

Health in Transportation Corridor Planning Framework

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Health in Transportation Corridor Planning Framework



Background

The **Health in Transportation Corridor Planning Framework** aims to support transportation agency efforts to incorporate health into corridor planning studies. It is intended to be used within an existing corridor planning process; not as a stand-alone or parallel process. Because transportation planning at the corridor level is flexible and adaptable to many different issues and contexts, the Framework is scalable to any type of corridor. It can be used at a single point in the process or to inform every aspect of the corridor planning study. It may also be used to inform planning activities at both the regional and project level to support broad health goals. Transportation practitioners at the State, regional, and local levels who conduct or participate in corridor studies are the intended audience for the Framework; recognizing health professionals are highly useful partners. Health issues, goals, and priorities are very context specific, and the Framework does not provide answers or outcomes. It identifies things to consider, as well as data, tools, and resources that may be helpful.

Getting Started

Why should a transportation agency try to address health problems?

The simple answer is because transportation decisions can impact health in the community. Considering these impacts early, as decisions are made, supports better outcomes.

What does health or public health mean?

Health can mean many things and public health often has strong associations. Practitioners who assisted in development of the Health in Transportation Corridor Planning Framework (Framework) recommended that the tool remain flexible enough to include **any individual, group, or agency that has an interest in health**. The definitions below informed the development of the Framework.

World Health Organization: Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Public Health refers to the science and art of preventing disease, prolonging life and promoting health through organized efforts and informed choices of society, organizations, public and private, communities and individuals. Access to healthcare is an important part of supporting public health.

Social determinants of health are life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education, and health care, whose distribution across populations effectively determines length and quality of life.

Health equity is when everyone has the opportunity to attain their full health potential and no one is disadvantaged from achieving this potential because of their social position or other socially determined circumstance.

The Health in Transportation Corridor Planning Framework uses the terms “health” and “public health” interchangeably except with reference to specific State and county agencies often referred to as departments of public health. Health equity is an area of specific interest that includes both the social determinants of health and potentially disadvantaged populations.

Helpful Hints — Use the icons below to search quickly for specific information in the Framework regarding data, tools, and resources.



Air Quality



Bike and Ped



General



Health Equity



Safety



Transit

Getting Started Checklist

Use the questions below to identify how you might use the Framework in your transportation planning efforts.

- Does your process for completing a corridor planning study appear similar to the Framework steps?

You can organize the Framework information to match your needs. Individual transportation agencies will conduct corridor planning according to their own established practice. Match the steps to your existing corridor planning process so that you can consider health without a change to common practice.

- Where are you in the corridor planning process at this time?

The Framework can be used at any point in the process. If you are adapting an active corridor planning study to incorporate health, you will need to match the steps to your process and identify where you are now. Check the previous steps to see if you missed something useful.

- Do you or others in your agency currently have relationships with health professionals?

Established relationships are the quickest way to get started and provide the greatest support for data and information. Transportation agencies often include staff that routinely interface with public health agencies or other health support services. This may help you access important information, resources, and perspective. Identifying these partners and stakeholders is essential in using the Framework.

- Is there currently an interest in public health within your agency or from external participants?

Your agency's interests or the surrounding public/political environment may currently support incorporating health. Support for incorporating health comes from many different interests. For example, active transportation, complete streets, livability, sustainability, built environment, and other topics. Community planning processes such as land use, comprehensive planning, and school siting are other connections. There may be inter-agency leadership activities that are underway based on the surrounding political context.

Step 1: Define Transportation Problems and Public Health Issues

What happens here?

This is a scoping step where transportation practitioners consider the problems and needs to be addressed in the corridor planning study. There also may be an opportunity to address public health issues during transportation decision making, depending on what is important in the specific corridor. This could be access to health services or healthy food, reduced emissions, more active transportation options, or a combination of needs. Practitioners will need to identify agencies, groups, and individuals that might have information to share about potential health issues and needs.

Questions to Consider at this Step

- Do transportation agencies with jurisdiction in the corridor recognize public health as an important issue related to transportation decisions?
- What transportation problems and needs must the corridor planning study address?
- Is there a potential for transportation decisions to impact health outcomes?
- What health issues can be identified?
- What health stakeholders do we need to contact?

Partnerships and Stakeholders

Considering a wide range of perspectives early in the process is critical. There is a potential for many new participants in the corridor planning study when health is incorporated.

At this initial step it is likely that all participants are considered stakeholders. The difference between partners and stakeholders in the Framework is simple: if the

Do transportation partners and stakeholders support the incorporation of public health?

Is there a willingness in your transportation agency or with partners and stakeholders to support incorporating health?

If there is no existing interest/support, what are the options to get started?

Consider whether your situation is one of lack of interest/support, resistance, or just lack of knowledge. You might be able to make the case for incorporating health by identifying benefits, strong community support, or other factors that enhance the potential outcomes for your decision makers. Strong resistance can be addressed with small initial steps that can be built upon over time.

Who are the potential health stakeholders?

1. **In your agency:** Relationships might already be established in other parts of your agency that you can build on. For instance, safety and land use are often high-interest areas for public health professionals.
2. **Other transportation groups:** Transportation professionals at many levels might be working with health for other purposes. Consider the list below for potential contact.
 - ◆ USDOT Staff – FHWA Division and FTA Regional staff who address Complete Streets, transit, corridor planning, project development, air quality, and safety
 - ◆ State DOT Staff – Staff from planning, project development, safety, bicycle and pedestrian transportation, transit, and operations
 - ◆ MPOs– Staff across all areas of responsibilities; citizen advisory or technical committees



transportation agency shares decision making with another group, that is a partnership. Partnerships will be established over time as the details of the corridor study become clear.

Public health agencies at the county and State level are the most likely health stakeholders at the beginning of the corridor study. Public health staff will likely have information about health issues in the corridor population, and may have data to share. The Framework assumes the county/State public health agency is always invited to participate when health is being considered.

- ◆ Elected officials in the community and those on policy boards with a particular interest in health
 - ◆ Local transportation agencies – Municipal or county transportation staff
 - ◆ Para-transit operators – Including non-profit providers and city/county services
 - ◆ Transit authority – Any State, local, or county transit authority/service provider, whether fixed-route or on-demand
- 3. Health groups:** Health professionals have goals and interests that could inform your plans for the corridor. Public health departments are available at the county and State levels as your first potential resource. Other health groups are listed below for consideration.
- ◆ Local health agencies
 - ◆ Local agencies representing special interests, such as the Agency for Aging, organizations representing minority, low-income, or transit-dependent populations, and housing authorities
 - ◆ Hospital, medical school/center, medical service providers, and medical insurance providers
 - ◆ Medical first responders
 - ◆ Non-profit health advocacy groups, including special interests such as the local AARP chapter
 - ◆ Environmental departments at the local/county, State, regional, and federal levels
 - ◆ Centers for Disease Control and Prevention (CDC)
- 4. In the community:** Representatives from the community provide critical insight on transportation problems, health issues, and community priorities.
- ◆ Other local, county, and State departments such as land use, education, economic development, social services, recreation, law enforcement
 - ◆ Community groups with a focus on health or social determinants of health
 - ◆ School districts
 - ◆ Advocacy groups such as bicycle and pedestrian , livability, trails, social justice, environment
 - ◆ Individual advocates
 - ◆ Professional associations such as the American Planning Association, American Public Health Association
 - ◆ Economic development groups such as Chamber of Commerce, tourism
 - ◆ Large employers or corporate citizens as potential champions
 - ◆ Employers in the corridor who stand to benefit from improvements
 - ◆ Anchor institutions, including universities, hospitals, YMCA, and related groups that contribute to the local economy and community well-being



	<ul style="list-style-type: none"> ◆ Philanthropies/foundations ◆ Government funders <p>What are some enablers in working with health professionals? Grant funding or shared planning funds have catalyzed collaboration between transportation and public health in many States. Grants from CDC, non-profits, HUD, and others have supported interagency collaboration in this area. Health professionals are often very proactive about including equity issues in plans and engaging low-income and minority communities.</p> <p>What are some potential challenges? Use of language that is unfamiliar or means different things in the two fields Data sharing and formatting along with a reluctance to share some data due to privacy issues Data and tools available to consider health issues do not match the scale common in transportation Unfamiliar structure of transportation decision making to those in health</p>
<p><i>Questions to Inform Decision Making</i></p> <p>When incorporating public health, the intent is to consider potential opportunities for health benefits in the community as transportation decisions are made. Identifying how transportation decisions will support improvements in health or those that may lead to negative consequences is important.</p> <p>Health stakeholders are essential to help transportation</p>	<p>What is the transportation purpose and desired outcome of the corridor planning study? What are the transportation problems to be addressed? Have strategies been proposed to address these problems? What problems in the corridor relate to transportation but require action from others? How does land use impact transportation problems/strategies in the corridor?</p> <p>What health issues are anticipated in the corridor area/populations? Is a high rate of obesity, asthma, crash incidences, or other health issues present? Are there opportunities to support increased physical activity, access to food, or access to other services? Are there special populations who live in or regularly use the corridor?</p> <p>What are the health priorities? What health issues are understood to be a priority for the community? How have the health issues been identified? How can the priorities for the corridor be put into a context to be more easily understood? How will the corridor planning study help achieve overarching planning goals related to health and transportation?</p> <p>Is there information to support consideration of specific health topics? Is this corridor bike-friendly? Is there an established bicycle population? Is this a desired addition? Are sidewalks available, safe, and connected to provide access to food/services/recreation?</p>

