City of St. Charles Long Range ADA Transition & Sidewalk Plan

Public Works Department

2015

The Goal of the Long Range Sidewalk Plan is to drive recommendations for future CIP submittals.

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EXECUTIVE SUMMARY

The City of St. Charles Long Range ADA Transition and Sidewalk Plan is another step towards establishing safe and convenient walking routes throughout the City to enhance the livability for residents and visitors. The primary focus has been to prioritize sidewalk repairs and installation by inventorying deficiencies in the City's existing walkway network and identifying opportunities and constraints to close gaps in the extensive surface infrastructure. Though sidewalks are considered a private responsibility by City Code Section 505.270, City Council apportions funds to improve sidewalks and the Public Works Department of the City of St. Charles serves as the appointed steward for that funding. Over the years, Public Works has moved from a reactive, spot-repair approach to a systematic, asset management approach to ensure the high level of quality of the infrastructure. The goals of the asset management methodology within the framework of this project are to:

- Optimize the use of City funds in the maintenance and expansion of the sidewalk network
- Achieve an ADA-compliant sidewalk network
- Improve pedestrian safety throughout the City
- Decrease roadway congestion and correspondingly improve transportation diversity to include increases among pedestrians, bicycles, and mass transportation
- Support city neighborhoods and economic benefit by making the City more pedestrian friendly
- Improve pedestrian access to public places for city residents and visitors
- Improve public health and well-being by encouraging walking
- Create a framework for public policy decision-making with regard to pedestrian issues

As the project was executed, the most recent sidewalk condition data from the 2012 Sidewalk Inventory was incorporated into the City's Geographical Information Systems (GIS) application. The GIS application allowed data aggregation to visually identify and explore trends and risks within predetermined zones (defined as areas that may include one or more subdivisions or commercial districts – See Figure 1). From both data analysis and visual representation of that data, categories of repairs and extensions emerged that combined the condition and level of use (sidewalk score) and the cost effectiveness (estimated costs of improvements) of repairs for sidewalks within a given zone.

In accordance with this framework, existing sidewalk priorities were broken into four main quadrants:

Existing Sidewalk Priority Categories

1 NEGATIVE TREND
1. HIGHER TOTAL COST OF AREA
2. LOWER AVERAGE SIDEWALK SCORE
3. IDEAL FOR STAND-ALONE PROJECT

2 NEGATIVE TREND
1. HIGHER TOTAL COST OF AREA
2. HIGHER AVERAGE SIDEWALK SCORE
3. IDEAL FOR STAND-ALONE PROJECT

3 POSITIVE TREND
1. LOWER TOTAL COST OF AREA
2. LOWER AVERAGE SIDEWALK SCORE
3. IDEAL FOR MAINTENANCE PLAN

4 POSITIVE TREND
1. LOWER TOTAL COST OF AREA
2. HIGHER AVERAGE SIDEWALK SCORE
3. IDEAL FOR MAINTENANCE PLAN

Figure 8 provides the fullest picture of the existing sidewalk analysis as a bubble chart – bubbles depicting each zone – each zone within a quadrant – quadrants separated by the medians of zone scores and costs per foot – and each bubble size corresponding to the total costs of repairs in the respective zone.

Also of great importance is the construction of new sidewalks where sidewalks are missing along streets – depicted in Figure 4. Significant consideration has been dedicated to resolving this type of deficiency, as it disrupts the City's pedestrian network and creates barriers for all community citizens, particularly students, seniors, and disabled individuals. The City prioritized new construction within missing sidewalk segments by considering the following factors:

- Activity Factor. Proximity of neighborhood zones to schools, governmental buildings and other such entities significantly increases the priority of the zone.
- Abundance of missing segments, particularly whether or not segments on both sides of the road are absent

The areas within New Town and Charlestowne subdivisions in Ward 8 were analyzed separately in this plan. Recently, the developments have suffered significant sidewalk deficiencies prematurely; already, the segments and ADA curb ramps reflect such great deterioration at an abnormal rate that risk to citizens and properties is imminent. Given their low proximity to governmental buildings and other high-traffic destinations, sidewalk assets in these areas received low Activity Factors. While temporary repairs cannot be avoided, such repairs can become problematic. **Staff has observed continued and additional displacements of sidewalk since the 2012-2013 inventories were completed.** The full report for New Town and Charlestowne is provided in Appendix B, but a summary of the options is as follows:

- Option #1 recommends the total removal and replacement of all concrete sidewalks with reinforced panels and aggregate/remediated base, for an estimated cost of approximately $6M.

- Option #2 would remove and replace sidewalk with the most critical deficiencies at this time with ongoing costs of permanent and temporary repairs applied over time. This option is estimated to cost approximately $400K-$500K to replace the currently displaced sidewalk panels, but will not address any ongoing problems.
- Option #3 would apply temporary remedial repairs globally (primarily grinding) until funding for permanent repairs was secured. The cost for this option is approximately $200K to $300K for initial repairs of displacements greater than ½", plus a $50K annual maintenance cost.
- Option #4 is considered to be an additive alternate for Private Property sidewalk and porch/stair stoop remediation. Mud jacking (injecting a cement grout under pressure into the voided underlying soil) is being considered for this remediation. The costs associated with this additive option for 1500 residences are in the range of $1M to $1.5M.

From these various categories, priorities for sidewalk maintenance and extension were established. The most apparent advantage of the asset management approach is that the repair and maintenance component is scalable; priorities and the resulting schedules of work can be readily adjusted based on any budgetary constraints City Council desires or approves. Based on the four quadrants for existing sidewalks, the final activity scores of zones with missing sidewalks, and the analysis of the New Town-Charlestowne Area, it was determined sidewalks will be maintained or extended according to the following strategy tiers:

- Existing sidewalks to be maintained as stand-alone projects by zone (zones with the higher repair costs per sidewalk scores) – Figures 2 & 3 – Total = $10.5 Million
- Existing sidewalks to be maintained concurrently with pavement maintenance by zone (zones with lower repair costs per sidewalk scores) – Figures 2 & 3 – Total = $4.4 Million
- Missing segments by zone to receive new extension funding (or where to pursue extension funding – Transportation Alternatives Program or Safe Routes to School for example) – Figures 4 & 5 – Total = $134 Million (completing one side of each major street and one zone per project, as funding allows, is the alternate staff recommendation)
- New Town and Charlestowne zones where premature sidewalk failures are occurring for the age of the subdivision due to soil conditions – Figure 11 – Total = $6 Million ($250,000 initially and $50,000 annually for on-going repairs is the alternate staff recommendation)

As the City moves forward with this plan, it is recommended City Council revisit the appropriateness of City Code Section 505.270 which identifies all sidewalk maintenance as that of the abutting private lot owner. Staff will use this plan as the guide for the allocation of any dollars provided for sidewalk repairs and extensions. Any sidewalk repair and extension budget will be allocated among these four tiers. An example of $1 Million in Year 1 is provided as follows:

Tier 1 – Stand-alone sidewalk repair project in Zone 1-14 @ $200,000 (20%)

Tier 2 – Sidewalk repairs corresponding with pavement maintenance in zones: 6-3, 7-5, 8-2, and 9-2 @ approximately $650,000

Tier 3 – Stand-alone sidewalk extension project in Zone 7-1 @ $100,000 (10%)

Tier 4 – On-going sidewalk maintenance in New Town and Charlestowne @ $50,000 (5%)

Priorities in each tier have been established by this plan. Ultimately, repair and construction activity will occur according to the funding levels established by City Council per Tier.

INTRODUCTION

According to the most recent demographic report conducted by the Department of Economic Development in 2014, the City of St. Charles is projected to reach nearly 70,000 residents by the year 2019. To accommodate and sustain such growth, the City of St. Charles must provide a complete transportation network for all modes of travel to benefit existing and prospective residents and visitors.

Consisting of an interweaving matrix of streets, this network must maximize the quality and range of accessibility for everyone, particularly our most vulnerable residents and visitors (i.e., children, older adults, and those with disabilities). This plan will meet and, in some areas, exceed the basic requirements that were established by the Americans with Disabilities Act of 1990 (ADA) and the Rehabilitation Act of 1973 (Section 504). The commitment to address the deficiencies within the pedestrian sub-network served as the impetus for the Sidewalk Inventory Projects and this document – The Long-Range ADA Transition and Sidewalk Plan.

OVERVIEW

Gathering inventory data on the existing pedestrian facilities and assessing the accessibility of the travel way were the first steps towards providing access for all pedestrians. The resulting objective data obtained from sidewalk assessments enabled Public Works to meet the requirements established by the Americans with Disabilities Act (ADA). The initial analysis of the collected data resulted from the 2012 ADA Sidewalk Inventory, which described its intent to catalog the existing curb ramps and pedestrian facilities within City limits, identify ADA deficiencies, and develop procedures for comparative scores of sidewalk and ramp conditions. It reported on the inventory work performed by both contractors and contracted employees, who physically traversed each block of the sidewalk system on city-owned right-of-way and recorded their observations of sidewalk and curb ramp deficiencies (including missing sidewalk segments); recorded data was then transferred into the City's GIS database and critically analyzed before a proposed compliance schedule and associated budget were generated. The 2012 ADA Sidewalk Inventory was successfully approved and executed over the course of two years. The next step in achieving and maintaining an optimal pedestrian network is the City of St. Charles' Long Range ADA Transition and Sidewalk Plan.

The goals of the City of St. Charles' Long Range ADA Transition and Sidewalk Plan (hereafter referred to as the "Plan") are to:

- **Address sidewalk disruptions and other tripping hazards on public street sidewalks (right of way)**
- **Install new sidewalks in areas that have no sidewalks present**
- **Maintain or increase the overall Sidewalk Condition Score**
- **Update the inventory data of sidewalks and curb ramps within the City GIS system**
- **Identify the budget needs for sidewalk repairs and extensions**
- **Prioritize the use of CIP budgets to be provided**
- **Develop a plan to address Ward 8's New Town and Charlestowne premature sidewalk failures**

To attain such goals for more than 400 miles of existing sidewalk and nearly 200 linear miles of identified missing sidewalk, the City of St. Charles was split into 101 geographic clusters (hereafter referred to as "zones") that closely correspond with neighborhood/subdivision borders. Within each zone, the current inventory of existing curb ramps, obstructions and sidewalk segments was reevaluated on the basis of several factors, such as sidewalk score, activity score, and obstruction score. As trends in the analysis emerged, four execution strategies were created and will serve as the central focus of the Plan.

The Plan's execution strategies (as outlined in the report) represent the most effective and efficient approaches currently possible. The strategies are subject to change to reflect changes in funding, resources, priorities, and time constraints. Changes to the Plan will be appropriately communicated to all relevant parties in a timely fashion.

