CITY OF LOS ANGELES

CALIFORNIA

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February 10, 2026

The Honorable City Council
c/o Patrice Lattimore
Office of the City Clerk
Room 360, City Hall

COUNCIL FILE NO. 21-1469-S1 – PILOT PEDESTRIAN FACILITY INVENTORY AND ASSESSMENT: FINAL REPORT AND RECOMMENDATIONS
COUNCIL FILE NO. 25-1142 – BEST PRACTICES FOR THE REPAIR, REPLACEMENT, AND MAINTENANCE OF PUBLIC RIGHT OF WAY INFRASTRUCTURE: PEDESTRIAN FACILITIES INCLUDING SIDEWALKS AND CURB RAMPS

SUMMARY

The Bureau of Engineering (BOE), in partnership with the Bureau of Street Services (StreetsLA), completed the pilot phase of the citywide Pedestrian Facility Inventory and Assessment. The pilot determined that current technology can cost-effectively collect data on the location and condition of pedestrian facilities at scale and recommends proceeding with a citywide program. The report further recommends that the City adopt an asset management framework, including assigning roles and responsibilities for pedestrian facilities management, adopting a uniform asset condition rating system, and establishing a mechanism for ongoing data maintenance. The major pilot findings are summarized below and key implementation actions are reflected in the recommendations of this report.

Subsequent to the completion of the pilot report, but prior to the date of this report, the City Council approved a funding transfer to pay for the first year of the next phase of the citywide program (CF 21-1469-S4). BOE, in coordination with StreetsLA, the Bureau of Street Lighting (BSL) and the Department of Transportation (LADOT) procured assessment services in October for the areas surrounding 2028 Olympic and Paralympic Games venues and the LADOT Central Yard service area.

RECOMMENDATIONS

That the City Council:

1. RECEIVE AND FILE the Pedestrian Facility Inventory and Condition Assessment Pilot Project Final Report, attached;

2. DIRECT BOE and StreetsLA, in consultation with LADOT and any other relevant departments, to report in 120 days with a consolidated list of existing City programs that construct, repair, remediate, and/or maintain pedestrian facilities, including current funding, staffing, workflow, and prioritization methodology;

3. ADOPT the standardized Pedestrian Facility Damage Severity Matrix (Table 4-2), superseding the Damage Severity Matrix adopted by the Council in 2018 under CF14-0163-S3, and AUTHORIZE the City Engineer to make technical changes;

4. DIRECT BOE, in partnership with the StreetsLA, to prepare technical specifications for maintenance work on sidewalks and curb ramps and issue a Special Order within 120 days; and

5. DIRECT BOE, in coordination with the Department on Disability, StreetsLA, LADOT, and other relevant departments, to report with a scope of work and resources needed to complete a formal citywide Americans with Disabilities Act (ADA) Self Evaluation and Transition Plan for Public Right of Way (PROW) pedestrian facilities and directly associated assets.

BACKGROUND

On October 23, 2023, the City Council authorized funding for a Pedestrian Facility Inventory and Assessment pilot program (CF 21-1469-S1). As described in an August 30, 2023, joint BOE-StreetsLA report, the pilot scope included researching available technologies, consulting with agency and private stakeholders to determine needs, identifying the types and technical specifications of pedestrian facilities to be inventoried, demonstrating technologies at designated locations, analyzing pilot assessment data, developing a uniform asset condition rating system, and recommending an approach for a citywide inventory and assessment based on the pilot results. Completing a citywide inventory and assessment would fulfill a recommendation of the November 17, 2021, City Controller audit of the City's sidewalk programs to determine the scope and scale of needed sidewalk repair throughout the City so that resources can be more effectively prioritized and contribute to the City's compliance with Americans with Disabilities Act requirements for completion and update of a Self-Evaluation and Transition Plan.

DISCUSSION

Summary of Pilot Report

The completion of the pilot phase of the Pedestrian Facility Inventory and Assessment (Pilot) was the City's first step toward developing a comprehensive citywide inventory and assessment. Specifically, this pilot phase allowed the City to investigate, understand, and then provide detailed recommendations on the most cost-effective and practical means to accomplish the larger citywide inventory and assessment—including best practices for management and utilization of the resulting data within the City's existing asset management tools and the necessary components for the data to support completion of a Citywide Americans with Disabilities Act (ADA) Self Evaluation and Transition Plan for pedestrian facilities.

The citywide Pedestrian Facilities Inventory and Assessment will support coordination between stakeholders and facilitate the creation of a citywide approach to pedestrian facility repair—including the establishment of policies for how the City manages and delegates responsibility among stakeholders for remediation and ongoing maintenance. The data obtained can inform project scope, assist with strengthening grant applications, and, most importantly, assist the City in prioritizing its limited resources on the most impactful pedestrian facility maintenance and repairs. It will strengthen and inform financial planning on a strategic, multiple-year basis.

The Pilot report details that the City of Los Angeles covers 469 square miles and has the largest municipal street system in the United States. Along these streets are over 9,000 miles of sidewalk and more than 80,000 curb ramps. Technologies were tested in selected locations that are representative of the City's diverse terrain and neighborhood layouts to determine the most cost-effective approach for capturing comprehensive citywide data.

Technologies Tested

The Pilot tested various collection methods for assessment and inventory of the City's pedestrian facilities. Vendors used multiple technologies and methodologies to acquire and deliver data. The vendors tested were Bureau Veritas-PathVu which used a propelled profiler mounted on a three wheel bike trailer; Citian and Cyclomedia which used vehicle-mounted Light Detection and Ranging (LiDAR) with AI processing; DaxBot which used an unmanned robot with high-precision instrumentation; Deepwalk which used an iPhone application with LiDAR and AI processing; and IMS which used an ATV-mounted sidewalk surface tester.

The Pilot data collection and processing duration was three months. A longer duration for the Pilot would have afforded vendors more time to align with City data format specifications, resulting in less effort for data analysis. Nevertheless, each approach resulted in data largely meeting the City's needs that was optimized for sidewalk and curb ramp assessment. Pedestrian signals, bus boarding areas, accessible passenger loading zones, and other facility types required greater manual data collection. The vendors

collected measurements of slopes, uplifts, dimensions, cracks, and other facility-specific values. Data was georeferenced and included photographs to aid the City with data evaluation.

Detailed analysis of the vendor-provided data demonstrated its quality for each methodology. Most met the City's requirements necessary for at-scale inventory and assessment. Data and deliverable specifications used in the Pilot were found to not fully align with GIS, asset management, and quality assurance processes and were refined to facilitate later assessment phases. The Pilot found that mobile-mounted LiDAR collects data for all facilities in the public right of way (PROW) such as signs, light poles, pavement striping, hydrants, etc., which offers potential value for other City operations. These technologies and vendors support a range of capabilities for project scaling and scoping, from citywide level collection for planning and asset management purposes to small area project collection where City staff could perform data collection with appropriate technologies.

Public Input

While primarily a technology-focused initiative, the Pilot also obtained input from constituents through a stakeholder survey to better understand their community's priorities related to pedestrian facilities and potential use cases for the assessment data. Some of the key concerns collected from over 800 response from 152 zip codes were poor sidewalk maintenance related to cracks, uplifts, and uneven surfaces caused by tree roots; desire for safety improvements such as crosswalks, traffic calming measures, and better lighting; improving accessibility with more curb ramps, wider sidewalks, and obstacle removal; planting and maintaining trees for shade and comfort; and a desire for pedestrian-friendly areas like parklets, plazas, and seating zones. BOE also convened a Technical Advisory Committee (TAC) consisting of pedestrian-focused community-based organizations. The TAC helped BOE interpret the results of the public survey and advised on the development of the proposed asset management framework.

Application to Citywide Inventory and Assessment and ADA Self Evaluation and Transition Plan

Facilities Self-Evaluation and Transition Plan were evaluated for eight jurisdictions to assess what pedestrian facilities and attributes were collected, how the data was collected, costs, and overall effectiveness of their processes. It was found that ADA Facilities Self-Evaluation represents a one-time snapshot of their condition and updates are not planned due to the significant cost to conduct a Facilities condition assessment and a lack of comprehensive, integrated framework that updates Facilities conditions as repair work is performed. Public outreach varies with each jurisdiction with some conducting extensive outreach over several years while other cities conduct community engagement after releasing their Draft Transition Plan, often with minimal public input. The report concludes that Facilities inventory and assessment will implement a framework supporting the Self-Evaluation needs and provide necessary data to develop a Transition Plan that aligns maintenance and capital investments with available funding to maximize

overall accessibility and state of good repair and to regularly update the Transition Plan to reflect changing conditions and priorities.

A citywide inventory and assessment, will support the City's efforts to meet ADA legal requirements for a Self-Evaluation and Transition Plan. The Department of Public Works is responsible for updating the public right of way component of the City's Self-Evaluation and Transition Plan, which requires the City to identify barriers to accessibility and outline how the City will address them over time. Data from the citywide inventory and assessment, coupled with implementation and documentation of procedures under an asset management framework is needed to meet the City's reporting requirements under the ADA.

Estimated Costs

The Pilot report outlines a number of costs for implementing various aspects of an asset management framework for pedestrian facilities. Some elements assume that existing City resources can be leveraged, such as GIS and asset management system software. Other aspects of the program would require adding staff specifically dedicated to managing pedestrian facilities using these tools, including analyzing and verifying data, applying prioritization methodologies, and routing selected barriers into maintenance or capital workflows. The estimated direct cost to complete the citywide Pedestrian Facilities Inventory and Assessment is estimated at between $4M and $9M. This estimate only reflects the cost of capturing pedestrian facilities and does not include additional costs to extract data about other assets in the public right of way. Furthermore, this estimate does not include the cost of City staff and/or consultant support required to oversee data collection, ensure quality control, and integrate the data into City systems. This estimate assumes a project duration of 18-24 months. These costs can feasibly be spread out over a longer period if slower data collection is assumed. All costs require validation by implementing agencies.

Implementation of Citywide PROW Assessment Program

The Pilot recommended proceeding with a LIDAR-based inventory and assessment as the most cost-effective and practical method for meeting the City's pedestrian facility data needs. The report further identifies the possibility to coordinate with other departments' asset inventory and assessment needs. Based on this recommendation, BOE and StreetsLA collaborated with LADOT to join forces with their Code the Curb initiative to digitize LADOT assets, such as traffic signs, signals, and curbs. The result of this collaboration will be a complete asset database of LADOT assets, which will enable their use of a modern Asset Management Software platform. BOE, StreetsLA, and LADOT have procured assessment services for the LADOT Central Yard service area as the first phase toward a citywide assessment. The program partners have also engaged with the Department of Water and Power, BSL, and Bureau of Sanitation to discuss bringing additional partners on board for the citywide effort. Due to the inclusion of additional assets beyond pedestrian facilities, BOE now calls this initiative the PROW Assessment Program.

Additionally, the first phase of citywide assessment includes the area around all 2028 Olympic and Paralympic Games venues in order to streamline the identification of maintenance and capital needs and prioritization of resources to facilitate a safe and accessible event for visitors and residents near venue sites. Within the venue areas, BOE will work with program partners to demonstrate assessment and maintenance workflows envisioned by Executive Directive 9. New systems and approaches to proactive asset management are an intended legacy of the 2028 Games.

With this combined 2028 Games and LADOT Central Yard scope, BOE solicited best and final offers from qualified vendors to determine the best value service provider that could meet the City's technical requirements and guarantee data accuracy. The project partners selected a vendor that will provide asset data, attribute data, and compliance determinations in a format that is directly compatible with the City's asset management systems without extensive staff or consultant work to extract and analyze asset data, providing the greatest utility and best overall value. By integrating into asset management systems, City agencies will be able to keep the data up to date through normal operations, extending the life of the data and reducing the need for frequent re-assessment.

BOE, LADOT, and StreetsLA provided funding for the first year of a three-year software services agreement with the City's preferred vendor (CF-21-1469-S4). BOE has submitted a budget request to the Mayor's Office to fund the second of three years of the contract. Resources are also required for staff and/or consultant support, software licensing, and program contingency for a total cost of $1.8 million per year. At this pace of investment, approximately one-third of the City would be assessed in each three-year cycle, meaning that data for the entire City would be collected about once per decade, which is the recommended timeline for assessing pedestrian facilities. Citywide data collection could be accelerated should additional resources become available.

Transitioning to Pedestrian Facilities Asset Management (Recommendation 2)

Fully realizing the value of the inventory and assessment will require the City adopting an asset management framework for pedestrian facilities. The City does not currently proactively manage pedestrian facilities like other assets in the public right of way, such as roadways, street trees, and streetlights. The Department of Public Works has not operationalized its responsibility to ensure that pedestrian facilities are connected, free of safety hazards, and accessible to people with disabilities. Improvements to pedestrian facilities are generally incidental, such as part of a larger transportation grant project, associated with adjacent roadway maintenance, or in response to complaints. Currently there is no active City program to maintain pedestrian facilities.

Executive Directive 9 envisions that the City will adopt asset management best practices, with all assets having clear owners and those owners responsible for either directly performing maintenance or ensuring that maintenance is performed by third parties. The Pilot report similarly contemplates an asset management framework for pedestrian facilities, with LADOT responsible for signal-related facilities (i.e. pedestrian push buttons and Accessible Pedestrian Signals) and striping (i.e. crosswalk striping) and StreetsLA

responsible for sidewalks, curb ramps, crosswalks, pavement condition, bus stop amenities, public staircases, and tunnels. For public staircases and tunnels, StreetsLA is only responsible for maintenance tasks that do not involve structural failures. If any potential structural issues arise with these assets, StreetsLA will refer the maintenance to the BOE for expert analysis, design, and construction solutions.

While both Executive Directive 9 and the Pilot report recommend establishing these clear roles and responsibilities, no agency is currently funded to perform either asset management or maintenance for the City's sidewalks and curb ramps. This framework envisions that StreetsLA and LADOT would intake and manage asset data for their respective assets in their Asset Management Systems and be empowered to make management decisions, such as prioritizing maintenance activities and planning for capital investments. StreetsLA does not currently have this function, which would require a dedicated organizational unit for asset management, maintenance crews to perform work, and inspectors to enforce private property owner obligations. LADOT currently maintains pedestrian signals as part of their overall signal maintenance but does not have dedicated resources for remediating these facilities to current accessibility standards.

As an incremental step toward resourcing these proposed functions, Recommendation #2 would inventory existing programs that perform work on pedestrian facilities in order to quantify the total investment in maintaining and/or improving these facilities and determine whether these programs could be more intentionally coordinated under an asset management framework.

As a more significant step toward resourcing these proposed functions, StreetsLA has proposed organizational changes and resource realignments for the Mayor and Council's consideration as part of the Fiscal Year 26/27 budget process. In order to address this backlogged pedestrian facility maintenance work, StreetsLA proposed a new Sidewalk Maintenance Program, and requested $18 million for 133 new resolution authority positions to perform sidewalk maintenance work that does not trigger full ADA compliance. Additionally, StreetsLA proposed to re-purpose (no additional new authorities) 27 staff currently working on the SRP Access Request Program projects to work on StreetsLA managed Pavement Preservation Program (PPP) Access Ramps.

LADOT and BOE generally require less substantial organizational changes to fulfill the responsibilities envisioned in this report. Given significant funding constraints in street and transportation special funds, this report anticipates these new functions would need to be phased in over time, starting with asset management functions to establish systems and program structures and followed by field crew and inspection capacity.

Given the urgency of performing facility maintenance near Olympic and Paralympic Games venues prior to 2028 and staffing shortages in StreetsLA, BOE and StreetsLA are partnering to bring on contract maintenance capacity to support StreetsLA's asset management needs in the short term. Per direction from the Mayor's Office, under the Fiscal Year 26/27 budget process, BOE has requested $15M to establish a *2028 Games: Delivery of Sidewalk Maintenance/Construction Contract*. The Program would establish

and manage sidewalk maintenance activities required for the LA28 Games. The proposal assumes two new asset management positions in StreetsLA to perform data management and asset decision making. BOE would establish a time and materials-based consulting and expedited construction contracts to perform sidewalk maintenance activities. Activities are anticipated to include grinding, minor panel replacements, and crack seal on and around approaches to Games venues.

If implemented incrementally, these recommendations are expected to result in lower liability for sidewalk injury claims over time, however these savings will likely not materialize for several years due to the accumulated deferred maintenance.

Technical Standards to Support Pedestrian Facilities Management (Recommendations 3-4)

The citywide assessment will identify the location of existing facilities and take precise measurements of each pedestrian facility's condition, creating a data set that provides the information necessary to understand the status of the City's assets that serve pedestrians. To effectively utilize this volume of data, the Pilot report recommends adopting objective standards, or rating, for different levels of barrier severity. Adoption of this barrier severity rating standard will allow the City to prioritize work and reduce risk, such as identifying and mitigating severe barriers on highly trafficked corridors first, regardless of whether a constituent has reported the issue previously. Management of pedestrian facilities in this way allows the City to be strategic and intentional with its investment of funding and personnel or contracted resources. The standardized rating will also facilitate the City's deployment of the most appropriate work type based on the barrier type and severity. For example, grouping pedestrian facilities with a moderate barrier rating may be programmed for expedited maintenance treatments such as saw cutting or grinding, whereas pedestrian facilities with a severe barrier may be programmed for full reconstruction. This allows the City to efficiently deploy the appropriate resource to each location.

Recommendation #3 would adopt a standardized barrier severity scoring system for use in projects whose purpose is to remove existing barriers to access or maintain accessible pedestrian facilities. The barrier scoring system is designed to be responsive to people with different types and levels of mobility disabilities. While all barriers, as defined by the ADA, can pose a challenge to individuals with disabilities, and while the City maintains an obligation under the ADA to remediate all barriers to full compliance per its Transition Plan, some barriers have a greater negative impact than other barriers based on their severity and locations. If the City's goal is to implement an ADA Transition Plan and maximize mobility for people with disabilities in a resource-constrained environment, the scoring system provides an objective basis for prioritizing such barrier remediation work. As proposed, minor barriers that are not in compliance with accessibility standards, but in practice are still navigable by most people with a mobility disability, would be lower priority to remediate. Moderate barriers, posing increasing challenges to some members of the disability community, such as those using manual wheelchairs, would be a higher priority to remediate. Severe barriers are defined as those that would likely impede

commonly used mobility aides, such as motorized wheelchairs. Very severe barriers, which are not navigable, prevent someone with a disability from proceeding forward, and likely pose significant safety risks, such as tipping wheelchairs, would be the highest priority to remediate. While the scoring system is calibrated for people with mobility disabilities, barriers impact other users' mobility as well, such as parents pushing strollers or people pulling shopping carts. Even moderate barriers can pose a tripping hazard for the general public since they are often not as readily apparent to pedestrians. The barrier scoring system is further intended to be used when determining project compliance with Measure HLA in Pedestrian Enhanced Districts, which requires that pedestrian facilities be free of severe barriers.

Recommendation #4 would help the City provide new maintenance capabilities by establishing technical standards for maintenance activities, such as patching, grinding, and panel replacement. Generally, these maintenance activities are appropriate for mitigating minor and moderate barriers. The new standards would clarify how to perform maintenance to an existing facility while still complying with the City's ADA obligations, such as the distinction between maintenance and alteration. In addition to guiding City crews, these technical specifications would provide the basis for any future contracted maintenance capacity and potentially serve as a standard for property owners performing maintenance repairs to temporarily reduce barriers and increase accessibility of the sidewalks fronting their property.

ADA Self Evaluation and Transition Plan (Recommendation 5)

Under Title II of the ADA, the City is required to provide equal access to its programs, services, activities and facilities. For pedestrian facilities, this obligation can be generally described as a requirement to 1) assess existing policies, practices, procedures, and facilities and remove barriers to access according to the a schedule provided in the City's Transition Plan and other legal contracts (Willits Settlement Agreement), 2) update the Self Evaluation and Transition Plan at least every 3 years, 3) ensure that all new, added, and altered facilities meet accessibility standards in place at the time of construction, and 4) maintain accessible features of facilities to ensure their ongoing usability. The City most recently completed an ADA Self Evaluation and Transition Plan in 2000 and the Department on Disability is currently working on an update that includes selected elements covered by the ADA. This update does not address the City's public right of way pedestrian facilities. Responsibility for completion of an updated Self Evaluation and Transition Plan for public right of way pedestrian facilities remains with the Department of Transportation and the Department of Public Works and its Bureaus.

The citywide Pedestrian Facilities Inventory and Assessment will facilitate an overdue update to the City's Self Evaluation and Transition Plan by identifying physical barriers to access and providing an objective means to prioritize those barriers for remediation. Additionally, the specificity of the data obtained and its import into the City's asset management system will allow the data to remain up to date as work occurs over time, therefore increasing the value of the data and allowing the City to more easily update its Self Evaluation and Transition Plan in future years, ultimately reducing the City's

exposure to liability. Recommendation #5 would develop a scope of work to meet the City's ADA Self Evaluation and Transition Plan obligations for public right of way pedestrian facilities, building on the Pilot, proposed asset management framework, and Executive Directive 9.

FISCAL IMPACT

Approval of this report has no direct fiscal impact. The recommended actions include direction to report back with information about new programs and associated costs. Like all other asset classes, implementing asset management practices for pedestrian facilities will require direct expenditures on staff, contractual services, equipment, and materials. This report recommends phasing in new programs over time to manage upfront costs and build capacity. Over time, proactive asset management is expected to significantly reduce liability costs resulting from the current condition of the City's pedestrian facilities.

Respectfully submitted,

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AM/KD:eb:jsdlv;jm

Box\EXE_2025 City Engineer\ 21-1469-S1 PROW Inventory and Assessment Report Back_2025-1103 FINAL

Attachments

cc: Randall Winston, Office of the Mayor
Andrea Greene, Office of the Mayor
Steve S. Kang, Board of Public Works
Faith Mitchell, Board of Public Works
Laura Rubio-Conejo, Department of Transportation
Miguel Sangalang, Bureau of Street Lighting
Stephen Simon, Department on Disability

NOTE: PRIORITIZATION OF BARRIERS BY SEVERITY IS ONLY APPLICABLE TO ADA BARRIER REMOVAL PROJECTS IN EXISITING FACILITIES THAT HAVE NOT BEEN ALTERED SINCE THE ADA.

4.5 Barrier Severity Scoring Recommendations

Facilities will be evaluated based on assessment measurements to determine its compliance with accessibility criteria. If found non-compliant, the level of severity will be scored. Individual non-compliance measurements are defined as access barriers that will be considered for repair.

This barrier severity ranking is only applicable to barrier remediation projects, as defined. It does not apply to other projects and shall not inform the scope of new construction, alterations, or other similar projects.

Severity Scoring

Barriers to Facilities identified in the condition assessment process will represent a wide range of accessibility non-compliance from very minor to significant. Given the City's obligations under the ADA to remediate access barriers with a timeline, rating the severity of a barrier is beneficial due to the magnitude of the projected alterations and limited resources. Adopting a barrier severity score to standardize the classification will then prioritize the mechanism and timeline for barrier removal or mitigation.

Facilities evaluated through the scoring process may be identified as non-compliant with accessibility standards based on field measurements of each facility. Field measurements exhibit a range of measurement errors based on the measurement methodology and equipment used. Therefore, Facilities without a non-compliant severity score have no known non-compliant characteristics.

Recommended barrier severity scores are based on criteria such as vertical displacement, horizontal displacement, cross slope, run slope, and travel path width. Four barrier severity scores are recommended—**Minor, Moderate, Severe, and Very Severe**. This framework ensures sidewalk and access ramp conditions are assessed systematically and remediation is aligned with the severity of non-compliance, prioritizing both safety and accessibility requirements. Measurement criteria determining the Severity Scores are presented in the tables below for sidewalks and curb ramps along with repair options.

RESULTS	A standardized barrier severity scoring system that prioritizes accessibility barrier remediation based on safety and compliance severity, ensuring consistent evaluation and efficient allocation of repair resources.

Severity Index and Repair Options

THIS SHALL NOT BE APPLIED TO NEW CONSTRUCTION OR ALTERATION PROJECTS WHICH REQUIRE THE PROVISION OF ACCESSIBLE PEDESTRIAN FACILITIES, REGARDLESS OF THE SEVERITY OF EXISITING BARRIERS.

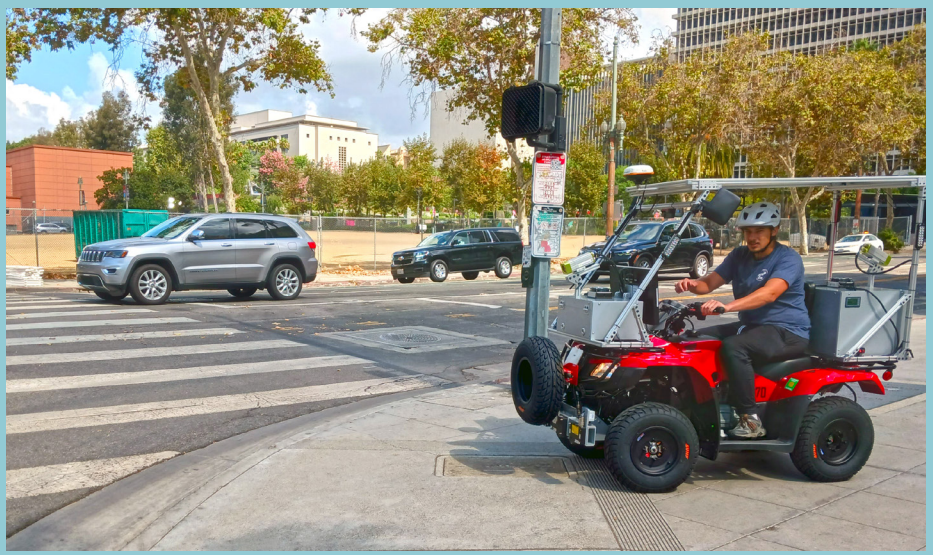
Table 4-2. *Severity Index and Repair Options*

Pedestrian Facility Type	Barrier Type	Barrier Severity Category			
		Very Severe	Severe	Moderate	Minor
Sidewalk	Scoping	*Gap* in sidewalk where the existing terrain is *greenfield* and/or space has not been allocated for pedestrian use.	*Gap* in sidewalk comprised of an *unprepared surface* (dirt, grass, etc.).	*Gap* in sidewalk comprised of a *non-standard prepared pedestrian surface* (decomposed granite, pavers, asphalt).	—
	Obstructed Clear Width	< 32"	32" – 35.9"	36" – 47.9"	48" – 59.9"
	Cross Slope	> 17%	17% – 11.1%	11% – 5.1%	5% – 1.9%
	Running Slope	*Roadway grade* + 10% or more	*Roadway grade* + 6.0% to 9.9%	*Roadway grade* + 2.0% to 5.9%	*Roadway grade* + 1.9% or less
	Uplift	≥ 3.1"	3" – 2.1"	2" – 1.1"	1" – 0.5" unbeveled
	Openings	> 4"	4" – 2.1"	2" – 1.1"	1" – 0.5"
Curb Ramp	Scoping	Missing curb ramp(s) at *marked crossings*.	Missing curb ramp(s) at *marked crossings*.	—	—
	Scoping	Missing curb ramp(s) at *unmarked, signalized* crossings at intersections of four-ways or greater.	Missing curb ramp(s) at *unmarked, signalized* crossings at intersections of four-ways or greater.	—	—
	Scoping	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *residential/local streets* of four-ways or greater without an accessible crossing within 200'.	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *residential/local streets* of four-ways or greater without an accessible crossing within 200'.	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *collector/arterial streets* of four-ways or greater without an *accessible crossing* within 200'.	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *collector/arterial streets* of four-ways or greater with an *accessible crossing* within 200'.
	Top Landing	No landing or top landing of less than 32" in length or width is provided and the curb ramp running slope is > 17%.	No landing or top landing of less than 32" in length or width is provided and the curb ramp running slope is 17% – 11.1%.	No landing or top landing of less than 32" in length or width is provided and the curb ramp running slope is 11% – 5.1%.	No landing or a top landing is less than 32" in length or width is provided and the curb ramp running slope is 5.0% or less.

Pedestrian Facility Type	Barrier Type	Barrier Severity Category			
		Very Severe	Severe	Moderate	Minor
Curb Ramp *(continued)*	Top Landing Slopes	> 10% in any direction	10% – 6.1% in any direction	6.0% – 4.1% in any direction	4.0% – 2.1% in any direction
	Ramp Run Width	< 32"	32" – 35.9"	36" – 47.9"	36" – 47.9"
	Ramp Run Running Slope	> 17%	17% – 13.1%	13% – 10.1%	10% – 8.34%
	Ramp Run Cross Slope	> 10%	10% – 6.1%	6% – 4.1%	4% – 2.1%
	Openings within Top Landing or Ramp Run	> 2.5"	2.5" – 1.1"	1" – 0.5"	< 0.5"
	Uplifts within Top Landing or Ramp Run	> 2"	2" – 1.1"	1" – 0.5"	< 0.5"
	Clear Space at Bottom of Curb Ramp Run	Clear space is not provided within the width of the crossing, or provided clear space is < 32" in any dimension, or provided clear space has a running slope > 17%.	Clear space is not provided within the width of the crossing, or provided clear space is < 36" in any dimension, or provided clear space has a running slope between 17% - 12.1%.	Clear space is provided within the width of the crossing or provided clear space is 36" – 47.9" in any dimension, or provided clear space has a running slope between 12% – 8.1%.	Clear space is provided within the width of the crossing or provided clear space is 36" – 47.9" in any dimension, or provided clear space has a running slope between 8% – 5.1%.
	Turning Space at Bottom of Curb Ramp Run	Turning space is not provided within the width of the crossing, or provided turning space is < 32" in any dimension, or provided clear space has a running slope > 10%.	Turning space is not provided within the width of the crossing, or provided turning space is < 36" in any dimension, or provided clear space has a running slope between 10% – 8.1%.	Turning space is provided within the width of the crossing, or provided turning space is 36" – 47.9" in any dimension, or provided clear space has a running slope 8% – 5.1%.	—
	Grade Breaks at Top and Bottom of Curb Ramp Run	> 2"	2" – 1.1"	1" – 0.5"	< 0.5"
	Detectable Warning Surface	Uplifts or openings > 2"	Uplifts or openings 2'' or less	Not provided (never installed)	Color is non-yellow or yellow and does not provide required contrast.
	Curb Ramp Type	—	—	One curb ramp is provided to serve two crossings (i.e. diagional curb ramp)	—
Other	Vertical Clearance	70" or less	70.1" – 80"	—	—
Pedestrian Push Button	Button Type	—	Finger Push Type	—	—
	Clear Space	No clear space is provided, or the width of the route to the button is < 32", or there is an *unprepared surface* from the sidewalk to the button, or there is prepared pedestrian surface with slopes in any direction > 10%.	No clear space is provided, or the width of the route to the button is between 32" – 35.9" wide, or there is prepared pedestrian surface with slopes in any direction between 10% – 8%.	TBD	TBD
	Reach Range	—	For side approach, the separation between button and edge of clear space > 12''.	For side approach, the separation between button and edge of clear space is 10.1" – 12".	—
Bus Boarding Areas	Surfaces	A *prepared pedestrian surface* is not provided.	A *non-standard prepared pedestrian surface* is provided.	—	—
	Dimensions	< 3' in any direction.	< 4' in any direction.	< 5' in any direction.	—
	Pedestrian Access Route to the Boarding Area	< 32" wide, or no curb ramp is provided	32" – 36.1" wide and a curb ramp is provided	36"– 47.9" and a curb ramp is provided	—

ENGINEERING
CITY OF LOS ANGELES

PEDESTRIAN FACILITY INVENTORY AND CONDITION ASSESSMENT PILOT PROJECT FINAL REPORT



Submitted To:
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April 10, 2025

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EXECUTIVE SUMMARY

The City of Los Angeles has approximately 7,000 miles of streets, most of which have adjacent PROW pedestrian facilities essential for mobility and disabled access to commerce, transit, education, healthcare, and recreation.

