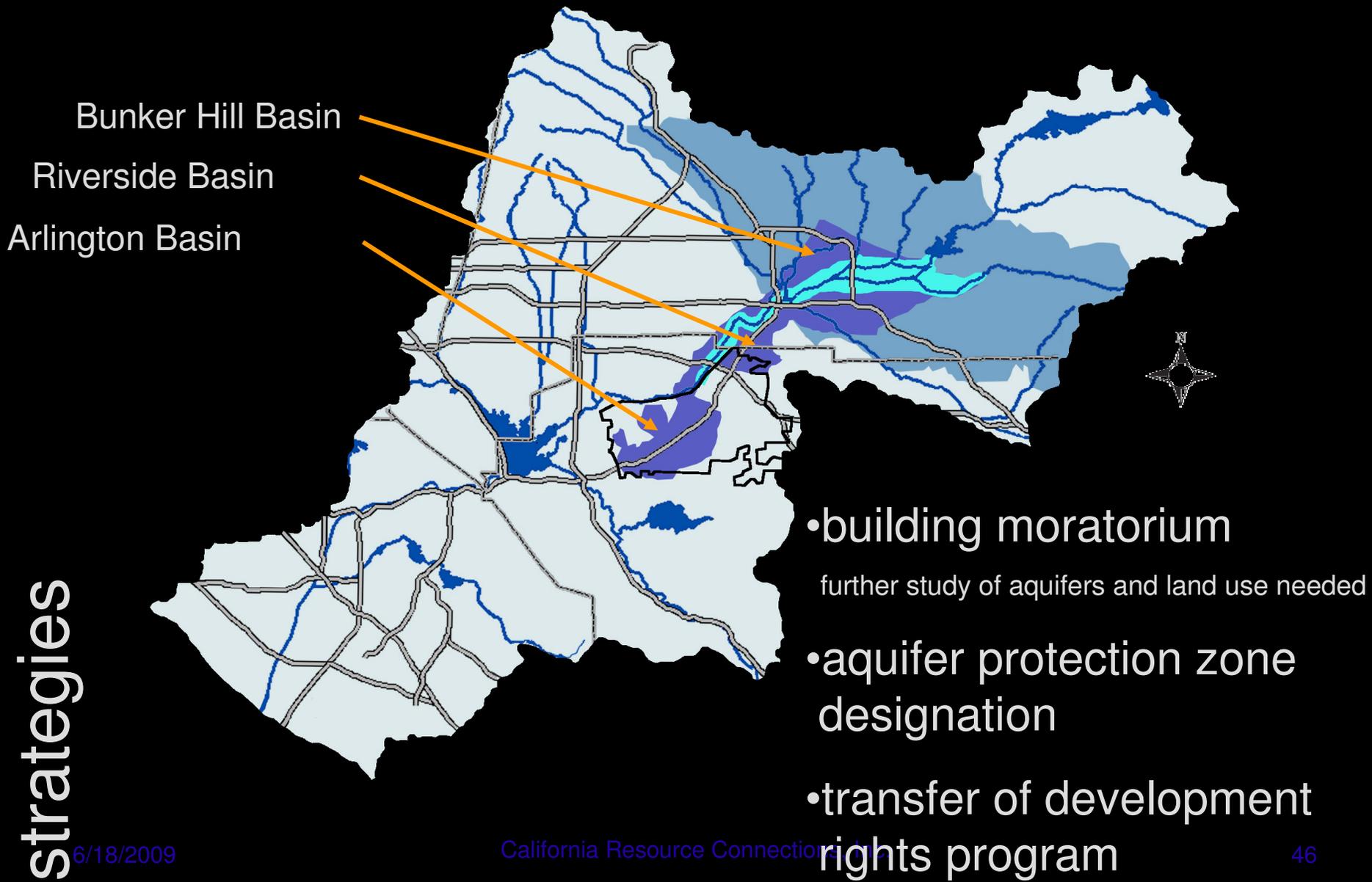
strategies

6/18/2009

California Resource Connections, Inc.

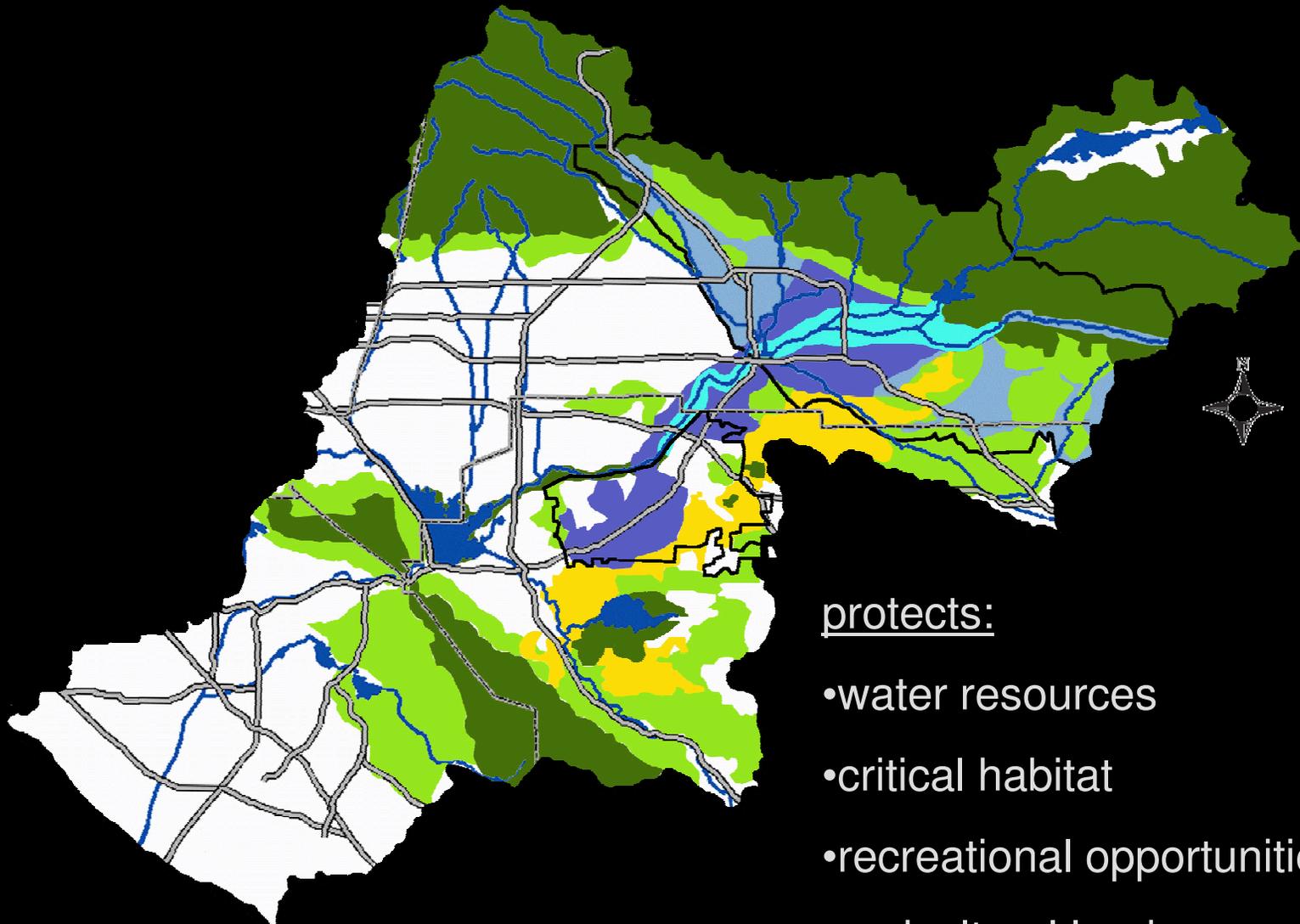
45

drinking water protection zone



strategies

watershed protection plan



protects:

