

Sacramento Area Council of Governments

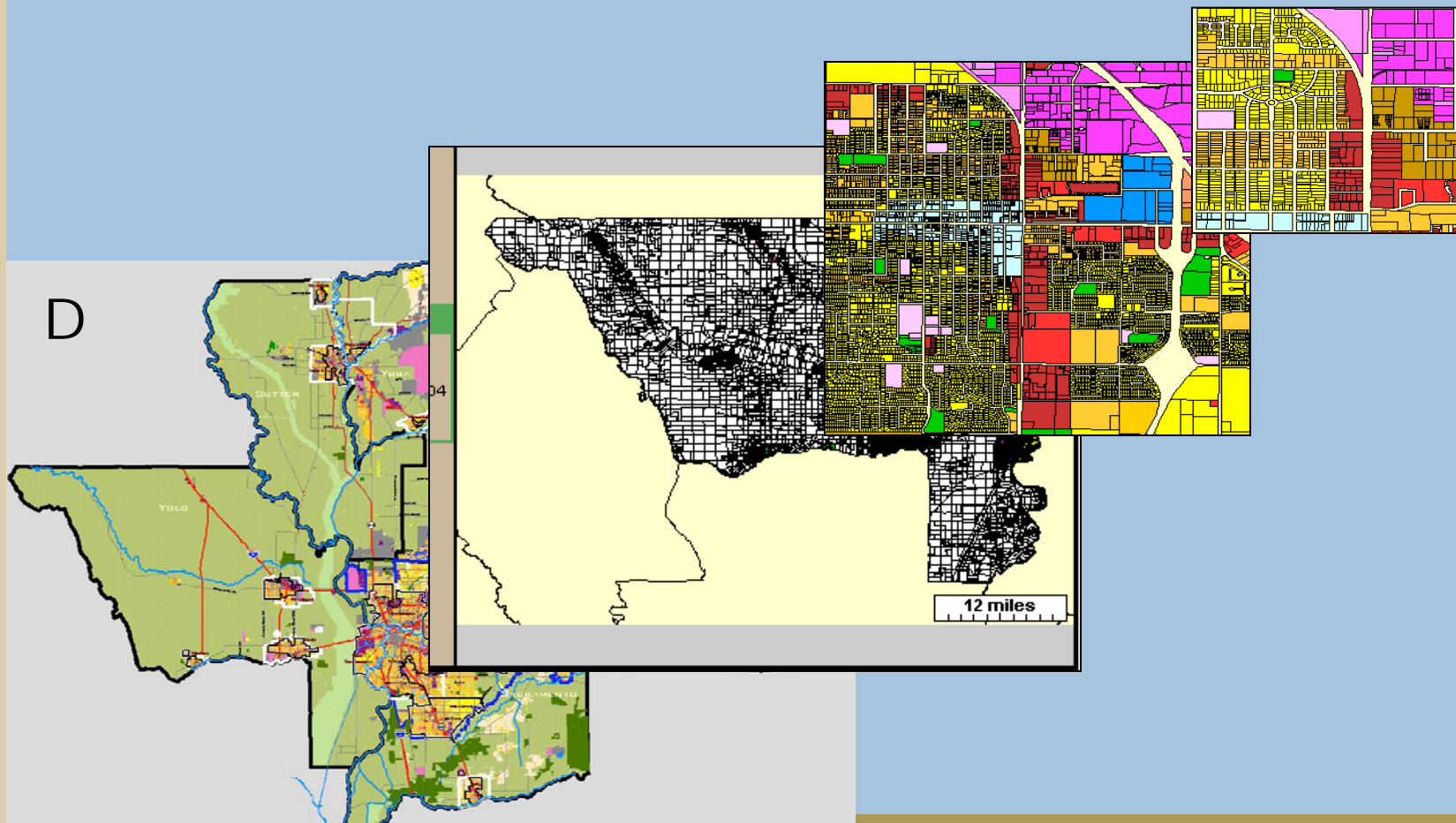


New Challenges Require New Tools: Innovative
Approaches to Achieve Climate Stabilization