CITY PROW PEDESTRIAN FACILITIES

- Sidewalks
- Curb Ramps
- Crosswalks
- Pedestrian Refuge Islands
- Pedestrian Signal Push Buttons
- Staircases
- Transit Stop Boarding Areas
- Accessible On-street Parking
- Accessible Passenger Loading Zones

The City of Los Angeles (City) has responsibility to assure public right-of-way (PROW) pedestrian facilities (Facilities) comply with the Americans with Disabilities Act (ADA), Title II, and the Willits Settlement Agreement (Settlement), addressing disabled access barriers on the Facilities. This is a challenging mandate as **there is no existing detailed Facilities inventory or a complete accessibility compliance determination.**

Currently, the City investigates and addresses disabled access barriers on Facilities through a reactive process—responding to public complaints. The ADA requires the City to conduct a Facilities Self-Evaluation and develop a Transition Plan to address Facilities identified as non-compliant with accessibility standards. Facilities inventory and assessment will address Self-Evaluation needs and provide necessary data supporting the Transition Plan.

This report presents findings from the Inventory and Assessment of the City's Public Right-of-Way Pedestrian Facilities Phase I: Pilot (Phase I: Pilot) conducted for the City's Department of Public Works, Bureau of Engineering (BOE), evaluating technologies and methodologies to accurately and efficiently inventory, measure, and determine Facilities compliance with accessibility standards. Recommendations include implementing a framework supporting the Self-Evaluation and Transition Plan processes.

1.0 Requirements and Needs

Key findings assert that using automated Facilities inventory and assessment methods combined with a data-based management approach can support citywide management of Facilities in compliance with ADA and Settlement requirements.

- Using manual measurement processes to perform Self-Evaluation and Transition Plan for Facilities is cost prohibitive.
- A review of eight other jurisdiction's Self-Evaluation and Transition Plan validate the benefits of using automated Facilities inventory and assessment methods, deploying data-based management processes to remediate non-compliant Facilities, and maintaining Facilities in accessible condition. A phased approach and severity ranking to prioritize are key.
- Automated Facilities inventory, measurement, and accessibility compliance determination methods performed by technology vendors can accurately and efficiently complete the Facilities inventory across the entire City to address the Self-Evaluation requirement.
- The City lacks sufficient tools and methods for Facilities data management at a citywide scale to prioritize repairs, plan capital improvement projects, and track repair projects.
- The City's geographic information systems (GIS) and asset management systems can be used as a data-based system and be extended to assign accessibility compliance scores to each pedestrian facility, automate barrier repair prioritization, support capital planning, inform the Transition Plan, automate citywide reporting, and comply with the Settlement.
- It is most practical for the City to implement Facilities inventory and condition assessment at scale for the entire city area or implement the assessments incrementally for targeted areas within a Citywide ADA Transition Plan.
- The needs outlined in this report and associated processes for managing Facilities disabled access compliance are aligned with the broader need for PROW asset management reflected in Executive Directive 9 (ED9): Streamlining Capital Project Delivery and Equitably Investing in the Public Right-of-Way.

Disabled Access Requirements

This report recommends establishing a PROW Pedestrian Facilities Management Framework that enables the City's compliance with regulatory requirements and City policies and priorities to efficiently and effectively manage the data, prioritize repair, plan repair projects, and track and report activities.

Disabled Access Compliance

Oversight should be provided by the City's ADA Coordinator for PROW in coordination with the Capital Planning Steering Committee established via ED9, or alternate City governing body, to ensure alignment with other PROW initiatives.

Access Barrier Projects

Repair should follow existing processes for engineering, construction, and project management within the BOE, Bureau of Street Services (BSS), and the Department of Transportation (LADOT). Asset management activities should reflect general roles and responsibilities with maintenance by owners and remediation by BOE.

Phase I: Pilot Specifications

Facilities inventory, condition measurements and classification, and vendor condition assessment procedures and deliverables that addressed the pilot project needs should be enhanced with minor revisions to improve standardization to better support a citywide Facilities management framework.

Phase I: Pilot Overview

The following presents an overview of the Phase I: Pilot process and results presented within this report.

The pilot identifies the feasibility, costs, schedule, and necessary steps to accurately and efficiently determine the location and condition of the City's Facilities and strategically plan for disabled access, safety, and mobility.

Phase I: Pilot

The pilot was tailored to City's needs, mandates and initiatives, unique geography, organizational structure, and technology frameworks to assure the findings and recommendations are applicable and appropriate to aid the City in addressing pedestrian access barriers.

Key Goals

- Conduct a needs assessment to understand the existing setting and stakeholders' requirements for Facilities management.
- Research and evaluate technologies and methodologies for Facilities location-based inventory and condition assessment.
- Select and deploy a sample of leading national vendors to perform Facilities inventory and assessment demonstration.
- Propose an objective scoring criteria for Facilities to be used in a repair prioritization system at scale without manual field assessment.
- Recommend a Facilities management framework that leverages data collection and management technologies, achieves policy goals and regulatory compliance, and applies asset management and capital planning principles.
- Provide relevant, actionable findings and recommendations to inform the implementation of a Pedestrian Facilities Management Framework and associated multi-year work plan.

The Phase I: Pilot began with a Needs Assessment to understand the current City setting and needs, developed data and analysis specifications, and engaged six vendors to perform Facilities assessments in sample areas. The pilot then analyzed the vendor data against a "control" assessment and prepared a recommended Pedestrian Facilities Management Framework implementation plan with costs and schedule estimates.

Needs Assessment

A Needs Assessment engaged City departments, other cities and jurisdictions, and community stakeholders to identify their specific needs and understand existing processes and gaps for managing Facilities.

Key Findings from City Departments

- City Facilities condition data is largely lacking, yet accessibility barriers are present throughout the City PROW.
- Facilities condition data requires specific precise measurements of cracks, uplifts, slopes, width, obstructions, and other facility type-specific data in order to assess compliance under ADA and related standards. This data is not currently available for the vast majority of the City PROW.
- GIS inventory of Facilities represented is outdated.
- Historical Facilities maintenance and detailed construction data is incomplete and difficult to access.
- Established processes to maintain a current inventory and condition of Facilities to inform capital project planning are inadequate to effectively and efficiently meet the City's planning, project delivery, and documentation/ record keeping needs.
- Condition severity ratings and standard criteria are needed to establish a uniform determination for non-compliant Facilities.
- Hazardous and/or non-compliant Facilities repair planning is not sufficiently coordinated with other PROW asset management system activities to leverage funding, reduce impact to the public, and achieve better outcomes.
- Departments use common GIS and asset management system technologies and are working to broaden their use. However, a centralized data architecture is needed to optimize data interoperability and consistency, and reduce redundant data management.
- Citywide Facilities data standards are needed to enable cross-departmental data sharing and Facilities repair process coordination.
- Greater transparency—internally across departments and externally with the public and numerous stakeholders—is needed for sharing Facilities data, planned repair projects, and work accomplishments.
- Well-defined roles and responsibilities for all pedestrian facility types and all aspects of their management are needed, including inventory, condition assessment, accessibility scoring, capital project planning, reconstruction, and governance.

PARTICIPATING DEPARTMENT AND CITY ENTITIES IN THE NEEDS ASSESSMENT

- Department on Disability
- Department of City Planning
- Department of Public Works
  - Bureau of Street Services (BSS)
  - Bureau of Engineering (BOE)
  - Bureau of Sanitation (SAN)
  - Bureau of Contract Administration (BCA)
- Los Angeles Department of Transportation (LADOT)
- Board of Public Works Office of Forest Management
- The Sidewalk Repair Program Executive Steering Committee
  - Bureau of Street Lighting
  - The Mayor's Office
  - The City Administrative Office
  - Chief Legislative Analyst

Findings from Other Jurisdictions and Survey Respondents

Facilities Self-Evaluation and Transition Plan were evaluated for eight jurisdictions to assess what pedestrian facilities and attributes were collected, how the data was collected, costs, and overall effectiveness of their processes. An online survey assessed stakeholders' needs and preferences for Facilities with 644 Angelenos and 171 respondents from outside the City. The list of external stakeholders can be found in Appendix E.

Findings from Other Jurisdictions	Findings from External Stakeholders
■ ADA Facilities Self-Evaluation represents a one-time snapshot of their condition. Updates are not planned due to the significant cost to conduct a Facilities condition assessment and a lack of a comprehensive, integrated framework that updates Facilities conditions as repair work is performed. ■ Agencies are selective in the types of Facilities they focus on and include in their Self-Evaluation and Transition Plan, often limiting Facilities to only sidewalks and curb ramps. ■ Advanced technologies including Artificial Intelligence (AI) based processing is promising, but in-person field observations are still required to fulfill each jurisdiction's data collection needs and satisfy sidewalk and ramp ADA requirements. ■ Facilities condition assessment costs vary significantly, but modern automated methods are reducing costs.	■ Key concerns included timeliness of correcting non-compliant Facilities, desire for safer Facilities through improved sidewalks, lighting, and traffic calming. ■ Priority Facilities are sidewalks, curb ramps, pedestrian push buttons, crosswalks, and public transit stops. ■ Improvements should focus on areas around government buildings, schools, healthcare, parks, and public transit sites.

Findings from the Phase I: Pilot Technical Advisory Committee

A Technical Advisory Committee (TAC) was formed and engaged during the Phase I: Pilot to review the task approach and findings. TAC participants can be found in Appendix E. The TAC provided guidance on criteria to use for Facilities repair prioritization.

Findings from the TAC
■ **Top Priorities:** The most critical factors revolve around ensuring direct accessibility for individuals with mobility disabilities. This includes proximity to priority destinations, user characteristics, and reported facility issues, reinforcing the need to address essential locations first and tailor solutions to those most affected. ■ **Mid-Level Priorities:** Neighborhood characteristics, barrier severity, and pedestrian volume are significant but secondary factors. These considerations help balance localized needs, ensuring repairs align with area-specific needs. ■ **Connectivity and Public Input:** Community engagement and network integration should influence repair prioritization, secondary to considering higher priorities. ■ **Efficiency and Costs:** While important, repair efficiency and cost minimization are lower priorities, indicating a willingness to prioritize impact over budget constraints.

2.0 Technology Research and Demonstration

The Phase I: Pilot included researching available and effective technologies and vendors for Facilities inventory and assessment. Six vendors were engaged to perform assessments on 4.3 miles of PROW in select locations generally representing field conditions found across the City. The vendors used various technologies for Facilities measurements. The vendors and technology included:

- **Bureau Veritas-PathVu:** Manually propelled profiler
- **Citian:** Vehicle-mounted LiDAR with AI processing
- **Cyclomedia:** High-precision LiDAR with AI processing
- **DaxBot:** Unmanned robot with high-precision instrumentation
- **DeepWalk:** Manual iPhone LiDAR with AI processing
- **IMS:** ATV-mounted sidewalk surface tester
- **Psomas:** Conventional measurements using labor intensive manual measurements to serve as a benchmark for data accuracy

Figure 1. *Psomas*

Figure 2. *Bureau Veritas-PathVu*

Figure 3. *Citian*

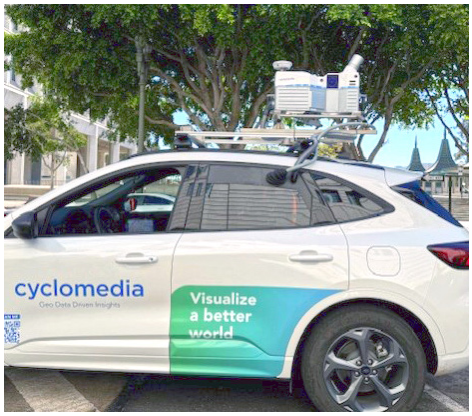


Figure 4. *Cyclomedia*

Figure 5. *DaxBot*

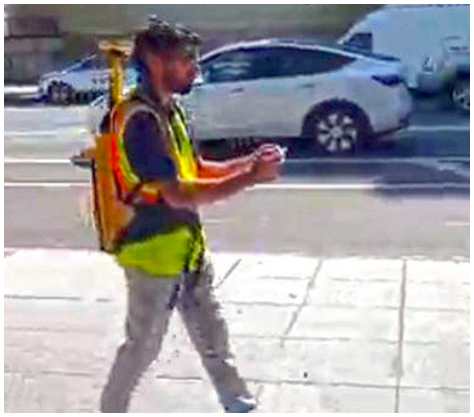


Figure 6. *DeepWalk*

Figure 7. *IMS*

Key Findings

Findings from Vendors

- Vendors used multiple technologies and methodologies to deliver data. Each approach resulted in data largely meeting the City's needs that was optimized for sidewalk and curb ramp assessment. Pedestrian signals, transit stop landings, accessible passenger loading zones, and other facility types required greater manual data collection.
- Vendors collected measurements of slopes, uplifts, dimensions, cracks, and other facility-specific values. Data was georeferenced and included photographs to aid the City with data evaluation.
- Detailed analysis of the vendor-provided data demonstrated its quality for each methodology. Most met the City's requirements necessary for at-scale Facilities inventory and assessment.
- A longer duration for the pilot would have afforded vendors more time to align with City data format specifications, resulting in less effort for data analysis.
- Vendor data delivery quality review processes need to be streamlined and largely automated to manage Facilities inventory and assessment at scale.
- Vendors can effectively perform the inventory and assessment, providing Facilities data aligned with City criteria and sufficient to perform disabled access compliance determination.
- Multiple technologies and vendors are available to address City needs. Technologies and vendors support a range of capabilities for project scaling and scoping, from citywide level collection for planning and asset management purposes (Citian) to small area project collection where City staff could perform data collection and submit to DeepWalk for processing.
- Data and deliverable specifications used in the Phase 1: Pilot need refinement to align fully with GIS, asset management, and quality assurance processes.
- By default, mobile-mounted LiDAR collect data for all facilities in the PROW such as signs, light poles, pavement striping, hydrants, etc. This offers potential value for other City operations.

3.0 Facilities Management Framework Approach

A Pedestrian Facilities Management Framework Approach based on best practices aligned with City needs include:

Inventory Facilities, assess condition, and determine disabled access compliance level. This informs the Self-Evaluation.

Prioritize non-compliant Facilities using various criteria including safety, legal compliance, complaints, and other City defined criteria. This informs the Transition Plan.

Define a Facilities repair plan incorporating short-term capital planning and alignment with other public works projects.

Repair Facilities and track conditions as work is performed.

PROCESS

- Establish Interdepartmental Working Group
- Conduct a Comprehensive Facilities Inventory & Condition Assessment
- Implement Construction & Repair Tracking
- Evaluate Compliance with Standards
- Prioritize Facilities Needs Based on Compliance & Policies
- Implement Framework Monitoring & Reporting
- Develop Phased Framework Implementation Approach
- Establish Multi-Year Capital Improvement Plan
- Align Existing Resources
- Upgrade or Acquire New Technologies as Needed to Enhance Data Management
- Sustain Public Engagement & Communication

4.0 Facilities Management Framework Implementation Plan

The Framework Implementation Plan presents detailed implementation tasks assigned to City Departments and Divisions.

1	**Establish Facilities Management Framework Elements**

Define the framework for governance, task planning and execution, specifications, technology structure, and tools. Recommend development of a Strategic Asset Management Plan to develop more in-depth strategies and approach for a sustainable and streamlined framework.

2	**Conduct Facilities Inventory and Condition Assessment**

Perform the Facilities inventory and condition assessment, load data in a GIS and asset management system, determine compliance, and assign repair priority.

3	**Perform Barrier Repair**

Plan and remediate disabled access barriers using the Facilities non-compliance information and priority. Barrier repair includes reactive repair for urgent repairs and programmatic repairs defined by the Capital Improvement Plan (CIP).

4	**Perform Framework Operations**

Support the continuing operation of the Pedestrian Facilities Management Framework by inputting, updating, and managing the data; maintaining the technologies; training staff; providing routine reports; and performing periodic framework review.

5	**Adopt Policies Affecting Facilities Repairs**

The City may wish to evaluate and adopt policies to reduce future non-compliant Facilities and transfer responsibility of the repair to property owners adjacent to the Facilities.

Barrier Severity Scoring Recommendations

Facilities barriers identified in the condition assessment process will represent a wide range of accessibility non-compliance from very minor to significant. The City should adopt a barrier severity score to standardize the classification of the barrier severity and aid in prioritizing non-compliant barriers for repair.

Four severity scores are recommended for non-compliant barriers to aid the City in prioritization—Minor, Moderate, Severe, and Very Severe. Each score is associated with specific repair options supporting repair work planning.

5.0 Citywide Inventory and Assessment Cost and Schedule

Estimated costs for the Facilities inventory, assessment, and repair planning activities defined in the implementation plan are presented below. Costs estimates are for the direct costs for the recommended planned tasks and City staff efforts. Existing costs or internal City staff efforts aligned with the recommendations are not included.

Facilities Management Framework Structure

Estimated costs are $175,000 and 4–6 City staff over a duration of approximately 12–18 months.

Key milestones supporting the initiation of a new Facilities inventory and assessment can be initiated within 6–10 months of starting this task.

Facilities Inventory and Condition Assessment

Estimated costs for a citywide Facilities inventory and assessment (7,000 miles of streets) is between $4M and $9M, plus 6–8 City staff with a project duration of 18-24 months.

Estimated cost for an example project of 1,000 miles of streets is between $1.4M and $1.6M plus 2–3 City staff, with a project duration of 10–15 months.

Framework Operations

Annual operations costs assume existing GIS and asset management system software continues to meet the need without additional costs attributable specifically to the Pedestrian Facilities Management Framework. Support needs are estimated at 4–5 City staff.

Barrier Repair

Barrier repair costs are unknown but generally range from $1M and $5M per linear mile of sidewalk remediated, and maintenance cost to be determined due to variability. The cost and duration is defined by the number, type, and condition of non-compliant Facilities found via the assessment and the rate at which new barriers are introduced. This effort is expected to take decades. City crews should perform the repair if necessary staff are available. Department of Public Works project managers should manage the repair if work is completed by a contractor.

Report Structure

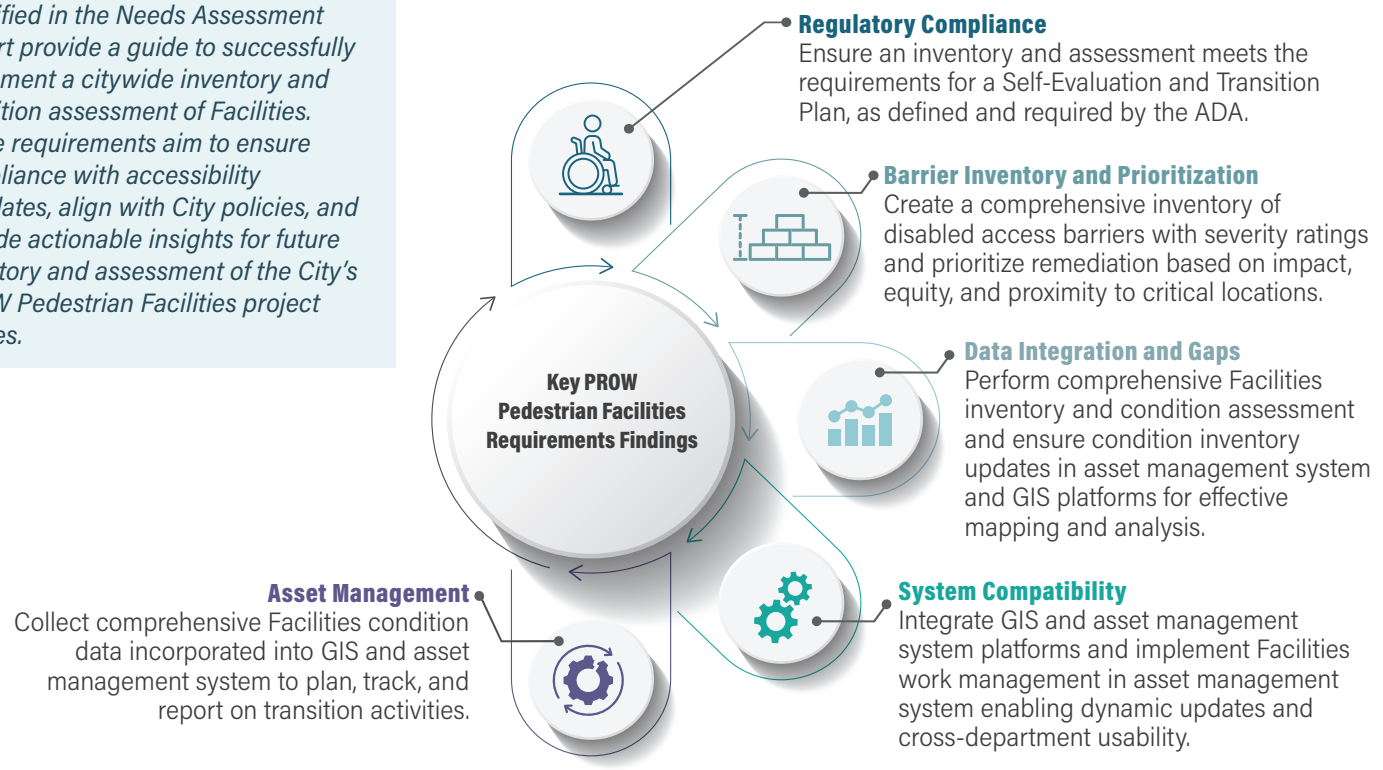
Section 1.0	**Requirements and Needs**
	Outlines legal mandates, inventory needs, and planning strategies.
Section 2.0	**Technology Research and Demonstration**
	Details pilot objectives, methodologies, results, and lessons learned.
Section 3.0	**Facilities Management Framework Approach**
	Summarizes current Facilities management activities, industry best practices, and a vision for an updated approach.
Section 4.0	**Facilities Management Framework Implementation Plan**
	Recommends seven primary implementation tasks with City responsibilities. Presents criteria for classifying disabled access barriers into four categories based on severity and presents recommended barrier repair.
Section 5.0	**Citywide Inventory and Assessment Cost and Schedule**
	Provides estimates of costs and timeframes for implementation of recommendations.
Section 6.0	**Appendices**

1.0 REQUIREMENTS AND NEEDS

Section 1.0 outlines the requirements for Facilities inventory and assessment based on the stakeholder Needs Assessment. Conducted as part of Phase I: Pilot, the requirements identified in the Needs Assessment Report provide a guide to successfully implement a citywide inventory and condition assessment of Facilities. These requirements aim to ensure compliance with accessibility mandates, align with City policies, and provide actionable insights for future inventory and assessment of the City's PROW Pedestrian Facilities project phases.

1.1 Background

The graphic below summarizes the requirement to address regulatory compliance and recommendations for barrier inventory, prioritization, and data management practices to support Transition Plan development and barrier mitigation.



1.2 Disabled Access Requirements

As a covered entity under Title II of the ADA, the City is responsible for ensuring its program of Facilities is readily accessible to and usable by people with disabilities. This includes, among other requirements, a Self-Evaluation and Transition Plan to address policies and existing facilities.

A Self-Evaluation is an analysis of and update to the City's policies which impact compliance and equal access by people with disabilities. A Self-Evaluation would include, but are not limited to: policies, practices, procedures, standards, contracts, local laws and codes, etc. relating to budgeting practices; contracting practices; project selection and prioritization; public outreach practices; project scoping, design, construction, inspection; and Facilities maintenance, by the City or by other agencies and individuals.

The Self-Evaluation and update to noncomplying polices was required to be completed by January 26, 1993, within one year of the ADA. Additionally, California Department of Transportation (Caltrans) requires the City's to update the Self Evaluation at least every three years and annual certify these requirements have been met. The current project (Pilot Phase: Inventory and Assessment) does not include a Self-Evaluation of the City's policies, practices, and procedures.

In the event structural changes are needed to provide equal access to the City's Facilities, a Transition Plan is required to be completed by July 26, 1992. A Transition Plan, at a minimum, identifies physical obstacles in existing Facilities (as defined) that limit accessibility to individuals with disabilities; identifies the steps necessary to complete the work; describes in detail the methods that will be used to make the Facilities accessible; specifies the schedule for achieving compliance and the steps that will be taken each year; includes a schedule for providing curb ramps where sidewalks cross curbs; and indicates the official responsible for implementation of the plan.

1.2.1 Self-Evaluation and Transition Plan Lessons Learned

The evaluation of eight other municipalities that have completed ADA Self-Evaluation and Transition Plan between 2005 and 2023 provide insight as best practices and lessons learned.

Self-Evaluation and Transition Plan Findings

ADA Self-Evaluation represents a limited "snapshot" in time, capturing existing barriers to guide Facilities improvement priorities. Future engineering-level, project site-specific assessment will be necessary to accommodate changes in conditions, public input, funding, and federal requirements.

There is a wide range of ADA Self-Evaluation Facilities scope analyses and timing of updates. Some cities elect to only analyze curb ramps and sidewalks, while others include push buttons, pedestrian signs, ADA parking spaces, etc. Cities must meet the base requirements of the 1990 ADA, the 1973 Rehabilitation Act Section 504, CBC Title 24, and PROWAG. There is also a wide range of acceptable methods regarding timing. Some jurisdictions aim to update the ADA Transition Plan every year, Caltrans recommends updates every three to five years, and the Federal Highway Administration (FHWA) leaves the update timelines undefined.

Public outreach methods vary greatly. While some jurisdictions conducted extensive outreach over several years, other cities conducted community engagement after releasing their Draft Transition Plan, often with minimal public input.

Traditional, in-person measurements and fieldwork still have advantages despite new automated technologies. Despite advances in automated scanners and digital-visual analysis, qualitative analysis of sidewalk surfaces, crosswalk striping, and aboveground elements may require in-person surveyors. AI integration can improve visual analysis, especially for large jurisdictions like Los Angeles, but in-person verification and analysis of ADA assets and Facilities to augment automated data collection methods will be needed.

There is a high degree of variability in cost. In comparison of eight jurisdictions, costs varied greatly due to inconsistent PROW assets and features studied, depending on the jurisdiction. However, Long Beach, Charlotte, Seattle, and Fresno had significantly lower costs by applying automated scanners and computer-based virtual reviews to reduce expenses.

1.3 Data Requirements

1.3.1 Stakeholder Data Gaps

Facilities management requires significant data to support decision making, facility repair needs, and planning and executing prioritized repairs. Stakeholders identified gaps in data availability, content, or level of detail needed to manage Facilities.

Table 1-1. Stakeholder Data Gaps and Examples

Stakeholder	Data Need	Current Data Availability	Identified Data Gaps	Example
Department on Disability (DOD)	Known barriers to Facilities with non-compliance severity	Accessibility requirements data and barriers partially documented	Severity of non-compliance and prioritization; integration of compliance data across systems; no centralized database for severity assessment	Lack of a unified severity scoring system for ADA non-compliance
Los Angeles Department of Transportation (LADOT)	Crosswalk markings Pedestrian signals Traffic control devices Transit stops On-street accessible parking and loading zones	Crosswalk markings and signals represented in GIS but lacking detailed condition data Transit stops in GIS	Detailed signal and crosswalk condition data; integration with broader pedestrian traffic data On-street accessible parking and loading zones are not defined in GIS Missing details on crosswalk markings, lighting, and pedestrian refuge islands	Missing detailed condition data for pedestrian signals near major intersections
Bureau of Street Services (BSS)	Road surface conditions Sidewalk and curb ramp inventory and characteristics Sidewalk and curb ramp condition and repair history Transit stop amenities Tree impacts on Facilities	Sidewalk and curb ramp locations and attributes exist in GIS, however condition data and repair tracking is incomplete Transit stop amenities are linked to GIS and asset management	Comprehensive condition assessment and historical maintenance data for sidewalks and curb ramps Sidewalks lacking detailed data on cracks, uneven surfaces, slopes, or obstructions affecting sidewalks Inadequate information on curb ramp slopes, transitions, and detectable warning surfaces	Sidewalk and curb ramp repairs are not tracked in the GIS or asset management system

Stakeholder	Data Need	Current Data Availability	Identified Data Gaps	Example
Bureau of Engineering (BOE)	Sidewalk and curb ramp inventory and characteristics Sidewalk and curb ramp condition and repair history Tree impacts on Facilities	Curb ramps and sidewalks represented in GIS, however limited tree impact data and condition updates	Complete geometric data for curb ramps; systematic tree impact analysis and updates Sidewalks lacking detailed data on cracks, uneven surfaces, slopes, or obstructions affecting sidewalks Inadequate information on curb ramp slopes, transitions, and detectable warning surfaces	Tree root uplift causing sidewalk damage not systematically recorded

1.3.2 Barrier Data Needs Identification and Classification

Stakeholder-identified Facilities barrier needs represent specific measurement data for each barrier type.

Table 1-2. Barrier Data Needs

Barrier Type	Data Required	Purpose	Example Data Point
Sidewalk Uplifts	Measurement of vertical offsets, slope, and gaps	Assess accessibility requirements and prioritize repairs	Uplift exceeding ¼ inch causing trip hazard
Curb Ramp Non-Compliance	Geometric data (e.g. slope, width, detectable warnings)	Assess accessibility requirements and prioritize repairs	Ramp slope exceeding 2% or missing tactile surface
Pedestrian Signal Accessibility Issues	Functionality of push buttons, audible and tactile features	Ensure signals meet accessibility standards for disabled users	Non-functioning audible indication at major intersection
Crosswalk Condition	Surface condition data, presence of markings, and material	Evaluate safety and compliance for pedestrian crossing	Rough surface impeding wheelchair travel
Tree Root Damage	Impact assessment of roots on sidewalk elevation and safety	Identify and mitigate tree-related safety hazards	Roots causing 2-inch uplift on heavily used sidewalk

Other Needs

Additional information is needed to manage Facilities.

- **Severity Ratings:** Lack of a standardized system for classifying the severity of identified barriers.
- **Unmapped Barriers:** Gaps in geospatially tagging barriers for prioritization and remediation planning.
- **Connectivity:** Missing data on pathway connectivity, including gaps in sidewalk networks and links to critical destinations like schools and healthcare facilities.

GIS Data Integration and Geolocation	Accessibility Data
Incomplete Geospatial Data: GIS mapping of pedestrian facilities incomplete, making mapping and analysis challenging. **Dynamic Updates:** Stakeholders identified the need for timely GIS data updates to reflect new construction or barrier repair activities.	**Missing Features:** Lack of data on missing accessibility elements, such as tactile strips at transit stops or accessible pedestrian signals. **Amenities Data:** Limited information on amenities like benches, shelters, and lighting that affect pedestrian usability. (Note: This data is available through the BSS Sidewalk and Transit Amenities Program).
Stakeholder-Identified Data Priorities	**Long-Term Data Maintenance**
Equity Indicators: Absence of data reflecting equity considerations, such as socioeconomic and demographic information for prioritization. (Note: This data is in GIS and can be used by other departments). **Community Feedback:** Insufficient mechanisms for integrating direct input from residents about accessibility challenges. (Note: MyLA311 allows public reporting of pedestrian facilities and reported to DOD).	**Ongoing Monitoring:** Missing protocols for tracking changes in facility conditions over time. **Lifecycle Data:** Facilities maintenance schedules and facility degradation rates are not defined.

1.4 System Compatibility Needs

Integration with Existing Systems

GIS Platforms: Ensure full compatibility with the City's GIS platforms, such as NavigateLA and GeoHub, for seamless mapping and spatial analysis.

Asset Management Systems: Align with the City's asset management system tools like OpenGov or similar systems to streamline Facilities monitoring and barrier remediation planning.

Data Interoperability: Utilize open data standards to facilitate smooth data exchange between systems.

Data Format and Structure

Standardized Formats: Store data in formats compatible with commonly used tools and platforms (e.g. Geodtabase, shapefiles, GeoJSON, CSV).

Metadata Requirements: Include metadata for each dataset to describe attributes, collection methods, and quality assurance processes.

Scalability: Design data systems to accommodate future expansions as new data points are added or updated.

Timely Updates

Dynamic Data Integration: Enable Facilities inventory and condition updates to reflect changes due to new construction, barrier repair, or facility degradation.

Automated Synchronization: Ensure Facilities inventory and condition updates are automatically synced with centralized databases to maintain accuracy.

User Access

Cross-Department Usability: Ensure all relevant City departments can easily access and use the system for planning, reporting, and decision-making.

