Healthy Streets, Healthy Cities
An Assessment of the City of Spokane's Street Design Standards

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Summary
This paper compares various aspects of Spokane, Washington's street design standards to those of other cities on the basis their contribution to public health. It provides an overview of research on linkages between street design and health and discusses the performance of Spokane's standards in these areas of significance. Specifically, Spokane's standards have strengths in the areas of Street Connectivity and Incorporation of Active Modes (although in some cases implementation of the standards is inconsistent). In the areas of Vehicle Lane Widths and Safety Design Criteria there significant changes to Spokane's standards would be required to meet national best practices.

Assessment
Our communities are more than just our homes and places of work—the way they are designed have major impacts on our health on a daily basis. There have been numerous studies in the past decades documenting the United States' rising rates of obesity, heart disease, and other problems caused, in part, by sedentary lifestyles. For example, in 1976 about 47 percent of adults were overweight or obese; in 2007, an alarming 68 percent of adults are above healthy weights. The situation has become worse for children and adolescents as well: the percentage of kids that are overweight or obese has tripled since 1976.[i] Conventional wisdom points to a lack of exercise and poor eating habits, which all relate to an individual's choices.

More recently, researchers have begun to study how our physical environments help shape our choices. In 1969, about 41 percent of all children either walked or biked to school. Now, the figure is somewhere between 13 and 17 percent.[ii] Some of this change could be explained by an increased fear of children's safety walking to school; but much of it has to do with how we have designed our communities in the past five decades. Distances between home and school are greater, and safe, comfortable sidewalks and trails are less likely to be present. We have built our neighborhoods around the comforts of driving—at the peril of our collective health.

The City of Spokane's Comprehensive Plan policies call for the City to become a healthier place to live, work, and play. There are many different approaches to achieving this goal; this paper focuses on how street design can positively impact the health of residents, and what the City can do to upgrade its current standards to better meet this objective.

THE RELATIONSHIP BETWEEN HEALTH + COMMUNITY DESIGN

In the past ten years, a significant body of work has emerged analyzing the relationship between health and community design. While the summary below is not an exhaustive literature review on the topic, it highlights some of the major leaders in the field and their findings.

Center for Disease Control (CDC)

Although most people think of the CDC in terms of deadly epidemics and health catastrophes, the organization has done considerable work in studying the slow, quiet epidemic of obesity in the United States. Through its research and case studies, the CDC has developed 24 strategies for community design to reverse the obesity trend. Some of these strategies, such as "Discourage consumption of sugar-sweetened beverages", must be addressed outside the arena of street design. Others, however, are directly related to our streets:

- *Improve access to outdoor recreational facilities*. The easier it is for a person to reach a park or open space, the more likely he or she is going to use it. Access to open space is influenced by factors such as proximity to homes and schools, cost, hours of operation and transportation. Although some of these factors must be addressed through large scale planning and design, the presence of sidewalks and bicycle paths to parks—particularly where roadways do not provide a tight network—is important to providing access to these spaces.

- *Enhance infrastructure supporting bicycling*. Like parks and open spaces, the closer and easier it is to reach a bicycle facility, the more likely a person is to take advantage of it. Supportive infrastructure ranges from bike lanes, shared-use paths, bike routes on existing and new roads, and bike racks at destinations such as schools, community centers, and places of work. This is an area where smart street design and small financial investments can have a major impact on a community's health.

- *Enhance infrastructure supporting walking.* Everyone is a pedestrian at some point in a trip, even if it is just walking from their living room to the garage. In the middle of the twentieth century when driving became the primary mode of transportation, communities got out of the habit of providing facilities for pedestrians. Furthermore, our communities have sprawled away from urban cores and distances to destinations have become unwalkable. While this land use problem is not easily solved, street design can support infrastructure that encourages walking, such as sidewalks, footpaths, walking trails, and safe pedestrian street crossings.

- *Improve access to public transportation.* Although transit is not a 100 percent active mode, most riders reach transit through walking or bicycling. Street design plays a role by ensuring people have access to transit through sidewalks and paths to stops, and comfortable places to wait. Signage for transit and lighting also helps encourage ridership.

- *Enhance personal safety in areas where persons are or could be physically active.* While people are more inclined to walk or bike where there are sidewalks and trails, people will not use these facilities if they feel unsafe. Street design, through initiatives such as Crime Prevention through Environmental Design (CPTED), can help make places feel safe through ample lighting, clear sight lines, and consistent maintenance.