- water resources
- critical habitat
- recreational opportunities
- agricultural lands
- residents from natural hazards

strategies

6/18/2009

California Resource Connections

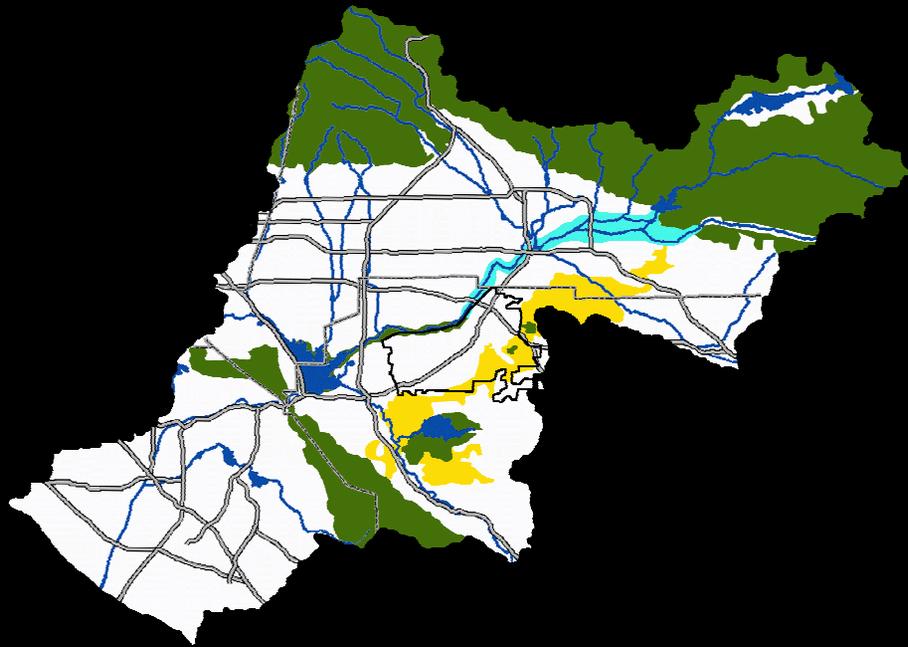
bringing it all together



6/18/2009

California Res

land conservation evaluation



land conserved by infill
development by 2030:

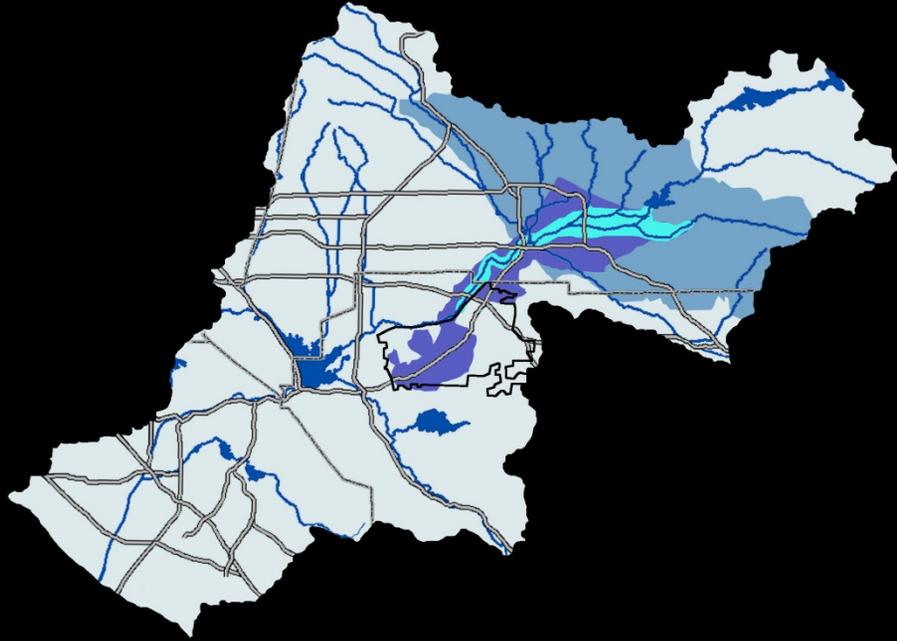
57,218 acres

identified critical habitat land: **42,688** acres

identified river floodplain land: **17,920** acres

60,608 acres

water conservation evaluation



322,000 acre feet/year of water is imported

ET controller with existing lawns: **136,500** acre feet/year

converting 2000 sf lawns to drought tolerant landscapes:
420,420 acre feet/year

converting 2000 sf lawns to drought tolerant landscapes
with ET controller: **520,520** acre feet/year

