

# Methods and Assessment Results

## CLIMATE SMART COMMUNITIES SCENARIOS HIA

(PORTLAND METRO REGION, OREGON)

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25 cities  
 3 counties  
 1 region

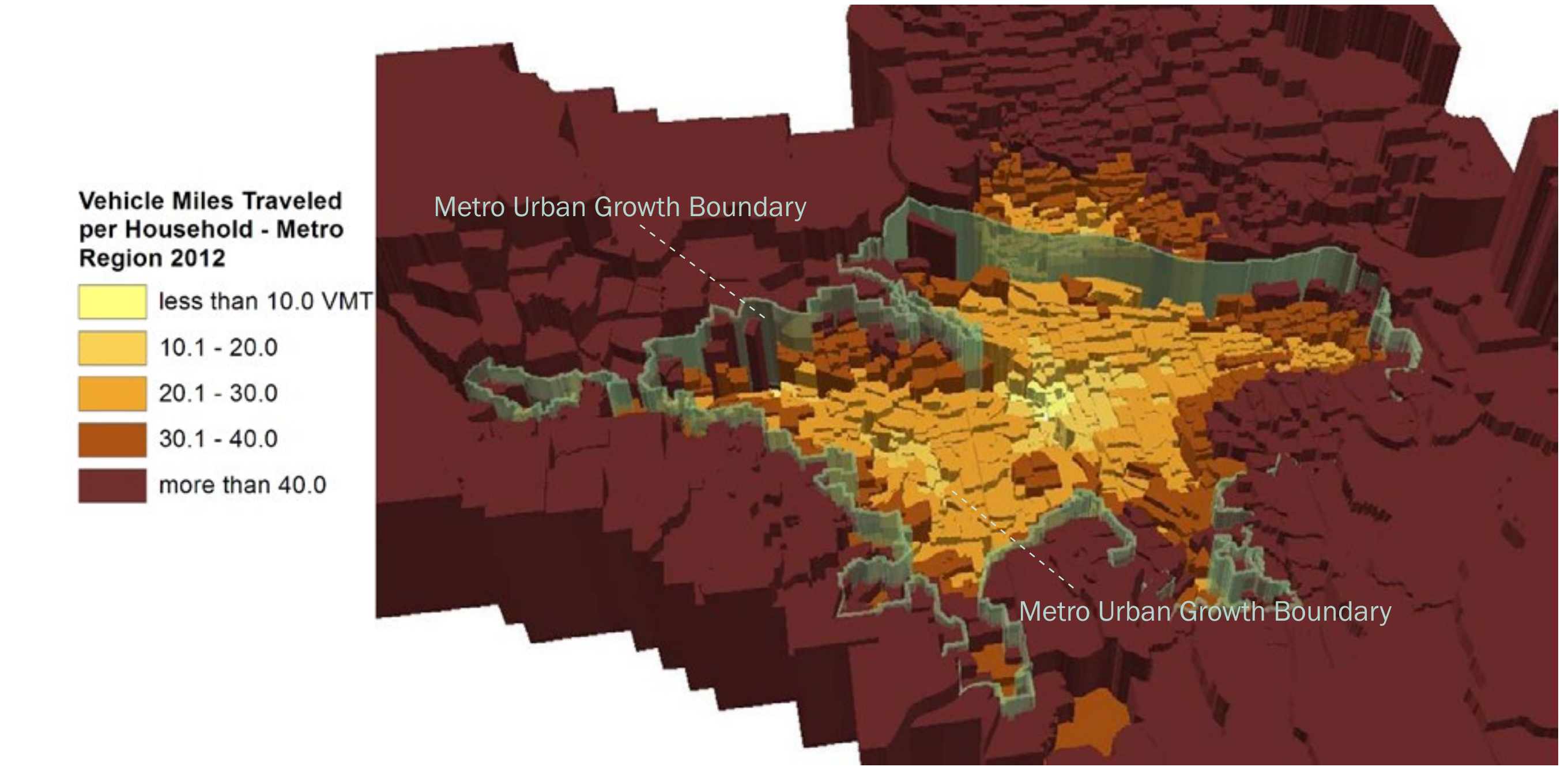
1.5 million people  
 7 directly elected Councilors  
 17 member MPO Board