Public Transparency: Support public-facing tools, such as dashboards or interactive maps, to enhance community engagement and transparency.

Reporting and Analysis Tools

Custom Reporting: Support customizable reporting features to meet specific stakeholder needs, such as barrier severity analysis or cost estimates.

Analytical Compatibility: Ensure compatibility with advanced analytics tools like Tableau, ArcGIS Insights, or Python-based modeling platforms.

Future-Proofing

Scalable Architecture: Design systems with scalability in mind to handle increased data volumes and complexity as the City's needs grow.

Adaptability: Ensure systems can accommodate changes in accessibility regulations or City policies without major overhauls.

1.5 Cross-Department Coordination Needs

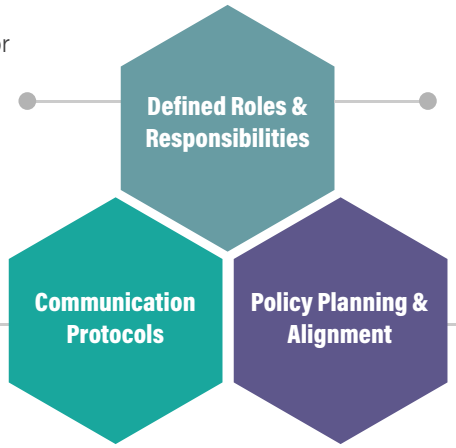
Data Access and Sharing

Centralized Database: Create a shared database accessible to all relevant departments, ensuring data on Facilities, barriers, and compliance status is consistent and available.

Standardized Formats: Use uniform data formats and structures to facilitate interoperability and consistency across departments.

Cross Departmental Data Update: Enable departments to view and contribute data updates, reducing duplication of efforts and ensuring accuracy.

Clear Assignment of Tasks: Define specific roles for each department involved in inventory and assessment of the City's Facilities, such as data collection, analysis, remediation planning, and community engagement.



Lead Agency Designation: Appoint a lead agency or coordinator to oversee cross-departmental efforts, resolve conflicts, and ensure alignment with inventory and assessment of the City's Facilities goals.

Regular Meetings: Establish regular coordination meetings with stakeholders to discuss progress, address challenges, and share updates.

Collaboration Platforms: Use centralized collaboration tools such as GIS Web based Application and streamline communication.

Reporting Frameworks: Develop standardized reporting using asset management systems or Power BI to ensure consistency in updates shared across departments.

Unified Policies: Align departmental policies and procedures to avoid conflicts and ensure consistency in decision-making.

Integrated Planning: Coordinate planning efforts for accessibility compliance with other citywide initiatives, such as capital infrastructure plan development.

1.6 Community Needs

As part of the Phase I: Pilot, a survey questionnaire was sent out to gather input from community members, businesses, and organizations to identify accessibility barriers and prioritize improvements within the PROW in Los Angeles. The pilot contributes to the City's future comprehensive planning and organization of PROW-related strategy and funding, as well as contribute updates to the City's Self-Evaluation and Transition Plan, required in compliance with disabled access laws and regulations. The feedback is crucial to developing a comprehensive approach to Facilities construction, repair, and maintenance across the City.

The online survey was issued in English and Spanish from June 27, 2024, to September 25, 2024, receiving 644 responses from within the City limits, 171 responses outside of the City, and covering 152 zip codes.

1.6.1 Key Findings from Survey Respondents

The following are key findings and insights derived from the survey responses:

Top Concerns	Priority Facilities
Sidewalk Maintenance: Cracks, uplifts, and uneven surfaces caused by tree roots necessitate prompt repair and regular upkeep. **Safety:** Calls for improved crosswalks, traffic calming measures, and better lighting. **Accessibility:** Increased demand for curb ramps, wider sidewalks, and obstacle removal. **Shade and Trees:** Emphasis on planting and maintaining trees for shade and comfort. **Community Spaces:** Desire for pedestrian-friendly areas like parklets, plazas, and seating zones.	**Sidewalks** **Curb Ramps** **Pedestrian Push Buttons** **Crosswalks** **Public Transit Stops** **Additional Features:** Adequate lighting, shade, cleanliness, and slip-resistant surfaces.
Key Locations for Improvements	**Data Utilization**
Government Buildings **Schools** **Healthcare Facilities** **Parks** **Residential Areas** **Public Transit Access Points**	**Enhance** accessibility and safety. **Centralize** data systems for efficient management. **Prioritize** facility repairs and strategic improvements. **Allocate** funding effectively. **Develop** long-term maintenance plans.

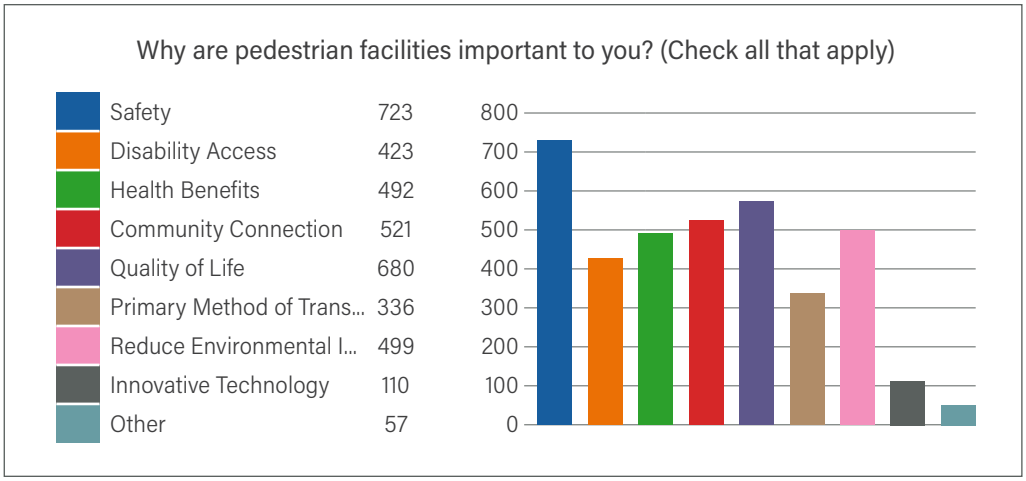


Figure 1-1. *Survey Results for Facilities Ranking*

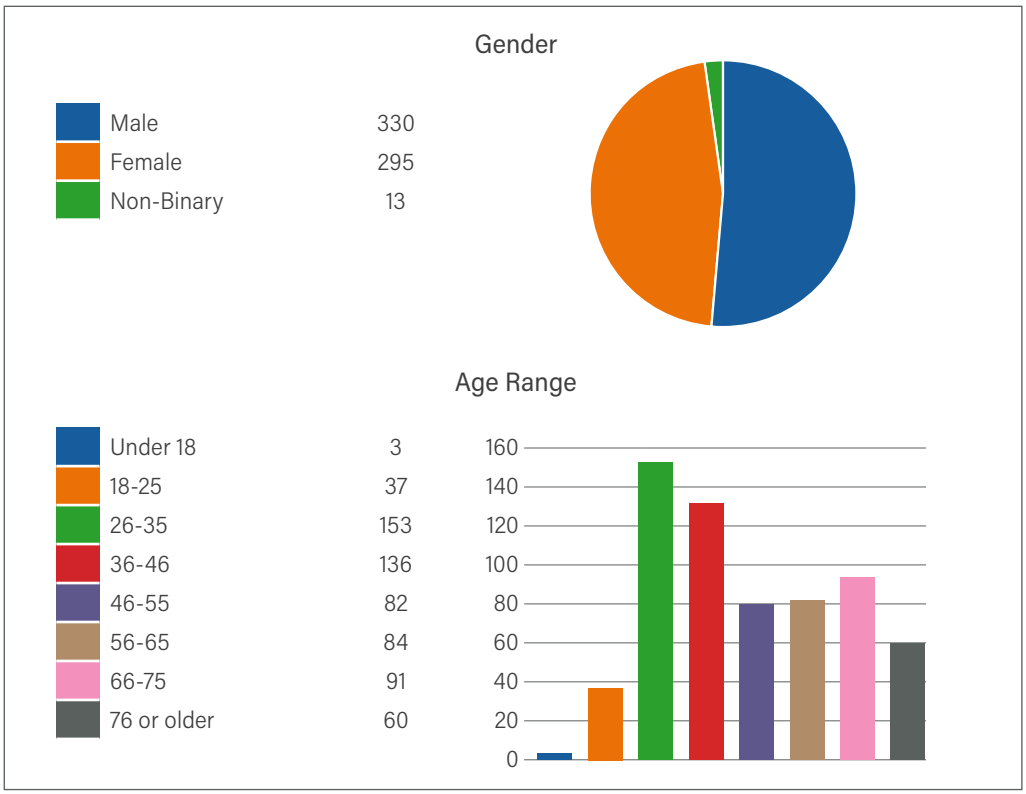


Figure 1-2. *Survey Results for Gender and Age Breakdown*

2.0 TECHNOLOGY RESEARCH AND DEMONSTRATION

Section 2.0 discusses the Phase 1: Pilot objectives, methodologies, results, and lessons learned. Technology research was performed to assess viable technologies to efficiently inventory facilities and assess accessibility compliance by collecting facility measurements. Multiple vendors performed an assessment on facilities in targeted areas of the City using various technologies.

2.1 Objectives

The Inventory and Assessment of the City's PROW Pedestrian Facilities Phase I: Pilot aimed to evaluate the effectiveness of various technologies in assessing pedestrian assets within the City's PROW for compliance with PROWAG. The goal was to inform strategies for a citywide inventory and compliance effort, balancing cost-efficiency, accuracy, and scalability while integrating with existing GIS and asset management systems.

2.2 Approach

The study engaged six vendors and technologies to assess diverse pilot locations within Los Angeles, using data from approximately 4.3 miles of sidewalks and related Facilities. The vendor methodologies were compared for their accuracy, data richness, operational scalability, and applicability to meet the Facilities management requirements.

2.3 Phase I: Locations

The selected locations covered various environments, including residential, commercial, hillsides, and high-traffic transit corridors, ensuring the findings addressed diverse pedestrian infrastructure challenges and the findings are relevant for citywide analysis. Table 2-1 below identifies the pilot locations and land use categories.

Table 2-1. *Phase I: Pilot Locations, Category, and Miles*

Phase 1: Pilot Location	Location	Category	Centerline Miles
1	Grand Ave. from Pico to Olympic Blvd.	Commercial/Major Pedestrian and Vehicular Transit Corridor	0.3 miles
2	S. Grand Ave. from W. 5th St. to W. 2nd St.	City Hall/Downtown	1.0 miles
3	S. Flower St. from W. 12th St. to Venice Blvd.	Regional Commercial/Downtown	0.4 miles
4	San Rafael Ave. from Mount Washington Dr. to W. Ave 37th & W. Ave 37th from San Rafael Ave. to Mayfair Dr.	Hillside/Rural	0.7 miles
5	N. Ave 52nd from Granada St. to Monte Vista St.	Historic	0.3 miles
6	S. Flower St. from Venice Blvd. to W. 9th St	Urban Residential	0.7 miles

2.4 Participating Vendors

The Phase I: Pilot engaged multiple vendors to test a variety of data collection technologies and methods across selected pilot locations. Each vendor contributed unique expertise and tools to evaluate Facilities for compliance with ADA and PROWAG standards. The inclusion of both advanced technological methods and conventional collection ensured a balanced assessment, enabling a comparison of accuracy, scalability, and cost-effectiveness.

Participating Vendors

1. **Bureau Veritas-PathVu:** Utilized GPS-equipped carts with cameras, lasers, and intertial measurement recording (IMU) sensors to profile sidewalk conditions and provide remediation insights.
2. **Citian:** Deployed high-precision LiDAR with AI processing to deliver detailed, scalable data for citywide PROW assessments.
3. **Cyclomedia:** Deployed vehicles mounted with 360-degree cameras and LiDAR sensors to capture high-resolution panoramic imagery and 3D point cloud data to collect PROW assets.
4. **DaxBot:** Introduced autonomous robotic technology combining LiDAR and IMU for precise pedestrian infrastructure mapping.
5. **DeepWalk:** Leveraged iPhone-based LiDAR systems for localized, affordable data collection suitable for smaller-scale projects.
6. **IMS:** Employed ATV-mounted Gocater lasers and cameras to collect scalable datasets across extensive areas with vehicle-based systems.

2.4.1 Role of Psomas for Conventional Collection

Psomas played a critical role in the Phase I: Pilot by providing traditional data collection methods. This approach included the use of digital levels and manual measurements to assess vertical displacements, slopes, and sidewalk widths. Psomas' data served as a control dataset against which the accuracy and reliability of advanced technologies were evaluated. The manual methods provided a ground truth benchmark, ensuring technological outputs could be validated and refined for future large-scale implementations.

The participation of multiple vendors allowed for a diverse range of data collection techniques to be evaluated. By including Psomas' conventional methods alongside advanced technologies, the Phase I: Pilot ensured a rigorous assessment of accuracy, precision, and scalability. This comparative analysis supports the City's efforts to select the most effective technologies for a comprehensive citywide Facilities inventory.

2.5 Requested Data Collected – Vendor Comparison

2.5.1 Overview

Data collection phase of the Phase I: Pilot aimed to evaluate the ability of vendors to capture critical pedestrian infrastructure attributes with accuracy and granularity. To ensure compliance with PROWAG standards, vendors were tasked with collecting and analyzing features such as sidewalks, curb ramps, slopes, and barriers.

The Vendor Asset Collection Comparison table below compares the capabilities of various vendors and their respective technologies in collecting data relevant to pilot data requirements and ADA and PROWAG standards. It highlights each vendor's ability to gather information on critical features such as sidewalks, displacement, barriers, street slopes, curb ramps, crosswalks, passenger loading zones, pedestrian signals, transit stops, and staircases. The table also notes whether the technologies provide detailed data, categories, or flags for remediation recommendations. By presenting this information, the table helps stakeholders evaluate the suitability of each technology for accessibility requirements assessments, focusing on which features are covered, the depth of the data provided, and any limitations. This comparison is essential for selecting technologies that align with specific Phase I: Pilot requirements, ensuring comprehensive, accurate, and actionable data collection for accessibility requirements.

Table 2-2. Vendor Asset Collection Comparison

Vendor	Technology	Sidewalk	Displacement	Barriers	Street Slope	Missing Sidewalk	Curb Ramp	All Curb Ramp Criteria	Crosswalk	Passenger Loading Zone	Pedestrian Signals	Transit Stop	Staircase	Images
Bureau Veritas-PathVu	Cart with GPS and high-resolution cameras, lasers, IMU	✓	H/V - Category	Flag	✓	–	✓	✓	–	–	–	–	–	✓
Citian	High-precision LiDAR with AI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	P/NP	✓
Cyclomedia	High-precision LiDAR with AI processing	✓	–	–	–	–	✓	–	✓	✓	✓	✓	–	✓
DaxBot	Autonomous robot with LiDAR and IMU	✓	✓	✓	✓	✓	✓	✓	✓	✓	P/NP	✓	–	✓
Deep Walk	iPhone LiDAR with AI	✓	H/V - Category	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓
IMS	ATV-mounted Gocator lasers, IMU, and camera	✓	✓	✓	✓	–	–	–	–	–	–	–	–	✓

Attributes assessed included:

- **Sidewalks:** Cross slope, running slope, vertical changes, travel path width, surface material.
- **Curb Ramps:** Slope, width, detectability, and obstructions.
- **Other Facilities:** Passenger loading zones, crosswalks, transit stops
- **Sidewalk Width:** Daxbot, IMS, BV-PathVu had width measurement limits. For a complete sidewalk width, two passes will be required.

LEGEND

✓	Met pilot data requirement with data
–	Item not collected
P/NP	Presence/absence of an asset is flagged
Flag	Condition is flagged, no measurement
H/V-Category	Categorized based on horizontal and vertical displacement (e.g. severity levels)

2.6 Collection Technologies Recommendations

To support a scalable and cost-effective citywide inventory and assessment of Facilities, the following technologies should be considered:

MTLS with AI Processing

Mobile Terrestrial Laser Scanning (MTLS) with AI-powered processing is the preferred technology for large-scale and citywide Facilities condition assessments. Citian: Vehicle-mounted LiDAR with AI Processing—balanced high accuracy, precision, and match rate, excelling in scalability and consistency.

Advantages

- High accuracy and scalability across extensive areas.
- AI integration ensures automated analysis for PROWAG compliance.
- Cost-effective for capturing additional assets (e.g. trees, barriers) from LiDAR data without requiring additional surveys.
- Seamless integration with GIS and asset management systems

Use Case

Ideal for comprehensive citywide assessments, particularly where data collection must be efficient and repeatable.

Bureau Vertias-PathVu or DaxBot

For localized or high-precision assessments, Bureau Veritas-PathVu's cart-based systems and DaxBot's autonomous robotic technology are recommended.

Advantages

- **Bureau Vertias-PathVu:** Provides detailed assessment with actionable remediation recommendations (e.g. grinding, pruning).
- **DaxBot:** Delivers advanced voxel mapping for complex environments requiring highly detailed measurements. Unmanned robot with high-precision instrumentation delivered reliable precision and consistent results through robust quality control and instrumentation.

Use Case

Suitable for smaller and challenging areas, such as historic districts, high-pedestrian zones, or areas with irregular terrain.

Considerations for Citywide Assessment

- **Citian:** Vehicle-mounted LiDAR with AI processing appears to be the most suitable vendor for large-scale sidewalk data analysis projects.
- **DaxBot:** Unmanned robot with high precision instrumentation is a strong contender for sidewalk-specific data collection for specialized project needs.

2.7 Compatibility Challenges Between Proprietary Systems

One of the key challenges encountered was integrating vendor data into the existing OpenGov Cartegraph asset management system. Many vendors rely on proprietary data formats, tools, and processes that are not directly compatible with the City's EAM infrastructure. This mismatch led to delays in data processing and increased the need for manual adjustments to align vendor deliverables with system requirements.

Key Issues

- Non-standard file formats and naming conventions.
- Limited interoperability of vendor-specific software.
- Inconsistent attribute mapping for critical data points.

Recommendations

- Require vendors to deliver data in a predefined OpenGov-compliant schema to ensure consistency and compatibility.
- Establish clear integration protocols for vendors, including required formats, units, and attribute standards.
- Use ETL (Extract, Transform, Load) tools to automate the mapping and alignment of vendor data into OpenGov systems.

2.8 Need for Predefined Asset Management Compliant Schemas for Vendor Data Submissions

The integration of vendor-provided data into the asset management system is critical for streamlining operations, maintaining data accuracy, and ensuring compliance with ADA and PROWAG standards. However, the lack of standardized, asset management system compliant data schemas for vendor submissions has introduced challenges, including delays in data processing, inconsistencies in format and structure, and additional costs for post-processing workflows.

To address these issues, the City should create a predefined, asset management system compliant schema as a requirement for all vendor data submissions. These schemas will provide clear guidelines on data formats, attribute structures, and submission protocols, ensuring seamless integration with the asset management system.

3.0 FACILITIES MANAGEMENT FRAMEWORK APPROACH

Section 3.0 summarizes the City's current Facilities management activities, provides information on the industry's best practices, and a proposed City framework for an updated approach. The framework approach is informed and guided by best practices and findings from the technology Phase I: Pilot and is shaped by the specific needs and characteristics of the City's Facilities.

The recommended approach drives the Pedestrian Facilities Management Framework Implementation Recommendations presented in Section 4.0.

3.1 Background

Public right-of-ways are critical for providing access and connectivity throughout the City, serving commercial activities, emergency services, and public needs such as access to work, school, shopping, tourism, and other essential functions.

The City and other stakeholders are responsible for maintaining Facilities, including sidewalks, curb ramps, street crossings, and other facilities to enable safe and accessible movement across the City. These facilities connect various modes of private and public transportation through pedestrian pathways.

The City's Facilities have been constructed over many decades, adhering to different design standards and experiencing varying levels of physical degradation due to factors like tree root uplift and other impacts.

The structural condition and disabled access compliance of these Facilities vary significantly. However, a comprehensive assessment of the current state, including condition, has not yet been completed. This lack of complete information complicates the planning, funding, and execution of necessary repairs to meet accessibility requirements and the Settlement.

3.2 The Need for a Pedestrian Facilities Management Framework

The City should establish a robust Pedestrian Facilities Management Framework to:

- Ensure pedestrian safety and disabled access compliance of pedestrian infrastructure within the PROW.
- Support Self-Evaluation and Transition Plan requirements.
- Improve compliance with federal and state disabled access laws and regulations.
- Increase transparency of Facilities needs and repair activities.
- Facilitate long-term capital planning.

The Framework will address existing gaps and provide a sustainable framework of policy, operations, and technology that meets legislative, legal, and operations requirements. Current practices leave significant gaps in identifying the inventory, condition, and compliance status of Facilities. These gaps hinder systematic, data-driven prioritization, leading to ad-hoc solutions that fail to address comprehensive citywide needs for Facilities management.

By developing a comprehensive Facilities inventory and assessment framework, the City can implement automation-assisted compliance scoring and prioritization for repairs, reflecting legal requirements and City policies.

The Framework also enhances operational efficiency in work planning and execution, enabling multi-year planning and coordination across departments to achieve better outcomes, seize broader funding opportunities, and expand neighborhood and travel path improvements.

Technological advancements, such as automated data collection, GIS integration, and modern asset management systems, will further enhance coordination, support data-driven decision-making, provide transparency, improve work planning and execution, and support long-term financial planning for reconstruction and maintenance.

> The Framework will be designed to adapt to evolving standards, policies, technologies, roles, responsibilities, and funding levels.

3.2.1 Vision for a Citywide Pedestrian Facilities Management Framework

The following sections outline the vision and key components necessary for establishing a Citywide Pedestrian Facilities Management Framework.

Framework Objectives

The Framework is intended to address needs for Facilities management using systematic processes and standards to address pedestrian safety, regulatory compliance, and City policies.

1 MANAGE

Facilities within the PROW.

2 EMPHASIZE

pedestrian safety, mobility, and accessibility.

3 COMPLY

with all Facilities regulations and accessibility requirements.

4 ESTABLISH AND APPLY

standards, procedures, specifications, analysis tools, and reporting to all Facilities management processes.

4 IMPLEMENT

information systems and technologies to enable centralized information access to Facilities Information pertaining to all aspects of the Facilities management lifecycle.

6 DEFINE

responsibilities for the planning, design, construction, inspection, maintenance, repair, and long-term planning of Facilities.

7 REFLECT

the unique characteristics of the City's Facilities considering the PROW's scale of the PROW, existing Facilities conditions, land use characteristics, physical topography, demographics, pedestrian generator sites, and interconnections with other travel modes.

8 DESIGN

the Framework for sustainability by incorporating flexibility into the Framework components to adapt to changing specifications, technologies, policies, and funding levels.

9 APPLY

relevant best practices and continue to consider the evolution and maturation of best practices to shape the Framework over time.

Framework Strategy

The strategy outlines a comprehensive approach to effectively implement and manage the Pedestrian Facilities Management Framework.

1 Establish an Interdepartmental Working Group

Form a cross-departmental working group including representatives from all City entities responsible for any aspect of the Facilities' lifecycle. This group will oversee the launch and development of the Framework, ensuring collaboration across departments.

2 Conduct a Comprehensive Facilities Inventory

Execute a citywide inventory and assessment to collect data on the condition of all Facilities using advanced technology and contracted services. This will serve as the baseline for tracking status and identifying pedestrian facilities for improvement.

3 Implement Construction and Repair Tracking

Using an asset management system, implement standardized tracking of construction and maintenance activities related to Facilities. This system will be used to keep the inventory up-to-date, ensuring accurate data on conditions impacted by City operations.

4 Evaluate Compliance with Standards

Assess all Facilities for compliance with relevant standards and regulations to help prioritize improvements based on safety, accessibility, and performance.

5 Prioritize Facilities Needs Based on Compliance and Policies

Categorize Facilities improvement needs based on compliance scoring, safety concerns, and City policies regarding prioritization. This enables resource allocation to areas where they are most needed.

6 Implement Framework Monitoring and Reporting

Create monitoring and reporting capabilities to track progress and performance over time. Regular reporting will ensure transparency and provide insights for continuous improvement.

7 Develop a Phased Framework Implementation Approach

Create a phased implementation plan that reflects the prioritization of needs and the scale of necessary improvements. This phased approach will ensure a manageable and strategic Framework implementation, aligned with resource capacities.

8 Establish a Multi-Year Capital Improvement Plan

Develop a long-term capital improvement plan based on prioritized location data. This plan will guide repairs and upgrades over multiple years, ensuring steady progress toward Framework goals.

9 Align Existing Resources

Utilize current City technologies, data tracking, and work management processes as the foundation for initiating the Framework. Leverage ED9 to address needed changes to organizational structures and align resources with the Framework. This will streamline implementation and reduce operational overhead.

10 Upgrade or Acquire New Technologies as Needed to Enhance Data Management

Assess the need to enhance current technologies or acquire new tools to support efficient Framework operations, including data management and reporting.

11 Sustain Public Engagement and Communication

Develop and maintain a robust public engagement and communication strategy. This will inform stakeholders about the Framework's progress and seek their input to ensure it addresses public needs and expectations.

3.3 Best Practices for Pedestrian Facilities Management

Public agencies across the U.S. face similar challenges in managing Facilities. The goal is to provide safe, accessible pedestrian paths while complying with regulatory requirements. Best practices in pedestrian facilities management incorporate recommendations from industry organizations, relevant legislation, City policies, and other references.

Three major components contribute to the recommended best practices:

01 **Specifications, Standards, and Other Documented Best Practices**

02 **Review of Self-Evaluation and Transition Plan**

03 **Data Collection Pilot Study**

3.4 Specifications, Standards, and Other Documented Best Practices

The documents listed below include relevant best practices that have informed the development of the Pedestrian Facilities Management Framework (Framework) Approach.

Scoping and Technical Standards Defining Compliance Criteria	Organizational Recommendations, Case Studies, and Experiences
– Americans with Disabilities Act (ADA), Title II – Willits Settlement Agreement – US DOT: 2006 ADA and PROWAG standards for Transportation Facilities – Section 504 of the Rehabilitation Act of 1973 (Section 504) (29 U.S.C. §794) – U.S. Access Board Public Right-of-Way Accessibility Guidelines (2023 PROWAG) – BOE Special Order No. 04-0222 – 2022 California Building Code (CBC), Part 2, Title 24 CBSC (2021 International Building Code) – 2014 California Manual on Uniform Traffic Control Devices, based on FHWA's MUTCD 2009 Edition (California MUTCD Rev 8, effective January 11, 2024) – Departments of Transportation (DOT) – ADA Transition Plan by Local Governments	– Metropolitan Planning Organizations (MPO) – American Public Works Association (APWA) – National Association of City Transportation Officials (NACTO) – Asset Management System Software Providers – Automated Data Collection Techniques by Industry Practitioners – UCLA School of Engineering – Case Studies from Municipalities

3.4.1 Review of Self-Evaluation and Transition Plan

As part of this study, eight city and county Self-Evaluation and Transition Plans were reviewed for an in-depth analysis of their methodologies for Facilities condition assessment including standards applied, technologies used, data collected, work prioritization, and quality management.

3.4.2 Data Collection Pilot Study

A pilot data collection study included evaluation of multiple technologies for Facilities inventory, condition measurements, and condition classification. The pilot demonstrated the application of industry practitioners' best practices and technologies to areas of the City representing a diversity of expected Facilities conditions throughout the City.

3.4.3 Recommended Best Practices

Based on published standards and methods, Phase I: Pilot, and industry understanding, the following best practices are recommended for the City to manage Facilities.

Facilities management is currently dispersed across multiple departments, and existing practices do not fully align with best practices. The City's approach has evolved incrementally over time to address specific needs, leading to a system that lacks a comprehensive programmatic approach. Gaps also exist due to technologies that were established years ago and have not kept pace with current advancements.

Table 3-1 on the following page contrasts best practices with current City practices for key Framework areas.

Table 3-1. Recommended Barrier Severity Scores

Best Practices	Current City Practices
1. Inventory Pedestrian Facilities	
■ Conduct comprehensive inventory of Facilities across the City. ■ Conduct condition assessment of each existing facility and note missing facilities. ■ Conduct periodic inspections of Facilities. ■ Document non-compliance issues. ■ Complete the Self-Assessment.	■ The existing GIS inventory of curb ramps and sidewalks is approximate and needs enhancement. ■ Street crossings are represented in GIS, pedestrian push buttons are not inventoried in GIS. ■ Bus pads, parking, and loading areas are not inventoried in GIS. ■ Full conditions of City Facilities are not known or documented. ■ Self-Assessment not performed.
2. Define Repair Prioritization Criteria	
■ Assess risks to pedestrian safety. ■ Ensure compliance with policy, laws, and judgements. ■ Prioritize improvements in underserved or historically disadvantaged communities. ■ Incorporate user/stakeholder complaints and requests. ■ Use data-driven decision-making for automated prioritization.	■ Curb ramp reconstruction is driven by street resurfacing activities. ■ Sidewalk repair work is primarily driven by complaints from individuals with mobility disabilities, litigation, and property owner agreements. Thus repair work is predominantly reactive due to the lack of citywide condition information (Self-Assessment). ■ Other Facilities lack remediation workflows or prioritization processes.
3. Develop Repair Execution Strategies	
■ Implement a phased approach to remediation. ■ Coordinate with other public works projects. ■ Ensure disabled access compliance in all new projects. ■ Sustain a consistent and adequately funded maintenance effort. ■ Engage in public outreach and communication. ■ Initiate work orders or projects to remediate barriers not otherwise addressed through capital projects.	■ New construction is compliant with regulations and standards. ■ Citywide strategic prioritization is not possible due to the lack of Facilities condition information. ■ Work tracking is not linked to a centralized GIS inventory, and in several cases is not in any GIS inventory. However, work is progressing to increase the work linkage to GIS by deploying an asset management system. ■ Multiple tracking systems are used but not standardized or integrated. ■ Sidewalk and curb ramp improvements performed by StreetsLA are reported monthly, quarterly, and annually. Gaps in reporting exist from work performed by other entities. ■ An asset management system is being implemented to plan and track work activities.
4. Develop and Update a Transition Plan	
■ Develop a Transition Plan, either as a standalone plan or integrated into a capital improvement plan, that aligns maintenance and capital investments with available funding to maximize overall accessibility and state of good repair. ■ Regularly update the Transition Plan to reflect changing conditions and priorities.	■ A complete and comprehensive Facilities Self-Evaluation has not been conducted. ■ Transition planning is limited by the lack of Facilities inventory, compliance determination, barrier identification, and prioritization.
5. Leverage Technology	
■ Use automated data collection methods. ■ Utilize GIS mapping. ■ Apply asset management system software. ■ Generate a repair queue by applying data-driven prioritization criteria to asset management system data. ■ Create dashboards and maps to aid in planning and communicate Framework progress with stakeholders.	■ GIS is consistently used for mapping of ramps, sidewalks, and painted crosswalks, but other Facilities are not mapped. ■ Asset management systems are being deployed to multiple City entities involved in Facilities management. ■ Google sheets are largely used for Facilities work planning and tracking. ■ The Financial Management System (FMS) tracks City costs associated with Facilities maintenance and repair. ■ Property owner sidewalk reconstruction activities are tracked through www.sidewalks.lacity.gov.

Best Practices	Current City Practices
	■ Departmental workflows and technology systems are not fully integrated, increasing challenges for citywide Facilities planning and work coordination. ■ Facilities inventory methods and technologies have been investigated as part of the Phase I: Pilot

Adopting these best practices will help the City systematically manage Facilities, prioritize work based on need and risk, and execute improvements—ensuring accessibility and Settlement compliance with safe, accessible pedestrian facilities.

Despite gaps, the City continues to advance its practices through initiatives aimed at coordinating Facilities improvement projects across departments, expanding the use of GIS, and transitioning to modern asset management systems.

3.4.4 Existing Departmental Roles and Responsibilities Relative to the City's Facilities

Roles and responsibilities related to Facilities are distributed across departments. An integrated Facilities Management Framework will facilitate interdepartmental coordination by sharing common information and systems for planning and Facilities management activities.

