

Blueprint Health Metrics:

Incorporating Health Metrics into SACOG's Regional Transportation Planning Process

Proposed Approach & Draft Analysis

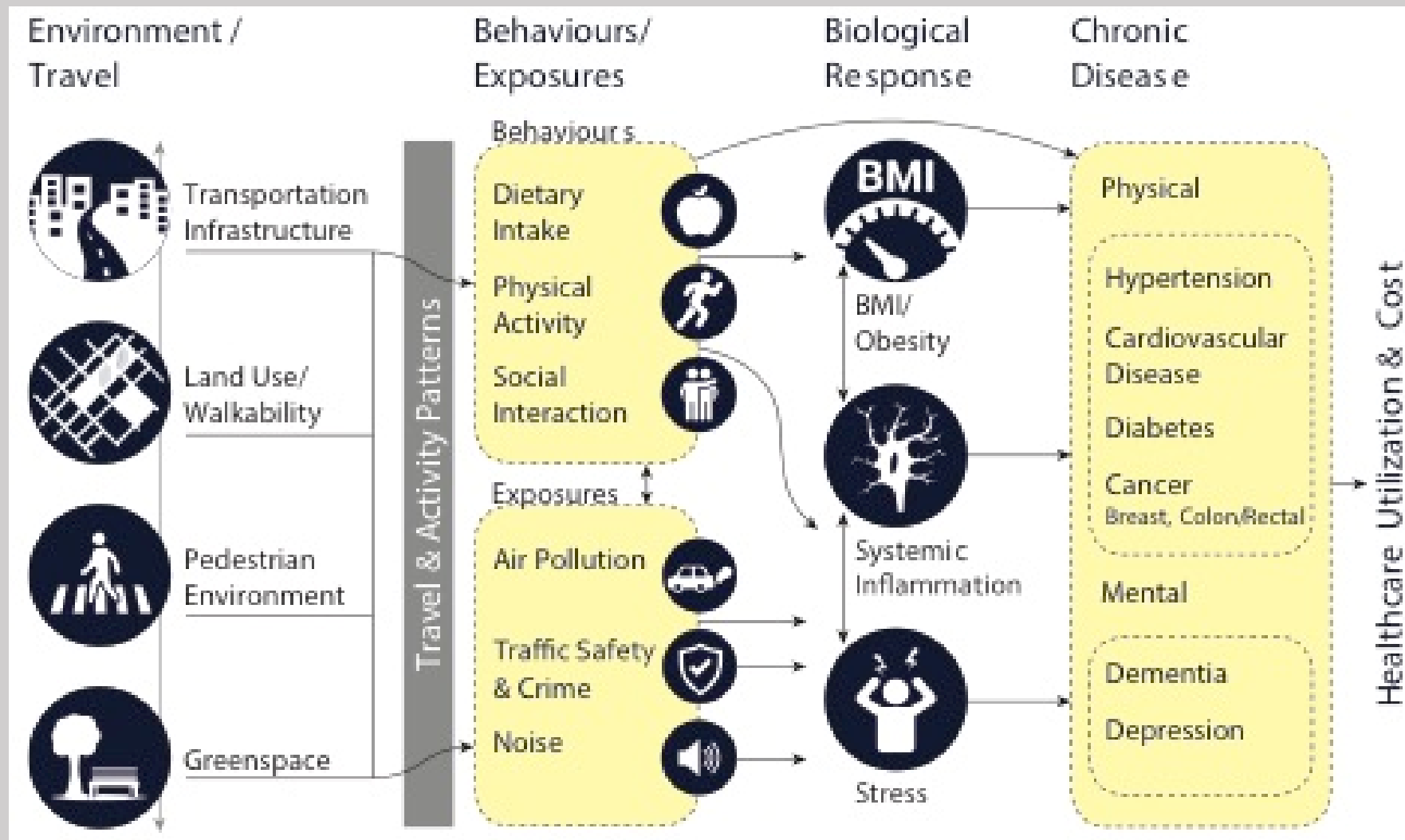
Urban Design 4 Health, Inc. www.ud4h.com

Lawrence Frank, President and Founder

Billy Bachman, Senior GeoSpatial Data Scientist



Pathway and Mechanisms



- Frank et al, 2019 Journal of Transport and Health

2021 Infrastructure Investment and Jobs Act – \$2+ Trillion

- ✓ **Focus: climate, resilience, equity, safety**
 - Repair/maintenance
 - Multi-modal accessibility
 - Clean energy
 - Bicycle and Pedestrian Safety
 - Ensure investment in underserved and vulnerable communities



BUILT ENVIRONMENT ELEMENTS & SCALE

MACRO

Transportation
Accessibility



Complete
Communities



MICRO

Pedestrian Environment



Recreational Versus Utilitarian Travel

- Active travel can be both recreation and destination based. Both forms result in physical activity that can reduce downstream chronic disease.
- Sedentary time (including time spent in cars) causes obesity and downstream chronic disease.
 - Time spent in cars has been linked with obesity and chronic disease. Each additional hour spent in a car is associated with a 6 percent increase in the likelihood of obesity.*
- A win - win relationship between health based co-benefits and climate mitigation can be achieved through the inclusion of active travel within daily destination based utilitarian travel

Frank, L.D., Andresen M, Schmid TL, 2004. Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars. [American Journal of Preventive Medicine](#). 27(2), 87-96.