52 miles light rail  
 17 miles commuter rail  
 86 bus lines

33,229 acres of parks & natural areas  
 400 sq. miles urban growth boundary

### POLICY BACKGROUND

In 2007, Oregon passed a bill requiring MPOs to implement greenhouse gas (GHG) reduction strategies to reduce carbon emissions to 10 percent below 1990 levels by 2020, and to 75 percent below 1990 levels by 2050. In 2009, Oregon enacted House Bill 2001, which requires Metro (Portland's regional government) to develop a preferred scenario that accommodates planned population and job growth and reduces GHG emissions from light duty vehicles (cars and small trucks). The law requires Metro to adopt the preferred scenario after public review and consultation with local governments. It also requires that local governments implement the preferred scenario through scheduled updates to transportation and land use plans.



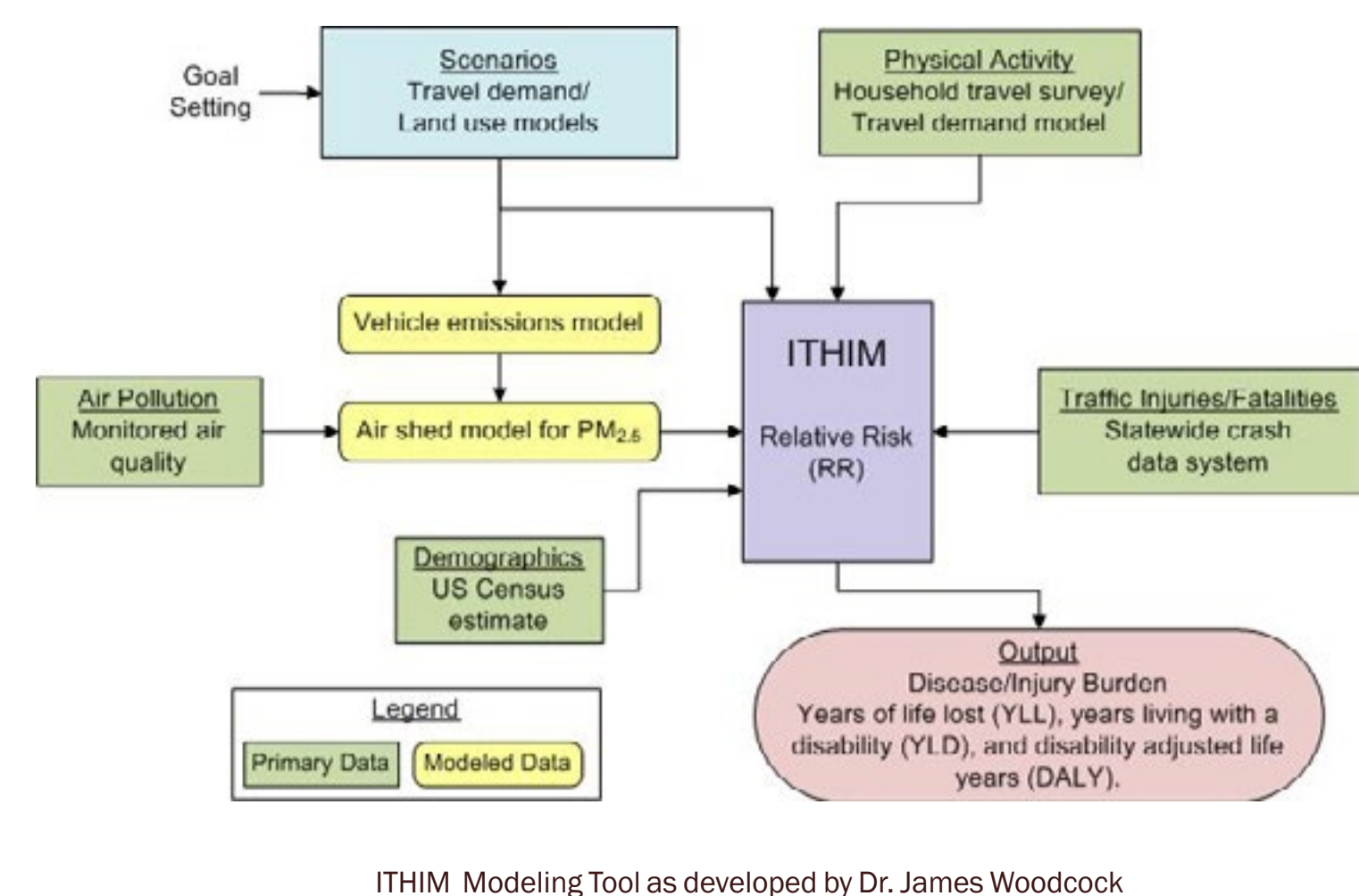
### CLIMATE SMART COMMUNITIES SCENARIOS HIA