- *Enhance traffic safety in areas where persons are or could be physically active.* Conflict occurs where pedestrians and vehicular traffic are in the same place, but there is a lack of clear differentiation of space and rules of travel. In areas where people could be physically active, street design can help improve the environment for pedestrians and bicyclists through appropriate intersection geometries, lighting, crosswalks, and clear markings. A more proactive tactic is traffic calming through methods such as roundabouts, speed tables, and chicanes.

The CDC has published a number of studies and reports that go into further detail on these topics; please visit their Healthy Places page at http://www.cdc.gov/healthyplaces/healthy_comm_design.htm for additional information.

SMARTRAQ

Georgia Institute of Technology recently completed a comprehensive seven-year study*, Strategies for Metropolitan Atlanta Regional Transportation and Air Quality* (SMARTRAQ). The study is important in that it was the first to scientifically prove that a person's neighborhood is a good predictor of a person's weight. At a broader scale, the study found that mixed land uses, residential and employment density, and street connectivity are all positively correlated with fewer vehicle miles traveled, greater use of transit, and increased physical activity.

The study examined the effects of the physical environment on people's behavior; significant findings included that for every 30 minutes a person spends in the car, he or she has a 3 percent greater chance of being obese. Also, people who live in neighborhoods with a mix of shops and businesses within easy walking distance are 7 percent less likely to be obese. Although mixed land uses is the most important

factor in getting people active, SMARTRAQ proved that street design and connectivity was also found to be important in shaping the behavior of residents.

National Center for Bicycling and Walking

The National Center for Bicycling and Walking is a program of the Project for Public Spaces (PPS). Its mission is to help communities become more bicycle- and pedestrian-friendly through smart design and thoughtful policy decisions.

In June, 2010 the Center published a report titled *Increasing Physical Activity Through Community Design: A Guide for Public Health Practitioners and Livable Community Activists*. This how-to guide recommends strategies for community health in a number of categories: transportation facilities; land use planning and development; schools; recreation, parks and trails; safety, security and crime prevention; protecting the environment; and environmental justice. The guide communicates an important message: communities need not spend millions of dollars on expensive infrastructure to achieve meaningful results. Even simple, small improvements such as adding curb ramps and traffic calming measures, or striping a bicycle lane, can have positive effects. The Center advocates for Complete Streets that contain sidewalks, bike lanes, bus lanes, crosswalks and medians—all of which encourage people to get out of their cars and onto the sidewalks or bicycle lanes.

Summary

What all of these organizations have found is that our population's declining health is directly related to the physical environment. Issues of land use are difficult to solve and "un-do"; however, there are many opportunities to tackle the problem via better street design and retrofits that can incrementally lead to a healthier community.

ELEMENTS OF HEALTHY STREET DESIGN

Street design can positively impact community health in three major ways:

1. Mode Shift
2. Crash Prevention
3. Improved Access

1. Mode Shift

Mode shift refers to a shift in the type of transportation a person chooses; from a healthy communities perspective, mode shift typically refers to a shift from passive transportation (such as driving) to a more active mode like walking, biking, or taking transit. Although there are many factors that people use to decide which mode of transportation to take—namely time, cost, and convenience—the built environment can provide incentives for choosing active modes like walking, bicycling, or transit.

Design for Pedestrians

Designing for pedestrians can be thought of on two levels. At the most basic, a path for pedestrian travel needs to be in place, such as a sidewalk or trail. To truly encourage walking as a mode of transportation, however, greater attention must be paid to the pedestrian environment. This means ensuring that sidewalk widths are adequate; crosswalks, pedestrian signals, and curb ramps are in place at intersections; and that there is lighting, etc. The provision of shade, attractive streetscape elements such as plantings and benches, and building frontages at the edge of sidewalks all help encourage people to shift to walking for short trips.

Design for Bicyclists
Like pedestrians, there are two basic levels of facilities that can encourage a mode shift to bycicling. At the most basic, there needs to be a facility for bicyclists to use: this could be anything from a multi-purpose trail to a striped bicycle lane to a shared bike/car space (sometimes marked with sharrows). Although sharrows tend to have minimal impact on increasing bicycling, bike lanes and trails encourage less confident cyclists to stop driving and start biking instead. More shifts can be expected when bike lanes are clearly marked through painting, prominent signage, shade, trailheads, and bicycle racks at destinations. Generally, the more buffered the bicycle facility is from vehicular traffic, the more people will be willing to make the shift.

