URBAN DESIGN 4 HEALTH

2019-2020 San Joaquin County Health Outcome Update & Small Area Focus Studies

TASK 2: Regional Physical Activity & Health Outcome Update for San Joaquin County

Master Contract & Task Order #:

- C-18-019, TO#3

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SAN JOAQUIN COUNCIL OF GOVERNMENTS

About this Report

This report was prepared by Urban Design 4 Health, Inc. (UD4H). UD4H's mission is to support clients with innovative and objective information and tools to achieve health, environmental, economic, and quality of life goals that are intrinsic in efforts to build new communities and to retrofit existing ones. Learn more at www.ud4h.com.

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Eric Fox served as the Project Manager for this study. He identified and organized the methodological procedures used, completed data analysis, and was the lead author for this report. Jim Chapman contributed to methodology development, project design, and assisted with the writing of this report. Dr. William Bachman helped with data analysis, calibration, and interpretation of findings using the tool. Dr. Larry Frank reviewed the analysis approach and provided critical input and feedback.

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This work builds on the original health equity study (C-18-019, #1) completed for SJCOG by UD4H in 2017-2018. UD4H would like to acknowledge Nicole Iroz-Elardo, Principal, UD4H (currently at the University of Arizona, School of Landscape Architecture and Planning) who led the 2017-2018 study, and Jessica Schoner, Lead Analyst & Project Manager, UD4H (currently at Toole Design Group) who managed the National Public Health Assessment Model (NPHAM) analysis for the original study.

Suggested Citation for Original Health Equity Study:

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1 Introduction

Urban Design 4 Health (UD4H) is under contract to the San Joaquin Council of Governments (SJCOG) to provide assistance related to its Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) implementation efforts. In a pilot study completed in early 2018, UD4H applied its National Public Health Assessment Model (NPHAM) to San Joaquin County. This was done to analyze the current conditions of estimated public health benefits (e.g., physical activity levels and health outcomes), as well as the built, natural, and social environment metrics used as inputs to calculate those estimated benefits.[1]

The current analysis uses an enhanced version of NPHAM with additional health outcomes to build upon these pilot efforts, and update health outcome estimates for the San Joaquin County at the census block group-level. The 2018 pilot analysis examined baseline characteristics and three alternative scenarios. The enhanced NPHAM is applied to the baseline and the alternative scenario (Scenario 2A) that was adopted for the 2018 RTP. This document is the draft report produced in fulfillment for *Task 2: Regional Physical Activity & Health Outcome Update*.

A growing body of evidence suggests that transportation and land use investments and policies can have broad-reaching implications for population health, access to economic opportunities, and climate change[1-6]. Transportation systems link people with social and health-promoting resources, such as employment, education, food, recreation, social services, and health care[7-10]. Transportation systems influence healthy behaviors such as walking and biking. The resulting health outcomes from increases in physical activity are well documented[11].

Long-range regional transportation planning is informed through modeling of travel demand and land use. There is an increasing demand for these models to be linked to additional analyses to understand the social and health impacts of planned land use and transportation policies and investments This report describes current and future conditions of health equity and other social equity goals. This can be used to inform additional analyses in the RTP context.

1.1 SJCOG 2018 RTP

Long-range scenario planning efforts compare different land use and investment strategies. In 2017, SJCOG started with four alternative development scenarios. Three of them were investigated for health effects during the development of the 2018 RTP: Scenario 1, Scenario 2A, and Scenario 3 (Figure 1). Walkability, physical activity, and health are best supported by compact design. This suggested that, based on the

[1] 2018 RTP/SCS SJCOG – Public Health Analysis of Draft Scenarios, 2018.

development changes they include, positive health effects would be highest for Scenario 3 and lowest for Scenario 1.

The final 2018 RTP adopted the Scenario 2A alternative, which is the focus of this updated analysis. This analysis aligns directly with the temporal periods used for the 2018 RTP, with baseline indicating outcomes in 2015 and the future scenario corresponding to a 20-year horizon (2035).

Figure 1: 2018 RTP/SCS SJCOG scenario development infographic.
Source: SJCOG, 2018.

2 Methodology

The spatial unit of analysis used to estimate health impacts is the census block group (CBG). In the equity analysis, CBG values are reported using population-weighted averages for certain CBGs defined as communities of concern.

2.1 Using NED & NPHAM Data for Baseline

Scenario planning requires a comparison of future scenarios to baseline conditions. Baseline conditions in this analysis are provided using the National Environmental Database (NED) and the National Public Health Assessment Model (NPHAM, v. 2.0). UD4H developed both of these resources. Current conditions were provided for all 395 block groups in San Joaquin County.

The UD4H-assembled National Environmental Database (NED)[2] provides spatially resolute (census block-group) objectively measured built, natural, and social environmental conditions. It uses data from various sources, including the U.S. Environmental Protection Agency, the U.S. Department of Housing and Urban Development, and the National Land Cover Database. It contains a core set of

[2] National Environmental Database (NED), Urban Design 4 Health, 2019. Funded by the Robert Wood Johnson Foundation (RWJF).

environmental features that have been found or theorized to predict physical activity, diet, and other health-related behaviors.

The UD4H-developed National Public Health Assessment Model (NPHAM)[3] estimates health-related outcomes at the same spatially resolute (census block group) level. NPHAM uses evidence-based inferential statistics to predict active travel, physical activity, and health outcomes such as body mass index (BMI), obesity, and type 2 diabetes. NPHAM predictive equations were built by modeling NED data, California Health Interview Survey (CHIS),[4] and California Household Travel Survey (CHTS) outcomes[5]. NPHAM predicts current conditions using the current conditions data from NED.

2.2 Linking Envision Tomorrow and NPHAM for Future Scenario Predictions

NPHAM can also be used to predict future conditions associated with RTP scenarios. Envision Tomorrow[6] developed by Fregonese Associates – the scenario planning software in use by SJCOG for RTP process – was linked to NPHAM v. 2.0. Aggregation of SJCOG developed parcel-level data – both built environment and demographic – occurred within Envision Tomorrow.[7]

After being aggregated to the CBG-level, the value for each variable above was passed from Envision Tomorrow to NPHAM (housed on an external server) via an application program interface (API). NPHAM uses these values to calculate new outcome values for each CBG. Note that some built environment variables and many demographic variables within the predictive models remain unchanged, using instead base conditions from the NED. The interpretation of future scenario outcomes (travel and health conditions) must recognize that (a) only a selected set of variables with matching data sources from Envision Tomorrow changed, and (b) not all input variables were in each predictive equation.

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[3] National Public Health Assessment Model (NPHAM), Urban Design 4 Health, 2020. Funded with support from the U.S. Environmental Protection Agency (EPA).
[4] http://healthpolicy.ucla.edu/chis/about/Pages/about.aspx
[5] http://www.dot.ca.gov/hq/tpp/offices/omsp/statewide_travel_analysis/chts.html
[6] See http://envisiontomorrow.org/health-assessment-model/ for documentation of how Envision Tomorrow works with NPHAM. Additional NPHAM documentation is provided in Appendix A.
[7] Envision Tomorrow place types characteristics for residents are tied to assumptions about households. This means that population assumptions are foremost assumptions about number of households and household sizes.

2.3 Updates to NPHAM Version 2 Models

Since the initial pilot application of the NPHAM v. 1.0 tool in San Joaquin County in 2017-2018, UD4H has updated its health and physical activity outcome models and metrics. This was accomplished with support from the U.S. Environmental Protection Agency. As part of the model improvement process, there were modifications to the demographic and environmental variables required as model inputs. These changes to input variables were determined based on an enhanced analysis of health and transportation survey data and through direction provided by the NPHAM technical advisory panel.

NPHAM v. 1.0 and v. 2.0 are similar in that they both rely on demographic and environmental variables. The newer NPHAM v. 2.0 models were developed using a wider array of demographic and built/natural environment metrics. The master set of NPHAM v. 2.0 demographic variable categories is provided in Table 1 and the built/natural environmental variables are provided in Table 2. Each of these sets of variables was included in the development of the final statistical models.

Table 1: Summary of NPHAM 2.0 demographic variable inputs at the block group-level.

Category	*Description*
Age	Average age and percentage in three categories (<18, 18-64, >64)
Income	Average household income and % in four categories (<25k, 25-50k, 50-100k, >100k)
Race	Percentage in five categories (White, Hispanic, African American/Black, Asian, remaining race/ethnicities[8])
Education	Percentage in five categories (less than high school, high school graduate, some college, bachelor's degree, graduate degree)
Family Type	Percentage in three categories (married or single without children, single with children, couple with children)
Household Size	Average household size
Employment Status	Percentage in 5 categories (employed, unemployed, student, homemaker, retired)
Poverty Level	Percentage below the federal poverty level
Sex	Percentage of female

Table 2 shows the demographic and built environment inputs for NPHAM v. 2.0. Sources of expected changes include the presence/absence and density of different neighborhood development-types and land uses at the parcel level. For the countywide level analysis, not all built environment inputs were customized with datasets from San Joaquin County, rather existing values based on national datasets for NPHAM were

[8] Includes race/ethnicity categories used by the U.S. Census Bureau including American Indian/Alaska Native, mixed race and Hawaiian or Pacific Islander.

used.[9] Also, other sources of expected changes include assumptions based on an existing trend or a direction outlined in plans or policy. These assumptions are made depending on data availability and are described for each variable.

One of the most significant changes to the input variables for NPHAM version 2 is the creation of a series of index or composite variables comprised of the combination of several individual variables. Five new composite indices were developed to include core components of the built and natural environment: 1) density index, 2) destination index, 3) transit index, 4) park index, and 5) the bicycle/pedestrian index. These five indices are the built environment input options for each model. Expected new scenario alternatives changes to the component variables, which make up these indices, are described in detail in the sections that follow.

[9] A more extensive effort to add in customized region-specific built environment inputs were developed for baseline and future scenarios for the subarea analysis for the South Stockton Promise Zone as part of *Task 3: South Stockton Promise Zone Subarea Analysis* and *Task 4: Translation of Health Outcome Analysis Into Investment Guidance*.

Table 2: Summary of built environment and demographic inputs to NPHAM v. 1.0 and 2.0.