Oregon's state public health agency, the Oregon Health Authority (OHA), collaborated with Metro on a health impact assessment of the Climate Smart Communities Scenarios planning process in 2012 and 2013. The HIA focused on three areas: active transportation and physical activity, roadway-related injuries and fatalities, and particulate air pollution. The primary goal of the HIA was to ensure that public health and health equity are considered in the selection and implementation of transportation and land use options related to GHG reduction policy in the Portland metropolitan region and throughout the state.

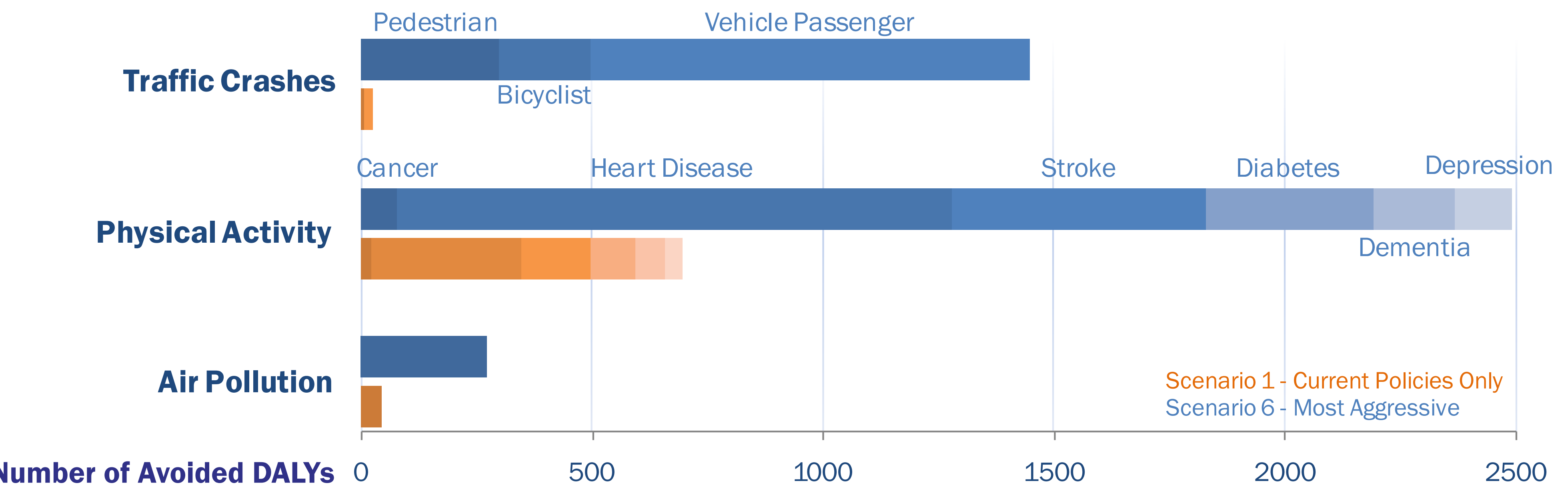
**SCENARIO:**  
 An example of what the future might look like based on the choices we make today (METRO).

### HIA METHODS

The HIA methods included a profile of existing conditions, a literature review, pathway diagrams, and the Integrated Transport and Health Impacts Modelling tool (ITHIM). ITHIM, developed by Dr. James Woodcock, estimates changes to premature mortality and preventable morbidity for scenarios based on known relationships between physical activity and chronic illnesses; serious injuries and fatalities from motor vehicle related crashes; and illness and death from particulate air pollution exposure. This HIA was the first use of ITHIM in the Pacific Northwest. OHA adapted the tool for use in the Portland metropolitan region, including the use of census data for the region governed by Metro.