National Public Health Assessment Model (NPHAM)

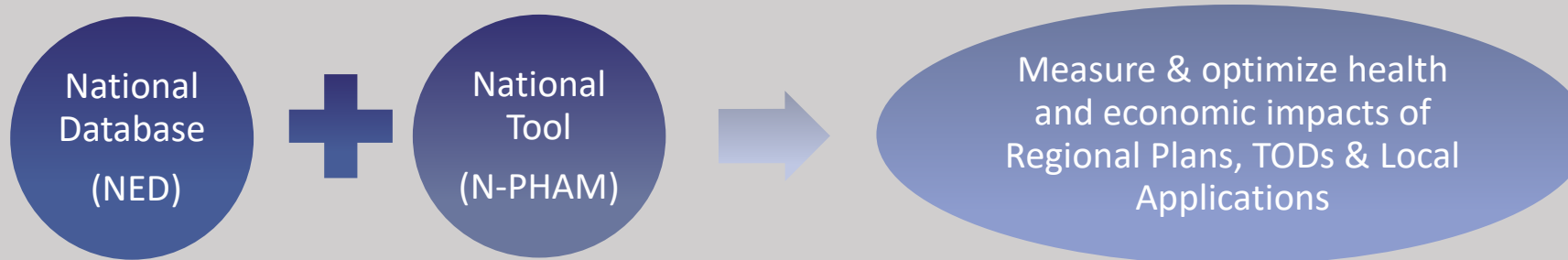
Purpose:

- Built to address a major gap in uniform health outcome measurement
- Tool to forecast future health conditions of alternative investments



Development:

- Created by Urban Design 4 Health
- Supported by the U.S. Environmental Protection Agency (EPA)



N-PHAM Application Process

Geospatial Inputs



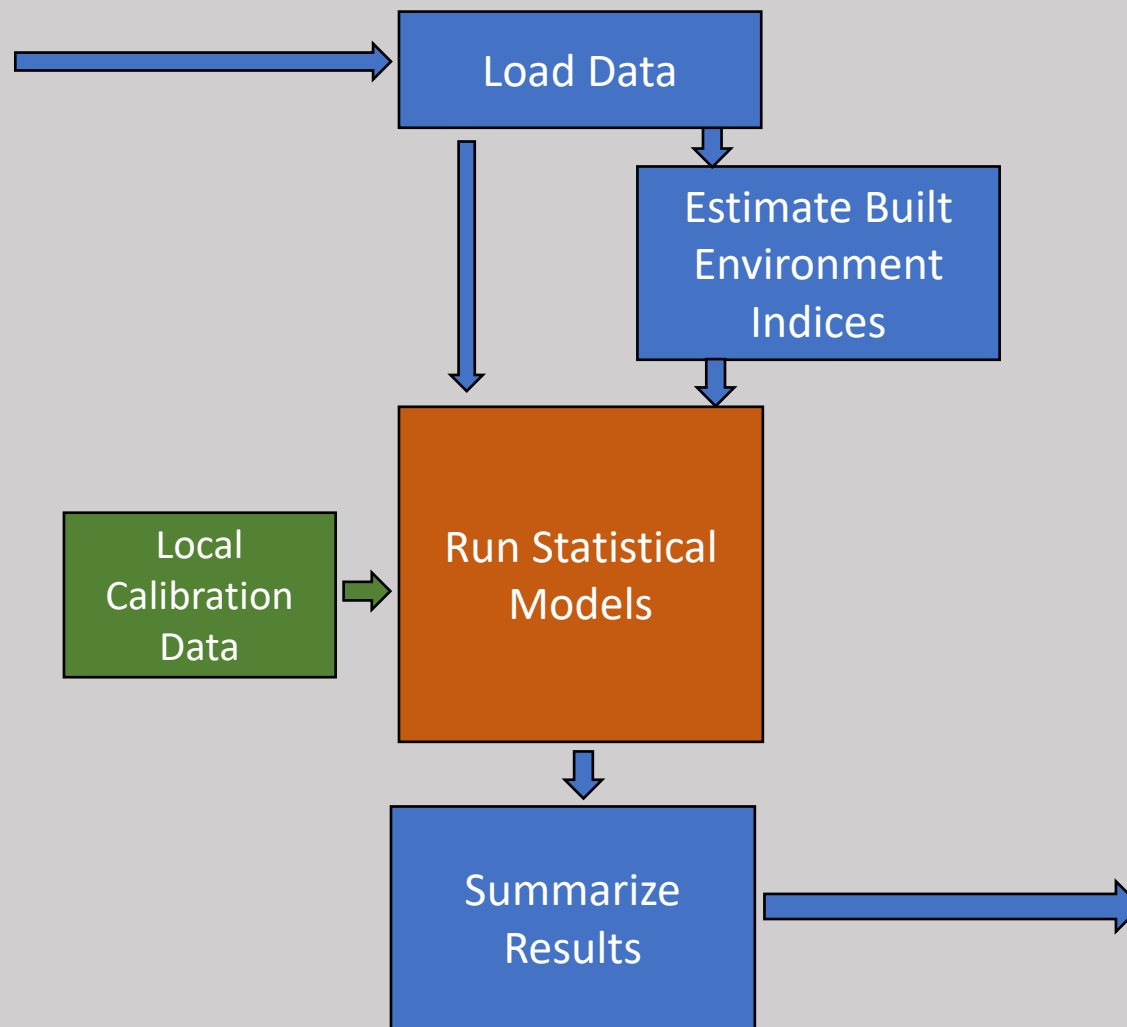
35 Social/Cultural Metrics

(Demographics - Census)

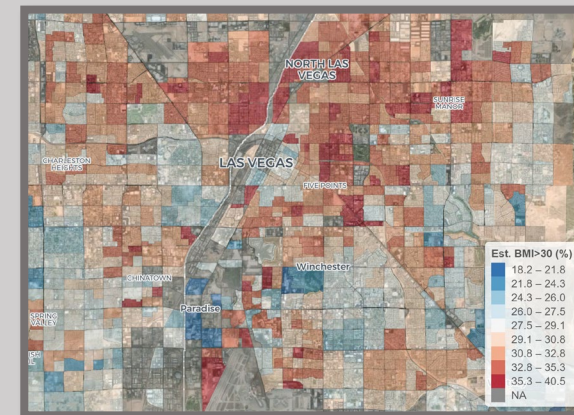
- Age
- Race
- Income
- Vehicles
- Family type
- Employment