Bureau of Engineering (BOE)

Standard Plans, project delivery for LADOT and other projects, and scoping design and construction for City Facilities. Management of the City's Sidewalk Repair Program (Settlement) and remediation of settlement-eligible barriers for PROW. Determination of PROW improvement requirements for private development and encroachments.

Dept. of City Planning (DCP)

Updates and maintains the City's General Plan, including the Mobility Element of the General Plan (Mobility Plan 2035). Creates and implements land use and zoning plans, including Community Plans and other planning overlays. Requires Facilities enhancements via private development approvals.

Dept. of Transportation (LADOT)

Policy, planning, and project development for street and transportation improvement projects. Construction, operation, and maintenance of traffic control devices and parking equipment. Development review for disabled access and circulation.

Bureau of Street Services (BSS)

Asset management and maintenance of streets, Facilities*, trees, and street furniture; construction of Facilities through BOE-managed Sidewalk Repair Program (Settlement); grant project delivery; and street use inspection and enforcement.

Bureau of Street Lighting (BSL)

Responsible for lighting of Facilities and associated obstructions (e.g. street poles in sidewalks).

Dept. on Disability (DOD)

Provides information to City departments on the compliance of accessibility requirements, Self-Assessment, and Transition Plan.

Office of Forest Mgmt. (OFM)

Responsible for developing an Urban Forest Management Plan, addressing tree canopy equity, and enhancing tree preservation.

Bureau of Sanitation (LASAN)

Bulky item removal of obstructions on Facilities, scoping design and construction of green infrastructure in Facilities.

Bureau of Contract Admin. (BCA)

Establish contracting requirements, verify Public Works projects comply with federal law, and inspect constructed improvements in the PROW.

*BSS does not currently operate an asset management program for Facilities.

3.5 Proposed Framework Scope Elements

The following elements form the backbone of the recommended Pedestrian Facilities Management Framework. These elements guide the Framework's work plan, addressing policies, data needs, tools, practices, and responsibilities essential for effective execution.

3.5.1 Policies and Standards

Policies and standards shape the Framework's priorities, scope, and actions.

- **Americans with Disabilities Act (ADA), Title II:** Accessibility laws and regulations.
- **Facilities Data:** Specifies the types of Facilities and information to be collected (e.g. condition, type, location).
- **Prioritization Policy:** Establishes criteria for prioritizing the remediation of non-compliant Facilities.
- **Responsibility Policy for Sidewalk Repairs:** Defines who is responsible for maintaining and repairing sidewalks (e.g. private property owners vs. the City).

3.5.2 Pedestrian Facilities Inventory

A comprehensive, up-to-date inventory of Facilities inventory is essential to document their location, condition, and characteristics.

- **Initial Inventory**
  Conduct a detailed inventory covering all Facilities such as sidewalks, curb ramps, crosswalks, and pedestrian signals. Use GIS-based asset management system software to map Facilities, their characteristics, physical condition, and document gaps where Facilities are missing.
- **Tracking Work and Condition**
  - **Work Tracking:** All construction, maintenance, and inspection activities must be recorded using an asset management system. This helps in maintaining an updated condition record of each individual pedestrian facility.
  - **Alternative Monitoring and Predictive Analysis:** Explore alternatives to reinspection, such as crowd-sourced data from the public and organizations, and incorporating requests from 311. Images from the City or third parties may also be processed with nascent AI tools to classify conditions of Facilities.
  - **Predictive Models:** Have Facilities degradation models consider factors like tree growth when estimating potential impact to sidewalks, triggering an inspection for condition verification.
- **Periodic Assessment:** Reassessment of City Facilities may be periodically performed to establish a new baseline. No industry standard exists for reassessing the compliance of Facilities. However, the City may model primary causes for pedestrian facility degradation such as tree root uplift to understand the rate of degradation associated with various primary causes. Further analysis could determine where and how frequently to reassess Facilities impacted by known factors.

  Further, Facilities inventory and assessment technologies are expected to advance, resulting in lower costs for updating pedestrian facility conditions. Significant cost reductions may enable more frequent reassessment in future years.

  In the absence of a standard reassessment interval, the City should evaluate the rate of Facilities degradation (10 years after the initial assessment) to inform a City policy for reassessment. Reinspection should be limited to areas with high probability of degradation, such as tree root uplift and Facilities without any work history or inspection over an extended period of time. Reinspection should use methods similar to those used during the initial assessment or upgraded to newer technologies.

3.5.3 Identifying Needs and Priorities

Data analytics using objective scoring and automation should be used to determine repair priority based on Facilities condition scores and prioritization criteria. Scoring can inform project selection but it cannot inform project scoping. Severity rating can only inform barrier removal and maintenance projects, as defined.

- **Pedestrian Facilities Compliance Scoring**
  A computerized compliance scoring model should evaluate Facilities based on criteria like surface integrity, slope, obstructions, and width or other applicable facility characteristics defined by disability access standards. Each criterion will have its own score (e.g. compliant/non-compliant and severity levels). Aggregate scores should be calculated for each pedestrian facility and block level for consistency and efficiency in identifying high-priority areas.
- **Pedestrian Facilities Prioritization Scoring**
  Prioritization criteria should guide the order in which non-compliant Facilities are remediated or repaired. Assign prioritization by using a model configured to City policies, reflecting facility condition and factors such as demographics and pedestrian traffic. Scores could be categorized as high, medium, or low for simplicity.
- **Key Factors to Base Prioritization**
  - **Severity of Damage or Barrier:** Facilities compliance scoring enables prioritization of higher severity damage or barrier.
  - **Risk-Based:** Focus on areas where non-compliance poses the greatest risk to the greatest number of pedestrians, particularly in high-traffic areas.
  - **Pedestrian Generation:** Prioritize areas near public facilities (e.g. schools, hospitals, event venues) and locations frequently used by people with disabilities.
  - **Equity Considerations:** Ensure improvements in historically underserved communities.
  - **User Complaints and Requests:** Use citizen feedback to help identify high-priority issues.
  - **Coordination with Other Projects:** Align Facilities upgrades with ongoing public works projects to reduce costs and community disruption.
  - **Neighborhood Impact:** Prioritize areas where multiple small improvements will have a larger collective impact on pedestrian safety and accessibility, providing a usable connection to other Facilities.
  - **Legal Responsibility:** Consider sidewalk repair responsibilities as stipulated by law, particularly for private property owners.

3.5.4 Capital Project Programming

Capital project programming involves scheduling facility repairs based on priority, considering both short-term (1-2 fiscal years) and long-term (up to 30 years) needs. This process must account for available resources and funding.

- **Facilities Investment Planning:** Use the Facilities inventory and condition data, along with estimated repair costs, to forecast Framework long-term capital funding needs. This cost information helps assess funding strategies, including general funds, municipal bonds, grants, and partnerships. The planning process clarifies funding expectations over time, which in turn defines the pace of Facilities repairs.
- **Phased Approach:** Prioritize high-need areas, such as those near public infrastructure, and expand to secondary priority areas over time, working towards comprehensive compliance.
- **Coordination with Other Projects:** Align the scheduling of pedestrian facility repairs with other public infrastructure projects to optimize costs and minimize disruptions to the community.
- **Resource Alignment:** Align work plans with available resources, including funding, staffing, vendors, equipment, and materials.
- **Ensuring Accessibility Compliance in New Projects:** Design reviews and compliance checks must confirm new construction and major alterations adhere to accessibility standards.
- **Maintenance Programs:** Incorporate routine maintenance and minor repairs to mitigate risks and extend the lifespan of Facilities.
- **Property Owner Driven Repairs:** The City may enforce property owners' responsibility to maintain sidewalks as outlined by law.

3.5.5 Public Engagement

Public Input

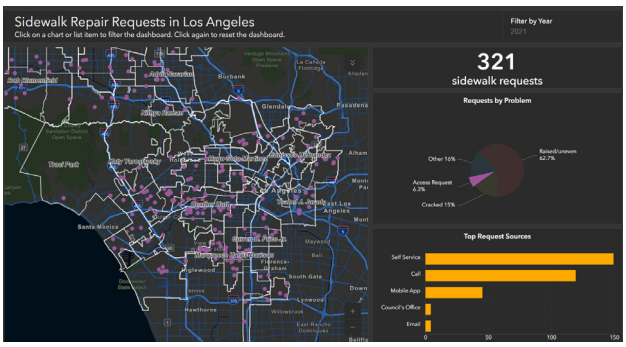
Integrating public feedback is essential to shaping the Pedestrian Facilities Management Framework to reflect the needs and priorities of the community. This engagement should be structured and ongoing to ensure it effectively informs decision-making processes. Key approaches include:

- **Community Surveys and Workshops:** Conduct surveys, focus groups, and public workshops to gather input from a broad range of stakeholders, including people with disabilities, pedestrians, community groups, business owners, and other organizations.
- **Feedback Integration into Decision-Making:** Establish clear mechanisms to incorporate public feedback into planning, prioritization, and policy updates. This may include a public advisory board or regular public input sessions where feedback is reviewed and considered alongside technical data.
- **Accessible Reporting Channels:** Use MyLA311 to allow residents to report issues like sidewalk damage, accessibility concerns, or other problems with Facilities. Ensure 311 is accessible to people of all abilities and available in multiple languages.

Public Outreach and Communication

A proactive and transparent public outreach strategy is essential to keeping the community informed and engaged throughout the Framework's implementation. Clear and frequent communication will foster trust and participation from the public. Consider the following strategies:

- **Regular Updates on Planned Improvements:** Publish detailed information about upcoming projects, including timelines, scope of work, and locations, using various media outlets (e.g. City websites, newsletters, social media, and local news channels). Ensure this information is accessible and easy to understand, avoiding technical jargon.
- **Work Schedule Notifications:** Provide timely notifications to affected residents and businesses about construction schedules and any temporary disruptions. Continue to use signage, flyers, and expand digital notifications (e.g. email or text alerts) to keep people informed well in advance of road closures, detours, or sidewalk disruptions.
- **Public-Facing Dashboards:** Implement a real-time dashboard that allows the public to track the progress of pedestrian facility upgrades, view project statuses, and access information about areas undergoing repairs. The dashboard could also display anticipated completion dates and highlight areas of focus based on public input.
- **Feedback Loop:** Ensure there is a clear and responsive feedback loop where the public can see how their input is being used. Provide updates on how community feedback has influenced decisions or led to specific changes in work prioritization or design.



Inclusivity and Equity in Outreach

It is crucial to ensure outreach efforts reach all members of the community, particularly underserved or vulnerable populations. Efforts to consider:

- **Targeted Outreach:** Make sure communication efforts reach underrepresented groups, including people with disabilities, non-English speakers, and residents in historically underserved areas. Partner with local community organizations to extend outreach to these populations.
- **Inclusive Engagement Practices:** Host community meetings or information sessions in accessible venues, at various times, and offer virtual options to increase participation. Provide materials and sessions in multiple languages and ensure they are accessible to individuals with disabilities.
- **Engagement with Advocacy Groups:** Collaborate with disability advocacy organizations, seniors' groups, and other community advocates to ensure the Framework's communication strategies and engagement efforts address the needs of all pedestrians. Continue engagement through a Technical Advisory Committee engaging Los Angeles Walks and other mobility organizations.

Transparency and Accountability

Transparency is critical in building public trust and ensuring the long-term success of the Pedestrian Facilities Management Framework. A few strategies include:

- **Public Reporting:** Release periodic public reports that highlight key framework achievements, upcoming projects, and areas where public input is influencing decisions. This could be done through annual reports or more frequent newsletters.
- **Performance Metrics:** Continue to share performance metrics with the public, such as the number of Facilities brought into compliance, miles of sidewalk repaired, or improvements in accessibility scores. This will help demonstrate progress and justify continued investment in the Framework. Present information in various formats including dashboards with charts, graphs, and maps with filters enabling users to segment the data in various ways.

3.5.6 Interagency Coordination

Facilities management activities, including the removal of disabled access barriers, are not isolated from other public works projects within the PROW. The PROW serves as a shared space for transportation and utility services throughout the City. As a result, various construction projects, such as those improving roadway surfaces and underground utilities, can impact Facilities and create similar disruptions to the local community by inhibiting movement and disability access.

When planning the repair and replacement of Facilities, opportunities should be identified to coordinate with other utility and roadway construction efforts. This coordination can create joint funding opportunities to reduce Facilities improvement costs and minimize local disruptions by aligning construction schedules and reducing the duration of overlapping activities.

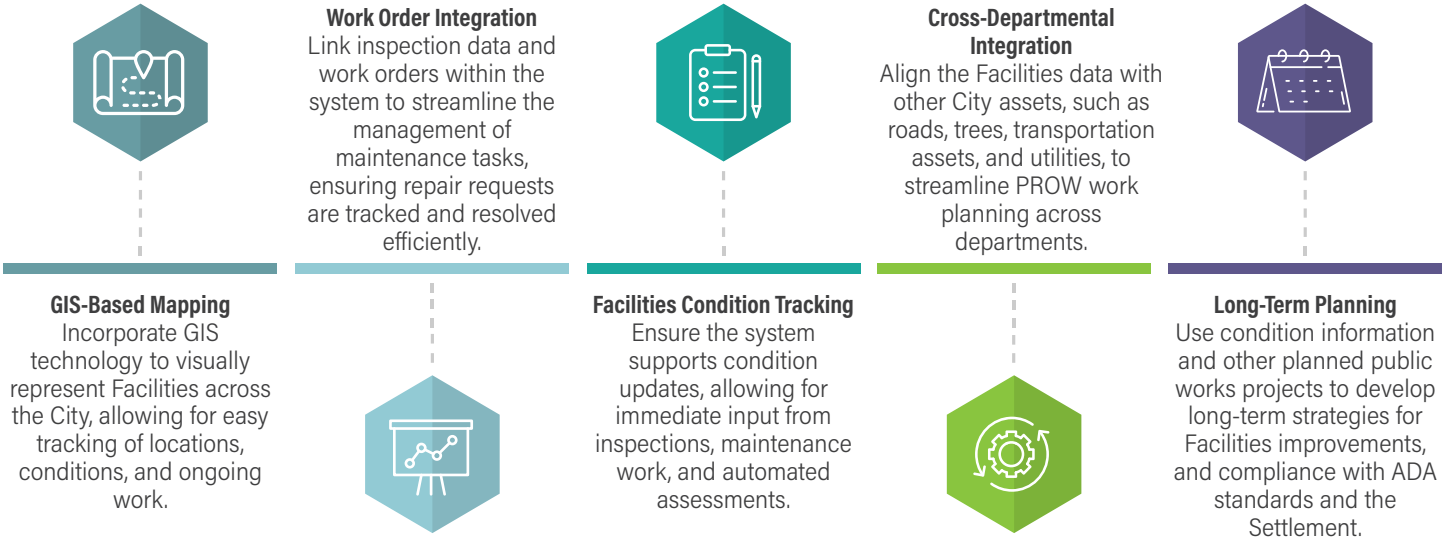
Facilities work programming should continue to use the BOE Public Way Reservation System (PWRS) as it serves as a clearing house for planned and upcoming construction projects.

3.5.7 Technology Framework

> Information technology systems are the enabling structure to support the Pedestrian Facilities Management Framework. These systems tightly integrate Facilities data, work planning and execution coordination, inter-departmental information sharing, financial data management, work backlog tracking, and other elements described in this section.

Asset Management System

Continue to deploy asset management system software throughout the City with departments involved with Facilities and accessibility concerns. The asset management system integrates GIS mapping and analysis, inspection results, work order management, and condition tracking.



Automated Data Collection

Utilizing automated technologies for data collection enhances the efficiency and accuracy of Facilities assessments. These tools can continuously monitor and update the condition of pedestrian infrastructure, ensuring the inventory remains current.

- **High-Efficiency Collection:** Use technology-focused methodologies for Facilities inventory and condition measuring. Technologies include GPS, GIS, LiDAR, and other sensors to perform ground-level scans of sidewalks, curb ramps, and other Facilities.
- **Camera Sensors:** Evaluate the implementation of camera sensors along critical pedestrian pathways, using fixed cameras or mobile-mounted cameras to record existing physical conditions including obstructions.
- **AI-Based Data Analysis:** Use AI and machine learning algorithms to automatically process camera sensor images, classify Facilities conditions, detect anomalies, and predict future maintenance needs.

Reporting

A robust reporting system drawing directly from the Pedestrian Facilities Management Framework is needed to support analysis, planning, monitoring, and performance reporting. The system should address the needs of various constituencies with the appropriate level of detail. Constituencies include the public and stakeholders, City executives, City department and division heads, Framework leads, superintendents, and crew levels.

Reporting should support historical, current, and planned work and allow for data filtering and choices of presentation forms including dashboards, graphs and charts, and tabular reports. Connections of the reporting data should include interaction with GIS mapping for enhanced comprehension of the data.

Asset management system reporting of planned and completed barrier mitigation work should be augmented with GIS spatial analysis to enhance existing City performance reporting to enable detailed and summary reporting by specific areas of the City by facility type.

City Responsibilities

The Framework outlined above is far-reaching, comprehensive, and will involve multiple City departments and divisions. It is essential that the implementation responsibilities be clearly defined and coordinated. Key responsibilities include:

- **Accessibility and Settlement Compliance Oversight:** Responsible for assuring public requests and complaints are tracked and processed, necessary reporting is performed and public engagement is managed.
- **Facilities Activity Responsibilities:** Responsible for each specific type of pedestrian facility for the lifecycle activities including inventory, condition assessment, engineering, planning, work programming, budgeting, funding, work execution, and tracking.
- **Systems Management:** Responsible for technology selection, implementation, operations management, upgrades, and technology administration. Key technologies include GIS, asset management system, data collection instrumentation, reporting systems, analysis systems, and integration between systems.

4.0 FACILITIES MANAGEMENT FRAMEWORK IMPLEMENTATION PLAN

Section 4.0 outlines a recommended plan for City implementation of the Facilities Management Framework (Framework) guided by the Pedestrian Facilities Management Framework Approach. The intent of the Framework plan is to define activities, outcomes, and responsibilities for implementing and operating the Framework.

Section 5.0 Citywide Inventory and Assessment Plan Costs and Schedule aligns with the plan recommendations, backing-up estimates and clarifying assumptions for the implementation timeframe and costs aligned with Work Plan tasks.

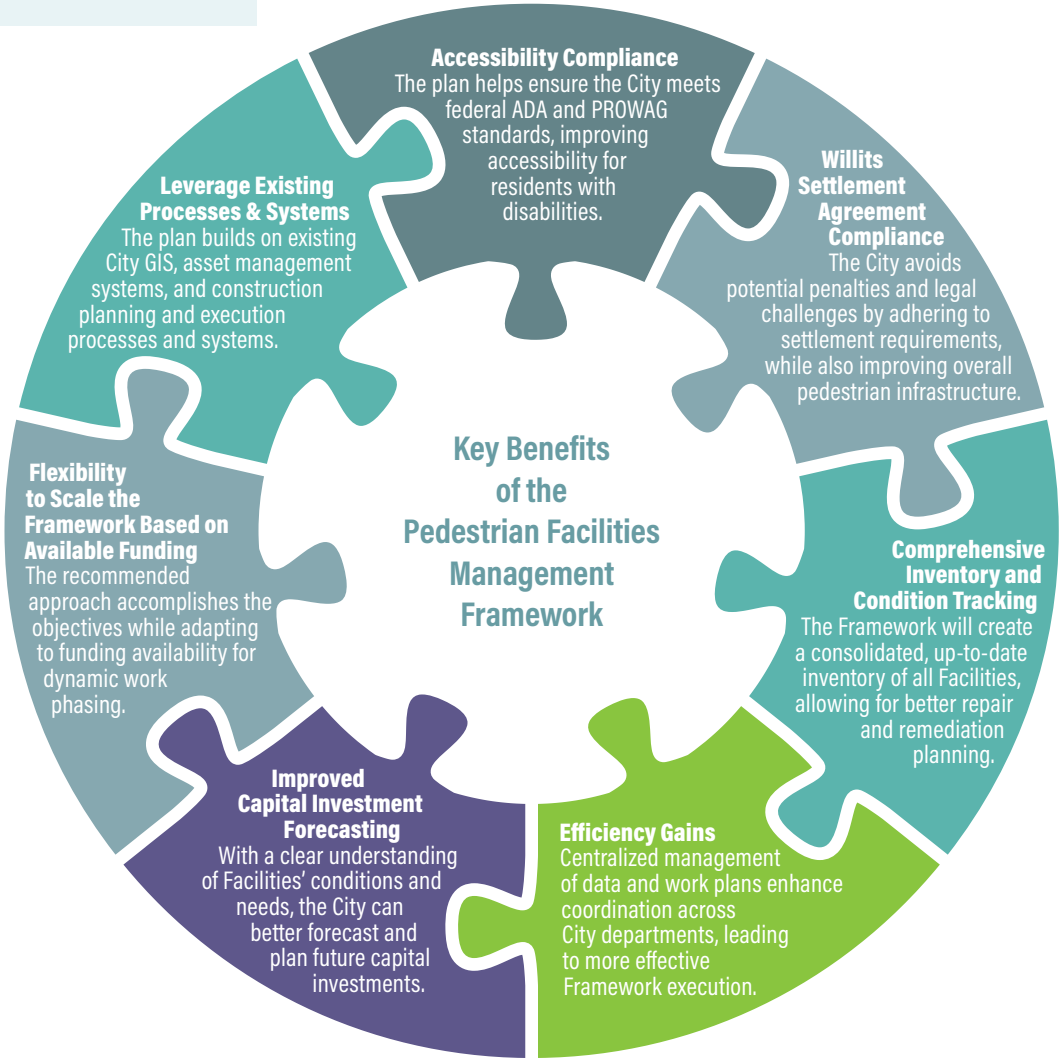
4.1 Scope

The scope of this plan encompasses citywide Facilities, addressing the inventory, condition assessment, compliance scoring, barrier repair prioritization, and barrier repair work execution planning and tracking. The plan is designed to be adaptable to City priorities, resource constraints, and phasing.

For example, the City may prioritize certain geographic areas based on need, focusing first on areas with high pedestrian activity and accessibility deficiencies. A phased approach ensures priority areas, such as those serving vulnerable populations or located near public infrastructure, receive attention early in the Framework lifecycle.

4.2 Benefits

The proposed Framework plan provides several key benefits:



4.3 Challenges

Challenges expected during implementation of the plan include:

- **Technology Limitations:** The Facilities condition assessment technologies evaluated in the Phase I: Pilot can meet the City needs, however a structured quality control process is needed during vendor data acceptance to substantiate the data findings and validate data specification compliance for all future Facilities inventory and assessment. A portion of Facilities identified as non-compliant will require additional review of specific pedestrian facilities to establish the prescribed repair.
- **Extent of the City:** With 7,000 miles of PROW, the data collection effort and associated data management is a significant undertaking. A full citywide data collection provides the greatest data consistency and a comprehensive point-in-time condition assessment. However, City resource limitations may call for incremental collection—requiring a higher level of City management to assure data consistency and manage multiple collection projects.
- **Adoption of Asset Management for Citywide Work Tracking:** A vital element of this Framework is the commitment of City departments to plan and track work in the asset management system. A failure to change from the existing segmented, siloed work tracking processes to a uniform, consolidated asset management approach will significantly limit the City's ability to efficiently and effectively manage Facilities condition data and perform repairs.

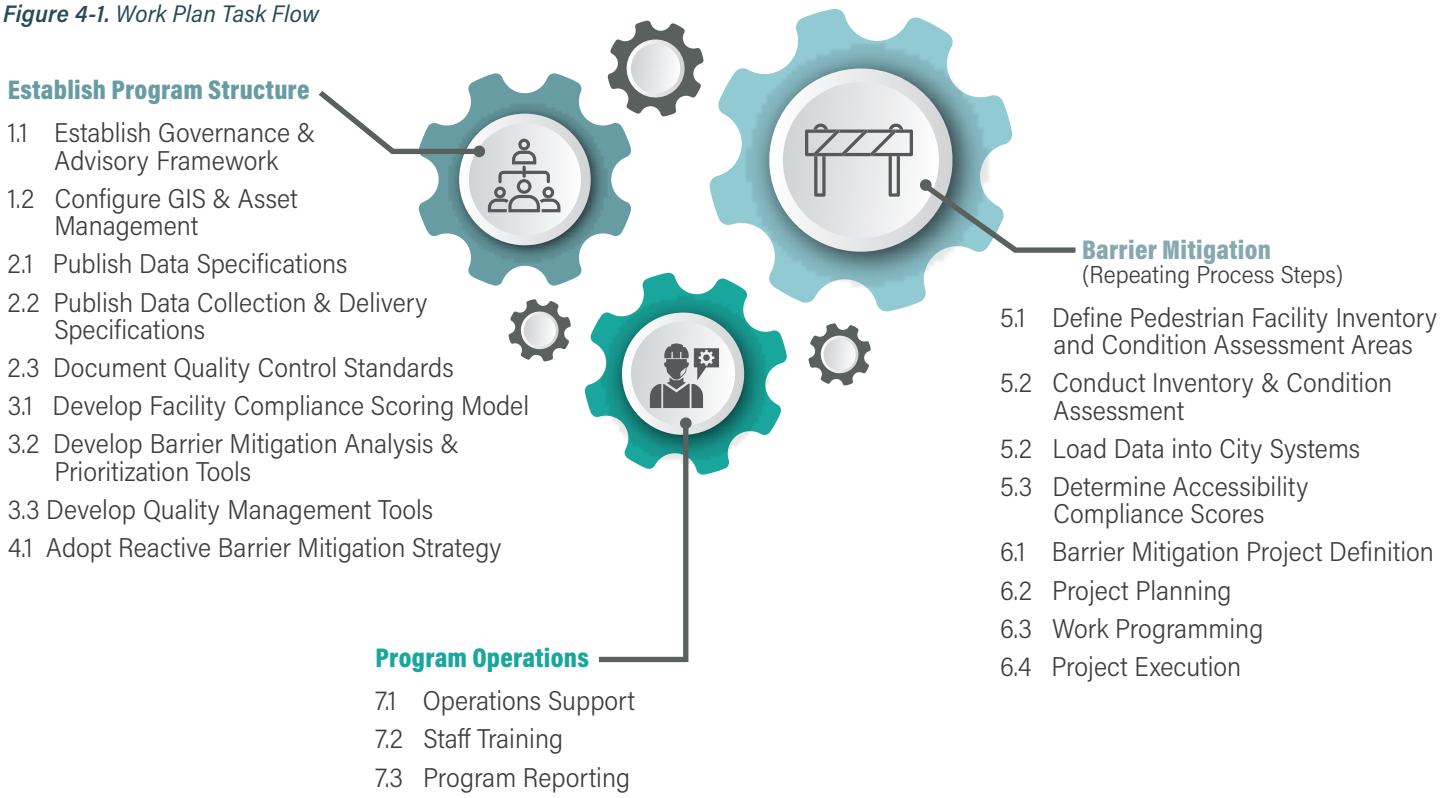
4.4 Framework Tasks

> The recommended Facilities Management Framework is a prescription for implementing and maintaining the Framework with the ability to adapt to City priorities, constraints, pacing, and other changes.

The plan is structured with seven primary tasks, each with one or more subtasks. This structure addresses the initial setup of the Framework followed by tasks that are iterated and optimized as the City applies a systematic approach to address Facilities barrier repairs.

The plan defines tasks in three groups: 1) Establishing the Framework Structure, 2) Performing Barrier Repair Planning and Execution, and 3) Framework Operations Support, as illustrated below.

Figure 4-1. Work Plan Task Flow



4.5 Work Plan

Task 1: Establish Framework Governance and Operations

The objective is to create a robust, streamlined, and efficient governance structure and operational Framework that clearly defines roles, responsibilities, and accountability mechanisms. This structure will facilitate alignment with City policies and directives, foster stakeholder engagement, and enable efficient Framework execution through the integration of existing resources and initiatives.

TASK 1 – DELIVERABLES

- Established governance framework
- Assigned roles and responsibilities
- Initial configuration of GIS and asset management to support Facilities data storage

1.1 Establish Governance and Advisory Framework

- **Internal Governance:** Define roles, responsibilities, and oversight mechanisms to ensure Framework execution and alignment with City objectives. Integrate Facilities management efforts with the Capital Planning Steering Committee governance framework. Mayor Bass' ED9: Streamlining Capital Project Delivery and Equitably Investing in the Public Right-of-Way, issued October 16, 2024, reflects this approach.
- **External Advisory Engagement:** Engage stakeholders (e.g. non-City utilities, community organizations, and other groups) to receive input and share framework updates. Establish clear channels for public engagement and public reporting.

RESULTS	A cohesive governance structure ensuring alignment with broader PROW programs, accountability, operational standardization, and stakeholder collaboration.

1.2 Define Roles and Responsibilities

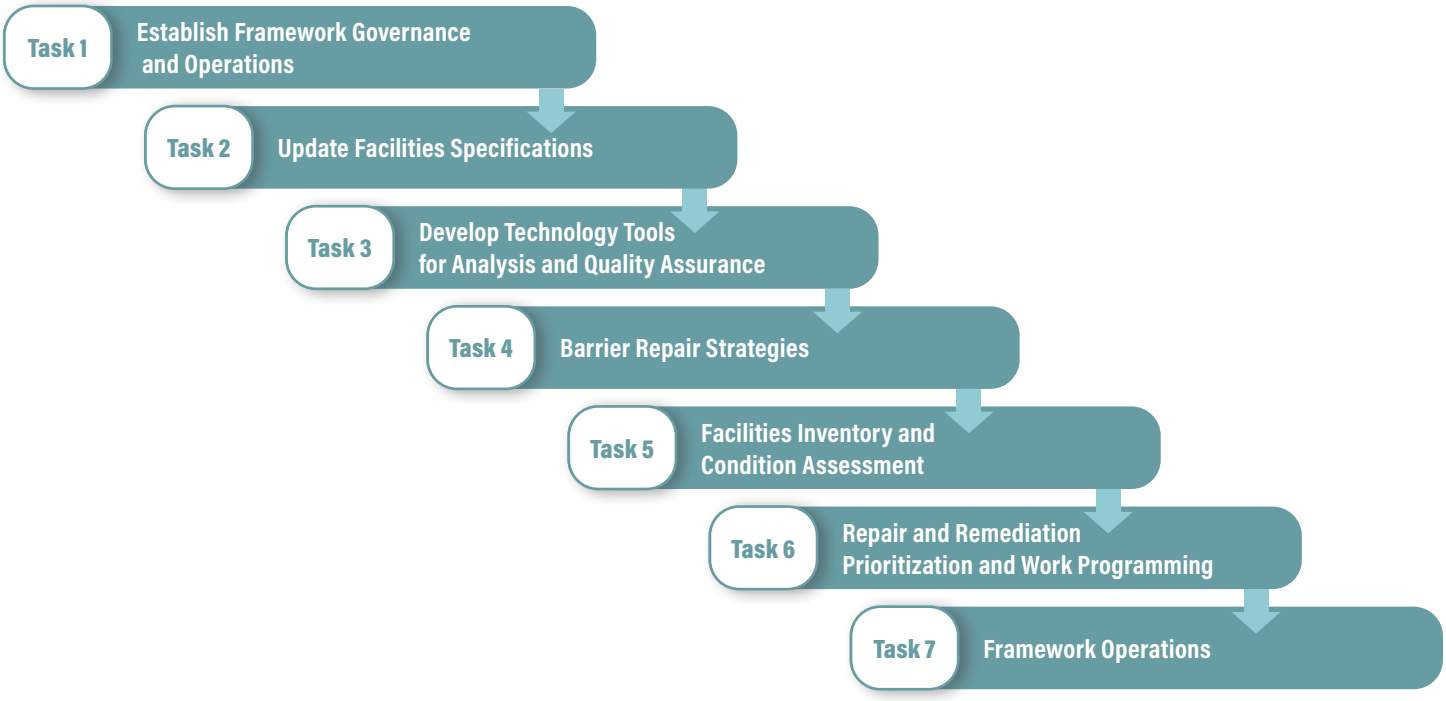
Defined roles and responsibilities are needed to ensure the multi-organizational Framework is coordinated with each entity performing their necessary role.