As a result of the 2012 ADA Sidewalk Inventory, the City GIS system currently holds data on over 400 miles of sidewalk and more than 15,000 handicap ramps that vary in age, condition, and construction standards. The data collected reflects the concerns of City citizens; characterized in the following list:

- Step separation - A vertical displacement of 13 mm (0.5 in) or greater at any point on the walkway that could cause pedestrians to trip or prevent the wheels of a wheelchair or stroller from rolling smoothly;
- Badly cracked concrete - Holes and rough spots ranging from hairline cracks to indentations wider than 13 mm (0.5 in);
- Spalled areas - Fragments of concrete or other building material detached from larger structures;
- Settled areas that trap water - Sidewalk segments with depressions, reverse cross slopes, or other indentations that make the sidewalk path lower than the curb. These depressions trap silt and water on the sidewalk and reduce the slip resistant nature of the surface;
- Tree root damage - Roots from trees growing in adjacent landscaping that cause the walkway surface to buckle and crack;
- Vegetation overgrowth - Ground cover, trees, or shrubs on properties or setbacks adjacent to the path that have not been pruned can encroach onto the path and create obstacles;
- Obstacles - Objects located on the sidewalk, in setbacks or on properties adjacent to the sidewalk that obstruct the passage space. Obstacles commonly include trash receptacles, utility poles, newspaper vending machines, and mailboxes;
- General Safety - Any safety issue that a pedestrian or sidewalk inspector believes should merit attention;
- Blocked drainage inlets and inadequate flow planning;
- Temporary construction interruptions;
- Inadequate patching after utility installation

Within GIS, an exhaustive list of attributes were associated with each sidewalk segment and curb ramp. In addition, details regarding each observed obstruction were documented and then cataloged within GIS. **A summary of data for over 7,000 sidewalk segments concluded that more than 50% of the City's entire pedestrian network must be restored or installed to achieve an overall score of 70.**

SIDEWALK SCORES					
Grade	**# Sidewalk Segments**	**% Sidewalk Segments**	**Min Score**	**Max Score**	**Average Score**
A	645	9%	90	100	95
B	1340	19%	80	89	85
C	1466	21%	70	79	75
D	**836**	**12%**	**60**	**69**	**65**
F	**2787**	**39%**	**1**	**59**	**39**
Total	**7074**	**100%**	**1**	**100**	**60**

An example of a sidewalk segment with an overall score of 70 is pictured below. The area between the two red lines is the sidewalk segment inventoried. While the pictured segment does have minor flaws, it is not located near governmental buildings, schools or any other high-traffic, public area; this fact lends itself to a higher, more favorable sidewalk score.

The next picture is one of the Grade F sidewalk segments inventoried:

This particular segment achieved a high obstruction score (which lowered its condition score) and is listed in poor condition. In addition, this segment also had a lower score for its proximity to a school, which impacts prioritization significantly. Because the previous survey generated such a rich, detailed catalog of asset attributes, the asset management approach could be applied to a complete visual comparative and qualitative assessment of the City's pedestrian network.

SIDEWALK INVENTORY METHODOLOGY

The City has created a comprehensive GIS database from the information gathered from the inventory used by staff for future planning. For the initial development of this inventory, a small segment of the City was inventoried to test the criteria. These test areas were in four different locations that represented samples of the types of sidewalk found in the City. The information collected was then analyzed using a Scoring System that guided the City's sidewalk repairs and construction strategies (described below).

Data was gathered using a mobile GIS data collection unit. The unit had customized forms to insert data that related to sidewalks, obstructions, and curb ramps. College interns were utilized, under the supervision of City staff, to collect sidewalk and curb ramp data during the summers of 2012 and 2013. The interns worked in teams of two to collect the remaining data needed. By breaking the City into smaller and more manageable sections, staff could ensure full and complete data collection. Staff and interns were trained on current ADA guidelines and field procedures to guarantee consistent, relevant data across multiple survey teams. The City staff performed routine quality assurance checks to verify that the collection teams were gathering all necessary data and to ensure the accuracy of the information.

Collection procedures for sidewalk segments, obstructions, and curb ramps were completed by walking every block of pedestrian facilities within the City. The basic surveyor duties included:

a) Traveling the sidewalk and curb ramps while gathering data with the mobile GIS data collection unit as assigned by a supervisor
b) Visually inspect, measure, and record observations using the drop down menus created inside the mobile GIS unit
c) Download the information off of the GIS unit at the end of every workday to eliminate the possibility of losing data
d) Discuss with the supervisor any problems or field judgments for non-typical situations to ensure consistency
e) Represent the City of Saint Charles while in the field by looking and acting professionally, observing safety precautions, and treating members of the public politely

PUBLIC ENGAGEMENT

Public engagement was and is an important component of the Plan. High public engagement can be sustained with satisfactory levels of transparency and accountability in all outreach efforts when each stage of implementation has been achieved. Important messages, such as Plan objectives, scope, timeline and progression obstacles are to be relayed within a detailed, multifaceted communication strategy. Outreach during the 2012 ADA Sidewalk Inventory consisted of hosting public meetings, as well as more focused meetings with affected citizens and a widely circulated survey to harvest community demographics and needs.

During the data collection and analysis process, the 2012 ADA Sidewalk Inventory actively sought input from all interested parties, including those with disabilities and the groups that represent them. Meetings were held with these parties to help determine the priority rating system, allow for comments and make specific recommendations for areas in need of improvement. City staff and their consultants met with various City committees and civic and advisory groups through the process to gather insight and answer any questions. Separate meetings were held with the Delta Center, who represents numerous individuals in the local disabled community, historic districts, the Police Department, the Senior Citizens Advisory Board, the Citizens with Disabilities Board and school districts to explain the project and gain their feedback.

The input received was used in the development of the priorities for both sidewalks and curb ramps, as well as in the development of standards to be used Citywide. Next, a survey was developed and distributed to gather information related to user demographics and accessibility concerns with the City sidewalk system. Finally, public review of the 2012 ADA Sidewalk Inventory and an associated public meeting were held to receive feedback and recommendations. The results generated responses that included global concerns, such as the need for more accessible travel ways, and individual concerns, such as a utility pole blocking an ADA ramp at a specific intersection. For the City of St. Charles Long Range ADA Transition and Sidewalk Plan, public engagement will transition its focus from input to participation. To maximize citizen participation for this Plan, the City will employ a different, more varied communications toolset.

There are significant benefits to looking at multiple methods to share and distribute information and obtain feedback. This “multichannel” approach uses a variety of methods to disseminate and share the project or program materials. This approach will enable the City to reach members of the public that do not usually follow what is going on in local government. Specifically, the City will utilize this approach in the following ways:

- City of St. Charles website (www.stcharlescitymo.gov) is the main site for governance and policy information. There will be a link to a sub-page that is dedicated to Long Range Plan information, including contact information for involved City staff, scheduled work and announcements for community meetings and focus groups. In addition, there will be links to social media channels, such as Twitter and YouTube.
- By implementing a more transparent decision-making process, the City will be able to ensure that more information, such as meeting agendas and minutes, staff reports and videos, are posted in a clear and easy-to-navigate manner.
- Meetings will be broadcasted via virtual host (i.e., Skype) as an additional feature of open Plan meetings (public meetings, focus groups, etc.).
- Post notices and plan results will be issued via Twitter or YouTube.

In addition, public engagement meetings may be hosted in community settings; particularly those communities that may be significantly impacted but historically generate low participation in local government proceedings. For such communities, co-sponsorship with respected intermediary groups and organizations will be necessary to engage them. Public Works staff will seek for the direction and assistance of the Mayor and the Department of Administration in the development of these outreaches and engagements.

SCORING AND ANALYSIS

For detailed measurements, the survey team collected and analyzed the following data:

SIDEWALK SEGMENTS	CURBS/RAMPS	OBSTRUCTIONS
Condition	Condition	Clear Width
Cross Slope	Cross Slope of Crosswalk	Driveway Slope through Sidewalk
Curb Type	Crosswalk Alignment	Encroachments
Flangeway Gaps	Crosswalk Width	Fixed Obstruction
Green Space	Detectable Warning Panels	Vertical Displacement
Running Slope	Flare Slope	
Sidewalk Gratings	Gutter Slope	
Sidewalk Width	Landing	
Surface	Landing Slope	
	Ramp Length	
	Ramp Type	
	Ramp Width	
	Running Slope of Crosswalk	
	Surface	
	Vertical Displacements	

The sidewalk section and curb ramps were scored based on not only physical conditions, but proximity to schools, government buildings, and other pedestrian traffic generators. The goal of the sidewalk scoring system was to assign the lowest rating to a non-compliant sidewalk that is most likely to have a high amount of pedestrian traffic. An activity factor was developed as a multiplier for the sidewalk and ramp score and was applied based on the geographic location with respect to a predefined set of pedestrian generators (e.g. government buildings, schools, commercial areas, etc.). The sidewalk segments and curb ramps are scored on a scale between 1 and 100 with 1, the lowest score, representing a non-existent sidewalk segment or curb ramp within the proximity of all pedestrian traffic generators and 100, the highest score, representing a segment with no ADA deficiencies that is outside the proximity of all the pedestrian traffic generators. As the analysis proceeded, staff found it necessary to adjust the weight given to some factors from the 2012 ADA Sidewalk Inventory since some weightings were rarely used but unnecessarily skewed scoring results (non-compliant flange ways on railroad crossings for example).

For analysis, the sidewalk score equation is as follows:

SIDEWALK SCORE = (ACTIVITY FACTOR) x (IMPEDANCE SCORE + OBSTRUCTION SCORE)

For analysis, the curb ramp score equation is as follows:

CURB RAMP SCORE = RAMP TYPE + RUNNING SLOPE + CROSS SLOPE + FLARE SLOPE + RAMP WIDTH

NOTE: Activity Factor corresponds inversely to Activity Score. The activity score derives from a scale between 1 and 10. The activity score increases if a segment is located near schools, government buildings, SCAT bus stop, parks, senior services, public housing, traffic generators (such as the historic districts of Downtown Saint Charles) and street classification. Higher activity scores result in lower activity factors, which then produce lower sidewalk scores (negative trend).

PLANNING

Identified areas where improvements are necessary on sidewalk segments, curbs/ramps, and obstructions were grouped in neighborhood clusters or zones. These zones are depicted on Figure 1 and are identical to the City's pavement maintenance zones. Costs were assigned to segments, curb/ramps, and obstructions based on historical sidewalk project data and summarized into a cost per linear foot. Based on the medians of both the costs per linear foot and sidewalk score (depicted in Figures 6 and 8), neighborhood zones were categorized into four quadrants:

SIDEWALK PRIORITY CATEGORIES			
1	**NEGATIVE TREND** 1. HIGHER TOTAL COST OF AREA 2. LOWER AVERAGE SIDEWALK SCORE 3. IDEAL FOR STAND-ALONE PROJECT	2	**NEGATIVE TREND** 1. HIGHER TOTAL COST OF AREA 2. HIGHER AVERAGE SIDEWALK SCORE 3. IDEAL FOR STAND-ALONE PROJECT
3	**POSITIVE TREND** 1. LOWER TOTAL COST OF AREA 2. LOWER AVERAGE SIDEWALK SCORE 3. IDEAL FOR MAINTENANCE PLAN	4	**POSITIVE TREND** 1. LOWER TOTAL COST OF AREA 2. HIGHER AVERAGE SIDEWALK SCORE 3. IDEAL FOR MAINTENANCE PLAN

These quadrants indicate whether neighborhood zones are selected for regular sidewalk maintenance or for more intensive, stand-alone projects. Quadrant 1 contains those neighborhood zones in need of repair, but tend to cost more – these zones have a lower overall sidewalk score, and the cost to repair these segments are higher than all other zones. Quadrant 2 refers to zones that have slightly higher sidewalk scores (most likely due to the fact that these segments are not close to public buildings, schools, or parks), but the costs of repair remain relatively high. Both Quadrants 1 and 2 qualify for stand-alone projects, as these zones pose significant risk to citizens and/or property with higher costs. These neighborhood zones are considered to be Tier 1. The work required to repair zones in these quadrants will be more varied, as repairs will be specific to the conditions of quadrant sidewalk segments, and will inherently be more labor-intensive.

Neighborhood zones in Tier 2 (Quadrants 3 & 4) can be restored to optimal condition as part of street maintenance work. Segments in Quadrant 3 zones typically have lower sidewalk condition, but low restoration costs as well, while segments in Quadrant 4 zones are close to achieving optimal condition, but costs remain lower to keep them at this standard. Standard maintenance work include minor concrete repair and in-fills, sidewalk grinding, curb markings, curb cuts and sidewalk access ramp construction, removal and replacement of hardscape, or minor excavation. In comparison to zones in Quadrants 1 and 2, these particular neighborhood zones contain issues that can be resolved more quickly and efficiently. Therefore, zones in Quadrants 3 and 4 will be completed in parallel with street maintenance work taking place inside of these zones.

