A Health in All Policies Approach to Complete Streets Ordinances

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INTRODUCTION

The New Hampshire State Health Improvement Plan 2013-2020 affirms the premise that "the conditions in which we live, work, and play have an enormous impact on our health." Increasingly, communities are becoming aware of the connection between planning and health. In New Hampshire, one of the top public health concerns is the proportion of the population that is considered obese. Obesity in New Hampshire mirrors the national average with 26% of adults and 18% of children classified as obese.

In the Nashua region, the Greater Nashua Public Health Network recently completed a Community Health Assessment (CHA) for the 13 communities in the region. A CHA is a process by which community members gain an understanding of the health concerns and needs of the community by identifying, collecting, analyzing and disseminating information on the community's assets, strengths, resources and needs. The CHA revealed that about 64% of adults in the region are obese or overweight, 12% of Nashua high school students are obese and 17% of Nashua's third graders are obese.

Both of these plans suggest that we look to the built environment to help address this issue. In particular, they recommend that communities consider adopting complete streets policies and ordinances as a way to encourage daily physical activity.

This report reviews a "Model Local Ordinance on Complete Streets" (MLOCS), developed by the National Policy and Legal Analysis Network to Prevent Childhood Obesity, and provides suggestions for local communities seeking to incorporate public health considerations into the decision making process using a Health in All Policies (HiAP) approach.

COMPLETE STREETS

Complete Streets offer a safer, more inclusive and aesthetically pleasing transportation network for a variety of transportation modes and for people of all ages, incomes, and abilities. Safe and well-maintained pedestrian and bicycle infrastructure can reduce the need to own and maintain a car in order to access necessary goods and services. Well-designed pedestrian and bicycle infrastructure can also improve community health by increasing opportunities for physical activity, access to basic goods and services, reducing crash risks, improving air and water quality, increasing public safety, and supporting greater levels of social cohesion and community connectedness as more people move about by foot or by bike and interact with their neighbors.

Complete Streets can improve the efficiency and capacity of existing roads by serving more people in the same amount of space. The process of increasing productivity of the existing road and public transportation systems is vital to reducing congestion and improving air quality. Fewer cars on the road reduces infrastructure maintenance costs which is beneficial for communities with limited budgets.

HEALTH IN ALL POLICIES

Health in All Policies (HiAP) is a collaborative approach communities can use to improve the health of their residents by incorporating health considerations into policies and regulations. The goal of HiAP is to take a look at an issue from a wide range of perspectives to ensure that decision-makers are informed about the health, equity, and sustainability consequences of various policy options when developing ordinances, regulations and other public policy.

A HiAP approach identifies the ways in which regulatory decisions affect health, and how better health can support the goals of multiple sectors. It engages diverse governmental partners and stakeholders to

work together to encourage health, equity, and sustainability. A HiAP approach also has the benefit of advancing other community goals such as promoting job creation and economic stability, transportation access and mobility, a strong agricultural system, and educational attainment. There is no one right way to implement a HiAP approach, and there is substantial flexibility in process, structure, scope, and participation (Rudolph, Linda, et al, 2013). One particularly helpful resource for understanding how use a HiAP approach is *Health in All Policies, A Guide for State and Local Governments*, produced by the American Public Health Association and Public Health Institute.

Health Impacts of Complete Streets

The Model Local Ordinance on Complete Streets (MLOCS) was developed by the National Policy and Legal Analysis Network to Prevent Childhood Obesity. It is designed to help local governments address chronic disease rates and improve community health by making streets safe, comfortable, and convenient for all age groups and all users. Traditional street design is focused on automobiles, which makes it difficult and sometimes dangerous for all users to get regular physical activity and access amenities during their daily routine. The objective of the MLOCS is to offer an alternative to traditional street design in favor of a multi user corridor that accommodates all ages and ability levels.

The benefits listed below are typical of most Complete Streets projects and designs. Human health benefits are one feature of implementing Complete Streets, but economic growth and a healthier environment provide added benefits. By implementing a Complete Streets Policy, such as the MLOCS explored here, a community can expect several health benefits, including:

1. Reduced rates of several chronic diseases related to increases in physical activity from walking and bicycling. Key impacted diseases include diabetes, heart disease, depression, and some cancers.
2. Reduced rates of injury and death from decreased traffic crashes and improved road safety for all users.
3. Reduced rates of asthma and other respiratory issues due to improved air quality through emissions reductions and vegetative air filtration.
4. Multiple health and wellness benefits resulting from improved access necessary amenities for vulnerable populations.
5. Reduced risk of illnesses related to water-borne pathogens resulting from improved stormwater infiltration
   Source (Smart Growth America, 2014)

Some of the ways that Complete Streets can be measured is by examining the resulting impact on health determinants, which are defined as the range of personal, social, economic and environmental factors that determine the health status of individuals or populations. This report uses the following health determinants commonly associated with Complete Streets:

- Opportunities for physical activity
- Safety from traffic accidents
- Access to parks
- Maintaining water quality
- Decreased exposure to air pollutants
- Opportunities for social cohesion

DEVELOPING A MODEL COMPLETE STREETS POLICY AND ORDINANCE

The Model Local Ordinance on Complete Streets (MLOCS) recommends establishing a committee to address short and long term steps needed to adopt and implement complete streets policies and practices (see section II.5 Further Steps). This committee should be made up of a cross section of community departments that have responsibility for planning, construction, and operations of roadways and associated infrastructure. This includes the local transit agency, public works department, planning department, public health department, city manager, advocacy groups, school district personnel and other similar groups or local champions should be considered as integral members of the committee.

This type of cross-sector committee is one of the key elements of a Health in All Policies approach. It is instrumental in steering the work that assesses community needs, develops recommendations for public policy and regulations, monitors the long term success of the measures, and makes recommendations for adjustments to the policies as needed. The discussion in this report assumes a committee is formed and given the charge of developing a complete streets policy and ordinance.

COMMUNITY ASSESSMENT AND FINDINGS

The first step in developing any policy or ordinance is to establish the justifications for why it is needed. The Committee should conduct a community assessment to gather input and determine community needs. In New Hampshire, there are Regional Public Health Networks that conduct this type of assessment. In the Greater Nashua Region, the Greater Nashua Public Health Network conducted a Community Health Assessment as well as a Community Health Improvement Plan which documents the region's existing conditions, considered a large amount of public input and developed public health recommendations.

Once an assessment is completed, it is important to develop related findings. The MLOCS offers a suite of sample findings that communities can select that are supported by expert research (see Complete Streets: Appendix A). These findings range from encouraging walking and biking, to supporting cost savings for local governments by reducing road construction, repair, and maintenance costs and expanding the tax base.

Committees should consider relating the findings to common health determinants for adopting a complete streets policy:

- Opportunities for physical activity
- Safety from traffic accidents
- Access to parks
- Maintaining water quality
- Exposure to air pollutants
- Opportunities for social cohesion

A brief overview of each of these follows with an overview of how they may be impacted by Complete Streets.

OPPORTUNITIES FOR PHYSICAL ACTIVITY

Physical activity and recreation are core elements of Complete Streets. The addition of sidewalks, shared use paths, bicycle lanes and end-use infrastructure, accessible design elements, and pedestrian signaling

all provide increased opportunities for residents to access the transportation corridor and use it as a means of gaining health and well-being and not just for travel.

Physical activity and the ability to access walkable areas have a direct and specific relation to the health of residents. Walkability is the extent the built environment is friendly to the presence of people living, shopping, visiting, enjoying or spending time in an area. One comprehensive study of walkability, for example, has found that people in walkable neighborhoods had about 35-45 more minutes of moderate intensity physical activity per week and were substantially less likely to be overweight or obese than similar people living in low-walkable neighborhoods (New Hampshire Division of Parks and Recreation & New Hampshire Office of Energy and Planning, 2013; Smart Growth America, 2014).

Physical activity in childhood establishes health lifestyle choices and prevents childhood diseases such as obesity (Franzini et al., 2009). Being overweight or obese increases the risk for chronic disease such as heart disease, stroke, hypertension, type 2 diabetes, osteoarthritis and cancer. Neighborhood design features, such as sidewalks and bike trails, provide opportunities for safe play. Children use these amenities as modes of transportation to and from destinations (Franzini et al., 2009). According to the New Hampshire Office of Energy and Planning the 2011 top activities for New Hampshire residents age six and older are: running, jogging, and trail running.

Safety from Traffic Accidents

One of the primary goals of Complete Streets is to increase the overall safety of the road corridor for all users. The inclusion of infrastructure elements such as sidewalks, shared use paths, bicycle lanes, crosswalks, refuge islands, signage, surface treatments, pedestrian signals, and traffic calming devises (curbs, bulb outs and traffic bumps) all improve traffic safety from traffic accidents. In the United States, over 30,000 people die every year from vehicle crashes and are the leading killer for youth, teens and young adults age 5-34 (Center for Disease Control, 2011).

