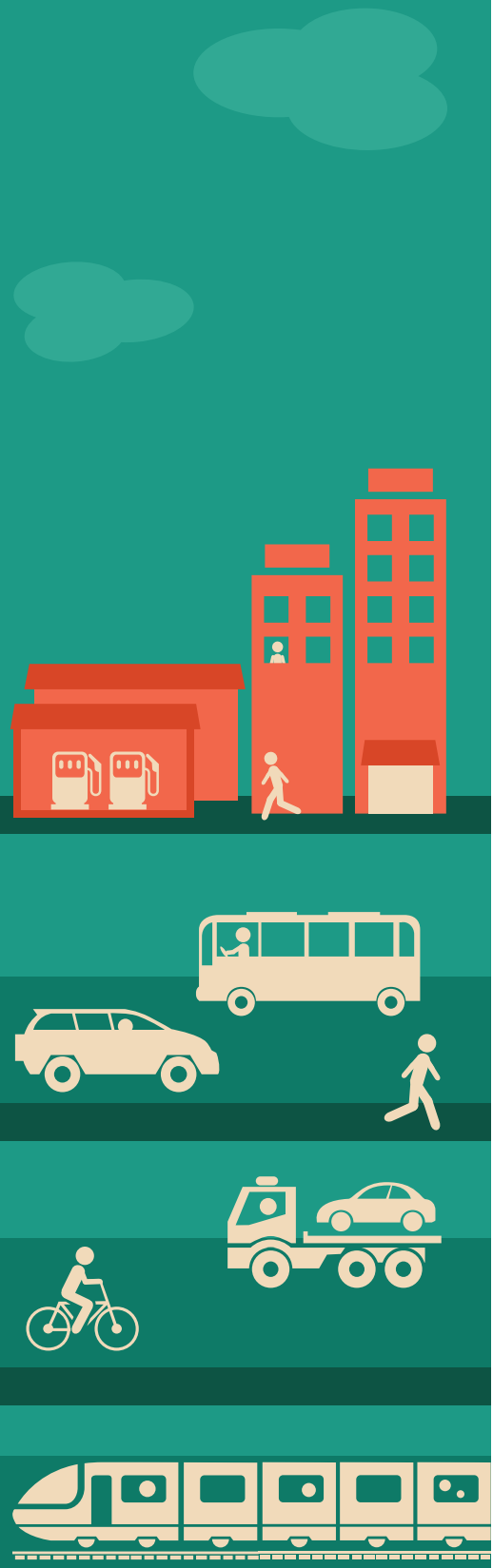


Linking Transportation Planning and Health Outcomes



WHAT LINKS TRANSPORTATION AND HEALTH?

The Centers for Disease Control and Prevention, Community Transformation Grant expanded community efforts in active living, and healthy and safe physical environments. This document describes the link between transportation systems and the health of a community. When available, local information on the topic is provided. The cost of poor health outcomes and the community perspective is also discussed. Information is limited to available secondary data sources. Primary data was not collected.



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Transportation System Designs

A transportation system connects people to other people and to places where they shop, work, and play. It is a network of roads, sidewalks, bike paths, and trails. It accommodates personal or commercial vehicles, buses, bicyclists, and pedestrians. An equitable transportation system provides equal opportunity for use regardless of age, ability, income, or race. Active transportation is a means of getting around using non-motorized methods, generally walking and bicycling. Active and motorized transportation systems both should be safe, well-maintained, and provide connectivity to destinations.

Current transportation systems are designed predominantly for increased vehicle mobility, allowing for people to efficiently access goods and services. Yet, this model for transportation design can have the following negative health effects for the whole population, those who use the system, and those who do not.^{1, 2, 3, 4}



AIR POLLUTION from vehicle emissions is associated with respiratory diseases.



Transportation network designs affect the **SAFETY** of all who use the system by impacting the frequency and severity of injuries from motor vehicle, pedestrian, and bicyclist crashes.



Most transportation systems without access to active modes of transportation can lead to a **SEDENTARY LIFESTYLE**. Lack of physical activity is a risk factor for obesity and chronic conditions such as diabetes and heart disease.