22 Built/Natural Environment Metrics

- Density
- Accessibility
- Greenspace
- Transit
- Bike/ped



Geospatial Outputs



- Body Mass Index
- Physical Activity
- % Overweight
- % Obese
- % Type 2 Diabetes
- % Hypertension
- % Coronary heart disease
- Annualized cost of illness

SACOG Blueprint Pathways Allocating 278,000 New Households

Pathway 1:

Outward Expansion and Limited Infill

- Expands on historical development trends with majority of future growth occurs via outward expansion

Pathway 2:

Balanced Infill and Phased Expansion

- Some outward growth, robust infill
- Reflects development pattern of 2020 MTP/SCS

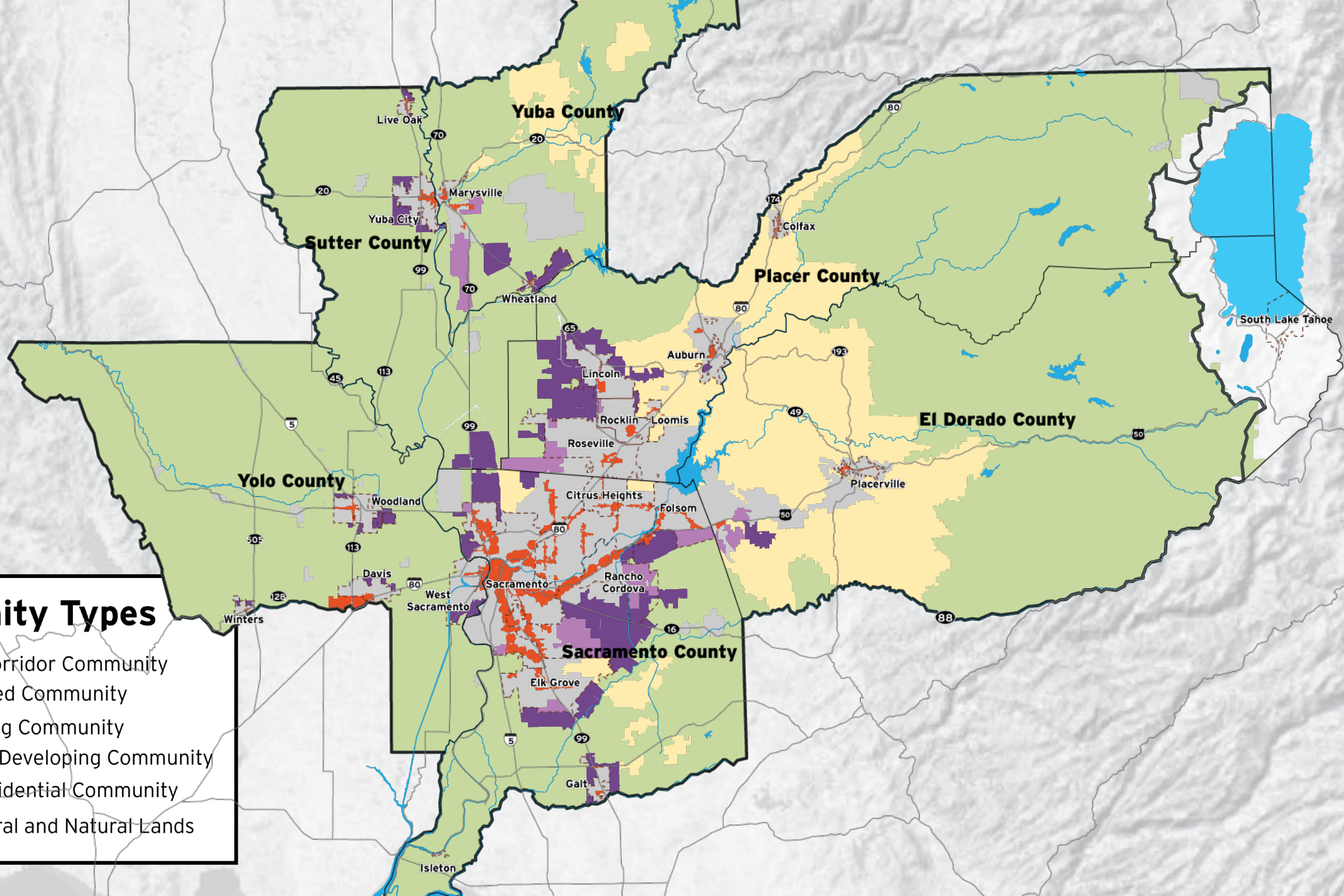
Pathway 3:

