SECTION 5: PRIORITIZING CONSTRUCTION OF SIDEWALKS

INTRODUCTION

The purpose of this section is to describe a system for selecting among potential construction projects. Such a system is needed to prioritize projects for the CIP. Like the two previous non-motorized plans, this Plan does not propose specific pedestrian projects. Instead, it proposes a ranking system for evaluating sidewalk construction projects that can be used as part of a prioritization process (see Figure 44). This replaces the Priority 1 and Priority 2 route networks contained in earlier plans. As described on Page 52, the priority networks from previous plans fed information to the Project Ranking System. This Plan revises that ranking system, originally developed to evaluate all kinds of projects, with a system tailored to sidewalk ranking. In general, the ranking system gives first priority to construction of facilities on higher volume streets, close to schools, parks, commercial areas and bus routes. It favors construction on school walk routes. And, it favors locations where existing walkways are narrow and not constructed from concrete (See Goal G3).

The system is based on data such as presence of sidewalk, sidewalk conditions and proximity to various features like parks and schools. Much of this information changes with time. For example, new sidewalks are constructed, existing sidewalks are repaired and transit routes are altered. It is important to note that all of the maps and data shown here **illustrate how the system works, they do not provide definitive results.** The first step in using the system will be to update and carefully field check the underlying data before beginning to rank projects. Four sections make up the ranking system as shown in Figure 44.

Figure 44 Project sidewalk prioritization process

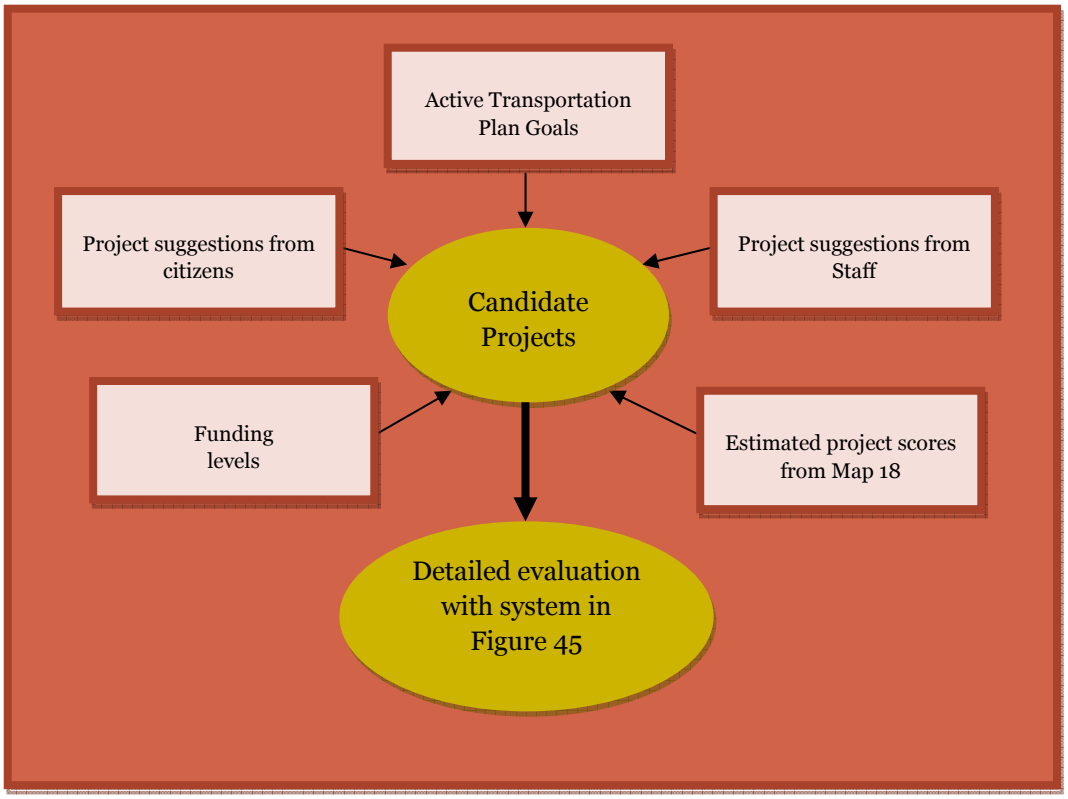
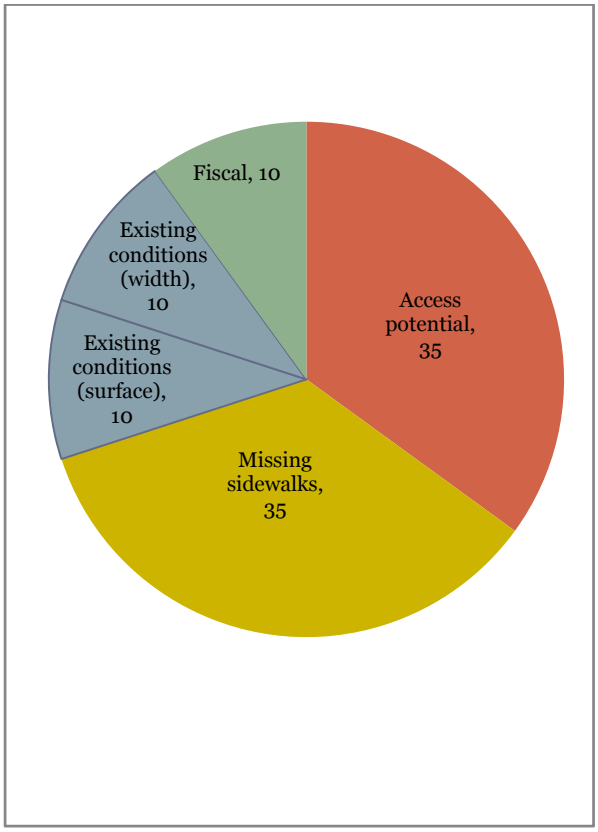