Final results of the Quadrant analysis for existing sidewalks are presented by map in Figure 2.

Also of great importance is the construction of new sidewalks where sidewalks are missing along streets. The extent of missing sidewalk segments in the City is depicted in Figure 4. Significant consideration has

been dedicated to resolving this type of deficiency, as it disrupts the City's pedestrian network and creates barriers for all community citizens, particularly students, seniors, and disabled individuals. However, Figure 4 also illustrates a number of street segments, though missing sidewalks should likely not be considered highest priorities or the best use of sidewalk extension funds. For example, attaining at least one sidewalk on each side of a street should be a priority ahead of completing sidewalks on both sides of a street. Cul-de-sac streets should likely be lower priorities than primary subdivision, collector, and arterial streets, in that order.

It proved very challenging to analyze the data geospatially by considering activity scores, street type, missing sidewalk scores, and the length of missing segments on each side of the street. In fact, in consultation with GIS professionals, this type of analysis may only be possible for some of the most expert GIS technicians and likely beyond the needs of the Plan. Furthermore, sidewalk extensions can be completed as part of the Tier 1 stand-alone maintenance projects or as individual CIP projects assigned their own funding. Trending found by reviewing the combined existing and missing sidewalk data is presented in Figures 7 and 9. Alternatively, sidewalk extension funding could be prioritized by zone simply on the basis of Activity Score as this is primary measure of sidewalk need where none exists. The Plan recommendation is outlined within the next section, Execution Strategy.

The areas within New Town and Charlestowne subdivisions in Ward 8 (Zones 8-1 and 8-4 thru 8-9) were analyzed separately in this plan. Recently, the developments have suffered significant sidewalk deficiencies prematurely; already, the segments and ADA curb ramps reflect such great deterioration at an abnormal rate that risk to citizen and property is imminent. Located just north of I-370 on approximately 630 acres, New Town and Charlestowne were built approximately ten years ago to accommodate nearly 3,500 independent living dwelling units (at full build-out) and a viable commercial district. Recently, the developments suffered significant sidewalk deficiencies. Sidewalk segments and ADA curb ramps reflect such great deterioration at a great rate of speed that risk to citizens and properties is imminent. The full analysis of the New Town and Charlestowne sidewalk deterioration is presented in Appendix B.

In more rigid paradigms, ignorant of the City's other sidewalk needs, temporary sidewalk repairs could be administered to quickly mitigate the defects until the scheduled permanent repairs can be completed. While temporary repairs cannot be avoided, such repairs can become problematic. Temporary repairs typically will not address the cause of the defect, such as the subgrade soil underneath the sidewalk segment. The lifespan of the repair can last several weeks to months, significantly affecting the timing of the permanent repair application. Staff has also observed continued and additional displacements of sidewalks in New Town and Charlestowne since the 2012-2013 inventories were completed.

Given their low proximity to governmental buildings and other high-traffic destinations, sidewalk assets in these zones received low Activity Factors. When paired with the relative age of the two developments, these communities will consistently rank lower than older, more active zones. In short, it will be sometime before significant sidewalk investment would be made in New Town and Charlestowne following the priorities outlined in this Plan.

As a result, the emergent issues of New Town and Charlestowne must be addressed, but not by detrimentally affecting the delivery of the other stand-alone projects for neighborhood zones in Tier 1 or the standard maintenance program for neighborhood zones in Tier 2. The strategies developed by the report in Appendix B are summarized in the next section.

EXECUTION STRATEGIES

Adherence to the City of St. Charles Long Range ADA Transition and Sidewalk Plan requires a long-term commitment to the restoration and progression of the City's pedestrian network. There is no projected term of this Plan because it will vary, depending upon the level of funding ultimately ascribed by City Council. The cumulative costs associated with repairing existing sidewalk segments in Quadrants 1 and 2 are estimated to be approximately $10.5M, while the cumulative costs of repairing existing sidewalk segments in Quadrants 3 and 4 are approximately $4.4M. Some consideration has been given to inflation and continued deterioration, but costs should generally be compared in 2014 dollars. Consideration for Quadrants 1 and 2 should be separate from that for Quadrants 3 and 4, as scheduling and other resources will be on project specific budgets and timelines.

Quadrants 1 and 2 (Tier 1) will be spread out over the course of the Plan as funding allows. Work will begin in neighborhoods with the highest proximity to public buildings, schools, etc. (also known as the Activity Factor) and most risk to citizen and/or property and work to the least risky zone in the quadrants. These zones may be further segregated into stand-alone projects which will have individual engineering designs and may or may not include sidewalk extensions. After design, bids will be requested from contractors qualified to perform work specific to each neighborhood zone within the quadrants. Multiple bid proposals will be required to address the various deficiencies over the course of the Plan.

Quadrants 3 and 4 (Tier 2) will be scheduled in parallel with the Pavement Maintenance Efforts of the corresponding zones. As the Pavement Management Plan is introduced into the CIP, a corresponding sidewalk repair amount will be introduced with the CIP. In other words, zones within Quadrants 3 and 4 will receive sidewalk repairs at the same time street pavement maintenance is performed.

The resulting Plan for the repair of existing sidewalks is presented graphically in Figure 2 and in a tabular format in Figure 3. Figure 8 provides the fullest picture of the plan with as a bubble chart depicting each zone within each quadrant and a bubble size corresponding to the total costs of repairs in the respective zone.

As previously suggested the construction of missing sidewalks can be classified as either a component of stand-alone maintenance projects (Tier 1) or encapsulated wholly within a separate capital project. The priority of completing sidewalk extension in connection with sidewalk maintenance efforts is provided in Figure 9. The overall cost of implementing missing sidewalk segments within Tier 1 (Quadrants 1 and 2) is $95M, while the cost of implementing Tier 2 (Quadrants 3 and 4) is $39M. Please note that those costs are for the implementation of all missing sidewalk segments in all quadrants (e.g., cul-de-sacs, both sides of a given street, etc.) at the same time.

While implementing the installation of all missing segments at once would significantly improve the pedestrian network quickly, this option is not cost-effective. For individual extension projects, this Plan proposes zones be prioritized strictly by the Activity Factor of the zone. This seems to be the best indicator of sidewalk need. If funding allows alignment with stand-alone maintenance projects, this will also be pursued, but priorities will be aligned according to Figure 5 and the following approaches:

- Propose CIP projects to complete at least one side of a major street in each respective zone
- Propose different zones (by priority in Figure 5) with each CIP project funding request
- As CIP funding is adjusted, complete projects as funding allows for each zone identified

The full report for New Town and Charlestowne is provided in Appendix B, but a summary of the options is as follows:

- Option #1 recommends the total removal and replacement of all concrete sidewalks with reinforced panels and aggregate/remediated base, for an estimated cost of approximately $6M.

- Option #2 would remove and replace sidewalk with the most critical deficiencies at this time with ongoing costs of permanent and temporary repairs applied over time. This option is estimated to cost approximately $400K-$500K to replace the currently displaced sidewalk panels, but will not address any ongoing problems.

- Option #3 would apply temporary remedial repairs globally (primarily grinding) until funding for permanent repairs was secured. The cost for this option is approximately $200K to $300K for initial repairs of displacements greater than ½", plus a $50K annual maintenance cost.

- Option #4 is considered to be an additive alternate for Private Property sidewalk and porch/stair stoop remediation. Mud jacking (injecting a cement grout under pressure into the voided underlying soil) is being considered for this remediation. The costs associated with this additive option for 1500 residences are in the range of $1M to $1.5M.

New Town and Charlestowne require a unique approach to address their sidewalk problems. The investment necessary to fix all of the sidewalk segments would be detrimental to advancing repairs within the remaining City network. However, doing nothing in one of the most highly populated subdivisions of the City is also impractical. Because the City has continued to witness movement where temporary repairs have already taken place and the soil conditions lend themselves to continued subgrade movement, this Plan proposes Option 3 as presented above and further detailed in Appendix B. This will require an initial investment by the City followed by continued annual investment to eliminate trip hazards and other minor defects in an on-going basis.

Based on the four quadrants for existing sidewalks, the final activity scores of zones with missing sidewalks, and the analysis of the New Town-Charlestowne Area, it was determined sidewalks will be maintained or extended according to the following strategic tiers:

- Existing sidewalks to be maintained as stand-alone projects by zone (zones with the higher repair costs per sidewalk scores) – Figures 2 & 3 – Total = $10.5 Million
- Existing sidewalks to be maintained concurrently with pavement maintenance by zone (zones with lower repair costs per sidewalk scores) – Figures 2 & 3 – Total = $4.4 Million
- Missing segments by zone to receive new extension funding (or where to pursue extension funding – Transportation Alternatives Program or Safe Routes to School for example) – Complete one side of each major street and one zone per project, as funding allows. Priority will be based strictly upon the activity factor – Figures 4 & 5
- New Town and Charlestowne zones – premature sidewalk failures due to soil conditions – Invest $250,000 in initial repairs of the worst areas and $50,000 annually to mediate recurring trip hazards and other deficiencies – Figure 11

Contractors who successfully win the bids will be required to report pre-work and post-work conditions via mobile GIS tools and electronic forms. This information will be tracked and stored within the City's Enterprise Asset Management (EAM) system and used to update the sidewalk condition inventory.

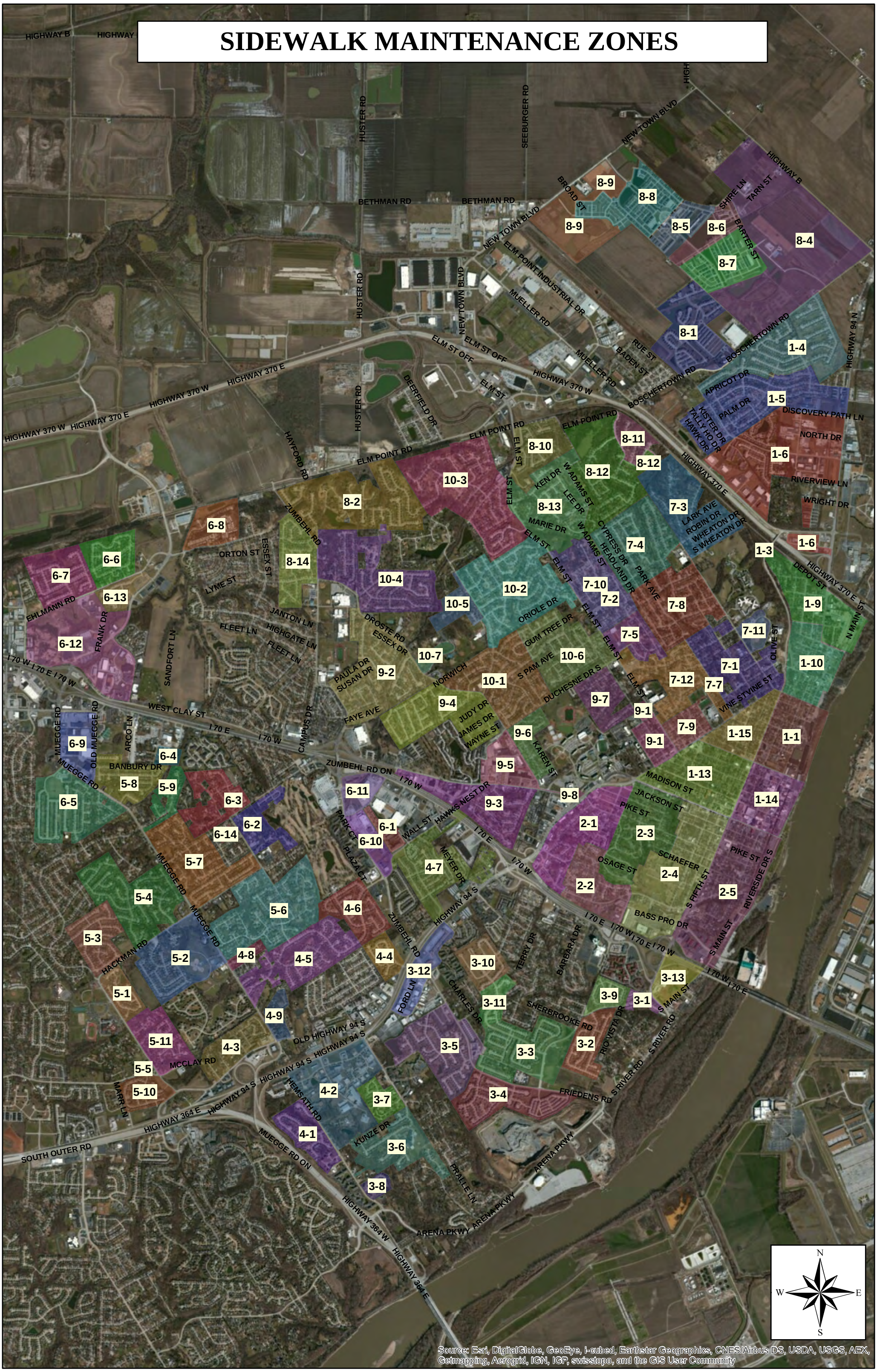
To offset the costs of maintaining a complete pedestrian network, cost-sharing programs have been implemented by other municipalities across the country. For instance, City of Seattle has built and maintained a superior pedestrian system through a voter-approved $365M, nine-year transportation levy known as "Bridging the Gap." Since 2006, the levy has funded programs to address the maintenance backlog for paving; sidewalk development and repairs; bridge repair, rehabilitation and seismic upgrades; tree pruning and planting; transit enhancements; and other much needed maintenance work. Funding also supports projects that implement the Bicycle and Pedestrian Master plans, create a Safe Routes to School Program, improve transit connections and help neighborhoods get larger projects built through the Neighborhood Street Fund large project program. Other cities have instituted 50/50 programs to alleviate the growing backlog of sidewalk repair and in fact, St. Charles has a codified 50/50 program. Given the anticipated population growth in the coming years, such programs are worthy of serious consideration and deliberation.