### RESULTS



\*One DALY represents one lost year of healthy life.

	Scenario 1		Scenario 6	
	Avoided Premature Deaths	Avoided DALYs	Avoided Premature Deaths	Avoided DALYs
<b>Air Pollution</b>	<b>3</b>	<b>47</b>	<b>22</b>	<b>272</b>
Pedestrian	0	4	10	297
Bicyclist	0	2	4	198
Motorist	0	19	15	952
<b>Traffic Crashes Total</b>	<b>0</b>	<b>25</b>	<b>29</b>	<b>1447</b>
Cancer	1	22	4	75
Heart Disease	30	326	98	1204
Stroke	12	150	37	550
Diabetes	3	96	11	365
Dementia	3	65	7	174
Depression	0	34	0	125
<b>Physical Activity Total</b>	<b>48</b>	<b>693</b>	<b>157</b>	<b>2493</b>
<b>TOTAL</b>	<b>51</b>	<b>760</b>	<b>208</b>	<b>4212</b>

A summary of ITHIM's health impact results for the six sample scenarios that OHA tested show reductions in premature deaths, years of life lost (YLL), years living with disability (YLD), and disability adjusted life years (DALY) for changes in physical activity, particulate air pollution exposure, and road traffic crashes. OHA found that, compared to existing conditions, almost all of the policies under consideration could improve health, and that certain policy combinations were more beneficial than others.

The majority of the health benefits result from increased physical activity, followed by reductions in road traffic crashes and lower exposure to particulate air pollution. The most health promoting scenarios have similar elements: ambitious levels of community design policies, intermediate and ambitious levels of pricing and incentives, high levels of active transportation (including transit), low levels of single occupancy vehicle driving, and low levels of particulate air pollution.

Some of the policies under consideration, or the way they are implemented, may also negatively affect health. For example, some communities in the Portland metropolitan region have poor access to active transportation infrastructure (sidewalks, bike routes, transit service). If these areas are not prioritized, implementation could aggravate existing inequities. The ITHIM results showed positive health impacts due to reductions in motor vehicle crashes, but also revealed potential negative impacts from increased bike and pedestrian injuries for some scenarios. The HIA recommendations suggest ways to mitigate this increase.

### SCENARIO SIX



- 5% fewer premature deaths
- 6% fewer years of life lost for cardiovascular disease, heart attack & stroke
- 4% reduction in diabetes
- 47% reduction in Household Vehicles Miles Traveled (VMT)

### LIMITATIONS

ITHIM is a unique and reliable tool for modeling and comparing the health impacts of planning scenarios. This is especially true when ITHIM's outputs are considered alongside local health data, such as those described in the HIA's existing conditions summary. However, ITHIM was developed using World Health Organization U.S. burden of disease data, and OHA did not adapt the tool to use Oregon or Portland metropolitan region health data. Additionally, ITHIM uses particulate air pollution, specifically PM<sub>2.5</sub>, as the most harmful element of total transportation-related air pollution. Although such an assessment is outside of the scope of the HIA, additional analyses on the reduction of toxic air pollutants and ozone precursors from transportation and transportation specific policies (such as fleet turnover and advances in fuel technology) would likely show additional health benefits. In addition, it is possible that future advances in clean fuels and vehicle technology will make a big difference in reducing emissions; however the timeline and size of effects for such developments is unknown.

### NEXT STEPS

OHA will continue its partnership with Metro during the next phase of scenario planning with an additional HIA. The new HIA will build on the success of the Climate Smart Communities Scenarios HIA project by using improved air pollution data (to included air toxics), as well as including an economic impact model to assess the costs and benefits of the health effects of Oregon's GHG emissions reductions policies. OHA is also developing a community/neighborhood-level tool for assessing the health impacts of planning and policy decisions in a variety of sectors.

### REFERENCES

Green M, Hamberg A, Main E, Early-Alberts J, Dubuisson N, Douglas JP. Climate Smart Communities Scenarios Health Impact Assessment. Oregon Health Authority. April 2013: Portland, OR.

Woodcock J., et al., Public health benefits of strategies to reduce greenhouse-gas emissions: urban land transport. Lancet, 2009. 374(9705): p. 1930-43.