I-PLACE³S Decision-Support Tool

Kacey Lizon, Sacramento Area Council of Governments
February 6, 2010

Neighborhood to Region-level Applications



Building Scenarios



- One Set of Tools, Two Applications
 - Scenario Building to establish alternatives from ground up
 - Public Workshops to evaluate and refine scenarios

Scenario Planning Land Use Alternatives

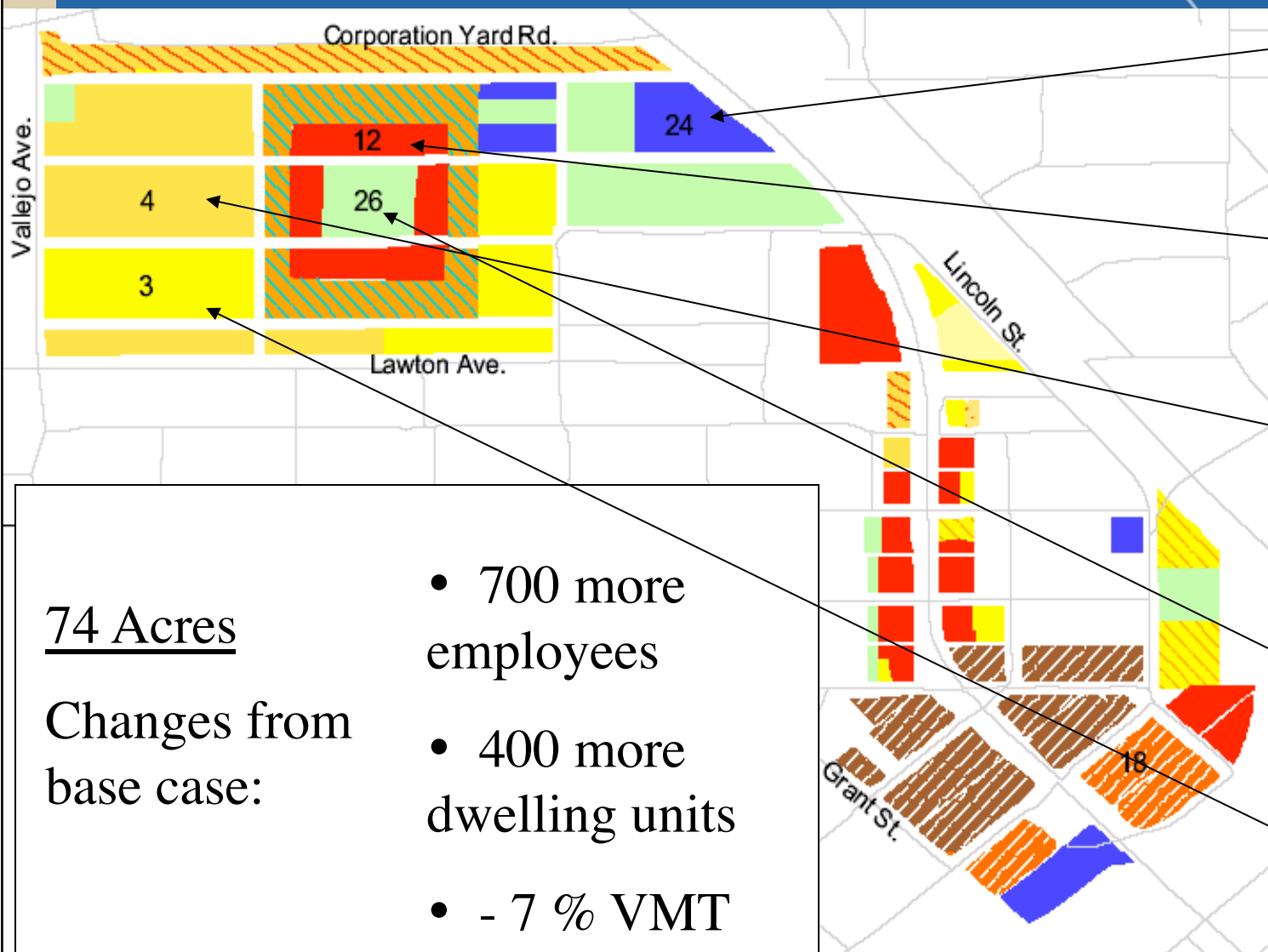


RESIDENTIAL BUILDING TYPES							
1	Rural Residential			2	1	--	Rural residential includes very large lot residential (1 acre per lot).
2	Large Lot Single Family Residential			1	4	--	Alden Park has mainly large lots in the ... to 1/3 acre size. Gardenland (South Natomas) has grid-streets with 1 acre
3	Medium Lot Single Family Residential			2	6		
4	Small Lot Single Family Residential			2	12		
5(O)	Townhouse (Owner)			3	15		
5(R)	Townhouse (Rental)			3	15		
6(O)	Low-Rise Condos (Owner)			2	24		
6(R)	Low-Rise Apartments (Rental)			2	24		
7(O)	Mid-Rise Condos (Owner)			3	35		
7(R)	Mid-Rise Apartments (Rental)			3	35		
8(O)	High-Rise Condos (Owner)			6	66		
8(R)	High-Rise Apartments (Rental)			6	66		
9(O)	Urban Condos (Owner)			10	105		
9(R)	Urban Apartments (Rental)			10	105		

LAND USE CHIP SET												