As described in the City's Street Maintenance Policies and Procedures, City Code Section 505.270, identifies sidewalks as the responsibility of the property owner's adjoining the public right-of-way. Therefore, all sidewalk maintenance is technically a private responsibility; however, the City dedicates annual funding toward the repair and expansion of sidewalks, performs repairs of sidewalks with Street Division crews, and provides a 50/50 cost-share sidewalk program per City Code Section 505.320. As the City moves forward with this plan, it is recommended City Council revisit the appropriateness of City Code Section 505.270 and/or the expansion of the 50/50 program described in City Code Section 505.320. In addition, Public Works will begin reviewing and bringing forward suggested changes to sidewalk construction standards and specifications with the intent to avoid future premature failures like those seen in New Town and Charlestowne. In the absence of other legislative or funding changes, staff will use the Plan as the guide for the allocation of sidewalk repair and extension budgets among the four tiers.

The program recommended by the Plan focuses on the integrity of the data collected from new and existing assets; it is this data that will play the most integral part in defining and adhering to repair criteria and developing and refining maintenance priorities. From the establishment of such policy comes the generation of the maintenance schedules; the extent and frequency of maintenance schedules will vary greatly depending on the location, amount of use, and resources available. The City has instituted a comprehensive asset management software application that will track the lifecycles of all assets, including sidewalks, from installation to retirement. This system also catalogs citizen complaints and requests. The data generated from this application will allow the City to monitor the Plan and identify density trends in neighborhood zones.

The methodology which has been presented enables the City of St. Charles to make more sound decisions – decisions that will prioritize the relationship between cost and performance. Perhaps one of the most valuable attribute of such methodology is its pliability; simply put, the City of Saint Charles can adjust the delivery and level of service when resources are constrained. The Plan will assist in ensuring the effects of a reduction in the level of service are mitigated through an efficient deployment of available resources. As a result, risks of ongoing maintenance, repair, and new construction efforts will be continuously identified, balanced, mitigated and documented, allowing further identification of trends and irregularities in order to refine the methodology accordingly.

SIDEWALK MAINTENANCE ZONES



Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SIDEWALK MAINTENANCE ZONES
for Existing Sidewalks Only
Indicated as "Zone (Priority)"

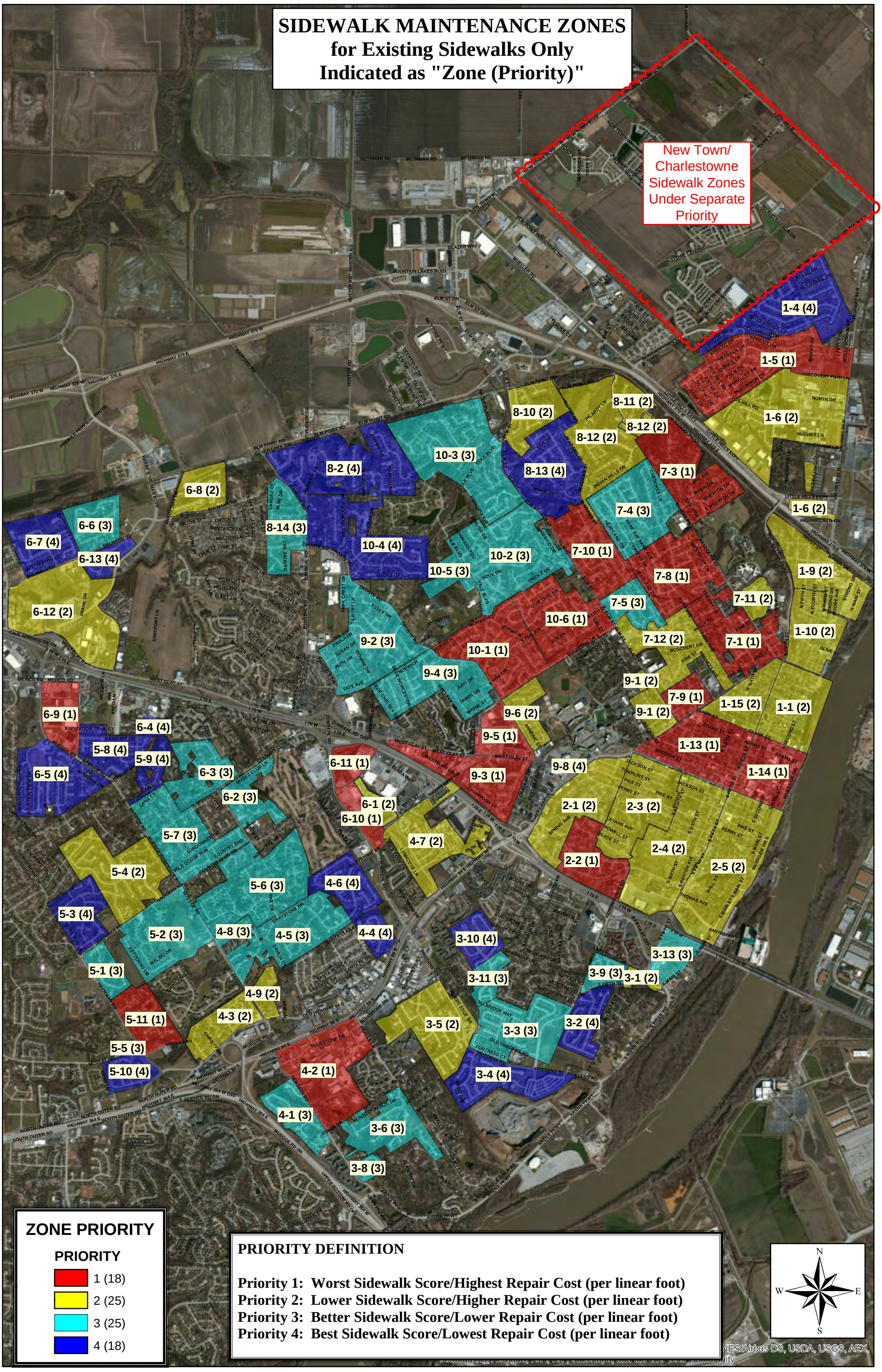


Figure 3: Sidewalk Plan Analysis (Existing Sidewalks Only – Excludes Driveway Approaches)

Priority	Zone	Activity Score	Sidewalk Score	# Segments	Total Linear Length	# Obstructions	Segment Cost	Curb/Ramp Cost	Obstruction Cost	Total Cost	Cost Per Linear Foot
1	1-14	35	41	198	24,272	272	$334,602	$181,000	$181,133	$696,735	$28.71
1	7-1	31	40	62	13,849	136	$95,685	$51,000	$71,247	$217,931	$15.74
1	2-2	26	43	21	3,545	42	$63,363	$20,000	$25,417	$108,779	$30.69
1	7-10	26	37	9	3,289	29	$0	$14,000	$23,944	$37,944	$11.54
1	6-9	26	43	22	5,083	22	$15,880	$71,000	$20,024	$106,904	$21.03
1	1-13	25	39	258	37,155	672	$193,004	$159,500	$357,442	$709,945	$19.11
1	6-10	23	39	13	2,337	17	$0	$47,500	$13,192	$60,692	$25.97
1	6-11	22	36	11	2,041	26	$0	$18,500	$18,186	$36,686	$17.98
1	9-5	22	41	66	6,418	113	$77,162	$26,500	$59,955	$163,617	$25.49
1	7-8	22	38	119	31,225	383	$71,676	$73,000	$224,343	$369,019	$11.82
1	10-1	21	40	95	30,177	293	$166,783	$48,500	$178,078	$393,361	$13.04
1	10-6	20	42	67	21,996	270	$188,904	$25,500	$154,562	$368,967	$16.77
1	5-11	19	35	4	1,437	7	$0	$16,000	$9,433	$25,433	$17.70
1	7-9	18	42	51	8,462	182	$68,229	$46,500	$67,941	$182,670	$21.59
1	7-3	17	42	34	12,249	114	$61,651	$9,000	$74,817	$145,468	$11.88
1	9-3	15	43	41	6,120	68	$38,433	$38,500	$40,283	$117,216	$19.15
1	4-2	14	41	39	7,026	61	$13,010	$49,000	$25,832	$87,842	$12.50
1	1-5	12	42	73	22,516	244	$178,744	$10,000	$129,294	$318,038	$14.12
2	7-11	37	50	2	875	2	$19,725	$8,500	$1,170	$29,395	$33.60
2	1-1	30	44	111	16,609	242	$298,716	$91,000	$148,166	$537,882	$32.39
2	2-4	29	47	119	19,261	332	$383,582	$96,500	$201,300	$681,382	$35.38
2	2-5	29	45	241	38,519	558	$606,582	$354,000	$383,545	$1,344,127	$34.90
2	1-15	27	45	111	17,666	269	$197,348	$79,000	$162,959	$439,307	$24.87
2	7-12	25	44	38	8,260	151	$44,193	$26,500	$80,927	$151,620	$18.35
2	2-3	23	47	57	12,273	209	$149,337	$37,000	$105,677	$292,015	$23.79
2	1-10	22	51	98	13,503	154	$243,585	$113,000	$78,228	$434,813	$32.20
2	1-9	21	50	51	9,047	54	$54,085	$38,000	$31,451	$123,535	$13.65
2	9-1	19	45	63	11,236	135	$53,718	$48,000	$66,003	$167,721	$14.93
2	4-9	18	46	7	2,208	2	$0	$23,500	$1,170	$24,670	$11.18
2	6-1	18	59	9	2,340	25	$78,008	$18,500	$12,855	$109,363	$46.74
2	2-1	18	46	14	1,363	34	$16,042	$41,000	$20,439	$77,481	$56.85
2	3-1	17	55	4	822	5	$0	$6,000	$3,840	$9,840	$11.97
2	1-6	16	51	34	9,563	36	$82,024	$18,000	$27,503	$127,527	$13.33
2	3-5	16	47	70	23,488	88	$149,244	$84,000	$41,634	$274,879	$11.70
2	4-3	15	60	6	2,200	25	$62,532	$35,000	$10,709	$108,241	$49.20
2	6-12	14	49	21	4,682	50	$0	$70,000	$25,722	$95,722	$20.44
2	8-10	12	55	23	6,857	46	$44,587	$9,000	$36,848	$90,435	$13.19
2	9-6	12	70	2	62	2	$2,252	$0	$685	$2,937	$47.09
2	5-4	11	48	74	29,592	89	$220,226	$58,000	$42,327	$320,553	$10.83
2	4-7	10	44	62	26,185	242	$145,463	$16,500	$145,722	$307,685	$11.75
2	8-12	7	46	50	18,268	145	$208,053	$13,000	$77,109	$298,162	$16.32
2	8-11	6	44	17	8,041	54	$107,082	$6,000	$30,147	$143,229	$17.81
2	6-8	3	73	15	5,238	22	$93,462	$2,000	$15,751	$111,213	$21.23
3	7-5	26	39	16	6,339	68	$6,598	$16,000	$40,545	$63,143	$9.96
3	5-5	22	41	3	1,128	0	$0	$2,500	$0	$2,500	$2.22
3	3-13	22	41	8	1,342	3	$0	$12,500	$1,531	$14,031	$10.46
3	10-5	22	41	9	2,298	20	$3,985	$4,500	$11,294	$19,779	$8.61
3	5-1	21	41	33	12,143	74	$28,450	$23,500	$35,504	$87,455	$7.20
3	9-2	21	36	90	30,569	336	$37,313	$43,500	$231,783	$312,596	$10.23
3	10-2	20	40	107	39,138	357	$114,991	$22,500	$185,357	$322,848	$8.25
3	9-4	18	35	61	24,251	280	$10,704	$37,000	$162,831	$210,535	$8.68