Type	*Index*	*Variable*	*V. 1.0*	*V. 2.0*
Built Environment	Density	Gross population density (people/acre) on unprotected land	✓	✓
		Total road network density	✓	✓
		Street intersection density (weighted, auto-oriented intersections eliminated)	✓	✓
		Gross employment density (jobs/acre) on unprotected land	✓	✓
	Destination	Trip productions and trip attractions equilibrium index; the closer to one, the more balanced the trip making	✓	✓
		8-tier employment entropy (denominator set to the static 8 employment types in the CBG)	✓	✓
		Gross retail (8-tier) employment density (jobs/acre) on unprotected land	✓	✓
	Transit	Proportion of CBG employment within ¼ mile of fixed-guideway transit stop	—	✓
		Proportion of CBG employment within ½ mile of fixed-guideway transit stop	—	✓
		Unbuffered rail station (any type) count	—	✓
		Unbuffered rail station (any type) gross density using sausage buffer as the denominator	—	✓
		Aggregate frequency of transit service within 0.25 miles of block group boundary per hour during evening peak period	—	✓
		Aggregate frequency of transit service per square mile	—	✓
		Distance from population-weighted centroid to nearest transit stop (meters)	—	✓
	Park	Gross park acreage for developed, state and national parks	—	✓
		Unbuffered percent tree canopy coverage	✓	✓
		Unbuffered percent forest	✓	✓
		Unbuffered percent natural land cover	✓	✓
	Bicycle/ Pedestrian	Unbuffered sum line segment length (m) for all bike infrastructure types	—	✓
		Buffered bike-share facility count	—	✓
		Buffered NHTSA pedestrian/bicyclist-involved fatal traffic crash rate per 1,000 persons	—	✓
		Unbuffered FBI violent crime rate per 100,000 persons	—	✓

NPHAM outcome variables chosen for this study were estimated using regression models derived from the California Health Interview Survey (CHIS)[10] and two household travel surveys: 1) the California Add-On[11] to the National Household Travel Survey (NHTS) [12] and the California Household Travel Survey (CHTS).[13] While CHTS data were used for NPHAM v. 1.0, California Add-On data were used for NPHAM version 2 for physical activity and travel-related outcomes except for recreational physical activity. For each CBG, the following transport activity behavior and health variables were included:

- Daily transport walking minutes per person
- Daily leisure walking minutes per person
- Daily transport bicycling minutes per person
- Average body mass index (BMI)
- Percentage of population with poor general health

Additionally, daily total recreational physical activity minutes per person from CHTS-based activity behavior variables were included. As part of the updated health analysis, a set of newly developed CHIS-based health outcome variables focused on 1) cardiovascular diseases, 2) type 2 diabetes and 3) mental health became available and have been developed for San Joaquin County:

- Cardiovascular disease:
    - Percentage of the population with high blood pressure
    - Percentage of the population with coronary heart disease
- Percentage of population with type 2 diabetes
- Mental health:
    - Percentage of the population experiencing psychological distress
    - Percentage of the population experiencing depression

Table 3 provides a summary of health outcomes for NPHAM v. 1.0 and 2.0, as well as data sources.

[10] http://healthpolicy.ucla.edu/chis/about/Pages/about.aspx
[11] https://nhts.ornl.gov/addOn.shtml
[12] https://www.nrel.gov/transportation/secure-transportation-data/tsdc-nhts-california.html
[13] http://www.dot.ca.gov/hq/tpp/offices/omsp/statewide_travel_analysis/chts.html

Table 3: Summary of health outcomes and data sources for NPHAM v. 1.0 and 2.0.

Type	*Health Outcome*	*V. 1.0*	*Source*	*V. 2.0*	*Source*
Physical Activity & Travel Behavior	Daily minutes of walking for transportation	✓	CHTS	✓	NHTS
	Percent of daily walking for transport participation	✓	CHTS	✓	NHTS
	Daily minutes of walking for leisure	✓	CHTS	✓	CHIS
	Percent of weekly walking for leisure participation	✓	CHTS	✓	CHIS
	Daily minutes of bicycling for transportation	✓	CHTS	✓	NHTS
	Percent of daily bicycling for transport participation	✓	CHTS	✓	NHTS
	Weekly minutes of recreational physical activity	✓	CHTS	✓	CHTS
	Percent of weekly recreational physical activity participation	✓	CHTS	✓	CHTS
Health Behavior	Average body mass index (BMI)	✓	CHIS	✓	CHIS
	Percent of the population with obese status (>30 BMI)	✓	CHIS	✓	CHIS
	Percent of the population with overweight or obese status (>25 BMI)	✓	CHIS	✓	CHIS
	Percent of the population with coronary heart disease	–	CHIS	✓	CHIS
	Percent of the population with high blood pressure	–	CHIS	✓	CHIS
	Percent of the population with type 2 diabetes	–	CHIS	✓	CHIS
General & Mental Health	Percent of the population reporting fair to poor general health status	✓	CHIS	✓	CHIS
	Percent of the population reporting depression	–	CHIS	✓	CHIS
	Percent of the population reporting psychological distress	–	CHIS	✓	CHIS

3 NPHAM Inputs & County-Level Results

The primary goal of scenario planning is to understand the relative performance of the scenarios' policy and investment packages under consideration. Mean CBG-level values for health outcomes were summarized for the county-level. The results are evaluated by demonstrating (1) changes from baseline to Scenario 2A in demographic and built environment variables that serve as inputs for the health modeling and (2) the predicted behavior and health outcomes. NPHAM, by using CBGs as the spatial scale of analysis, is sensitive to the total population, households, and jobs, as well as average demographics and built environment characteristics within each CBG.

3.1 Demographic NPHAM Inputs for Baseline & Scenario 2A

Table 4 provides a detailed summary of the demographic and employment characteristics at the CBG-level within the region for both baseline and Scenario 2A. Assumptions about changes in these variables were a translation of the changes in land use place type characteristics within Envision Tomorrow. The summary variables were weighted by the population for their respective year.

While the RTP assumed that each future scenario alternative would have consistent population growth to 2035, Envision Tomorrow estimated this population using place types, which resulted in a place-based distribution for the future scenario. Additionally, Envision Tomorrow applied income to households based on place types resulting in an approximately 21% decrease in low-income households under Scenario 2A conditions. All scenarios (Scenario 1, 2A, and 3) evaluated previously had approximately the same 21% decrease.

Table 4: Weighted demographic characteristics between baseline and Scenario 2A.

Variable	*Weighted Mean (Weighted SD)*		*Absolute change*	*Percent change*
	Baseline	*Scenario 2A*		
CBG population	3,194 (3,426)	4,587 (7,834)	+1,393	+44%
CBG households	938 (889)	1,463 (2,657)	+525	+56%
CBG employees (jobs)	557 (861)	970 (1,566)	+413	+74%
Average household size	2.8 (0.45)	3.3 (1)	+0.5	+16%
Percent low income households	42% (21%)	33% (16%)	-9%	-21%

Scenario 2A indicated an increase in the total population[14] of 44% is 2035. It is important to note that the increase in population and other factors was not evenly distributed

[14] Note that the SJCOG Regional Transportation Plan (RTP) assumes that all scenarios will have the same population growth in 2035. However, Envision Tomorrow estimates this population growth using place types, households, and household size, resulting in some spatial variation in population growth across scenarios.

across the region. There was a handful of CBGs with a slight loss as a result of changes in household size assumptions, but the vast majority gained population. Figure 2 shows the distribution of population change in absolute terms for Scenario 2A. Most areas within the multiple urbanized cores (e.g., Stockton, Tracy, Lodi, and Manteca) within the region were predicted to remain relatively stable (dark yellow) or see a slight reduction in population (dark orange). Suburban areas, particularly in the southwest portion of the region, were projected to see significant population growth (mid and dark purples).

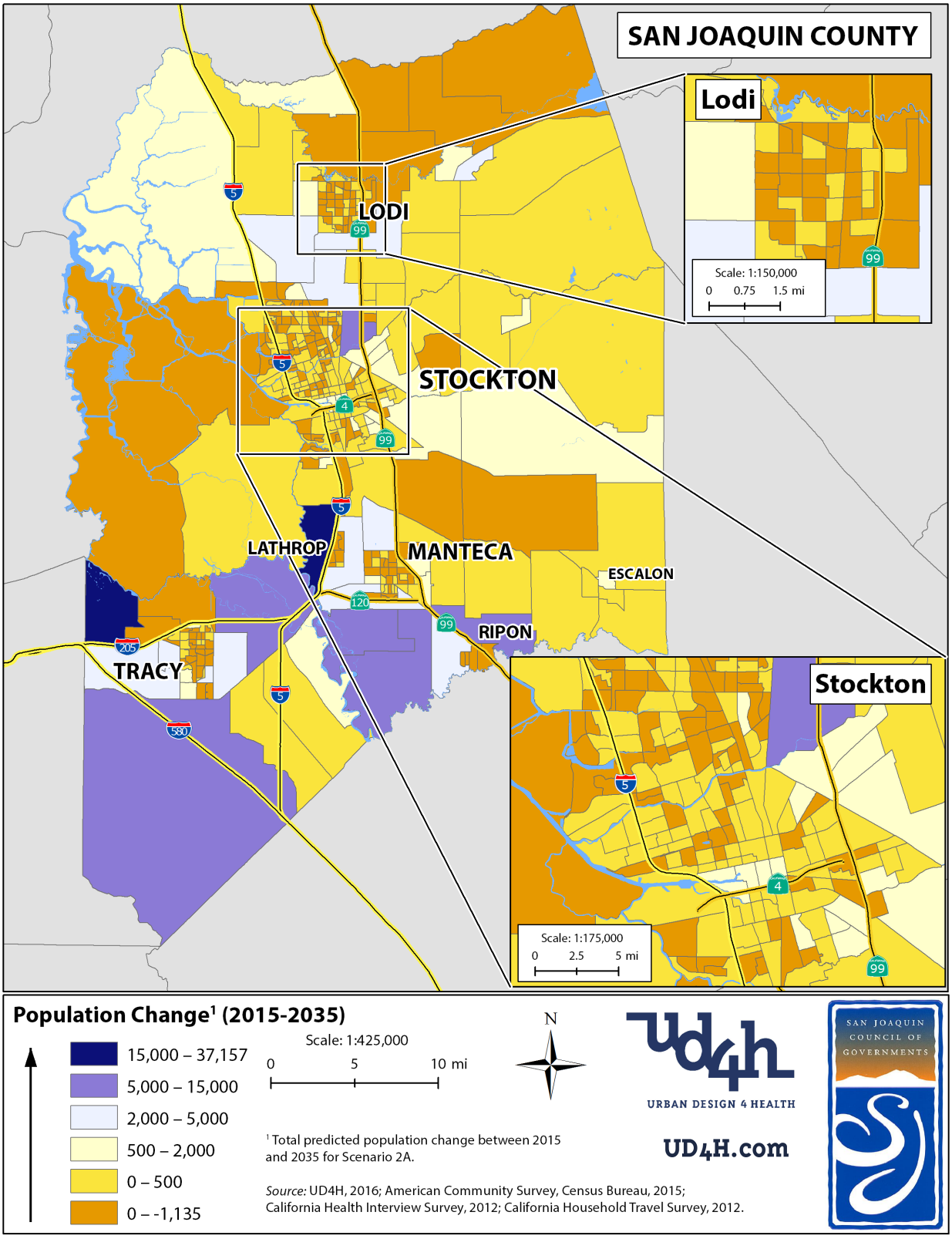

Figure 2: Absolute Population Change from Baseline (2015) to Scenario 2A (2035)

3.2 Built Environment NPHAM Inputs for Baseline & Scenario 2A

Table 5 provides a detailed summary of the built environment characteristics of each CBG within the region for both baseline and Scenario 2A. The summary variables were weighted by the population for their respective year. This is best interpreted as the built environment characteristics of the CBG of residence for the average person in San Joaquin County.