Figure 45 Proposed prioritization system for sidewalk construction projects



Access potential *35 % of total score*
Access potential measures the proximity of a given street segment to uses that pedestrians walk to. It reflects the responses to the pedestrian survey; errands, exercise and transit are typical uses for those who answered the survey.

Missing sidewalks *35% of total score*
This category evaluates the amount of sidewalk already constructed, favoring locations that have no sidewalk over those that have sidewalk on one side. This is also one of the places where school walk routes are taken into account and given extra points.

Existing Conditions *20% of total score*
Existing walkway surface type and walkway width are examined in this category. More points are given for projects that build where concrete sidewalk is not already present on the segment and where walkways are less than 4' wide.

Fiscal *10% of total score*
This category is based on the existing project scoring criteria; it evaluates the anticipated cost of the project relative to typical projects of the same type.

ACCESS POTENTIAL

Proximity to parks, commercial areas, bus routes and schools are the factors used to develop the access potential score. Each of the four destinations is ranked relative to each other; Schools and Parks at 30% and Transit and Commercial areas at 20% for a total of 100%. Using a GIS system, the City was divided into a grid of 25' squares then, each square was scored based on distance to Parks, Transit, Schools and Commercial areas. Values were adjusted to reflect the desired weightings as shown in Table 10 (see Appendix C).

Table 10 Relative weighting between and within destination types.

Destination	*Relative weighting within destination by type*				*Total % weighting for destination*
Schools	One school		Shared campus		30%
	⅛ mile or closer	between ¼ and ⅛mile	⅛ mile or closer	between ¼ and ⅛mile	
	1.25	1.00	1.30	1.10	
Transit	Peak hour		All-day		20%
	⅛ mile or closer	Between ¼ and ⅛mile	⅛ mile or closer	Between ¼ and ⅛mile	
	0.95	0.75	1.25	1.00	
Parks and Commercial areas (counted separately)	⅛ mile or closer	Between ¼ and ⅛mile	Not used, only one type		Parks 30%
	1.25	1.00			Commercial areas 20%

Higher weights were given to parks and schools than to transit and commercial areas to reflect their higher importance as expressed by the community. For simplicity, each park and each commercial area is considered to draw the same amount of pedestrian traffic (hence equal weighting among parks and among commercial areas) even though different parks have different features as do different commercial areas. Different weightings were given within the school and transit categories. Campuses with more than one school get higher weighting than campuses with only one school. Transit that runs all day gets higher weighting than transit that only runs in the peak period. Proximity to each feature is measured separately. For example, if a particular location is within ¼ mile of three different parks, it will receive three times the value of a site within ¼ mile of only one park. The only exception to this is transit. Scores for transit are capped at five routes; in other words a location that is close to more than five routes scores the same as one that is close to only five routes. This helps to prevent locations where many transit routes meet from having too high an influence on the overall score.

Distances of ¼ and ⅛ miles were used because they are conservative in that only a few people would consider distances of ¼ mile or less to be inconvenient.

Distances were measured from the edges of parks because this is less likely to exclude any possible access. Some parks have only one or two discrete entrances, others have many entrances.

Adjacent commercial areas were combined to avoid double counting. For example, the nine separate zones in and around the Totem Lake neighborhood are considered one, not nine separate areas each with its own influence.

Schools are included here because they can generate walking trips that are outside the school day or made by non-students. These might include trips to use play fields, to attend athletic events or for evening activities. Northwest University, Lake Washington Technical College, and the Boys & Girls Club were all included for these reasons. The Seventh Day Adventist School and the Holy Family School were also included because they are the only private school campuses with K-8 students and because they are located in residential areas.

Comparing the existing and proposed project ranking systems.

The existing project ranking system is described beginning on page 63. Most of the factors that have been used in the existing system are also used in the new system. These factors include:

- Proximity to pedestrian generators like parks, schools, commercial areas
- Width of existing shoulder, presence of existing walkway
- Type of existing walkway
- School walk route

The system described here gives about twice as much weight to the project's proximity to pedestrian traffic "generators" like parks, commercial areas and schools.