Design for Transit
Shifting from drivers to transit-riders is not only good for congestion, but also adds some amount of physical activity to a person's trip. Although most transit is planned at a regional level, there are opportunities in street design to make the option more attractive. This can be done through providing comfortable, safe and attractive transit shelters, clear signage, and bus pull-out lanes that allow passengers enough time to board and disembark.

2. Crash Prevention

Mode shift is only one impact healthy street design can have. When done well, street design can make streets safer for everybody—drivers, pedestrians, and bicyclists alike. There are three primary ways that street design can improve community safety and prevent crashes: better intersection design, vehicle speed modification, and protection of the vulnerable.

Intersection Design
Whether it's between multiple vehicles or a vehicle and a pedestrian, the majority of crashes happen at intersections. The way an intersection is designed can have an enormous impact on its safety. The most important factor is ensuring that all users have adequate sight lines and can see—and understand—where others are. The clear division and demarcation of paths of travel is essential: clearly marked (and maintained) crosswalks and stop bars help communicate to drivers and pedestrians where they should be spatially, and where they shouldn't. Communities can make these visual cues even more obvious by raising crosswalks and/or adding textured pavement. Signalization is also important for both pedestrians and vehicles. Pedestrian heads that use countdowns are most useful, and help people make better informed judgments by gauging the amount of time they have to cross.

In the case of building new streets and intersections, there is great opportunity to design for safety. Generally speaking the fewer and narrower the lanes, the safer the intersection. This is because it requires less time for pedestrians to cross, and narrower lanes also tend to make drivers travel at a slower speed[1]. Reduced curb radii—effectively making a turn much tighter—also help, as cars must slow down to safely make the turn. In places where lanes cannot be narrowed, corner bulb-outs are one option to decrease the crossing distance.

Vehicle Speed Modification
Another way to improve safety in the physical environment is to slow down cars. When the speed that a car travels increases by just 1 percent, the injury crash rate goes up by 2 percent, the serious injury crash rate increases (by?) 3 percent, and the fatal crash rate increases (by?) four percent. [iii] In other words, the faster a car is traveling, the possibility of injury and death increases exponentially.

[1] *Safe Livable Streets*, Eric Dumbaugh, Journal of the American Planning Association

The traditional way of managing speed is through posted speed limits; however, this typically requires enforcement that is often not available. Conversely, the visual environment can be a powerful tool in influencing speed. Street design can be used to:

- Alter the horizontal alignment of roadways by chicanes (short diagonal jogs), traffic circles, and roundabouts;
- Alter the vertical alignment of roadways through speed tables and humps, raised intersections, and raised crosswalks; and
- Narrow the path of travel.

All three of these methods work because people's brains can only process so much information at certain speeds. The more visually complex an environment and the narrower we perceive a space, the more time we need to safely negotiate the path of travel. This discomfort causes most drivers to slow down, regardless of posted speed limits. These methods are often referred to as "traffic calming," and have proven successful in multiple types of environments; in a recent study of 24 intersections before and after traffic calming measures, the study found a 39 percent overall decrease in crashes and a 76 percent decrease in crashes that resulted in injuries.[iv]

Protection of the Vulnerable

Pedestrians and bicyclists are exceedingly more vulnerable in the built environment than drivers and those riding transit. Pedestrians are especially at risk of injury: according to a report from 2010, pedestrians were 11.3 percent of all traffic fatalities nation-wide, and 25 percent of all traffic fatalities in major cities.[v] Although thoughtful intersection design and vehicle speed modifications can help protect pedestrians and bicyclists, there are other methods as well. For example, on streets where intersections are far apart but there is a desire to cross mid-block, mid-block crosswalks and signals can help protect people safely traverse multiple lanes of traffic. In highly complex visual environments, the presence of barriers between people and cars, such as trees, furniture or bollards, can also provide an extra layer of protection.

3. Improved Access

A more difficult—but just as important—aspect of healthy street design is improving access to destinations. As much as possible, street design guidelines should strive to make schools, jobs, green space, and fresh food as accessible as possible through sidewalks, trails, bicycle lanes, and streets. Established programs such as Safe Routes to Schools enable children to safely walk or bicycle to schools, eliminating the need for family members to drive them when it is only a short distance. The provision of bicycle facilities to, from, and within employment centers facilitates a mode shift of commuters, providing that there are "end facilities" such as bike racks and showers. Additionally, the easier it is for one to reach green space or a source of fresh food—such as a farmers market or health food store—the more likely the person is to take advantage of that resource.