In general, Scenario 2A assumed a denser environment than for baseline:

- Population density increased by 16%. Population density is important because it supports a greater concentration of amenities (see retail density).
- Employment density increased substantially by 34%. Nearby employment density can indicate the extent to which people can walk to their job.
- Retail density also increased substantially to 84%. This is important because an increase in nearby retail destinations increases the likelihood that individuals will walk or bike to the destination.
- The employment mix[15] decreased slightly.
- Intersection density increased modestly (4.4%). Intersection density quantifies street connectivity. Increased connectivity facilitates more direct routes and has been shown to support walking and biking.

Table 5: Weighted built environment characteristics between baseline and Scenario 2A.

Variable	*Weighted Mean (Weighted SD)*		*Absolute change*	*Percent change*
	Baseline	*Scenario 2A*		
Gross population density on unprotected land (people per acre)	9.1 (6.1)	10.54 (5.8)	+1.44	+16%
Gross employment density on unprotected land (employees/jobs per acre)	1.73 (3.9)	2.31 (4.2)	+0.58	+34%
Retail Density	95 (272)	174 (441)	+80	+84%
5-tier employment mix	0.49 (0.29)	0.49 (0.28)	-0.002	-0.3%
Intersection density	71 (46.35)	74 (43.27)	+3.09	+4.4%

[15] 5-tier employment entropy index, with the denominator set to the static 5 employment types in the CBG

3.3 NPHAM Travel Behavior Estimates for Baseline & Scenario 2A

This section describes the population-weighted predicted travel and physical activity behaviors for both baseline and Scenario 2A. These variables are presented for both physical activity duration in minutes and percent of participation for each type. Figure 3 provides a choropleth map illustrating daily minutes of walking for transportation for Scenario 2A (2035). It shows the highest concentration of duration minutes (2.4 minutes or more per day) in Downtown Stockton and the concentrated urban centers of Tracy, Lodi, and Manteca.

Table 6 summarizes countywide mean values and changes in baseline and predicted future measures. Changes are color-coded to indicate a healthy direction in population health (green) or an unhealthy direction (red).

Table 6: Weighted travel behavior and physical activity estimates for baseline and Scenario 2A.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Daily minutes of walking for transportation	1.58 (0.33)	1.61 (0.36)	+0.036	+2.26%
Percent of daily walking for transport participation	16.06% (6.40%)	16.62% (6.69%)	+0.006	+3.52%
Daily minutes of walking for leisure	15.06 (1.75)	15.13 (1.78)	+0.071	+0.47%
Percent of weekly walking for leisure participation	59.95% (2.09%)	60.03% (2.11%)	+0.001	+0.13%
Daily minutes of bicycling for transportation	1.05 (0.03)	1.05 (0.03)	+0.003	+0.26%
Percent of daily bicycling for transport participation	1.16% (0.43%)	1.19% (0.44%)	+0.000	+2.63%
Weekly minutes of recreational physical activity	60.40 (45.85)	60.38 (45.73)	-0.0219	-0.04%
Percent of weekly recreational physical activity participation	7.27% (26.13%)	7.29% (26.05%)	+0.0002	+0.10%

Green = region shows improved health; red = region shows worse health

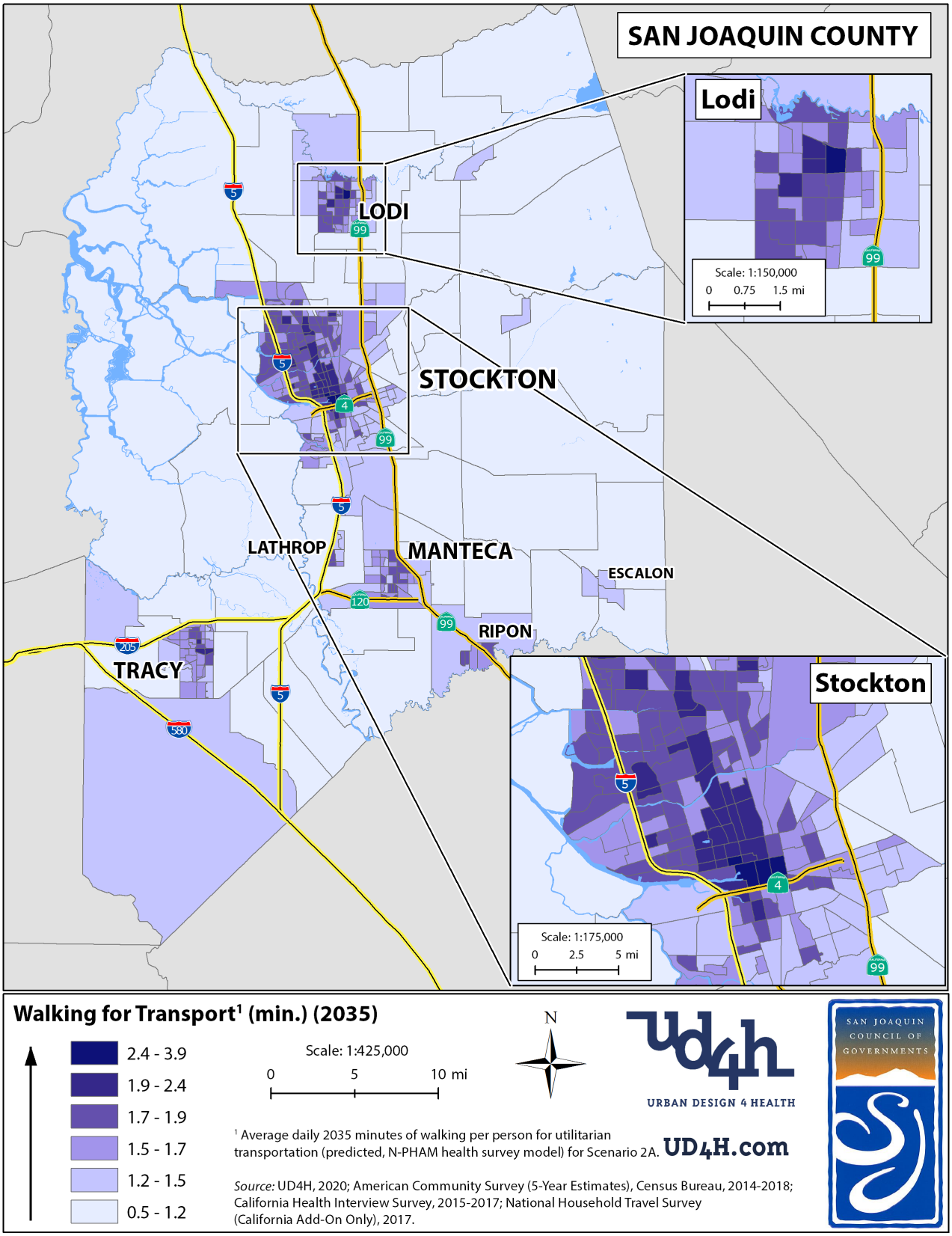

Figure 3: Estimated daily walking for transportation minutes for Scenario 2A (2035).

Highlights include:

- **Walking Behavior –** Scenario 2A was predicted to modestly increase walking for both transportation and leisure. Walking for transportation showed the highest relative increases with a 3.5% increase in participation and a 2.3% increase in duration in 2035. Walking for leisure indicated smaller increases (0.5%) for duration minutes and 0.1% for leisure participation.
- **Bicycling Behavior** – Scenario 2A was estimated to result in a 2.6% increase in participation in bicycling for transportation to 1.2% with relatively stable (+0.3%) duration minutes.
- **Recreational Behavior** – Recreational physical activity is less sensitive to built environment changes. Duration minutes per week for recreational physical activity decreased slightly, but the percent participating in this type of physical activity increased by 0.1%.

Additional insight into the spatial distribution of the behavior outcomes can be found by examining mapped projected differences in future scenario outcomes. Figure 4 shows the highest concentration of increases in walking for transportation daily minutes in the outlying more suburban areas of the region where significant levels of development are expected, as well as some concentrated such as Weber Point in Downtown Stockton. Mountain House, for example, is anticipating substantial growth where transportation walking increases by nearly 40% from under 1.2 minutes per day in 2015 to nearly 1.6 minutes in 2035.

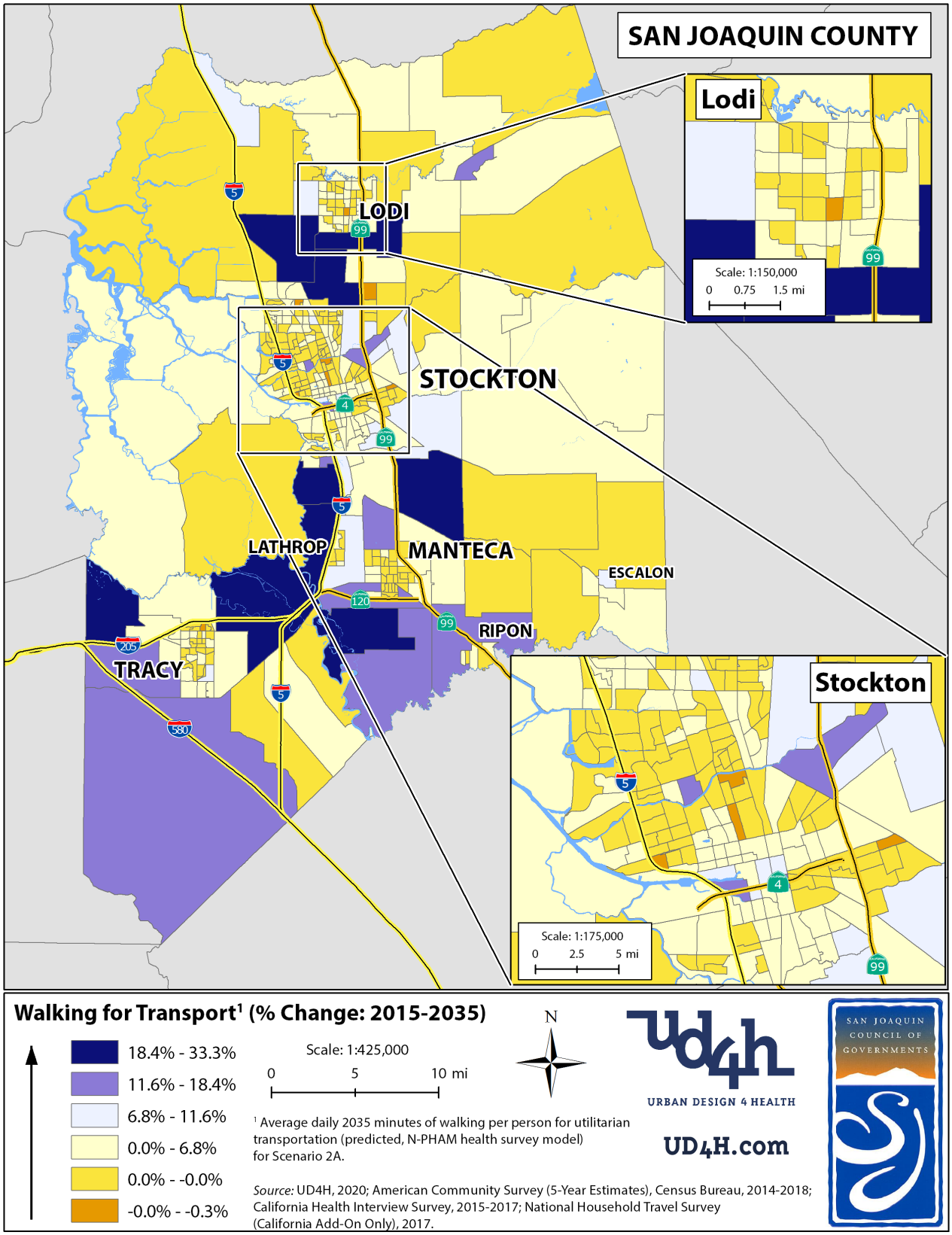

Figure 4: Percent change in daily minutes of walking for transportation between 2015 and 2035.