<p>practitioners understand these issues and the affected population. Prioritizing specific public health issues that transportation decisions can most realistically impact is necessary and best done collaboratively.</p>	<p>Is transit service provided in this corridor? Are transit stops safe and accessible? Is additional service needed? Are there characteristics of the built environment that could enhance use of the corridor or adjacent facilities for non-motorized transportation/transit? Is there evidence of pollution-related illness in the corridor? Is the distance from traffic to dwellings, schools, parks, playgrounds, and other population centers a concern? Are there specific populations of interest in the corridor? Is access a potential issue? Does the community have a complete streets policy? Does the corridor contain a hospital or other medical service facilities? Are there adopted or legislated policies concerning public health to build upon?</p>								
<p>Data and Analytical Support</p> <p>Data sources and analytical methods in this step are for gathering more general information to understand how transportation problems and needs may be related to health issues. Detailed data sources and tools will be presented in future steps when priorities have been identified.</p> <p>Information at this step may be used to help decision makers understand the potential value of integrating health into the study. This initial understanding may be useful to ensure support</p>	<p>What data and tools are available to develop an understanding of health issues?</p> <p>What data are available for an understanding of the existing environment and infrastructure in the corridor? What specific studies conducted by others might include health data?</p> <p>Data sources that might be useful at this step</p> <p>Data at the local, county, State, and national level common to transportation planning:</p> <table border="0"> <tr> <td>County comprehensive plans</td> <td>School siting plans, Safe Routes to School</td> </tr> <tr> <td>Bicycle and pedestrian plans</td> <td>Emissions data</td> </tr> <tr> <td>Modal share</td> <td>Crash data or other injury/fatality data sources</td> </tr> <tr> <td>Land use plans, zoning plans, and development plans</td> <td>Census population data</td> </tr> </table> <p>Data from studies conducted by others:</p> <ul style="list-style-type: none"> University or other research centers Non-profit grants or awards CDC or HUD grants <p>Local planning departments, transit providers, and paratransit services may also have useful data.</p> <p>Specific data sources to consider:</p> <p> Behavioral Risk Factor Surveillance System (BRFSS) is the gold standard of behavioral surveillance. Available for all 50 States and many US territories, BRFSS provides health-related behavior information that includes active transportation and physical activity information and the rate for several chronic diseases. More information at: http://www.cdc.gov/brfss/</p> <p>The Selected Metropolitan/Micropolitan Area Risk Trends (SMART) project uses BRFSS to analyze the data of selected metropolitan and micropolitan statistical areas (MMSAs) with 500 or more respondents. More information at: http://www.cdc.gov/brfss/smart/smart_data.htm</p>	County comprehensive plans	School siting plans, Safe Routes to School	Bicycle and pedestrian plans	Emissions data	Modal share	Crash data or other injury/fatality data sources	Land use plans, zoning plans, and development plans	Census population data
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throughout the process. Use the icons to help target the data and tools that are most appropriate for your corridor study.

County Health Rankings – The University of Wisconsin Population Health Institute compiled data from several national sources to rank counties by health. Highly recommended initial resource. For more information: <http://www.countyhealthrankings.org/>

CDC Community Health Improvement Navigator – Public health departments, hospitals, and other federal grantees are often required to complete needs assessments. The community health improvement (CHI) process identifies and addresses community health needs, and these assessments can be useful resources for preliminary data on health needs and issues in the community. For more information: <http://www.cdc.gov/chinav/index.html>



America’s Health Rankings – American Health Foundation published this report tracking each State’s overall health as well as other health metrics. These metrics include obesity, smoking, diabetes, and physical inactivity. The Foundation also develops the **America’s Health Rankings Senior Report**. For more information: <http://www.unitedhealthfoundation.org/Publications/AHR.aspx>

USDA Food Access Research Atlas – Provides food security data. Available at: <http://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas.aspx>



EPA’s AirData – Similar to the Environmental Public Health Tracking Tool, but updated more regularly and more consistent with FHWA guidance. Available at: <http://www.epa.gov/airdata/>

EPA EJSCREEN – Provides data and maps that identify different factors such as demographics, health, environmental, and facility-level data. Available at: <http://www2.epa.gov/ejscreen>



Rails-to-Trails Conservancy TrailLink – Inventory of rail-trails and other types of shared use pathways. Available at: <http://www.trailink.com/>

TOD Database – Information on jobs and households located near rail transit stations. Available at: <http://toddata.cnt.org/>

Tools that could be useful at this step:



Transportation and Health Tool (USDOT and CDC)—provides data to practitioners that examine the health impacts of the transportation system. More information: <https://www.transportation.gov/transportation-health-tool>

Healthy Community Design Toolkit (CDC) contains a Healthy Community Design Checklist, a Healthy Community Design PowerPoint, a How-to on “Creating a Health Profile for Your Neighborhood,” and a Planning for Health Resources Guide. For more information: <https://www.planning.org/nationalcenters/health/communitydesigntoolkit.htm>

Community Metrics Tool allows users to search for performance measures relevant to their specific circumstances, communities, and quality of life goals. http://www.fhwa.dot.gov/livability/tools/community_vision/

	<p>Sustainable Community Indicator Catalog allows users to identify indicators that can measure progress toward their sustainability objectives. https://www.sustainablecommunities.gov/indicators/discover</p> <p> H&T Affordability Index—Provides 2009 data on housing costs and estimates transportation costs for over 900 metropolitan and micropolitan areas in the country. More information: http://htaindex.cnt.org/map/</p> <p>HUD Location Affordability Index—This tool has up-to-date cost data, but does not include the underlying transit and land use layer. For more information: http://www.locationaffordability.info/lai.aspx</p> <p> Walk Score allows you to search for addresses, neighborhoods, and cities to gauge access to destinations via walking, biking, and transit. For more Information: http://www.walkscore.com/</p>
<p>Resources</p> <p>Resources often provide very specific information that is useful. The Framework includes resources in the following categories:</p> <ul style="list-style-type: none"> General Transit Air Quality Safety Bicycle and Pedestrian Health Equity <p>Use the icons to search each step for resources that may be helpful.</p>	<p> How Does Transportation Affect Public Health? http://www.fhwa.dot.gov/publications/publicroads/13mayjun/05.cfm</p> <p> Department of Transportation Key Issues in the Planning Process Briefing Book https://www.planning.dot.gov/documents/briefingbook/bbook.htm</p> <p>Health in All Policies Toolkit—Support for collaboration on health across government sectors. http://www.changelabsolutions.org/publications/HiAP_Start-to-Finish</p> <p>Lessons on Communicating at the Interface between Transportation and Public Health—Effective ways for transportation and public health professionals to communicate with each other. http://t4america.org/wp-content/uploads/2011/08/Dr.-Ellen-Alkon-APHA-Presentation.pdf</p> <p>Healthy Plan Making: Integrating Health into the Comprehensive Planning Process—Analysis of seven case studies and recommendations for change. https://www.planning.org/research/publichealth/pdf/healthyplanningreport.pdf</p> <p>The Hidden Health Costs of Transportation—Examines potential health impacts of transportation investments. http://www.apha.org/~media/files/pdf/topics/transport/hidden_health_costs_of_transportation_backgrounder.ashx</p> <p>Livable and Sustainable Communities—FTA’s webpage with resources related to livable and sustainable communities. http://www.fta.dot.gov/about/13747.html</p> <p>National Complete Streets Policy Atlas—An interactive database of complete streets projects. http://www.smartgrowthamerica.org/complete-streets/changing-policy/complete-streets-atlas</p> <p>Safe States Alliance—contains a number of resources, including the Livability and Smart Growth Assessment Tool Database and the Safe, Healthy, and Active Transportation Toolkit. https://www.transportation.gov/mission/health/literature-and-resources</p> <p>The Transportation Cost Savings Calculator—A compilation of data that quantifies and/or monetizes the health impacts of transportation. http://mobilitylab.org/research/the-transportation-cost-savings-calculator/</p> <p>AARP Livability Index—Provides data on a variety of different quality of life measures including housing, transportation,</p>