Figure 3: Sidewalk Plan Analysis (Existing Sidewalks Only – Excludes Driveway Approaches) (cont.)

Priority	Zone	Activity Score	Sidewalk Score	# Segments	Total Linear Length	# Obstructions	Segment Cost	Curb/Ramp Cost	Obstruction Cost	Total Cost	Cost Per Linear Foot
3	5-2	17	43	62	22,392	117	$72,490	$19,000	$73,346	$164,836	$7.36
3	3-6	17	40	31	12,265	197	$47,824	$30,000	$48,172	$125,995	$10.27
3	8-14	17	43	4	1,420	5	$0	$5,000	$3,241	$8,241	$5.80
3	6-2	15	44	12	4,037	13	$6,649	$0	$6,175	$12,824	$3.18
3	5-6	14	43	22	9,030	90	$0	$18,000	$44,578	$62,578	$6.93
3	3-8	13	43	6	2,516	2	$0	$4,000	$1,170	$5,170	$2.05
3	5-7	13	41	47	18,525	76	$40,230	$30,500	$39,127	$109,857	$5.93
3	3-3	13	43	95	32,867	126	$0	$62,000	$45,915	$107,915	$3.28
3	7-4	12	38	92	33,568	445	$86,654	$18,500	$248,598	$353,751	$10.54
3	4-5	12	43	59	21,481	133	$116,312	$25,000	$73,687	$214,999	$10.01
3	4-8	11	19	5	2,431	20	$0	$4,500	$12,642	$17,142	$7.05
3	3-9	11	41	14	5,527	86	$0	$3,500	$38,863	$42,363	$7.66
3	10-3	10	43	103	37,605	329	$16,523	$20,000	$186,959	$223,483	$5.94
3	3-11	10	42	12	4,403	19	$0	$8,000	$7,619	$15,619	$3.55
3	4-1	8	39	25	12,850	94	$18,019	$20,000	$22,904	$60,924	$4.74
3	6-3	6	41	23	10,554	88	$35,217	$6,000	$39,628	$80,845	$7.66
3	6-6	5	44	36	13,261	91	$53,399	$2,500	$39,951	$95,850	$7.23
4	9-8	19	48	4	1,793	1	$2,899	$3,000	$585	$6,484	$3.62
4	5-10	14	45	24	9,710	41	$31,393	$9,500	$20,344	$61,238	$6.31
4	10-4	14	45	52	20,512	126	$21,526	$24,000	$68,063	$113,590	$5.54
4	5-8	12	45	44	17,002	60	$3,328	$2,500	$25,382	$31,210	$1.84
4	3-4	11	46	103	31,642	178	$49,815	$94,000	$65,584	$209,399	$6.62
4	4-6	11	46	41	15,082	65	$52,877	$7,500	$27,006	$87,382	$5.79
4	1-4	11	45	77	33,939	159	$59,737	$10,000	$76,024	$145,761	$4.29
4	5-3	11	44	59	22,181	131	$100,019	$5,000	$60,261	$165,280	$7.45
4	8-13	9	47	63	23,536	212	$63,710	$20,500	$131,676	$215,885	$9.17
4	3-2	9	44	42	16,110	110	$54,859	$43,500	$25,158	$123,517	$7.67
4	6-13	8	59	14	6,103	32	$11,089	$10,000	$20,612	$41,701	$6.83
4	6-5	7	48	72	26,385	85	$75,753	$35,500	$42,311	$153,564	$5.82
4	6-4	7	62	4	435	2	$0	$3,000	$1,085	$4,085	$9.38
4	8-2	5	47	62	27,784	132	$36,529	$9,500	$65,317	$111,345	$4.01
4	6-7	5	52	42	17,514	74	$58,756	$34,000	$39,330	$132,086	$7.54
4	5-9	5	44	12	4,540	31	$0	$3,500	$13,441	$16,941	$3.73
4	4-4	4	45	17	7,624	20	$7,799	$12,000	$15,741	$35,540	$4.66
4	3-10	3	48	41	11,009	11	$3,143	$10,000	$4,153	$17,296	$1.57
TOTAL					**1,182,195**	**10461**	**$6,155,561**	**$2,972,500**	**$5,730,503**	**$14,858,564**	
MEDIAN		**16**	**44**	**40**	**11,123**	**86**	**$44,390**	**$20,000**	**$39,479**	**$111,279**	**$10.69**

Figure 4: Sidewalk Improvement Plan Analysis (Missing Sidewalks Only)

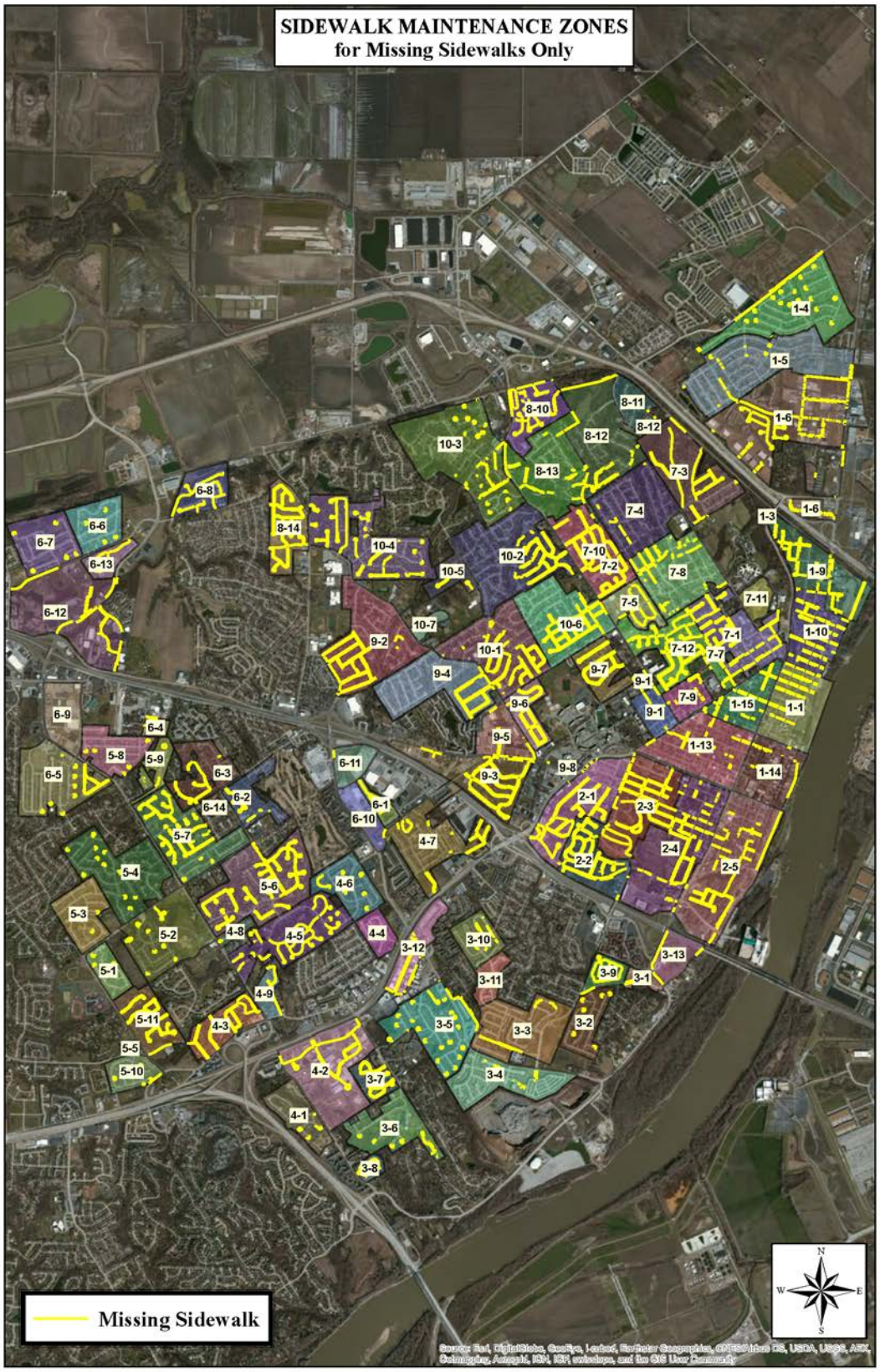


Figure 5: Sidewalk Improvement Plan Analysis (Missing Sidewalks Only)

SIDEWALK IMPROVEMENT PLAN ANALYSIS
(Missing Pavement Only)

Priority	Zone	Activity Score	Sidewalk Score	Total Linear Length (Missing Sidewalks)	Missing Sidewalk Cost
1	1-14	35	41	2,975	$428,831
1	7-1	31	40	24,792	$3,573,955
1	1-1	30	44	9,570	$1,379,663
1	2-4	29	47	16,508	$2,379,744
1	2-5	29	45	20,702	$2,984,424
1	1-15	27	45	8,304	$1,197,133
1	2-2	26	43	19,746	$2,846,568
1	7-10	26	37	22,589	$3,256,412
1	7-5	26	39	5,479	$789,915
1	1-13	25	39	4,946	$712,963
1	7-12	25	44	23,310	$3,360,383
1	6-10	23	39	2,492	$359,233
1	2-3	23	47	25,822	$3,722,546
1	6-11	22	36	3,081	$444,194
1	1-10	22	51	17,799	$2,565,883
1	5-5	22	41	385	$55,512
2	3-13	22	41	2,509	$361,663
2	9-5	22	41	3,768	$543,230
2	10-5	22	41	2,944	$424,351
2	7-8	22	38	11,947	$1,722,333
2	5-1	21	41	640	$92,269
2	10-1	21	40	17,959	$2,589,039
2	9-2	21	36	18,507	$2,668,003
2	1-9	21	50	24,627	$3,550,252
2	10-6	20	42	17,459	$2,516,906
2	10-2	20	40	14,633	$2,109,525
2	5-11	19	35	13,604	$1,961,218
2	9-1	19	45	4,108	$592,162
2	9-8	19	48	87	$12,600
2	7-9	18	42	3,349	$482,801
2	4-9	18	46	3,828	$551,777
2	9-4	18	35	9,326	$1,344,451
2	6-1	18	59	2,304	$332,202
2	2-1	18	46	25,716	$3,707,170
2	5-2	17	43	2,803	$404,126
2	3-6	17	40	2,324	$334,984
2	8-14	17	43	19,860	$2,863,036
2	3-1	17	55	1,510	$217,704
2	7-3	17	42	16,721	$2,410,509
2	1-6	16	51	41,233	$5,944,161
2	3-5	16	47	10,160	$1,464,732
3	9-3	15	43	22,352	$3,222,212
3	4-3	15	60	15,229	$2,195,401
3	6-2	15	44	3,347	$482,559
3	4-2	14	41	14,093	$2,031,596
3	6-12	14	49	12,168	$1,754,144

Figure 5: Sidewalk Improvement Plan Analysis (Missing Sidewalk Only) (cont.)