1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4
5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)
5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)
6(O)	6(O)	6(O)	6(O)	6(O)	6(O)	6(O)	6(O)	6(O)	6(O)	6(O)	6(O)	6(O)
6(R)	6(R)	6(R)	6(R)	6(R)	6(R)	6(R)	6(R)	6(R)	6(R)	6(R)	6(R)	6(R)
7(O)	7(O)	7(O)	7(O)	7(O)	7(O)	7(O)	7(O)	7(O)	7(O)	7(O)	7(O)	7(O)
7(R)	7(R)	7(R)	7(R)	7(R)	7(R)	7(R)	7(R)	7(R)	7(R)	7(R)	7(R)	7(R)
8(O)	8(O)	8(O)	8(O)	8(O)	8(O)	8(O)	8(O)	8(O)	8(O)	8(O)	8(O)	8(O)
8(R)	8(R)	8(R)	8(R)	8(R)	8(R)	8(R)	8(R)	8(R)	8(R)	8(R)	8(R)	8(R)
9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)
9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)
10	10	10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13	13	13



Neighborhood Study Area Land Use Scenario



74 Acres

Changes from
base case:

- 700 more employees
- 400 more dwelling units
- - 7 % VMT

Key Land Uses Featured



24 Public/Civic/
Education



12 Community/
Neighborhood Retail



4 Small Lot Single
Family Residential

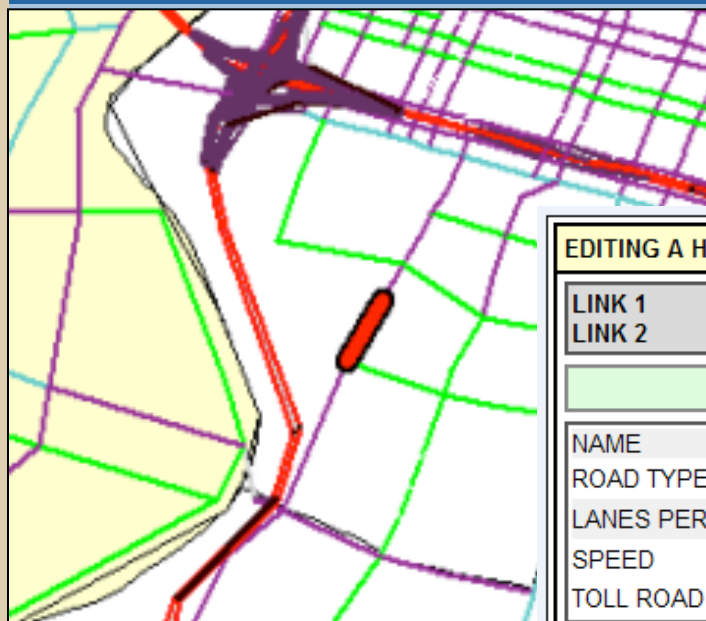


26 Parks



3 Medium Lot Single
Family Residential

Regional Transportation Plan Public Workshops



EDITING A HIGHWAY LINK [EDIT DETAILS](#)