river plan evaluation



759 acres of wetlands and floodplain restoration

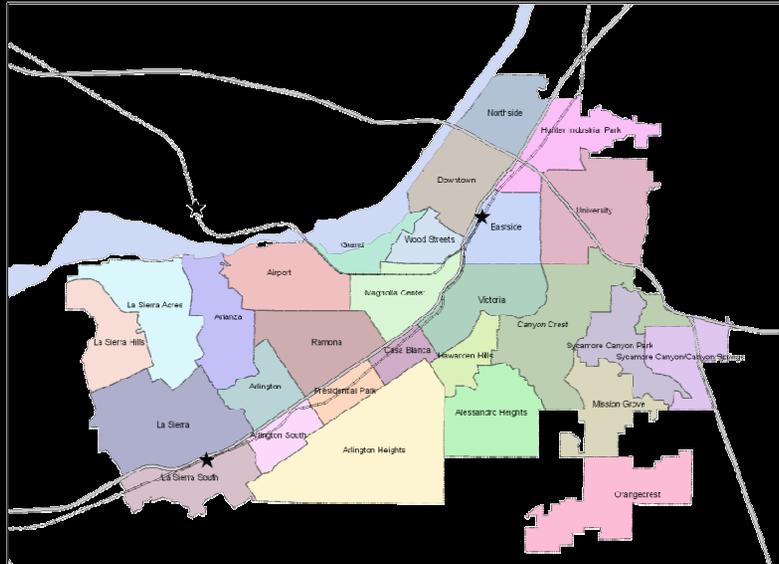
67 acres parks/detention basins

2,030 acre feet recharge capacity per storm event, low

3,500 acre feet recharge capacity per storm event, high

water conservation evaluation

City of Riverside



7,087 acre feet/year of water from infill development

retrofit single family detached residences

ET controller with existing lawns: **4,860** acre feet/year

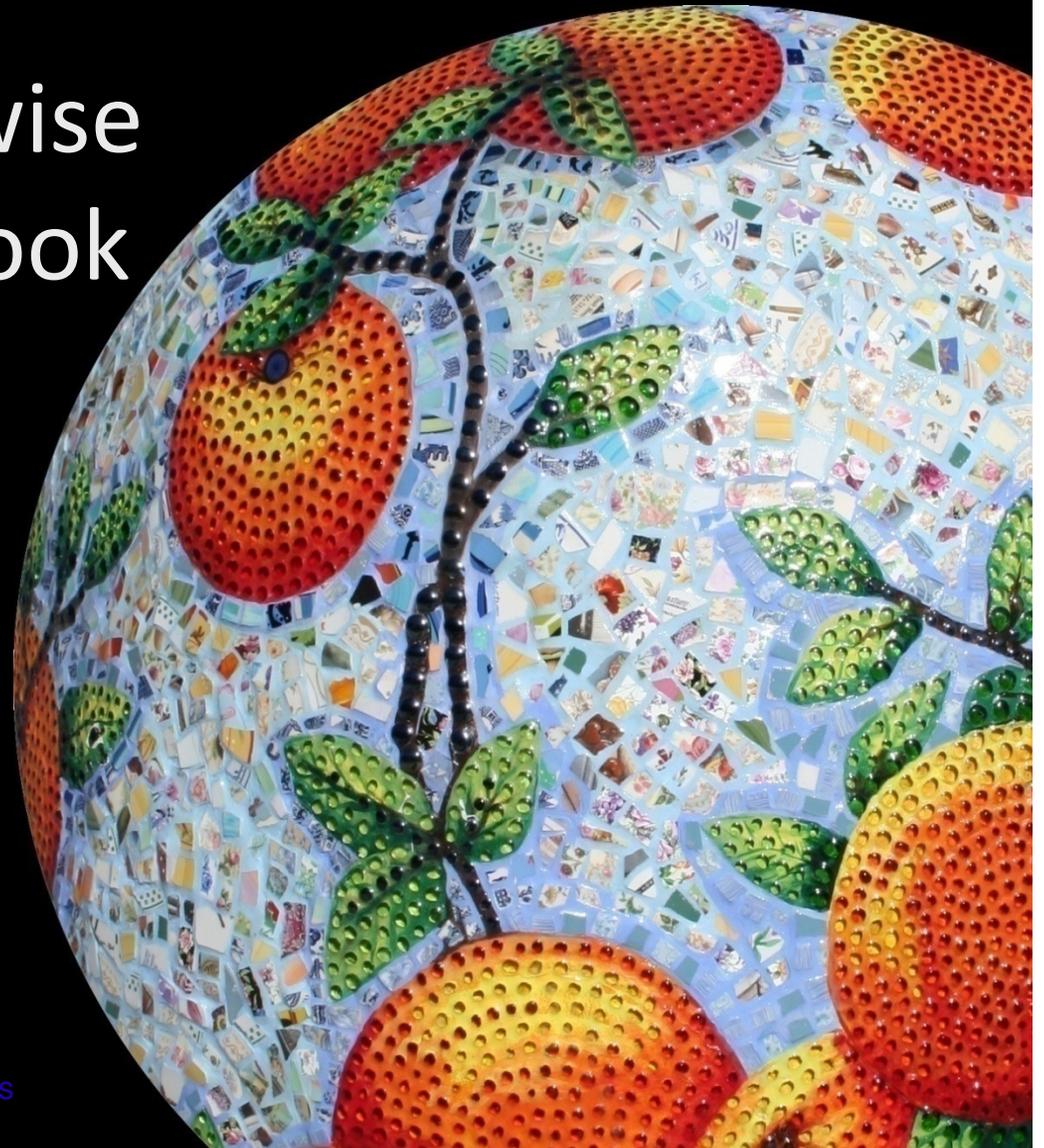
converting 2000 sf lawns to drought tolerant landscapes:

14,965 acre feet/year

converting 2000 sf lawns to drought tolerant landscapes

with ET controller: **15,724** acre feet/year

what does waterwise
re-development look
like in the inland
empire?



downtown riverside area river plan

restored wetlands, flood plain, & natural function

- reconfigure levees
- restore river braiding and wetlands
- divert wastewater discharge to constructed wetlands
- utilize treated wastewater for parks and golf courses
- restore minimal flow to springbrook wash & fairmount park lakes

downtown re-development & citywide infill

- concentrate residential and commercial development in downtown urban villages and already developed areas