SOCIAL CAPITAL improves with transportation network changes that increase walkability, public transit, and social interactions.



PUBLIC HEALTH GOAL:

Improve the transportation system to promote and protect the health and safety of all residents while accomplishing the primary transportation objectives.





AIR POLLUTION

Air pollution is known to cause health problems. People who live or go to school within 300 feet of a major roadway are more likely to have asthma and other respiratory illnesses.^{5,6,7} There are four schools in Spokane County that are located within 300 feet of a highway or interstate. Nearly 3,000 students are enrolled in those schools, placing them at increased risk for respiratory illness.

In 2012, 16.4% of Spokane County adolescents reported currently having asthma. The proportion of Spokane County youth was similar to that of Washington state (15.3%), but was significantly higher than that of the U.S. (11.9%).⁸

A decreased exposure to vehicle exhaust results in a decrease in acute asthma events. During the 1996 Atlanta Olympics, organizers arranged alternative transportation methods. This resulted in decreased traffic density and congestion, and as such reduced the level of ozone pollution. During this time, there was a 42%-44% decrease in children being treated for an acute asthma event. There was no change in other pediatric conditions during this time.⁹



ACTIONS TO DECREASE AIR POLLUTION

- Increase use of active transportation
- Increase use of public transportation
- Implement traffic congestion and air quality programs
- Reduce speed
- Reduce vehicle miles traveled per capita

SAFETY

Walking and bicycling may be viewed as unsafe because of traffic and lack of sidewalks, crosswalks, and bicycle facilities.¹⁰ Among Spokane County survey respondents, 53% reported that busy traffic was a barrier to walking in their neighborhood. Lack of sidewalks was a barrier to walking for 44% of respondents. In rural areas, lack of room to walk on the road shoulder was a barrier. The most reported destination when walking from home was a park.¹¹

In Spokane County, reported changes that would make it easier to walk more were having more pedestrian facilities such as sidewalks and paths (76%), enforcing motorist laws (50%), and making walking areas safer (50%). To make it safer for children to walk to school in Spokane County, programs like a walking school bus and having designated routes for students were supported (66% and 71%, respectively).¹²

In Spokane County, approximately 40 pedestrians are hospitalized each year with non-fatal injuries sustained in a collision with a motor vehicle. An additional eight residents are hospitalized each year with non-fatal injuries while riding a bicycle and being in a collision with a motor vehicle. There are approximately one bicyclist and five pedestrians who die each year from a collision



with a motor vehicle.¹³

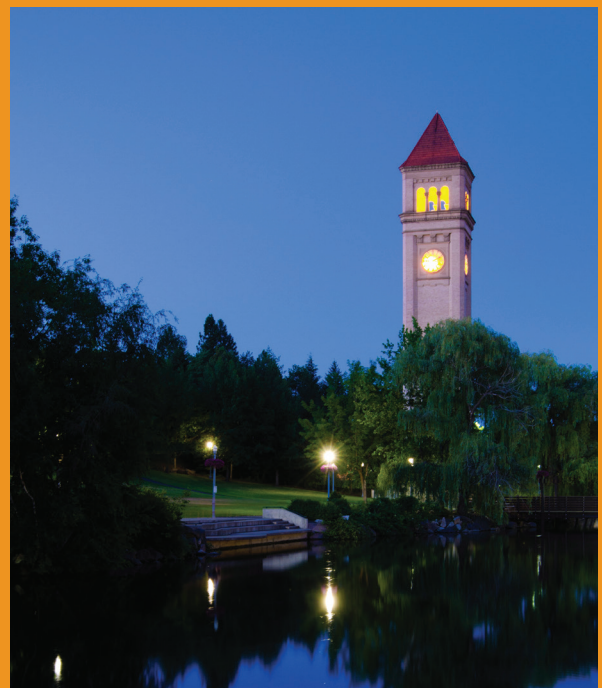
Community designs for active transportation seek to not only make the transportation system functional and enjoyable, but also safe for pedestrians and bicyclists.