LINK 1	3823 : 3824
LINK 2	3824 : 3823

ENABLED - YES

NAME

ROAD TYPE: 4 - Minor Arterial

LANES PER DIRECTION: 1 LANE

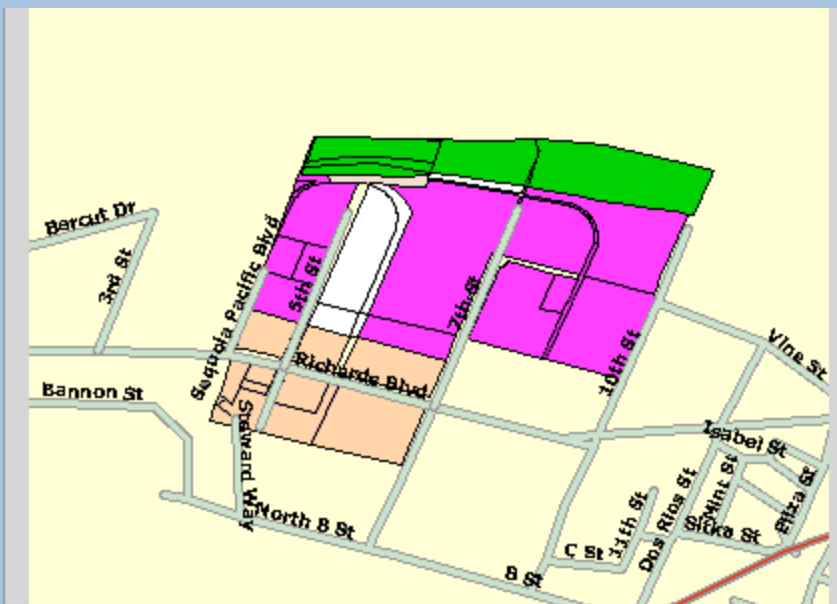
SPEED: 35 MPH

TOLL ROAD: YES NO

TRAVEL MODEL TRANSIT LINKS				
LINK NAME	TRANSIT TYPE	ENABLED	FREQ1	FREQ2
001	Local Bus	<input checked="" type="checkbox"/>	15	30
003	Local Bus	<input checked="" type="checkbox"/>	15	0
004	Local Bus	<input checked="" type="checkbox"/>	60	60
007	Local Bus	<input checked="" type="checkbox"/>	45	0
009B	Local Bus	<input checked="" type="checkbox"/>	60	60

- Edit roadway links or roadway projects
- Edit transit routes

Measure Potential Land Use and Transportation Changes



- BASE CASE



- MIXED RETAIL/RESIDENTIAL

SCENARIO COMPARISON

SCENARIO NAME	TOTAL EMPLOYEE CHANGE	TOTAL EMPLOYEES	EMPLOYEES PER ACRE	TOTAL DWELLING UNIT CHANGE	TOTAL DWELLING UNITS	DWELLING UNITS PER ACRE	VMT PER HOUSEHOLD CHANGE	VMT PER RETAIL JOB CHANGE	VMT PER NON-RETAIL JOB CHANGE	TRANSIT CHANGE	PED/BIKE CHANGE
BASE CASE	0	2,209	21.16	0	2	1.07	0%	0%	0%	0.0%	0.0%
MIXED RETAIL/RESIDENTIAL	-604	1,605	29.46	+2,999	3,001	72.27	-56%	-85%	-64%	+0.6%	+6.2%