Enhancing access through street design guidelines can be a challenge, especially in that a lack of access typically points to a broader-scale land use problem. Where possible, communities can use street design guidelines to mandate pedestrian access where no street exists, provide crosswalks, and encourage environments more conducive to walking and bicycling.

NATIONAL BEST PRACTICES

Across the U.S., numerous cities have taken up the challenge of incorporating public health policy into the daily operations of their government. The design and maintenance of streets is one of the areas which has been included. As a part of the methodology for this assessment of Spokane, a review of healthy street design practices around the country was undertaken. Guidance on which cities have pursued these practices are available from a variety of sources including: The Complete Streets Coalition, Transportation For America and the Victoria Transport Policy Institute among others. Using these resources as a guide, a group of candidate cities representing a variety of sizes, climates and geographies were reviewed. These included:

Seattle, WA
Grand Rapids, MI
New Haven ,CT
Boulder, CO
Broward County, FL
San Francisco, CA
Erie, PA
Boston, MA
Denver, CO
Los Angeles County, CA

While all of the above cities have taken some actions to move their street design to a more complete and healthy standard, the approaches and degrees of action varied widely. Some of the design standards that were reviewed and not chosen as the standards for comparison are listed below along with some of the reasoning:

	Strengths	Shortcomings
Seattle	High Flexibility Strong Pedestrian Elements	Clarity of Cross-Section Guidance Comprehensive Bike Design Transit Guidance
New Haven, CT	Complete Streets Policy Comprehensive Menu of Tools Focus on Data and Measures	Little Specific Dimensional Guidance No Detail on Transit Integration
Broward County, FL	Complete Streets Policy Comprehensive Menu of Tools Focus on Data and Measures	Modeled on L.A. No New Innovation Weak Link To Specific Types
Boulder, CO		More How-To Than Policy
San Francisco, CA	Complete Streets Policy Comprehensive Menu of Tools Focus on All Modes	No Specific Roadbed Dimensions
Grand Rapids, MI		Resolution + Sidewalk Focus Only Old Control Standards Still Relevant
Erie, PA		Focused Specifically on Downtown

The two sets of standards that were chosen for comparison to Spokane's standards were:

Boston, MA – Boston, like Spokane, is a cold weather city with all of the attendant mobility and maintenance issues that arise from snowplowing, salting and the general discomfort that can come from being exposed to low temperatures. Even given their cold climate, Boston has a thorough set of street design standards with very specific dimensional guidance consistent with the health factors discussed in this memorandum,

Los Angeles County, CA – While certainly different than Spokane in terms of climate, L.A. county encompasses numerous cities around the same size as Spokane (Glendale, Santa Clarita, Pomona, etc.). The primary characteristic of this manual that recommends it for comparison is its breadth. It provides guidance in all of the design areas (mode shift, crash prevention, access) that can affect health.

The paragraphs below outline the specifics of Spokane's current design standards and how those standards compare with the comparison cities.

NATIONAL GUIDANCE

Most State and municipal engineers feel most comfortable when their decisions fall within the parameters of several nationally recognized guiding documents. The most commonly cited of these are *A Policy on Geometric Design of Highways and Streets* (commonly known as the Green Book) by the American Association of State Highway and Transportation Officials (AASHTO), the *Manual on Uniform Traffic Control Devices* from the Federal Highway Administration and the Institute of Transportation Engineers' *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*. Given the level of comfort provided by these documents, none of this memorandum's recommendations fall outside their guidelines.

Emerging thought in street and road design in the last two decades has greatly emphasized flexibility as a key to meeting needs while minimizing impact, a concept explored in publications by both FHWA (Flexibility in Highway Design) and by AASHTO (A Guide for Achieving Flexibility in Highway Design). Because of this, these guidelines emphasize desirable settings and dimensions in choosing designs that will work well in a given part of a City. The AASHTO Green Book emphasizes this policy very clearly, stating that "sufficient flexibility is permitted to encourage independent design tailored to particular situations." The Green Book's discussion of lane width for urban areas in particular reflects a high degree of flexibility. It is noted that lane widths "may vary from 10 to 12 ft (3.0 to 3.6 m) for arterials."