The recommended Framework roles and responsibilities are guided by existing City department responsibilities, best fit to Framework tasks, and asset management best practices established by the Institute of Asset Management[1]. The intent for structuring the roles is to clarify responsibilities; consolidate planning, design, and construction activities; and follow best practices for asset management and construction management.

Identified key roles include:

- The Capital Planning Steering Committee
- Facilities Asset Manager, Department of Public Works, BSS
- Facilities Asset Manager, LADOT
- Capital Projects Planning, Department of Public Works, BOE
- Facilities Maintenance and Construction, Department of Public Works, BSS
- Facilities Maintenance and Construction, LADOT

Figure 4-2. Facilities Management Framework Work Plan Tasks



[1] https://theiam.org/

Table 4-1. Governance and Operations Roles and Responsibilities

Task	Task #	Capital Planning Steering Committee	Facilities Asset Manager, BSS and LADOT	Capital Projects Planning, BOE	Facilities Maintenance and Construction, BSS and LADOT
Framework Governance					
Pedestrian Facilities Management	1.1	A R	R	C	C
Define Framework Priorities	1.1	A R	C	C	C
Funding Request Coordination	1.1	A	R	R	C
Policy Development					
Barrier Repair Prioritization Policy	4.1 4.2	A	R	C	C
Strategic Asset Management Plan for Facilities	4.3	A	R	C	C
Facilities Asset Investment Policy	4.3	A	R	C	C
System Implementation					
Deploy and Manage Asset Management for Facilities	1.2	I	A R	C	C
Configure and Manage GIS Data Structure to Support Facilities Inventory	1.2	I	A R	C	C
Perform Facilities Inventory	5.1 5.2 5.3	C I	A R	C	C
Perform Facilities Condition Assessment	5.2	I	A R	I	I
Assess Facilities Compliance with Accessibility Standards	5.4	I	A R	C	I
Develop Barrier Repair Plan	6.1 6.2 6.3	I	A R	I	I
Perform Barrier Repair	6.4	I	A	A	R
Produce Framework Performance Reporting	7.3	A	R	I	I
Technical Standards and Compliance					
Develop Facilities Data Specifications	2.1	I	A R	C	I
Develop Facilities Data Collection and Delivery Specifications	2.2	I	A R	C	I
Implement Data Quality Control	2.3 3.3	I	A R	I	I
Develop Facilities Compliance Scoring Model	3.1	I	A R	C	I
Develop Barrier Repair Prioritization Tools	3.2	I	A R	C	I
Competence Management					
Staff Training	7.2	I	A R	C	C
Asset Management, GIS, and Condition Assessment Policy and Technology Monitoring	7.2	I	A R	I	C
System Operations and Continuous Improvement					
Manage Framework Operations	7.1	I	A R	I	I
Review Framework Performance and Alignment with Framework Goals and Future Needs	7.4	A	R	C	C
Recommend Framework Changes	7.4	A	R	C	C
Implement Framework Changes	7.4	A	R	C	C

NOTES

* BSS is the asset manager for the structure and condition of all Facilities except for LADOT Facilities.

** LADOT is the asset manager for Facilities markings, striping, signage, pedestrian push signals, and push buttons.

*** BOE is the program manager of the City's Sidewalk Repair Program (Settlement).

LEGEND

R	Responsible	Entity completing the task
A	Accountable	Entity approving the deliverable/task
C	Consulted	Entity whose opinions are sought, typically subject matter experts
I	Informed	Entity kept up-to-date on progress

1.3 Configure GIS and Asset Management

Existing GIS and asset management systems used by the BOE, BSS, and LADOT must be reviewed and adjusted to address the data content, presentation, reporting, and work planning needs of the Framework. Existing systems in the Department of Public Works and LADOT should be configured and interconnected.

- **GIS Configuration:** GIS will serve as the central repository for Facilities inventory and condition data, supporting cross departmental Facilities data and project access and analysis.
  - Configure each pedestrian facility type with required attribute to serve as a repository for the Facilities inventory.
  - Configure layers for raw condition assessment data unlinked to pedestrian facilities as a record of vendor performance prior to synthesizing the raw measurements.
- **Asset Management:** Configure asset management systems data to link and display through GIS, Facilities compliance scoring, prioritization, and barrier repair plans.
  - Link Facilities assets in GIS to asset management system.
  - Design asset profiles including current condition score and priority consistent with the ADA and Settlement requirements.

RESULTS	A unified, technology-enabled framework supporting Facilities data management, analysis, presentation, reporting, and work planning and management.

Task 2: Update Facilities Specifications

The goal is to standardize data, processes, and quality assurance measures for Facilities management. By defining uniform specifications and collection procedures, the Framework will ensure consistent, accurate data, and reliable evaluation criteria for accessibility and barrier repair efforts.

TASK 2 – DELIVERABLES

- Facilities data specifications
- Collection and delivery specifications and procedures
- Framework level quality control standards and procedures
- Project-level quality control procedures

2.1 Publish Facilities Data Specifications

- Define the structure, classification, and format of Facilities data.
- Adopt and manage accessibility criteria used for determining Facilities compliance, referencing applicable accessibility standards.
- Publish and maintain the data specifications.

RESULTS	Documented data specifications to incorporate into data collection agreements and guide quality control processes.

2.2 Publish Facilities Inventory and Assessment Collection and Data Delivery Specifications

- Specify acceptable methodologies, logistical requirements, and delivery standards to guide individual Facilities inventory and assessment projects.
- Collection procedures include methods for traversing pedestrian facilities, measurement densities and parameters, data aggregation or normalization, and data reporting.
- Data format and documentation for project deliverables.
- Guidelines for Facilities inventory and assessment planning, issue resolution, and field reporting.

RESULTS	Documented data collection and delivery specifications to incorporate into data collection agreements and guide quality control processes.

2.3 Document Quality Control Standards

Quality control standards and procedures provide a quality Framework that assures the information collected and resulting analysis is consistent with the standards and specifications and procedure requirements the City has established.

- Establish high-level quality control standards, including roles, responsibilities, inspection procedures, acceptance tolerances, error reporting, and acceptable remedies to data exceeding tolerances.
- Document quality control procedures for reviewing Facilities data, model outputs, reporting, and other Framework deliverables.
- Develop project-level quality control processes tailored to vendors' methodologies.

RESULTS	Quality control specifications to drive the configuration of automated and checklist-based data compliance review, reporting, and acceptance processes.

Task 3: Develop Technology Tools for Analysis and Quality Assurance

This task aims to establish a comprehensive technological infrastructure using GIS, asset management systems, and quality management tools. These components will facilitate data analysis, prioritization, compliance scoring, and reporting to ensure informed decision-making and streamlined processes.

TASK 3 – DELIVERABLES

- Facilities compliance scoring model
- Barrier repair prioritization model
- A suite of quality assurance tests

3.1 Develop Facilities Compliance Scoring Model

The scoring model is implemented with the computer software that evaluates the conditions of Facilities against compliance to accessibility standards. This may include a non-compliance severity score. The model should be developed by the City using GIS and asset management data compared to the Framework accessibility standards.

The model results should be carefully evaluated as part of the quality control processes to assure output accuracy. When needed, the model should be updated to improve accuracy, consistency of results, and address variations in Facilities characteristics as broader areas of the City are measured.

Scoring Facilities accessibility compliance involves evaluating each measurement to applicable accessibility criteria. Facilities-level scoring results in multiple scores per facility to form the basis of compliance determination and non-compliance severity scores. Non-compliance severity score could use a simple scoring of high, medium, or low severity to aid in work planning.

Vendors retained for project data collection may have previous Facilities condition scoring models that could be applied for a project and provide compliance scores and severity measures in deliverables to the City. However, vendor models should not substitute the City's efforts to establish an internal compliance modeling capability to assure uniformity of analysis across the City and over time.

- Create a scoring model to evaluate Facilities compliance to accessibility standards, comparing Facilities measurements to accessibility criteria.
- Validate and improve the model through quality control evaluations.

RESULTS A vetted model using Facilities measurements is developed to assign a score for accessibility compliance.

3.2 Develop Barrier Repair Analysis and Prioritization Tools

Barrier repair prioritization modeling incorporates multiple criteria reflecting Facilities conditions, location, barrier density, proximity to high pedestrian traffic areas, coordination with other public works projects, legal responsibilities, and other policy directives.

This modeling process will use GIS analysis tools extensively and draw upon Facilities condition information, suitability of maintenance intervention, planned projects, remediation cost estimates, public requests, and other data.

Prioritization tools should allow policymakers to adjust weights for model parameters, geographic area targeting, and resource constraints. The model can be iteratively run using different parameters to evaluate alternative outcomes. Additionally, as Facilities condition information becomes more available for broader areas of the City, the model can be rerun on larger geographic areas to help identify areas for targeted projects.

- Develop a GIS-based prioritization model using multiple criteria (e.g. facility condition, specific obstruction types (vegetation, vertical offset, slope, etc.), location, barrier density, pedestrian loads, proximity to pedestrian attractors, travel paths, etc.).
- Enable scenario analysis for policy and funding decisions.

RESULTS An operating model that scores geographic areas (sites, street blocks, project areas) based on known barriers and other model parameters. The output brings location-based focus on specific areas of need.

3.3 Develop Quality Management Tools

Quality management tools are used to assure process compliance and data consistency throughout the Framework. These tools should be developed by the City using GIS, and use checklists assuring processes for Facilities inventory and assessment data collection, planning, execution, and reporting are performed.

- Document standard quality control procedures identifying specific tests and thresholds for acceptance.
- Document procedures for correcting or flagging test score outliers.
- Implement software and checklists to ensure process compliance and data consistency.
- Examples include verifying data format, spatial accuracy, and completeness.

RESULTS Quality control software and procedures ready to apply to Facilities data collection, scoring, and quality control processes.

Task 4: Barrier Repair Strategies

TASK 4 – DELIVERABLES

- Defined strategy for programmatic Facilities barrier repair.
- Strategic Asset Management Plan for Facilities
- Facilities asset investment policy

The objective is to implement a dual approach to barrier repair—addressing urgent, reactive issues while systematically planning long-term improvements. By prioritizing areas based on City strategies and accessibility needs, the Framework will focus barrier repair in priority areas based on resource availability.

Completion of the previous tasks results in a governance and technology framework necessary to systematically address barriers to Facilities across the City. The next group of tasks address the planning and execution of Facilities barrier repair. These tasks are intended to be iterative, incrementally addressing priorities established by the City, expanding the extent of barrier repair aligned with the capacity to perform the work.

Priorities for barrier repair address both reactive removal and programmatic prioritized barrier repair. Reactive removal addresses high-priority public safety issues that suddenly emerge through damage or become known, usually identified through MyLA311 notifications. Programmatic prioritized areas represent a strategic approach to identify and address existing barriers to optimize accessibility in communities and areas of high pedestrian traffic.

4.1 Adopt Reactive Barrier Repair Strategy

Reactive barrier repair addresses immediate needs based on prioritization criteria primarily focused on mitigating public safety concerns. The types of reactive barrier repair issues are due to sudden changes in Facilities, such as fallen tree branches, large debris on sidewalks, or the result of vehicular accidents or other natural impacts resulting in damage or barriers. Reactive barrier repair is urgent and not part of programmatic barrier repair planning. Reactive barrier repairs are addressed in Task 6. Barrier Repair Prioritization and Work Programming. Access requests require a reactive facility inspection to determine the barrier severity to address as an urgent repair or as a standard programmatic barrier repair strategy as discussed below.

RESULTS Reactive barrier repair bypassing programmatic barrier repair planning with immediate barrier repair scheduling.

4.2 Adopt Programmatic Barrier Repair Strategy

Programmatic barrier repair is best accomplished through a multi-year plan that is forward-looking and area targeted. This optimizes opportunities for project collaboration and funding. The planning should represent a rolling, multi-year period and be reviewed and updated annually to reflect current City priorities.

This initial stage of barrier repair planning establishes candidate project areas based on City strategies, priorities, and known areas of need. Initially, the planning is done with minimal knowledge of existing barriers, but as Facilities inventory and condition assessment is performed, the planning can incorporate known barriers. As discussed in Task 3, areas of high pedestrian traffic or planned, large-scale events are examples of candidate project areas.

RESULTS Defined candidate project areas to guide further Facilities inventory, condition assessment, and capital project planning.

4.3 Adopt Policies Affecting Facilities Repairs

The City may wish to evaluate and adopt policies to reduce the occurrence of future non-compliant Facilities and/or enforce repair responsibility of property owners adjacent to the Facilities. Three examples are presented.

- **Update Current Policies to Prevent Future Barriers:** Identify why compliant Facilities become non-compliant. For example, certain tree species consistently cause sidewalk uplift. Policies could ensure suitable tree species are planted in sufficiently sized tree wells.
- **Require Inspection and Repairs by Property Owners:** Require repair of any non-compliant facilities identified through City inspection processes or as a new requirement for property owners to inspect and repair facilities prior to property sales and transfers.
- **Assess Owners a Sidewalk Maintenance Fee:** Instead of private responsibility for public infrastructure, assess a new proportionate fee to support City maintenance of pedestrian facilities along property frontage.

RESULTS Reduced ongoing liability for non-compliant Facilities.

4.4 Strategic Asset Management Plan for Pedestrian Facilities

A Strategic Asset Management Plan (SAMP) for Facilities is needed to guide policy development throughout their lifecycle. The SAMP is a planning tool to clarify intentions, priorities and certain practices to be adopted. It takes a long-term view and considers the combination of organization needs, stakeholder expectations, and the realities of existing assets and asset management capabilities.

The SAMP should define a Facilities asset investment policy to guide the allocation of resources for Facilities barrier repair.

RESULTS A SAMP guiding the management of Facilities in an optimal manner throughout their lifecycle, aligned with City priorities and policies.

NOTE: PRIORITIZATION OF BARRIERS BY SEVERITY IS ONLY APPLICABLE TO ADA BARRIER REMOVAL PROJECTS IN EXISITING FACILITIES THAT HAVE NOT BEEN ALTERED SINCE THE ADA.

4.5 Barrier Severity Scoring Recommendations

Facilities will be evaluated based on assessment measurements to determine its compliance with accessibility criteria. If found non-compliant, the level of severity will be scored. Individual non-compliance measurements are defined as access barriers that will be considered for repair.

This barrier severity ranking is only applicable to barrier remediation projects, as defined. It does not apply to other projects and shall not inform the scope of new construction, alterations, or other similar projects.

Severity Scoring

Barriers to Facilities identified in the condition assessment process will represent a wide range of accessibility non-compliance from very minor to significant. Given the City's obligations under the ADA to remediate access barriers with a timeline, rating the severity of a barrier is beneficial due to the magnitude of the projected alterations and limited resources. Adopting a barrier severity score to standardize the classification will then prioritize the mechanism and timeline for barrier removal or mitigation.

Facilities evaluated through the scoring process may be identified as non-compliant with accessibility standards based on field measurements of each facility. Field measurements exhibit a range of measurement errors based on the measurement methodology and equipment used. Therefore, Facilities without a non-compliant severity score have no known non-compliant characteristics.

Recommended barrier severity scores are based on criteria such as vertical displacement, horizontal displacement, cross slope, run slope, and travel path width. Four barrier severity scores are recommended—**Minor, Moderate, Severe, and Very Severe**. This framework ensures sidewalk and access ramp conditions are assessed systematically and remediation is aligned with the severity of non-compliance, prioritizing both safety and accessibility requirements. Measurement criteria determining the Severity Scores are presented in the tables below for sidewalks and curb ramps along with repair options.

RESULTS	A standardized barrier severity scoring system that prioritizes accessibility barrier remediation based on safety and compliance severity, ensuring consistent evaluation and efficient allocation of repair resources.

Severity Index and Repair Options

THIS SHALL NOT BE APPLIED TO NEW CONSTRUCTION OR ALTERATION PROJECTS WHICH REQUIRE THE PROVISION OF ACCESSIBLE PEDESTRIAN FACILITIES, REGARDLESS OF THE SEVERITY OF EXISITING BARRIERS.

Table 4-2. *Severity Index and Repair Options*

Pedestrian Facility Type	Barrier Type	Barrier Severity Category			
		Very Severe	Severe	Moderate	Minor
Sidewalk	Scoping	*Gap* in sidewalk where the existing terrain is *greenfield* and/or space has not been allocated for pedestrian use.	*Gap* in sidewalk comprised of an *unprepared surface* (dirt, grass, etc.).	*Gap* in sidewalk comprised of a *non-standard prepared pedestrian surface* (decomposed granite, pavers, asphalt).	—
	Obstructed Clear Width	< 32"	32" – 35.9"	36" – 47.9"	48" – 59.9"
	Cross Slope	> 17%	17% – 11.1%	11% – 5.1%	5% – 1.9%
	Running Slope	*Roadway grade* + 10% or more	*Roadway grade* + 6.0% to 9.9%	*Roadway grade* + 2.0% to 5.9%	*Roadway grade* + 1.9% or less
	Uplift	≥ 3.1"	3" – 2.1"	2" – 1.1"	1" – 0.5" unbeveled
	Openings	> 4"	4" – 2.1"	2" – 1.1"	1" – 0.5"
Curb Ramp	Scoping	Missing curb ramp(s) at *marked crossings*.	Missing curb ramp(s) at *marked crossings*.	—	—
	Scoping	Missing curb ramp(s) at *unmarked, signalized* crossings at intersections of four-ways or greater.	Missing curb ramp(s) at *unmarked, signalized* crossings at intersections of four-ways or greater.	—	—
	Scoping	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *residential/local streets* of four-ways or greater without an accessible crossing within 200'.	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *residential/local streets* of four-ways or greater without an accessible crossing within 200'.	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *collector/arterial streets* of four-ways or greater without an *accessible crossing* within 200'.	Missing curb ramp(s) at *unmarked, unsignalized* crossings at intersections of *collector/arterial streets* of four-ways or greater with an *accessible crossing* within 200'.
	Top Landing	No landing or top landing of less than 32" in length or width is provided and the curb ramp running slope is > 17%.	No landing or top landing of less than 32" in length or width is provided and the curb ramp running slope is 17% – 11.1%.	No landing or top landing of less than 32" in length or width is provided and the curb ramp running slope is 11% – 5.1%.	No landing or a top landing is less than 32" in length or width is provided and the curb ramp running slope is 5.0% or less.

Pedestrian Facility Type	Barrier Type	Barrier Severity Category			
		Very Severe	Severe	Moderate	Minor
Curb Ramp *(continued)*	Top Landing Slopes	> 10% in any direction	10% – 6.1% in any direction	6.0% – 4.1% in any direction	4.0% – 2.1% in any direction
	Ramp Run Width	< 32"	32" – 35.9"	36" – 47.9"	36" – 47.9"
	Ramp Run Running Slope	> 17%	17% – 13.1%	13% – 10.1%	10% – 8.34%
	Ramp Run Cross Slope	> 10%	10% – 6.1%	6% – 4.1%	4% – 2.1%
	Openings within Top Landing or Ramp Run	> 2.5"	2.5" – 1.1"	1" – 0.5"	< 0.5"
	Uplifts within Top Landing or Ramp Run	> 2"	2" – 1.1"	1" – 0.5"	< 0.5"
	Clear Space at Bottom of Curb Ramp Run	Clear space is not provided within the width of the crossing, or provided clear space is < 32" in any dimension, or provided clear space has a running slope > 17%.	Clear space is not provided within the width of the crossing, or provided clear space is < 36" in any dimension, or provided clear space has a running slope between 17% - 12.1%.	Clear space is provided within the width of the crossing or provided clear space is 36" – 47.9" in any dimension, or provided clear space has a running slope between 12% – 8.1%.	Clear space is provided within the width of the crossing or provided clear space is 36" – 47.9" in any dimension, or provided clear space has a running slope between 8% – 5.1%.
	Turning Space at Bottom of Curb Ramp Run	Turning space is not provided within the width of the crossing, or provided turning space is < 32" in any dimension, or provided clear space has a running slope > 10%.	Turning space is not provided within the width of the crossing, or provided turning space is < 36" in any dimension, or provided clear space has a running slope between 10% – 8.1%.	Turning space is provided within the width of the crossing, or provided turning space is 36" – 47.9" in any dimension, or provided clear space has a running slope 8% – 5.1%.	—
	Grade Breaks at Top and Bottom of Curb Ramp Run	> 2"	2" – 1.1"	1" – 0.5"	< 0.5"
	Detectable Warning Surface	Uplifts or openings > 2"	Uplifts or openings 2'' or less	Not provided (never installed)	Color is non-yellow or yellow and does not provide required contrast.
	Curb Ramp Type	—	—	One curb ramp is provided to serve two crossings (i.e. diagional curb ramp)	—
Other	Vertical Clearance	70" or less	70.1" – 80"	—	—
Pedestrian Push Button	Button Type	—	Finger Push Type	—	—
	Clear Space	No clear space is provided, or the width of the route to the button is < 32", or there is an *unprepared surface* from the sidewalk to the button, or there is prepared pedestrian surface with slopes in any direction > 10%.	No clear space is provided, or the width of the route to the button is between 32" – 35.9" wide, or there is prepared pedestrian surface with slopes in any direction between 10% – 8%.	TBD	TBD
	Reach Range	—	For side approach, the separation between button and edge of clear space > 12''.	For side approach, the separation between button and edge of clear space is 10.1" – 12".	—
Bus Boarding Areas	Surfaces	A *prepared pedestrian surface* is not provided.	A *non-standard prepared pedestrian surface* is provided.	—	—
	Dimensions	< 3' in any direction.	< 4' in any direction.	< 5' in any direction.	—
	Pedestrian Access Route to the Boarding Area	< 32" wide, or no curb ramp is provided	32" – 36.1" wide and a curb ramp is provided	36"– 47.9" and a curb ramp is provided	—

Task 5: Facilities Inventory and Condition Assessment

Task 5 focuses on systematically assessing Facilities by leveraging specialized services and integrating data into City systems to create a detailed inventory and their condition.

Conducting an inventory of Facilities and assessing their condition will identify barriers requiring maintenance and remediation of the City. Evaluating the entire City is most ideal to provide a comprehensive understanding of the extent of existing barriers, their severity, location, and concentration of barriers—the sufficient level of information required to determine needs and order of magnitude costs. Condition data then prioritizes projects and drive long-term capital planning strategy.

A citywide approach to Facilities condition assessment will benefit from economies of scale for the collection work, improving information consistency, efficiency, and likely at a lower cost. However, given near-term priorities, resource availability, and funding constraints, a phased and targeted approach driven by prioritized candidate project areas may be necessary. An initial approach to a limited area can also serve as a pilot effort to work through and refine the task plan and system prior to advancing to additional areas.

TASK 5 - DELIVERABLES

- Retain vendor or plan for City staff to perform Facilities inventory and condition assessment
- Define broad collection areas to cover multiple project areas and fill gaps in prior collection areas
- Manage vendor performance and accept project deliverables
- Integrated inventory and condition data within GIS and asset management systems
- Link compliance scores to individual assets for analysis and planning in asset management.

5.1 Define Pedestrian Facility Inventory and Condition Assessment Areas

Pedestrian facility inventory and condition assessment areas are geographical areas if an incremental approach to identify barriers requiring maintenance and remediation is taken instead of a single effort to inventory the entire City. If an incremental approach is taken, the City should define each inventory area and assure there are no gaps between areas. Each inventory area should represent contiguous areas incorporating entire city blocks for efficient data collection.

Using a single citywide collection approach will provide a complete point in time inventory and condition assessment to enable maintenance and repair prioritization considering all identified barriers across the City. Using an incremental approach could complicate barrier maintenance and repair prioritization as higher priority barrier maintenance and repairs identified in new assessments will likely reshuffle the existing list of barriers prioritized maintenance and repair.

RESULTS Project study areas are defined to guide Facilities inventory and condition assessment efforts.

5.2 Conduct Inventory and Condition Assessment

Contracted services should be retained for large-scale Facilities inventory and condition assessment—taking advantage of specialized technologies and services scaled to the project area, providing efficiency and cost-effective results.

However, the City may choose to undertake Facilities inventory and condition assessments on smaller scale areas using commercial technologies. If the City performs the inventory and condition collection process, the same vendor-adhered standards and procedures should be followed.

Project study areas should be refined as areas for Facilities inventory reflects an efficient data collection—areas aligned with full street blocks, geographic areas such as downtown districts and neighborhood boundaries to avoid minor gaps in coverage.

The scope of work for Facilities inventory incorporates the specifications defined in Task 2. The Department of Public Works should serve as the project management lead, providing project management and technical services to oversee vendor work. Once services are completed, the final result is a data set consisting of Facilities, their condition, and photographic documentation per the specifications. Throughout the process, City oversight assures compliance with the standards, specifications, and performance of quality assurance (Task 3), prior to accepting final deliverables.

RESULTS Retain vendor to perform Facilities inventory and condition assessment for areas of the City, potentially covering multiple candidate project areas and resulting in Facilities data compliant with Framework specifications.

5.3 Load Data into City Systems

Following acceptance of the Facilities inventory and condition measurement data, the data will be loaded into GIS and linked with the asset management system. Facilities condition data should be saved as a unique data set per the Facilities specifications. Additionally, assign summary condition scoring to existing GIS Facilities assets.

RESULTS Data loaded into GIS and asset management system to support focused Facilities barrier repair planning.

5.4 Determine Accessibility Compliance Scores

All Facilities and their location will be evaluated based on accessibility standards and detailed Facilities measurements to determine compliance scores per the compliance model established in Task 3.1. These scores assigned to individual assets and areas of the PROW will enable planning efforts to assess the needs across the project area. The scoring will be linked with the GIS and asset management systems to facilitate analysis and work programming.

RESULTS All Facilities in the collection area will be assigned an accessibility compliance score.

Task 6: Repair and Remediation Prioritization and Work Programming

The goal is to identify efficient and effective project packages for barrier repair, plan, and execute the capital projects or maintenance activities. Task 6 integrates prioritization models, barrier repair project planning, and resource coordination to deliver targeted improvements in pedestrian accessibility.

TASK 6 – DELIVERABLES

- Prioritized candidate barrier repair project definitions
- Preliminary barrier repair project definitions
- Projects accessible through GIS and the asset management system
- Committed barrier repair projects with schedule, costs, and task details
- PWRS representation of committed barrier repair projects
- Tracking and reporting of barrier repair project progress
- Updated Facilities asset records with accessibility scores and asset condition index

6.1 Barrier Repair Project Definition

Barrier repair project packages are defined by assessing priority areas guided by policy, location, density of barriers, and other factors defined in the prioritization model. Project packages can also be organized by type of work (e.g. saw cutting). GIS visualization tools can aid those contributing to prioritization by visualizing the barrier characteristics of the Facilities, as well as provide community information, land use, pedestrian demand, and other location-based data.

The output from this process is the definition of one or more preliminary project packages, ideal completion dates, and preferred fiscal years for implementation. Use GIS tools to identify and rank priority packages based on policy, barrier density, and community needs.

RESULTS	Identification of capital project packages or maintenance activities based on priority.

6.2 Barrier Repair Project Planning

Barrier repair project planning is guided by the preliminary packages to develop discrete projects for barrier repair. The projects define specific extents of Facilities, proposed treatments to remedy each barrier, giving consideration to delivering unmitigated disabled access through accessibility pathways.

Project collaboration opportunities may be identified through the BOE's Public Way Reservation System (PWRS), resulting in possible modifications to the project scope and timing.

Each project will be documented in the asset management system, tagging individual assets and treatments with estimated costs. This process is informed by the asset condition data, photos of Facilities, and barrier identification. If needed, staff field investigation can validate and expand on pedestrian field conditions. Projects defined in the asset management system can then be reviewed, amended, or canceled.

RESULTS	A project plan identifying all barrier repair measures, locations, and rough cost estimates represented in the asset management system.

6.3 Work Programming

Work programming involves the final planning for projects including engineering, final cost estimates, and activity scheduling—all following existing capital PROW planning protocols. As projects are approved, the project information syncs with PWRS, identifying the planned work location and schedule. Identifying which Facilities are exempt from disability access requirements will require researching construction dates. Exempt Facilities will be excluded from the repair plan.

Another benefit of this approach is to spread costs and City staff resources needed to perform the work over multiple years.

RESULTS	Final plan including refined cost estimates based on detailed review, all project tasks included and scheduled in asset management system, PWRS reservation in place.

6.4 Barrier Repair Project Execution

Capital Process: Barrier repair projects follows an established process of site feasibility, detailed design survey, construction design, construction, project documentation, and closure. Design surveys can apply LiDAR scanning technologies recommended for Facilities compliance, but a site-specific level is needed to capture design grade measurements to import into CAD software.

Maintenance Process: During barrier repair project execution, the asset management system records progress, reporting KPIs, crew assignments, material and equipment use, and labor resources. As the barrier repair completion is recorded in the asset management system, the accessibility compliance score and asset condition index automatically updates the Facilities record based on the repair performed.

RESULTS	Committed barrier repair project definitions including schedule, costs, and task definitions in the asset management system.

Task 7. Framework Operations

All components of the Framework need support to assure it remains aligned with the Framework objectives, technologies, and assure City staff are trained in the operation of each Framework task and system.

TASK 7 – DELIVERABLES

- An operations support effort to oversee ongoing system operations
- Training and briefing materials targeted for specific user groups
- Training sessions conducted with new users or refresh sessions with existing users
- Reports of various types and formats designed for specific user groups
- Annual reporting of system operations and known unmet needs
- Periodic framework review and recommendations report

7.1 Operations Support

Operations support assures the Framework components are being used as designed, they are maintained, and adjustments are made as needed to align with the Framework needs. Operations support activities include but are not limited to:

- Maintaining system documentation
- Updating GIS and asset management structure and functions
- Maintaining and publishing updates to specifications and procedures
- Maintaining and updating analytical models
- Maintaining and updating reports
- Maintaining and expanding quality control tools
- Monitoring system use and performance

RESULTS Oversight is provided to monitor and manage the Framework components and to update the components to align with City needs and technology advancements.

7.2 Staff Training

Staff training classes and supporting documentation needs to be developed and maintained to support the training of users and stakeholders of the system. Initial training needs to convey an understanding of the Framework objectives, processes, use of tools, and reports based on user roles. Staff changes and broadening user engagement with the system will require new training sessions over time.

Training curriculum and documentation are needed for various roles:

- Technical system users of GIS, asset management, models, and reports
- Data quality analysts
- City staff using asset management to plan and record work
- City staff industry review and training on GIS, asset management, and Facilities assessment best practices
- City management for overall Framework understanding, performance monitoring, and reporting
- Public understanding of the high-level intent of the Framework and how to monitor activities, progress, and provide input.

RESULTS A training program with supporting materials is established to enable staff to align Facilities management practices with established policies, priorities, and system.

7.3 Framework Reporting

The systems will be configured to create reports supporting various user types needs associated with transition planning, Settlement compliance, capital project planning and tracking, and community reporting needs. Reports are developed from data within the GIS, asset management system, and Financial Management System.

Reports may include combinations of maps, tabulations, graphs, charts, and other content produced partially or fully from the system. Reports may be configured within the asset management system, from GIS, or through PowerBI dashboards depending on needs and reporting system design.

Reporting implementation and operation steps include:

- Reporting requirements gathering
- Reporting system design
- Report configuration and testing
- Exposing a report interface to enable access to standard reports or interactively configured reporting
- Configuration of GIS map-based viewing
- Maintain existing reports, modify as needed, create new reports

RESULTS Reports are implemented and access is provided to various reports designed for specific uses and users.

7.4 Periodic Framework Review

Following the initial implementation of the Framework components, the Framework should be evaluated against its objectives and current and future needs. Engaging stakeholders in a Framework review process will assess how well it is currently serving their needs and identify nascent needs that may not be fulfilled with the current system configuration. Framework capabilities and methodologies may need to be adjusted when current needs change and gaps in capabilities are identified.

Review processes include:

- Evaluate system enhancement requests from users to identify significant requests that cannot be addressed with standard framework maintenance.
- Produce an annual system report to the governance body, reporting on system KPIs including alignment with user needs, changes in technology, operational support levels, and known unmet needs.
- The governance body may provide direction to remedy known shortcomings and request a broader Framework review.
- If a broad framework review is requested, engage Framework stakeholders in interviews to comprehensively assess how the system is meeting needs and where gaps exist. Submit a report summarizing the state of the system, user needs, and recommendations.