In New Hampshire, the cost of crash related deaths are $143 million per year, $2 million in medical costs and $141 million in work loss costs. New Hampshire rates fourth for crash related death costs in New England, leading Vermont and Rhode Island by approximately double (Center for Disease Control, 2011). While the numbers of bicyclists and pedestrians killed has been in decline for the past decade, experts attribute this in part to a decline in the total number of people bicycling and walking. In the Nashua region, 25 percent of all car trips are commuting trips, furthermore, 14 percent of all trips are under 1 mile in length (Nashua Regional Planning Commission Travel Demand Model, 2013).

Community and neighborhood design can have a significant impact on transportation use type and traffic injury. Planning for pedestrians and bicyclists is gaining in popularity as many communities work to incorporate alternative modes of transportation. Additionally, commercial and residential development has the potential to generate new trips using all forms of transportation and increasing the number of traffic related injuries (Ito, et al., 2013). Poorly designed areas can limit transportation options and increase crash rates. In addition to emissions reduction, using alternative modes of transportation increases physical activity reducing risk of obesity and associated diseases (Bedimo-Rung, Mowen, & Cohen, 2005).

Access to Parks

Parks and open space improves health by providing opportunities for physical activity and access to nature. Parks provide a variety of recreational opportunities, act as sound buffers for traffic, wildlife habitats and provide locations for arts and culture festivals which increase opportunities for social cohesion. Typical park types include: forested areas, riparian buffers, skate parks, athletic fields and

open space areas. The proximity of a half mile to one mile of an amenity indicates the relative distance a person will use alternative transportation to a destination like a park. Sidewalks and shared use paths that are accessible encourage use by all populations including those with disabilities.

Maintain Water Quality

The infiltration of rain water and the beauty associated with the natural environment can be built into streets and help create a sense of place while also creating a more positive living environment. Street trees and landscaping, and planting strips in traffic calming elements (raised medians, rotary circles and refuge islands, chicanes, islands, and curb extensions) provide site opportunities for bio-swales, rain gardens and creative stormwater catching elements. Green elements are also important deterrents of crashes and injuries (see safety above), and contribute to a more comfortable and visually interesting environment for all users. Drainage and stormwater runoff issues are common on traditional streets. Optimal stormwater management looks beyond simply removing rainfall as quickly as possible, which risks negative environmental impacts associated with both stormwater quality and quantity, like polluted runoff, sedimentation, and bank erosion. Instead it focuses on efforts to retain and treat, or eliminate, runoff at the source through cost-effective green infrastructure, improving water quality (Smart Growth America, 2014).

Drainage facilities can affect pedestrians, bicyclists, and public transportation users in various ways. Poorly maintained systems can create puddles that splash pedestrians and those waiting in bus shelters and are hazards for bicyclists by hiding potential cracks that could encourage rough spills. Some cities are investing in pervious surfaces, such as pervious asphalt and concrete, pervious pavers, and reinforced gravel pacing, once it has been determined the surfaces will not compromise pedestrian and bicyclist access and safety (Smart Growth America, 2014). Alternative surfaces also provide the opportunity for groundwater infiltration which reduces stormwater runoff. The decrease in stormwater runoff helps protect water ways and water supplies from pollution for humans and wildlife by reducing the likelihood of water-borne parasites such as *Cryptosporidium* and *Giardia* finding their way into drinking water (US EPA.

Exposure to Air Pollutants

Children and elderly populations living within 100-200 meters of a highway often show poor lung function, asthma and cancers (Bhatia, Rajiv & Rivard, Thomas, 2008). Poor air quality is also linked with other diseases: heart disease and atherosclerosis. Secondary effects of poor air quality include type 2 diabetes and obesity. Poor air quality limits outdoor activities obliging residents to remain indoors decreasing physical activity and social interaction (Giles et al., 2011).

One of the largest sources of transportation greenhouse gas (GHG) emissions is from personal cars and trucks. Walking and bicycling for the shortest trips (less than 1 mile), rather than taking a car, could reduce CO_2 emissions, a major GHG, by 12 to 22 million tons per year in the U.S. Replace the car with walking and biking for longer trips (1 to 3 miles), and the CO_2 savings come to 9 to 23 million tons annually in the US. Health effects of air pollutants are thoroughly documented.

By providing alternative transportation infrastructure that encourages non-motorized travel, such as sidewalks, shared use paths, bicycle lanes, crosswalks, refuge islands, street furniture, communities can decrease the number of trips by car and decrease air pollutants.

Opportunities for Social Cohesion

Social cohesion can be described as social support or social networks. It is also recognized as "the degree to which an individual is interconnected and embedded with in a community - is vital to an individual's health and well-being…" (McNeill et al., 2006).

A growing body of evidence exists to support the concept that design elements in the built environment affect opportunities for social interaction and overall health of the individuals who reside in the community (De Jesus, et al., 2010; McNeill, et al., 2006). High levels of social cohesion can contribute to positive health outcomes by enabling the dissemination of health-related information such as medical care options, establishing and maintaining social norms and practices associated with healthful behaviors, and by discouraging unhealthful behaviors such as smoking and drug use. In addition, higher levels of social cohesion have been correlated with increased rates of physical activity, including walking and biking among both children and adults (Oregon Public Health Institute).

Older adults and low-income citizens are two populations that are less likely to own cars or drive. Without safer roads, those with limited transportation options have few transportation options: travel along high-speed roadways with few pedestrian accommodations or stay home. By limiting mobility to automobiles alone, these citizens risk isolation from community and the economy. Social support is increased for seniors in areas with sidewalks and paths. As the ability to drive deteriorates, proximity to amenities becomes vital to maintain social interactions and decrease health issues such as obesity (Berke, et al., 2007).

Requirements – Relate the findings and regulations

Once findings and health determinants have been developed, the appropriate regulations related to those findings should be selected. The Health Impacts Table in Appendix B shows the intersection of key health issues with all of the Complete Streets infrastructure elements. The table was developed by a thorough review of academic journals and with the assistance of public health experts. It is divided into five areas of Complete Streets infrastructure: pedestrian, environment, bicycle, automobile and traffic calming. A planning department or municipal board can review the specific elements and the effect on health to determine which elements would benefit the community. The arrows indicate the likely direction of impact based on existing evidence and literature review. A zero indicates minimal impacts, no impact or no data available.

As the Health Impacts Table indicates, pedestrian and bicycle infrastructure has a positive impact on health for all ages and ability levels. It is important to note that some infrastructure, such as sidewalks that are located directly next to a roadway can increase exposure to air pollutants for bicyclists and pedestrians using these facilities and can lead to a negative health effect for individuals with respiratory issues. Exposure to air pollutants increases with bicycle infrastructure and traffic calming devices.

Other findings demonstrate the similarities on impacts to youth and seniors. Infrastructure for youth has a positive impact for seniors and individuals with disabilities. Traffic calming has the least amount of findings for impacts on diseases, access to parks and opportunities for social cohesion. Pedestrian and traffic calming infrastructure have a positive and negative effect on physical injuries and accidents. The addition of pedestrian infrastructure provides safe opportunities for recreation and commuting; on the other hand, by increasing the amount of pedestrians, there is a greater chance of collision.

Below is a review of common Complete Streets infrastructure and recommendations for communities to consider. Some of these may already exist in current planning documents and others may require a new ordinance or policy. A good reference for additional infrastructure recommendations is Smart Growth America's Complete Streets website which provides a list of examples from around the country where communities and local Department of Public Works altered existing streets for a greater community experience.

PEDESTRIAN INFRASTRUCTURE

Sidewalks and other pedestrian infrastructure provide many health benefits and opportunities for all users. Health benefits of pedestrian infrastructure can include an increase in social cohesion, recreation and physical activity opportunities, safety from traffic and offer alternative modes of travel or vulnerable populations (Berke et al., 2007; Christian et al., 2013).

The installation of pedestrian infrastructure can also expose users to an increase in air pollutants when the infrastructure is sited directly next to the road, increase impervious surface areas and effect stormwater quality (Bhatia, et. al, 2008). Mitigation efforts should be taken to reduce the negative effects of increased impervious areas such as stormwater infiltration sites, porous pavement, smaller roadways and placing sidewalks or shared use paths away from high traffic areas as applicable (New Hampshire Estuaries Project, 2007).