CITY OF SPOKANE'S EXISTING STANDARDS

The City of Spokane currently has two policy documents that guide street design: the City of Spokane Municipal Code (SMC) and the City of Spokane Department of Engineering Services Design Standards. The Municipal Code is a wide-ranging document that contains the City's laws for everything from taxation to environmental standards; Title 17H Engineering Standards contains the laws regarding street development standards and a placeholder for the new Complete Streets ordinance. The City of Spokane Department of Engineering Services Design Standards expands on some of the elements from the Code to provide greater detail. Other documents, such as the Initial Design Standards and Guidelines for Centers and Corridors (LMN Architects, August, 2002) and the Downtown Spokane Design Guidelines (October 30, 2000) also contain guidelines relating to healthy streets, but are limited by geography and a lack of a mechanism to make their use mandatory.

There are four broad topics where the existing code has an impact on healthy physical environments in Spokane:

- Street connectivity and design
- Vehicle lane widths
- Accommodation of active modes
- Safety design standards

Currently, the SMC and Design Standards provide some support for designing streets that encourage mode shift, reduce accidents, and improve access. However, there are other areas that need to be updated to become better aligned with the City's goals for a healthy physical environment. Following is a discussion of some of the provisions that support and detract from a healthy community.

STREET CONNECTIVITY + DESIGN

Section 17H.010.030 of the SMC requires that access is provided to all parcels of land, and the "street system shall facilitate all forms of transportation including pedestrian, bicycles, vehicles and emergency services." It goes on to state that a grid pattern should be implemented where possible, and that permanent dead-ends and cul-de-sacs must be approved by the director of engineering services. Section 17H.010.060 (Street Width – General) also states that "spacing between collector arterials shall be no more than one-half mile. Spacing between streets with a twenty-foot clear width shall be no more than one-quarter mile." Although encouraging a well-spaced grid design optimizes the ability to create environments where people want to walk and bicycle, the SMC also states that block lengths should not exceed six hundred and sixty feet—approximately two times the ideal block length for walkable streets.

The SMC contains an entire section (17H.010.120) devoted to on-street parking. Specifically, it mandates that "streets located in the central business district and in centers and corridors require on-street parking." Although this is preferable to encouraging surface parking lots, it does not allow for the flexibility to use rights-of-way to enhance other modes, such as making a sidewalk wider to allow for plantings or outdoor seating. The current standard is that the parking lane is 8 feet wide, with seven feet in narrow streets in low density residential areas.

Comparison and Practice

the Los Angeles County manual clearly articulates the need for connectivity as a core principal in a much more clear way than the City of Spokane's standards.. Citing research from 24 cities, the L.A. County manual clearly articulates that "Hierarchical street patterns (arterial-collector-local) with cul-de sac subdivisions depending on arterials do not perform as well as sustainable street networks and cause more traffic crashes." The manual goes on to articulate numerous other health and safety related benefits of connected networks including emergency vehicle access. The guidelines establish a maximum block size and call for street calming measures such as low vehicle speed designs and on-street parking to further improve safety.

Spokane's standards compare positively with the comparison cities, in fact going into greater detail and a finer grain regarding block sizes than does the L.A. manual. However, the built network in Spokane suggests these adopted standards have not always been employed in practice. On street parking is the exception, rather than the rule in most centers outside of downtown. This is particularly true along arterial corridors that have been deemed by some as critical for high speed vehicular mobility. The standards for connectivity, while in place in older parts of the City, are less rigorously present in newer parts. In fairness, some of this is due to difficult topography.

Best Practice Option: SPOKANE'S GUIDELINES IN THIS AREA ARE STRONG AND SHOULD BE APPLIED RIGOROUSLY.

VEHICLE LANE WIDTHS

Spokane's Design Standards for vehicle lane widths are complex, and based on the type of street and type of feature in question (see Tables 1and 2). There are two sets of standards: one for arterial and commercial roadways, and one for residential local access roadways.