RESULTS	Annual reporting of system operations performance and known unmet needs, periodic review of Framework's alignment with needs and delivery of a recommendations report.

5.0 CITYWIDE INVENTORY AND ASSESSMENT COST AND SCHEDULE

Section 5.0 provides estimates of costs and timeframes for the implementation recommendations presented in Section 4.0. The information presented addresses the recommendations to establish 1) a Facilities Framework structure to manage subsequent work and 2) perform barrier repair considering variability in the scope, pace, and level of effort.

5.1 Introduction

Costs are presented in current dollars and will need to be adjusted for long-term planning since the assessment is likely to extend for multiple years. When planning for long-term assessment costs, consideration should also be given to technology innovation and market adoption of best practices by consulting firms as these will drive costs downward and improve data collection quality and efficiency.

5.2 Cost

5.2.1 Establish Facilities Management Framework Structure

This initial framework development effort includes all work for Tasks 1–4. Costs include estimated City staff resource and consultant cost estimates to develop software tools defined in Task 3. The cost for existing software is not included unless added costs are attributed to the Framework.

Table 5-1. *City FTE and Cost – Establish Facilities Management Framework Structure*

	Task
1.0	**Framework Governance**
1.1	Establish Governance and Advisory Framework
1.2	Define Roles and Responsibilities
1.3	Configure GIS and Asset Management
2.0	**Update Facilities Specifications**
2.1	Publish Facilities Data Specifications
2.2	Publish Data Collection and Delivery Specifications
2.3	Document Quality Control Standards
Estimated City Staffing:	4–6 staff

	Task
3.0	**Develop Technology Tools for Analysis and Quality Assurance**
3.1	Develop Facilities Compliance Scoring Model
3.2	Develop Barrier Repair Analysis and Prioritization Tools
3.3	Develop Quality Management Tools
4.0	**Barrier Repair Strategies**
4.1	Adopt Reactive Barrier Repair Strategy
4.2	Adopt Programmatic Barrier Repair Strategy
4.3	Strategic Asset Management Plan for Facilities
Estimated Consultant Costs:	$175,000

5.2.2 Facilities Inventory and Condition Assessment

The scope of the data collection process is variable and expected to be incurred as multiple initiatives scaled from a full citywide collection to targeted area projects covering up to 1,000 miles of roadway.

Facilities assessment cost provided by vendors participating in the Phase I: Pilot ranged from $1,042 per mile to $1,700 per mile. Vendor costs presented below are based on the per mile costs plus annual software cost that would be needed a minimum of one year during an inventory and assessment project.

Scenario 1. Citywide Facilities Inventory and Assessment

The scope of Scenario 1 is for a citywide effort to assess the condition of Facilities across the entire city as a single project across 7,000 miles of streets. The benefit of this approach is that it provides a comprehensive assessment of all Facilities and enables evaluation and prioritization of barrier repair with consideration of a complete Facilities inventory. Additionally, economy of scale will result in lower aggregate costs and the resulting data and analysis will be more consistent than an incremental collection, involving multiple vendors.

The disadvantage of this approach is that due to the extended period for barrier repair, a data refresh (complete reassessment) is recommended in the future to capture degradation of Facilities caused by tree growth or other factors to assure work prioritization is working on a valid Facilities assessment.

Table 5-2. *City FTE and Cost – Single Project Citywide Facilities Inventory and Assessment*

	Task
5.0a	**Facilities Inventory and Condition Assessment** (Citywide - 7,000 miles)
5.1	Define Project Study Areas
5.2	Conduct Inventory and Condition Assessment
5.3	Load Data into City Systems
5.4	Determine Accessibility Compliance Scores
Estimated City Staffing:	6–8 staff
Estimated Consultant Costs:	$4M–$9M

Scenario 2. Targeted Projects for Facilities Assessment

The scope of Scenario 2 is for a targeted project to assess the condition of Facilities across approximately 1,000 miles of roadway. The project size can be larger or smaller—1,000 miles is used to illustrate costs. The benefit of this approach is that it provides the City an incremental assessment of Facilities for areas of focus. The areas can be a cohesive area or target many areas across the City that represent high pedestrian traffic areas, for example. The intention of a targeted area assessment is aligned with a project area strategy defined by the City.

Table 5-3. City FTE and Cost – 1,000-Mile Project Facilities Inventory and Assessment

Task	
5.0b	**Facilities Inventory and Condition Assessment** (Example Project - 1,000 miles)
5.1	Define Project Study Areas
5.2	Conduct Inventory and Condition Assessment
5.3	Load Data into City Systems
5.4	Determine Accessibility Compliance Scores
	Estimated City Staffing: 2–3 staff
	Estimated Consultant Costs: $1.4M–$1.6M

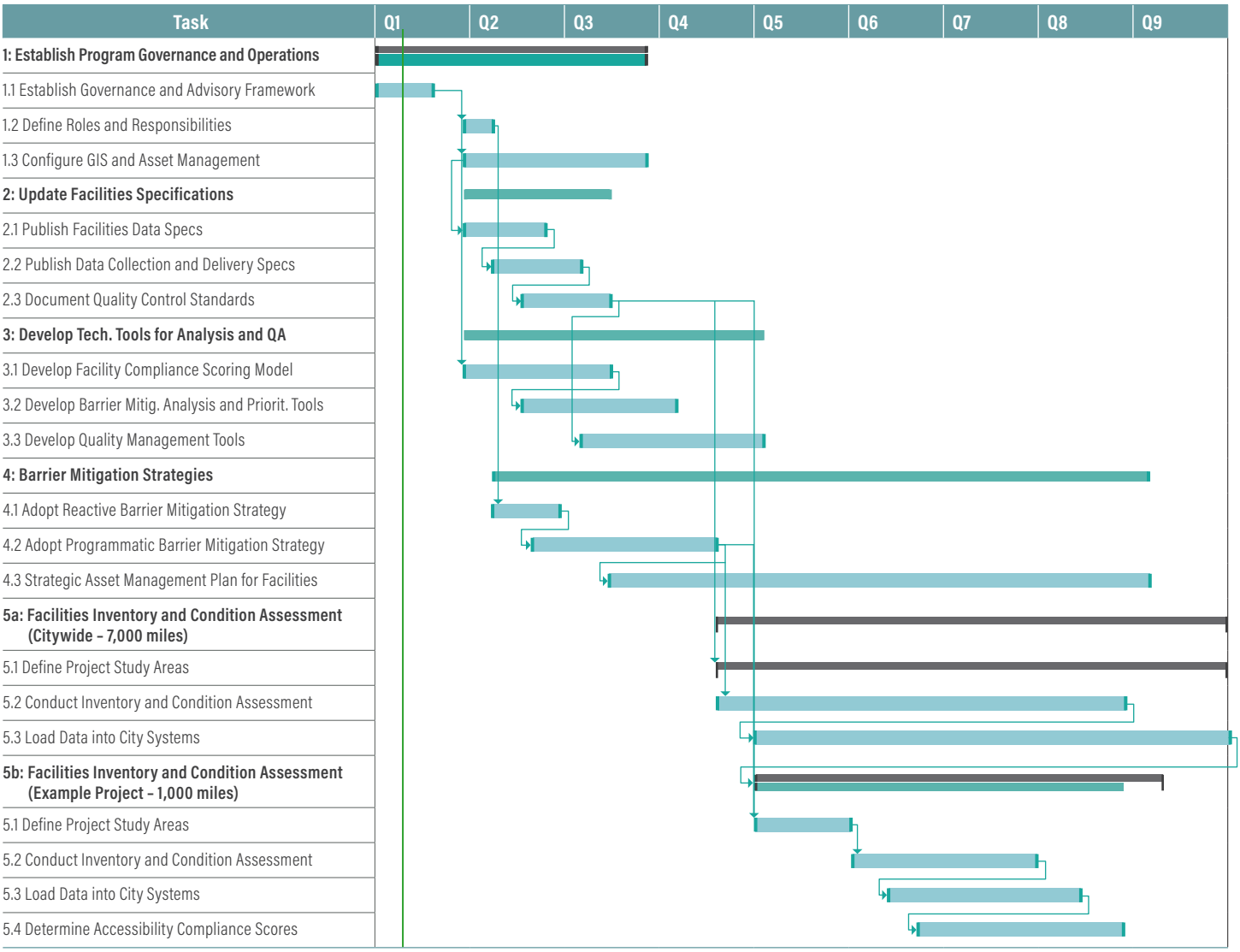
The disadvantage of this approach is that incremental area assessments do not provide the City with awareness of the Facilities across the entire city area, and as a result do not allow barrier repair policies to identify the most objectionable barriers citywide. The focus of barrier repair is thus only on the areas of assessment. Costs are higher per mile due to project definition, data management, and compliance analysis processing—efficiencies achieved on larger projects. Another benefit of this approach is to spread costs and City staff resources needed to perform the work over multiple years.

5.3 Schedule

The representative schedule shown below assumes the City can assign staff to initiate and proceed with the Work Plan. Critical path lines are shown to define specification development (Task 2), which is a prerequisite to initiating a Facilities Inventory and Assessment.

Task 5a and Task 5b projects are both shown to contrast the project durations.

Figure 5-1. Representative Schedule



5.3.1 Barrier Repair Prioritization and Work Programming

Costs for prioritizing work and programming, as well as executing barrier repair is dependent on the quantity, type of barrier repair, local conditions, and the distribution of Facilities that are repaired or replaced.

Cost for barrier repair projects is not expected to be different than currently incurred by the City with existing Facilities project repairs and replacements. Thus, no costs are estimated for repair and replacement.

The assessment would be more effective at reducing liability exposure if paired with a maintenance program to address immediate safety risks while working to fully remediate barriers over time.

5.3.2 Framework Operations

Annual operations of the Pedestrian Facilities Management Framework are necessary to keep the system current, provide training, perform reporting, and auditing the framework as described in Task 7 of the Work Plan.

Table 5-4. *Annual Framework Operations*

Task	
7.0	**Framework Operations** (Annual)
7.1	Operations Support
7.2	Staff Training
7.3	Framework Reporting
7.4	Periodic Framework Review
	Estimated City Staffing: 4–5 staff (additional)

6.0 APPENDICES

6.1 Appendix A – Draft Facilities Data Specifications

The following are draft data specifications for the Facilities Inventory and Condition Assessment. The specifications are initial specifications that may evolve or be modified for specific projects.

Pedestrian Facilities Attribution

The following attribution is to be provided associated with each pedestrian facility. Preferred data delivery structure is a shape file or Esri file geodatabase feature class for each facility type with associated attribution. Comma separated value (CSV) files with Longitude (X) and Latitude (Y) coordinates for each point feature may be accepted if unable to produce shape file or Esri file geodatabase feature class. Each record shall include a data collection timestamp YYYY-MM-DD hh:mm: ss.

Access Barrier

The Access Barrier feature is to be provided when the barrier will not otherwise be noted by the assessment of other facility types.

- Barrier Type (pole, vegetation, sign, fire hydrant, vault, etc.)
- Travel width considering barrier (IN)

Crosswalk

- Crosswalk Width (IN)
- Travel Path Width (considering protruding or overhanging objects) (IN)
- Side Slope (%)
- Running Slope (%)
- Vertical Displacement (IN)
- Horizontal Displacement (IN)
- Surface Material
- Striping and Markings Present (Y/N)
- Compliant (Y/N) *

Curb Ramp

Measurements by Curb Ramp Table

Measurement	Perpendicular	Parallel	Blended Transition	Depressed Corner
Right Flare Slope (%)	✓		✓	
Left Flare Slope (%)	✓		✓	
Right Ramp Cross Slope (%)	✓	✓	✓	✓
Right Ramp Running Slope (%)	✓	✓	✓	✓
Left Ramp Cross Slope (%)		✓	✓	✓
Left Ramp Running Slope (%)		✓	✓	✓
Right Ramp Length (IN.)	✓	✓	✓	✓
Right Ramp Width (IN.)	✓	✓		✓
Left Ramp Length (IN.)		✓	✓	✓
Left Ramp Width (IN.)		✓		✓
Center Ramp Running Slope 1 (%)			✓	
Center Ramp Running Slope 2 (%)			✓	
Turning Space Cross Slope (%)	✓	✓	✓	✓
Turning Space Running Slope (%)		✓	✓	
Turning Space Cross Slope 2 (%)	✓			✓
Turning Space Length (IN.)	✓	✓	✓	✓
Turning Space Width (IN.)	✓	✓	✓	✓
Gutter Counter Slope (%)	✓	✓	✓	✓
Roadway Grade (%)	✓	✓	✓	✓
Left Roadway Grade (%)			✓	✓
Clear Space Width (IN.)	✓	✓		
Clear Space Length (IN.)	✓	✓		
Accessible floor and ground surface condition	✓	✓	✓	✓
Vertical Offset (IN)	✓	✓	✓	✓

Measurement	Perpendicular	Parallel	Blended Transition	Depressed Corner
No Grade Break	✓	✓	✓	✓
Detectable warning surface type	✓	✓	✓	✓
Detectable warning surface width (IN)	✓	✓	✓	✓
Detectable warning surface distance from flowline (IN)	✓	✓	✓	✓
Compliant (Y/N) *	✓	✓	✓	✓

On-Street Parking

- Is blue curb present (Y/N)
- Is accessible parking sign present with accessibility symbol (Y/N)

Passenger Loading Zone

- Is accessible loading zone sign present with accessibility symbol (Y/N)

Pedestrian Signals

- Pedestrian Push Button (PPB) Side Reach (IN.)
- PPB Mounting Height (IN.)
- PPB Type
- PPB Audible (Y/N)
- PPB Vibrotactile (Y/N)
- PBB Separation (IN.)
- Is the APS close to the crosswalk it controls? (Y/N)
- Is the tactile arrow in line with crosswalk? (Y/N)
- Is the audible WALK indication properly functioning? (Y/N/NP)
- Is the vibrotactile WALK indication properly functioning? (Y/N/NP)
- Is the WALK indication volume sufficient (Y/N)
- Is the locator tone volume sufficient (Y/N)
- Is the sensitivity level of the automatic volume adjustment appropriate (Y/N/NP)
- Check Braille, if provided (Y/N/NP)
- Compliant (Y/N) *

Pedestrian Refuge Island

- Accessible Route Width (IN)
- Landing Width (IN)
- Clear Length (IN)
- DWS Depth (IN)
- DWS Full Width (Y/N)
- DWS Separation (IN)
- Compliant (Y/N) *

Sidewalk

- Sidewalk Width (IN)
- Travel path Width (considering protruding or overhanging objects) (IN)
- Side Slope (%)
- Running Slope (%)
- Vertical Displacement (IN)
- Horizontal Displacement (IN)
- Surface Material
- Compliant (Y/N) *

Staircase

- Riser Heights (IN)
- Tread Depth (IN)
- Are all risers and tread equal for the stairs (Y/N)
- Handrails on both sides of stairs (Y/N)
- Handrail gripping surfaces height (IN)
- Handrails are continuous for the length of the stairs (Y/N)
- Clearance between handrail gripping surfaces and adjacent surfaces (IN)
- Clear width between handrails (IN)
- Distance handrail gripping surfaces shall extend beyond (IN)
- Is handrail the same direction of stair flights (Y/N)
- At the top of a stair flight, handrails horizontal extension above the landing (IN)
- At the bottom of a stair flight, handrails extend at the slope of the stair flight for a horizontal distance at least equal to one tread depth beyond the last riser nosing (Y/N)
- Compliant (Y/N) *

Transit Stop Boarding or Alighting Area

- Paved Boarding and Alighting Area Present (Y/N)
- Width (IN)
- Side Slope (%)
- Running Slope (%)
- Smooth Transition to Sidewalk (Y/N)
- DWS at Curb (Y/N)
- Compliant (Y/N) * Measurement Requirements

* Compliant (Y/N) is a determination of the Facilities compliance to 2023 PROWAG based on the measurements and observations recorded for each specific pedestrian facility. Other PROWAG criteria associated with the facility type not measured and recorded are not considered.

Measurement Requirements

The following table shows the minimum measurement unit for reporting measurements of PROW pedestrian facility conditions. Based on these units of measure and the significant digits of the measure, the measuring device accuracy must provide for greater accuracy of measure than the minimum measurement unit.

Measurement	Minimum Measurement Unit from Specifications	Measuring Device Accuracy
Elevation Measurements	1/4 inch	1/8 inch
Distance Measurements	1/4 inch	1/16 inch
Angular (Slope) Measurements	0.1%	0.033%

Coordinate Definitions

Coordinates defining measurements for pedestrian facility locations shall be submitted as latitude and longitude in decimal degrees to 6 digits.

Longitude and Latitude (X, Y) coordinates shall be captured in World Geographic Coordinate System 1984 in decimal degrees to 6 digits.

Northing and Easting (N, E) coordinates shall be captured in the State Plane Coordinate System for California Zone V North American Datum 1983 in feet to 6 digits.

Measurement Guidelines for Walks

The following apply to sidewalks and crosswalks. Measurement guidelines should follow U.S. Access Board measurement guidelines. The following are extracted and adapted from Dimensional Tolerances in Construction and for Surface Accessibility.

- **Walk Running Slope**
  Measure for overall running slope (the primary direction of travel) by determining elevations at the ends of the walk, noticeable changes in slope, or at a maximum of 20 foot (6 meter) intervals beginning at one end of the walking surface. Elevations should be measured at the midpoint of the width of the walking surface. Calculate the slope using the horizontal distance between elevation points and the difference between the elevations at those points (i.e. the rise over the run). **Running slope should be measured at a maximum of 10 feet or at noticeable changes in slope.**
- **Walk Cross Slope**
  Measure for overall cross slope (the direction perpendicular to the running slope) by establishing elevations at the outside edges of the walking surface at 10 foot (3 meter) intervals beginning at one end of the walking surface. Calculate the cross slope at these locations using the horizontal walking surface width and difference between the measurement elevations at the edges of the walking surface (i.e. the rise over the run).

  If an obvious change in cross slope occurs between measuring points (such as a steeper driveway crossing a sidewalk), measure a minimum of two cross slopes at the steeper portion, but in no case should the measurements be farther apart than 5 feet (1.5 meters).

Other Deliverables

Other deliverables that may be useful to the City should be provided for evaluation. These may include but are not limited to:

- **Photographs:** Spatially indexed photographic imagery representing the assets collected.
- **LiDAR Products:** Point clouds, surface models, or other derivatives.
- **Software:** Analysis algorithms, online applications, repair or replacement cost models, or other tools.

KAREN BASS
MAYOR

EXECUTIVE DIRECTIVE NO. 9

Issue Date: October 16, 2024

Subject: Streamlining Capital Project Delivery and Equitably Investing in the Public Right-of-Way

The City of Los Angeles' expansive infrastructure is fundamental to the City's health, livability, economic development, and resilience to climate change. In fiscal year 2022-2023, the City spent over $860 million on public infrastructure, including capital projects and investments in our public right-of-way.

As Mayor, I am committed to making our neighborhoods more resilient and equitable by revitalizing our streets and tackling years of deferred maintenance and underinvestment in our most vulnerable communities. Although Los Angeles has adopted pioneering infrastructure and transportation policies like Mobility Plan 2035 and Vision Zero, we are not delivering on these projects with the urgency they require. In December 2022, the Council instructed the City Administrative Officer (CAO) and Chief Legislative Analyst (CLA) to reform the City's capital infrastructure programs, recognizing that capital investments are made in an ad-hoc manner between City departments, not fully addressing critical infrastructure needs in low-income communities (C.F. 21-0039). In November 2023, the Council instructed the CAO to work with departments to provide recommendations for a Five-Year Capital Infrastructure Plan for more equitable transportation investments (C.F. 23-0919). In March of this year, Measure HLA passed, calling on the City to implement roadway design improvements included in Mobility Plan 2035.

The City of Los Angeles currently lacks a comprehensive, multi-year plan for maintaining and developing infrastructure in the public right-of-way. Angelenos do not have a clear understanding of what can realistically be funded and when, nor what the City's long-term priorities are beyond those of a given year. Additionally, fragmented governance over what gets built on and below our streets means that projects requiring strong collaboration between City departments experience last-minute changes, creating cost overruns that contribute to a growing total cost of capital projects. Furthermore, the City is financing

many of these projects in a year-over-year approach, often meaning that without dedicated and predictable sources of capital, project work stops and starts and takes much longer to complete, costing us more. As a result, many communities suffer from deferred maintenance that degrade our streets, sidewalks, parks and aging facilities, and delay improvements that prevent injury and save lives.

As we prepare for major international events and the uncertainties of a changing climate, we must ensure our City's infrastructure is safe, clean, accessible, resilient, well-maintained, and world-class. This future demands a Citywide, strategic vision for infrastructure grounded in an equitable, transparent process for initiating, planning, budgeting, and executing capital projects. We must deliver on this commitment through streamlined governance, appropriate staff resources, centralized asset management, and long-term capital planning to deliver projects on time, on budget, and with maximum benefit to the public.

To that end, I am hereby creating the **Capital Planning Steering Committee** led by my Office of Infrastructure and consisting of the following departments:

- City Administrative Officer
- City Planning Department
- Department of Public Works
    - Bureau of Contract Administration
    - Bureau of Street Lighting
    - Bureau of Engineering
    - Bureau of Sanitation
    - Bureau of Street Services
- Department of Recreation and Parks
- Department of Transportation
- Department of Water and Power
- Department on Disability
- General Services Department
- Information Technology Agency

This effort is dependent on Citywide collaboration and alignment. Therefore, I invite the Chief Legislative Analyst to participate in the Capital Planning Steering Committee.

I hereby direct the Capital Planning Steering Committee to perform the following tasks:

1. **Capital Projects Governance**: within 60 days, the Capital Planning Steering Committee shall create a Charter that clearly defines roles and responsibilities, a shared understanding of purpose and objectives, decision-making processes, and resourcing requirements of the Committee and its functions. Participating departments shall be represented by General Managers or their designated representatives. The Charter shall establish governance of the Committee to meet the obligations outlined below. Committee members shall build out staffing plans needed to execute this directive.

2. **Capital Projects Funding:** The Capital Planning Steering Committee shall develop proposals to address known funding shortfalls affecting the repair, replacement, cleaning and maintenance of public right-of-way and parks assets. The Committee shall author proposals to be delivered to the Mayor's Office of Infrastructure and the Mayor's Office of Finance, Operations and Innovation that:

    a) Generate new revenue to meet current gaps in existing capital infrastructure projects, as well as projects expected to be identified within a future Capital Improvement Plan (CIP).
    b) Fund modernization of City yards and shops used to maintain the public right-of-way, and the cleaning, repair, replacement, and maintenance of major asset classes like streets and sidewalks, street trees and lighting, aging facilities, parks, and public spaces.
    c) Create dedicated contingency fund pools that capital projects under the auspices of this Committee can draw upon in order to speed project delivery and reduce project work stoppages. Proposals shall include reporting requirements to ensure transparency and accountability, and identify any City of Los Angeles Charter limitations, and what courses of action might be needed to address potential limitations.
    d) Develop a comprehensive public-private partnership strategy for funding major asset and capital project types in the public right-of-way and the parks system taking into account current types of agreements prevalent in the City, as well as assets or projects not currently funded in this way, and how a future citywide CIP may facilitate new opportunities for philanthropic funding.

3. **Capital Projects Maintenance, Delivery, and Development**: within 90 days, the Capital Planning Steering Committee shall consolidate existing public right-of-way working groups and committees to better align policy goals, integrate project delivery and maintenance workflows, and develop shared metrics across departments. Existing groups to be consolidated include the Street Working Group, Street Renewal Management Group, Sidewalk Repair Program Executive Steering Committee, Transportation Grants Advanced Planning, Complete Streets Program Executive Steering Committee,[1] Vision Zero Steering Committee,[2] Transportation Infrastructure Steering Committee,[3] and the Interdepartmental Memorandum of Understanding Core Team and Oversight Committee.[4] The Committee may identify other existing working groups and committees to consolidate if such consolidation would better align project maintenance, delivery, and development. The Committee shall meet at least monthly and focus on three subject areas, for which Subcommittees shall be formed:

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[1] Supersedes Complete Streets Program Executive Steering Committee established by Executive Directive No. 1 (Garcetti Series)

[2] Supersedes Vision Zero Steering Committee established by Executive Directive No. 10 (Garcetti Series)

[3] Supersedes Transportation Infrastructure Steering Committee established by Executive Directive No. 19 (Garcetti Series)

[4] Assumes the responsibilities of the Interdepartmental Memorandum of Understanding Core Team and Oversight Committee established by BPW File BPW-2022-0048

a) *Maintenance Coordination*: Participating departments shall report on maintenance programs and efforts to decrease backlogs, and pivot toward a more coordinated approach to asset management. Maintenance activities include but are not limited to sidewalk repairs including access ramp installations, street light outages including copper wire theft replacement, public electric vehicle charging, tree maintenance, street sweeping, street resurfacing, maintenance of traffic safety improvements, heat mitigation, climate resilience, and flood control. This Subcommittee shall also identify opportunities to coordinate maintenance activities and project delivery (e.g., street resurfacing and installation of new bike lanes).
b) *Project and Program Delivery Coordination*: Participating departments shall coordinate delivery of grant- and City-funded projects and programs using the Right-of-Way Protocols established by the Interdepartmental Project Delivery Memorandum of Understanding, including pedestrian infrastructure, active transportation infrastructure, and other projects in the public right-of-way.
c) *Project Development Coordination*: Participating departments shall share unfunded project concepts to coordinate planning, ensure multimodal and holistic design, strategically prioritize limited capital funding, and best position the City to compete for grant funding. This Subcommittee shall also centralize grant coordination and develop a strategy that focuses limited staff time on the most viable applications.

The Mayor's Office will assign a department lead for each of the above Subcommittees. Participating departments shall assign leadership at the executive level of General Manager or Assistant General Manager, subject to final approval from the Mayor's Office.

4. **Centralized Asset Management Systems**: within 120 days, the Capital Planning Steering Committee shall document all asset types that each participating department repairs, replaces, cleans, or manages in the public right-of-way. Departments shall develop a data implementation plan to create digital records of these assets within a single centralized, enterprise-wide asset management system interoperable with existing departmental platforms.

    a) Departments shall document life-cycle data on assets, including current condition, cost of operations and maintenance through remaining useful life, cost of replacement including potential upgrades in pursuit of decarbonization, and risk of failure. For assets for which life-cycle data is not currently available, departments shall provide plans to develop this data and, in the intervening period, base the condition of such assets on industry standards for useful life and any relevant operations and maintenance data.
    b) The centralized asset management system shall provide the basis for determining the cost of deferred maintenance for current assets in the public right-of-way, and enable a more data-driven, transparent capital planning and budgeting process. The system shall also provide the information to determine the funding priorities for following fiscal year budgets.

c) The centralized asset management system shall also provide public-facing information on asset maintenance and capital projects that is easy to understand and access. The system shall incorporate MyLA311 customer relationship improvements identified through my Executive Directive No. 5: Improving Customer Experience.

5. **Capital Projects Planning and Prioritization**: The Capital Planning Steering Committee shall compile all current and planned capital expenditures and recommend strategic priorities for capital projects and deferred maintenance in the public right-of-way over five-year, ten-year, and twenty-year periods. The City Administrative Officer shall, as part of the Committee and upon agreement with it, publish a Capital Infrastructure Plan (CIP), which will replace the Physical Plant Projects (other than Clean Water) portion of the Five-Year Capital and Technology Improvement Plan (CTIP). The CIP will inform future budget requests and continue to be updated annually. The Capital Planning Steering Committee shall:

   a) Recommend a citywide vision for capital improvement supported by an equitable strategy for developing, prioritizing, funding, and implementing projects over the subsequent five-year, ten-year, and twenty-year periods to meet legal requirements and other criteria including the Americans with Disabilities Act, Measure HLA, the General Plan's circulation element, mobility equity goals, climate change goals, and other departmental capital prioritization policies.
   b) Propose project intake reforms to ensure new capital projects maximize public benefit while addressing investment disparities throughout the City.
   c) Propose project closeout reforms to ensure delivered projects maintain a good state of repair with sufficient operations and maintenance resources.
   d) Assess the City's fiscal capacity and long-term financial considerations based on the above-referenced asset life-cycle data, to help the Mayor, City Council, policymakers and the public understand the true costs of constructing and maintaining the City's assets, and the costs of maintenance deferrals, so that budgeting can be more informed and justified.
   e) Document desired features and requirements for a common Citywide inter-departmental capital project management information system. This system shall allow for integration with asset management and customer relationship management systems. The Committee shall develop plans for enhancing existing departmental project management information systems, while planning for and procuring a new system or systems.

Executed this 16th day of October, 2024

KAREN BASS
Mayor

6.3 Appendix C - Glossary

Accessible
Accessible means that those with disabilities have free and full access to the same programs, services, and areas as those without disabilities do, and without discrimination.

Accessibility Compliance
The state of pedestrian facilities meeting legal and regulatory standards for pedestrian accessibility, such as the Americans with Disabilities Act (ADA), ensuring safe and equitable disability access for all individuals, including those with disabilities.

ADA (Americans with Disabilities Act) Standards
Federal regulations ensuring equal access and opportunities for individuals with disabilities, including detailed accessibility requirements for pedestrian facilities such as sidewalks, ramps, and crossings.

Accessibility Pathways
Routes designed or upgraded to meet accessibility standards, ensuring continuous, barrier-free pedestrian access through public rights-of-way.

Asset
Any physical element of the pedestrian facilities system, such as sidewalks, curb ramps, or pedestrian signals, managed as part of the Pedestrian Facilities Management Framework.

Asset Investment Planning
A process of forecasting and allocating financial resources for the maintenance, repair, and improvement of PROW pedestrian facility assets, based on inventory data, condition assessments, impact on pedestrian safety, and projected costs. This planning ensures optimal use of available funds to maintain asset performance, meet compliance standards, and align with organizational goals.

Asset Management System
A software tool for tracking the lifecycle of pedestrian facilities, including inspections, repairs, condition scoring, and maintenance activities. It integrates with GIS to enable centralized management and prioritization.

Automated Data Collection
The use of advanced technologies, such as LiDAR, GPS, and AI, to efficiently gather detailed information about PROW pedestrian facility conditions and compliance.

Barrier Repair
The process of repairing access barriers on pedestrian facilities through a maintenance procedure or remediation. Includes reactive and programmatic strategies.

Barrier Repair Prioritization Tools
GIS-based models and software are used to rank and prioritize repair projects based on PROW pedestrian facility conditions, public input, pedestrian traffic, City policies, and other criteria.

Candidate Project Areas
Geographic locations identified for potential PROW pedestrian facility upgrades or barrier repair based on initial assessments, community needs, and policy priorities.

Capital Planning Steering Committee
The governing body responsible for overseeing major City infrastructure projects, including pedestrian facilities, ensuring alignment with City directives and funding priorities.

Centralized Data Repository
A single database storing all PROW pedestrian facility information, including inventory, compliance scores, repair records, and updates, integrated with GIS and asset management systems.

Condition Assessment
The process of evaluating the physical state of pedestrian facilities to identify defects, non-compliance issues, or barriers.

Coordination with Public Works Projects
Aligning PROW pedestrian facility upgrades with other City infrastructure projects to optimize costs, minimize disruptions, and improve efficiency by addressing overlapping work scopes.

Compliance
Accessibility compliance.

Compliance Criteria
Specific measurable standards, such as slope, surface condition, or width, used to evaluate whether pedestrian facilities adhere to accessibility regulations and guidelines.

Compliance Scoring Model
A model that evaluates PROW pedestrian facility conditions against accessibility standards. Scores are assigned based on compliance criteria such as slope, width, and surface integrity, with aggregate scores used in repair prioritization.

Dashboards
Interactive, online tools providing real-time updates on PROW pedestrian facility conditions, repair progress, and project timelines. Dashboards are accessible to stakeholders for transparency and public accountability.