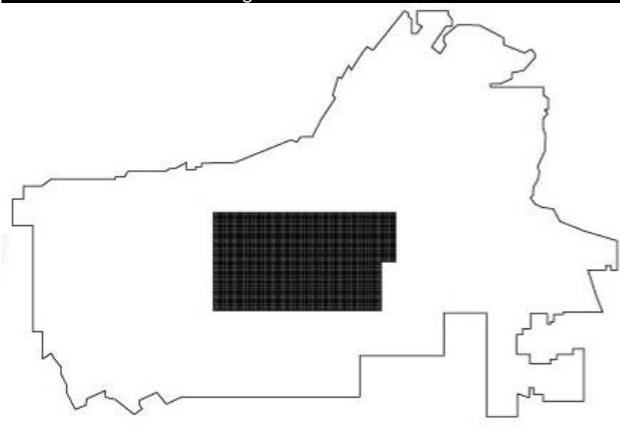




6 units per acre



supports auto culture
congress for new urbanism



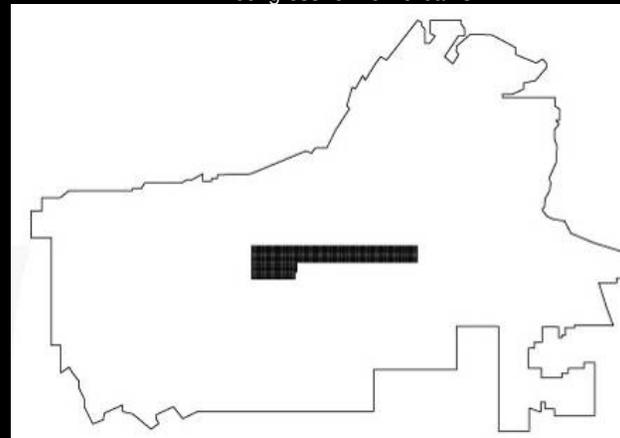
6/18/2009
6333 acres consumed



30 units per acre



supports premium bus
congress for new urbanism



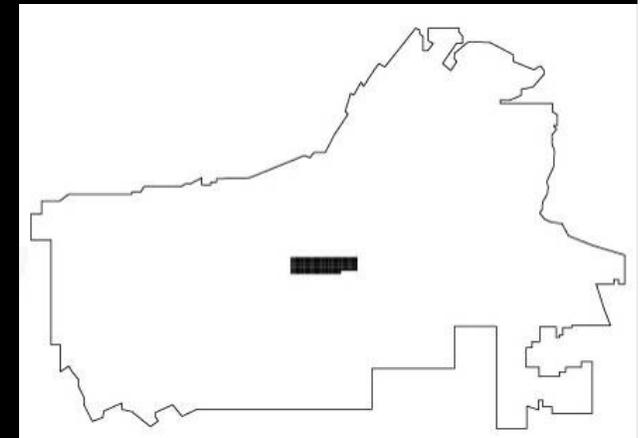
California Resource Connections, Inc.
1266 acres consumed



100 units per acre



supports full transit
j. jacobs, 1967



380 acres consumed⁵⁵

growth through infill development

Community

- improve opportunities for social interaction and networking
- provide a compressed wealth of choices
- integrate historic and culture identity of place

Connections

- promote alternative transportation
- improve pedestrian mobility
- improve access to parks and nature

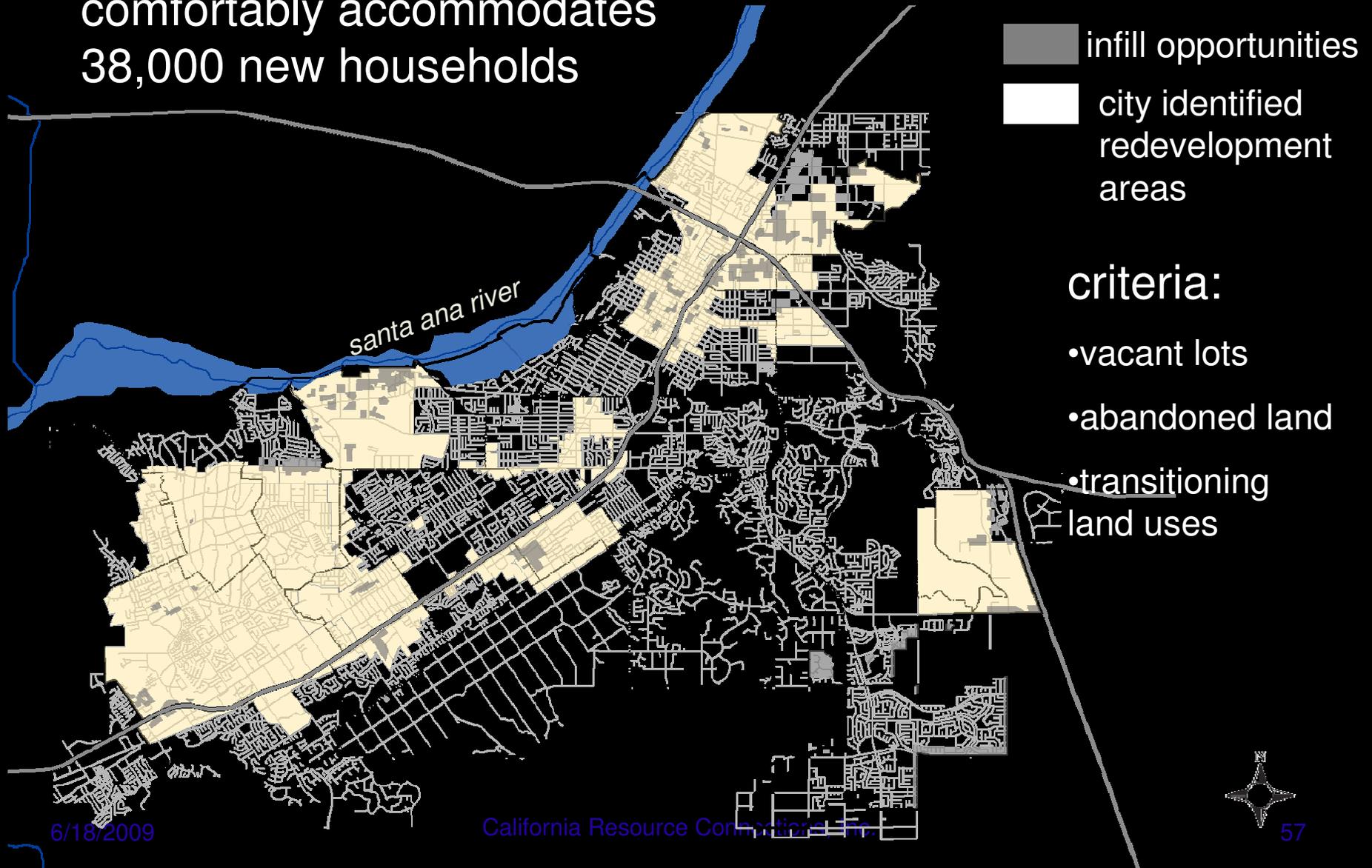
Conservation

- create a green infrastructure network
- promote green building techniques
- reduce resource consumption



infill opportunities in riverside

comfortably accommodates
38,000 new households



human connection to nature

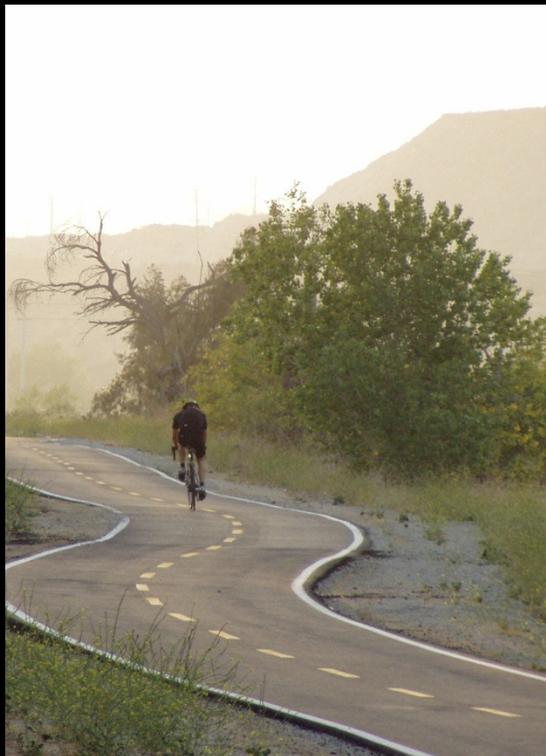
goal

Connect urban residents to local and regional natural recreational opportunities

strategies



6/18/2000 **increase access**



California Resource Connections, Inc. **connect systems**



increase open space 8

community

goal

rejuvenate existing communities by transforming neglected and underutilized properties into vibrant and diverse urban villages