The revised ranking system also weights school walk routes more heavily – about 8% to 17% of the total score compared to about 9% in the existing method.

School walk routes which are intended for use by elementary school students, are accounted for elsewhere. Distances to schools are measured from the edges of the school buildings to compensate for the large and irregular boundaries of some school properties. This also helps to account for the fact that some campuses have multiple schools on their campus.

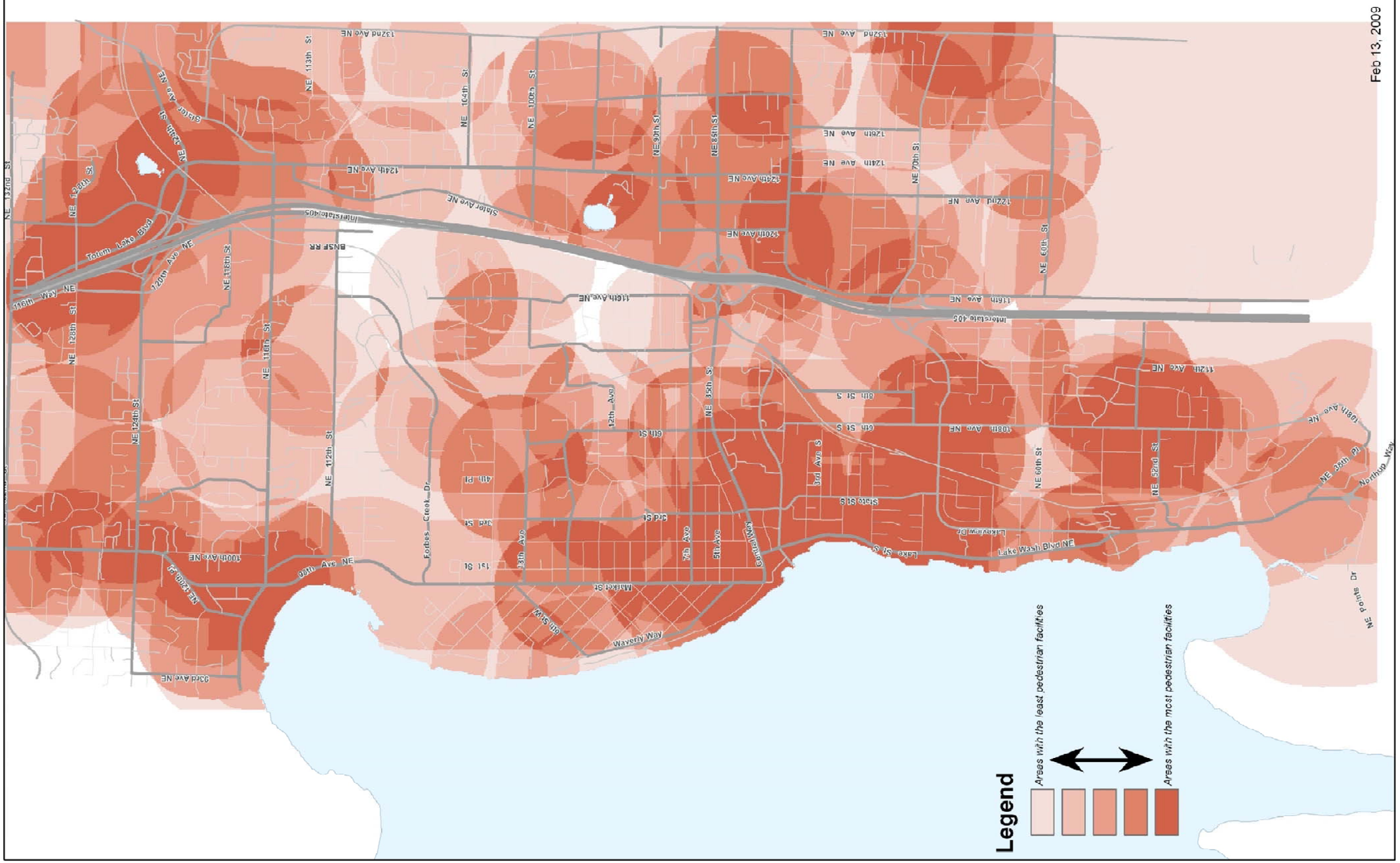
For simplicity, it's assumed that transit stops are uniformly spread along the routes and distances can be measured from the routes. Portions of routes along freeways are not considered, although stops at freeways are. Peak hour transit routes typically run in one direction, for example to Seattle in the morning and the other direction – to Kirkland for example – in the evening. There are typically eight or less runs on these peak hour routes in each direction as opposed to the 40 or so in each direction on an all day route with evening coverage. Therefore, peak hour routes get fewer points.

Map 15 shows the results of the pedestrian access analysis. Darker areas show more potential for needing pedestrian access, based on the methods described above.