Table 1. Arterial and Commercial Roadway Requirements and Widths

	Principal Arterial	**Minor Arterial**	**Collector Arterial**	**Commercial Local Access**
	Public	Public	Public	Public or Private
FEATURE				
Sidewalk	Required both sides Min. 5' [2]	Required both sides Min. 5' [2]	Required both sides Min. 5' [2]	Required both sides Min. 5' [2]
Pedestrian Buffer Strip	Hard or Planted Width Varies[3]	Hard or Planted Width Varies[3]	Hard or Planted Width Varies[3]	Hard or Planted Width Varies[3]
208 Swale	Optional[4] 10'	Optional[4] 10'	Optional[4] 10'	Optional[4] 6.5'
On-Street Parking	Varies[5] 8'	Varies[5] 8'	Varies[5] 8'	Varies[5] 8'
Exterior Thru Lane	12'	12'	12'	12'
Interior Thru Lane	12'	12' Optional	NA	NA
Two Way Left Turn Lane	14'	14'	14'	NA
Exclusive Turn Lane				
With Channelization	12'	12'	12'	NA
Without Channelization	14'	14'	14'	NA
Bicycle Facilities[6]				
Shared-Use Lane	15'	15'	15'	NA
Bicycle Lane	5'	5'	5'	NA
Paved Shoulder	5'	5'	5'	NA
Separated Bike Path	8'	8'	8'	8'
Minimum Right of Way Width[7]	6 lane – 110' 4 lane – 90'	4 lane- 102' 2 lane- 75'	65'	65'
Curb to Curb Width	Varies[8]	Varies[8]	40'	40'

[1] Variances from the above standards may be granted on a case-by-case basis by the Engineer based on the length of proposed street, traffic circulation, traffic volumes, location, alternate routes, and the ability of emergency services to access the site.

[2] Required sidewalk width is shown in Table 3-G. The required width varies according to the zoning and the street designation.

[3] Pedestrian Buffer Strips are hard surfaced or planted depending on the zoning. The width varies based on the type of strip and the zoning. Refer to Table 3-G for details.

[4] The requirement for 208 swales is dependent on the overall stormwater management plan. When utilized, a minimum 10-foot width is required on arterials and 6.5' on local access streets.

[5] Refer to SMC 17H.010.120 and Section 3.3-6 for on-street parking requirements.

[6] Bicycles are allowed on all streets except for those on which they are specifically prohibited. Additional bicycles facilities are required where shown on the Spokane Regional Pedestrian/ Bikeway Plan. When implemented, all bicycle facilities shall meet the requirements shown above.

[7] Additional right of way may be required if roadside swales are used to control storm drainage.

[8] Curb to curb width varies depending on road features including number of lanes, on-street parking, bike lane, median, and turn lanes.

Table 2. Residential Local Access Roadway Requirements and Widths

	Residential Standard	Residential – Low Density[2]	Residential – Restricted Parking[2]	Hillside Development[2]
FEATURE				
Sidewalk	Required both sides 5'	Required both sides 5'	Required both sides 5'	Required one side 5'
Pedestrian Buffer Strip	Planted Min. 6.5'	Planted Min. 6.5'	Planted Min. 6.5'	Planted Min. 6.5'
208 Swale	Optional[3] 6.5'	Optional[3] 6.5'	Optional[3] 6.5'	Optional[3] 6.5'
On-Street Parking	Required both sides[4] 8'	Required both sides[4] 7'	Required one side[4] 7'	Required one side[4] 7'
Driving Lane	20'	18' [5]	20'	20'
Separated Bicycle Path[6]	8'	8'	8'	8'
Minimum Right of Way Width				
Sidewalks in ROW	60'	56'	51'	40'
Sidewalks on Easements	50'	46'	41'	35'
Curb to Curb Width	36'	32'	27'	27'

[1] Variances from the above standards may be granted on a case-by-case basis by the Engineer based on the length of proposed street, traffic circulation, traffic volumes, location, alternate routes, and the ability of emergency services to access the site.

[2] Narrower Streets are appropriate only in low density (less than 10 units per acre) residential neighborhoods.

[3] The requirement for 208 swales is dependent on the overall stormwater management plan.

[4] Refer to SMC 17H.010.120 and Section 3.3-6 for on-street parking requirements.

[5] When a driving lane less than 20 feet is proposed, adequate emergency vehicle access and staging areas must be provided in accordance with SMC 17H.010.140.

[6] No special accommodation for bicycles is required on local access streets, except for a bicycle/ pedestrian connection at the end of a dead end street. Where a separated bicycle path is provided, it shall meet the requirements shown above.

Comparison and Practice

Both the Boston and Los Angeles manuals contain clear, strong, progressive guidance regarding lane widths. The Los Angeles manual calls for vehicle lane ranges of 9-10 feet for slow streets and 10-11 feet on moderate speed (30-35mph) streets. The Boston manual calls for lane widths in the range of 10-12 feet, with widths at the 12' end of the range reserved for curbside lanes. Both manuals describe a variety of street types and discuss the importance of designs that recognize the full function of the street (not just the automobile).