Feature	**Healthy Infrastructure Recommendation**
Sidewalks	Sidewalks that are accessible to all users
Shared use paths	Shared use paths occur in town and are accessible to all users
Accessible curb ramps	All sidewalks include accessible curb ramps
Crosswalks	Crosswalks are in commercial, residential and school areas to connect sidewalks for all users
Bulb out	Major and minor intersections include bulb outs
Curbs	Major municipal roads and intersections include curbs as applicable
Refuge islands	High traffic roads or large pedestrian areas use refuge island and are accessible to all users
Pedestrian and traffic signals	All intersections with lighting include pedestrian signaling for all users
Street furniture	Sidewalk and park upgrades include street furniture appropriate for all users and community character

BICYCLE INFRASTRUCTURE

Biking provides an alternative form of transportation for all age groups and users. Children and seniors who lack a vehicle can use biking as a form of commuting to access amenities, friends, schools and events (Romero, Vivian, 2010). Bicycle infrastructure provides recreation opportunities for families and all users. Bicycle parking facilities are important to include for residents to store bikes while performing other tasks such as shopping, using a playground or eating out which can improve the local economy (Garrett-Peltier, 2011; Tilahun et. al, 2007).

One downside of bike lanes is the exposure to air pollutants especially in high traffic areas for users. Mitigation efforts to reduce exposure can include inserting a median or a buffer, vegetated or not, in between the auto lane and the bike lane. Local air quality monitoring can provide baseline data to identify areas with air quality issues (Bhatia, et. al, 2008).

Feature	Healthy Infrastructure Recommendation
Bicycle lanes	Commercial and large residential areas use have bike lanes
Paved shoulders	Rural roads or those lacking sidewalks use wide paved shoulders for all users
Bicycle parking facilities	Bike parking facilities occur in commercial and public areas including downtowns, parks, schools and shopping areas

AUTO INFRASTRUCTURE

Since the early 20th century, street design has been centered on the automobile in most communities across the country. This auto-centric design has been detrimental to incorporating alternative forms of transportation and individuals with limited access to a vehicle. Retrofitting roadways to accommodate slower speed limits and incorporating appropriate signage can decrease traffic accidents and be safer for all users (Smart Growth America).

For individuals who are at risk for heat related issues, traveling by vehicle on a hot day can be ideal to reduce exposure to outside temperatures. Unfortunately, vehicles are associated with a number of negative health issues, for example, decrease opportunities for physical activity and recreation, increase traffic accidents, reduce water quality, decrease in air quality, increase in obesity related diseases and increase in impervious surfaces (Baum, et. al, 2009; Smart Growth America, 2014).

Public transit is an alternative form of transportation for all users if vehicles are equipped to service individuals with bikes and wheelchairs. The use of public transportation can increase the quantity of air compared to the use of a regular vehicle (Ito, Kate et al., 2013). Transit timing is important and Complete Streets offers strategies to prioritize public transit over other automobiles. Transit oriented lanes and signaling can decrease transit times for riders who rely on public transit to access amenities and for commuting.

Feature	Healthy Infrastructure Recommendation
Automobile lanes	Road design is appropriate for the area and use alternatives to manage stormwater
Traffic signals	Traffic signals favor transit vehicles and implement a green wave to improve traffic flow
Public transportation	Transit transportation is available for all users to areas with amenities and offers covered facilities and signage for users
Transit priority signalization	Traffic signals favor transit vehicles in high traffic areas

TRAFFIC CALMING

There are many types of traffic calming devices that can be used to decrease vehicle speeds and orient pedestrians across a transportation corridor. Traffic calming has a positive correlation with decreasing traffic accidents due to lower speeds and improve traffic flow. The improved traffic flow can decrease idle times and emissions resulting in positive air quality changes (Smart Growth America). Surface treatments may cause an issue for an individual with disabilities to navigate textured road areas thus should be used appropriately. Traffic calming devices that include pedestrian infrastructure can provide an opportunity to navigate an intersection or cross a street which may have been inaccessible beforehand such as a rotary that includes crosswalks and medians.

Feature	Healthy Infrastructure Recommendation
Rotary circles	High congestion areas use traffic circles or rotaries with built in pedestrian infrastructure
Traffic bumps	Areas prone to speeding, high pedestrian areas and schools include traffic bumps to reduce traffic speed
Surface treatments	High pedestrian areas and environmentally sensitive areas use appropriate surface treatments such as paving blocks, textured asphalt and concrete to reduce traffic speeds and not inhibit access for all users
Narrow vehicle lanes	Vehicle lanes will be project appropriate and maintain community character
Raised medians	Raised medians will be used for areas prone to speeding and to delineate alternative transportation corridors
Dedicated transit lanes	Major traffic routes and high density areas will use dedicated transit lanes to reduce congestion and maximize transit times

Environmental elements

Lastly, the environmental elements of street trees, landscaping and planting strips all have a positive effect on health related diseases. Vegetation can reduce air pollutants and increase street aesthetics to improve the sense of safety for pedestrians and bicyclists (Fleissner, Heinzelmann, 1996).

The MLOCS ordinance lacks a section on the use of native plants in planting strips and landscaping but the practice is generally encouraged among municipalities. The use of nonnative plants or invasive species can have unintended consequences such as killing native species, attracting pests and require the use of harmful pesticides and herbicides.

Feature	Healthy Infrastructure Recommendation
Street trees and landscaping	Road and sidewalk upgrades will include project appropriate landscaping and street trees
Planting strips	Planting strips and other landscaping will be used for stormwater collection and for aesthetic purposes

When and How do Communities Administer the Policy?

A large portion of Model Local Ordinance on Complete Streets (MLOCS) is devoted to how and where the Complete Streets policy will be applied (see Section II.3). There are many ways a Complete Streets policy and ordinance can be incorporated into community planning. The documents described below are a general guideline of different planning documents which will vary based on a community's capacity.

Municipal code, zoning ordinances and land use regulations provide an opportunity to incorporate aspects of the MLOCS ordinance such as adding language to existing operations, revising design templates and conducting Complete Streets trainings. Master plans, transportation plans, community service planning and capital improvements plans are high level planning documents that can include specific Complete Streets projects, identify areas of concern, identify funding sources for project implementation, and create committees to study including Complete Streets in a community.

Incorporate Complete Streets practices into everyday operations

Complete Streets can be incorporated into municipal planning departments as part of everyday operations. The community must decide whether to include private roads into the ordinance. It would be beneficial for communities where private roads are in central locations compared with public roads.

However, in more rural communities, where private roads are typically dirt, this may not be a feasible option. Including private roads into the ordinance can expand the effectiveness of Complete Streets projects (National Policy and Legal Analysis Network, 2010).

Including Complete Streets practices into everyday planning makes the process routine for staff and easier to implement future infrastructure that is conducive to all users. Vulnerable populations such as children, seniors and disabled populations who live on private roads may have enhanced opportunities to use alternative forms of transportation if private roads are included in the ordinance (Romero, Vivian, 2010). Coordination with other departments when implementing Complete Streets is important to accommodating all users. Other departments may have necessary information regarding the land use, local vulnerable populations and can create working intradepartmental relationships.

Incorporate Complete Streets for all projects with limited exclusions

While the model ordinance seeks for complete streets to be applied to all projects to ensure reasonable safe travel along and across right of way for each user, it does suggest exclusions where documentation and data indicate:

- Non-motorized use is prohibited by law
- Cost would be excessive and disproportionate to the need and future use over the long term
- Absence of current or future need
- Infrastructure would be unreasonable compared to the scope of the project

It is important for the community to determine needs based on data from multiple sources: demographic, school, employment, and public transportation route data. This data may indicate a need currently unexpressed due to a lack of existing infrastructure. While the scale of the project is important, a community should weigh the costs of flexibility versus implementing Complete Streets practices. A cluster of smaller projects in the same location may, over time, increase or decrease accessibility for multiple users. Furthermore, a community may include exceptions based on needs. For instance, the impacts to the environment may significantly outweigh the positive effects of infrastructure. This would be appropriate for a community where the transportation network may be rural (National Policy and Legal Analysis Network, 2010).

Improve safety and enhance the existing transportation network for all users

The importance of retrofitting existing streets should be considered where the network is unavailable for all users. Communities should examine the transportation network to see if it is preventing access recreation or green spaces, providing enough space for bike users in the right of way or a if there is a lack of sidewalks for disabled, young and senior populations.

Communities should allow for some flexibility in determining the priority of retrofitting projects by incorporating the term, ‘as feasible’ into the policy or ordinance (National Policy and Legal Analysis Network, 2010). For example, it may be more prudent for a community to install curb ramps and proper signaling devices for an area due to the needs of the local population compared to installing bike lanes or shared use lanes. Both projects may be necessary but communities may be limited by funding or other barriers. Decision makers can identify the populations around the project to determine the needs of the area. Additionally, decision makers could priorities projects that have a higher impact and address the needs of multiple vulnerable populations rather than focusing on smaller projects that meet the needs of a few residents.