“Place Types” are the Building Blocks



RESIDENTIAL BUILDING TYPES							
1	Rural Residential			2	1	--	Rural residential includes very large lot residential (1 acre per lot).
2	Large Lot Single Family Residential			1	4	--	Arden Park has mainly large lots in the 1/2 to 1/3 acre size. Gardenland (South Natomas) has grid-streets with 1 acre lots and small houses.
3	Medium Lot Single Family Residential			2	6	--	Standard single family lot of 52x100 min. Allows cul-de-sacs or grid pattern, w/cul-de-sac subdivisions at low end of range. Curtis Park at high end of range.
4	Small Lot Single Family Residential			2	12	--	Small lot subdivisions: Villa Palazzo in Peckot (3,500 sqft lots), standard lots in Laguna West and some low density suburban garden apartments.
5(O)	Townhouse (Owner)			3	15	--	Metro Square in midtown is detached townhouse project at approx. 20 DU/ac. Most standard 2-story apts w/ surface parking are in this range.
5(R)	Townhouse (Rental)						
6(O)	Low-Rise Condos (Owner)			2	24	--	2+ story attached units with structured parking (e.g., tuck-under).
6(R)	Low-Rise Apartments (Rental)						
7(O)	Mid-Rise Condos (Owner)			3	35	--	3 story mid-level development. Less space dedicated to landscaping; more frontage on street.
7(R)	Mid-Rise Apartments (Rental)						
8(O)	High-Rise Condos (Owner)			6	66	--	6 story development with structured parking. Buildings include elevators, interior courtyards, and hallways.
8(R)	High-Rise Apartments (Rental)						
9(O)	Urban Condos (Owner)			10	105	--	10 story urban development. Buildings may include a health facility, door man, etc.
9(R)	Urban Apartments (Rental)						

User-Defined, includes:

- Inventoried allowed land uses
- Land uses that might not yet exist in codes (e.g. mixed use)

Basic Data Needs



- General Plan or Zoning designations
- Existing Conditions:
 - Housing Units
 - Employees
 - Land uses
- Growth forecast:
 - Housing Units
 - Employees
- Parcel data
- Environmental Constraints
- Subarea shapefiles for reporting and analysis

Building Scenarios



MAIN MENU | CHANGE PASSWORD | LOGOUT

PLACE³S

ZOOMIN 2X ZOOMOUT 2X PAN IDENTIFY

Parcel

50% REDEVELOPMENT MODE MARK PLACE TYPE 95%

A. Rural Residential* [PLACE](#)

[TYPE LEGEND](#)

Layers CLICK ON THE MAP TO PERFORM THE SELECTED ACTION!

- Highways
- Major Roads
- Minor Roads
- Parcel Lines

SUB-AREA LAYERS

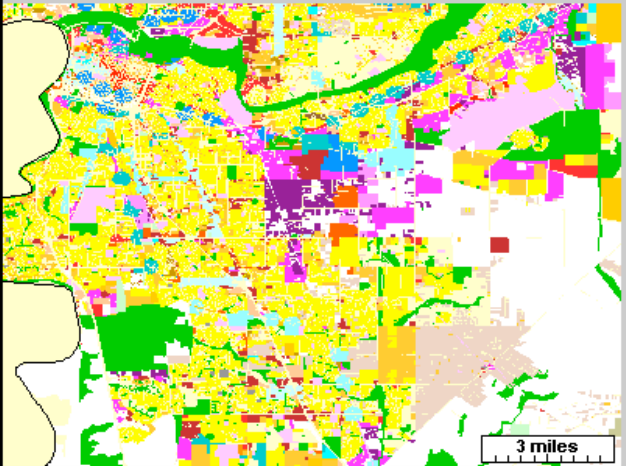
- 160-ACRE GRIDS
- LRT_STATIONS

SUB-AREA QUERIES

- NONE

Map Size: 1X

Redraw



SAC SCENARIO D EAST - TABLE 15

[BACK TO SCENARIO DETAIL MENU](#) [ZOOM TO SCENARIO EXTENT](#)

2.422 s [QUICK INDICATORS](#) | [VIEW / SAVE THIS MAP IMAGE](#)

User Applies Place Types to study area via:

- Map
- Query
- Overlay

Performance Measures to Compare Alternative Planning Scenarios



- Total jobs and dwelling units
- Density by land use type
- Mix of uses (defined by land use type)
- Economic feasibility (Return on Investment)
- Vehicle mile traveled and vehicle trips per household
- Change in walk/bike and transit mode shares
- Export data to regional travel model
- Mobile source air emissions

Future Applications Under Development



- Rural landscapes evaluation
- CO₂ emissions calculation added to I-PLACE³S Sacramento travel model
- Infrastructure costs impacts
- Building energy usage and emissions (beta testing)

New Modules Developed for King County



Public health (outcomes: physical activity, BMI, walk and bike trips)

Climate change and air quality (outcomes: CO₂, NO_x, HC, and CO; vehicle trips and VMT)

Climate Change Module (Household Inputs)