	<p>neighborhood characteristics, environment, health, opportunity, and civic and social engagement. http://livabilityindex.aarp.org</p> <p>The National Association of County and City Health Officials (NACCHO) Toolbox—provides users with a collection of free, local public health tools. http://www.naccho.org/toolbox/</p> <hr/> <p> Active Transportation: Making the Link From Transportation to Physical Activity and Obesity http://activelivingresearch.org/active-transportation-making-link-transportation-physical-activity-and-obesity</p> <p>The New Majority: Pedaling Towards Equity—includes data on demographic ridership, the effect of safe cycling infrastructure on ridership, new immigrant perceptions of bicycling, and the economic impact of transportation and health inequity. http://bikeleague.org/sites/default/files/equity_report.pdf</p> <p>Designing for Active Living among Children—summarizes research on the environmental factors and policies related to youth’s physical activity and sedentary behavior patterns. http://activelivingresearch.org/designing-active-living-among-children</p> <p>Walkable and Affordable Communities—Looking at an area’s affordability through the lens of both housing and transportation can shed light on how communities can maintain a healthy mix of uses and income levels. http://bostonfed.org/commdev/c&b/2015/spring/scott-bricker-walkable-and-affordable-communities.htm</p> <hr/> <p> Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects http://pubs.healtheffects.org/view.php?id=334</p> <hr/> <p> State of the Health Equity Movement, 2011 Update Part B: Catalog of Activities—Examples of how to reach health partners. http://www.altfutures.org/draproject/pdfs/Report_11_02_HealthEquityMovement_PartBActivities.pdf</p> <p>A New Way to Talk About the Social Determinants of Health—a high level report on how to best incorporate discussions of the social determinants of health into planning processes. http://www.rwjf.org/content/dam/farm/reports/reports/2010/rwjf63023</p> <p>Promoting Health Equity: A Resource to Help Communities Address Social Determinants of Health http://www.cdc.gov/nccdphp/dch/programs/healthycommunitiesprogram/tools/pdf/SDOH-workbook.pdf</p>
<p>Examples from Practice Transportation</p>	<p>Tennessee DOT used the Framework to develop a standard process for consideration of health as transportation improvements are identified and prioritized. TDOT used every opportunity available to solicit input in determining health and transportation priorities for the corridor, including joining forces with an active access management study. The most successful engagement strategy was small group and individual interactions. Using opportunities to drive the corridor, the team solicited specific input about sections of the corridor as viewed from the perspective of the various</p>



practitioners often find it helpful to consider examples of successful integration of health. These examples may provide ideas to consider or a means to inform decision makers about potential outcomes.

stakeholders. This approach was particularly useful with the elected officials from the cities and counties represented. For more information see the full case study report.

The City of Charlotte/Mecklenburg County and the University of North Carolina at Charlotte created the **Quality of Life Dashboard** to assess the health of neighborhoods in Charlotte/Mecklenburg County. An online dashboard provides data on several neighborhood statistics, categorized under: [Neighborhood] Character, Education, [Civic] Engagement, Environment, Health, Housing, and Safety. This resource provides neighborhood-level data related to transportation (e.g., proximity to public transit, availability of sidewalks), and health (e.g., access to opportunities for physical activity, healthy food, and healthcare). The Town of Davidson, NC has used the dashboard to provide aggregated data at a more specific level than census tracts to inform the town’s Active Transportation Plan, which included a health equity analysis to identify areas of greatest need. More information at: <http://maps.co.mecklenburg.nc.us/qoldashboard/index.html>

The **Rhode Island Division of Planning** works regularly with the State Department of Health. The Health Department has supported the Division of Planning in better addressing equity into plans, including low-income and minority community concerns. RhodeMap RI is a coordinated and forward-looking effort by the State to make Rhode Island a better place to live and work, and is funded with a Sustainable Communities Initiative Grant. One of the six key areas supported in the effort is Social Equity and Community Engagement. For more information: <http://www.planning.ri.gov/statewideplanning/sustainable/>

Kentucky Transportation Cabinet and the Kentucky Department of Public Health are working together to increase physical activity to address obesity. KDPH convened a multiagency committee that includes transportation, education, safety, tourism, parks, youth and disabilities programs, and the Federal Highway Administration Division office. The group agreed pedestrian master plans were the first step communities needed to get started. KTC received a CDC 1305 grant and began working with county health departments to develop walking master plans.

MPO Planning for Healthy Communities and State DOTs Role in Planning for Healthy Communities. These two reports developed by the U.S. DOT Volpe Center can assist practitioners at MPOs and State DOTs in considering health throughout the transportation planning process by providing examples of successful practice in several transportation agencies. http://www.fhwa.dot.gov/planning/health_in_transportation/resources/healthy_communities/ and http://www.fhwa.dot.gov/planning/health_in_transportation/resources/statewide_healthy_communities/index.cfm

Step 2: Identify Transportation and Health Needs, Resources, and Priorities

What happens here?

This step begins the development of a baseline understanding for the corridor study by collecting data and information about the needs, available resources, and priorities for both transportation and health. Health partners will assist in looking at the problems and issues identified in Step 1 to help focus on what can/should be addressed in this study. Other activities at this step are to identify gaps in information and decide how to communicate effectively with stakeholders.

Questions to Consider at this Step

- What data and information are available to define the health priorities and potential benefits from transportation decisions?
- What are the boundaries of the study with respect to geographic area, representative populations, scope, and funding?
- What is the baseline understanding for setting expectations of future improvements?
- Have you walked the corridor with stakeholders for improved perspective?
- How will health stakeholders be engaged and informed?

Partnerships and Stakeholders

At this step, the different roles for participants will begin to emerge. Health stakeholders that provide significant support or will be needed for implementation of the corridor plan should be engaged on a regular basis.

Although the transportation decision making structure is the ultimate authority, health partners can be a part of technical decision making.

How and when will stakeholders and the public be engaged?

The full list of potential stakeholders provided in Step 1 can be refined to include those agencies/groups specific to this corridor. If the intent is to share decision making within the corridor study, specific stakeholders will become partners. Stakeholders may advise the process by providing expertise and perspective at specific points in the study. Advocacy groups and others with a special interest can provide valuable support with respect to outreach and unique sources of information to support the identified health priorities.

The effected community is always a primary stakeholder. This includes those who live in the area as well as those who depend on the corridor for transportation. Preparing for stakeholder and public involvement is important at this step. Supplementing the agency’s public participation plan with new outreach mechanisms and participant lists may be necessary. Public health professionals are particularly skilled at reaching special-interest groups and disadvantaged populations.

The study will benefit from establishing specific times to check in with the public, either through collecting information about their interests or providing information about what has been learned/what is happening within the study. The steps in the framework will be a useful communication tool to assist in understanding the progress of the corridor planning study and what happens next. Consider how to effectively communicate with this new audience such as visualization techniques or other innovative approaches to sharing information.

Questions to Inform

What are the boundaries of the transportation corridor planning study?

What is the area of influence for transportation needs? For health issues?



Decision making

Step 2 establishes the baseline condition in the corridor before improvements are considered. This information will be used to compare potential health outcomes. Health issues can be prioritized as an input to transportation decision making.

Decision makers want to understand the return on investment. Practitioners must consider the data, tools, and information available to support this understanding.

Information traditionally collected in a transportation corridor study must be expanded to incorporate the health context. Health issues often elevate the importance of multimodal options.

Health Impact Assessments (HIA) can provide information for decision making if they apply to the specific corridor under study.

Available funding is always a consideration as well as the potential for shortfalls and/or delays. Grant funding may provide additional resources

What analytical capacity exists (data, tools, and skills) to conduct the corridor study?

Who uses the corridor? What are the primary uses (access, mobility, connectivity)?

Are there unmet transportation needs in the corridor?

What types of transportation improvements might be useful to address identified health issues?

What are the safety issues in the corridor?

What are the physical, environmental, and socio-demographic characteristics of the corridor?

What is the current land use pattern? How is it forecast to change?

What are the available travel options in the corridor?

What is the level of active transportation in the corridor to use as a baseline?

What existing plans or policies should be considered?

Who is living and working in proximity to the corridor?

Are there disincentives to using the corridor due to safety or access concerns?

What interests do health agencies and stakeholders have in the corridor?

Who are the key individuals/groups to involve?

What data/resources/skills might they bring?

Do the stakeholders have a history of transportation and health partnerships?

What are the public health priorities for the corridor?

Does management/leadership in both transportation and public health agencies support the priorities identified?

Are health priorities supported by the community and other stakeholders?

Are disadvantaged/special-interest populations present in the corridor?

What are the priority issues among disadvantaged/special-interest populations?

Is an HIA or other health-related study available or being considered for this area of influence?

Is the timeframe appropriate for this corridor study?

Are the transportation agency, partners, and stakeholders open to including this information?

What will be the process for incorporating results or conclusions into the corridor plan?

Are other forms of health assessment being considered?

What are the funding sources that will support considerations of public health?

Is there a current Transportation Improvement Program (TIP) project in this corridor?

Is additional funding needed to incorporate health into the corridor planning study?

Is the public health interest supported by grants or other funding sources?

Is there an opportunity to engage others with planning grants or in-kind services?