Improve safety through road and signal improvements

The update and maintenance of existing roadways provides an opportunity to include bicycle and pedestrian infrastructure. Safety can be improved by adding bicycle or shared use lanes when road improvements such as resurfacing occur. These improvements are especially important for vulnerable populations such youth and low income individuals who can use them for access jobs, school and other destinations. Funding for items such as signaling and resurfacing may be much more cost effective for communities.

Review and revise local plans, ordinances and regulations

The MLOCS approach recognizes that it is necessary to continually review and revise existing language or develop new language to integrate Complete Streets holistically through the community's regulatory and policy operations.

Regular review of policies and ordinances by a cross-sector committee provides an opportunity for the community to determine which Complete Streets infrastructure is most feasible for implementation and address vulnerable population needs as quickly as possible (National Policy and Legal Analysis Network, 2010). For example, a municipal land use board may adopt regulations including Complete Streets infrastructure into the site planning process. If the information is not disseminated to all corresponding agencies, a discrepancy may occur between departments on future projects which can impede the implementation of Complete Streets opportunities.

Integrate Complete Streets infrastructure into design guidelines

Design guidelines are an effective way to provide a detailed picture of what a community wants to look like. This is important for both the community to come to consensus and for developers to understand what the community desires.

As new road construction is directed by local road design guidelines and regulations, it is important to ensure complete integration of standards. Design guidelines for local land use development applications may include provisions for streetscaping, landscaping, and architectural features. Other elements that should be included in the guide are bicycle lanes, sidewalks, street crossings and planting strips. Paved shoulders may be appropriate for communities that are unable to install bike lanes due to small road width or other barriers (New Hampshire Department of Environmental Services, 2008; Rifaat, Tay, Perez, & De Barros, 2009). Ideally, design guideline templates should be updated in conjunction with other planning documents to ensure continuity.

Conduct Complete Streets trainings

Trainings provide an opportunity for staff and other officials to gain knowledge and subsequently incorporate Complete Streets principals into everyday practice. Staff may be unaware of needs of vulnerable populations and how it translates into everyday operations or the potential opportunities that exist from incorporating Complete Streets. Trainings should include an overview of Complete Streets, vulnerable populations in the area such as youth, seniors, disabled populations, veterans and low income individuals and needs for all users. Identifying the health impacts of the infrastructure can assist in relating the design elements to planners and decision makers such as: increase alternative forms of transportation opportunities, reduce air pollution, increase accessibility for individuals with disabilities, low impact development elements and increase aesthetics, increase opportunities for social cohesion and community connectedness and increase recreation and exercise opportunities (Bhatia, R & Rivard, T, 2008; McNeill et al., 2006).

How Do You Measure Success?

The MLOCS provides guidance for data collection and public input to evaluate the effectiveness of the ordinance and assesses the local populations' needs. There are five short subsections that identify the responsible entities and process to quantify and monitor how Complete Streets:

- Serve all users,
- Enable users to travel in safety and comfort,
- Ensure public participation in policy decision making, and
- Evaluate and mitigate impacts of proposed projects .

By establishing an agency or agencies responsible for data collection, measurements and enforcement, a community can ensure that Complete Streets elements are more likely to be evaluated and implemented on future projects. Data sets for measuring how streets are currently serving each user include: latent demand, existing levels of service for different modes of transportation and users, collision statistics and bicycle and pedestrian injuries and fatalities.

The data sets should inform the development of specific performance standards that can help a community establish bench marks and timeframes. Without specific goals and benchmarks, Complete Streets elements may not be thoroughly implemented. An example of performance standard includes indicators such as transportation mode shift, miles of new bicycle lanes or paths and sidewalks, percentage of streets with tree canopy, low design speeds, and public participation rates. The community will need to determine which Complete Streets elements will yield the most meaningful results after implementation. In addition to existing data, other research may be possible such as literature review, interviewing, empirical research and conducting community surveys or creating focus groups to comment on the issues.

Data Collection for Key Health Issues

There are many forms of data collection which should include a combination of qualitative and quantitative data points. A Health in All Policies approach values the needs of all users which is why an inclusionary public process is important. Municipal officials may not understand the needs of all users and how to appropriately accommodate them. Public input is necessary for gaining support in the community and identifying needs. Below are possible performance measures that could be used to establish existing conditions and track progress over time; however communities should determine which performance measure will be most effective for the given project.

Opportunities for Social Cohesion: Measuring social interaction or social cohesion can be difficult. Municipalities can consider doing literature reviews of social cohesion for various age groups. Other performance measures include: the number of community activities per year, the average lot size or space between houses, the amount of errand trips by car, the miles of sidewalks, public participation or volunteerism, the number of seniors living alone, the number of churches or meeting spaces public and private, number of parks and the amount of public transportation opportunities.

There are studies counting the number of social interactions among townhouse users which may be helpful to urban and suburban communities seeking alternative town home designs but may be an unrealistic measure for smaller towns (Macdonald, 2005). Senior and youth centers may have daily attendance records to provide usage data which would indicate social interaction for two vulnerable populations. School enrollment and athletic data can supplement social interaction data for children and

teachers. Ultimately, the community will need to decide on the most appropriate definition and measurements for social cohesion based on their size and population.

EXPOSURE TO AIR POLLUTANTS: Air pollutant data is widely available through the Department of Transportation and state environmental agencies. Communities may wish to perform community surveys to identify areas of traffic congestion or areas of naturally occurring poor air quality. Performance measures for indoor and outdoor air pollutants include: amount of ozone, amount of nitric oxides, amount of sulfuric oxides, amount of carbon monoxide, amount of particulate matter, amount of volatile organic compounds, number or percent of individuals with asthma, number or percent of individuals with respiratory diseases, average pollen and mold counts, proximity in miles to hazardous air polluters such as coal fired power plants, amount of lead, location of landfills, location of large scale animal husbandry operations, and the percentage of streets with trees.

MAINTAIN WATER QUALITY: Access to clean water is essential to residents and businesses. Stormwater is an important issue as the consequences of runoff have become evident. Development and reduced forest cover increase the amount of stormwater and polluted runoff into neighboring water bodies. The environmental elements measures in Complete Streets offer infiltration areas for runoff instead of the storm drain. State and federal data may be available for water bodies surrounding the project site but other performance measures include: the size and quality of surrounding wetlands, number of planting strips, percent of impervious surface, percent of pervious pavement, and percent of streets with tree canopy.

ACCESS TO PARKS: Parks are important for recreation opportunities, exercise spaces, wildlife habitats, aesthetics, ground water infiltration and air quality maintenance (New Hampshire Division of Parks and Recreation & New Hampshire Office of Energy and Planning, 2013). Parks vary in size, quality and quantity depending on the environment and offer low impact recreation opportunities for all age groups. Park access is tracked by state recreation agencies or municipalities; conservation land and preserved lands are overseen by state environmental agencies in addition to local conservation commissions. Parks lands and access to open spaces can be measured by: percent of population within one mile of a park or open space, number or acres of parks or conservation lands, number of athletic fields and playgrounds, number of access points to parks and water bodies, and percent of forest lands and wildlife habitats.

SAFETY FROM TRAFFIC ACCIDENTS: One component of Complete Streets is the reduction of traffic accidents. Some communities are heavily designed around the use of cars and provide limited infrastructure for pedestrians and bicyclists. Complete Streets infrastructure is designed to reduce speeds, create designated spaces for each user and provide a safer experience for all. Performance measures for safety include: transportation mode shift, miles of new bicycle lanes and sidewalks, percent of streets with tree canopy and low design speeds, number of bicycle and pedestrian injuries and fatalities, collision statistics, number of accessible curb ramps, number of crosswalks and refuge islands, implementation of Safe Routes to School, width of vehicle lanes, number of traffic calming devices, mode of transport and users, number of new signs for bicycle and pedestrian infrastructure, vehicles miles traveled, amount of rail lines, pavement conditions, travel mode share, population with access to multi-modal transportation and greenhouse gas emissions attributed to transportation.

OPPORTUNITIES FOR PHYSICAL ACTIVITIES: The growing epidemic of overweight and obese individuals in the country is a public health concern for children and adults. In New Hampshire, 38 percent of adults are overweight and 25 percent are obese (New Hampshire Department of Health and Human Services,

2011). Complete Streets can provide opportunities for physical activities such as running, walking and bicycling for all ages and abilities. Children who grow up with active lifestyles will continue to be active into adulthood reducing the risk of obesity, diabetes and associated illnesses. Communities can play an active role in providing infrastructure for physical activity. Performance measures can include: percent of population within one mile of a park or open space, miles of bicycle lanes and sidewalks, number of access points to parks, public pools and water bodies, number of playgrounds, implementation of Safe Routes to School, municipal or county public health statistics for obesity, overweight, individuals with disabilities, diabetes and asthma, amount of parks and conservation land, accessibility for individuals with disabilities.