Crosswalks without traffic signals actually increase the risk of injury to a pedestrian.¹⁴ The risk of injury can be decreased by increasing visibility, improved signaling, and separation from motor vehicle traffic. Design modifications could include improved street lighting, flashing lights, off road pathways, and four way stops or roundabouts for traffic calming.¹⁵

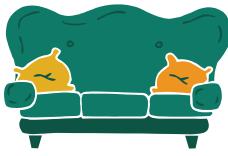
Reduced traffic speed decreases the frequency and severity of motor vehicle crashes. Road conditions with less room for correction of driver error impel drivers to drive more safely. Examples include fewer lanes, narrower lanes, and trees near the roadway.¹⁶ *An Assessment of the city of Spokane's Street Design Standards* explains that current vehicle lane width requirements are not less than 12 feet. It also describes that narrow lane widths between 10-12 feet are safer in areas of expected or desired pedestrian activity.¹⁷

ACTIONS TO INCREASE SAFETY

- Implement community designs to limit traffic speeds in neighborhoods
- Increase safe road crossings
- Narrow lane widths to 10-12 feet for areas of expected or desired pedestrian activity
- Increase well-lit sidewalks and connectivity
- Increase well-lit bike lanes and paths, and their connectivity



SEDENTARY LIFESTYLE



People who live in areas with destinations, such as parks, schools, shopping, and work, within ½ mile are more likely to be more physically active. Land use decisions impact the availability and accessibility of those destinations. People living in mixed use neighborhoods, who have more destinations within walking distance are more likely to be physically active than people living in residential neighborhoods.^{18, 19}

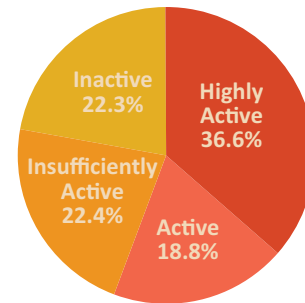
Almost half of adults in Spokane County do not get enough physical activity. Sixty percent of adults in Spokane County are either overweight (34%) or obese (26%). The likelihood of an adult being obese increases as activity level decreases. Inactive adults are two times more likely to be obese compared to highly active adults. Spokane County residents who are obese are more likely to be hospitalized for heart disease, hypertension, respiratory disease, digestive disease, genito/urinary disease, back disorders, and osteoarthritis.

Those who live near a community feature such as a park or trail are more likely to meet recommended physical activity levels. Other examples of community features related to being physically active are the presence of sidewalks and street lights. Barriers to using community features for increased physical activity are the state of repair of sidewalks or roads, perceived safety of the area, visual aesthetics, and physical barriers such as a freeway or railroad.²⁰

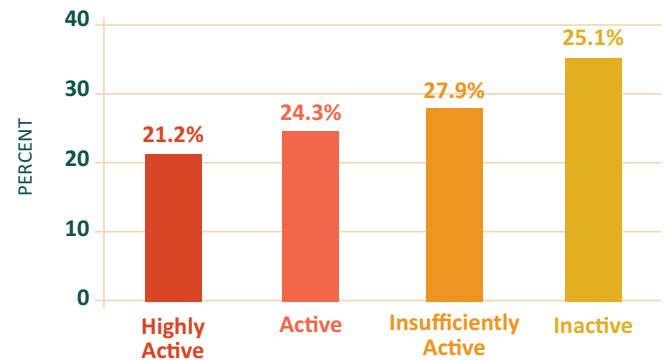
Half of children (53%) in sixth grade in Spokane County never walk or bike to or from school. By eighth grade, 59% of children never walk or bike to or from school. A similar proportion of 8th grade children were overweight or obese for those who walked or biked to or from school every day (26%), some days (23%), or never (25%). Many factors affect whether children walk or bike to school such as family preference, distance from the school, living in a hazard zone, and perception of safety. Spokane County children whose school is near a highway or interstate were 32% less likely to walk or bike to or from school every day compared to children in schools further away from busy roadways.²¹