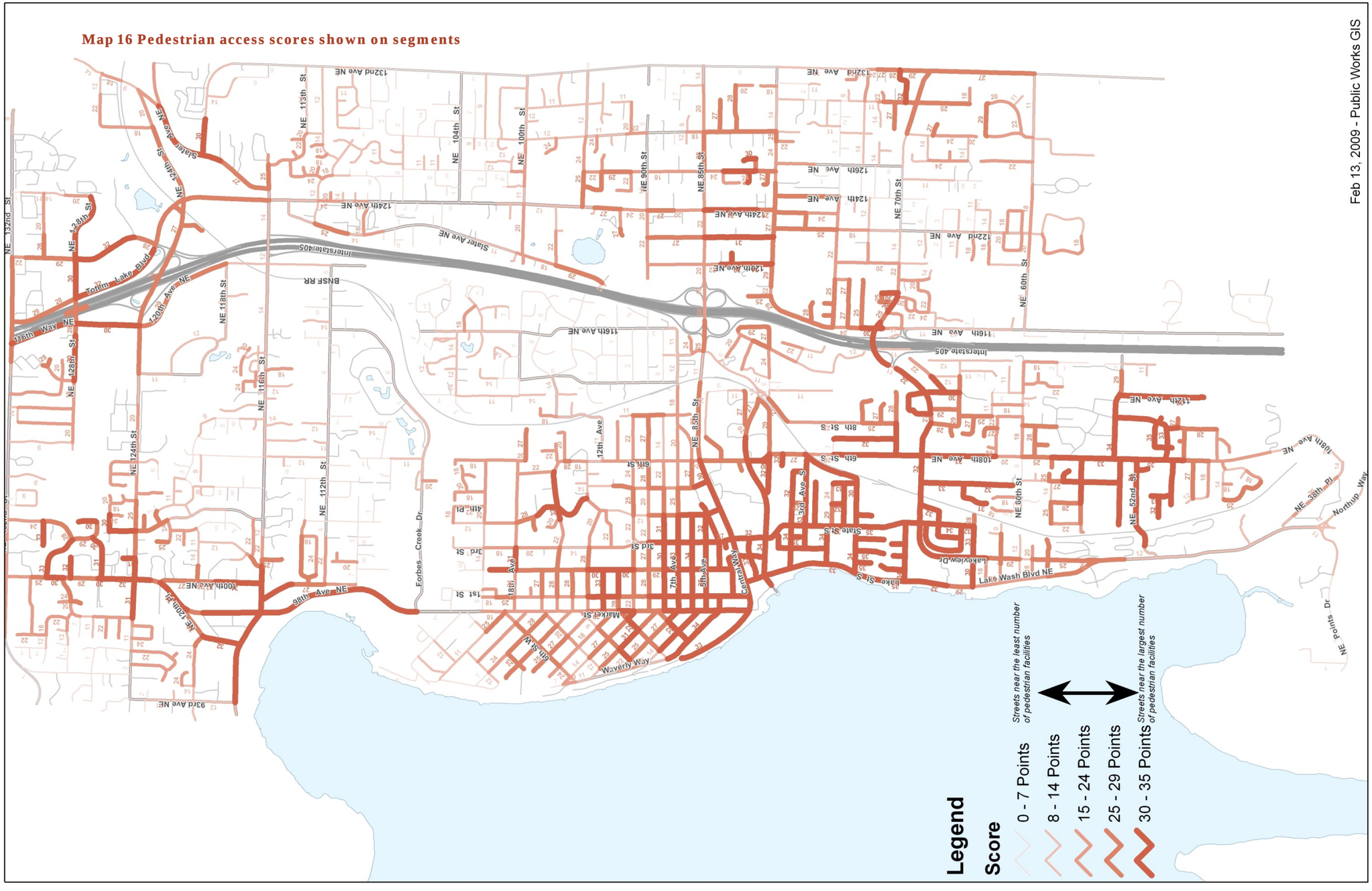
Each segment in the roadway system was given a score based on the pedestrian access ranking described above[19]. These scores were translated into a 1-35 range because this section of the ranking accounts for 35% of the project score (see Page 78). Map 16 shows access scores on road segments. More details on this process are in Appendix C.

[19] Each segment passes through multiple 25' grid squares. The value of the highest scoring grid square was assigned to the segment.

Map 15 Pedestrian access scores shown on segments



Map 16 Pedestrian access scores shown on segments



MISSING SIDEWALKS

Along with pedestrian access – features that are important because of where the segment is – there are other important characteristics that are associated with existing conditions on the segment itself. Scoring based on these factors; the roadway[20] classification, the presence of existing sidewalk and whether or not the segment is on a school walk route is incorporated in the Missing Sidewalk category. Table 11 summarizes how these factors are ranked relative to each other in order to develop link scores. Unlike the pedestrian access component, the missing sidewalk component is computed directly by road segment.