3.4 Health NPHAM Outputs for Baseline & Scenario 2A

This section describes the population-weighted estimates for health behaviors, including BMI and type 2 diabetes, as well as cardiovascular diseases and mental health for both baseline and Scenario 2A. Changes are color-coded to indicate a healthy direction in population health (green) or an unhealthy direction (red).

Summaries of weighted mean values for health behaviors and cardiovascular disease for both baseline and Scenario 2A are provided in Table 7. The average countywide BMI for the baseline measurement was 28.93. Approximately 32.1% of people are estimated as obese (a BMI greater than 30) and 35.1% as overweight (a BMI greater than 25).

Table 7: Weighted health behaviors and cardiovascular disease estimates for baseline and Scenario 2A.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Average body mass index (BMI)	28.93 (0.60)	28.88 (0.60)	-0.045	-0.16%
Percent of the population with obese status (>30 BMI)	32.1% (3.79%)	31.8% (3.80%)	-0.003	-0.95%
Percent of the population with overweight or obese status (>25 BMI)	67.2% (4.03%)	66.9% (4.06%)	-0.003	-0.44%
Percent of the population with coronary heart disease	4.7% (1.40%)	4.6% (1.39%)	-0.0004	-0.93%
Percent of the population with high blood pressure	29.4% (5.28%)	29.1% (5.26%)	-0.003	-1.03%
Percent of the population with type 2 diabetes	9.5% (3.05%)	9.4% (3.01%)	-0.001	-1.35%

Green = region shows improved health; red = region shows worse health

Table 8 provides population-weighted, mean countywide values for general health and mental health status indicators. In 2015 (baseline) and 2035, 16.2% of the population indicated a fair or poor general health status, with 25.7% (25.6% in 2035) estimated to have experienced some form of depression in the last 30 days[16] and 4.7% reporting psychological distress[17].

[16] Depression based on CHIS survey question AJ32: "How often did you feel so depressed that nothing could cheer you up?", http://healthpolicy.ucla.edu/chis/design/Documents/2015-2016%20Questionnaires/CHIS%202016%20Adult%20Questionnaire%20(FINAL).pdf

[17] Derived from multiple questions, CHIS survey data dictionary: "Likely has had psychological distress in the past month", https://healthpolicy.ucla.edu/chis/data/public-use-data-file/Documents/CV2015-16_Adult_PUF.pdf

Table 8: Weighted general health and mental health status estimates for baseline and Scenario 2A.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Percent of population reporting fair to poor general health status	16.2% (7.27%)	16.2% (7.40%)	-0.0002	-0.14%
Percent of population reporting depression	25.7% (4.73%)	25.6% (4.78%)	-0.001	-0.49%
Percent of population reporting psychological distress	4.7% (1.14%)	4.7% (1.15%)	-0.001	-1.30%

Green = region shows improved health; red = region shows worse health

Highlights include:

- **BMI, Obesity & Overweight Status –** Scenario 2A was estimated to contribute to a slight decrease in BMI by -0.16% between 2015 and 2035. This reduced overweight status by 0.44% for a countywide weighted average of 66.9% (2035) and obese status even further by -1% to 31.8% (2035). Figure 5 shows the spatial distribution of BMI throughout San Joaquin County.
- **Cardiovascular Diseases –** High blood pressure estimates indicated a countywide average of 29.4% of the population in 2015 and was estimated to be reduced to 29.1% (-1.03%) in 2035. Coronary heart disease comprises a much smaller percentage of the population. It was estimated to decrease from 4.7% to 4.6% (-0.93%) by 2035.
- **Type 2 Diabetes –** Of people with diabetes, it was estimated that type 2 represents between 90% and 95% of all cases in the U.S.[18] In 2015, San Joaquin County reported a countywide average of 9.5% of the population with type 2 diabetes, which is anticipated to be reduced to 9.4% (-1.35%) in Scenario 2A by 2035. Figure 6 shows a choropleth map of the spatial distribution of type 2 diabetes across the County. With a few exceptions, such as the extreme northwest of the County and semi-rural areas east of SR 99, the highest reported type 2 diabetes were located throughout urbanized areas in Stockton, where there are estimated higher concentrations of demographic and built environment factors associated with higher incident rates.

[18] Bullard KM, Cowie CC, Lessem SE, et al. Prevalence of Diagnosed Diabetes in Adults by Diabetes Type – United States, 2016. MMWR Morb Mortal Wkly Rep 2018;67:359-361. DOI: http://dx.doi.org/10.15585/mmwr.mm6712a2

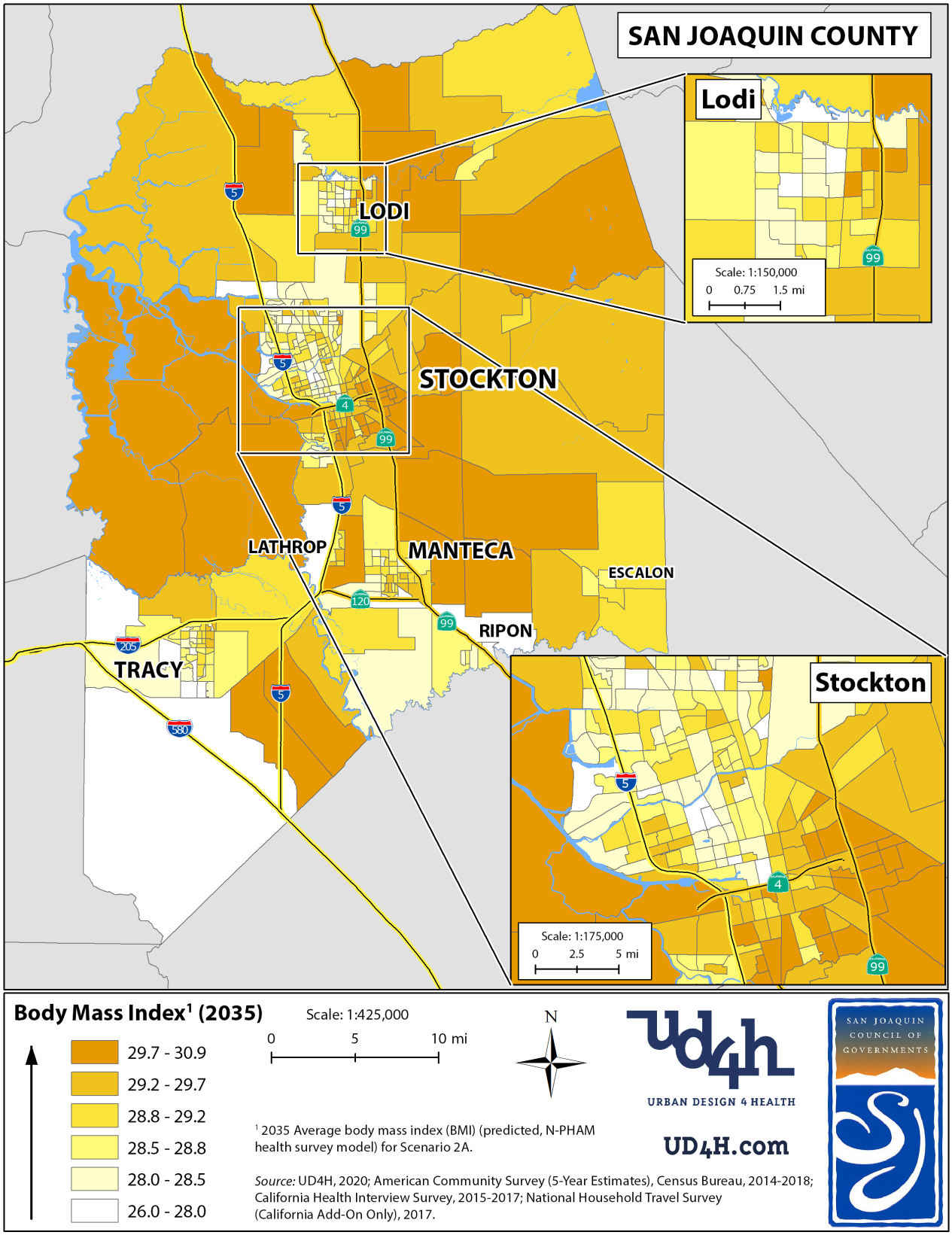

Figure 5: Estimated average population-weighted BMI for Scenario 2A (2035).