<p>to support the corridor study.</p>	<p>Are the public health partners willing or able to provide additional resources or funding?</p>
<p>Data and Analytical Support</p> <p>Data collection is a primary objective in Step 2 to determine what health data are available and how this can be used in the planning study. Transportation professionals have standard data analysis tools and criteria that often do not apply well to health data. Health data may be at a different scale or accuracy than common in transportation decision making.</p> <p>This step requires strong communication between transportation and health professionals to overcome any analytical/evaluation obstacles. Transportation practitioners are not expected to become health experts. Health professionals will be familiar with potential data sources and analytical methods to inform the study, and should be considered the primary resource.</p> <p>The data and tools used at</p>	<p>Questions to identify useful data and tools</p> <p>What existing data and tools are available to incorporate health in the corridor planning study?</p> <p>What data are needed to support the health priorities?</p> <p>Are health data available at the appropriate scale? Are there data gaps?</p> <p>Is quantitative modeling desired or needed? If so, are the right data/tools available?</p> <p>What is the timeframe for the health data?</p> <p>Is there qualitative data that could help inform the study?</p> <p>What baseline data are available on the transportation relationship to health?</p> <p>Is this corridor bike-friendly? Is there an established bicycle population? Is this a desired addition?</p> <p>Are sidewalks available, safe, and connected to provide access to food, services, recreation?</p> <p>Is transit service provided in this corridor? Are transit stops safe and accessible? Are more needed?</p> <p>Are there characteristics of the built environment that could enhance use of the corridor for non-motorized transportation/transit?</p> <p>What is the distance from traffic to dwellings, schools, parks, playgrounds, etc.?</p> <p>Are data on injuries and fatalities in the corridor available? Is the location specific enough to be useful in analysis?</p> <p>Is access for disadvantaged or special populations an issue?</p> <p>Data types useful in considering health:</p> <p>Travel survey data with information on mode preferences</p> <p>Mode choice data from the travel demand model</p> <p>Transit agency data on onboarding along the corridor and data on accessing buses via bicycles or wheelchairs along individual routes</p> <p>Bicycle and pedestrian level of service</p> <p>Bicycle and pedestrian count data (consider unusual sources such as advocacy groups, bike share programs, or local/regional governments)</p> <p>Crash Databases: Many States have crash databases that can be mapped at the corridor level.</p> <p>Average daily traffic counts or nearby air quality monitoring data might be available to inform air pollution levels.</p> <p>Data sources useful at this step:</p>



Step 2 in the Framework will likely be useful at Step 5 where potential solutions are analyzed for their effectiveness in addressing health issues as well as transportation needs. You may need to consider the ability to forecast data at this step in preparation for evaluating future outcomes.

Local plans and policies—environmental plans, county health plans, county comprehensive plans, economic development plans, and school siting plans may provide valuable information about the current and forecasted physical, environmental, and socio-demographic characteristics of the corridor.



Some States conduct health surveys, such as the California Health Interview Survey, which surveys more than 50,000 people through telephone surveys on topics such as health conditions, health behaviors, neighborhood and housing context, and food environment. Data can be analyzed down to the county level.

More information at: <http://healthpolicy.ucla.edu/chis/about/Pages/what-is-chis.aspx>

US Census/American Community Survey—The U.S. Census Bureau provides a range of data, including demographics, socioeconomic status, education, and commuting behaviors. These data provide an overview of the socio-demographic characteristics. Data are available by block groups. More information is available at:

<http://www.census.gov/>.

For additional specific information, note the two sources below.

Census Education Attainment Package—<http://www.census.gov/hhes/socdemo/education/>

Census Income, Poverty, and Health Insurance Coverage Package—

<https://www.census.gov/hhes/www/hlthins/data/incpovhlth/>

Census Transportation Planning Package The Census Transportation Planning Products (CTPP) was designed by transportation planners and provides a set of specific tabulations from large surveys the U.S. Census Bureau American Community Survey (ACS) data. The CTPP includes residence-based tabulations, workplace-based tabulations, and worker flows between work and home. More information can be found at

https://www.fhwa.dot.gov/planning/census_issues/ctpp.

Centers for Disease Control and Prevention’s National Environmental Public Health Tracking Network provides State and county level health data. More information at: <http://ephtracking.cdc.gov/showHome.action>

The **Chronic Disease Indicators (CDI)** is a crosscutting set of 97 indicators developed by consensus. The CDI enables States, territories, and large metropolitan areas to define uniformly, collect, and report chronic disease data that are important to public health practice. More information at: <http://www.cdc.gov/cdi/>



Safe Routes to School (SRTS) Program—student walk or bike counts. SRTS is a DOT program that addresses the challenges and barriers that prevent children from walking or biking to school.

<http://www.saferoutesinfo.org/data-central/find-state-contacts>

Fatality Analysis Reporting System (FARS) – location and information about fatal crashes, including separate data on bicycle and pedestrian fatalities. More information at: <http://www.nhtsa.gov/FARS>

Tools to consider at this step:





Oregon Mosaic—Mosaic is a new methodology for use in transportation planning the Oregon Department of Transportation developed in collaboration with local, regional, and statewide stakeholders. The approach offers planners and decision makers an effective and efficient way to evaluate the social, environmental, and economic costs and benefits of transportation actions and investments. <http://www.oregonmosaic.org/>



National Tree Benefit Calculator—The tool estimates the benefits (in dollars) of individual trees planted along a street and provides an analysis of the corridor’s existing trees. More information available at: <http://www.treebenefits.com/calculator/>



EPA Smart Location Database—Provides neighborhood level data on factors related to active transportation. Available at: <http://www2.epa.gov/smartgrowth/smart-location-mapping>

Route Tracking Tools, such as STRAVA—Although not an official assessment of all routes used, this crowd-sourced way of gathering data on trips and routes can inform the development of alternatives, as referenced by Kentucky Transportation Cabinet Bike-Walk. Although this will require purchasing the data, capturing commute data is often difficult. More information about Kentucky’s use of STRAVA at: <http://transportation.ky.gov/Bike-Walk/Pages/ResourceLinks.aspx>

Bicycle and pedestrian Level of Service (LOS) Calculator Tool—Because auto LOS is a standard measure, many attempts have been made to quantify multimodal LOS. This tool is one example for reference. <http://rideillinois.org/advocacy/bikeped-level-of-service-measures-and-calculators/>

The Physical Activity Neighborhood Environment Scale (PANES) and the Neighborhood Environment Walkability Scale (NEWS) are two data collection tools that measure and assess walking and biking characteristics at the neighborhood level. Designed by the University of California – San Diego, these tools are complemented by others such as Quality of Life Study for Seniors. More information available at: <http://sallis.ucsd.edu/measures.html>

Pedestrian Environmental Quality Index (PEQI)—A tool for assessing the existence of pedestrian infrastructure and overall walkability developed by the San Francisco Department of Public Health. The tool is a worksheet and mobile app that can be tailored according to neighborhoods in any State. More information available at: <http://www.peqiwalkability.appspot.com/about.jsp>

Young Child Risk Calculator—Developed by the National Center for Children in Poverty, this tool calculates the percentage of children in a given geographic area that are experiencing specific risk factors that lead to poor health, school, and developmental outcomes. Available at: <http://www.nccp.org/tools/risk/?state=US&age-level=3&income-level=Low-Income&ids%5B%5D=77&ids%5B%5D=84&ids%5B%5D=76&ids%5B%5D=78&ids%5B%5D=74&ids%5B%5D=72&ids%5B%5D=83&submit=Calculate>



Resources



Commuters' Exposure to Particulate Matter Air Pollution Is Affected by Mode of Transport, Fuel Type, and Route – Significant influence on rush-hour exposures. <http://www.ncbi.nlm.nih.gov/pubmed/20185385>



TCRP 100: Transit Capacity and Quality of Service: <http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp100/part%200.pdf>



NCHRP 616: Multimodal LOS for Urban Streets: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_616.pdf

Multimodal LOS Indicators: <http://www.vtapi.org/tdm/tdm129.htm>

Bike LOS documentation: http://nacto.org/docs/usdg/bicylce_Level_of_service_model_sprinkle_consulting.pdf

Ped LOS summary documentation: <http://asap.fehrandpeers.com/wp-content/uploads/2012/05/MMLOS-Tool-HCM-2010-Pedestrian.pdf>

TRB Tools for Pedestrian and Bicycle Volume Data Collection—covers methods to mine and manage data sources, find and use new technologies, and compile and disperse pedestrian and bicycle volume data. <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3159>



“A Census of the U.S. Near-Roadway Population: Public Health and Environmental Justice Considerations”—Baseline information on the race and income disparities of populations living near roads. More information at: <http://www.sciencedirect.com/science/article/pii/S1361920913001107>

Expanding Specialized Transportation: New Opportunities under the Affordable Care Act—describes how States can utilize the Affordable Care Act (ACA) to promote and/or fund specialized transportation services for the elderly and adults with disabilities. <http://www.aarp.org/content/dam/aarp/ppi/2015/AARP-New-ACA-Transportation-Opportunities.pdf>

The Imagining Livability Design Collection—describes several common tools and treatments that can be utilized to create age-friendly environments. <http://www.aarp.org/livable-communities/tool-kits-resources/info-2015/imagining-livability-design-collection.html>

Examples from Practice

Delaware Valley Regional Planning Commission has been actively incorporating health for several years. **The agency used the Framework** to enhance the Coordinated Human Services Transportation Plan by providing data to identify health issues, needs, and priorities in the Haddon Avenue corridor. Steps 1 and 2 were completed concurrently to develop an understanding of the baseline information prior to engaging stakeholders. Some data were readily accessible from the American Community Survey and other standard data sources. Customized maps with data from new sources were used to engage stakeholders at the first Advisory Group meeting. For more information see the full case study report.



Davidson Walks & Rolls Active Transportation Master Plan—Serves as an active transportation plan for the Town of Davidson, NC. The planning staff conducted extensive data collection and analysis of current conditions for walking and biking, including a health and environmental equity analysis to identify areas lacking access to necessities such as transit access. More information: <http://www.ci.davidson.nc.us/index.aspx?NID=774> (see Current Conditions and Appendix A).