MONITORING

Identifying a department or committee responsible for collecting data and measuring how well streets are serving each category of user is important. Those responsible for monitoring will need to collect necessary data for the project scope to evaluate the effectiveness. The original performance measures used to create the ordinance or to support segments of the ordinance to be incorporated into existing documentation should be used again in monitoring studies.

Adequate time must pass before monitoring begins, generally at least one year after implementation. For example, the addition of bike lanes or restriping of lanes can be monitored through counting bikers using the infrastructure or speed checks. Existing conditions data should be collected at the beginning of the project to provide a comparison between new and old usage and begin a trend analysis. If there were a multitude of new changes implemented at one time, it may be necessary to conduct multiple studies or additional data collection points to evaluate usage. Monitoring can also include preference surveys and comments from the populations effected by the alterations. Comment cards, phone surveys and public meetings can be held to gain public input.

Other monitoring tools could include before and after photos, collision data, realized outcomes, speed reductions, traffic volume changes and local economic impacts as applicable (Seattle Department of Transportation, 2012). All monitoring efforts should provide conclusions and/or additional recommendations based on collected data to improve the infrastructure and determine the effectiveness. The community can determine the framework and data collection points for monitoring. There are existing examples of monitoring plans, such as the Nickerson Street Rechannelization Before and After Report from Seattle, Washington, that may prove useful to community's initial efforts.

OTHER CONSIDERATIONS FOR MUNICIPALITIES

Every community is unique and should decide which infrastructure and regulations are most appropriate to satisfy the needs of the local population. Other considerations, not directly addressed in the MLOCS ordinance, include the needs of children, rural communities and weather related issues.

DISABILITIES

There are many types of disabilities which Complete Streets seeks to address through universal design. However, universal design can conflict with the needs of all disabilities. Detectable warning domes can impede individuals in wheelchairs and walkers but are vital for blind individuals. Communities seeking to install pedestrian infrastructure could conduct extensive public outreach on the community need for curbs, sidewalks and crosswalks. The community needs can help guide planners and municipal boards to address the needs in the community. Accessible curb ramps and other pedestrian infrastructure designs are available from the American Disabilities Association and the Department of Transportation which provide options to meet community needs (United States Department of Justice Civil Rights Division, 2009).

HEALTHY CHOICES FOR CHILDREN

Children need safe roads to reach school and activities. Road design features, such as sidewalks and bike trails, provide opportunities for safe play. Children who live in rural areas are at greater risk for obesity and related disease and are more likely to be overweight than those in urban areas (Franzini et al., 2009). Providing safe opportunities for walking and biking to and from school is a key strategy to keep kids active and healthy. Municipal boards should consider children's transportation needs and access to school and play areas. Additional signage and identifying Safe Routes to School may be necessary benchmarks or data collection points to address the needs of children. Roads that are accommodating of children and other vulnerable users will be safer for everyone.

RURAL NEEDS

Complete Streets will look different in rural communities than they do in more urban counterparts, and care should be given to ensure rural roadways are not one-size-fits all or overly suburban in nature. For example, roads surrounded by agricultural use may be "complete" by simply providing wide shoulders to allow safe bicycling, walking and providing connections to regional trail and public transportation networks. Roads where homes and other destinations are concentrated along one side of the street, sidewalks with accessible curb cuts lining one side may best fit the community context. In town centers, narrower streets, well-marked pedestrian crossings, sidewalks, and street trees can all work to improve safety while maintaining a pleasant, small town feel (Smart Growth America, 2014).

WEATHER ISSUES

Ice, snow and rain can compromise users from accessing Complete Streets infrastructure such as sidewalks, bike lanes and ramps. Poor maintenance and inadequate funding for plowing and deicing techniques and a lack of training can inhibit users from accessing necessary services. Communities should consider adding winter operations schedule practices when revising existing planning documents and guidelines. Municipal boards and planners should consider alterations to maintenance costs when implementing Complete Streets infrastructure.

CONCLUSION

The MLOCS is useful tool for municipalities interested in incorporating Complete Streets concepts and infrastructure into existing and future street projects. Complete Streets create opportunities for all users and ages to access the road and transportation network and amenities in a safer way than traditional street design. The ordinance suggests areas where Complete Streets can be incorporated into existing planning documents and establishing design guidelines for future street projects.

If a community decides to incorporate different sections of the ordinance into existing documents rather than adopting the full ordinance, the health benefits to vulnerable populations and all users should improve. The simple addition of sidewalks can increase social cohesion and community connectedness, increase access to local parks, increase safety from traffic accidents and increase opportunities for physical activity. Children, seniors and low income populations without access to vehicles benefit from the addition of pedestrian infrastructure to access to amenities more easily, access employment and benefit from recreation opportunities.

Municipalities are encouraged to use a Health in All Policies Approach to tailor the ordinance to their community and ensure that the benefits of a Complete Streets policy match the needs of their population. Each community is unique and will have different needs and concerns based the geography and local residents. Complete Streets are for rural, suburban and urban communities alike and can help shape the transportation system to be more inclusive, safe and environmentally friendly for all users.

APPENDIX A: MODEL LOCAL ORDINANCE ON COMPLETE STREETS

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NATIONAL POLICY & LEGAL ANALYSIS NETWORK TO PREVENT CHILDHOOD OBESITY

Model Local Ordinance on Complete Streets

Support for this document was provided by a grant from the Robert Wood Johnson Foundation.

February 2010

Introduction

"Complete streets" allow people to get around safely on foot, bicycle, or public transportation. Streets designed only for cars are dangerous for everyone else, and contribute to the obesity epidemic, by making it difficult for children and adults to get regular physical activity during their daily routine. In contrast, complete streets are safer, more convenient, and comfortable not only for drivers but also for pedestrians, bicyclists, children, and people with disabilities.

Model Local Ordinance

Local governments have the power to fight childhood obesity and improve community health by passing complete streets policies that foster streets safe for active travel. At the National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN), we developed this Model Local Ordinance on Complete Streets to assist localities in making streets safe, comfortable, and convenient for everyone. Our models are developed by thoroughly surveying existing law, conducting extensive legal research, and consulting legal and policy experts. Using these models, jurisdictions can feel confident in passing laws to improve community health. Because NPLAN is a national program, we cannot provide legal analysis that is tailored to each state's laws; it is important to consult local counsel, who may need to alter elements of this model to comply with state law. In addition, states vary widely in how their transportation systems are organized and administered, so local counsel may need to assist with any necessary customization.

Local Resolution Versus Local Ordinance

NPLAN has also developed a Model Local Resolution on Complete Streets. The model resolution encourages local agencies to approach every street project as an opportunity to make streets safe and welcoming for all users, but it is more exploratory and less directive than the model ordinance. Resolutions are often procedurally easier to enact than ordinances, and they can be an effective first step for a local government. A jurisdiction may pass a complete streets resolution and later go on to pass a law, but a resolution is not necessary where the complete streets law is adopted.

Policy Options

The model offers a variety of policy options. In some instances, alternate language is offered (e.g., [*night* / *day*]) or blanks have been left (e.g., [____]) for the language to be customized to fit the needs of a specific community. In other instances, the options are mentioned in annotations ("comments") following the legal provisions. In considering which options to choose, drafters should balance public health benefits against practical political considerations and other local conditions in the particular jurisdiction. One purpose of including a variety of options is to stimulate broad thinking about the types of provisions a community might wish to explore, even beyond those described in the model. NPLAN is interested in learning about novel provisions that communities are considering. Please contact us through our website: www.nplan.org.

Findings

An appendix entitled "Appendix A: Findings" accompanies this model. The Findings supply a variety of evidence-backed factual conclusions that support the need for adoption and implementation of a complete streets policy. Each jurisdiction should select those findings it views as most appropriate, and add findings related to specific community conditions or concerns.

An Ordinance of the [Municipality *(E.G. City Of _____)*]
Providing for Complete Streets and Amending the [Municipality]
Municipal Code

The [Adopting body] does ordain as follows:

SECTION I. FINDINGS. The [Adopting body] hereby finds and declares as follows:

SEE APPENDIX A: FINDINGS
A draft ordinance based on this model should include "findings" of fact ("whereas" clauses) that support the need for the municipality to adopt the ordinance. The findings section is part of the ordinance, but it usually does not become codified in the local government code. The findings contain factual information supporting the need for the law – in this case, documenting the need for complete streets. A list of findings supporting this model ordinance appears in "Appendix A: Findings." Municipalities may select findings from that list to insert here, along with additional findings addressing the need for the ordinance in the particular community.