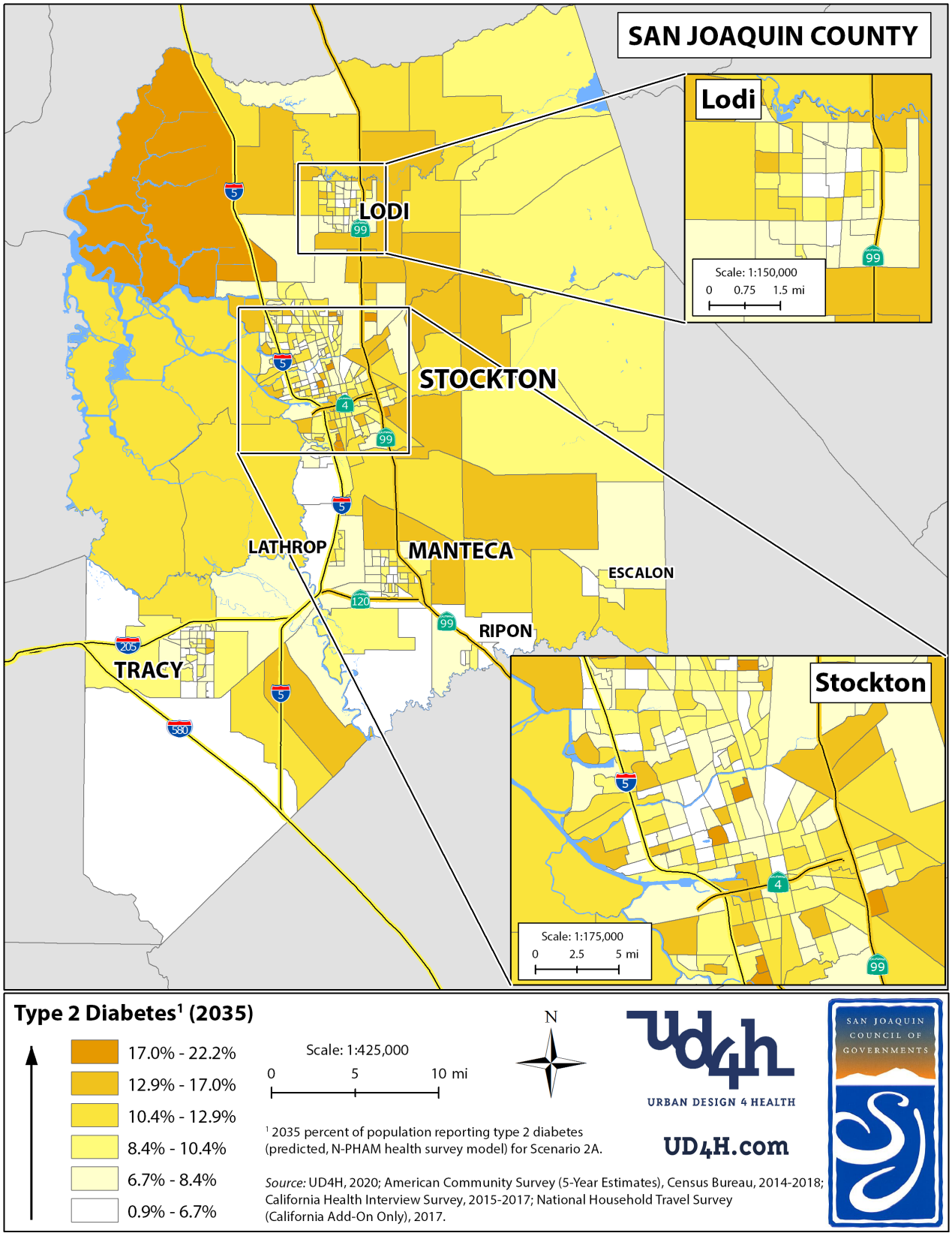

Figure 6: Estimated percentage of population reporting type 2 diabetes for Scenario 2A (2035).

4 Sub-County Equity Analysis

The benefits and impacts of land use and transportation investment policies and investment are not always evenly distributed across a region. Further, some socio-economic status groups typically have additional health risks and are often spatially clustered. One of the core advantages of NPHAM is the ability to estimate the spatial distribution of public health outcomes at a relatively fine-grain spatial scale. This allows for an equity analysis to be performed for regional studies. Calculating weighted means of sub-areas (i.e., communities of concern) within the County for baseline and the scenario year and the differences between the two can inform the extent to which the proposed plan is helping address health disparities.

This section documents sub-county comparisons between baseline and Scenario 2A for communities of concern.

4.1 Methods for Sub-County Equity Analysis

The equity analyses in this report rely upon comparisons of geographic areas flagged as areas of concern. The three geographic areas were examined for the 2018 RTP and have been used again in this report. These include the CalEnviroScreen defined disadvantaged communities developed by the California Environmental Protection Agency, areas of concentrated people of color populations referred to here as concentrated minorities, and areas of concentrated poverty. Each is described in more detail below.

CalEnviroScreen[19] provides an index of disadvantaged communities. The 207 CBGs within San Joaquin County that rank within the top quartile of all California CBGs were flagged for analysis. See Figure 7 for a map showing the locations of these CBGs.

[19] https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

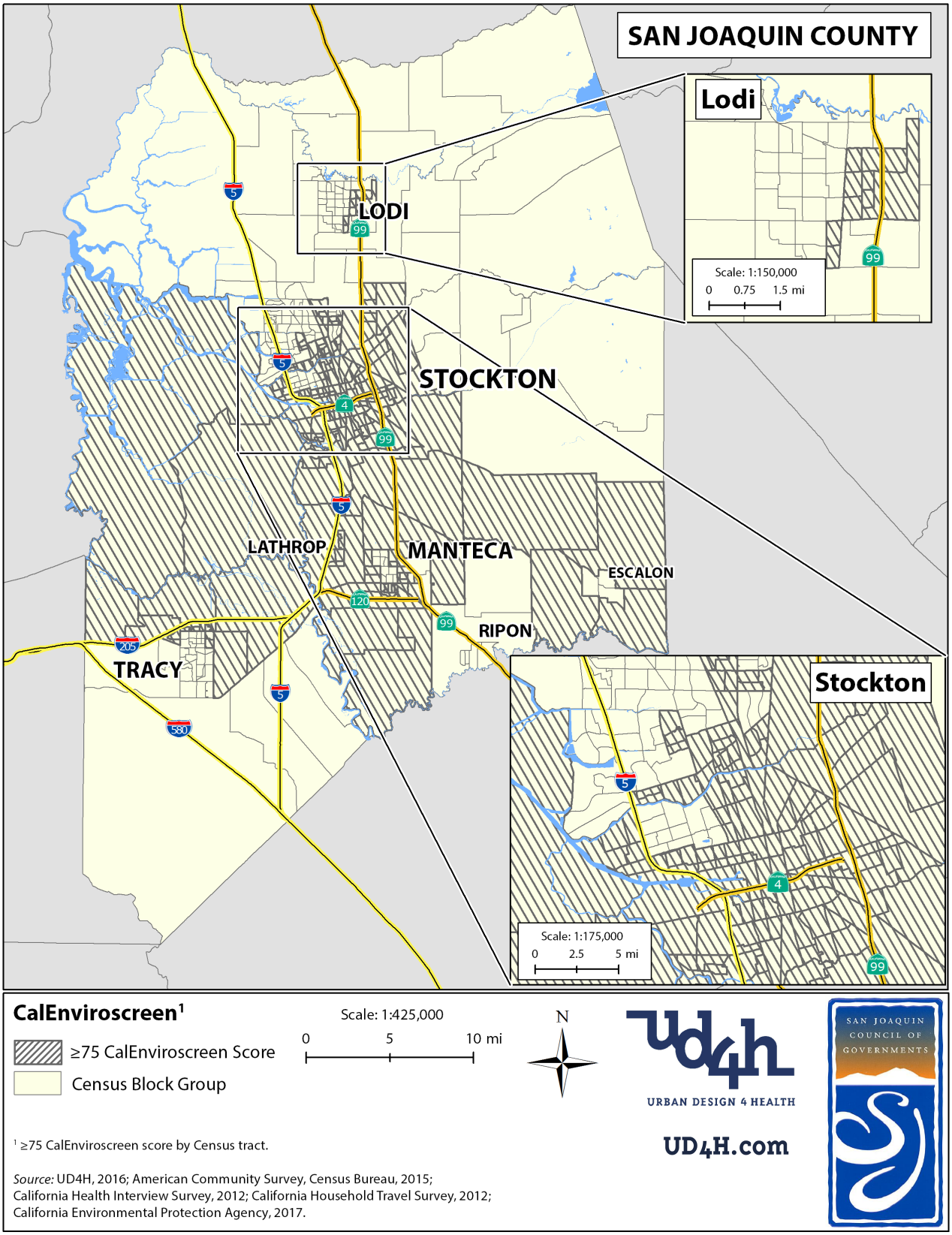

Figure 7: Map of block groups designated as the top quartile in the CalEnviroScreen index.

Concentration of Minorities are located using the American Community Survey (2015, 5-year estimate, B03002 dataset) to identify census tracts where at least 75% of a census block group's population consists of races and ethnicities, which are not non-Hispanic White. Within San Joaquin County, 136 census block groups meet the threshold and are defined as areas of concentrated minority populations. See Figure 8 for a map showing the locations of these CBGs.

Concentrated Poverty locations are identified using the American Community Survey (2015, 5-year estimate, S1701 dataset). Census tracts were used where 30% or more of the population is identified as "below federal poverty level." A total of 31 census tracts in the County meet the 30% threshold, resulting in 89 block groups being defined as areas of concentrated poverty. See Figure 9 for a map showing the locations of these CBGs.

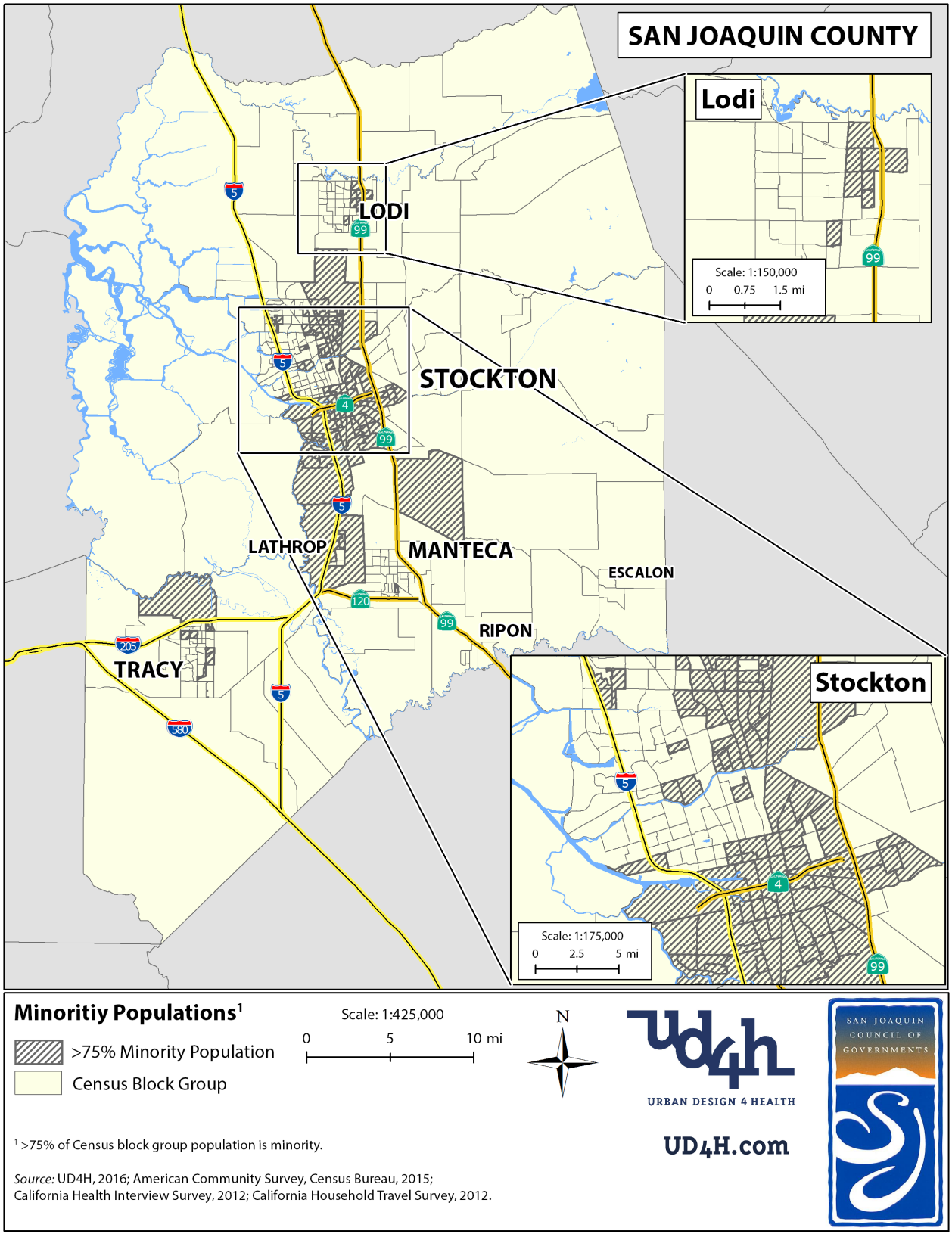

Figure 8: Map of block groups designated as areas of concentrated minority populations.