Middle Tennessee Transportation and Health Survey—Developed a travel survey that sampled 6,000 households that included questions about physical activity and eating behaviors along with other targeted health information about food security, physical activity for transportation and leisure, and chronic diseases prevalent in the household. A small subset of households (600) used GPS devices and activity monitors to collect more specific data on physical activity. More information: http://www.nashvillempo.org/docs/bikeped/ABOUT_HHTS_102212.pdf

Health Impact Assessment of the Massachusetts Department of Transportation (MassDOT) Grounding McGrath Study—Presents the results of MassDOT’s pilot HIA. The study includes demographic data, an assessment of conditions for walking and biking, transit availability, air quality, pedestrian and bicycle activity, safety (including pedestrian and bicycle crashes), and land use. Additionally, it includes an evaluation of the effects on these criteria that would result from a range of potential corridor improvement alternatives. www.mass.gov/eohhs/docs/.../hia-mcgrath-final-report.doc

Portland Metro Equity Baseline Report—Provides a framework for Metro to better understand its roles and responsibilities for equity in the region, and ideas for how to assess and measure progress in the future. More information: <http://www.oregonmetro.gov/regional-leadership/access-metro/equity>

I-Walk—Administered by the Iowa Department of Public Health and the Iowa State University Extension and Outreach, I-Walk is the State of Iowa’s walkability program. This walking assessment logistics kit is used to collect data, with a focus on older adults and school children. More information can be found at <http://www.i-walk.org/>

TransBASE—Initially developed through funding from CDC’s Health Impact Assessment to Foster Healthy Community Design grant, TransBASE is now institutionalized as a part of inter-agency transportation and health collaboration, and is currently funded as a local initiative. Data applications of TransBASE include: spatially identifying high-injury corridors for targeted safety efforts for pedestrians, cyclists, and motorists in support of Vision Zero; informing WalkFirst; harnessing data into a centralized system for monitoring and evaluation; and developing multivariate models to identify environmental correlates of pedestrian injuries. More information available at: <http://transbasesf.org/transbase/>

The **New York City Health Department** has compiled data from its annual community health survey into a searchable, user-friendly interface to query environmental data, health and behavior population data, and even downloadable neighborhood reports: <http://a816-dohbsp.nyc.gov/IndicatorPublic/publictracking.aspx>



Step 3: Develop Goals and Objectives that Promote Health in the Community

What happens here?

The corridor study may include goals related to health. The health impacts of potential transportation strategies will be considered as goals and objectives are developed. Goals and objectives related to health provide a benchmark for establishing evaluation criteria and analyzing solutions.

Questions to Consider at this Step

- What are the potential health benefits of transportation decisions?
- To whom do these benefits apply? Are they equitable?
- How do the benefits relate to the health priorities in the community?
- How do the transportation goals and the health priorities relate?

Partnerships and Stakeholders

Health partners and stakeholders play an essential role in identifying the relationships between transportation goals and objectives and public health outcomes. Transportation strategies are often connected to community benefits such as access to jobs and economic development goals that are also related to public health.

Incorporating health into transportation requires education on both sides to avoid potential communication barriers.

Does the potential health benefit connect to other social metrics such as education, jobs, income?

- Are there specific populations impacted by the transportation decision?
- Is there a potential negative outcome to this population?
- Are there ways to mitigate any adverse impact with respect to health?
- What are the community's overall goals and values?
- How are the community goals and values related to health?
- Are there specific public health risks?

Collaboration between health and transportation professionals leads to a strong understanding of how transportation improvements can benefit the community. Public health professionals can help engage community groups and individual champions to identify community goals, priorities, and objectives that are related to health. Health partners can provide technical assistance in creating measurable objectives.

As health partners and stakeholders become more engaged in the process, making sure both sides clearly understand what is being communicated is critical. Transportation process, terminology, and other considerations are unfamiliar to health professionals. Conflicts may emerge in the goals discussion with respect to budget constraints, engineering standards, analytical processes, and other obstacles. Considering how these potential conflicts can be evaluated and resolved is important.



<p>Questions to Inform Decision Making</p> <p>Decision makers need to understand how incorporating health will impact the transportation priorities and investments. Goal setting can formalize the intent to incorporate health. Transportation values and priorities can then be communicated clearly to health partners and stakeholders.</p>	<p>What are the transportation goals and objectives for the corridor? How does our investment in public health rank with other corridor priorities? What resources/attention will these investments receive? How will investment in health support other corridor priorities?</p> <p>How do the transportation goals and the public health priorities relate? What do they have in common? Are there any conflicts? Are any goals mutually supportive?</p> <p>What public health outcomes (determinants/behaviors/choices) can our decisions affect? How will potential inequities in the distribution of resources or access to health-promoting resources be addressed? What are the health risks that should be avoided in making transportation decisions (exposure, behavior, disparities)?</p> <p>Do any health priorities suggest different/new transportation objectives?</p>						
<p>Data and Analytical Support</p> <p>Data and analysis at Step 3 are needed to support the relationship between transportation decisions and health outcomes. This relationship will inform the setting of measurable objectives for identified health goals. Potential interactions and impacts with other community interests are also important to capture.</p>	<p>Data that could be useful: Any information that establishes the relationship between the current condition and the desired future condition could be useful. Such information will enable the identification of realistic and measureable goals and objectives. Consider these areas for comparison:</p> <table border="0"> <tr> <td>Active transportation</td> <td>Air quality, air pollution</td> </tr> <tr> <td>Safety</td> <td>Access to food/health services</td> </tr> <tr> <td>Land use</td> <td>Demographics, health equity</td> </tr> </table> <p>Tools that could be useful: Tools for setting goals are typically to meet three purposes:</p> <ol style="list-style-type: none"> 1. Analysis to compare the base year and future year: Tools and data used in Step 2 will address this purpose. 2. Prioritizing or ranking potential investments: Methods such as analytical hierarchy process (AHP), facilitated discussion, and other process tools are useful when there is potential conflict or new participants. 3. Engaging the public: Information from an existing community vision can provide useful input at this Step. Many public participation options are available to gather input. On-line surveys to collect public input on goals and priorities is a useful and inexpensive option. One relatively new example of public engagement is Meeting in a Box. For more information: http://www.planeasttn.org/Participate/MeetinginaBox.aspx. 	Active transportation	Air quality, air pollution	Safety	Access to food/health services	Land use	Demographics, health equity
Active transportation	Air quality, air pollution						
Safety	Access to food/health services						
Land use	Demographics, health equity						



Resources



Community Planning Toolkit – to support community and volunteer involvement in community planning processes. For information: <http://www.communityplanningtoolkit.org/community-engagement>

MetroQuest – A tool for interactive public engagement that builds on data that transportation agencies have available to solicit input on goals, visions, scenarios, and a variety of other uses: <http://metroquest.com/>

STARS Safety, Health, and Equity Credits – A rating system used to evaluate the safety, health, and equity of transportation solutions. STARS is available at the plan and project levels. For information: <http://www.transportationcouncil.org/>

Examples from Practice

The examples provided at this step highlight the potential for interagency collaboration to support healthy communities. By recognizing individual agency priorities and aligning efforts, health can be improved across governmental sectors. Identifying a shared interest is a good starting point for collaboration.

EMBARK used the Framework in the Northwest Corridor Concept planning in Oklahoma City to identify how changes can improve public health, mobility, quality of life, economic development, and livability. Potential strategies that help meet the goals and objectives were identified and considered by partners and stakeholders. By creating both health and transportation goals and objectives, the connections between the two areas became clear. The selected health goals and objectives show diverse health issues considered rather than focusing on a single challenge. These relate to improving public health, physical activity, and access to health resources. For additional information see the full case study report.

The **California Health in All Policies Task Force** is a collaboration of several State agencies, including Caltrans, the California Department of Public Health, the California Department of Food and Agriculture, the Office of the Attorney General, the Department of Education, and others. The Task Force works to improve the health of all people by applying the lens of health, equity, and sustainability to State agency decision making. The Task Force continues to prioritize active transportation as a key indicator of healthy communities. Its recently updated Active Transportation Action Plan identifies opportunities to increase walking, biking, and transit use and how each of the State agencies can support these goals. More Information: http://sgc.ca.gov/docs/Active_Transportation_Action_Plan_9-26-14.pdf

The **North Carolina Healthy Environments Collaborative (HEC)** is an interagency partnership of the State departments of Health and Human Services, Transportation, Environment and Natural Resources, cultural resources, and Commerce. The agencies work together to integrate and align departmental efforts to improve health (public, economic, and environmental) across the State. The HEC has been involved in the development of the Statewide Bicycle and Pedestrian Plan, which integrates public health considerations. More information: http://healthyamericans.org/health-issues/prevention_story/north-carolina-transportation-commerce-and-environment-are-integral-in-building-healthy-communities and



<http://www.walkbikenc.com/>

The **San Francisco Metropolitan Transportation Commission (MTC)** has been engaging with health agencies for many years with a focus on injury prevention. MTC's most recent Regional Transportation Plan included a health-based performance target of average daily time walking or biking for transportation. MTC based the target on the average amount of biking and walking for transportation among Bay Area residents who live within ½ mile of a rail or ferry station: 15 minutes per day. The agency evaluated 700 projects in the Bay Area, and completed a benefit/cost analysis for 100 of these projects to determine their impacts on the target. More information at: http://www.mtc.ca.gov/planning/2035_plan/

The **Oregon Metro Climate Smart Communities Scenarios Project** was established by legislation passed in 2009 after the Oregon Legislature mandated that the Portland MPO, Metro, develop and implement a strategy to reduce greenhouse gas emissions from cars and trucks by 2035. Metro identified policies that would make transit more affordable and accessible, biking and walking safer and convenient, and streets and highways safer and more connected. These strategies are anticipated to “help people live healthier lives” through reduced air pollution and increased physical activity to reduce illnesses and improve public health. The project shows how communities can fulfill environmental goals, while simultaneously supporting other initiatives such as transportation and equity. More information on the project can be found at <http://www.oregonmetro.gov/public-projects/climate-smart-communities-scenarios>



Step 4: Establish Evaluation Criteria that Include Public Health

What happens here?