Individuals who use public transit are less likely to live a sedentary lifestyle and less likely to be obese. Nationally, 29% of public transit users were physically active for at least 30 minutes per day.²² Among individuals 16 years of age or older who were in the workforce in Spokane County, 2.6% used public transit to get to work. This proportion has been stable since 2005.²³

Physical Activity Level, Spokane County Adults, 2011



Obesity by Activity Level, Spokane County, 2011



ACTIONS TO INCREASE PHYSICAL ACTIVITY

- Provide traffic calming methods
- Increase well-lit sidewalks and connectivity
- Increase well-lit bike lanes and paths, and their connectivity
- Limit block size to 600 feet
- Locate destinations within residential neighborhoods
- Increase safe road crossings
- Increase safe routes to school programs including walking school buses and bike trains
- Increase use of public transportation

SOCIAL CAPITAL



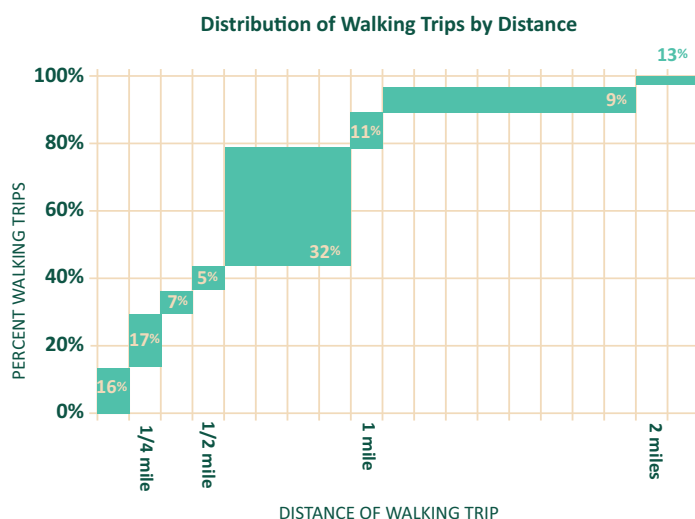
Social capital includes resources, information, and support provided by being connected to a specific

group. Social capital can have both an individual and a collective impact on a community. Individuals with higher social capital will know and engage with their neighbors. This can positively impact the health of the individual by increasing physical activity through walking in the neighborhood, decreasing stress from reciprocal assistance provided by connected neighbors, and providing an exchange of information for needed services. Social capital can also have a community level impact by providing a sense of security, a support network for vulnerable individuals, supportive social norms around behaviors, and a cohesive group that can work toward desired changes in the community. A gathering place provides somewhere for interactions to occur and builds social capital. In a neighborhood, this could be a park or other green-space area, walking trails or sidewalks, or a residential shop.²⁴

Individuals living in a connected neighborhood that is pedestrian-oriented are more likely to walk for leisure or to a destination and have a stronger sense of community social capital compared to a vehicle-oriented neighborhood. People living in low density urban sprawl neighborhoods are more reliant on their vehicle. These neighborhoods generally are not mixed-use, do not contain business or other community destinations, and have an unconnected transportation system. These features decrease the likelihood of encountering your neighbor, increase commute time, and decrease civic engagement.²⁴

In 2012, 87% of workers in Spokane County drove or rode in a car to work. Three percent used public transportation and 3% walked to work. Of the remainder, 6% work from home and 1% take a taxi, motorcycle, or bicycle. The average travel time to work was 20.8 minutes. It was slightly less for those driving alone (19.8 minutes) and higher for those in a carpool (25.2 minutes) and taking public transportation (34.9 minutes).²⁵ Transportation systems designed considering primarily vehicle traffic movement contributes to physical inactivity. The likelihood of obesity increases 6% for every additional hour per day spent in a car.²⁶