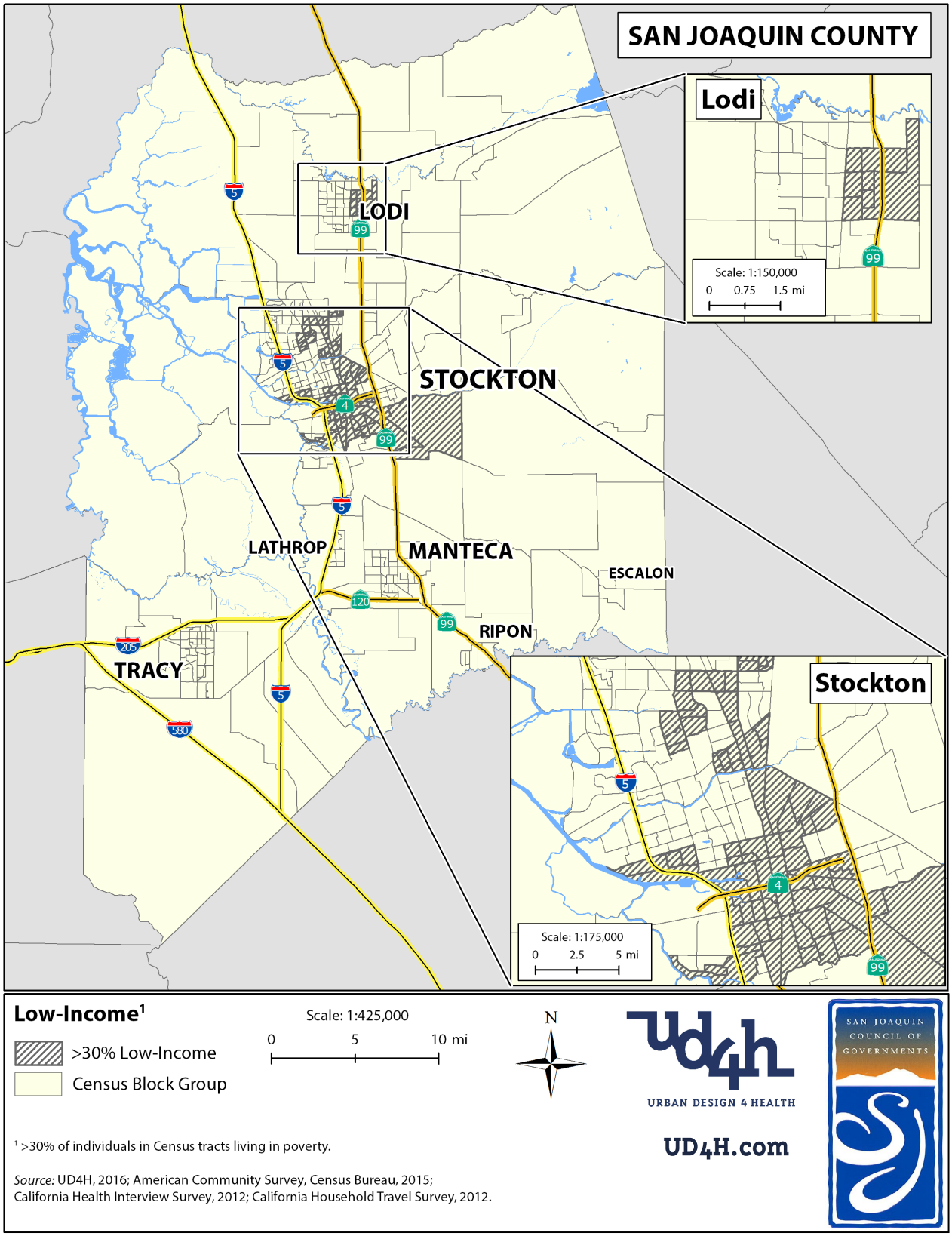

Figure 9: Map of block groups designated as areas of concentrated poverty.

The following methods were used to evaluate the population-weighted results:

- **Current Conditions & Future Scenario:** Population-weighted baseline averages and standard deviations were calculated for baseline using CBG 2015 population counts for the set of CBGs in each sub-group as defined above in areas of concern. Population-weighted scenario averages and standard deviations were calculated using the projected CBG 2035 population for the set of CBGs in each sub-group for Scenario 2A.
- **Change from Baseline:** Absolute differences between population-weighted averages for the baseline for Scenario 2A were calculated and evaluated.

4.2 Baseline Conditions

Current conditions reflect past investment patterns, built environment conditions, and demographics for communities of concern. Each of the 17 NPHAM health indicators were summarized by CalEnviroScreen areas, areas of concentrated minority populations, and concentrated poverty areas in San Joaquin County.

Appendix A provides more details on the health outcomes for baseline and Scenario 2A results for EnviroScreen areas (Table 12, Table 13, and Table 14), for areas of concentrated minority populations (Table 15, Table 16, and Table 17), and areas of concentrated poverty (Table 18, Table 19, and Table 20).

Results for baseline conditions include:

- **Physical Activity & Travel Behavior**:
    - CalEnviroScreen areas show the same levels of walking for transportation as for San Joaquin County as a whole (1.58 minutes for both), and only slightly higher levels of participation in walking for transport (16.40% compared to 16.06% for the County). Concentrated minority areas exhibited slightly higher levels than the County (1.63 minutes and 17.68% participation) and concentrated poverty areas even higher levels still (1.73 minutes and 19.58% participation).
    - Leisure walking duration and participation for CalEnviroScreen areas were similar to countywide averages (14.55 minutes and 59.37% participation compared to 15.06 minutes and 59.95% for the County). Duration and participation were lower for concentrated minority areas (13.88 minutes and 58.74% participation) and concentrated poverty areas (13.82 minutes and 58.65% participation).
    - Recreational physical activity showed the most differences between the countywide average and the areas of concern. CalEnviroScreen areas indicated 1 fewer minutes of duration and 2% less participation in comparison to the County (59.76 minutes and 5.34% participation vs.

60.40 minutes and 7.27% participation). Recreational physical activity was even lower for concentrated poverty areas with 9 fewer minutes (51.32) and about 6% lower participation at 0.56%.
    - Bicycling for transport remained relatively constant at the County and the three areas of concern at 1.05 daily minutes and about 1.2% participation.
- **Health Behaviors:**
    - Average BMI was slightly higher in CalEnviroScreen areas, concentrated minority areas, and concentrated poverty areas, as was percent obese and percent overweight or obese (29.10, 33.1%, and 68.1% respectively) for all areas of concern compared to countywide (28.93, 32.1% and 67.2% respectively).
    - The percentage reporting high blood pressure and coronary heart disease was slightly lower in each of CalEnviroScreen areas (29.0% and 4.4%), concentrated minority areas (28.3% and 4.0%) and concentrated poverty areas (28.6% and 4.1%) in comparison to the countywide weighted average (29.4% and 4.7%) respectively. Figure 10 shows a choropleth map of the distribution of coronary heart disease for San Joaquin County for the baseline year.
    - Type 2 diabetes was slightly higher in CalEnviroScreen areas (9.7%) and concentrated poverty areas (9.9%) than in the County as a whole and concentrated minority areas (9.5% for both).
- **General Health & Mental Health:**
    - Fair or poor general health was nearly 4% higher in CalEnviroScreen areas (20.0%), almost 8% higher in concentrated minority areas (23.6%), and 10% higher in concentrated poverty areas (25.9%) compared to the County (16.2%).
    - Both mental health indicators (depression and psychological distress) were also higher in CalEnviroScreen areas (28.0%; 5.2% respectively), concentrated minority areas (30.3%; 5.7%) and concentrated poverty areas (31.7%; 6.1%) than countywide (25.7% and 4.7%)

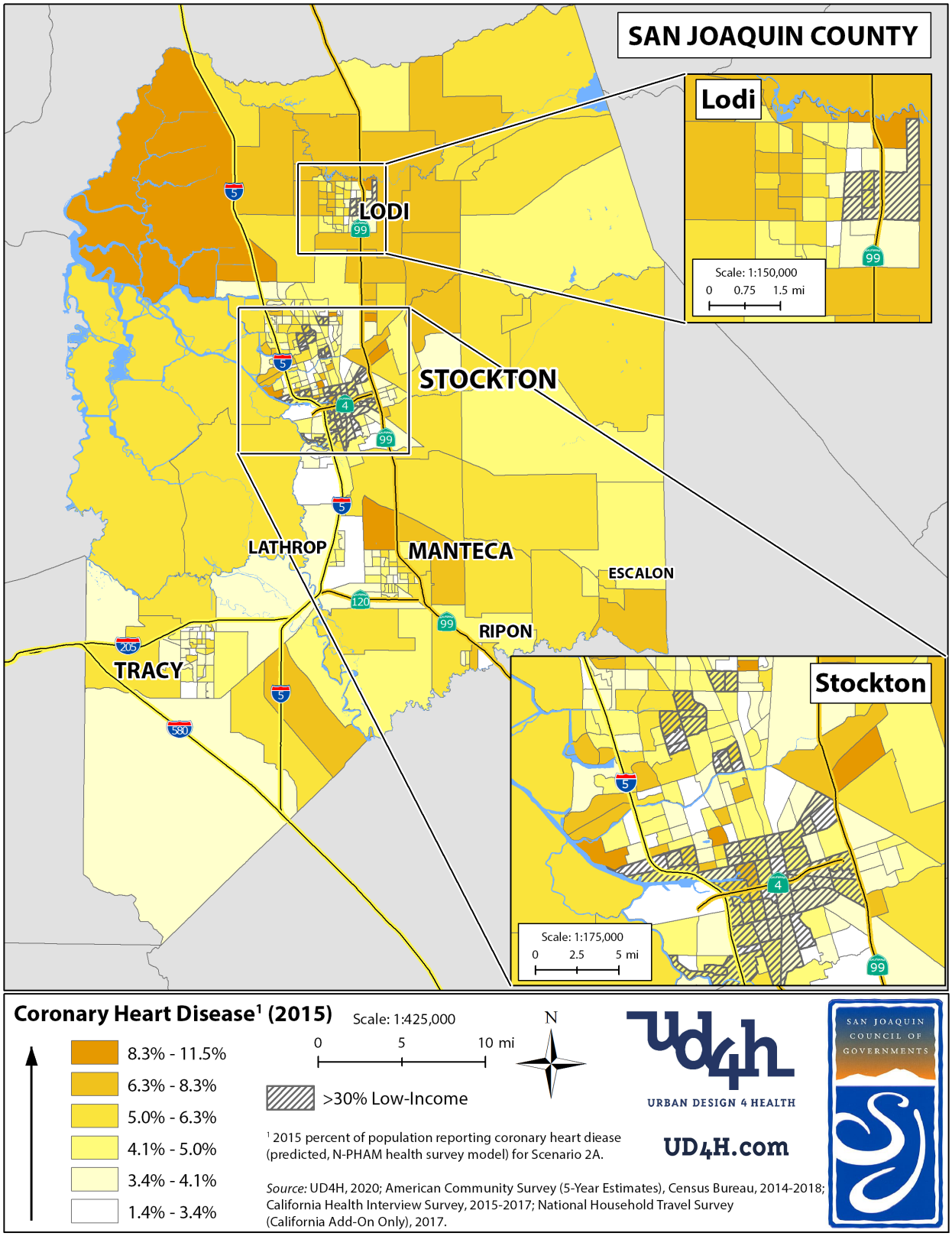

Figure 10: Estimated percentage of population reporting coronary heart disease for baseline (2015).