SIDEWALK IMPROVEMENT PLAN ANALYSIS
(Missing Pavement Only)

Priority	Zone	Activity Score	Sidewalk Score	Total Linear Length (Missing Sidewalks)	Missing Sidewalk Cost
3	5-6	14	43	27,456	$3,958,020
3	5-10	14	45	5,246	$756,228
3	10-4	14	45	18,358	$2,646,500
3	3-8	13	43	3,034	$437,330
3	5-7	13	41	20,596	$2,969,098
3	3-3	13	43	4,290	$618,426
3	5-8	12	45	2,628	$378,786
3	7-4	12	38	1,385	$199,704
3	8-10	12	55	26,886	$3,875,861
3	9-6	12	70	12,517	$1,804,414
3	4-5	12	43	12,417	$1,790,076
3	1-5	12	42	7,615	$1,097,746
3	3-4	11	46	1,164	$167,828
3	5-4	11	48	2,979	$429,416
3	4-8	11	19	254	$36,608
3	3-9	11	41	6,792	$979,100
4	4-6	11	46	4,300	$619,899
4	1-4	11	45	8,694	$1,253,332
4	5-3	11	44	597	$86,039
4	10-3	10	43	22,263	$3,209,437
4	4-7	10	44	8,154	$1,175,455
4	8-13	9	47	7,955	$1,146,760
4	3-2	9	44	1,644	$236,983
4	8-1	9	47	16,890	$2,434,925
4	6-13	8	59	4,423	$637,676
4	4-1	8	39	933	$134,520
4	8-12	7	46	12,910	$1,861,098
4	6-5	7	48	6,371	$918,496
4	6-4	7	62	1,482	$213,679
4	8-11	6	44	4,638	$668,558
4	6-3	6	41	8,789	$1,266,982
4	8-2	5	47	42,906	$6,185,367
4	6-6	5	44	2,675	$385,666
4	6-7	5	52	1,226	$176,701
4	5-9	5	44	1,490	$214,808
4	6-8	3	73	12,240	$1,764,485
4	3-10	3	48	2,237	$322,428
4	8-7	3	51	15,147	$2,183,549
4	8-8	1	52	17,347	$2,500,787
4	8-4	1	53	13,070	$1,884,127
4	8-5	0	52	5,759	$830,158
4	8-6	0	48	5,328	$768,150
TOTAL				**930,700**	**$134,169,682**
MEDIAN		**15**	**44**		**$1,122,253**

Figure 6: Sidewalk Condition Scatter Plot (Zones with Existing Sidewalks Only – Excludes Driveway Approaches)

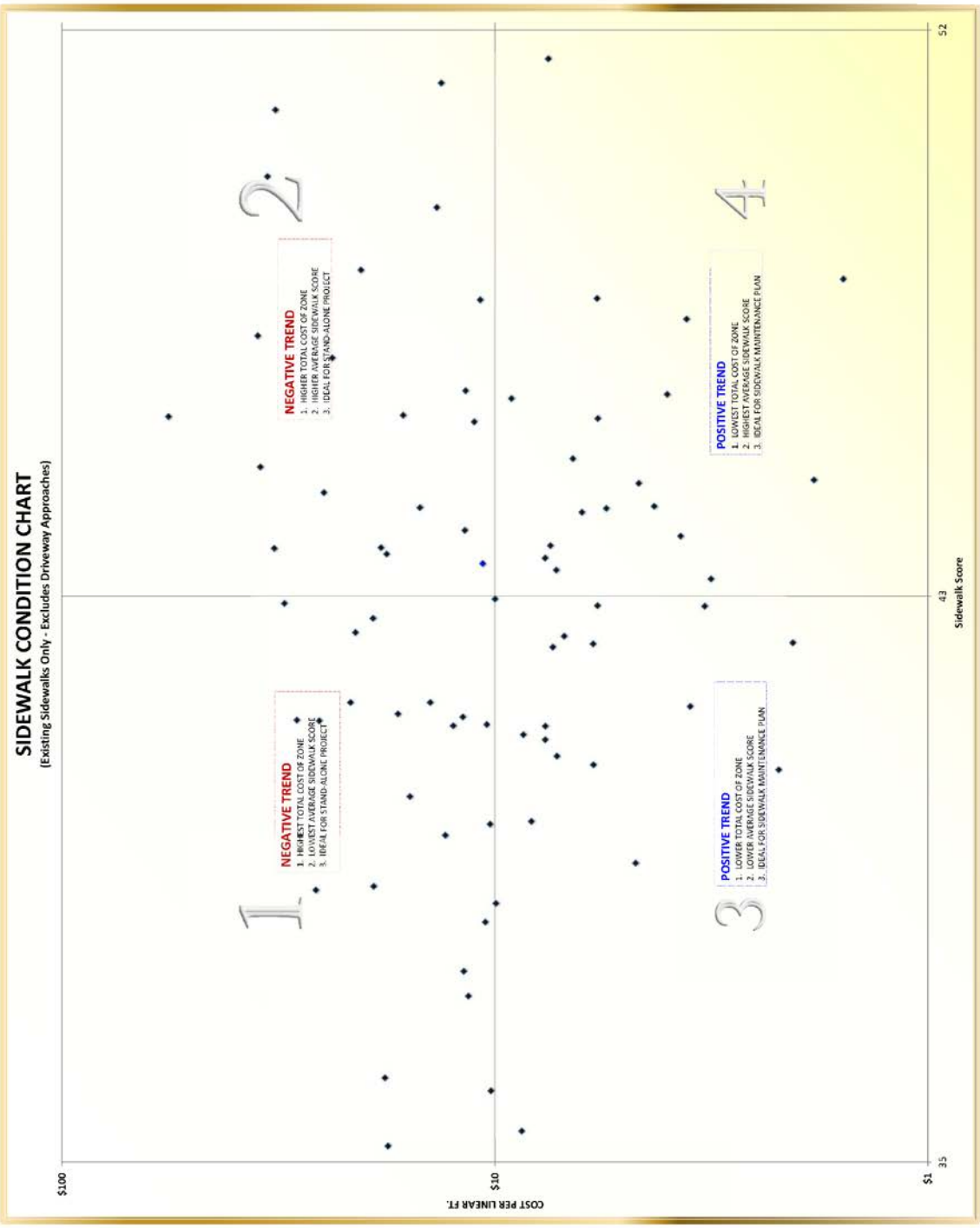


Figure 7: Sidewalk Condition Scatter Plot (Zones with Missing Sidewalks Only)

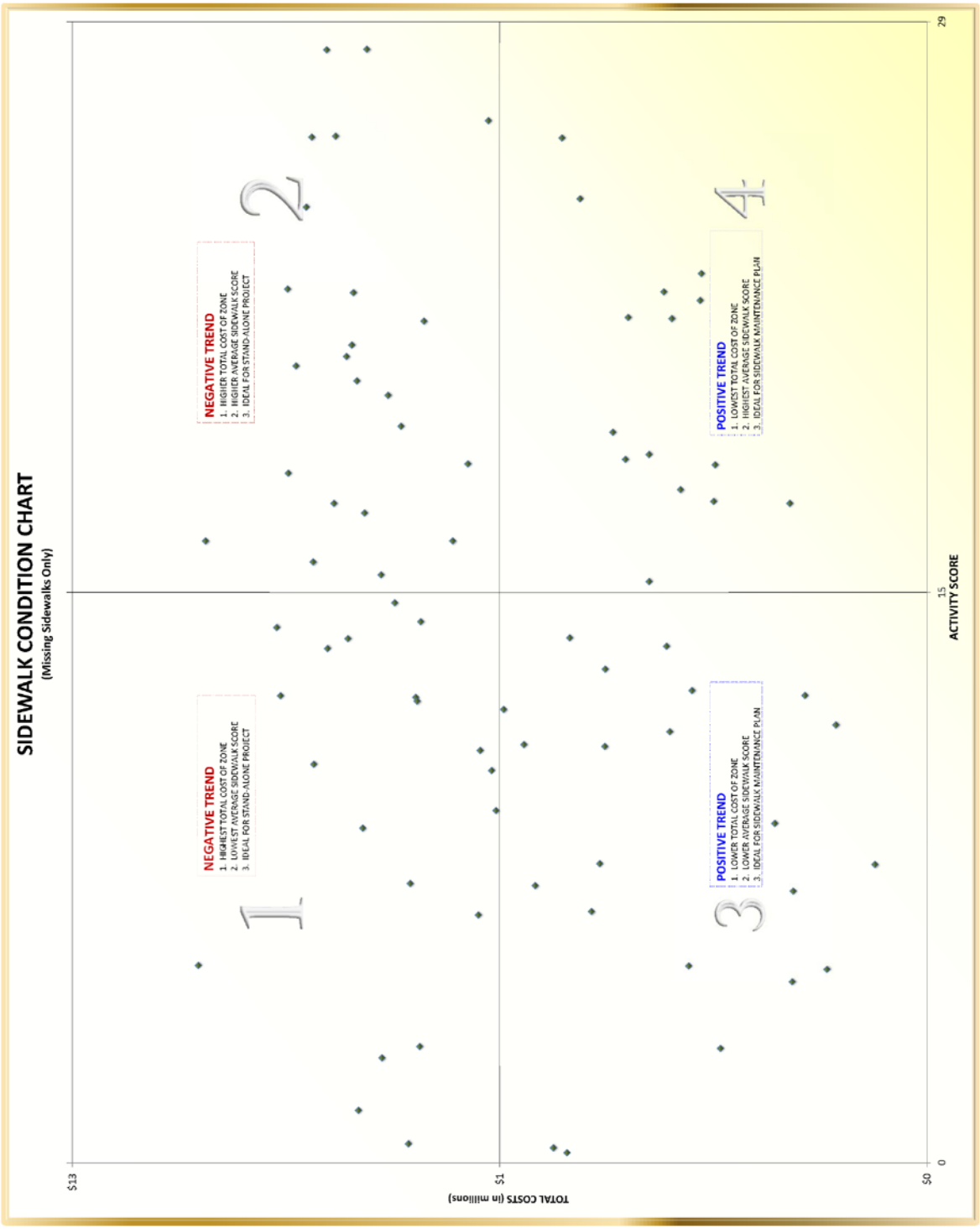


Figure 8: Sidewalk Condition Bubble Graph (Zones with Existing Sidewalks Only – Excludes Driveway Approaches)