Focused Infill and Limited Expansion

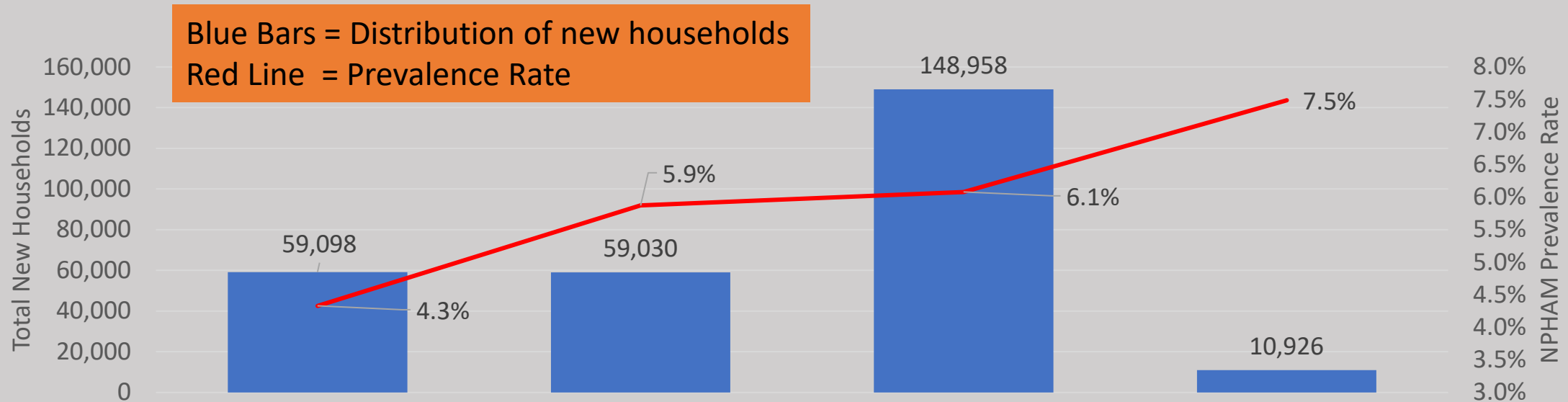
- Vast majority of growth occurs in infill areas with outward expansion only occurring when already under construction

Community Types

- Center/Corridor Community
- Established Community
- Developing Community
- Potential Developing Community
- Rural Residential Community
- Agricultural and Natural Lands