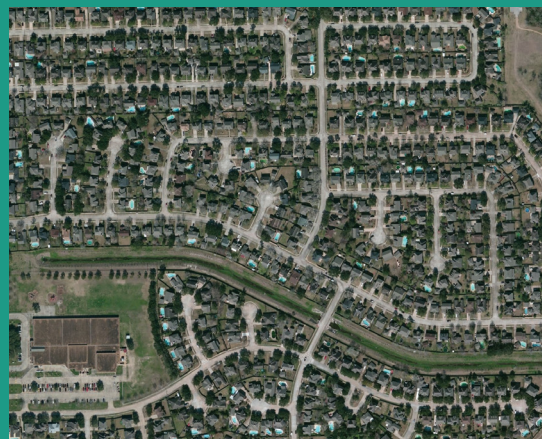
Nationally, 16% of people reported having at least one trip during their day where they walked. Nearly one-quarter (23%) of walking trips were one mile or longer. The most reported reason for a walking trip was for walking with a dog (72%). Walking for recreation was the next most reported reason (40%).²⁷



Source: 2012 Omnibus Resident Survey

ACTIONS TO STIMULATE INTERACTION WITH NEIGHBORS, DECREASE STRESS FROM COMMUTING, AND INCREASE PHYSICAL ACTIVITY

- Provide a community gathering place
- Provide a safe place to walk or bike
- Ensure accessibility of public transit



Cost of Transportation-Related Health Outcomes

Transportation choices are impacted by community design. Yet, community transportation planning does not typically include health impacts in a cost-benefit analysis. Cost of health impacts can be from premature death, health care costs, lost wages, and decreased quality of life. Research nationally is beginning to place an economic value on those transportation-related health outcomes.²⁸

Direct Outcomes (Cost-adjusted to 2012 dollars)	
MOTOR VEHICLE CRASHES	AIR POLLUTION FROM TRAFFIC
\$192 billion per year / includes:	\$53 - 85 billion per year / includes:
Health care costs	Health care costs
Lost wages	Premature death
Property damage	
Travel delay	
Legal/administrative costs	
Pain and suffering	
Lost quality of life	

Indirect Outcomes (Cost-adjusted to 2012 dollars)
OBESITY AND OVERWEIGHT
\$151 billion per year / includes:
Health care costs
Lost wages from illness or disability
Future earnings lost by premature death

In 2012, there were 62 hospitalizations among Spokane County residents for injuries sustained in a pedestrian or bicycle/motor vehicle crash. Charges* for those hospitalizations totaled \$3 million. The average charge was \$48,000, with a range from \$11,000 to \$132,500.

Hospitalization charges of Spokane County residents where the primary diagnosis was obesity totaled \$5.6 million in 2012. The average charge was \$46,000, with a range from \$16,000 to \$76,000.²⁹



ACTIONS TO INCLUDE HEALTH WITH ECONOMICS

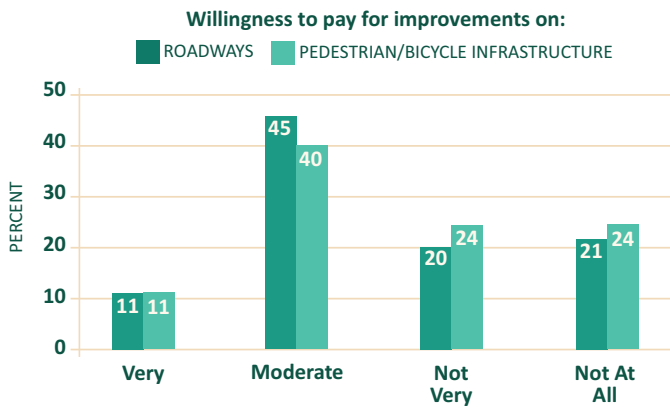
Conduct a health impact assessment for all transportation related projects. Prevention and safety measures are often times less expensive than treating poor health outcomes.

* Charges are only for hospitalizations, which is for the most severe condition. It does not include visits to an emergency department nor physician's office. Thus, it under-represents the cost in the community.