Table 11 Segment scores based on street classification, school walk routes and walkway completion.

MISSING SIDEWALK 35 point maximum *segments where walkways are not complete on both sides*				
Street Class	**School walk route points**	**Existing walkway**		
		Neither side complete		**One side complete**
Principal	+10	35		20
Minor		18		16
Collector	+7	14		10
Local	+3	**No walkway**	**Some walkway on one or both sides**	3
		5	9	

[20] The types of roadways are based on functional classification: Principal arterials, minor arterials, collectors and local streets. Functional classification is closely associated with the street's auto volume.

The type of road – its functional classification – is a surrogate measure for the auto volume on a segment. It is also a predictor of crash history. For the five year period 2003-2007 only 5% of all crashes took place on local streets the rest occurred on arterials or collectors. However, very few (2 out of 165, about 1%, during the period 1996-2007) crashes involved vehicles striking pedestrians that were not crossing the street. Constructing sidewalks has a direct effect on pedestrian comfort and that effect is proportionate to the volume of the adjacent street. When pedestrian comfort is improved, the number of pedestrians who walk regularly will increase, supporting the principles of this plan.

Constructing sidewalks along school walk routes is an important value to the community. Therefore a higher priority is given to segments that are on school walk routes.

The extent of the walkway that is currently available is also a consideration when determining the priority of a segment for additional sidewalk. More points are given when there is not a walkway complete on at least one side. For arterials and collectors, there are two categories of completion; either sidewalks are complete on one side or it is not. There are various subcategories, within each of these larger categories. However, Figure 8 on page 29 shows that very few segments that fall within any of these subcategories. Therefore, they can be collapsed into the two major groups described above. For local streets, the picture is a little different. There are many more miles of local streets and two subcategories have more than 10 centerline miles of segments. For local street segments where sidewalks are not complete, a distinction is made between those segments where there is no sidewalk at all and those where there are some sidewalks on one or both sides.

Scoring projects

The purpose of the prioritization system is to be able to evaluate different projects against each other and decide which should be built first.

Projects are often proposed by the public for consideration in the CIP. The goals of this plan to complete sidewalks on major streets and school walk routes would also be considered when proposing candidate projects. Map 19 can also be used as a guide to selecting projects with high potential to score well

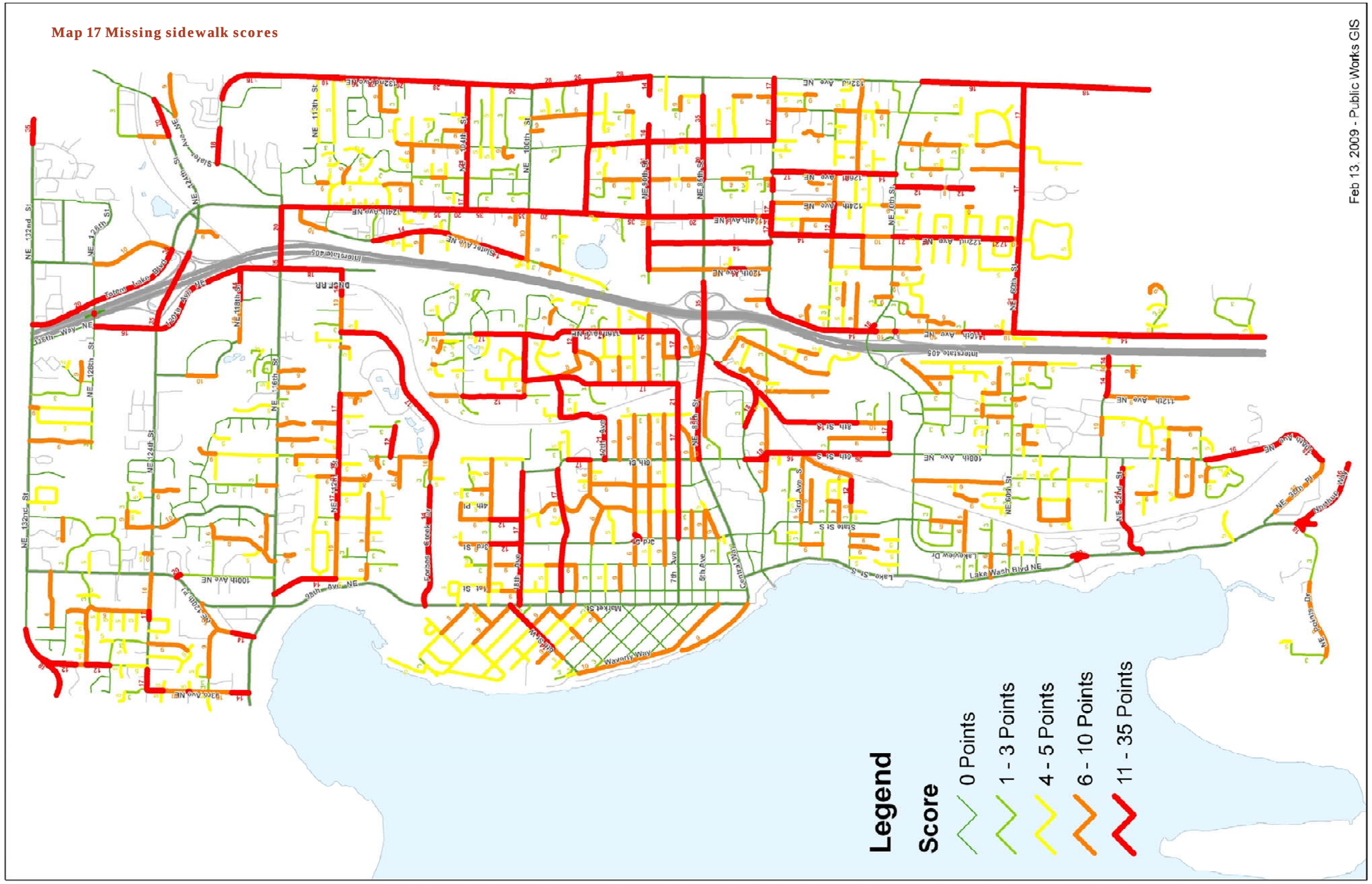
The first step in ranking projects would be to document the data necessary to calculate scores for the various ranking components. Essentially, this would mean updating maps 15 through 19 and computing the appropriate values from Tables 11-14. For each segment included in a candidate project.