4.3 Change from Baseline to Scenario 2A

By 2035, the planned land-use changes and investment strategies in the 2018 RTP are expected to be in place. To account for this, NPHAM estimates future outcomes for CBG based on built environment changes as defined by SJCOG within Envision Tomorrow. Demographics are primarily assumed to match the proportion within the CBG in 2015. The exception is an assumed overall regional reduction in the proportion of low-income households due to definitions around place type developments in Envision Tomorrow.

While the baseline and scenario distributions of healthy travel behavior and health outcomes are valuable in understanding equitable access to healthy environments, the change in baseline to Scenario A is the most descriptive in understanding the effect of the planned investments and policies. Even when disparities between areas of concern and the remainder of the region exist in 2035, larger changes in a healthy direction for areas of concern can indicate the scenario under consideration is moving in the right direction for health equity.

Table 9 provides a summary of the difference between the weighted mean of the future 2035 scenario (Scenario 2A) and the baseline 2015 for travel behavior and physical activity estimates by the three areas of concern. Each area of concern value is then compared with the average change between 2015 and 2035 for the balance of the County.[20] Absolute difference was chosen for this comparison because the percent difference may perpetuate inequities. The columns describing the change in weighted mean for areas of concern are color-coded to assist in interpretation. If the area of concern was moving in a more healthful direction, it was colored green; if the balance of the County was moving in a more healthful direction, it was colored black; if the area of concern or the balance of the County was moving in a less healthful direction, it was colored red; if the area of concern outperformed the balance of the County in a healthier direction, it was bolded, underlined and shaded.

Highlights of the equity analysis of changes attributed to Scenario 2A for travel behavior and physical activity are as follows:

- **Walking for Transportation:** This indicator demonstrated the highest levels of increase among the physical activity and travel behavior measures evaluated, ranging from a third to over a two-thirds increase. All areas of concern gained more transportation walking minutes than the balance of the County. The percentage of the population participating in transportation walking was higher

[20] The balance of the county includes all block groups that are not part of the specific area of concern and may include block groups that are flagged as areas of different concern. For example, block groups that are included in the balance of the county for CalEnviroScreen may include block groups that are minority or poverty areas of concern and vice versa.

between 2015 and 2035 in CalEnviroScreen areas, areas of concentrated minorities, and areas of concentrated poverty.

- **Walking for Leisure:** This indicator showed that all areas of concern were gaining both duration minutes and participation percentage at higher levels in comparison to their balance of the county counterparts. However, levels of absolute change were not as significant in comparison to walking for transport.
- **Bicycling for Transportation:** Although all areas of concern yielded results in a healthy direction, both duration minutes and participation percentage increased only slightly for all the areas of concern and the balance of the County.
- **Recreational Physical Activity:** The results indicate a slight unhealthy change in the duration minutes and only marginally healthy direction for participation. In addition to the potential built environment impacts on recreational opportunities and locations, one must also have the time available. People in areas of concentrated poverty may have less time for leisure activity, which may result in less recreational physical activity. It is also noted, that increases are shown for transportation walking and bicycling, and walking for leisure. It may be possible that a decrease in recreational physical activity could be due to people reallocating their time to these transportation and leisure activities, as well as others. The CalEnviroScreen areas, areas of concentrated minorities, and poverty all lost minutes even as their counterparts in the balance of the County lost fewer minutes. The percentage of the population participating in recreational physical activity showed moderate increases for CalEnviroScreen areas only and exhibited slightly lower increases for areas of concentrated minorities and poverty.

Table 9: Difference in weighted means between Scenario 2A and baseline for travel behavior and physical activity estimates by area of concern.

Health Outcome	*CalEnviroScreen*		*Minority*		*Poverty*	
	Area of Concern	*Balance of County*	*Area of Concern*	*Balance of County*	*Area of Concern*	*Balance of County*
Daily minutes of walking for transportation	**+0.037**	+0.022	**+0.039**	+0.025	**+0.038**	+0.028
Percent of daily walking for transport participation	**+0.63%**	+0.35%	**+0.68%**	+0.40%	**+0.71%**	+0.43%
Daily minutes of walking for leisure	**+0.085**	+0.060	**+0.083**	+0.068	**+0.080**	+0.071
Percent of weekly walking for leisure participation	**+0.10%**	+0.06%	**+0.10%**	+0.07%	**+0.09%**	+0.08%
Daily minutes of bicycling for transportation	**+0.003**	+0.002	**+0.003**	+0.002	+0.002	
Percent of daily bicycling for transport participation	**+0.03%**	+0.02%	**+0.03%**	+0.02%	+0.03%	
Weekly minutes of recreational physical activity	-0.012	-0.005	-0.018	-0.004	-0.017	-0.006
Percent of weekly recreational physical activity participation	**+0.04%**	+0.03%	+0.01%	+0.05%	+0.01%	+0.04%

Green = area shows improved health for the subareas; black = Balance of County shows improved health; red = area shows worse health; **bold underlined and shaded** indicates the area outperforms the balance of the County

Highlights of the equity analysis of changes attributed to Scenario 2A for health behaviors are as follows:

- **BMI, Obesity & Overweight Status**: All areas of concern improved at nearly the same rates in Scenario 2A with a reduced BMI (Table 10). The same was true for obesity and overweight or obese status, except for areas of concentrated poverty that exhibited a slightly lower percent decrease than the balance of the County.
- **Cardiovascular Disease**: All areas of concern showed changes in the healthy direction, with only minor decreases and virtually no changes between areas of concern. This was to be expected given the relatively low average prevalence of this condition in the region. High blood pressure showed a similar pattern, with marginal changes in prevalence in areas of concern over the balance of the County. Figure 11 shows a choropleth map of the distribution of high blood pressure for San Joaquin County for the Scenario 2A.
- **Type 2 Diabetes**: All areas of concern out-gained corresponding areas in the balance of the county with a decrease in this indicator in a healthy direction.

Table 10: Difference in weighted means between Scenario 2A and baseline for health behaviors and cardiovascular disease estimates by area of concern.

Health Outcome	*CalEnviroScreen*		*Minority*		*Poverty*	
	Area of Concern	*Balance of County*	*Area of Concern*	*Balance of County*	*Area of Concern*	*Balance of County*
Average body mass index (BMI)	**-0.051**	-0.034	**-0.050**	-0.039	**-0.045**	-0.042
Percent of the population with obese status (>30 BMI)	**-0.35%**	-0.23%	**-0.35%**	-0.26%	**-0.33%**	-0.28%
Percent of the population with overweight or obese status (>25 BMI)	**-0.33%**	-0.22%	**-0.32%**	-0.26%	-0.26%	-0.28%
Percent of the population with coronary heart disease	**-0.05%**	-0.04%	**-0.05%**	-0.04%	**-0.05%**	-0.04%
Percent of the population with high blood pressure	**-0.36%**	-0.24%	**-0.36%**	-0.27%	**-0.36%**	-0.28%
Percent of the population with type 2 diabetes	**-0.16%**	-0.10%	**-0.16%**	-0.12%	**-0.17%**	-0.12%

Green = area shows improved health for the subareas; black = Balance of County shows improved health; red = area shows worse health; **bold underlined and shaded** indicates the area outperforms the balance of the County

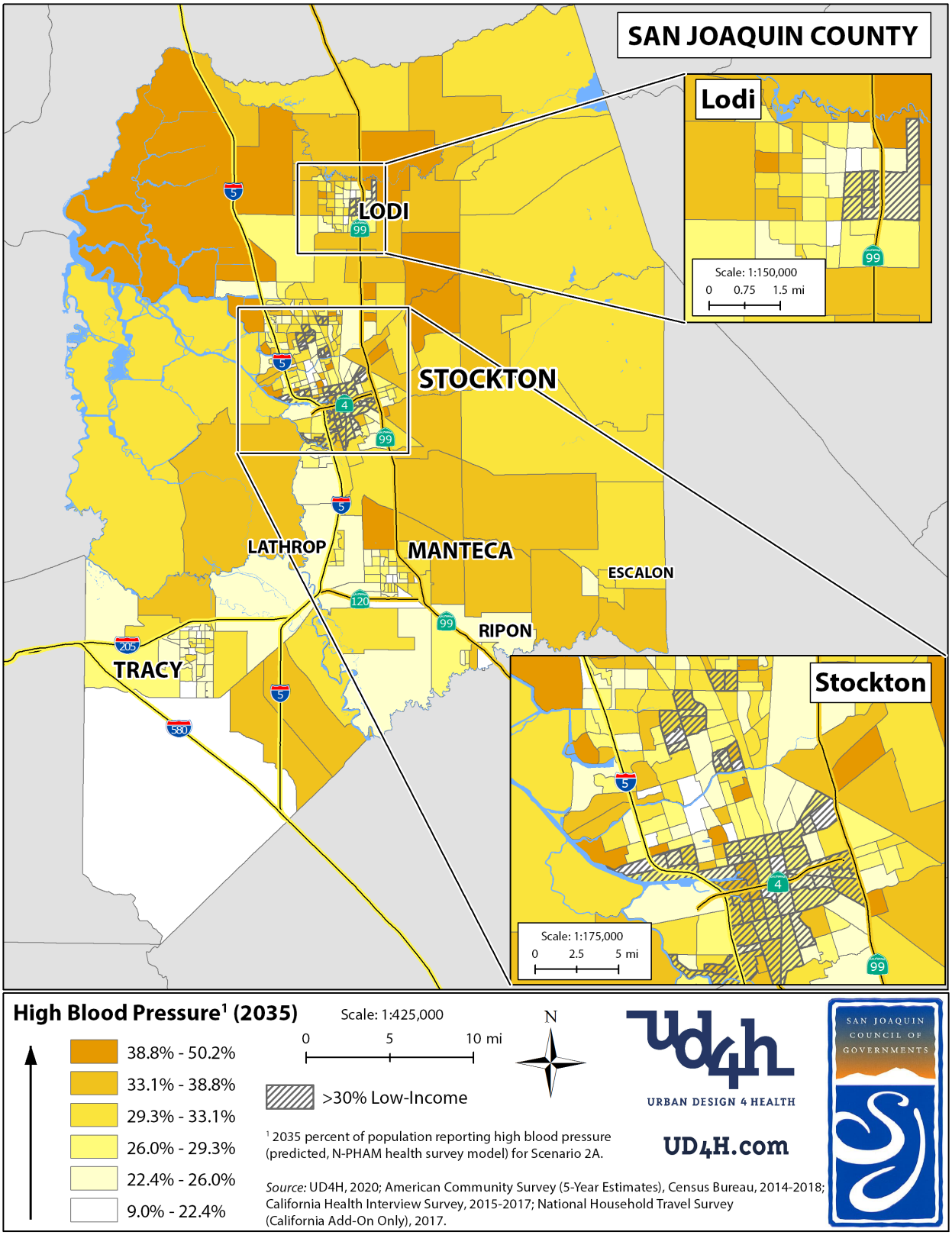

Figure 11: Estimated percentage of population reporting high blood pressure for Scenario 2A (2035).