- Household demographics
 - Working adults
 - Non-working adults
 - Children
- Household Income
- Access to transit
- Area intersection density
- Household area density
- Area mix of land uses

Physical Activity and BMI Module (Person Inputs)



- Demographics
 - Number of adults in household
 - Employment status
 - Number of children in household
- Ratio of adults to cars
- Household income
- Access to transit
- Intersection density
- Area housing density
- Area land use mix
- Park availability
- Area retail and fast food establishments

The White Center/ 98th Street Corridor Study



MAIN MENU | CHANGE PASSWORD

PLACE³S

ZOOMIN 2X
 ZOOMOUT 2X
 PAN
 IDENTIFY Parcel

% COV 100%
 REDEV MODE
 MARK
 % DENS 100%
 % ACRE 100%
 PLACE TYPE: 01 - (O). Townhouse (Owner)
 [LEGEND](#)

Layers

Roads

Parcel Lines

Map Size: 2X

Redraw

CLICK ON THE MAP TO PERFORM THE SELECTED ACTION

PLACE TYPE LEGEND

PLACE TYPE NAME	MAX STORIES	DU / ACRE	EMP / ACRE	FAR
01 - (O). TOWNHOUSE (OWNER)	3	15.00	0.00	0.48
02 - (R). TOWNHOUSE (RENTAL)	3	15.00	0.00	0.41
03 - (O). LOW-RISE CONDOS (OWNER)	2	23.60	0.00	0.65
04 - (O). MID-RISE CONDOS (OWNER)	3	35.42	0.00	0.89
05 - (R). MID-RISE APARTMENTS (RENTALS)	3	35.28	0.00	0.77
06 - (O). HIGH-RISE CONDOS (OWNER)	6	69.02	0.00	1.58
07 - **MID-RISE HOUSING (OWN & RENT, R-24)	3	41.82	0.00	0.67
08 - **MID-RISE MIXED USE (CBSO)	3	34.16	64.06	1.10
09 - **MID-RISE MIXED USE PED CORRIDOR (CBSO)	4.5	81.68	65.63	1.88
10 - *BANK (CBSO)	2	0.00	41.88	0.38
11 - *CONV STORE W/GAS (CBSO)	1	0.00	31.21	0.50
12 - *DUPLEX (R-18, R-24)	2	13.61	0.00	0.38
13 - *INDOOR ACTIVITY CENTER	1	0.00	10.89	0.25
14 - *LOW-RISE APARTMENTS (RENT, LIVE/WORK, R-18)	1	21.51	21.07	0.56
15 - *LOW-RISE APARTMENTS (RENT, SMALLLOT, R-18)	2	33.22	0.00	0.76
16 - *LOW-RISE APARTMENTS (RENT, LARGELOT, R-18)	2	33.22	0.00	0.76
17 - *OFFICE BLDG (CBSO, LARGELOT)	1	0.00	44.55	0.41
18 - *OFFICE BLDG (CBSO, SMALLLOT)	1	0.00	44.55	0.41
19 - *PARK/OPEN SPACE (R-6, R-18)	0	0.00	0.00	0.00
20 - *PARKING LOT (CBSO)	0	0.00	0.00	1.00
21 - *RESTAURANT	1	0.00	35.00	0.56
22 - *RETAIL STORE (CBSO)	2	5.75	52.53	0.53

Done

The White Center/ 98th Street Corridor Study



Land Use Assumptions

Scenario	Employees	Dwelling Units
Existing Conditions	827	777
Buildout	+1,017	+1,724
Interim Buildout	+31	+443
TOD Buildout	+4	+53