strategies



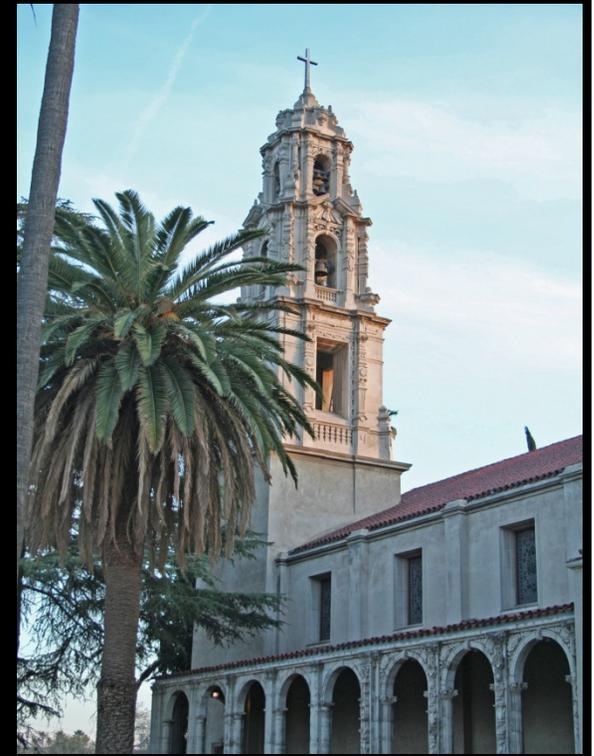
improve social networks

6/18/2009



expand access to opportunities

California Resource Connections, Inc.



celebrate identity of place

59

barrier: impacts



Jane Jacobs, *The Death and Life of Great American Cities* page 258

“Massive single uses in cities have a quality in common... they form borders, and borders in cities usually make destructive neighbors...borders exert active influences in how they impact the quality of life of adjacent uses”

existing Mission Inn Avenue from a repelling environment



existing Mission Inn Avenue to an inviting streetscape



connection

goal

design urban living environments to connect people to people, people to nature and nature to people

strategies



promote alternative transportation

6/18/2017



improve pedestrian networks

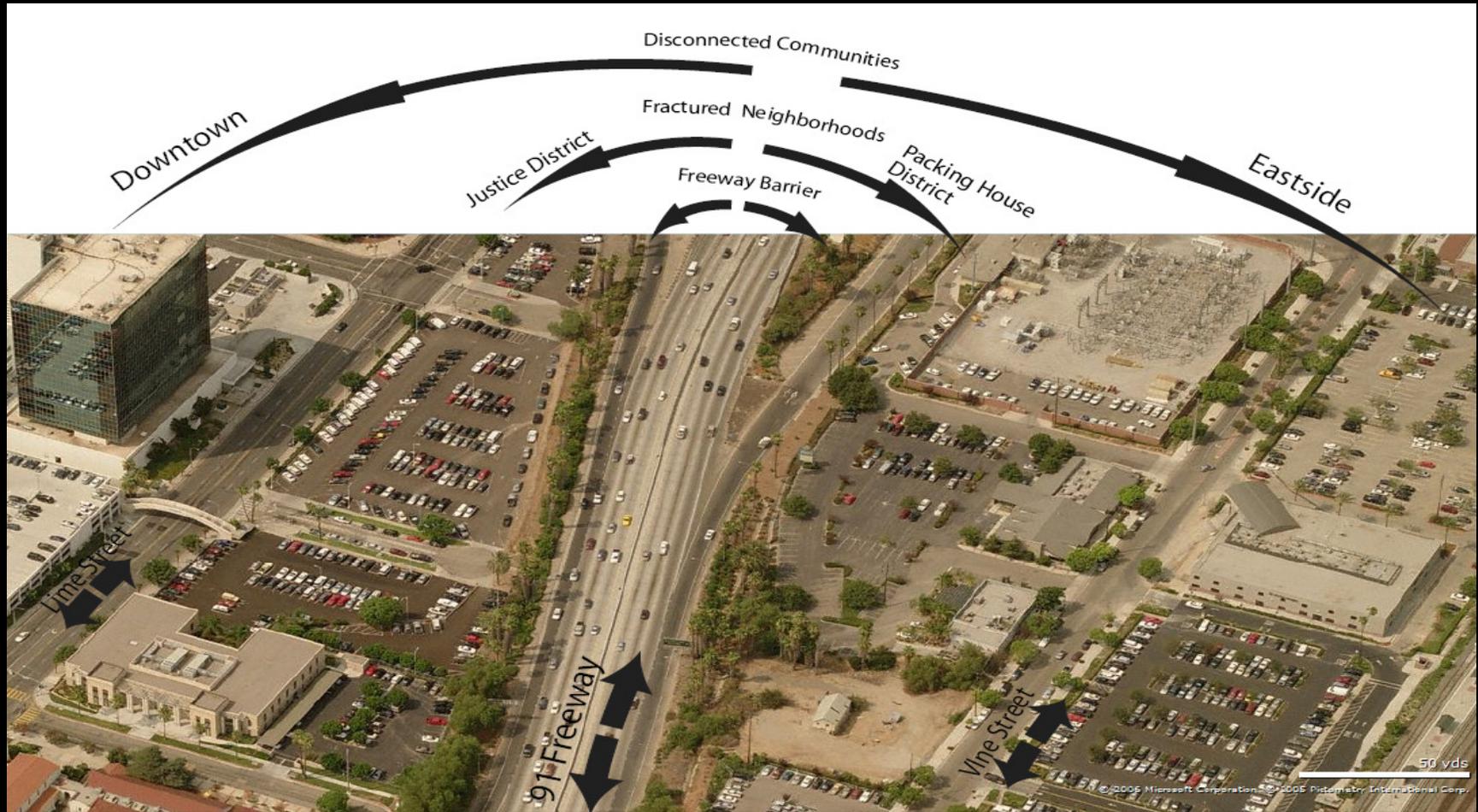
California Recreation Connections, Inc.



improve access to parks and nature

63

restore vibrancy to barrier edges

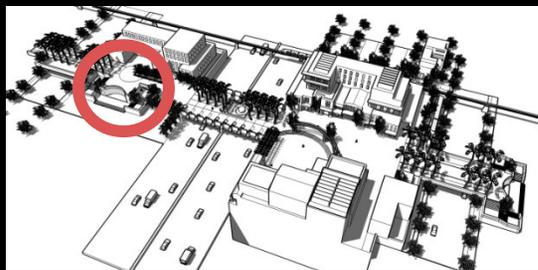


bridging barriers



proposed 11th street pedestrian bridge

people to people, people to nature



people to people, people to nature



6/18/2009

Proposed arroyo trail system

California Resource Connections, Inc.