When projects include more than one segment, the score for the total project is based on the scores of the component segments, with each segment being weighted in proportion to its length.

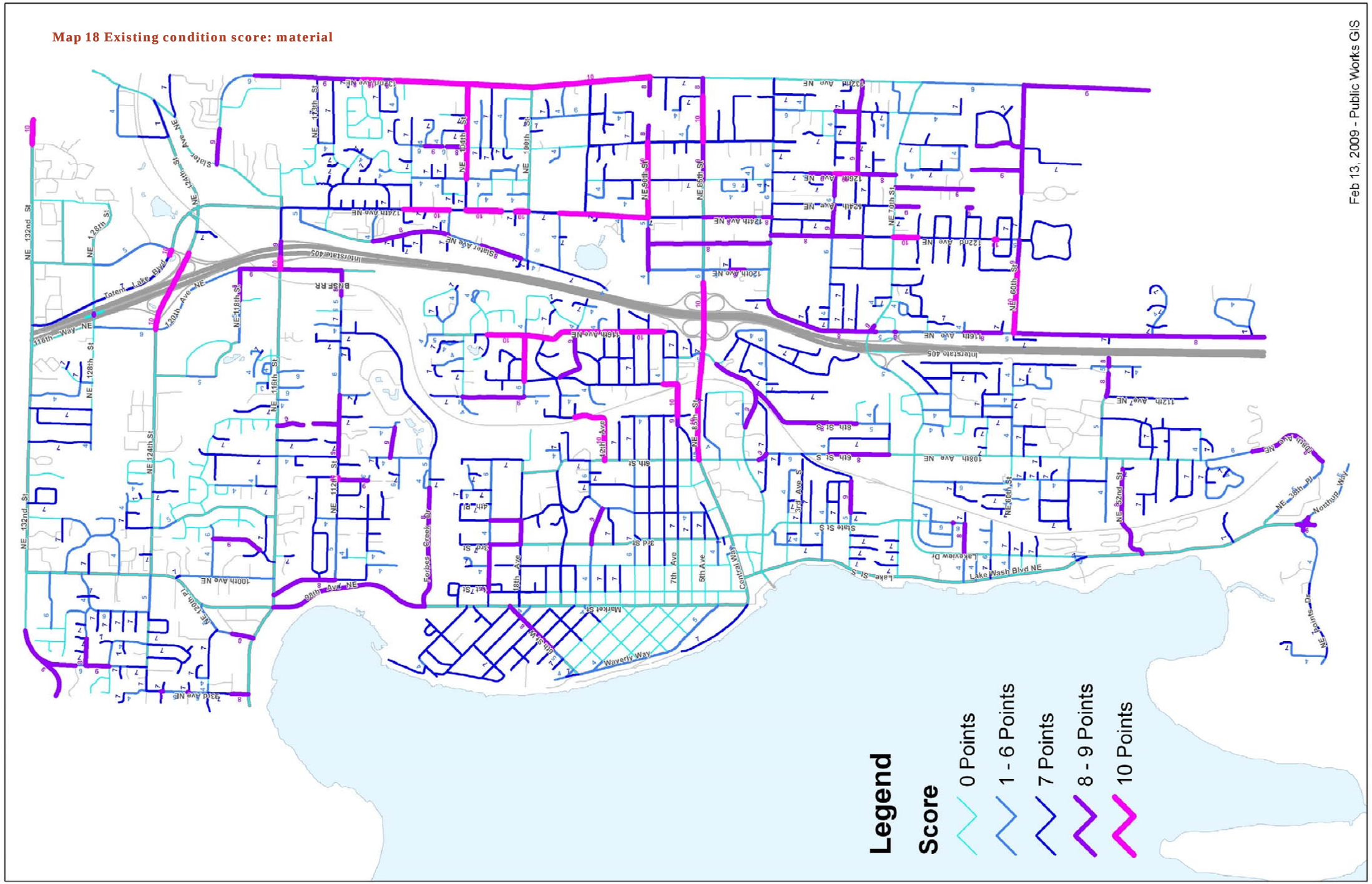
For a given sidewalk completion status, the highest priority for sidewalk improvements is assigned to principal arterials. Minor arterials and collectors receive the next most points and local streets receive the fewest points. Similarly, within a given street classification, the most points are given to segments where a sidewalk is not already complete on one side. For local streets, more points are given to segments where there is some sidewalk but it is not complete on one side. This supports Goal G3 and the desire to build upon sidewalk that is already in place and fill in gaps, first on busy streets.