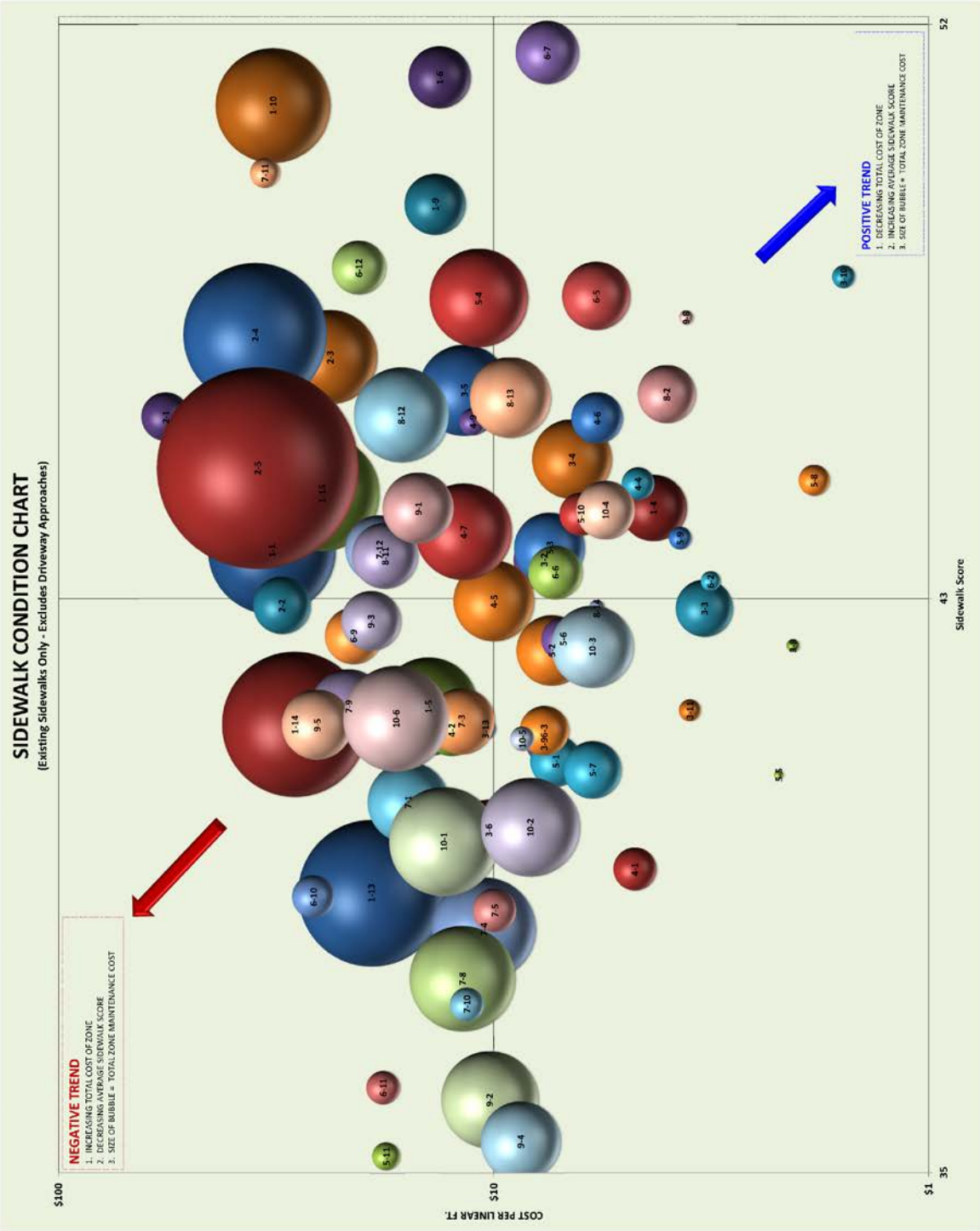


Figure 9: Sidewalk Condition Bubble Graph (Zones with Missing Sidewalks Only)