67

people to people, people to nature

Pedestrian Walk From Justice Center to Proposed Monorail Station



Proposed Monorail Connections



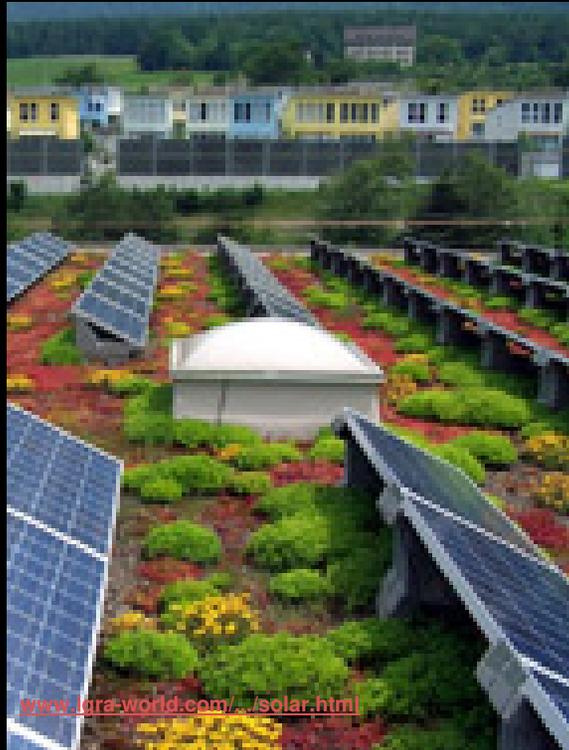
proposed monorail will connect urban villages and regional open spaces

conservation

goal

develop more sustainable communities that live lightly on the land by promoting pedestrian oriented development for healthier lives and environment

strategies



www.lgra-world.com/.../solar.html

utilize multi-objective systems

6/18/2009



develop green infrastructure

California Resource Connections, Inc.



conserve resources

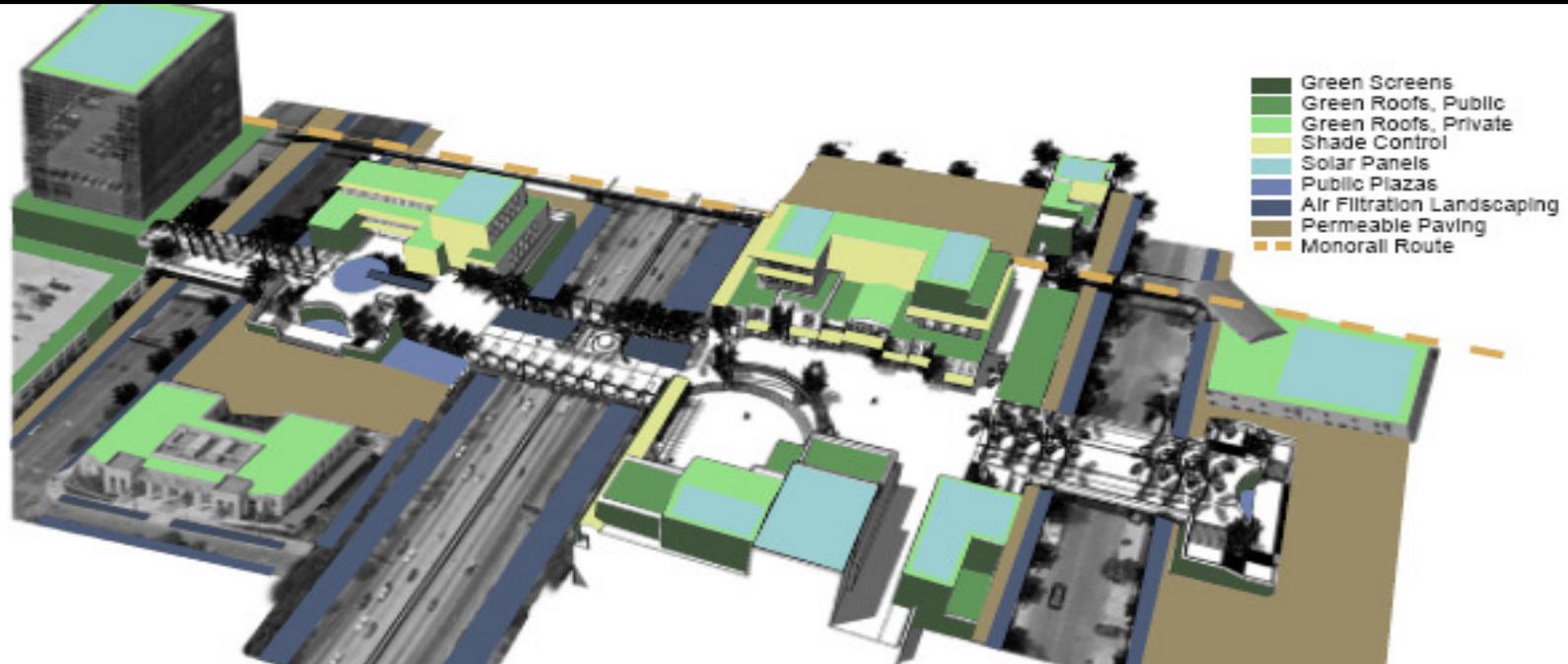
69

single purpose development

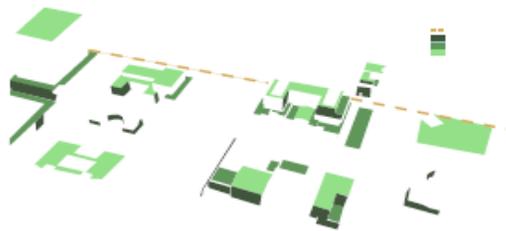
- Resource consumptive
- Impermeable surfaces
- Severe heat island effect



multiple objective green development



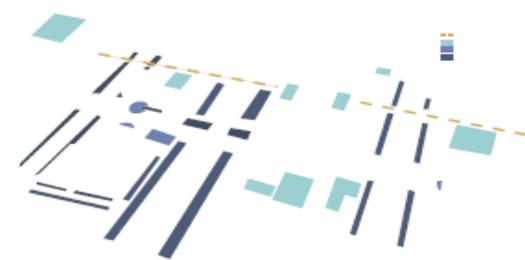
Green Redevelopment System



Green Roofs, Roof Gardens and Green Screens



Permeable Paving and Shade Control



Swales, Cisterns and Photovoltaic Panels

how we develop matters!