Spokane's standards for lane width are weak from a health perspective in many regards. Regardless of the type of street being described, the lane widths are wide (never less than 12'). In some cases, such as the 14' requirements for turn lanes, there is no guidance, even in the more conservative literature suggesting this is a good idea. The AASHTO manual, as described previously, discusses lane widths between 10 and 12 feet and available research suggests that narrower lane widths in areas of expected or desired pedestrian activity are safer.

The ways in which the different streets are classified in Spokane is also likely not conducive to the best health outcomes. To suggest that any arterial street, regardless of the land use context (and, therefore, the likelihood of pedestrians present), should have the same design parameters is not logical.

Best Practice Option: THIS IS AN AREA IN WHICH SPOKANE'S GUIDELINES CAN BE IMPROVED SIGNIFICANTLY

ACCOMODATION OF ACTIVE MODES

No matter what the type of roadway, the Standards require sidewalks on both sides (with the exception of Hillside Development, which only requires it on one side). Bicycle facilities however, are not required on all roadways—the footnotes explain that bicycles are allowed on all streets, but are only required where shown on the Spokane Regional Pedestrian/Bikeway Plan. There are currently no street design provisions that directly accommodate transit as a mode.

Comparison and Practice

Boston's manual contains a great deal of detail on the design, placement and factors for consideration for bike and transit facilities. Sidewalk design in the manual is driven by the street type and its overall function (i.e., allocating more pedestrian space in areas where pedestrians are expected). There is also a good deal of discussion of the elements other than width that cause a sidewalk to be useful and attractive (trees, furniture, hardscape materials). The treatment of transit and bus stops within the street right of way is also very explicitly discussed.

Spokane's guidance requiring bike facilities only on streets that are a part of the bike plan is not uncommon, nor is it generally problematic. While the City has a bike plan, the City's standards do not describe methodologies for implementation of facilities. What is to be done, for example, if a street on the bike plan only has enough room for bike lanes if vehicle lane widths are reduced? In a vacuum of guidance, a designer might eliminate the bike lanes. This may or may not be the right decision, but there is no guidance to inform it, nor a broad team mandated to help with the decision.

The lack of City guidance regarding the design and treatment of transit facilities likely results in haphazard or substandard designs that sends a clear message to potential transit riders. Given a low priority in the modal balance, fewer people are likely to choose transit.

Best Practice Option: THE CITY NEEDS AN IMPLEMENTATION COMPONENT TO IT'S BIKE PLAN TO GUIDE THE CURRENT POLICY AND DETAILED IMPLEMENTATION PRACTICES TO ASSURE PROGRESS. TRANSIT STREET TREATMENTS SHOULD BE DEVELOPED.

SAFETY DESIGN CRITERIA

The SMC contains multiple provisions for safety, with a particular emphasis on facilitating emergency vehicle access on all streets.

From a more preventative perspective, the SMC allows traffic calming in the form of traffic circles, chicanes, curb extensions, medians, entry-way treatments, landscaping, and turn or access restrictions. In practice, the code appears to discourage their use. For example, Section 17H.010.150 states that "Roundabouts shall be reviewed in every case and are intended for arterial intersections only" and

Section 17H.010.150 notes that "installation of traffic calming features on existing streets requires a public meeting and a petition representing at least sixty percent of the households in petition area."

Pedestrian safety is primarily addressed through pedestrian buffer strips (Section 17H.010.190). The SMC requires pedestrian buffer strips on both sides of all streets between the sidewalk and curb, and gives parameters for width based on the type of roadway (see Table 3, below).

Table 3. Sidewalk and Pedestrian Buffer Strip Design Parameters

	ARTERIALS			LOCAL ACCESS	
	Central Business District	Centers and Corridors	All Other Areas	Residential	Commercial
SIDEWALK WIDTH	8' [2]	7' [2]	5' [2]	5'	5'
MINIMUM PEDESTRIAN BUFFER STRIP WIDTH					
Hard Surfaced	4'	3'	3'	NA[3]	3'
Planted	NA	NA	6.5'	6.5'	6.5'
SIDEWALK CROSS SLOPE	¼" per ft.	¼" per ft.	¼" per ft.	¼" per ft.	¼" per ft.
SIDEWALK PROFILE GRADE					
Contiguous with curb	Same grade as street profile				
Isolated from Curb	5% max	5% max	5% max	5% max	5% max

Notes:

[1] See Section 3.4 discussion.