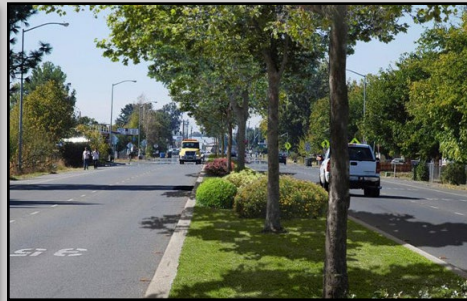
Pathway 1: Coronary Heart Disease



Centers and
Corridors



Existing
Communities



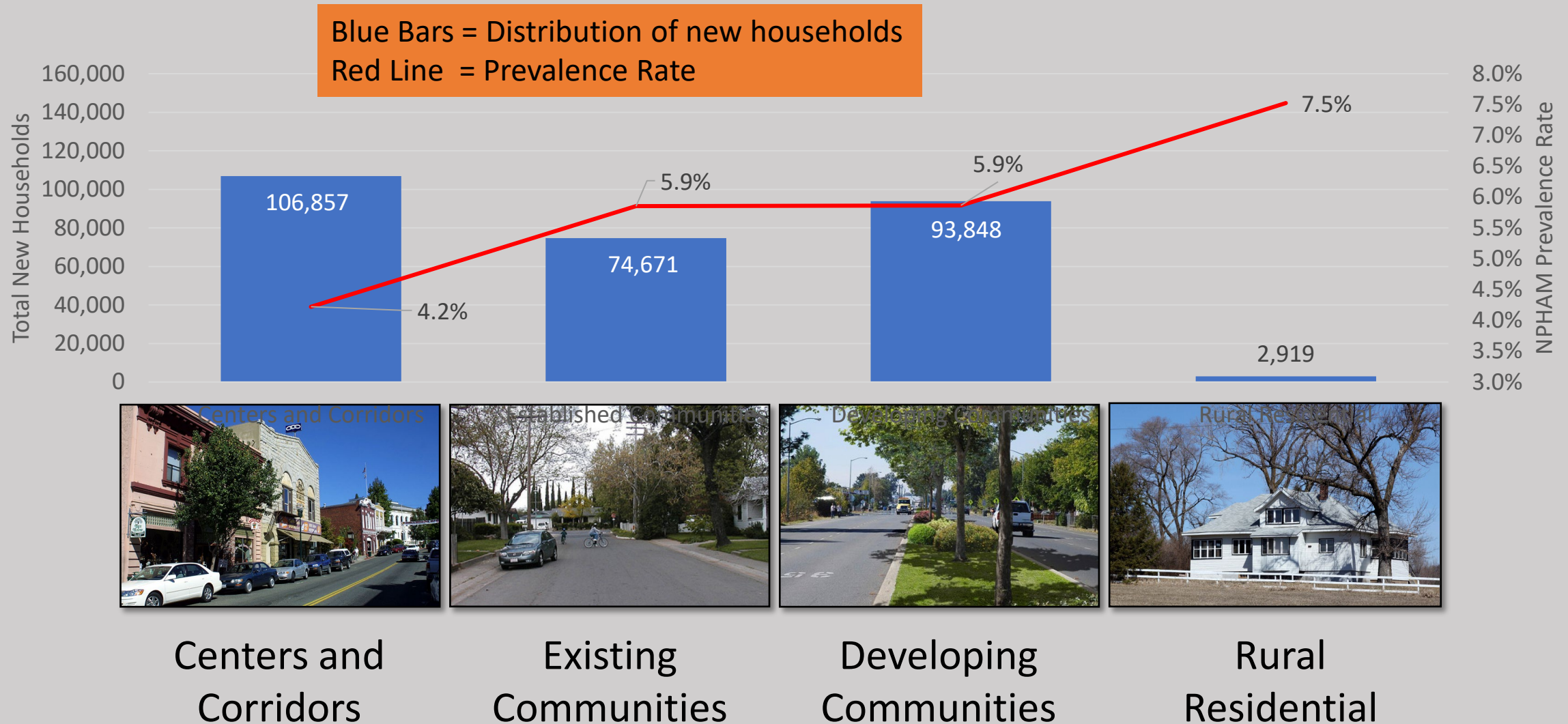
Developing
Communities



Rural
Residential

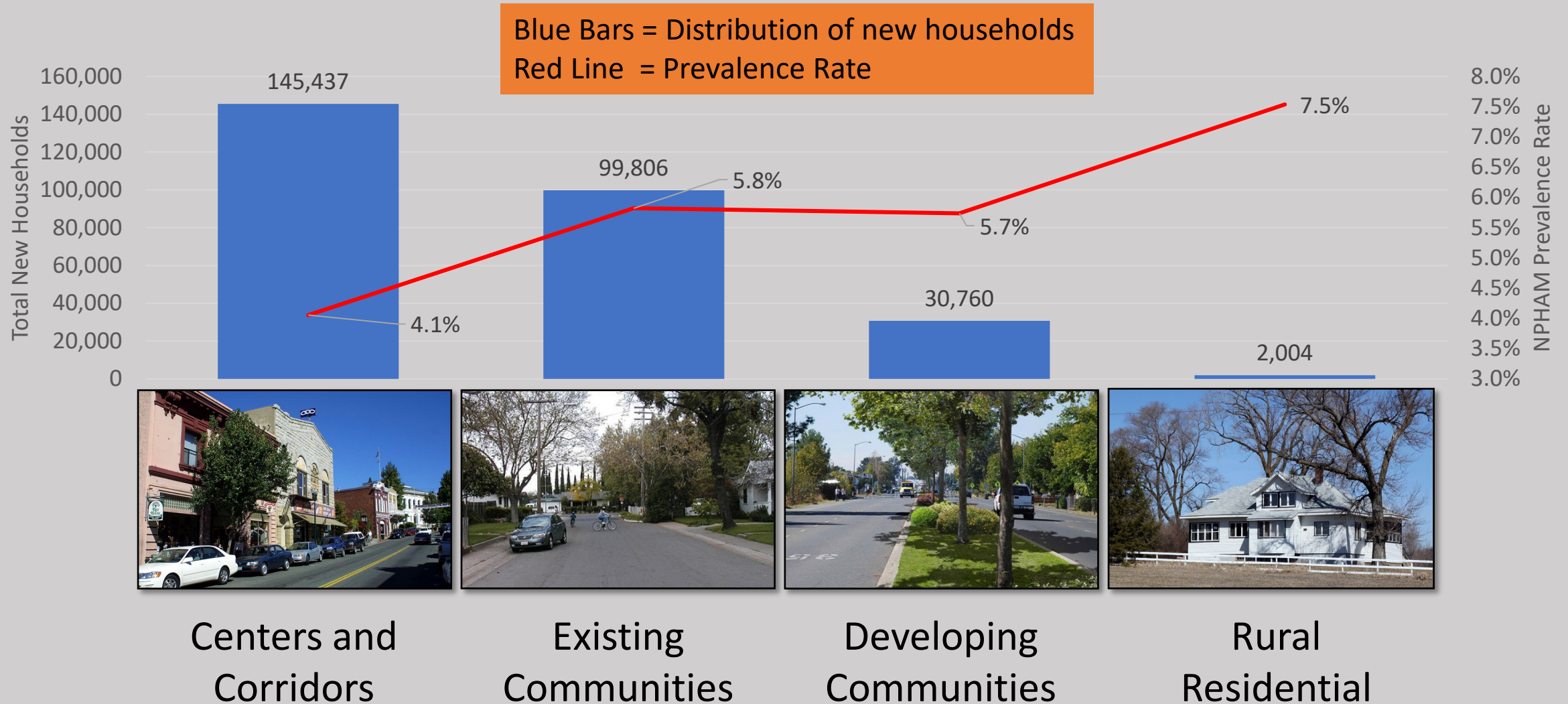
Pathway 2: Coronary Heart Disease

-5.8 % Fewer New Cases Compared to Pathway 1

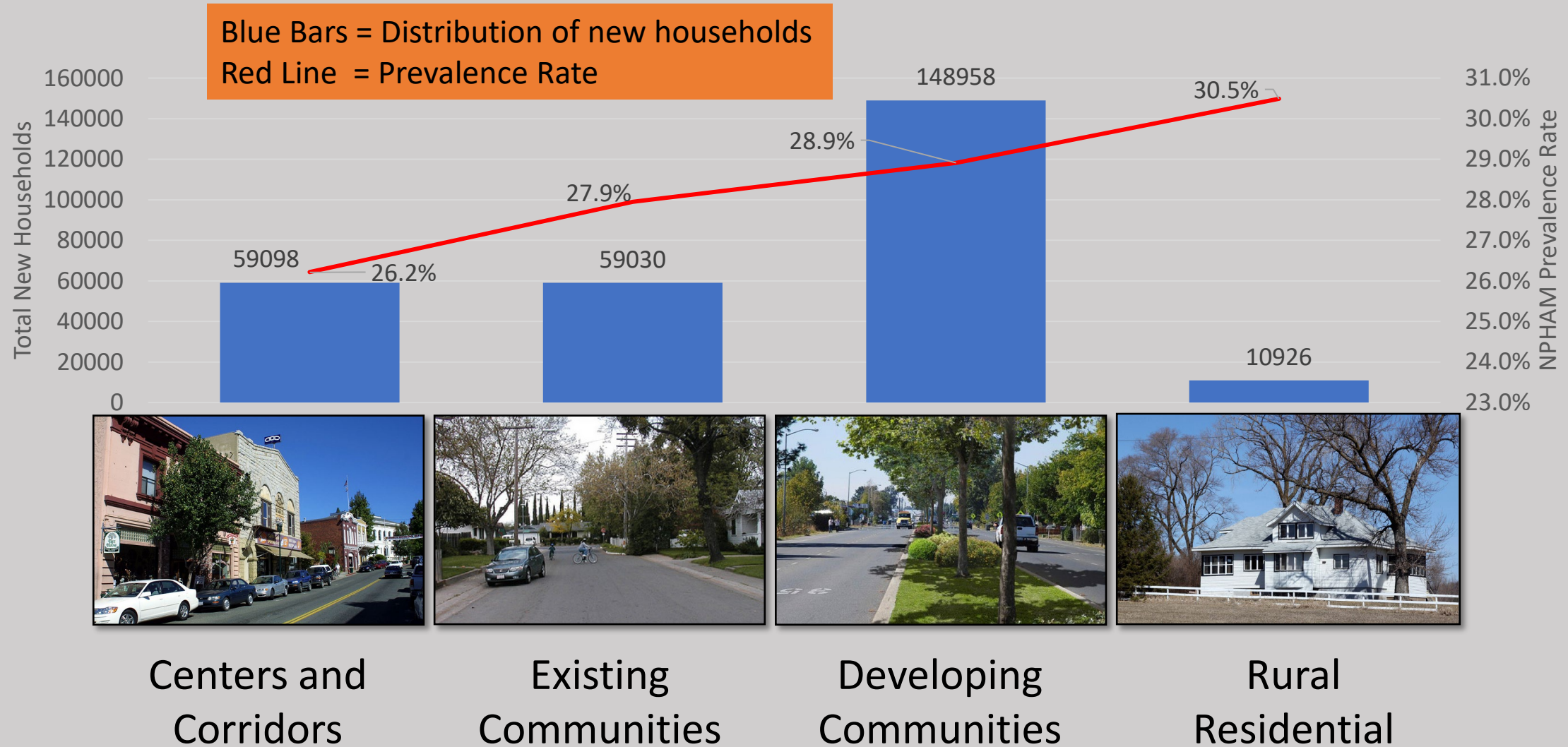