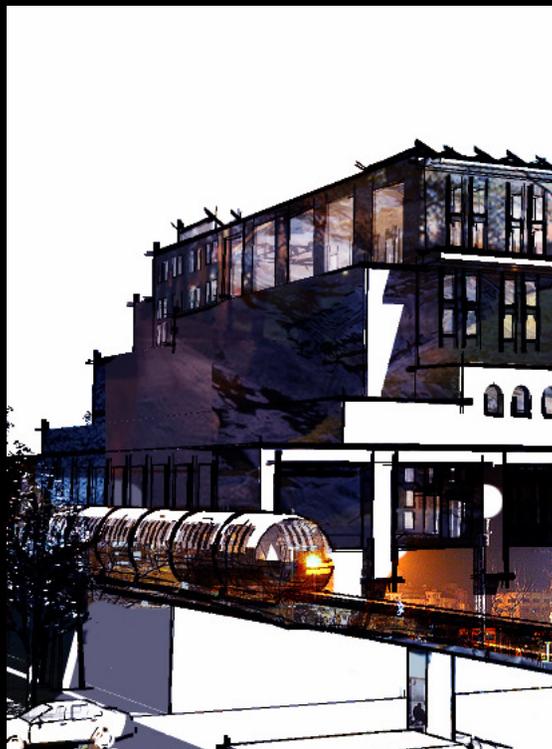
enhance the urban, preserve the natural

packing house district: bringing together community, connections, and conservation in a new urban village



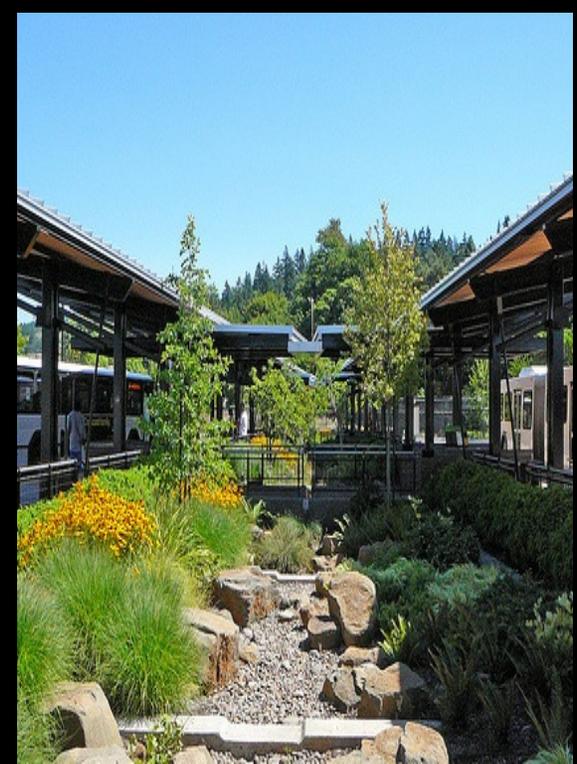
6/18/2009

community



California Resource Connections, Inc.