Map 17 shows the segment scores based on the missing sidewalk analysis. Like the pedestrian analysis scores, the missing sidewalk scores were translated into a 1-35 range because this section of the ranking accounts for 35% (see Page 78) of the project score

Map 17 Missing sidewalk scores



Map 18 Existing condition score: material



EXISTING CONDITIONS

Along with location and segment specific features, determining the priority of projects also depends on characteristics that are measured on a project by project basis. As points are assigned for location and segment elements, points are also assigned for project specific features. More points represent a higher priority for construction.

SURFACE

For walkways adjacent to streets, most people feel that asphalt and gravel are preferable to no walkway, but not preferable to concrete sidewalks with curb and gutter. Asphalt and gravel are acceptable surfaces for trails and sometimes gravel is used for equestrian paths.

Points are assigned based on the amount of non-concrete walkway on a segment. If there are no complete walkways of any type, the maximum points are assigned. No points are assigned if there is concrete sidewalk on both sides. Points are assigned even if there is a complete sidewalk on one side, but it is not concrete.

For a given set of existing conditions more points are assigned to street classifications with higher volumes. Extra points are given for school walk routes. A maximum of 10 points is assigned (see Table 12).

WIDTH

When determining where sidewalk should be built, priority is given to locations where there is the least area to walk. Segments where at least one side has areas at least 4' wide to walk on get higher priority than segments where both sides have areas 4' or wider. For a given set of existing conditions more points are assigned to street classifications with higher volumes. Extra points are given for school walk routes. A maximum of 10 points is assigned (see Table 13).

Sidewalk inventory

In 2004 a survey was made of all of Kirkland's walkways. Presence or absence and length of walkway along with the walkway material was noted on each side of every roadway segment. The information was tied to the City's GIS system for mapping.

Both the missing sidewalk and existing condition (surface) score depend on information from the sidewalk survey. This means that 45% of a project's score depends on information from the sidewalk inventory.

When the walkway is a wide shoulder, it can be difficult to decide whether or not there is a walkway present. Therefore, the inventory can sometimes be subject to correction. Sometimes, the inventory defines a wide shoulder as a walkway but sometimes it does not. This can make an important difference in the missing sidewalk portion of the project score. As noted several places in the plan, evaluating projects can't rely solely on the maps in this plan. Their primary purpose is to illustrate how the system works and serve as an estimate of the project scores.