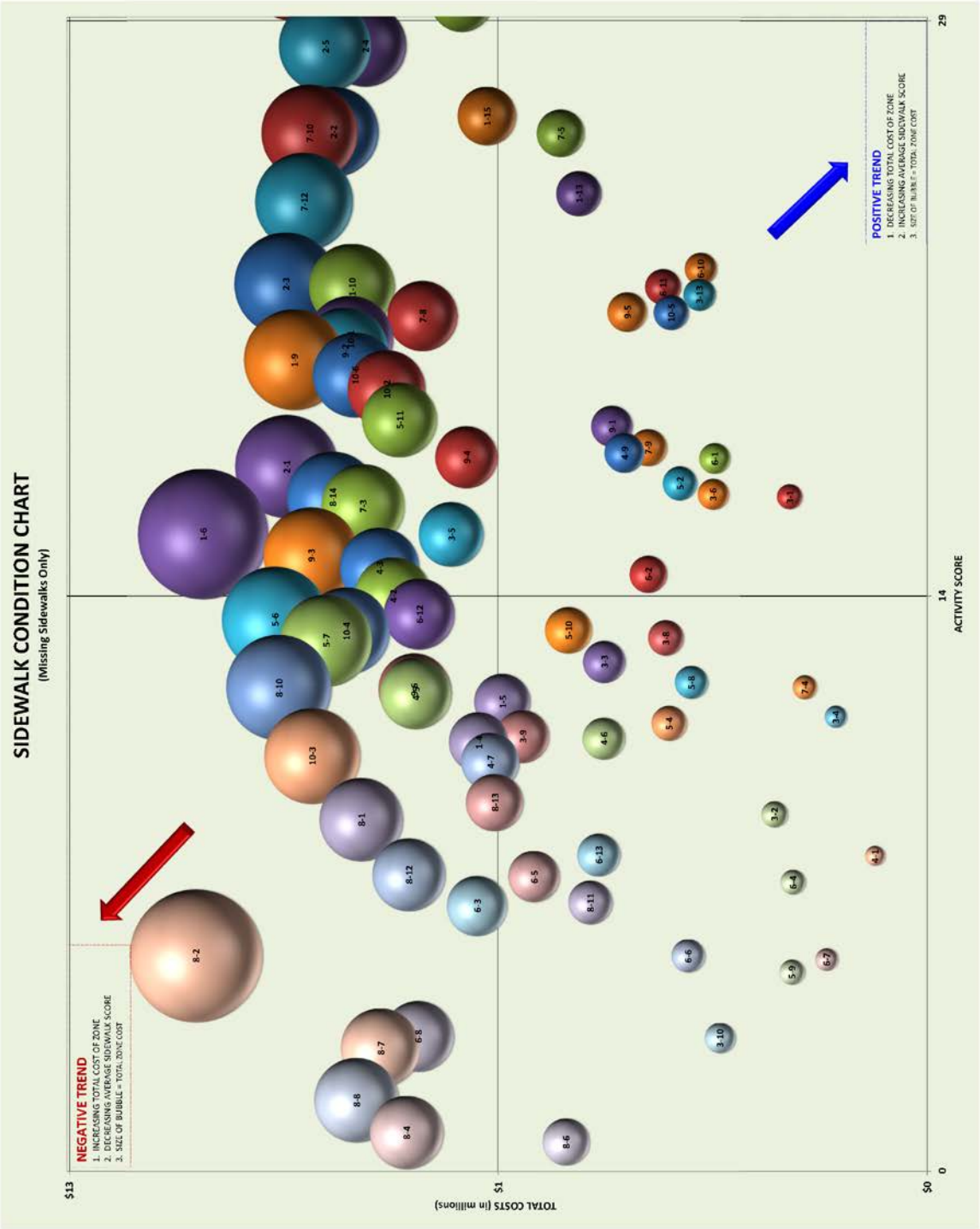


Figure 10: Sidewalk Plan Analysis – Obstructions Cost Breakdown

SIDEWALK PLAN ANALYSIS:
OBSTRUCTIONS COST BREAKDOWN

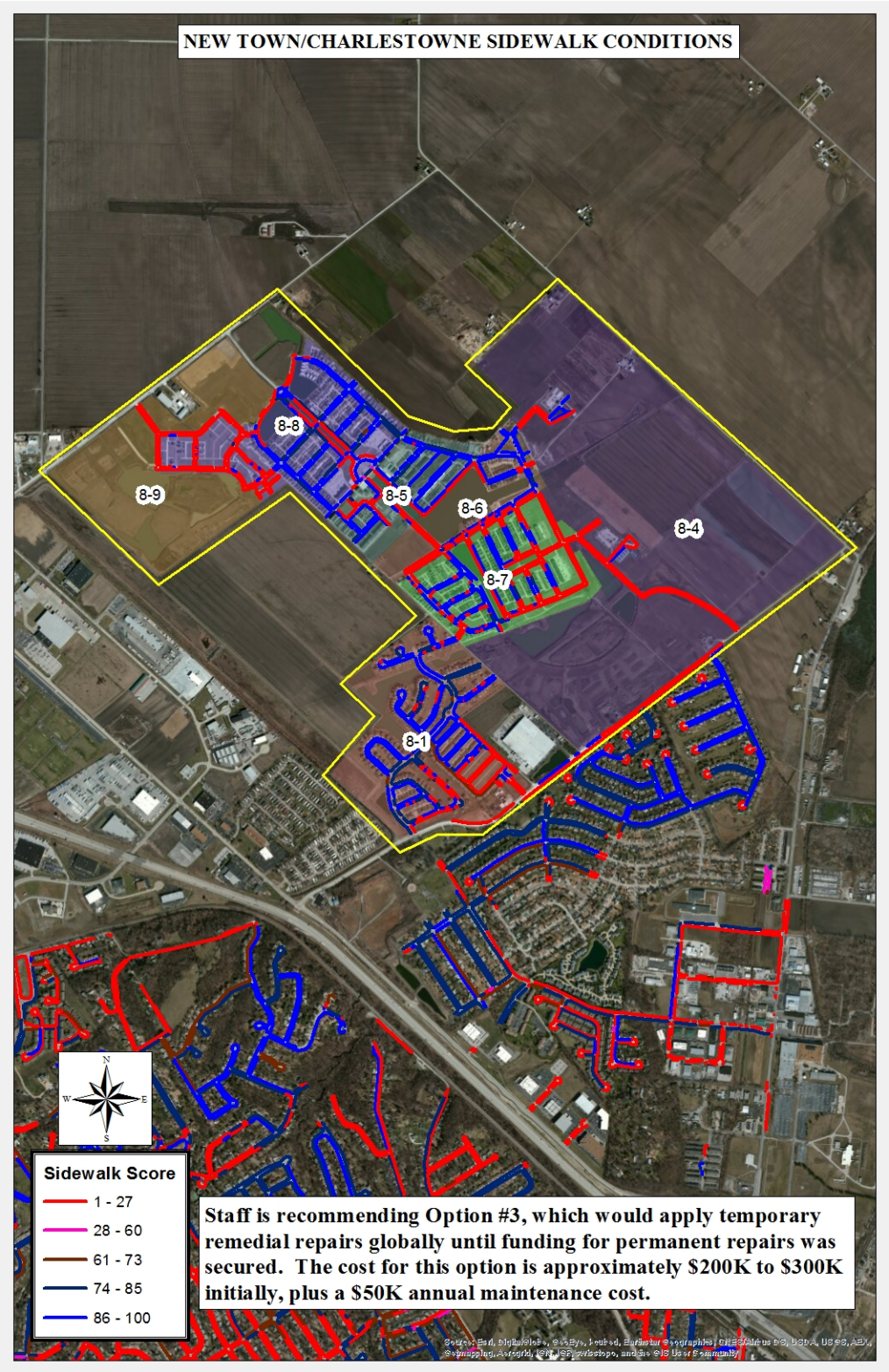
ZONES	Broken Sidewalk $	Hydrant $	Inlets $	Light Pole $	Mailbox $	Signs $	Trees $	Utility Pedestals $	Utility Pole $	Valves/ Manholes $	Vegetation $	Vertical Displacement $	ALL OTHER	TOTAL SUM	TOTAL COUNT
1-1	$95,940.00	$1,000.00	$7,500.00		$300.00	$3,300.00		$1,000.00	$10,000.00	$500.00	$1,500.00	$15,376.11	$11,750.00	$148,166.11	242
1-4	$47,385.00		$3,000.00				$2,000.00				$500.00	$22,388.89	$750.00	$76,023.89	159
1-5	$87,165.00		$15,000.00				$2,000.00			$500.00	$500.00	$24,129.44	$0.00	$129,294.44	244
1-6	$11,700.00		$10,500.00		$900.00		$2,000.00				$200.00	$2,202.78	$0.00	$27,502.78	36
1-9	$23,985.00								$4,000.00		$100.00	$3,365.56	$0.00	$31,450.56	54
1-10	$57,915.00	$4,000.00	$1,500.00			$1,200.00			$2,000.00	$1,500.00	$1,100.00	$9,013.33	$0.00	$78,228.33	154
1-13	$250,965.00	$1,000.00	$9,000.00			$300.00			$30,000.00		$5,600.00	$57,676.67	$2,900.00	$357,441.67	672
1-14	$47,970.00	$1,000.00	$25,500.00		$600.00	$10,200.00		$3,000.00	$68,000.00	$3,000.00	$1,200.00	$16,163.33	$4,500.00	$181,133.33	272
1-15	$95,940.00	$2,000.00	$12,000.00			$4,200.00			$32,000.00		$2,100.00	$11,468.89	$3,250.00	$162,958.89	269
2-1	$13,455.00							$500.00	$4,000.00			$2,484.44	$0.00	$20,439.44	34
2-2	$15,210.00	$1,000.00	$3,000.00						$4,000.00		$300.00	$1,906.67	$0.00	$25,416.67	42
2-3	$64,935.00	$3,000.00	$3,000.00			$3,000.00		$1,500.00	$12,000.00	$500.00	$1,600.00	$15,542.22	$600.00	$105,677.22	209
2-4	$100,620.00	$1,000.00	$30,000.00			$3,600.00			$30,000.00	$17,000.00	$2,200.00	$16,380.00	$500.00	$201,300.00	332
2-5	$149,175.00	$12,000.00	$30,000.00	$6,000.00		$11,700.00		$1,500.00	$134,000.00	$6,500.00	$5,900.00	$23,270.00	$3,500.00	$383,545.00	558
3-1	$2,340.00		$1,500.00										$0.00	$3,840.00	5
3-2	$9,360.00		$1,500.00								$200.00	$14,097.78	$0.00	$25,157.78	110
3-3	$28,665.00										$300.00	$14,950.00	$2,000.00	$45,915.00	126
3-4	$49,140.00										$3,500.00	$12,443.89	$0.00	$65,583.89	178
3-5	$28,080.00		$3,000.00								$400.00	$10,154.44	$0.00	$41,634.44	88
3-6	$19,305.00										$700.00	$28,166.67	$0.00	$48,171.67	197
3-8	$1,170.00												$0.00	$1,170.00	2
3-9	$28,080.00		$3,000.00									$6,283.33	$1,500.00	$38,863.33	86
3-10	$2,925.00											$1,227.78	$0.00	$4,152.78	11
3-11	$5,850.00											$1,769.44	$0.00	$7,619.44	19
3-13	$1,170.00											$361.11	$0.00	$1,531.11	3
4-1	$9,360.00										$400.00	$13,144.44	$0.00	$22,904.44	94
4-2	$21,060.00									$500.00	$300.00	$3,972.22	$0.00	$25,832.22	61
4-3	$1,755.00	$2,000.00	$1,500.00		$5,100.00							$353.89	$0.00	$10,708.89	25
4-4	$7,605.00		$7,500.00									$635.56	$0.00	$15,740.56	20
4-5	$42,120.00		$7,500.00		$300.00		$8,000.00			$500.00	$100.00	$15,166.67	$0.00	$73,686.67	133
4-6	$12,870.00		$3,000.00								$100.00	$11,035.56	$0.00	$27,005.56	65
4-7	$87,165.00	$1,000.00	$30,000.00				$4,000.00			$1,500.00		$22,056.67	$0.00	$145,721.67	242
4-8	$8,775.00		$3,000.00									$866.67	$0.00	$12,641.67	20
4-9	$1,170.00												$0.00	$1,170.00	2
5-1	$14,040.00		$1,500.00				$4,000.00			$1,000.00		$14,964.44	$0.00	$35,504.44	74
5-2	$40,950.00		$19,500.00							$1,500.00	$100.00	$11,295.56	$0.00	$73,345.56	117
5-3	$36,270.00		$1,500.00							$1,000.00	$200.00	$21,291.11	$0.00	$60,261.11	131
5-4	$16,965.00						$8,000.00					$17,362.22	$0.00	$42,327.22	89
5-6	$20,475.00	$1,000.00					$6,000.00			$1,000.00	$200.00	$15,903.33	$0.00	$44,578.33	90
5-7	$23,400.00		$3,000.00				$2,000.00			$500.00		$10,226.67	$0.00	$39,126.67	76
5-8	$10,530.00						$2,000.00			$1,500.00	$100.00	$11,252.22	$0.00	$25,382.22	60
5-9	$7,605.00											$5,835.56	$0.00	$13,440.56	31
5-10	$8,190.00		$4,500.00									$6,904.44	$750.00	$20,344.44	41
5-11			$9,000.00									$433.33	$0.00	$9,433.33	7
6-1	$8,775.00		$1,500.00		$1,200.00	$600.00						$780.00	$0.00	$12,855.00	25
6-2	$4,095.00											$2,080.00	$0.00	$6,175.00	13
6-3	$15,795.00						$2,000.00					$21,832.78	$0.00	$39,627.78	88
6-4	$585.00									$500.00			$0.00	$1,085.00	2
6-5	$14,625.00		$1,500.00				$4,000.00			$500.00	$200.00	$21,486.11	$0.00	$42,311.11	85
6-6	$23,400.00										$200.00	$16,351.11	$0.00	$39,951.11	91
6-7	$16,965.00		$4,500.00				$6,000.00				$100.00	$11,765.00	$0.00	$39,330.00	74
6-8	$7,020.00		$6,000.00		$600.00							$2,130.56	$0.00	$15,750.56	22
6-9	$7,020.00		$12,000.00									$1,003.89	$0.00	$20,023.89	22
6-10	$3,510.00		$4,500.00				$4,000.00				$200.00	$982.22	$0.00	$13,192.22	17
6-11	$5,850.00		$4,500.00				$4,000.00			$500.00	$100.00	$3,235.56	$0.00	$18,185.56	26
6-12	$16,380.00		$1,500.00								$100.00	$7,742.22	$0.00	$25,722.22	50

Figure 10: Sidewalk Plan Analysis – Obstructions Cost Breakdown (cont.)

SIDEWALK PLAN ANALYSIS:
OBSTRUCTIONS COST BREAKDOWN

ZONES	Broken Sidewalk $	Hydrant $	Inlets $	Light Pole $	Mailbox $	Signs $	Trees $	Utility Pedestals $	Utility Pole $	Valves/ Manholes $	Vegetation $	Vertical Displacement $	ALL OTHER	TOTAL SUM	TOTAL COUNT
6-13	$11,115.00		$7,500.00		$300.00							$1,697.22	$0.00	$20,612.22	32
7-1	$63,180.00								$2,000.00		$1,000.00	$4,766.67	$300.00	$71,246.67	136
7-3	$32,760.00	$1,000.00	$21,000.00		$2,100.00	$600.00			$8,000.00		$400.00	$8,457.22	$500.00	$74,817.22	114
7-4	$146,250.00		$39,000.00							$1,000.00	$700.00	$60,897.78	$750.00	$248,597.78	445
7-5	$26,325.00		$4,500.00								$100.00	$9,620.00	$0.00	$40,545.00	68
7-8	$108,810.00	$3,000.00	$61,500.00					$500.00	$14,000.00	$4,000.00	$1,600.00	$30,932.78	$0.00	$224,342.78	383
7-9	$47,970.00					$600.00			$2,000.00		$800.00	$15,520.56	$1,050.00	$67,940.56	182
7-10	$11,115.00		$7,500.00						$4,000.00			$1,328.89	$0.00	$23,943.89	29
7-11	$1,170.00												$0.00	$1,170.00	2
7-12	$53,820.00		$4,500.00			$1,200.00			$2,000.00	$500.00	$200.00	$18,207.22	$500.00	$80,927.22	151
8-1	$42,705.00		$13,500.00					$500.00		$500.00	$400.00	$9,345.56	$750.00	$67,700.56	114
8-10	$13,455.00		$19,500.00	$1,500.00	$300.00						$100.00	$1,993.33	$0.00	$36,848.33	46
8-11	$15,210.00		$7,500.00							$500.00	$200.00	$5,987.22	$750.00	$30,147.22	54
8-12	$33,930.00		$18,000.00								$300.00	$24,129.44	$750.00	$77,109.44	145
8-13	$54,405.00		$27,000.00	$3,000.00	$2,400.00	$300.00	$6,000.00		$6,000.00	$500.00	$200.00	$31,120.56	$750.00	$131,675.56	212
8-14	$585.00		$1,500.00									$1,155.56	$0.00	$3,240.56	5
9-1	$47,970.00								$2,000.00	$1,500.00	$1,100.00	$13,433.33	$0.00	$66,003.33	135
9-2	$16,380.00	$10,000.00	$94,500.00			$2,700.00		$500.00	$64,000.00	$5,500.00	$1,700.00	$30,802.78	$5,700.00	$231,782.78	336
9-3	$26,910.00		$6,000.00					$500.00	$2,000.00	$500.00	$300.00	$4,073.33	$0.00	$40,283.33	68
9-4	$69,615.00	$2,000.00	$51,000.00						$2,000.00	$2,000.00	$200.00	$32,666.11	$3,350.00	$162,831.11	280
9-5	$39,195.00		$7,500.00			$900.00		$500.00		$1,000.00	$100.00	$10,660.00	$100.00	$59,955.00	113
9-6	$585.00										$100.00		$0.00	$685.00	2
9-7												$317.78	$0.00	$317.78	1
9-8	$585.00												$0.00	$585.00	1
10-1	$94,185.00		$45,000.00		$2,100.00	$600.00				$1,500.00	$400.00	$33,792.78	$500.00	$178,077.78	293
10-2	$104,715.00		$16,500.00				$2,000.00		$4,000.00	$1,500.00	$100.00	$54,542.22	$2,000.00	$185,357.22	357
10-3	$84,825.00		$28,500.00				$16,000.00				$800.00	$53,834.44	$3,000.00	$186,959.44	329
10-4	$33,930.00	$1,000.00	$10,500.00								$100.00	$22,533.33	$0.00	$68,063.33	126
10-5	$5,265.00						$2,000.00				$100.00	$3,928.89	$0.00	$11,293.89	20
10-6	$84,240.00	$2,000.00	$36,000.00		$6,000.00	$300.00				$500.00	$100.00	$25,422.22	$0.00	$154,562.22	270
TOTAL	**$3,003,975**	**$49,000**	**$814,500**	**$10,500**	**$22,200**	**$45,300**	**$86,000**	**$10,000**	**$442,000**	**$61,000**	**$41,400**	**$1,094,080**	**$52,750**	**$5,733,205**	
MEDIAN															**81**

Figure 11: New Town/Charlestowne Sidewalk Conditions



Appendix A – 2012 Sidewalk Inventory Report

To view this report please see http://mo-stcharles.civicplus.com/DocumentCenter/View/1152

Appendix B – New Town / Charlestowne Report

To view this report please see http://mo-stcharles.civicplus.com/DocumentCenter/View/1153 .