Strategies proposed to meet the corridor study goals and objectives are identified at this step. To consider health impacts within each strategy, evaluation criteria are developed. These criteria will be used in the next step to measure the effectiveness of alternative solutions from both a transportation and health perspective.

Questions to Consider at this Step

- What transportation strategies have been proposed for the corridor?
- How can the potential health impact of these strategies be measured?
- What contribution do health stakeholders provide to establishing evaluation criteria?
- What skills, data, tools, and information are available to measure health impacts?
- How will the selected evaluation criteria be effectively communicated to health stakeholders and the community?

Partnerships and Stakeholders

Setting the evaluation criteria is essential to establishing a strong understanding between transportation and health before solutions are fully considered. Health stakeholders can provide supporting information and guidance for evaluating potential health outcomes.

How well are the selected evaluation criteria understood and agreed to?

- Who makes the final decision on evaluation criteria?
- How will the decision be communicated?

Communication to health stakeholders is essential before and after the approval of criteria. Stakeholders need to understand how their input has been considered and reflected in the criteria as well as who makes the final decision. If the corridor study team includes health partners, communication may be most effective from health representatives.

Information about potential health benefit to inform the selection of alternatives may emerge as criteria are established. Specific design features of potential solutions can illustrate to decision makers that small changes can have a measurable effect.



Questions to Inform Decision Making

Strategies are a critical step to identifying individual transportation improvements in the corridor to address the problems and needs. For example, land use changes or the addition of transit service might help meet the transportation goals and objectives while also addressing the health priorities. Although traditional transportation solutions will be identified easily, considering a full range of strategies to evaluate health impacts is critical.

At this step the inter-relationships between transportation, health, land use, and other aspects of the community emerge. It is possible to see benefits that are broadly applicable.

The questions identified also remind practitioners to look back to previous steps for opportunities to address more than the goals and objectives require.

What is the full range of strategies to address the needs and priorities identified for the corridor?

- Which strategies are most relevant to the transportation needs?
- Which strategies support desirable health outcomes?
- Which strategies address both the transportation needs and the desired health outcomes?
- Which strategies will be evaluated?

What is potential impact of the desired health outcome on the community/target population?

- Can the health outcome be measured quantitatively? If not, how will it be evaluated?
- Is the desired health outcome needed by the corridor population? Do they care about this outcome?
- Does the desired health outcome address health disparities among the population in this corridor?
- How long will it take transportation interventions to result in measurable health change?
- Can health impacts on individual population groups be measured? If so, who will be responsible measuring?
- How will the information collected be used?

What other non-transportation impacts/benefits such as access to jobs, economic development, or crime will be considered?

- How and when will these impacts be considered? During alternative analysis?
- How do the evaluation criteria address equity concerns?
- How will the evaluation criteria be communicated to the public and stakeholders?

Are there performance measures to support the goals and objectives for the corridor?

How will the evaluation criteria be prioritized or weighted?

- Do previous studies have existing criteria and examples that can be used to inform this study?
- How will health partners and stakeholders assist in the ranking of criteria?
- How do concerns with health equity affect the prioritization of the criteria?
- Which criteria are quantitative? Which criteria are qualitative?
- How will we include both in the evaluation?

Are any priorities identified in earlier steps not reflected in the goals?

- Does the study present an opportunity to address these priorities?
- Are any data, information, and metrics readily available?
- Is there time and resources available to consider these other health priorities?
- How will we communicate the evaluation of other priorities to the public and stakeholders?

Are any potential outcomes important to broader policy goals?



Data and Analytical Support

This step is a link between the baseline established in Step 2 to the comparison of alternatives that will occur in Step 5. Developing evaluation criteria will require agreement on data and analytical processes that will be used to evaluate potential solutions in the corridor.

Incorporating specific health criteria into the evaluation of transportation solutions establishes a more formal and visible intent to consider health in the community.

Do we have the analysis capabilities for the strategies identified?

What data and analysis tools do we need? Are they available? Are they at the right scale and in the right timeframe?

Who will collect and analyze the data?

What are the technical skills required for this analysis? Are they available?

What data/skills do our health partners bring? How does this affect our choice of criteria?

What is the baseline for comparison? Does the baseline data still apply? What data gaps have been identified?

What data on health indicators are available?

Can these data be collected easily and consistently?

Are there non-traditional sources of data to consider?

Data and tools at this step:

Although no specific analysis is required here, practitioners must plan for the data and tools that will be used for evaluating the alternatives. A direct correlation between transportation strategies and public health benefits is difficult to establish; however, evaluating options in a qualitative or separate approach that will still inform decisions is possible and valuable.

Data and analysis methods identified at Step 2 are the initial resources for this step. If the goals, and objectives introduced new considerations, re-establishing the baseline may be necessary. Tools and analysis methods that will be applied in Step 5 are also considered at this step to determine whether the required data are available. Tools are not generally necessary to define the strategies to be evaluated.

Resources



NCHRP 770: Estimating Bicycling and Walking for Planning and Project Development: A Guidebook– Available at:

<http://www.trb.org/main/blurbs/171138.aspx>

National Bicycle and Pedestrian Documentation Project – Methodologies for tracking and estimating user demand.

<http://bikepeddocumentation.org/>

Walk Bike NC Plan Appendix – contains data to be considered for potential health benefits associated with transportation design strategies.

Available at: <http://www.walkbikenc.com/wp-content/uploads/2014/11/Health-Appendix.pdf>



When are Bus Lanes Warranted? Considering Economic Efficiency, Social Equity, and Strategic Planning Goals - analyzes the impacts of adding bus lanes as well as how to gain the greatest benefit from the investment. Available at: <http://www.vtpi.org/blw.pdf>



Examples from Practice

EMBARK plans to screen Improvements for the Oklahoma City Northwest Corridor using evaluation criteria specifically related to the goals and objectives developed using the Framework. Selected strategies may add physical improvements or be policy-related, such as needed partnerships, awareness campaigns, and special zoning. Strategies can be further refined by criteria that identify how the strategy will be measured for effectiveness. For example, does a strategy that adds transit stops place a higher priority on access to health-related resources and jobs? For more information, see the full case study report.

The Minnesota Department of Transportation’s (MnDOT) Corridor Investment Management Strategy included public health impacts in the evaluation criteria used to evaluate, rank, and select highway projects for competitive funding. The criteria bases 60% of the project score on an enhanced benefit-cost evaluation using a tool developed by Parsons Brinkerhoff called PRISM. The PRISM tool uses dollar-value equivalents to evaluate social, economic, and environmental factors, including public health effects through bicycle and pedestrian physical activity, criteria pollutants, safety, and noise. Other factors considered in 30% of the project score include a category identified as Community Health and Access. Projects that improve access to preventative and clinical health care facilities/recreational facilities or that avoid/minimize negative impacts to or positively improve access for low-income or disadvantaged populations receive a higher score. The remaining 10% of the project score is based on local financial match. For more information on PRISM, see <https://prism.pbworld.net/prism-overview> .

The **Healthy Communities** grant program in Kentucky provided six mini grants of \$5000 for communities to develop or advance pedestrian plans. Training was provided to each community and interviews were conducted with grantees and State-level committee members. This information helped develop a vision document and identify three strategies (see below) needed to improve development of pedestrian plans in Kentucky. Kentucky Transportation Cabinet (KTC) will use the vision document to increase awareness of the need for pedestrian plans and to gain more partnerships to help with providing training, technical assistance, and resources.

STRATEGY 1: Engage the community. Engage the leaders of local coalitions and build relationships between the community and decision makers

STRATEGY 2: Connect communities with easy-to-use resources. Kentucky-specific resources that designs the community for physical activity

STRATEGY 3: Provide training, technical assistance, and networking opportunities. Experience the possibilities first-hand to motivate individuals

Oregon Health Authority Transportation Options Health Impact Estimator – The Healthy Communities Lab in the Oregon Health Authority’s Public Health Division (OHA-PHD) used the Integrated Transport and Health Impact Model (ITHIM) to assess the extent to which the Climate Smart Draft Approach is expected to increase physical activity, reduce exposure to air pollutants, and prevent traffic collisions. The study shows how Oregon used the BRFSS and ITHIM to evaluate scenarios to provide decision makers with cost savings associated with decreased illness and death. See: http://public.health.oregon.gov/HealthyEnvironments/TrackingAssessment/HealthImpactAssessment/Documents/CSCS/OHA-PHD_CSS%20HIA_Final.pdf



Step 5: Develop and Evaluate Alternatives and their Health Impacts

What happens here?