Highlights of the equity analysis of changes attributed to Scenario 2A for general and mental health status are as follows:

- **Percent Fair or Poor Health**: All areas of concern indicated positive change, with a reduction in fair to poor general health status. These areas showed double to triple the improvements made in the balance of the county.
- **Mental Health**: Both mental health indicators showed areas of concern improving more than the balance of the County.

Table 11: Difference in weighted means between Scenario 2A and baseline for general health and mental health status estimates by area of concern.

Health Outcome	*CalEnviroScreen*		*Minority*		*Poverty*	
	Area of Concern	*Balance of County*	*Area of Concern*	*Balance of County*	*Area of Concern*	*Balance of County*
Percent of population reporting fair to poor general health status	**-0.09%**	-0.03%	**-0.11%**	-0.04%	**-0.14%**	-0.04%
Percent of population reporting depression	**-0.21%**	-0.11%	**-0.26%**	-0.11%	**-0.33%**	-0.11%
Percent of population reporting psychological distress	**-0.09%**	-0.04%	**-0.12%**	-0.04%	**-0.15%**	-0.05%

Green = area shows improved health for the subareas; black = Balance of County shows improved health; red = area shows worse health; **bold underlined and shaded** indicates the area outperforms the balance of the County

Among the areas of concern, the CalEnviroScreen areas performed better than the balance of the region on 16 of 17 health indicators evaluated. Areas of concentrated minority populations followed suit performing better than the balance of the region on 15 of 17 health indicators only generating poorer health outcomes for recreational physical activity duration and participation. Areas of concentrated poverty performed better than the rest of the County on 12 of 17 health indicators. However, of the remaining five indicators, areas of concentrated poverty performed worse on three and had no discernable difference found on the remaining two indicators. When interpreting these results, it must be taken into account that the CalEnviroScreen includes more than double the number of block groups than poverty area block groups in the region (CalEnviroScreen area: 54.4% of block groups in San Joaquin County; poverty areas: 22.5% of block groups in San Joaquin County).

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6 Appendix A: Health Outcomes by Community of Concern Areas

Table 12, Table 13 and Table 14 show weighted health outcomes for CalEnviroScreen index designated areas for travel behavior and physical activity, health behaviors and cardiovascular disease, and general health and mental health status respectively.

Table 12: Weighted travel behavior and physical activity estimates for baseline and Scenario 2A for CalEnviroScreen designated areas only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Daily minutes of walking for transportation	1.58 (0.38)	1.62 (0.39)	+0.037	+2.33%
Percent of daily walking for transport participation	16.40% (7.14%)	17.03% (7.35%)	+0.006	+3.82%
Daily minutes of walking for leisure	14.55 (1.49)	14.63 (1.53)	+0.085	+0.58%
Percent of weekly walking for leisure participation	59.37% (1.88%)	59.47% (1.90%)	+0.001	+0.16%
Daily minutes of bicycling for transportation	1.05 (0.03)	1.05 (0.03)	+0.003	+0.27%
Percent of daily bicycling for transport participation	1.13% (0.44%)	1.16% (0.44%)	+0.000	+2.74%
Weekly minutes of recreational physical activity	59.76 (48.42)	59.75 (48.40)	-0.0122	-0.02%
Percent of weekly recreational physical activity participation	5.34% (22.47%)	5.38% (22.50%)	+0.0004	+0.24%

Green = area shows improved health; red = area shows worse health

Table 13: Weighted health behaviors and cardiovascular disease estimates for baseline and Scenario 2A for CalEnviroScreen designated areas only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Average body mass index (BMI)	29.10 (0.59)	29.05 (0.60)	-0.051	-0.18%
Percent of the population with obese status (>30 BMI)	33.1% (3.73%)	32.8% (3.78%)	-0.004	-1.06%
Percent of the population with overweight or obese status (>25 BMI)	68.1% (3.95%)	67.8% (4.02%)	-0.003	-0.48%
Percent of the population with coronary heart disease	4.4% (1.26%)	4.4% (1.24%)	-0.0005	-1.11%
Percent of the population with high blood pressure	29.0% (5.00%)	28.6% (4.96%)	-0.004	-1.23%
Percent of the population with type 2 diabetes	9.7% (3.06%)	9.5% (2.99%)	-0.002	-1.66%

Green = area shows improved health; red = area shows worse health

Table 14: Weighted general health and mental health status estimates for baseline and Scenario 2A for CalEnviroScreen designated areas only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Percent of population reporting fair to poor general health status	20.0% (7.70%)	19.9% (7.64%)	-0.0009	-0.45%
Percent of population reporting depression	28.0% (4.72%)	27.8% (4.62%)	-0.002	-0.75%
Percent of population reporting psychological distress	5.2% (1.14%)	5.1% (1.11%)	-0.001	-1.78%

Green = area shows improved health; red = area shows worse health

Table 15, Table 16 and Table 17 show weighted health outcomes for concentrated minority population areas for travel behavior and physical activity, health behaviors and cardiovascular disease, and general health and mental health status respectively.

Table 15: Weighted travel behavior and physical activity estimates for baseline and Scenario 2A for concentrated minority population areas only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Daily minutes of walking for transportation	1.63 (0.37)	1.67 (0.39)	+0.039	+2.37%
Percent of daily walking for transport participation	17.68% (7.11%)	18.36% (7.37%)	+0.007	+3.84%
Daily minutes of walking for leisure	13.88 (1.10)	13.96 (1.13)	+0.083	+0.60%
Percent of weekly walking for leisure participation	58.74% (1.49%)	58.84% (1.50%)	+0.001	+0.17%
Daily minutes of bicycling for transportation	1.05 (0.03)	1.05 (0.03)	+0.003	+0.26%
Percent of daily bicycling for transport participation	1.13% (0.43%)	1.16% (0.43%)	+0.000	+2.68%
Weekly minutes of recreational physical activity	63.57 (49.90)	63.56 (49.89)	-0.0178	-0.03%
Percent of weekly recreational physical activity participation	2.03% (13.50%)	2.04% (13.50%)	+0.0001	+0.37%

Green = area shows improved health; red = area shows worse health

Table 16: Weighted health behaviors and cardiovascular disease estimates for baseline and Scenario 2A for concentrated minority population areas only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Average body mass index (BMI)	29.10 (0.58)	29.05 (0.58)	-0.050	-0.17%
Percent of the population with obese status (>30 BMI)	33.3% (3.63%)	32.9% (3.66%)	-0.004	-1.06%
Percent of the population with overweight or obese status (>25 BMI)	67.8% (3.86%)	67.5% (3.95%)	-0.003	-0.47%
Percent of the population with coronary heart disease	4.0% (0.81%)	4.0% (0.79%)	-0.0005	-1.17%
Percent of the population with high blood pressure	28.3% (4.11%)	28.0% (4.08%)	-0.004	-1.28%
Percent of the population with type 2 diabetes	9.5% (2.81%)	9.3% (2.76%)	-0.002	-1.69%

Green = area shows improved health; red = area shows worse health

Table 17: Weighted general health and mental health status estimates for baseline and Scenario 2A for concentrated minority population areas only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Percent of population reporting fair to poor general health status	23.6% (6.28%)	23.5% (6.21%)	-0.0011	-0.48%
Percent of population reporting depression	30.3% (3.73%)	30.0% (3.61%)	-0.003	-0.86%
Percent of population reporting psychological distress	5.7% (1.02%)	5.6% (0.99%)	-0.001	-2.09%

Green = area shows improved health; red = area shows worse health

Table 18, Table 19 and Table 20 show weighted health outcomes for concentrated poverty population areas for travel behavior and physical activity, health behaviors and cardiovascular disease, and general health and mental health status respectively.

Table 18: Weighted travel behavior and physical activity estimates for baseline and Scenario 2A for areas of concentrated poverty only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Daily minutes of walking for transportation	1.73 (0.40)	1.76 (0.43)	+0.038	+2.18%
Percent of daily walking for transport participation	19.58% (7.44%)	20.28% (7.92%)	+0.007	+3.60%
Daily minutes of walking for leisure	13.82 (0.98)	13.90 (0.98)	+0.080	+0.58%
Percent of weekly walking for leisure participation	58.65% (1.41%)	58.74% (1.40%)	+0.001	+0.15%
Daily minutes of bicycling for transportation	1.05 (0.03)	1.06 (0.03)	+0.002	+0.18%
Percent of daily bicycling for transport participation	1.23% (0.46%)	1.25% (0.47%)	+0.000	+2.17%
Weekly minutes of recreational physical activity	51.32 (14.89)	51.31 (14.89)	-0.0169	-0.03%
Percent of weekly recreational physical activity participation	0.56% (3.51%)	0.57% (3.51%)	+0.0001	+0.49%

Green = area shows improved health; red = area shows worse health

Table 19: Weighted health behaviors and cardiovascular disease estimates for baseline and Scenario 2A for areas of concentrated poverty only.

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Average body mass index (BMI)	29.16 (0.56)	29.12(0.56)	-0.045	-0.16%
Percent of the population with obese status (>30 BMI)	33.6% (3.55%)	33.3% (3.54%)	-0.003	-0.98%
Percent of the population with overweight or obese status (>25 BMI)	68.1% (3.78%)	67.8% (3.82%)	-0.003	-0.39%
Percent of the population with coronary heart disease	4.1% (1.13%)	4.1% (1.12%)	-0.0005	-1.18%
Percent of the population with high blood pressure	28.6% (4.66%)	28.2% (4.61%)	-0.004	-1.26%
Percent of the population with type 2 diabetes	9.9% (2.95%)	9.7% (2.86%)	-0.002	-1.74%

Green = area shows improved health; red = area shows worse health

Table 20: Weighted general health and mental health status estimates for baseline and Scenario 2A for areas of concentrated poverty only

Health Outcome	*Weighted Mean (Weighted SD)*		*Absolute Change*	*Percent Change*
	Baseline	*Scenario 2A*		
Percent of population reporting fair to poor general health status	25.9% (5.76%)	25.8% (5.66%)	-0.0014	-0.54%
Percent of population reporting depression	31.7% (3.31%)	31.4% (3.16%)	-0.003	-1.03%
Percent of population reporting psychological distress	6.1% (0.87%)	5.9% (0.84%)	-0.001	-2.42%

Green = area shows improved health; red = area shows worse health