NOW THEREFORE, it is the intent of the [Adopting body *(e.g., city council)*] in enacting this ordinance to encourage healthy, active living, reduce traffic congestion and fossil fuel use, and improve the safety and quality of life of residents of [Municipality] by providing safe, convenient, and comfortable routes for walking, bicycling, and public transportation.

SECTION II. [Article / Chapter] of the [Municipality] Municipal Code is hereby amended to read as follows:

Sec. [____ (*1)]. PURPOSE. The purpose of this [article / chapter] is to enable the streets of [Municipality] to provide safe, convenient, and comfortable routes for walking, bicycling, and public transportation that encourage increased use of these modes of transportation, enable convenient travel as part of daily activities, improve the public welfare by addressing a wide array of health and environmental problems, and meet the needs of all users of the streets, including children, older adults, and people with disabilities.

COMMENT: Municipalities may add additional reasons to this purpose clause as appropriate or desired.

Sec. [____ (*2)]. DEFINITIONS. The following words and phrases, whenever used in this [article / chapter], shall have the meanings defined in this section unless the context clearly requires otherwise:

COMMENT: Municipal codes contain many definitions; municipalities should ensure that the definitions from this ordinance appear in the correct section and that modifications occur as needed.

(a) "Complete Streets Infrastructure" means design features that contribute to a safe, convenient, or comfortable travel experience for Users, including but not limited to features such as: sidewalks; shared use paths; bicycle lanes; automobile lanes; paved shoulders; street trees and landscaping; planting strips; curbs; accessible curb ramps; bulb outs; crosswalks; refuge islands; pedestrian and traffic signals, including countdown and accessible signals; signage; street furniture; bicycle parking facilities; public transportation stops and facilities; transit priority signalization; traffic calming devices such as rotary circles, traffic bumps, and surface treatments such as paving blocks, textured asphalt, and concrete; narrow vehicle lanes; raised medians; and dedicated transit lanes [, as well as other features such as *insert other accommodations if desired*] [, and those features identified in *insert name of Municipality's Pedestrian/Bicycle Master Plan if it exists*].

COMMENT: Although features such as street trees and landscaping have traditionally not been included in transportation infrastructure, these features are crucial for pedestrian comfort and safety. They are incorporated into this definition to ensure that Complete Streets Infrastructure addresses the needs of all Users.

(b) "Street" means any right of way, public or private, including arterials, connectors, alleys, ways, lanes, and roadways by any other designation, as well as bridges, tunnels, and any other portions of the transportation network.

COMMENT: This definition of "street" includes both public and private streets, and is broader than similar definitions contained in most municipal codes. The effect is to make many provisions of this ordinance applicable or potentially applicable to private streets.

(c) "Street Project" means the construction, reconstruction, retrofit, maintenance, alteration, or repair of any Street, and includes the planning, design, approval, and implementation processes [, except that "Street Project" does not include minor routine upkeep such as cleaning, sweeping, mowing, spot repair, or interim measures on detour routes] [and does not include projects with a total cost of less than $[___]].

COMMENT: In defining "Street Project," a municipality can use the following clause to reference and include the terms and definitions that are used to describe local street projects (e.g. capital project, major maintenance project, annual maintenance projects): "as well as [*insert local project terms*]."

(d) "Users" mean individuals that use Streets, including pedestrians, bicyclists, motor vehicle drivers, public transportation riders and drivers, [insert other significant local users if desired, e.g. drivers of agricultural vehicles, emergency vehicles, or freight] and

people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities.

Sec. [____ (*3)]. REQUIREMENT OF INFRASTRUCTURE ENSURING SAFE TRAVEL.

(a) [Insert appropriate agencies, such as Department of Transportation, Department of Public Works, Department of Planning] shall make Complete Streets practices a routine part of everyday operations, shall approach every transportation project and program as an opportunity to improve public [and private] Streets and the transportation network for all Users, and shall work in coordination with other departments, agencies, and jurisdictions to achieve Complete Streets.

COMMENT: This provision, like many of the following provisions, allows municipalities to choose whether to apply the requirement to private streets in addition to public streets. Generally, it will expand the effectiveness of the ordinance to apply it to private streets. However, such a requirement may be more practical in certain jurisdictions than in others. For example, the requirement might be very important in a jurisdiction where there are many private streets in central locations.

(b) Every Street Project on public [or private] Streets shall incorporate Complete Streets Infrastructure sufficient to enable reasonably safe travel along and across the right of way for each category of Users; provided, however, that such infrastructure may be excluded, upon written approval by [*insert senior manager, such as City Manager or the head of an appropriate agency*], where documentation and data indicate that:

COMMENT: This provision, which requires that street projects on new or existing streets create Complete Streets, is a fundamental component of a commitment to Complete Streets. This clause provides crucial accountability in the exceptions process by requiring documentation, a transparent decision-making process, and written approval by a specified official.

1. Use by non-motorized Users is prohibited by law;

2. The cost would be excessively disproportionate to the need or probable future use over the long term;

3. There is an absence of current or future need; or

COMMENT: Data showing an absence of future need might include projections demonstrating low likelihood of pedestrian or bicycling activity in an area. Such

projections should be based on demographic, school, employment, and public transportation route data, not on extrapolations from current low mode use.

4. Inclusion of such infrastructure would be unreasonable or inappropriate in light of the scope of the project.

COMMENTS: By including this fourth exception, a municipality gains considerable flexibility, but at the cost of potentially implementing Complete Streets practices less thoroughly. Municipalities should consider this trade-off in determining whether to include this exception.

Other exceptions can also be included in this list, for example: "Significant adverse environmental impacts outweigh the positive effects of the infrastructure."

(c) As feasible, [Municipality] shall incorporate Complete Streets Infrastructure into existing public [and private] Streets to improve the safety and convenience of Users, construct and enhance the transportation network for each category of Users, and create employment.

COMMENT: This provision sets forth the municipality's desire and intent to retrofit existing streets to increase safety for all users, but the words "as feasible" leave the municipality great flexibility to do only what it determines to be a priority.

(d) If the safety and convenience of Users can be improved within the scope of pavement resurfacing, restriping, or signalization operations on public [or private] Streets, such projects shall implement Complete Streets Infrastructure to increase safety for Users.

COMMENT: This provision is intended to encourage new bicycle lanes and reductions in the number of vehicle lanes where feasible as part of the restriping of pavement lines and markings during resurfacing, and to encourage improvements for pedestrians, particularly people with disabilities and older adults, as part of signalization projects.

(e) [*Insert appropriate agencies, such as Department of Transportation, Department of Public Works, Department of Planning*] shall review and either revise or develop proposed revisions to all appropriate plans, zoning and subdivision codes, laws, procedures, rules, regulations, guidelines, programs, templates, and design manuals, including [*insert name of Municipality's comprehensive plan equivalent as well as all other key documents by name*], to integrate, accommodate, and balance the needs of all Users in all Street Projects on public [and private] Streets.

(f) In design guidelines, [i*nsert appropriate agencies*] shall coordinate templates with street classifications and revise them to include Complete Streets Infrastructure, such as bicycle lanes, sidewalks, street crossings, and planting strips.

(g) Trainings in how to integrate, accommodate, and balance the needs of each category of Users shall be provided for planners, civil and traffic engineers, project managers, plan reviewers, inspectors, and other personnel responsible for the design and construction of Streets.

> **COMMENT:** Such trainings may cover a range of topics: a basic introduction to the concept of Complete Streets, an exploration of advanced implementation questions, or an overview of how to apply new systems, policies, and requirements put in place by the jurisdiction to implement Complete Streets.

Sec. [____ (*4)]. DATA COLLECTION, STANDARDS, AND PUBLIC INPUT.

(a) [Insert appropriate agency or agencies] shall collect data measuring how well the Streets of [Municipality] are serving each category of Users.

> **COMMENT:** Municipalities should look at latent demand, existing levels of service for different modes of transport and users, collision statistics, bicycle and pedestrian injuries and fatalities, and so on.

(b) [*Insert appropriate agency or agencies*] shall put into place performance standards with measurable benchmarks reflecting the ability of Users to travel in safety and comfort.

> **COMMENT:** Specific performance standards, with clear benchmarks and timeframes, greatly increase accountability and the ability to assess progress toward a goal. Communities that are just beginning to move toward Complete Streets may wish to establish limited benchmarks, whereas those seeking rapid and substantial impact will want to specify detailed performance standards. In establishing performance standards, municipalities should look at areas such as transportation mode shift, miles of new bicycle lanes and sidewalks, percentage of streets with tree canopy and low design speeds, public participation, and so on.

(c) [*Insert appropriate agency or agencies*] shall establish procedures to allow full public participation in policy decisions and transparency in individual determinations concerning the design and use of Streets.

COMMENT: A municipality may exclude this provision if existing law provides for a high level of public participation and transparency in such determinations.