Data Collection and Delivery Specifications
Detailed guidelines outlining how data related to pedestrian facilities should be collected, formatted, and delivered to ensure consistency, quality, and usability for planning and analysis.

Disabled Loading Zones
Designated areas within the PROW specifically reserved for loading and unloading passengers with disabilities, adhering to accessibility standards.

Disabled Parking Zones
Parking spaces reserved for individuals with disabilities, marked and designed to provide accessible entry and exit, compliant with ADA requirements.

Executive Directive 9
A City-issued directive aimed at streamlining capital project delivery and ensuring equitable investments in the PROW, guiding priorities for infrastructure improvements.

Facilities
All physical components of pedestrian infrastructure, including sidewalks, ramps, crossings, pedestrian signals, bus landings, parking zones, and other elements within the PROW.

Framework
Refers to the Pedestrian Facilities Management Framework.

Geographic Information System (GIS)
A system for mapping and analyzing PROW pedestrian facility locations, conditions, and compliance data. GIS serves as the central repository for PROW pedestrian facility inventory data and supports cross-departmental visualization and analysis of pedestrian facilities.

Inclusive Engagement Practices
Outreach strategies that ensure communication and participation from underserved or vulnerable populations, including non-English speakers and individuals with disabilities.

Interdepartmental Working Group
A collaborative committee comprising representatives from City departments involved in PROW pedestrian facility management. This group oversees framework implementation, resolves conflicts, and ensures alignment with City priorities.

MyLA311
A public service request platform allowing residents to report PROW pedestrian facility issues, such as damaged sidewalks or barriers, and receive updates on repair statuses.

Non-Compliance Severity Score
A numeric or categorical score indicating the extent to which a PROW pedestrian facility fails to meet accessibility standards, helping prioritize repairs based on urgency and impact.

Pedestrian Facilities
Infrastructure elements that enable safe and accessible pedestrian movement, such as sidewalks, curb ramps, street crossings, pedestrian signals, and other PROW assets.

Pedestrian Facilities Management Framework
A comprehensive City initiative designed to manage the planning, assessment, repair, and ongoing maintenance of pedestrian facilities within the PROW. It ensures compliance with legal and accessibility standards, including the ADA and Willits Settlement Agreement.

Pedestrian Generators
Locations such as schools, hospitals, public transit stops, and event venues that attract significant pedestrian traffic that may require prioritized accessibility improvements.

Performance Metrics
Quantitative indicators used to assess the success of the Pedestrian Facilities Management Framework, such as the number of repairs completed, compliance improvements, and community satisfaction.

Periodic Reinspection
Scheduled assessments of pedestrian facilities to update their compliance status and condition. Reinspections focus on areas with a high likelihood of degradation, such as those affected by tree roots.

Phased Implementation Plan
A strategy for addressing PROW pedestrian facility repairs in stages, prioritizing high-need areas, and expanding to less critical areas over time to align with available resources.

Pilot Project
A small-scale initiative designed to test methodologies, technologies, or strategies for managing pedestrian facilities, providing insights to inform broader Framework implementation.

Predictive Models
Analytical tools that estimate PROW pedestrian facility degradation over time based on factors like tree growth and usage patterns, helping to anticipate maintenance needs.

Prioritization Scoring
A system for ranking PROW pedestrian facility upgrades based on criteria such as safety, severity of damage, pedestrian traffic, and proximity to pedestrian generators.

Priority Areas
Locations identified for focused attention based on safety concerns, compliance needs, community input, or policy directives, such as underserved or high-traffic areas.

Programmatic Barrier Repair
A systematic approach to addressing known barriers in pedestrian facilities through planned, prioritized projects, as opposed to reactive measures.

Programmatic Barrier Repair Strategy
A long-term plan for systematically removing barriers from pedestrian facilities, focusing on high-priority areas and integrating efforts with broader City projects.

Project Study Areas
Defined geographic areas targeted for detailed assessments, data collection, and planning to determine PROW pedestrian facility needs and develop improvement projects.

PROW Pedestrian Facility Inventory and Condition Assessment
A comprehensive record of all pedestrian facilities, documenting their location, type, and condition to evaluate compliance and prioritize improvements.

Public Engagement
Structured interaction with the community, including surveys, workshops, and reporting tools like MyLA311, to gather feedback on PROW pedestrian facility priorities and progress.

Public Right-of-Way Accessibility Guidelines (PROWAG)
Federal guidelines outlining accessibility standards for pedestrian facilities, including sidewalks, curb ramps, and street crossings, to ensure safe and barrier-free access.

Public Way Reservation System (PWRS)
A tool used to coordinate and schedule construction projects in the PROW, including PROW pedestrian facility repairs, to avoid conflicts and align work across departments.

Quality Control Standards
Guidelines and procedures ensuring that data collection, condition assessments, and project execution meet defined quality benchmarks for consistency and accuracy.

Reactive Barrier Repair
Addressing urgent, unplanned issues in pedestrian facilities, such as hazards caused by fallen debris or sudden damage, without pre-scheduled planning. Reactive Barrier Repair is often considered maintenance that may fall short of ensuring full compliance. Not Programmatic Barrier Repair.

Remediation
ADA sidewalk remediation is the process of modifying existing sidewalks to meet ADA standards by correcting issues with width, slope, surface condition, curb ramps, and obstacle clearance to ensure equal access for people with disabilities.

Risk-Based Prioritization
A methodology for ranking PROW pedestrian facility repairs based on potential risks to pedestrian safety, particularly in high-traffic or severely non-compliant areas.

Self-Evaluation
A systematic process undertaken by a public agency to assess its existing pedestrian facilities within the PROW. The evaluation identifies barriers to accessibility, such as non-compliant sidewalks, curb ramps, or street crossings, and measures their compliance with applicable accessibility standards, including the ADA and PROWAG.

Scenario Analysis
A method of evaluating different potential outcomes based on varied assumptions or priorities, such as adjusting repair schedules or funding levels.

Strategic Asset Management Plan (SAMP)
A comprehensive, long-term framework designed to guide the management of infrastructure assets, such as pedestrian facilities, to maximize their value and functionality over their lifecycle. A SAMP aligns asset management activities with organizational goals, resources, and compliance requirements while addressing current and future needs.

Transition Plan
A formal document developed based on the findings of the self-evaluation. It outlines a strategy and timeline for removing barriers to accessibility, prioritizing improvements based on factors like safety, public input, and compliance requirements. The plan includes specific actions, funding strategies, and responsibilities to achieve full accessibility compliance over time.

Willits Settlement Agreement
A legal settlement requiring the City to remediate pedestrian facilities to ensure accessibility compliance in the PROW, with an emphasis on ADA and PROWAG standards.

Work Programming
The process of scheduling and coordinating PROW pedestrian facility repairs and upgrades based on priority rankings, resource availability, and alignment with broader City infrastructure plans.

6.4 Appendix D – Pilot Study Findings Summary

Pilot Objectives

The Inventory and Assessment of the City's Public Right-of-Way Pedestrian Facilities Phase I: Pilot aimed to evaluate the effectiveness of various technologies in assessing pedestrian assets within the City of Los Angeles' Public Right-of-Way for compliance with the Public Rights-of-Way Accessibility Guidelines (PROWAG). The goal was to inform strategies for a citywide inventory and compliance effort, balancing cost-efficiency, accuracy, and scalability while integrating with existing GIS and Asset Management (AM) systems.

Pilot Approach

The study engaged six vendors and technologies to assess diverse pilot locations within Los Angeles, using data from approximately 4.3 miles of sidewalks and related pedestrian facilities. The vendor methodologies were compared for their accuracy, data richness, operational scalability, and applicability to meet the PROW pedestrian facility management requirements.

Pilot Locations

The selected locations covered various environments, including residential, commercial, hillsides, and high-traffic transit corridors, ensuring the findings addressed diverse pedestrian infrastructure challenges and the findings are relevant for citywide analysis. Table below; "Phase 1: Pilot Locations," identify the pilot areas and land use categories.

Table 1. *Phase I: Pilot Locations, Category, and Miles*

Phase 1: Pilot Locations	Location	Category	Centerline Miles
1	Grand Ave. from Pico to Olympic Blvd.	Commercial/Major Pedestrian and Vehicular Transit Corridor	0.3 miles
2	S. Grand Ave. from W. 5th St. to W. 2nd St.	City Hall/Downtown	1.0 miles
3	S. Flower St. from W. 12th St. to Venice Blvd.	Regional Commercial/Downtown	0.4 miles
4	San Rafael Ave. from Mount Washington Dr. to W. Ave 37th & W. Ave 37th from San Rafael Ave. to Mayfair Dr.	Hillside/Rural	0.7 miles
5	N. Ave 52nd from Granada St. to Monte Vista St.	Historic	0.3 miles
6	S. Flower St. from Venice Blvd. to W. 9th St.	Urban Residential	0.7 miles

Participating Vendors

- **BV-PathVu:** Utilized GPS-equipped carts with cameras, lasers, and IMU sensors to profile sidewalk conditions and provide remediation insights.
- **Citian:** Deployed high-precision LiDAR with AI processing to deliver detailed, scalable data for citywide PROW pedestrian facility assessments.
- **Cyclomedia:** Deployed vehicles mounted with 360-degree cameras and LiDARsensors to capture high-resolution panoramic imagery and 3D point cloud data to collect PROW assets.
- **DaxBot:** Introduced autonomous robotic technology combining LiDAR and IMU for precise pedestrian infrastructure mapping.
- **Deep Walk:** Leveraged iPhone-based LiDAR systems for localized, affordable data collection suitable for smaller-scale projects.
- **IMS:** Employed ATV-mounted Gocator lasers and cameras to collect scalable datasets across extensive areas with vehicle-based systems.

Role of Psomas for Conventional Collection

Psomas played a critical role in the Phase I: Pilot by providing traditional data collection methods. This approach included the use of digital levels and manual measurements to assess vertical displacements, slopes, and sidewalk widths. Psomas' data served as a control dataset against which the accuracy and reliability of advanced technologies were evaluated.

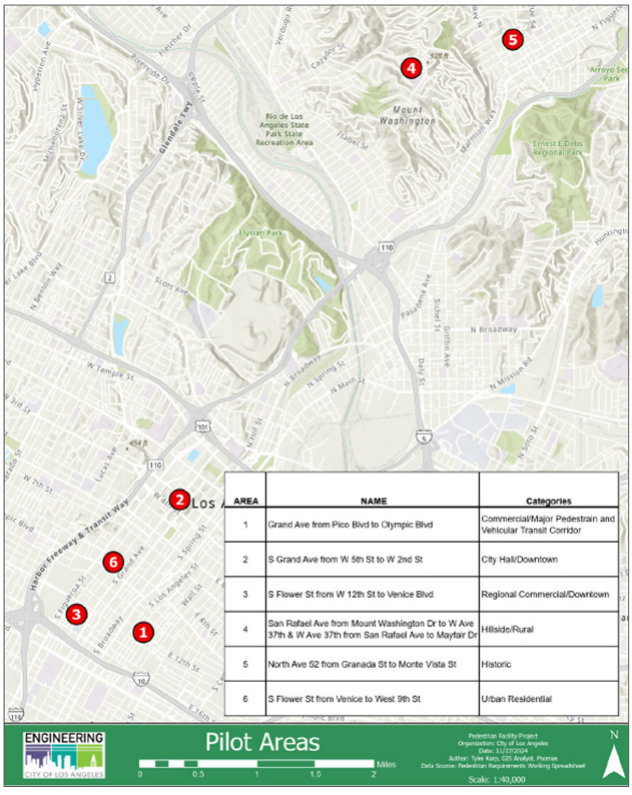


Figure 1. *Phase I: Pilot Areas*

The manual methods provided a ground truth benchmark, ensuring that technological outputs could be validated and refined for future large-scale implementations.

The participation of multiple vendors allowed for a diverse range of data collection techniques to be evaluated. By including Psomas' conventional methods alongside advanced technologies, the Phase I: Pilot ensured a rigorous assessment of accuracy, precision, and scalability. This comparative analysis supports the City's efforts to select the most effective technologies for a comprehensive citywide pedestrian facilities inventory.

Requested Data Collected – Vendor Comparison

Overview

Data collection phase of the Phase I: Pilot aimed to evaluate the ability of vendors to capture critical pedestrian infrastructure attributes with accuracy and granularity. To ensure compliance with PROWAG standards, vendors were tasked with collecting and analyzing features such as sidewalks, curb ramps, slopes, and barriers.

The Vendor Asset Collection Comparison table below compares the capabilities of various vendors and their respective technologies in collecting data relevant to pilot data requirements and ADA and PROWAG standards. It highlights each vendor's ability to gather information on critical features such as sidewalks, displacement, barriers, street slopes, curb ramps, crosswalks, passenger loading zones, pedestrian signals, transit stops, and staircases. The table also notes whether the technologies provide detailed data, categories, or flags for remediation recommendations. By presenting this information, the table helps stakeholders evaluate the suitability of each technology for accessibility requirements assessments, focusing on which features are covered, the depth of the data provided, and any limitations. This comparison is essential for selecting technologies that align with specific Phase I: Pilot requirements, ensuring comprehensive, accurate, and actionable data collection for accessibility requirements.

Table 2. Vendor Asset Collection Comparison

Vendor	Technology	Sidewalk	Displacement	Barriers	Street Slope	Missing Sidewalk	Curb Ramp	All Curb Ramp Criteria	Crosswalk	Passenger Loading Zone	Pedestrian Signals	Transit Stop	Staircase	Images
Bureau Veritas-PathVu	Cart with GPS and high-resolution cameras, lasers, IMU	✓	H/V - Category	Flag	✓	–	✓	✓	–	–	–	–	–	✓
Citian	High-precision LiDAR with AI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	P/NP	✓
Cyclomedia	High-precision LiDAR with AI processing	✓	–	–	–	–	✓	–	✓	✓	✓	✓	–	✓
DaxBot	Autonomous robot with LiDAR and IMU	✓	✓	✓	✓	✓	✓	✓	✓	✓	P/NP	✓	–	✓
Deep Walk	iPhone LiDAR with AI	✓	H/V - Category	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓
IMS	ATV-mounted Gocator lasers, IMU, and camera	✓	✓	✓	✓	–	–	–	–	–	–	–	–	✓

Attributes assessed included:

- **Sidewalks:** Cross slope, running slope, vertical changes, travel path width, surface material.
- **Curb Ramps:** Slope, width, detectability, and obstructions.
- **Other Facilities:** Passenger loading zones, crosswalks, transit stops
- **Sidewalk Width:** Daxbot, IMS, BV-PathVu had width measurement limits. For a complete sidewalk width, two passes will be required.

LEGEND

✓	Met pilot data requirement with data
–	Item not collected
P/NP	Presence/absence of an asset is flagged
Flag	Condition is flagged, no measurement
H/V-Category	Categorized based on horizontal and vertical displacement (e.g. severity levels)

Key Takeaways

- **Comprehensive Data Coverage**
  - Citian and DaxBot provide the broadest feature coverage, offering data for key accessibility requirements metrics such as sidewalks, barriers, curb ramps, street slopes, and crosswalks.
  - IMS and BV-PathVu have limited feature coverage, focusing on sidewalks and barriers, with significant gaps in other ADA-related categories.

- **Strengths of Each Vendor**
  - Citian: High-precision LiDAR with detailed data collection for most categories, making it a strong choice for comprehensive urban ADA assessments. However, it lacks data for passenger loading zones and provides incomplete curb ramp coverage.
  - DaxBot: Comprehensive coverage across most categories, including passenger loading zones and crosswalks, with data for street slopes and barriers. However, it lacks data for pedestrian signals.
  - Deep Walk: Covers basic ADA metrics like sidewalks and barriers but lacks more advanced categories such as pedestrian signals, transit stops, and complete curb ramp criteria.
  - BV-PathVu: Focuses on sidewalks and barriers with unique remediation recommendations but lacks data for many other ADA features such as curb ramps, crosswalks, and pedestrian signals.
  - IMS: Primarily collects sidewalk and barrier data but offers minimal coverage for other ADA-related criteria, making it less suitable for comprehensive assessments.
- **Limitations in Pedestrian Signal and Transit Stop Data**
  - Most vendors, except Citian and partially DaxBot, lack coverage for pedestrian signals and transit stops, which are critical for ensuring accessibility in urban environments.
- **Passenger Loading Zones**
  - DaxBot is the only vendor providing data on passenger loading zones, which is essential for evaluating accessibility in areas used by rideshare services or public transportation drop-offs.
- **Image Collection**
  - All vendors support image-based data collection, which is crucial for visual documentation and validation of accessibility requirements.
- **Specialized Focus**
  - Some vendors, like BV-PathVu and IMS, focus on specific categories such as sidewalks and barriers, which could complement other technologies for a more holistic assessment.

Data Analysis Approach – Accuracy, Precision, and Quadrant Analysis for Evaluating ADA Data Collection Technologies

Overview

As the City of Los Angeles works to ensure compliance with ADA and PROWAG standards, accurate and reliable data collection technologies were evaluated for sidewalk accessibility.

Accuracy and Precision

- **Accuracy:** Indicates how close measurements are to true values, ensuring results align with ADA and PROWAG standards. High accuracy is critical for identifying features like sidewalk widths, slopes, and surface irregularities that must meet precise requirements.
- **Precision:** Reflects the consistency and repeatability of measurements. High precision minimizes variability and ensures that repeated assessments yield reliable results, reducing the likelihood of false positives or negatives.

Quadrant Analysis

Beyond Accuracy and Precision, Quadrant analysis was used to provide a framework for comparing technologies by plotting their accuracy and precision on a graph, dividing performance into four distinct categories:

- **High Accuracy, High Precision:** Technologies in this quadrant are ideal, delivering consistent and correct measurements that fully support Accessibility requirements.
- **High Accuracy, Low Precision:** These technologies are generally accurate but lack consistency, which could lead to variability in identifying non-compliant features.
- **Low Accuracy, High Precision:** While consistent, these technologies deviate from true values, potentially misidentifying compliance issues.
- **Low Accuracy, Low Precision:** These technologies struggle with both correctness and consistency, making them less reliable for ADA assessments.

Why This Approach

Accessibility requirements require a rigorous evaluation of sidewalk features, including:

- **Sidewalk Travel Width:** Ensuring clear paths for accessibility.
- **Cross Slope:** Maintaining gradients below 2% to support mobility.
- **Run Slopes:** Verifying longitudinal slopes for safety and accessibility.
- **Uplift:** Detecting surface irregularities that pose tripping hazards.

By combining accuracy, precision, and quadrant analysis, the City of Los Angeles can:

- Identify the best-performing technologies for specific features.
- Understand trade-offs between accuracy and precision for different applications.
- Make informed decisions that optimize resource allocation and ensure compliance.

*Note: Cyclomedia did not provide sidewalk and ramp measurement data and were excluded from the data analysis.

Sidewalk Data

Sidewalk Data Collection

Sidewalk data was analyzed at the parcel frontage polygon level to compare vendor-collected data against control study data. This allowed for detailed evaluation of compliance metrics as outlined by ADA and PROWAG standards, such as:

- Sidewalk slope
- Cross slope
- Widths
- Surface conditions

Figure 2. *Sidewalk with Vegetation Barrier Sample Location*

Figure 3. *Sidewalk with Tree Uplift Barrier Sample Location*

Figure 4. *Sidewalk with Uplift Barriers Sample Location*

Figure 5. *Sidewalk with Cracks Sample Location*

Accuracy and Precision Assessment

Vendors' data was evaluated by matching their measurements to control data. This process determined:

- Whether the vendors identified the same issues (e.g., cracks, barriers, slope deviations) as the control data.
- Whether the severity or magnitude of issues matched the control data.

Match rates were used to measure accuracy and precision, showing how closely vendor-identified issues corresponded to control data. Analyses were conducted both for overall sidewalk data and for specific categories to gain detailed insights. A quadrant analysis was also performed to visually compare vendors' performance, enabling a robust evaluation of technologies.

Ramp Data

Ramps were analyzed differently due to their discrete locations, which allowed for direct comparisons of vendor measurements on a ramp-by-ramp basis. Two metrics were used:

- **Mean Absolute Error (MAE):** Represented accuracy by measuring the average difference between vendor measurements and true values.
- **Standard Deviation of the MAE (SDMAE):** Represented precision by measuring variability in the errors.

This approach ensured that vendors' ramp measurements could be directly and consistently compared, unlike sidewalk measurements, which might vary along different sections.

Figure 6. Curb Without Ramp Sample Location

Figure 7. Missing Curb Ramp Sample Location

Ramps: Accuracy and Precision by Technology

The table below summarizes the accuracy (MAE) and precision (SDMAE) of ramp slope and dimensional measurements for each vendor's technology:

Table 3. Vendor Technology Accuracy and Precision for Ramp Features

Vendor	Technology	Right Flare Slope (%)	Left Flare Slope (%)	Ramp Cross Slope (%)	Ramp Running Slope (%)	Length (in)	Width (in)	Gutter Counter Slope (%)	Roadway Grade (%)
BV	Manually Propelled Profiler	0.96 ± 0.18	1.1 ± 0.28	1.05 ± 0.22	0.96 ± 0.30	13.34 ± 3.58	3.71 ± 1.67	1.42 ± 0.46	1.46 ± 0.32
Citian	Vehicle Mounted LiDAR with AI Processing	1.00 ± 0.16	0.76 ± 0.17	0.93 ± 0.20	1.17± 0.39	13.52 ± 6.42	3.18 ± 1.02	1.78 ± 0.48	1.66± 0.27
DaxBot	Unmanned Robot with High Precision Instrumentation	3.26 ± 0.65	2.60 ± 0.62	0.93 ± 0.42	1.17 ± 0.54	12.39 ± 4.09	7.04 ± 1.61	2.52 ± 0.71	0.86 ± 0.26
DeepWalk	Manual iPhone LiDAR with AI Processing	Not Provided	Not Provided	1.59 ± 0.29	1.77 ± 0.65	24.06 ± 7.94	8.07 ± 3.25	Not Provided	0.80 ± 0.20
IMS	ATV Mounted Sidewalk Surface Tester	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided

Table 4. Vendor Technology Accuracy and Precision Percent Error for Ramp Features based on Accessibility Requirements

Vendor	Technology	Right Flare Slope (%)	Left Flare Slope (%)	Ramp Cross Slope (%)	Ramp Running Slope (%)	Length (in)	Width (in)	Gutter Counter Slope (%)	Roadway Grade (%)
BV	Manually Propelled Profiler	9.6% ± 18.7%	11.0% ± 25.4%	52.5% ± 20.9%	11.5% ± 31.3	3.7% ± 26.8%	10.3% ± 45.0%	28.4% ± 32.4%	29.2% ± 22.0%
Citian	Vehicle Mounted LiDAR with AI Processing	10.0% ± 16.0%	7.6% ± 22.37%	46.5% ± 0.20	14.0% ± 33.3%	3.8% ± 47.5%	8.3% ± 32.1%	35.6% ± 27.0%	32.2% ± 16.3%
DaxBot	Unmanned Robot with High Precision Instrumentation	32.6% ± 19.9%	26.0% ± 23.8%	46.5% ± 45.2%	14.1% ± 46.1%	3.4% ± 33.1%	19.5% ± 22.9%	50.4% ± 28.2%	17.2% ± 30.2%
DeepWalk	Manual iPhone LiDAR with AI Processing	Not Provided	Not Provided	79.5% ± 18.24%	21.3% ± 32.7%	6.7% ± 31.8%	22.4% ± 40.3%	Not Provided	16.0% ± 25.0 %
IMS	ATV Mounted Sidewalk Surface Tester	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided

Key Insights

- **Best Performing Technologies:** High-resolution cameras with lasers (BV) and High-Precision LiDAR with AI (Citian) provided the most accurate and consistent ramp measurements, achieving low MAE and SDMAE values.
- **Inclinometer Performance:** The CTi TILT-57A Inclinometer (DaxBot) showed strengths in general measurements but struggled with flare slope accuracy, resulting in higher error deviations.
- **Medium-Precision LiDAR Limitations:** iPhone LiDAR systems (Deep Walk) demonstrated limitations in precision and completeness, due to hardware constraints, particularly in flare slope and ramp dimensions.
- **Data Gaps:** IMS did not collect data for ramp assessments, making a comprehensive performance evaluation infeasible.

Sidewalk Data

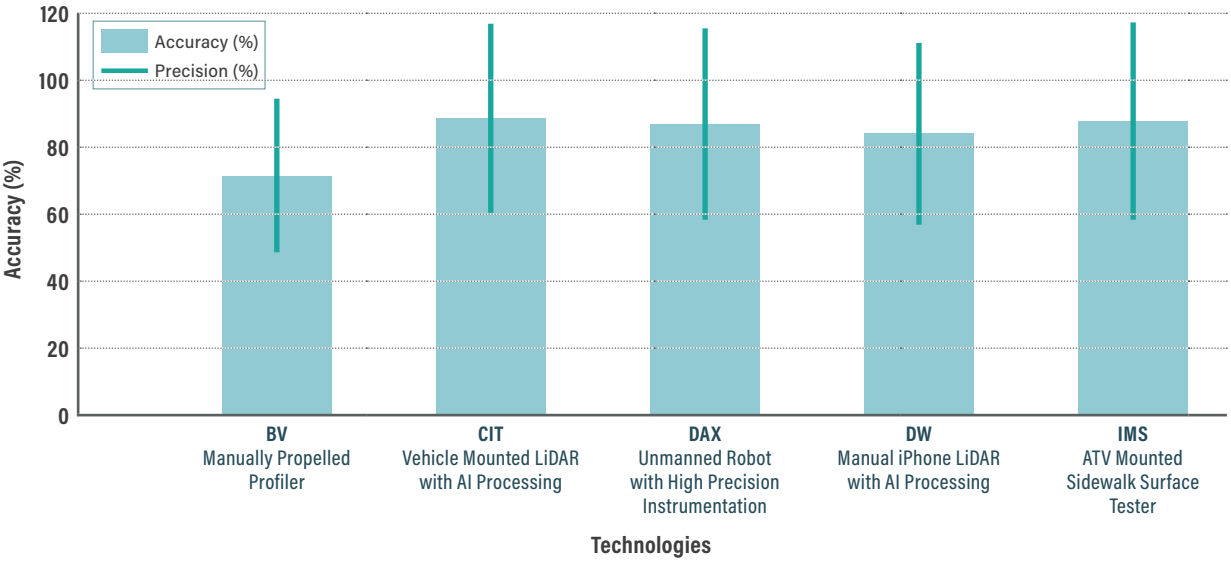
Sidewalk Overall Performance Accuracy and Precision

Vendor Comparison

Table 5. Vendor Technology Accuracy and Precision Percent Error for Ramp Features

Vendor	Technology	Match Rate (%)	Accuracy (%)	Precision (%)
BV	Manually Propelled Profiler	72.88	72.88	23.26
Citian	Vehicle Mounted LiDAR with AI Processing	90.00	90.00	28.27
DaxBot	Unmanned Robot with High Precision Instrumentation	88.29	88.29	28.85
DeepWalk	Manual iPhone LiDAR with AI Processing	85.25	85.25	27.34
IMS	ATV Mounted Sidewalk Surface Tester	89.04	89.04	29.57

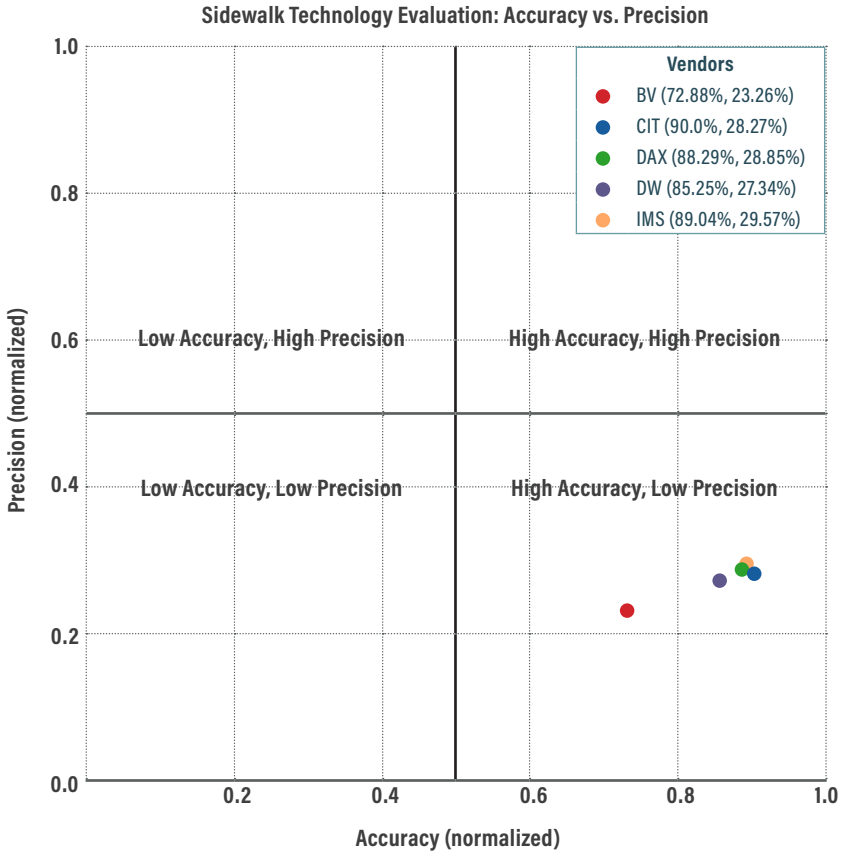
Figure 8. Overall Sidewalk Accuracy and Precision by Technology



Quadrant Analysis for Overall Technology Accuracy and Precision

This graph below evaluates the performance of various sidewalk data collection technologies by comparing their accuracy and precision on a quadrant level at a 50% division used as a threshold to categorize the performance of sidewalk ADA data collection technologies into four distinct quadrants.

Figure 9. Overall Sidewalk Accuracy and Precision Quadrant Analysis



Key Insights

- **High Accuracy, Low Precision**
  - Most vendors, such as CIT, DAX, DW, and IMS, achieved high accuracy (above 85%) but low precision (below 30%).
  - This suggests these technologies are effective at capturing overall correctness but may struggle with consistent detail in measurements.
- **Low Accuracy, Low Precision**
  - BV, while achieving moderate accuracy (~73%), exhibited the lowest precision (~23%), highlighting challenges in both overall correctness and measurement consistency.
- **High Accuracy, High Precision**
  - None of the technologies reached the optimal quadrant, indicating room for improvement in achieving both high accuracy and precision.
- **Implications for Accessibility Requirements**
  - High accuracy is critical for identifying areas needing improvement, while precision ensures consistent results across repeated measurements.
  - The trade-off between accuracy and precision must be considered when selecting technology for ADA sidewalk evaluations, especially for ensuring compliance and detailed analysis.

Sidewalk Feature Accuracy and Precision

The table below shows the accuracy and precision for key sidewalk features.