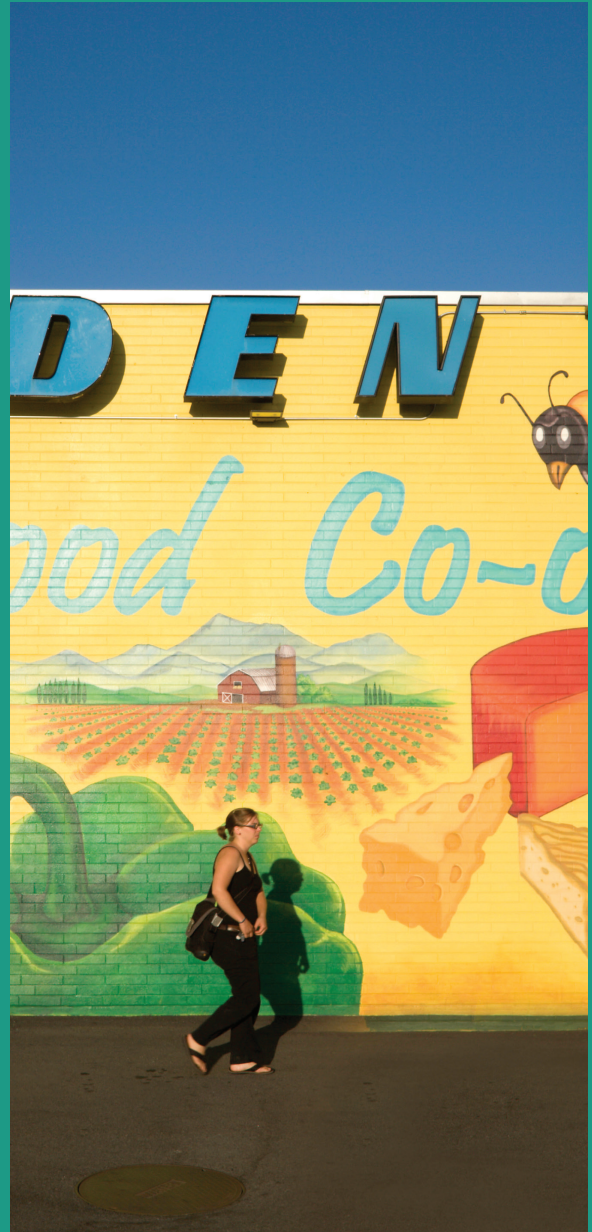
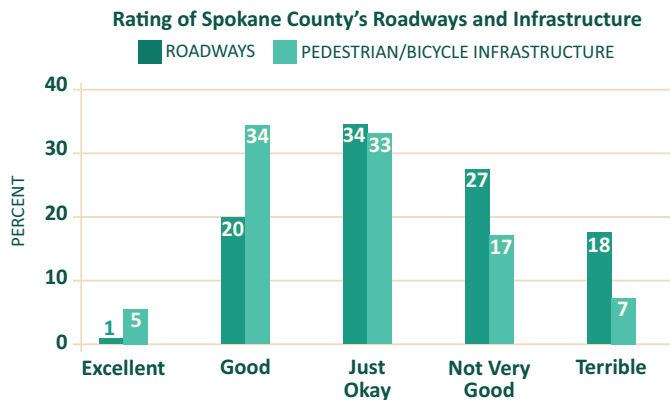
COMMUNITY SUPPORT

Only 1% of residents rated Spokane County’s roadway infrastructure, the city and county roads, as excellent. Five percent rated the current pedestrian and bicyclist infrastructure in Spokane County as excellent; its sidewalks, bike lanes, bike paths, and shared bike-auto lanes. Comparatively, nearly one in five rated the roads as terrible and 7% rated the pedestrian and bicyclist infrastructure as terrible. Approximately half of residents were willing to pay higher fees or taxes for improvement on roadways or pedestrian/bicyclist infrastructure.³⁰

All people are impacted by the vehicle, walking, and biking infrastructure in the community. How people use the transportation system will vary, and as such, so will their perception of how good the system is. A community should support a transportation system that all residents feel is a positive asset to the community.



Source: 2012 Omnibus Resident Survey



ACTIONS FOR EQUITABLE USE

Ensure all people have access to safe, healthy, convenient, and affordable transportation options regardless of age, income, and other socioeconomic factors.

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