(d) [*Insert appropriate agency, agencies, or official*] shall implement, administer, and enforce this [article / chapter]. [Agency] is hereby authorized to issue all rules and regulations consistent with this [article / chapter] and shall have all necessary powers to carry out the purpose of and enforce this [article / chapter].

COMMENT: This provision designates an agency or official to implement this ordinance and also bestows rulemaking and other powers on the agency. If existing law in a municipality provides such rulemaking authority, this provision or the second sentence of the provision may be omitted.

(e) All initial planning and design studies, health impact assessments, environmental reviews, and other project reviews for projects requiring funding or approval by [Municipality] shall: (1) evaluate the effect of the proposed project on safe travel by all Users, and (2) identify measures to mitigate any adverse impacts on such travel that are identified.

COMMENT: This clause provides for public accountability and improved outcomes by enabling written evaluation of the effects of certain projects on safe travel as a routine consideration factoring into decision-making processes.

However, some communities may need to build momentum prior to adopting this provision. Such communities may omit this provision and substitute the alternative provision available in subsection [5(c)].

Sec. [____ (*5)]. FURTHER STEPS.

(a) The head of each affected agency or department shall report back to the [Adopting body] [annually / within one year of the date of passage of this Ordinance] regarding: the steps taken to implement this Ordinance; additional steps planned; and any desired actions that would need to be taken by [Adopting body] or other agencies or departments to implement the steps taken or planned.

COMMENT: Municipalities are encouraged to tailor this clause to direct agencies to carry out additional specific implementation tasks as appropriate.

(b) A committee is hereby created, to be composed of [*insert desired committee composition*] and appointed by [the Mayor / President of adopting body / other], to forward [Municipality]'s implementation of Complete Streets practices by: (i) addressing short-term and long-term steps and planning necessary to create a comprehensive and integrated transportation network serving the needs of all Users; (ii) assessing potential obstacles to implementing Complete Streets practices in [Municipality]; (iii) if useful, recommending adoption of an [ordinance / internal policy / other document] containing additional steps; and (iv) proposing revisions to the [*insert name of Municipality's comprehensive plan equivalent*], zoning and subdivision codes, and other applicable law to integrate, accommodate, and balance the needs of all Users in all Street Projects. The committee shall report on the matters within its purview to the [Adopting body] within one year following the date of passage of this Ordinance.

COMMENT: Establishing a committee is one option for implementing a local Complete Streets law; however, just as with other provisions of this ordinance, a jurisdiction can omit this provision if it is not desirable. While local considerations will dictate committee composition, municipalities should consider including representatives of key departments or agencies, such as the transit agency, public works department, planning department, public health department, and others, as well as the city manager, advocacy groups, and a representative from the school district.

(c) [The committee shall also consider requiring incorporation of Complete Streets modifications and Complete Streets Infrastructure in Street Projects, as well as requiring all initial planning and design studies, health impact assessments, environmental reviews, and other project reviews for infrastructure projects requiring funding or approval by [Municipality] to: (1) evaluate the effect of the proposed project on safe travel by all Users, and (2) identify measures to mitigate any adverse impacts on such travel that are identified.]

COMMENT: For communities that are just beginning this process, a more exploratory approach to Complete Streets would involve inserting this subsection and deleting subsections [3 (b) & 4(e)].

SECTION III. STATUTORY CONSTRUCTION & SEVERABILITY.

(a) This Ordinance shall be construed so as not to conflict with applicable federal or state laws, rules, or regulations. Nothing in this Ordinance authorizes any City agency to impose any duties or obligations in conflict with limitations on municipal authority established by federal or state law at the time such agency action is taken.

(b) In the event that a court or agency of competent jurisdiction holds that a federal or state law, rule, or regulation invalidates any clause, sentence, paragraph, or section of this Ordinance or the application thereof to any person or circumstances, it is the intent of the Ordinance that the court or agency sever such clause, sentence, paragraph, or section so that the remainder of this Ordinance remains in effect.

COMMENT: This standard severability provision allows most of the ordinance to remain in effect even if a court deems part of the ordinance to be invalid.

(c) In undertaking the enforcement of this Ordinance, [Municipality] is assuming only an undertaking to promote the general welfare. It is not assuming, nor is it imposing on its officers and employees, an obligation through which it might incur liability in monetary damages to any person who claims that a breach proximately caused injury.

COMMENT: This provision provides that no new basis for tort liability is established by the enactment of this ordinance. Municipal attorneys in a given jurisdiction can assess whether this language provides adequate projection under state law, and substitute alternative language if desirable.

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APPENDIX A

Findings for Complete Streets Laws and Resolutions

Support provided by a grant from the Robert Wood Johnson Foundation.

Updated July 2012

INTRODUCTION

This document supplies a variety of evidence-backed factual conclusions that support a community's decision to enact a complete streets resolution or law. An adopting body should select those findings it views as most significant for its community and add findings related to local conditions or concerns. All policies should include the first finding, which defines complete streets.

FINDINGS

WHEREAS, the term "Complete Streets" describes a comprehensive, integrated transportation network with infrastructure and design that allows safe and convenient travel along and across streets for all users, including pedestrians, bicyclists, motor vehicle drivers, public transportation riders and drivers, [*insert other significant local users if desired, e.g. drivers of agricultural vehicles, emergency vehicles, or freight*] and people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities;

COMMENT: This clause introduces and defines the concept of Complete Streets. This finding should appear as the first finding in every policy and should not be omitted.

WHEREAS, streets that are not designed to provide safe transport for all users present a danger to pedestrians, bicyclists, and public transportation riders, particularly children, older adults, and people with disabilities;[1] over 4,700 pedestrians and bicyclists died on United States roads in 2009, and more than 110,000 were injured,[2] with children and older adults at greatest risk and disproportionately affected;[3] many of these injuries and fatalities are preventable, and the severity of these injuries could readily be decreased by implementing Complete Streets approaches;[4] and [Municipality / State / Regional body] wishes to ensure greater safety for those traveling its streets;

WHEREAS, the Federal Highway Administration has found measurable improvements to pedestrian safety from Complete Streets that combined sidewalks, raised medians, better bus

stop placement, traffic-calming measures, and accommodations for people with disabilities,[5] and bicycle safety studies show that the addition of well-designed, on-road bicycle lanes reduces the incidence of crashes by approximately 50%;[6]

WHEREAS, [Municipality / State / Regional body] wishes to encourage walking, bicycling, and public transportation use as safe, convenient, environmentally friendly, and economical modes of transportation that promote health and independence for all people;

WHEREAS, [Municipality / State / Regional body] acknowledges the benefits and value for the public health and welfare of [reducing vehicle miles traveled and] increasing transportation by walking, bicycling, and public transportation in order to address a wide variety of societal challenges, including pollution, climate change, traffic congestion, social isolation, obesity, physical inactivity, limited recreational opportunities, sprawl, population growth, safety, and excessive expenses;[7]

COMMENT: This clause describes the greater social and environmental benefits of encouraging non-vehicular travel.

WHEREAS, sedentary lifestyles and limited opportunities to integrate exercise into daily activities are factors contributing to increased obesity among adults and children and numerous correlated adverse consequences, such as diabetes, heart disease, stroke, high blood pressure, high cholesterol, certain cancers, asthma, low self-esteem, reduced academic performance, depression, and other debilitating diseases;[8,9]

COMMENTS: This clause and the following clause set out various additional problems that Complete Streets solve or alleviate.

See http://healthyamericans.org/state/ and http://apps.nccd.cdc.gov/brfss/Trends/TrendData.asp for state-specific information.

WHEREAS, [Municipality / State / Regional body] recognizes that the careful planning and coordinated development of Complete Streets infrastructure offers long-term cost savings for local governments by reducing road construction, repair, and maintenance costs and expanding the tax base; improves public health and thereby lowers health care expenses; provides financial benefits to property owners, businesses, and investors through increased tourist revenue, business relocation, and property values;[10] and decreases air and water pollution;[11] in contrast, streets that are not conducive to travel by all impose significant costs on government, employers, and individuals, including the cost of obesity, which may amount to $147 billion in direct medical expenses each year, not including indirect costs;[12]

WHEREAS, Complete Streets advance the objectives of the federal Task Force on Childhood Obesity, which seeks to reduce the childhood obesity rate to 5% by 2030 by increasing physical activity through the "built environment" and other approaches;[13]

[WHEREAS, in light of the numerous statewide benefits of Complete Streets for public and environmental health, including the ability to travel freely throughout the state for people with disabilities or those traveling by foot, bicycle, or public transportation, [State] wishes to establish minimum statewide standards, while not reducing the ability of local jurisdictions to establish additional requirements;]

COMMENT: This finding is designed to be included in policies adopted by states, as it helps demonstrate that this topic is an appropriate subject for state regulation while clarifying that the policy is not intended to preempt local efforts that provide for additional requirements.