Pathway 3: Coronary Heart Disease

-11.4 % Fewer New Cases
Compared to Pathway

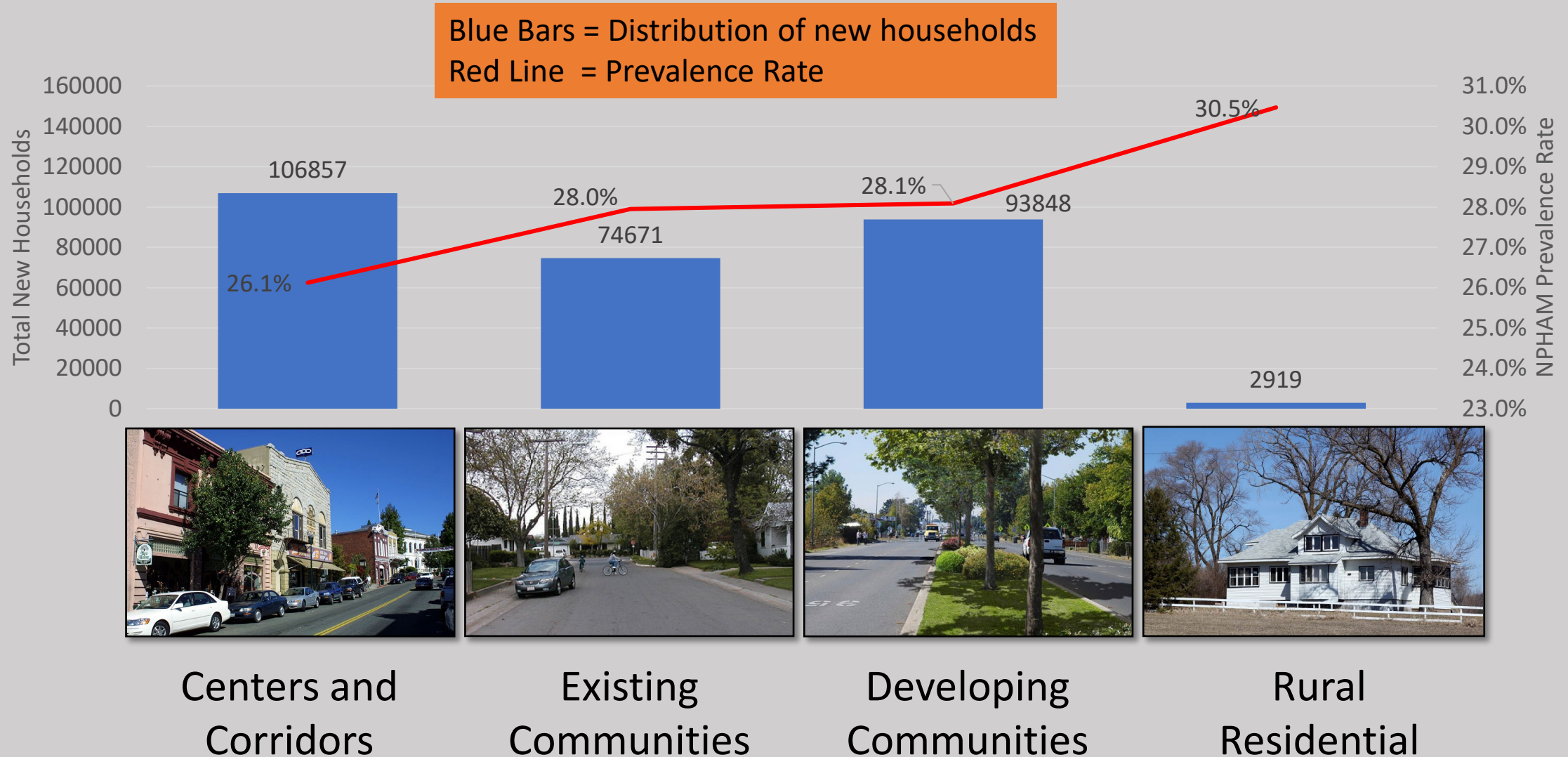


Pathway 1: Hypertension



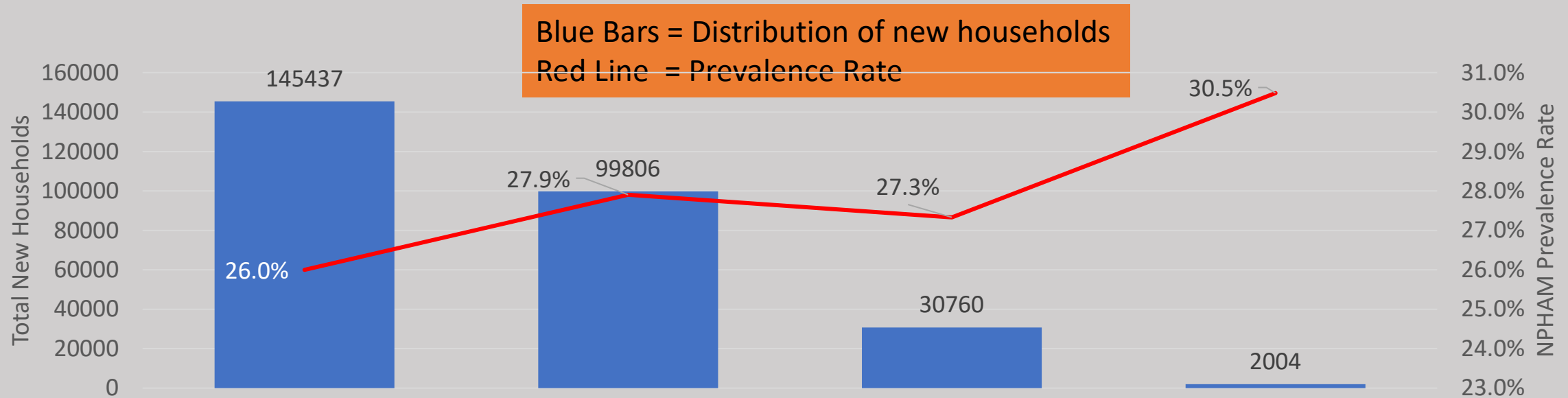
Pathway 2: Hypertension

-2.1 % Fewer New Cases
Compared to Pathway 1



Pathway 3: Hypertension

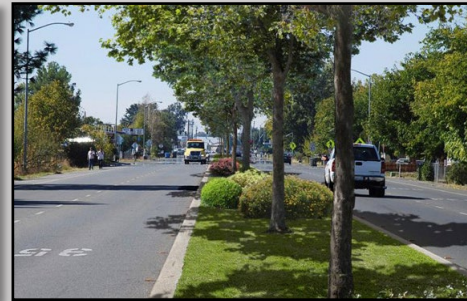
-3.1 % Fewer New Cases
Compared to Pathway 1