connections



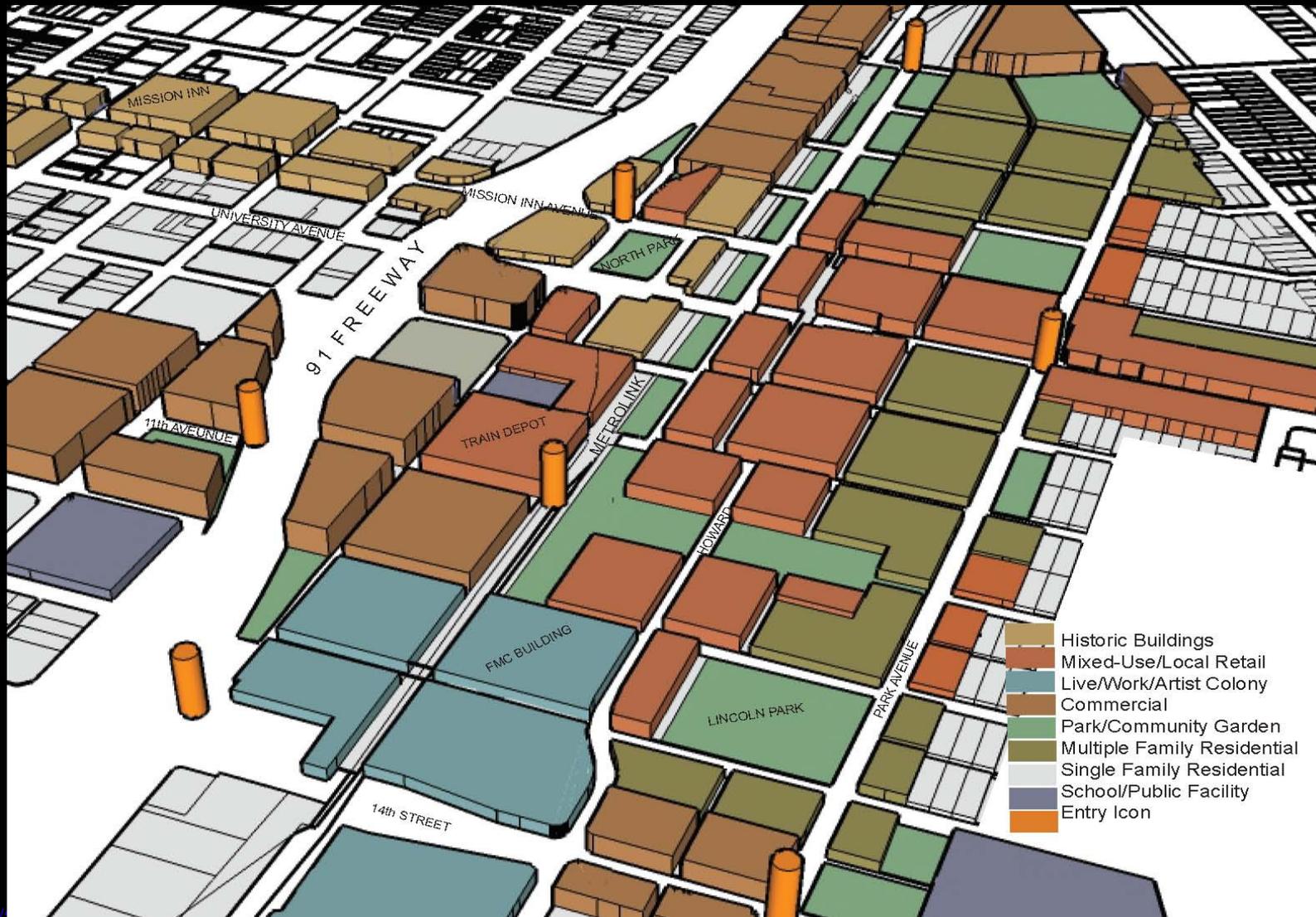
conservation

72

existing infill opportunity site



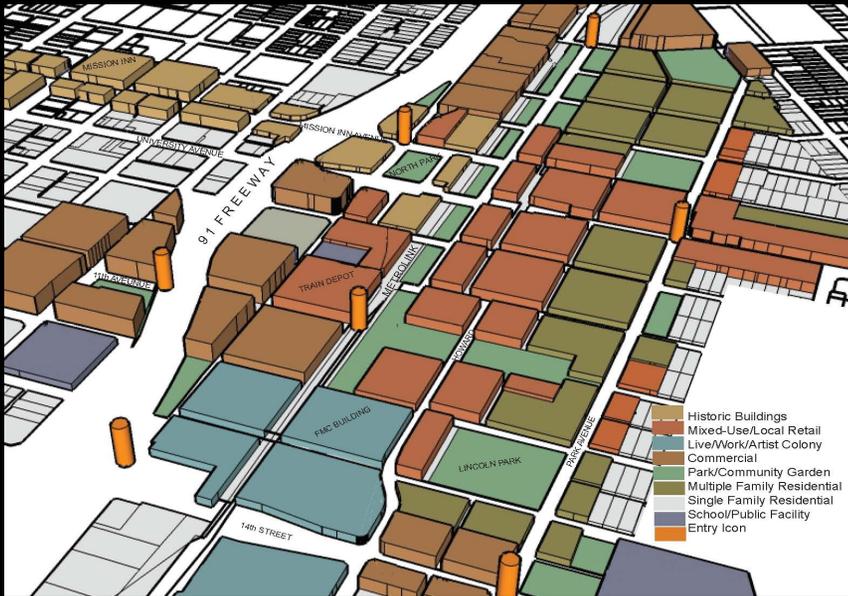
urban village concept



urban villages



packing house district evaluation



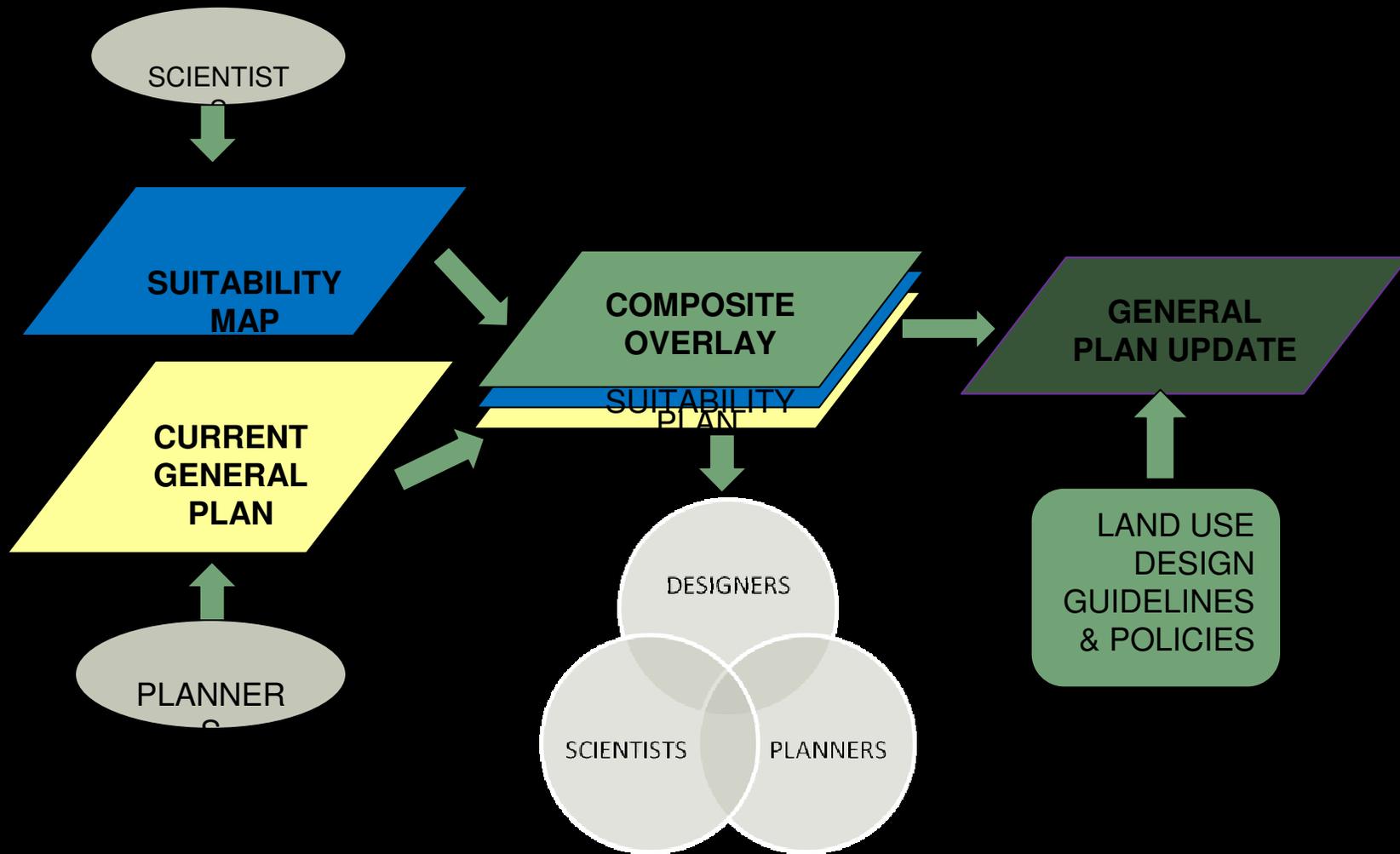
1200 residential units

1.2 million square feet of office and retail space

20 Extra days per year saved in commuting time (2 hr/day commute)

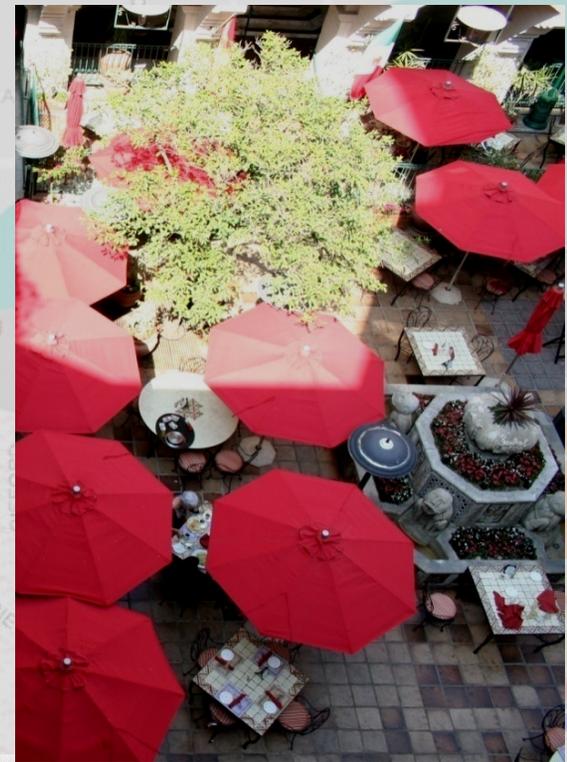
\$2,873 per year in gas savings
(\$3.33/gal at 22 mpg)

“ONE PLAN” INTEGRATION PROCESS



Thank You!

Eileen Takata
California Resource Connections, Inc.
(951) 897-7605
eileentakata@sbcglobal.net
www.watershedconnections.org



vision for a healthy future... ONE PLAN!