The White Center/ 98th Street Corridor Study



CLIMATE AND HEALTH INDICATORS REPORT

	<u>CO2</u> <u>(kg) /</u> <u>DU</u>	<u>NOx</u> <u>(grams) /</u> <u>DU</u>	<u>HC</u> <u>(grams) /</u> <u>DU</u>	<u>CO</u> <u>(grams) /</u> <u>DU</u>	<u>Car</u> <u>Vehicle</u> <u>Trips / DU</u>	<u>Car</u> <u>Vehicle</u> <u>Miles / DU</u>	<u>Transit</u> <u>Person</u> <u>Trips / DU</u>	<u>Transit</u> <u>Person</u> <u>Miles / DU</u>	<u>Walk /</u> <u>Bike</u> <u>Trips /</u> <u>DU</u>	<u>Walk /</u> <u>Bike</u> <u>Miles /</u> <u>DU</u>
BASE CASE	14.17	47.62	51.69	580.00	9.29	48.82	1.59	12.67	3.25	3.13
TOD Buildout	14.16	47.55	51.62	579.16	9.28	48.76	1.58	12.63	3.24	3.09
TOD Buildout with ped connection	14.17	47.61	51.68	579.71	9.29	48.82	1.58	12.64	3.23	3.08
Interim Buildout	14.04	47.09	51.11	573.56	9.21	48.30	1.55	12.47	3.23	2.98
Interim Buildout with ped connection	14.04	47.10	51.12	573.64	9.21	48.31	1.55	12.47	3.23	2.97
Buildout	13.95	46.74	50.65	570.24	9.08	47.90	1.57	12.99	3.36	2.73
Buildout with ped connection	13.94	46.70	50.61	569.82	9.08	47.85	1.57	12.99	3.37	2.73

The White Center/ 98th Street Corridor Study: Alternatives Testing



Scenario	Employees	Dwelling Units
Existing Conditions	827	777
Buildout + More Transit	+1,017	+1,724
Buildout + More Growth	+1,449	+1,918

CLIMATE AND HEALTH INDICATORS REPORT

	<u>CO2</u> <u>(kg)/</u> <u>DU</u>	<u>NOX</u> <u>(grams)/</u> <u>DU</u>	<u>HC</u> <u>(grams)/</u> <u>DU</u>	<u>CO</u> <u>(grams)/</u> <u>DU</u>	<u>Car</u> <u>Vehicle</u> <u>Trips / DU</u>	<u>Car</u> <u>Vehicle</u> <u>Miles / DU</u>	<u>Transit</u> <u>Person</u> <u>Trips / DU</u>	<u>Transit</u> <u>Person</u> <u>Miles / DU</u>	<u>Walk /</u> <u>Bike</u> <u>Trips /</u> <u>DU</u>	<u>Walk /</u> <u>Bike</u> <u>Miles /</u> <u>DU</u>
BASE CASE	14.17	47.62	51.69	580.00	9.29	48.82	1.59	12.67	3.25	3.13
Buildout	13.95	46.74	50.65	570.24	9.08	47.90	1.57	12.99	3.36	2.73
Buildout + Ped Connection + Transit	12.90	43.70	47.54	532.20	9.22	44.67	1.63	13.65	3.37	2.73
Buildout +Ped Connection + More growth	13.74	46.14	49.99	563.11	9.08	47.48	1.54	12.64	3.42	2.78

Demographic Variables



[MAIN MENU](#) | [CHANGE PASSWORD](#) | [LOGOUT](#)

PLACE³S

ZOOMIN 2X ZOOMOUT 2X PAN IDENTIFY Parcel

% COV 100% REDEV MODE MARK % DENS 100% % ACRE 100% PLACE TYPE - [LEGEND](#) 01 - (O). Townhouse (Owner)

Layers

- Roads
- Parcel Lines
- SUB-AREA LAYERS
- SHOW LABELS
- RAD DUMMY FILE

Map Size: 1X

Redraw

CLICK ON THE MAP TO PERFORM THE SELECTED ACTION

FIELD NAME	FIELD DESCRIPTION
GEOG_NAME	THIS IS THE NAME OF EACH SUB-AREA
OPTYPE	PLACE TYPE NAME
HHWRK	NUMBER OF WORKERS IN HH
HHNWRK	NUMBER OF NON-WORKERS IN HH
HHKIDS	NUMBER OF CHILDREN IN HH
HHINC1	HOUSEHOLD INCOME 1
HHINC2	HOUSEHOLD INCOME 2
HHCAR	NUMBER OF CARS OWNED BY HH

HEALTH TEST - BUILDOUT

[SCENARIO DETAIL MENU](#) | [PROJECT DETAIL MENU](#)

[ZOOM TO S](#) | [EDIT SCEN](#)

[QUICK INDICATORS](#) | [VIEW / SAVE THIS MAP IMAGE](#)

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Density & Accessibility Measures