[2] If sidewalk cafes are anticipated, the sidewalk width should be increased so that the hard surfaced area is a minimum of 16 feet wide.

[3] Planted strips are required on residential local access streets. A 3-foot wide concrete pedestrian buffer strip may be allowed in place of the 6.5-foot wide planted strip for certain land uses such as churches and schools that require passenger loading and unloading in accordance with SMC 17H.010.190(B).

Section 17H.010.200 of the SMC requires curb ramps at all intersections were new curbs or sidewalks are constructed. It also requires that no fewer than two curb ramps per lineal block be constructed near the crosswalks at intersections.
Interestingly, the positive measures for pedestrian safety are not reflected in the standards for crosswalks. Section 17H.010.210 states that,

> "Generally, painted crosswalks are installed only at patrolled school crossings and signalized intersections, as approved by the director of streets….Installation of painted crosswalks at other locations requires an engineering study and the approval of the director of streets."

This standard restricts the use of crosswalks—a low-cost, high value element to pedestrians—and makes it difficult to add new ones without going through a significant process of review.

The standards for street lighting require that at least one street light be provided at every arterial intersection. Although this requirement does not prevent a higher number of street lights, it is also a bare minimum that does little to promote walking and bicycling.

From City of Spokane Department of Engineering Services. Design Standards. February, 2007

Section 3 is all about streets

3.3-5 Intersections

"Arterial intersection designs are driven by the demands of the anticipated traffic flow. The minimum centerline distance between intersections shall be 150 feet.

"Generally, intersections should be at right angles. The minimum acute intersecting angle for streets shall be 70 degrees. For stop sign-controlled streets the 70 degree (tangent) portion shall extend along the controlled street a minimum of 30 feet from the end of the curb radius. For all cases, the effects of sight distance shall be considered."

3.3-14 Medians

"If medians are included on principal arterials, they must be 15 feet wide and may include turn Lanes. If striped as a two-lane roadway, minor arterials shall have a planted or raised median at least 8 feet wide. Medians on parkways shall be 20 feet wide. Proposed medians on local access and collector arterials will be evaluated on a case-by-case basis and allowed at the discretion of the Engineer. Unless approved by the Engineer, there shall be no parking adjacent to any median. The area inside all medians shall meet the requirements of the City of Spokane GSPs. Medians, where constructed, shall not exceed 600 feet in length without a break that allows emergency vehicles to cross through the median and continue in the same direction (S-Turn movement). The break in the median does not need to allow for U-turn movements."

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[i] National Center for Bicycle and Walking. *Increasing Physical Activity Through Community Design. A Guide for Public Health Practitioners and Livable Community Advocates*. June 2010. p3.
[ii] National Center for Bicycle and Walking. P3
[iii] National Center for Bicycle and Walking. p 17
[iv] National Center for Bicycle and Walking., p 18
[v] America Walks. *America Walks Signalization Report: Signalized Intersection Enhancements That Benefit Pedestrians.* 2011. P ii

Comparison and Practice

Both the Los Angeles and Boston manuals spend a great deal of space discussing the importance of balance and completeness in the design of healthy streets. One could not read either document without gaining a clear understanding of the policy direction and intended outcomes. This is not always the case with Spokane's standards. The presence of pedestrian friendly features such as sidewalk buffers, design standards for those with disabilities and rigorous standards for crosswalk maintenance are all good policies for a healthy city. There are, however, gaps and inconsistencies.

In some cases, the problem areas can be tricky. While few would argue with the desirability of providing access for fire trucks to buildings, modern emergency response is now far more likely to be related to medical or traffic emergencies. Given this reality, measures that can help reduce both of

these instances are likely to achieve better overall outcomes. It is worth considering that a street with narrow lanes may prove an occasional inconvenience to a large fire engine, but may save lives through the lower speeds it engenders. This is a delicate balance cities should consider, but is a debate avoided by most.

More striking is that the overall balance of design in the City's guidance is quite clear. It is, in fact, plainly stated: **Arterial intersection designs are driven by the demands of the anticipated traffic flow.** The placement of the least vulnerable, least active mode in a primary design position above all others is not the policy of a City that is interested in changing health outcomes.

Best Practice Option: THE TONE AND PRACTICE OF THE CITY'S OVERALL STANDARDS SHOULD BE REVIEWED TO CREATE BOTH TEXT AND PROCESSES THAT WILL LEAD TO A MORE BALANCED, SAFE AND HEALTHY ENVIRONMENT.