WHEREAS, bicycling often provides a feasible alternative to driving because 25 percent of all car trips are to destinations within 1 mile of home,[14] 40 percent of all trips are two miles or less from home,[15] and approximately 30 percent of the working population travels 5 miles or less to work;[16] and [Municipality / State / Regional body] wishes to encourage walking, bicycling, and public transportation use as safe, convenient, environmentally friendly, and economical modes of transportation that promote health and independence for all people;

WHEREAS, streets are a key public space, shape the experience of residents of and visitors to [Municipality / State / Region], directly affect public health and welfare, and provide the framework for current and future development;[17,18]

COMMENT: Where streets comprise a significant portion of the land in a particular municipality—particularly likely in the case of a larger city—a municipality may wish to describe the percentage of area occupied by streets. This may be done by inserting a reference such as "comprise __ % of Municipality's land area" following the phrase "streets are a key public space."

WHEREAS, the one-third of Americans who do not drive include a disproportionate number of older adults, low-income people, people of color, people with disabilities, and children,[19] and the insufficient and inequitable availability of safe alternative means of travel adversely affects their daily lives;

WHEREAS, the dramatic increase in the population of older and very old adults that will be seen by 2020 and 2030, with the concomitant decrease in driving, requires that changes begin to occur now to street design and transportation planning;[20]

WHEREAS, numerous states, counties, cities, and agencies have adopted Complete Streets policies and legislation in order to further the health, safety, welfare, economic vitality, and environmental well-being of their communities;[21]

COMMENT: This clause establishes that there is considerable precedent for policies of this type.

WHEREAS, [Municipality / State / Regional body] wishes to build upon its existing policies that recognize the importance of addressing the transportation needs of pedestrians, bicyclists, and public transportation riders, such as [*insert references to and brief descriptions of existing policies that incorporate any elements of the multi-modal/non-motorized travel concepts in Complete Streets*];

COMMENTS: This clause affirms the existing efforts of the jurisdiction, and establishes that although the Complete Streets policy involves a new commitment to making the streets safe for all users, the adopting body is not necessarily departing from its current practices but building upon and improving them.

If a state or regional body does not have applicable policies, but bodies within it do, it may reference those by adopting this alternative language: "**WHEREAS,** [State / Regional body] wishes to build upon existing policies in [State / Region] that recognize the importance of Complete Streets, such as [*insert relevant language*];"

WHEREAS, [Municipality / State / Regional body] wishes to encourage public participation in community decisions concerning street design and use to ensure that such decisions: (a) result in streets that meet the needs of all users, and (b) are responsive to needs of individuals and groups that traditionally are not incorporated in public infrastructure design;

WHEREAS, [Municipality / State / Regional body] recognizes the importance of Complete Streets infrastructure and modifications that enable safe, convenient, and comfortable travel for all users, such as sidewalks, shared use paths, bicycle lanes, paved shoulders, street trees and landscaping, planting strips, accessible curb ramps, crosswalks, refuge islands, pedestrian signals, signs, street furniture, bicycle parking facilities, public transportation stops and facilities, transit priority signalization, and other features assisting in the provision of safe travel for all users, such as traffic calming circles, narrow vehicle lanes, raised medians, dedicated transit lanes, transit bulb outs, and road diets [, as well as other features such as *insert other accommodations if desired*] [, and those features identified in *insert name of Pedestrian/Bicycle Master Plan if it exists*]; and

COMMENT: Although features such as street trees and landscaping have traditionally not been included in transportation infrastructure, these features are crucial for pedestrian comfort and safety; they are included here to ensure that Complete Streets infrastructure addresses the needs of all users.

WHEREAS, [Municipality / State / Regional body] therefore, in light of the foregoing benefits and considerations, wishes to [initiate a / expand upon its] Complete Streets program and desires that its streets form a comprehensive and integrated transportation network promoting safe, equitable, and convenient travel for all users while preserving flexibility, recognizing community context, and using the latest and best design guidelines and standards;

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APPENDIX B: HEALTH IMPACTS OF COMPLETE STREETS INFRASTRUCTURE ELEMENTS

	Pedestrian Elements										Environmental Elements		Bicycle Elements			Automobile Elements						Traffic Calming Elements			
	Sidewalks	Shared use paths	Accessible curb ramps	Crosswalks	Bulb out	Curbs	Raised medians	Refuge islands	Pedestrian and traffic signals	Street furniture	Street trees and landscaping	Planting strips	Bicycle lanes	Paved shoulders	Bicycle parking facilities	Automobile lanes	Traffic signals	Public transportation stops and facilities	Transit priority signalization	Narrow vehicle lanes	Dedicated transit lanes	Rotary Circles	Traffic Bumps	Paving Blocks	Textured asphalt
Impacts on Health Determinants																									
Opportunities for Social Cohesion	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↕	↕	↑	↓	↓	↑	↑	↓	0	0	0	0	0
Exposure to Air Pollutants	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↕	↕	↑	↑	↕	↕	↓	↕	↕	↑	↑	↕	↕	0	↕
Maintain Water Quality	↕	↕	0	0	↓	↓	↑	↕	0	0	↑	↑	↕	↕	↕	↓	0	↕	↕	↓	↕	↕	0	↕	↓
Access to Parks	↑	↑	↑	↑	↕	↕	↑	↑	↑	↑	↑	↑	↑	↕	↑	↕	↕	↕	↕	↕	0	0	0	0	0
Safety from Traffic Accidents	↑	↑	↕	↑	↑	↕	↑	↑	↑	↑	↑	↑	↑	↑	↑	↓	↕	↕	↕	↕	↕	↑	↑	↑	↕
Opportunities for Physical Activity	↑	↑	↑	↑	↑	↕	↑	↑	↑	↓	↕	0	↑	↑	↑	↕	↕	↓	↓	↕	↓	↑	0	0	↓
Impact on Health Outcomes																									
Diabetes	↓	↓	↓	↓	↓	↓	↓	↓	↓	↕	↓	↓	↓	↓	↓	↑	↕	↓	↓	↕	0	0	↓	0	0
Heart Disease	↓	↓	↓	↓	↓	↓	↓	↓	↓	↕	↓	↓	↓	↓	↓	↑	↕	↓	↓	↕	0	0	↓	0	0
Asthma	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↓	↓	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	0	0
Stress	↓	↓	↓	↑	↓	↕	↕	↓	↕	↓	↓	↓	↕	↕	↕	↑	↑	↕	↕	↕	0	↕	↕	0	0
Depression	↓	↓	↓	0	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↑	↑	↕	0	↕	0	0	0	0	0
Obesity	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↑	↑	↕	↕	↕	↕	0	0	0	0
Physical Injuries	↕	↕	↕	↑	↕	↕	↕	↕	↕	0	↕	↕	↕	↕	↓	↑	↕	↕	↕	↕	↕	↕	↕	↕	↕
Impacts to Vulnerable Populations																									
Youth	↑	↑	0	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↓	↕	↑	0	↕	↕	↕	↑	0	0
Seniors	↑	↑	↑	↑	↕	↕	↑	↕	↑	↑	↑	↑	↑	↑	↑	↕	↕	↑	0	↕	↕	↕	↑	0	↓
Low-Income	↑	↑	↑	↑	↑	↕	↑	↕	↑	↑	↑	↑	↑	↑	↑	↕	0	↑	0	0	↕	↕	↕	0	0
Persons with Disabilities	↑	↕	↑	↑	↑	↕	↑	↑	↑	↑	↕	↕	↑	↑	↑	↓	↑	↑	0	↑	↕	↕	↓	↓	↓

↑=likely direction of impacts based on existing evidence and professional judgment of key stakeholders and experts 0=minimal impact, no impact or no data available

APPENDIX C: DEFINITIONS

Health Outcome: Health status of an individual, group or population which is attributable to a number of determining factors such as behaviors, social and community environments, health care services, and genetics.

Streets: Streets are defined as right of ways, public or private roads including arterials, connectors, alleys, ways, lanes, roadways, bridges, tunnels and any other part of the transportation network.

Street Projects: Street projects include construction, reconstruction, retrofits, maintenance, alteration or repairs of streets, capital projects, and major maintenance projects. Communities can chose to exclude minor routine maintenance such as cleaning, sweeping, mowing, spot repair, or interim measures from the definition of street projects.

Users: Pedestrians, bicyclists, motor vehicle drivers, public transportation riders and drivers and others that determined by the municipality. Other users may include agricultural vehicles, emergency vehicles and freight.

Vulnerable Populations: Also users, who are people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities

Sources: (National Policy and Legal Analysis Network, 2010; World Health Organization, 2014).

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