Alternatives are potential solutions to address identified problems. Solutions may be very specific or no more than a high-level concept. This is an iterative step where potential solutions are vetted and refined prior to evaluation and selection.

The outcome of this Step is a set of alternatives that allow decision makers to understand the implications of their choices. Health outcomes from transportation decisions may be difficult to quantify, which transportation practitioners often find problematic.

Questions to Consider at this Step

What are the viable transportation alternatives?

How do these alternatives influence health outcomes?

Are any of the alternatives preferred by health partners and stakeholders?

Do the alternatives require additional support from partners outside transportation to implement effectively?

How can transportation practitioners evaluate the health impacts of alternative transportation solutions?

Partnerships and Stakeholders

At this step, health stakeholders can assist transportation practitioners by identifying the potential health impacts and tradeoffs of different alternatives.

Who are the health stakeholders that can provide information and assist in comparing alternatives?

Are there health stakeholders with specific knowledge that is needed for evaluation?

Are potential health impacts generally understood and agreed upon between health and transportation?

Are there specific populations affected by individual alternatives?



Questions to Inform Decision Making

Alternatives that address the transportation problem or need will provide the foundation for this step. The public health implications can then be considered with a viable set of potential transportation solutions.

This is often the point at which return on investment is a part of staff considerations. It is very difficult to quantify the “bang for the buck” that transportation decision makers are familiar with when incorporating health. In preparing for presenting alternative solutions to decision makers, it is useful to gather any supporting information available to characterize the potential return on investment.

How do the proposed alternative solutions affect health outcomes?

How do they differ in terms of health outcomes?

How are health criteria impacted by the alternative corridor designs?

What other known or planned activities are anticipated that might influence the importance of public health outcomes in the corridor? (new air quality standards, new transit line/station, or other anticipated changes)

How will health in the community change if this alternative is implemented?

How much change is anticipated and over what timeframe?

Do the alternatives meet the needs of specific population groups?

Do the alternatives disproportionately affect (positively or negatively) the health of specific population groups?

What tradeoffs and benefits are associated with incorporating health priorities?

How do we balance various public health outcomes?

Do improvements in one area result in setbacks in another?

Are the identified tradeoffs likely to be acceptable to decision makers?

Is it possible to modify any alternative to address both health and transportation priorities?

Does the alternative that best supports public health conflict with other transportation goals or functions? (preserving mobility and travel time reduction compared to access and safety issues)

Is there a threshold where the benefits are strong but do not negatively impact other needs?

Do we accept this threshold?

How will we communicate the tradeoffs to stakeholders and the public?

What improvements are necessary to achieve the desired health outcome in the corridor?

What level of investment is necessary to achieve the desired health outcomes?

What level of confidence do we have in potential outcomes? How will this be validated for future considerations?

Is there a recreational/ transportation distinction that is important to our decision makers?

What future land use pattern is needed or expected to support alternatives?

Is a connection to other bicycle and pedestrian/transit facilities included in the alternatives?

Are any potential extra costs associated with the alternatives? (right of way/easement acquisition)

Has information from an HIA or other health assessment been considered or did one inform these alternatives?

If there are TIP project(s) identified for this corridor, what impact does this have on the recommended alternatives?



Data and Analytical Support

Step 5 is a highly technical step where analysis, both quantitative and qualitative, is the focus. Data from health stakeholders will be essential to developing the alternatives and considering the potential outcomes and tradeoffs.

In this step, much of the data collected in previous steps will continue to be used. These data will help consider how the alternatives differ in terms of public health outcomes and how they compare to the baseline condition.

Data that could be useful:

Significant new data collection is not anticipated if data have been gathered in Step 2. Additional data related to specific alternatives may be available. Consider recent data collection efforts that may inform specific interests.

Local data about travel behavior and travel markets

Forecasted mode split changes

Anticipated future conditions (land use, demographics, travel patterns, economic development)

Recent survey data for transit, household travel, public involvement feedback

Baseline data on corridor health conditions, such as health equity or health disparities related to obesity and asthma, quality of life, and other social determinants of health

Anticipated health changes based on future population

Tools that may be useful:

The tools listed below are those currently available and used by some transportation practitioners. Some agencies have found developing their own database or spreadsheet analysis methods beneficial to meet the specific needs of their region. The use of tools and analytical methods for integrating health into transportation is growing, and this list is anticipated to grow and change over time.



The Integrated Transport and Health Impact Modeling Tool (ITHIM) – the ITHIM is a modeling tool that provides integrated health impact assessments of transport through changes in physical activity, road traffic injury risk, and urban air pollution. Modeling the alternative solutions for consideration of health impacts will help identify whether the alternatives can achieve the desired health outcomes, and what the tradeoffs might be. More information is available at: <http://www.cedar.iph.cam.ac.uk/research/modelling/ithim/>

Health Economic Assessment Tools (HEAT) – HEAT is an online tool that estimates the value of reduced mortality resulting from regular walking and bicycling. This tool helps assess how the proposed alternative solutions affect public health outcomes, particularly for walking and biking. More information at: <http://www.heatwalkingcycling.org/>

Resources



Health Effects of London Bicycle Sharing System: Health Impact Modeling Study –The study evaluated the health implications of the London bike share program. More information at: <http://www.bmj.com/content/348/bmj.g425>

Route Planning for Soft Modes of Transport: Healthy Routes – Describes approaches to linking walking and biking in an urban setting while reducing exposure to noise and air pollution. More information: http://www3.dsi.uminho.pt/seeum2010/CD/artigos/2074_1.pdf

Planning Complete Streets for an Aging America –More information: http://www.aarp.org/home-garden/livable-communities/info-08-2009/Planning_Complete_Streets_for_an_Aging_America.html





Air Quality and Exercise-Related Health Benefits from Reduced Car Travel in the Midwestern United States – This study quantifies the benefits from reducing automobile use for trips in urban and suburban areas. More information: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3261937/pdf/ehp.1103440.pdf>

The following resources are related to return on investment



A Resident's Guide for Creating Safer Communities for Walking and Biking - FHWA guide with practical information on improving pedestrian and bicycle safety; includes checklists, tip sheets, worksheets, and sample materials that can be adapted to meet the needs of a particular community. http://safety.fhwa.dot.gov/ped_bike/ped_community/ped_walkguide/residents_guide2014_final.pdf

Benefit Cost Analysis of Public Health Outcomes in Long-Range Transportation Planning in the San Francisco Bay Area – to identify the most cost-effective projects and programs to increase active transportation in the region. <http://trid.trb.org/view.aspx?id=1288720>

Safer Streets, Stronger Economies - Summarizes the impacts of 37 complete streets projects for which before and after transport and economic data were available. <http://www.smartgrowthamerica.org/research/safer-streets-stronger-economies/>

The Complete Business Case for Converting Street Parking into Bike Lanes - Synthesizes several studies that indicate bicycle facilities tend to support local business. <http://www.citylab.com/cityfixer/2015/03/the-complete-business-case-for-converting-street-parking-into-bike-lanes/387595/>

Community Design, Street Networks, and Public Health - Health outcomes using data from 24 cities in California indicate that more compact and connected street networks have reduced rates of obesity, diabetes, and high blood pressure. <http://www.sciencedirect.com/science/article/pii/S2214140514000486>

Designed to Move: Active Cities – Builds a case for creating active cities and then shares ways to do so. <http://e13c7a4144957cea5013-f2f5ab26d5e83af3ea377013dd602911.r77.cf5.rackcdn.com/resources/pdf/en/active-cities-full-report.pdf>

The Economic Costs of Overweight, Obesity, and Physical Inactivity Among California Adults – 2006 - Estimates and analyzes the costs of overweight, obesity, and physical inactivity for California; considering medical costs and lost productivity costs. http://www.publichealthadvocacy.org/PDFs/Costofobesity_BRIEF.pdf

Evaluating the Economic Benefits of Nonmotorized Transportation - Provides information both on the types of economic benefits possible as well as how to evaluate the benefits. <http://www.pedbikeinfo.org/data/library/details.cfm?id=4926>

Healthy Decatur: A Holistic Approach to Sustainability – Decatur, Georgia approach to sustainability, with some information regarding economic change based on increased active transportation. <http://www.atlantaregional.com/local-government/implementation-assistance/topical-resources>

North-Avenue Corridor Redesign: Potential Health Impacts - The Chittenden County Regional Planning Commission health impact assessments http://www.ccrpcvt.org/corridors/NorthAve/20140606_North_Avenue_Health_Impact_ASESSMENT_FINAL.pdf

Streetwise - Presents the case for increasing biking and walking in cities, quantifying the link between active transportation and public health. <http://www.economist.com/news/international/21663219-cities-are-starting-put-pedestrians-and-cyclists-motorists-makes-them>



Examples from Practice

Akron METRO applied the Framework with the goal to improve transit service quality for existing and future METRO customers. METRO wanted to ensure that transit decision making considers the needs of protected populations and engages them in the decision making process. The alternatives evaluated were arrangements of existing bus stops with each analysis incorporating health and public safety inputs. This enabled development of a stop consolidation scenario that protects access to medical/health facilities and purveyors of healthy food while improving travel time and schedule adherence for transit customers. For more information, see the full case study report.