Centers and
Corridors



Existing
Communities



Developing
Communities



Rural
Residential

Compared to Pathway 1

	Coronary Heart Disease	Type 2 Diabetes	Hypertension	Cost of Illness (COI)
Pathway 2	-5.8%	-3.1%	-2.1%	-4.23%
Pathway 3	-11.4%	-5.1%	-3.1%	-7.77%

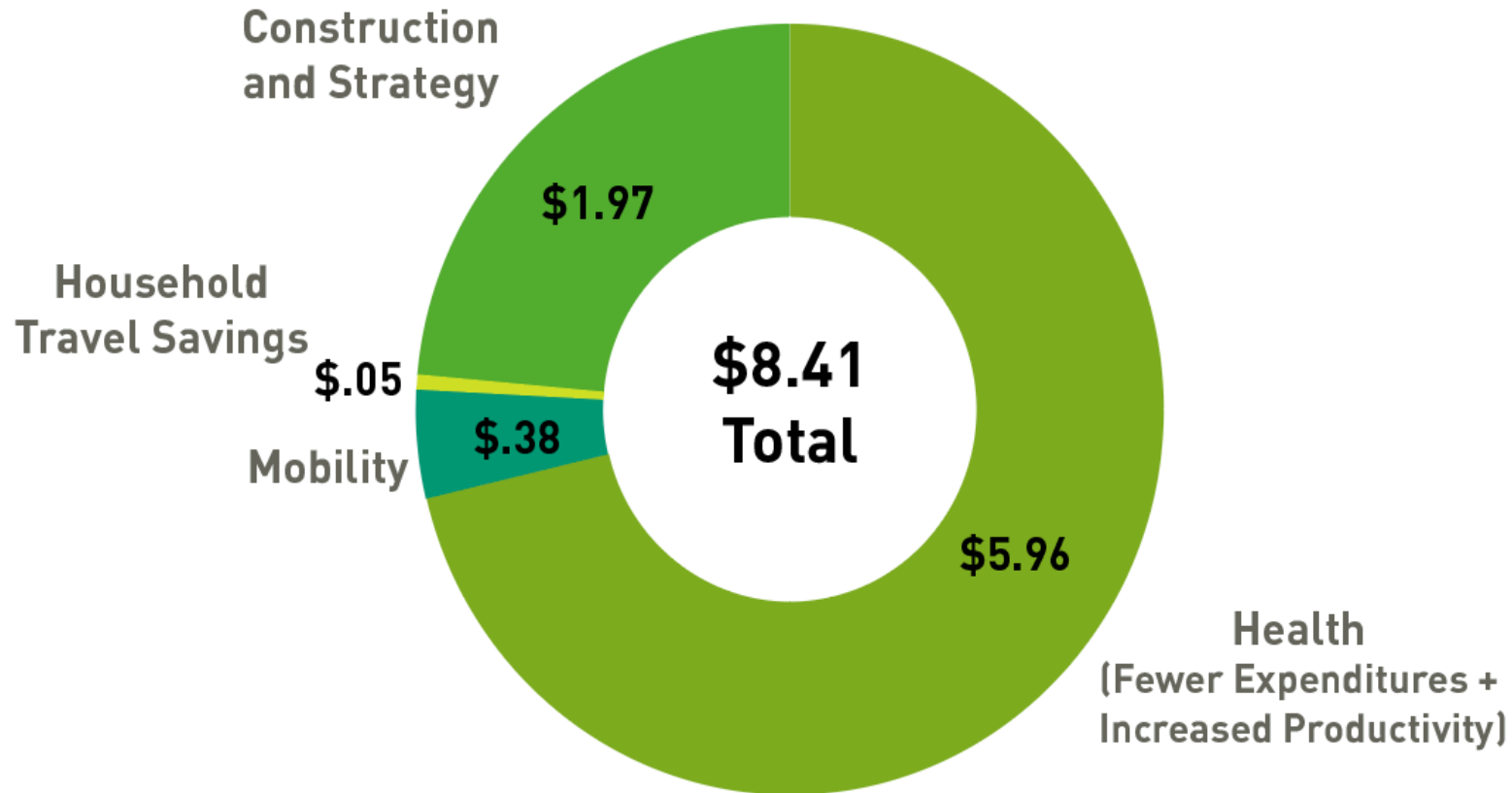
Using a Cost of Illness Approach to Capture a Portion of the Impacts:

- Pathway 2 saves **\$1.357 billion over 30 years**
- Pathway 3 saves **\$2.494 billion over 30 years**

Limitations: Does not capture major indirect effects from workforce productivity, only focuses on approximately 25% of the population in the region, only accounts for costs from a subset of illnesses

LOS ANGELES – REGIONAL TRANSPORTATION PLAN UPDATE

Per \$1 Spent on Active Transportation Infrastructure 2016-2040

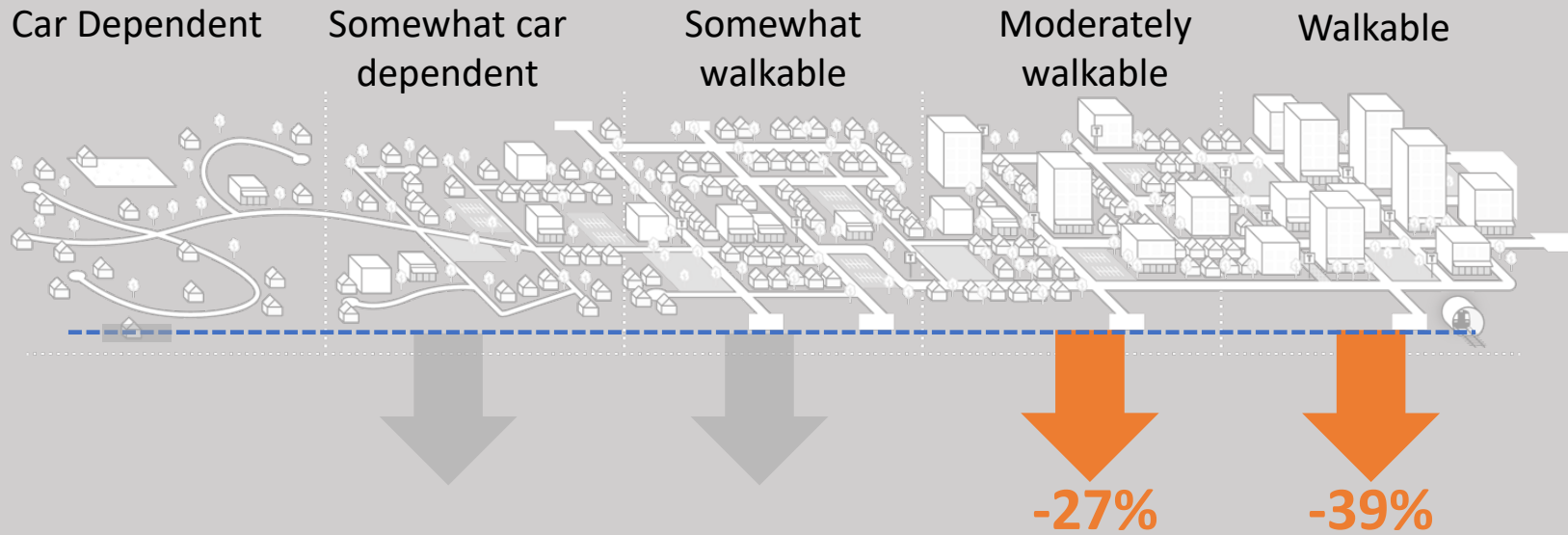


\$12.8 Billion Spent Will Generate \$113 Billion Over Life of the Plan

New SACOG Results
Consistent With
Published Evidence



Walkability and Diabetes



People living in a moderately walkable area are 27% less likely to have diabetes and people in a walkable area are 39% less likely to have diabetes compared to those living in a car dependent area.

Frank, L.D., Adhikari, B., White, K.R., Dummer, T., Sandhu, J., Demlow, E., Hu, Y., Hong, A., Van Den Bosch, M. (2022). Chronic Disease and Where You Live: Built and Natural Environment Relationships with Physical Activity, Obesity, And Diabetes. Environment International.

Summary and Limitations

- Significant reductions in chronic disease and related costs were observed for Pathway 2 and 3
- Results do not capture indirect effects of workforce productivity or economic impacts of transportation investment on land value
- Cost of illness (COI) estimates do not capture differences across gender and age at onset of illness
- Estimates shown only reflect the fraction of the population affected by proposed land use and transportation changes
- Future analysis opportunities include simulating additional changes in the built environment and community investment
- Results reflect changes at a regional scale - focusing on neighborhood-level changes will capture greater differences and larger magnitudes of change

Urban Design 4 Health

Thank you

Lawrence Frank, PhD, President – ldfrank@ud4h.com



URBAN DESIGN 4 HEALTH