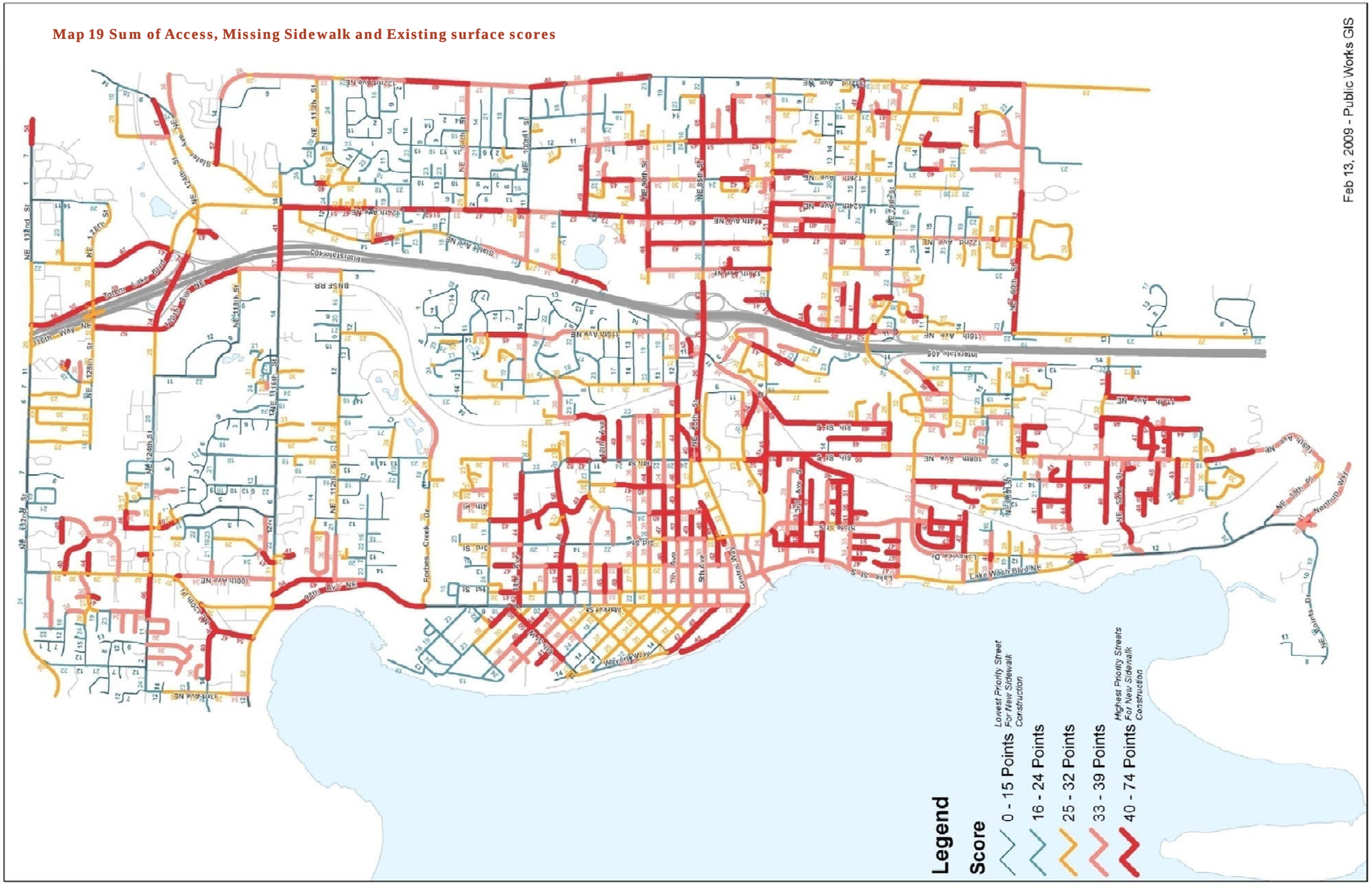
Table 12 Points for projects based on existing surface conditions

Walkway completion and Surface *by side of adjacent street, for locations where concrete sidewalk is not complete on both sides.* *10 POINT MAXIMUM*	*Functional class*				*School Walk routes*
	Principal	Minor	Collector	Local	
Neither side is complete and neither side is concrete	10	9	8	7	***Add 2 points for school walk route***
Only one side is complete, and it is not concrete	9	8	7	6	
Both sides are complete, but neither is concrete	8	7	6	5	
Only one side is complete and it is concrete	7	6	5	4	
Both sides are complete and only one is concrete	6	5	4	3	

Table 13 Points for projects based on existing walkway width

Width (area reserved for pedestrians) *10 POINT MAXIMUM*	*Functional class*				*School Walk routes*
	Principal	Minor	Collector	Local	
Both sides are less than 4' wide	10	10	8	6	***Add 2 points for school walk route***
One side is less than 4' wide	7	6	5	4	
Neither side is less than 4' wide	0	0	0	0	0

Map 19 Sum of Access, Missing Sidewalk and Existing surface scores



FISCAL

As mentioned above, the fiscal component of project evaluation is taken from the existing project evaluation criteria. It is made up of three subparts; the project's basic construction cost its maintenance cost and its affect on the cost of existing maintenance operations. A maximum of 10 points can be assigned to a project that has lower than average construction and maintenance costs (see Table 14).

Table 14 Points for projects based on fiscal factors

Fiscal factors 10 POINTS MAXIMUM		
Difference between forecast project unit construction costs and the standard unit construction costs for a similar project		
More than 25% greater than standard unit costs	***0-25% greater than standard unit costs***	***Less than standard unit costs***
0 points	3 points	6 points
Difference between forecast maintenance costs of project and the standard maintenance costs for a similar project		
Greater costs	Similar costs	Lower costs
0 points	1 point	2 points
Project affect on existing maintenance needs		
Greater than existing	Same as existing	Less than existing
0 points	1 point	2 points

COMBINING FACTORS

Map 19 shows scores for segments when all the components the can be mapped through existing GIS data are combined. Note that it only represents 80% of the overall possible project score because sidewalk width is not currently available in the GIS database and fiscal factors depend on a number of project specific factors. Note that while Map 19 gives overall picture of where the highest scoring segments are located, the scores on that map cannot be used directly to select or score projects. For example, some short dead-end streets score well --the scoring system does not exclude dead-end streets-- but short dead-end streets are not where sidewalk is needed.