The **Healthy Communities Atlas** was developed by the San Diego Association of Governments (SANDAG) in collaboration with the San Diego Health and Human Services Agency (HHS) as part of the Healthy Works program. It highlights the program's commitment to preventing obesity through access to healthy food and physical activity. The Atlas uses GIS tools to illustrate the geographic distribution of environmental factors that influence behaviors leading to obesity. More information at: <http://www.sandag.org/index.asp?classid=12&projectid=482&fuseaction=projects.detail>

Arlington County Commuter Services (ACCS) developed a method for determining the public health benefits of the agency's programs. **"Transportation Demand in Arlington County: Calculating the Return on Investment for Public Health"** describes the framework and its results. ACCS observed the links between public health and TDM programs through five basic metrics: physical activity, safety, access to healthcare and healthy food, quality of the environment, and mental health. In addition, ACCS adapted the Health Economic Assessment Tool (HEAT) and the Physical Inactivity Cost Calculator (PICC) in order to perform a cost-benefit analysis of TDM programs. Following this framework, ACCS determined that if the TDM programs helped an added 1% of residents get CDC-recommended levels of physical activity, the community would save \$12 million due to reductions in medical costs, lost productivity and workers compensation claims. Furthermore, residents would save \$7.5 million because of reduced mortality. More information: <http://mobilitylab.org/2013/05/07/the-transportation-cost-savings-calculator-public-health-and-safety/>

The Nashville Area MPO, in partnership with the Centers for Disease Control and Prevention, is the second city in the nation to run the Integrated Transport and Health Impact Model (ITHIM). The model is a scenario planning tool that uses population-level estimates for minutes of increased physical activity resulting from active transportation. It outputs the Disability Adjusted Life Years (years of lives saved and lived-longer) for decreased prevalence of diseases including: cancers related to physical inactivity, motor vehicle injuries, air quality-related respiratory diseases, and cardiovascular disease. Model outputs will be monetized for healthcare savings.

The Metropolitan Transportation Commission (MTC) explored the **Benefits of Walking and Biking in the San Francisco Bay Area** by developing a methodology to quantify these benefits for transportation purposes. The analysis examined which projects had the greatest positive impact in encouraging active transportation modes. Results identified that Bay Area residents could achieve \$1.1 billion in lost productivity and healthcare cost savings if the region could meet the regional target of 70% growth in active transportation by 2035. This is equivalent to 15 minutes of active transportation per person per day. In a parallel effort to quantify the benefits of active transportation, the California Department of Public Health, MTC, California Office of Environmental Health Hazard Assessment and others examined CO2 reduction scenarios and associated co-benefits. The CA Department of Public Health applied the Integrated Health Transport Impact Model (ITHIM) to the Bay Area using model, air quality, U.S. Census and public health data. For associated information see the press release from 2013: http://www.mtc.ca.gov/news/press_releases/rel595.htm



Step 6: Identify Alternatives that Support Health in the Community

What happens here?

Step 6 focuses decision makers on those alternatives that have the potential for improved community health. Health partner and stakeholder engagement is critical to create buy-in for the process regardless of the outcome. This step illustrates the potential impact transportation decisions can have on health and emphasizes the importance of maintaining relationships to continue supporting healthy communities. The step is a set up for adoption and implementation of a preferred alternative, and for continued partnership and relationship building.

Questions to Consider at this Step

- Which alternative has the most potential to influence public health meaningfully in this corridor?
- Are the resources available to implement the alternatives?
- How will the final decision on the selected alternative for the corridor be communicated to health stakeholders and the community?
- Have new relationships/partnerships been developed as a result of this study?
- How will the anticipated health outcomes be evaluated over time to inform future decisions?

Partnerships and Stakeholders

At this step, health partners and stakeholders show support for alternatives that have the most potential to influence public health. Long-term partnerships formed during the development of the corridor study provide additional incentive for incorporating health along with broader community support.

Health partners, stakeholders, and the public may have limited understanding of the transportation decision making process. This step also

Is there a sponsor or implementing partner for the alternatives preferred by public health?

- Is there a multiagency partnership at the State or regional level that supports incorporating health?
- Is there a relationship to other plans such as the Strategic Highway Safety Plan, Toward Zero Deaths, or Health in all Policies?
- Is there a community or agency champion that has the potential to bring broad support for implementation?
- What do we know about public support for the alternatives?

Who will make the final decision on the selected alternative for the corridor?

- When and how will it be made?
- How will the public and stakeholders be informed?
- How can the public and stakeholders communicate their support for those alternatives that protect and promote public health?

Have new relationships/partnerships been developed as a result of this corridor study?

- Are they likely to endure?
- What actions can be taken to improve the process/outcome in future corridor planning studies?
- Is there an interest in maintaining an ongoing interface outside of the corridor planning study?



<p>represents an education opportunity.</p>	<p>Does the process and outcomes of the corridor planning study further institutionalize partnerships between agencies? Is the public more engaged with this inclusion of health?</p> <p>What have we learned about the public interest and perspective?</p>
<p>Questions to Inform Decision making</p> <p>Comparisons of the alternatives developed in the previous step and the potential for positive health outcomes will be communicated to decision makers. If health is a new topic for the policy group, there will be a broader interest in how the alternatives may be supported by others and how future decision making will be impacted.</p>	<p>Do the alternatives address the identified transportation problems as well as the health priorities?</p> <p>How do the alternatives affect health outcomes? What is the anticipated return on investment? Do the alternatives conflict with other community goals? Has an implementation plan been prepared? How will outcomes be evaluated? How do we identify and communicate needed adjustments in future decisions? What other support is available to promote the alternatives preferred by health? Do other agencies buy in to the alternatives? (land use, economic development, other) Do other agencies have a role in implementation? Is financial support from outside transportation decision making available? Is there a way to create strong and lasting support for the process, the evaluation criteria, and the outcome? What additional information about public health outcomes is desired for future planning processes?</p>
<p>Data and Analytical Support</p> <p>At this step, discussions largely will involve input and findings from Step 5.</p>	<p>Additional data and analysis will be needed only if specifically requested by decision makers. This step could benefit from relaying experiences from other agencies as supporting information. Return on investment information developed or collected in Step 5 will be useful at this step.</p>
<p>Resources</p>	
	<p>Our Built and Natural Environments: A Technical Review of Interactions Among Land Use, Transportation, and Environmental Quality- More information: http://www2.epa.gov/smartgrowth/our-built-and-natural-environments-technical-review-interactions-between-land-use.</p> <p>Lessons for Leaders: Navigating the Process of Healthy Community Change- Provides guidance for community leaders on how to best communicate ideas and goals to the public. More information: http://activelivingbydesign.org/lessons-for-</p>



[leaders/communication/introduction/](#)

Healthy Community Design: Success Stories from State and Local Leaders - More information:

http://www.activeliving.org/files/HealthyCommunityDesign_ALL.pdf

Transportation and Health Policy Interventions for Safer Healthier People and Communities - Examines how policies can impact environmental public health, enhance community design, promote active transportation, and reduce motor vehicle related injuries. More information:

<http://www.prevent.org/data/files/transportation/transportationandhealthpolicycomplete.pdf>

Examples from Practice

Appleton TMA use of the Framework provided an opportunity and pathway to advance work on integrating health and transportation through increased dialogue and clear identification of shared interests and priorities among diverse stakeholders. After participating in initial stakeholder meetings where public health staff shared their interests and concerns about the corridor, the Wisconsin State DOT expanded the scope of their previously programmed traffic study to include the full corridor and multimodal components. The DOT also hired a consultant to consider bicycle and pedestrian improvements. For more information, see the full case study report.

North Carolina was awarded 2 years of American Recovery and Reinvestment Act (ARRA) funding to develop an interdepartmental policy initiative related to physical activity. The goal was to help each of four State agencies address policy issues to improve physical activity. The four participating agencies are: NC Division of Public Health; NC Department of Transportation; NC Department of Environment and Natural Resources; and NC Department of Commerce. The interdepartmental collaboration was referred to as the *Healthy Environments Collaborative* (HEC). The HEC remained in place for more than 2 years after the initiative ended. Collaboration is still in effect, but no longer identified as the HEC.

In **Iowa**, the Governor's office and Department of Public Health (DPH) have partnered on the **Iowa Healthiest State Initiative**. This privately-led public initiative is intended to inspire Iowans and their communities throughout the State to improve their health and happiness. In 2013, Iowa ranked as the 10th healthiest State in the nation. See more at: <http://www.iowahealthieststate.com/about/about-the-initiative#sthash.E0Fx4JaA.dpuf>

In **Minnesota**, the Department of Transportation and the Minnesota Department of Health (MDH) have partnered for many years on a wide range of health topics building on the State's vision of incorporating health. The **Statewide Health Partnership** represents a coalition of agencies. The 2013 Legislature provided funding for an Urban Air Quality and Respiratory Health initiative to examine the role air quality plays in the health burden of respiratory diseases in the Twin Cities region. Goals of the initiative include using data to inform communities regarding air quality issues, promoting coordination between agencies, and demonstrating the use of an HIA as a tool to inform public health decisions. MDH worked with the DOT, MPOs, and local governments to develop HIAs. MDH will suballocate grant funding to enable participation by staff from other agencies.