Table 6. Accuracy and Precision for Key Sidewalk Features

Feature	Vendor	Technology	Accuracy (%)	Precision (%)
Sidewalk Travel Width	BV	Manually Propelled Profiler	96	49
	Citian	Vehicle Mounted LiDAR with AI Processing	96	38
	DaxBot	Unmanned Robot with High Precision Instrumentation	96	51
	DeepWalk	Manual iPhone LiDAR with AI Processing	94	36
	IMS	ATV Mounted Sidewalk Surface Tester	51	26
Cross Slope	BV	Manually Propelled Profiler	45	29
	Citian	Vehicle Mounted LiDAR with AI Processing	52	32
	DaxBot	Unmanned Robot with High Precision Instrumentation	57	37
	DeepWalk	Manual iPhone LiDAR with AI Processing	54	33
	IMS	ATV Mounted Sidewalk Surface Tester	57	37
Run Slopes	BV	Manually Propelled Profiler	84	32
	Citian	Vehicle Mounted LiDAR with AI Processing	89	44
	DaxBot	Unmanned Robot with High Precision Instrumentation	93	47
	DeepWalk	Manual iPhone LiDAR with AI Processing	89	39
	IMS	ATV Mounted Sidewalk Surface Tester	88	49
Uplift	BV	Manually Propelled Profiler	73	23
	Citian	Vehicle Mounted LiDAR with AI Processing	90	28
	DaxBot	Unmanned Robot with High Precision Instrumentation	88	29
	DeepWalk	Manual iPhone LiDAR with AI Processing	85	27
	IMS	ATV Mounted Sidewalk Surface Tester	89	30

Figure 10. Sidewalk Travel Width Accuracy and Precision

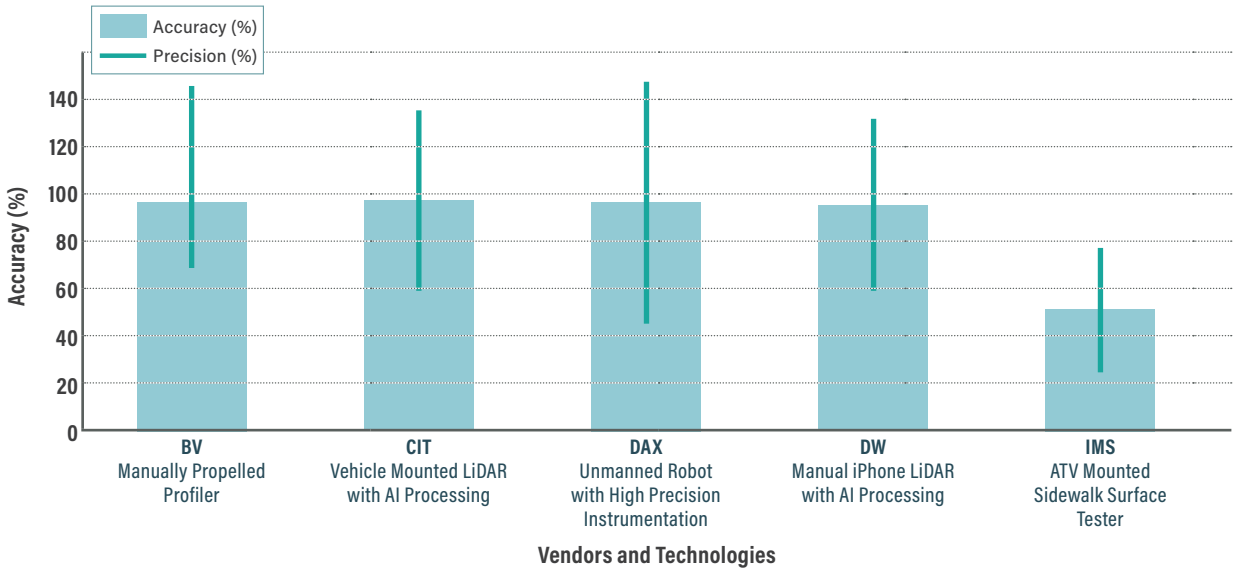


Figure 11. Sidewalk Cross Slope Accuracy and Precision

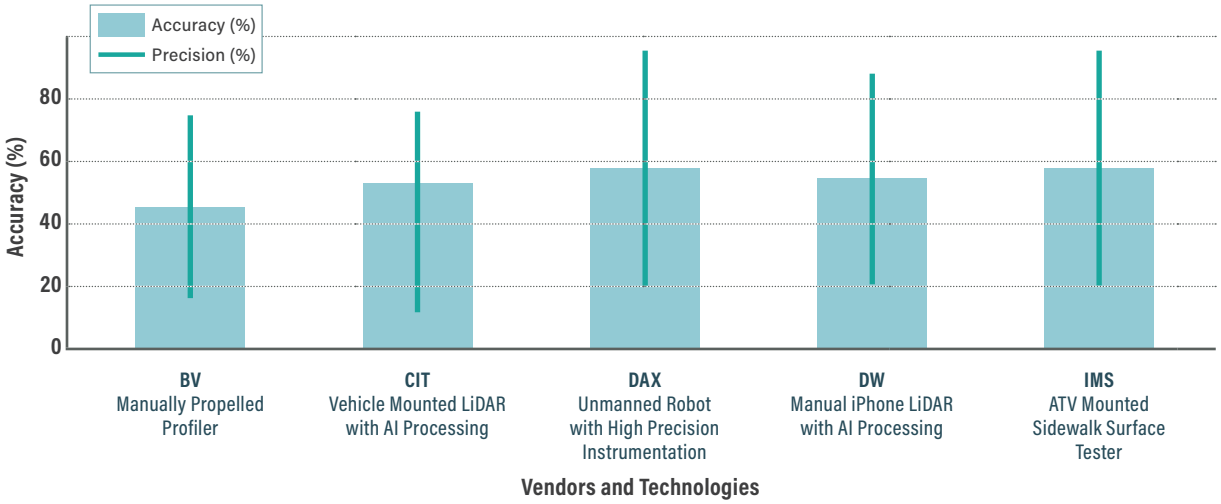


Figure 12. Sidewalk Run Slope Accuracy and Precision

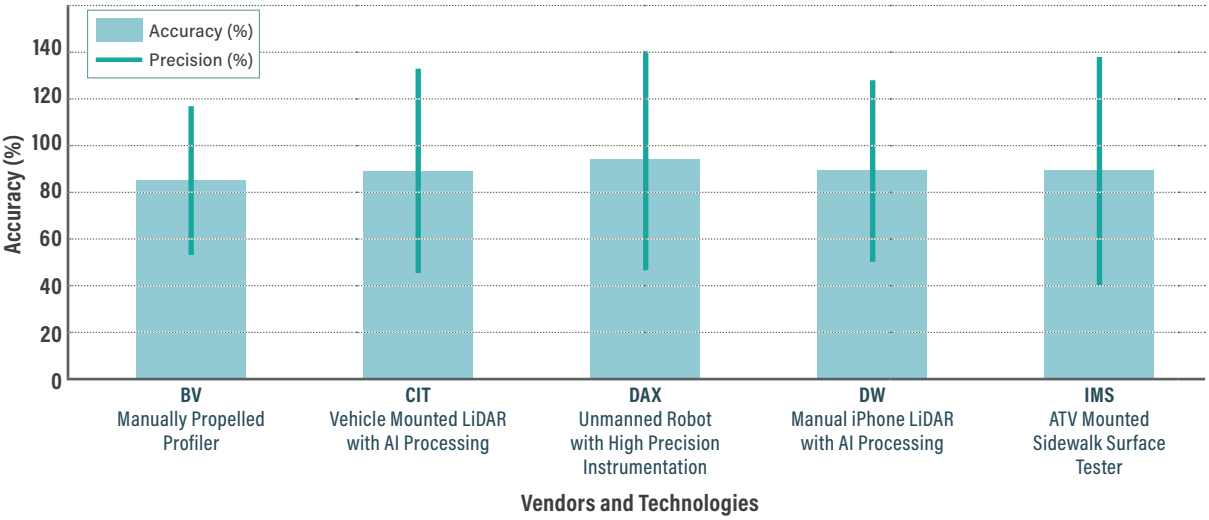
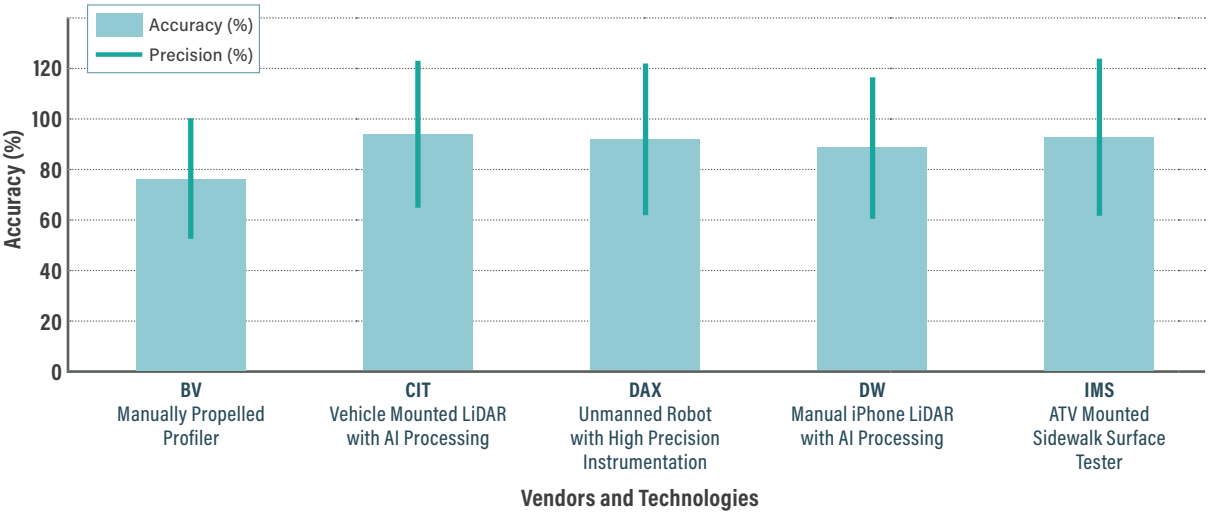


Figure 13. Sidewalk Uplift Accuracy and Precision



Technology Performance by Feature

Sidewalk Travel Width	Cross Slope
■ Technologies like BV, CIT, and DAX exhibit high accuracy (96%), while IMS has a significantly lower accuracy of 51%. ■ Precision for these technologies is lower, ranging from 26% to 51%, with DAX achieving the highest precision (51%).	■ Accuracy values range from 45% (BV) to 57% (DAX, IMS). DAX and IMS tie for the highest accuracy. ■ Precision ranges from 29% to 37%, with DAX and IMS again performing best in terms of precision.
Run Slopes	**Uplift**
■ This feature shows the highest accuracy overall, ranging from 84% (BV) to 93% (DAX). ■ Precision values range from 32% to 49%, with IMS demonstrating the highest precision.	■ Accuracy values range from 73% (BV) to 90% (CIT). ■ Precision values range from 23% to 30%, with IMS achieving the highest precision.

Top-Performing Technologies

- Unmanned Robot with High Precision Instrumentation (DAX) consistently demonstrates high accuracy and precision across features, making it a top-performing technology.
- Vehicle Mounted LiDAR with AI Processing (CIT) shows high accuracy but slightly lower precision, particularly for features like "Uplift."
- IMS (ATV Mounted Sidewalk Surface Tester) achieves moderate-to-high precision for most features but struggles with accuracy for "Sidewalk Travel Width." This was travel path and sidewalk width being revered in the data IMS indicated that they would address this for a city-wide effort.

Key Observations

- There is a clear trade-off between accuracy and precision. Technologies achieving the highest accuracy do not always exhibit the highest precision (e.g., CIT).
- Features like Run Slopes and Sidewalk Travel Width see higher accuracy compared to Cross Slope and Uplift.
- The Manual iPhone LiDAR with AI Processing (DW) performs well.
- "Uplift" is a challenging feature, with all technologies showing low precision, indicating potential areas for improvement in measurement techniques.

Quadrant Analysis Results for Sidewalk Details

Figure 14. Sidewalk Travel Path Width Quadrant Analysis

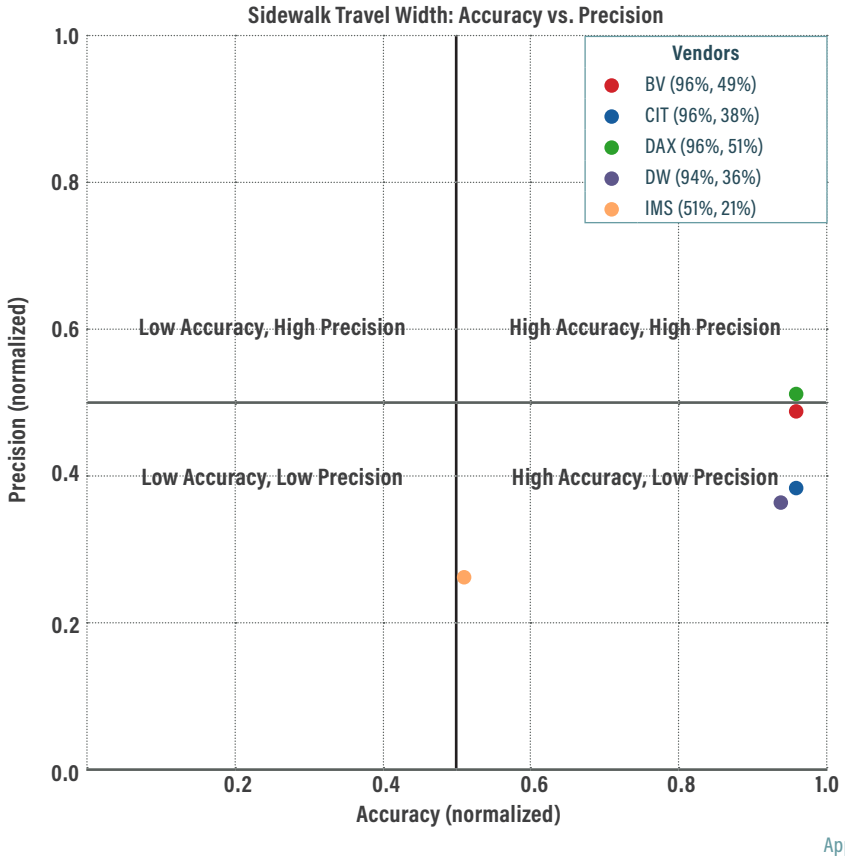


Figure 15. Sidewalk Cross Slope Quadrant Analysis

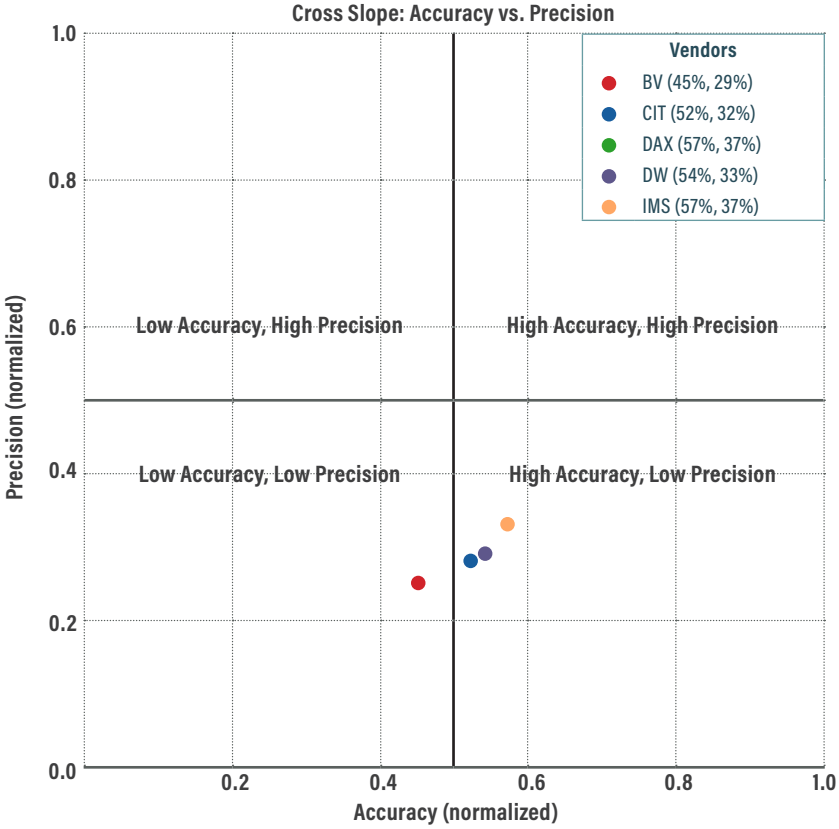
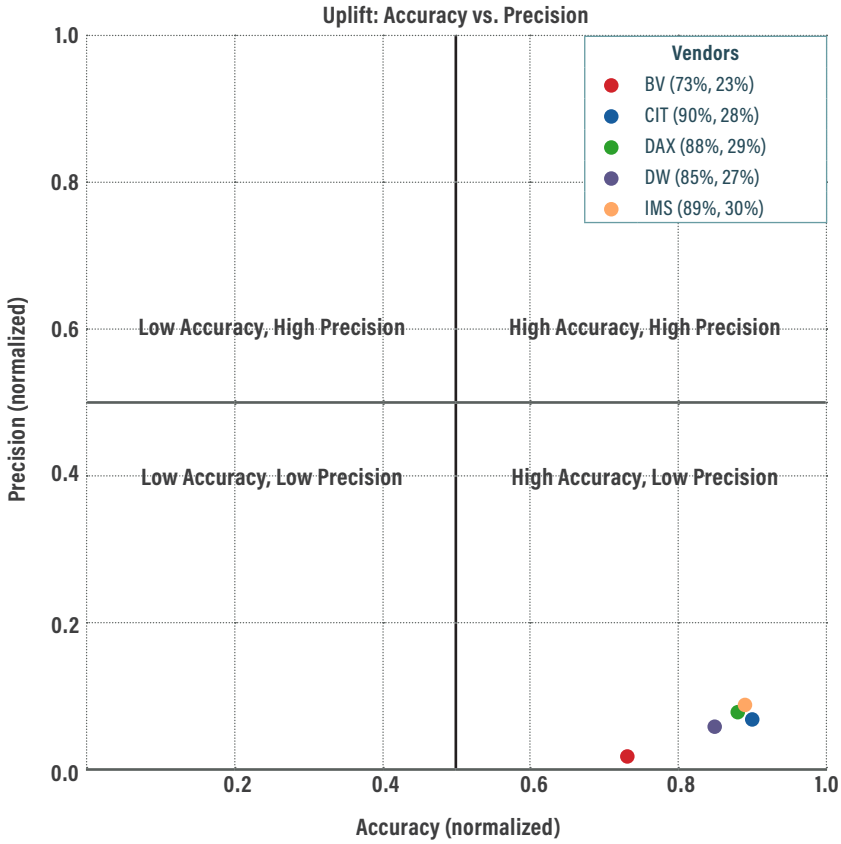


Figure 16. Sidewalk Uplift Quadrant Analysis



Key Insights

- All vendors fell into the High Accuracy and Low Precision Quadrant.
- Cross slope accuracy was lowest of all measurements and had high variability.

Run Slope vs. Cross Slope Variability Discussion

Cross slopes are subject to more variability due to several factors:

Measurement Complexity

- Run Slopes (longitudinal slope) typically involve simpler measurement mechanics, as the slope is measured along the length of the path, which usually has a consistent incline or decline. This type of measurement is less affected by surface irregularities or variations in path geometry.
- Cross Slopes, on the other hand, measure the lateral tilt of a surface, which is more sensitive to subtle irregularities (e.g., uneven paving, localized distortions). This sensitivity can introduce measurement errors, lowering accuracy.

Technology Sensitivity

- Technologies may be optimized for longitudinal slope measurements (Run Slopes) rather than lateral ones (Cross Slope). Sensors like LiDAR, for example, might perform better with smoother, more predictable data inputs (Run Slopes) than with the more variable inputs involved in Cross Slope measurements.
- In contrast, Cross Slope is measured at 2% and require higher sensitivity to detect small angles, which amplify inaccuracies.

Environmental Factors

- Environmental factors: uneven terrain, obstacles, or surface textures, can affect Cross Slope measurements more than Run Slope measurements. The irregularities in lateral surfaces lead to more noise or interference in data collection.
- For Run Slopes, the measurement path is generally smoother and less variable, reducing potential sources of error.

Geometry and Path Variability

- Cross Slopes have more variability due to their dependence on the path's width and curvature. Sidewalks and pathways may have inconsistent lateral inclines due to poor construction, wear, or environmental factors, making accurate measurement harder.
- Run Slopes tend to be more uniform, with gradual changes over longer distances, resulting in higher accuracy.

Algorithms and Data Processing

- The algorithms, which are a set of instructions used by technologies, might perform better for linear data (Run Slopes) compared to angular or lateral data (Cross Slope). Technologies may prioritize Run Slope calculations because they are more critical in applications like accessibility compliance or drainage planning, leading to better-calibrated results.

The cross slope and run slope variability seen in the pilot is supported by a report authored by Che, E., Olsen, M. J., and Trejo, D. (2023), titled "Evaluation of Curb Ramp Compliance: Review of Tools, Methods, and Time to Develop Error Tolerances." The report, published by the Oregon Department of Transportation and the Federal Highway Administration as part of the Final Report, SPR 844, from Oregon State University, highlighted the following key observations regarding factors affecting cross slope measurement accuracy.

- **Surface Variability (Flatness and Roughness):** Cross slopes are more sensitive to localized surface irregularities, such as dips, crowns, and small undulations, which introduce measurement errors. Unlike running slopes, which tend to be measured over longer and smoother paths, cross slopes are highly influenced by the flatness of the surface.
- **Inspector and Measurement Variability:** The placement of measuring devices (e.g., smart levels) affects accuracy. Variations in inspector methods, such as tilting or misalignment, have a more significant impact on cross slopes than on running slopes.

  Inconsistent positioning across the narrower cross-slope dimension can exaggerate measurement discrepancies.
- **Instrument Limitations:** Measurement tools like digital inclinometers or laser scanning systems may have a harder time detecting subtle changes in lateral slopes compared to the longitudinal slope. Calibration issues and limited sensitivity to minor lateral variations also contribute to less accurate cross slope measurements.
- **Field Effects:** Environmental factors, such as soil settlement and wear over time, disproportionately affect cross slopes due to their shorter measurement spans. Running slopes, being measured over longer and more gradual inclines, are less impacted by such small-scale variations.
- **Measurement and Design Challenges:** Current ADA and PROWAG standards for cross slope tolerances are very strict (e.g., 2%), leaving little room for acceptable error. This strict threshold increases the likelihood of cross slopes being deemed non-compliant compared to running slopes, which have slightly higher tolerances.
- **Construction and Sampling Techniques**: Construction processes may not focus as much on achieving uniform lateral slopes compared to longitudinal slopes. Sampling techniques may also be less representative for cross slopes because they cover shorter distances, leading to fewer data points and increased variability.

Transit Stop, Pedestrian Signal, Cross Walk Data Analysis

The following presents the data analysis results for transit stop, pedestrian signal, and cross walk pedestrian facilities.

Transit Stop

Citian was the only Vendor that collected transit stop quantitative data. The results are as follows:

	Width	Cross Slope	Run Slope
MAE	9.1 in	0.58%	0.5%
SDMAE	6.7 in	0.45%	0.39%

Citian and DaxBot collected the following qualitative data:

	Paved Boarding and Alighting Area Present? Yes/No	Smooth Transition to Sidewalk? Yes/No	Detectable Warning Surface at Curb? Yes/No
Citian	96% Correct	96% Correct	100% Correct
Daxbot	96% Correct	96% Correct	100% Correct

Pedestrian Signals

Citian was the only Vendor that collected pedestrian signal quantitative data. The results are as follows:

	PPB Mounting Height (IN.)
MAE	5.3 in
SDMAE	1.1 in

Citian consistently measured under the control values on the PPB mounting height.

Citian collected the following qualitative data:

	PBB Audible? Yes/No	PBB Vibrotactile? Yes/No	Is the Tactile Arrow Line with the Crosswalk? Yes/No
Citian	96.5% Correct	100% Correct	78.6%

Figure 17. *Transit Stop Sample Location*

Figure 18. *Pedestrian Push Button Facility Sample Location*

Crosswalk

Psomas was only able to collect the present and absent of the crosswalk due to the safety issues. Only Daxbot collected data for crosswalk, other vendors did not include this in the pilot due to time constraints.

Daxbot collected quantitative data on the crosswalks as follows:

- Width (in)
- Travel Path Width (in)
- Cross Slope %
- Running Slope %
- Primary Surface Type
- Striping and Marking Present
- Crosswalk Signal Type

Figure 19. Crosswalk Sample Location

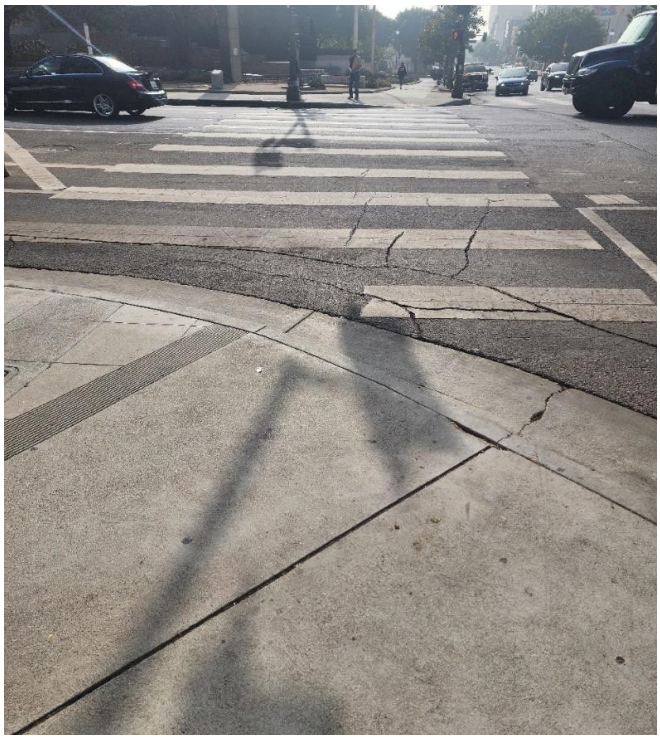


Figure 20. Crosswalk and Ramp Sample Location

Data Analysis Conclusion

Best Overall Technology Vendor	Strong Technology Performer
CIT: Vehicle Mounted LiDAR with AI Processing	**DAX: Unmanned Robot with High Precision Instrumentation**
Balanced high accuracy, precision, and match rate, excelling in scalability and consistency.	Delivered reliable precision and consistent results through robust QC and instrumentation.

Considerations for Citywide Assessment

- **CIT:** Vehicle Mounted LiDAR with AI Processing appears to be the most suitable vendor for large-scale sidewalk data analysis projects
- **DAX:** Unmanned Robot with High Precision Instrumentation as strong contender for sidewalk specific data collection for a specific project need. Dax was the only Vendor to collect detailed crosswalk data.

Barrier Measurements for Vertical or Horizontal Clear Width

Table 7 on the following page highlights each vendor's ability to detect and measure barriers, including vegetation, tree roots, and hard obstructions. Accurate identification of these barriers is essential for determining Accessibility requirements and prioritizing remediation.

Table 7. Vendor Technology Barrier Detected and Measured

Vendor	Technology	Barriers Measured	Vegetation	Tree Root	Hard Barriers
Bureau Veritas/PathVu	High-Precision LiDAR with AI	Yes	Yes	Yes	Yes
Citian Inc.	iPhone LiDAR with AI	Yes	Yes	Yes	Yes
Daxbot Inc.	Cart with GPS and high-resolution cameras, lasers, IMU	Yes	Yes	Yes	Yes
DeepWalk	Autonomous Robot with LiDAR and IMU	Yes	Yes	Yes	Yes
ICC-IMS	ATV-mounted Gocator Lasers. IMU and Camera	Yes	Yes	Yes	Yes

Key Take Aways

- Citian and Bureau Veritas/PathVu demonstrated the highest accuracy and consistency for barrier measurements and general sidewalk assessments.
- DaxBot provided advanced voxel mapping and high-precision measurements but faced challenges with obstructions requiring manual intervention.
- DeepWalk and IMS offered cost-effective, scalable solutions but struggled with precision and barrier detection in certain environments.
- For large-scale, high-accuracy assessments, High-Precision LiDAR (Citian) remains the preferred technology, while robotic tools like DaxBot provide innovative solutions for targeted areas.

Vendor Performance Comparison

The table below provides a detailed comparison of vendors and their respective technologies, evaluating their ability to integrate with the City of Los Angeles' OpenGov EAM system, usefulness for design feasibility reviews, and unique features. This analysis highlights the strengths and limitations of each vendor's solution, providing insights into their applicability for ADA and PROWAG compliance assessments.

Table 8. Comparison of Vendor Technology

Vendor	Technology	EAM	Usefulness for Design Feasibility Review	Unique Features	Advantages	Limitations
BV - PathVu	Cart with GPS and high-resolution cameras, lasers, IMU	Yes – GIS File	Low	Route Accessibility Index (RAI); detailed profiling of surface conditions, dimensions, slopes; includes grinding and pruning recommendations.	Provides actionable remediation insights.	Requires multiple passes for coverage in large sidewalk areas.
Citian	High-Precision LiDAR with AI	Yes – GIS File	High, Can provide C3D DWG as a deliverable	Comprehensive asset extraction; AI processing for ADA PROWAG & PROW assets; LiDAR & imagery for PROW that can be repurposed.	Proprietary, AI-assisted asset extraction process and performs an initial assessment to evaluate asset data.	Requires ADAPT software license for data extraction; supplemental methods needed for areas not collected by vehicles.
DaxBot	Autonomous Robot with LiDAR and IMU	Yes – GIS File	Low	Photogrammetry-like 3D voxel mapping for high-accuracy calculations; advanced robotic data collection for pedestrian infrastructure.	Precision instrumentation; innovative mapping methods for detailed analysis.	Can overestimate sidewalk width; robots need human intervention to bypass obstacles.
Deep Walk	iPhone LiDAR with AI	Yes – GIS File	Low	Utilizes LiDAR-equipped mobile devices (e.g., iPhone Pro) for small-scale, localized data collection.	Affordable and versatile for small areas; user-friendly.	Requires contracted labor for data collection; limited asset collection capabilities.
IMS	ATV-mounted Gocator Lasers. IMU and Camera	Yes – GIS File	Low	ATV-mounted system for scalable data collection, suitable for large-area projects. Can provide Vehicle Based LiDAR	Scalable and integrates easily with GIS; cost-effective for extensive data collection.	Lacks granularity for detecting minor vertical displacements, reducing precision in small-scale Accessibility requirements.

Pilot Inventory and Assessment Review

Vendor Accuracy Challenges and Solutions

The success of ADA and PROWAG compliance assessments hinges on accurate data collection, processing, and integration into systems such as StreetsLA's OpenGov EAM.

Each vendor employed different technologies and methodologies, leading to varying levels of accuracy and reliability. However, the assessment process uncovered key challenges associated with environmental factors, equipment limitations, data aggregation methods, and manual interventions, all of which impacted the precision of measurements and the quality of deliverables.

The **Vendor Accuracy Challenges and Solutions Table** outlines the specific accuracy issues encountered by each vendor, along with actionable solutions designed to mitigate these challenges. Below, the table identifies the challenges and proposes tailored solutions to enhance the accuracy and usability of vendor-provided data for ADA and PROWAG compliance initiatives.

Table 9. *Vendor Technology Accuracy Challenges and Solutions*

Vendor	Accuracy Challenges	Proposed Solutions
Bureau Veritas	– Difficulty capturing small vertical displacements (e.g. <0.25 inches).	– Upgrade sensors for higher sensitivity to detect minor vertical changes. – Use AI/ML to differentiate between true barriers and environmental noise (debris).
Citian/NV5	– Environmental factors (debris, water puddles) caused inaccuracies in cross slopes and surface roughness measurements.	– Pre-clean surfaces before data collection in critical areas.
	– Data aggregation into 10-foot segments could mask localized issues.	– Reduce reporting intervals to smaller segments (e.g. 5 feet) for more granular analysis.
	– Obstructions (parked cars, vegetation) created "shadowing," leading to incomplete scans.	– Deploy backpack-mounted LiDAR or drones to capture inaccessible areas. – Conduct multiple scans from different angles to minimize shadowing effects.
	– Difficulty differentiating minor vertical displacements from debris, trash, or other obstructions.	– Train AI algorithms to classify environmental noise vs. true barriers. – Use higher-resolution LiDAR sensors for more precise vertical displacement detection.
	– Challenges integrating multiple scans and ensuring alignment during post-processing.	– Automate scan alignment using advanced point cloud registration algorithms.
DeepWalk	– Frequent calibration of sensors (e.g., GPS and tread-based positioning) was needed to maintain accuracy, particularly in areas with GPS signal loss.	– Automate calibration processes to reduce downtime. – Use dual systems (GPS and SLAM) to improve positioning in complex environments.
	– Shadows, debris, and irregular surfaces interfered with measurement algorithms, causing false positives for barriers.	– Use multi-sensor fusion (e.g., cameras, LiDAR) to cross-validate measurements. – Implement AI models trained to filter out shadows and debris.
	– Conversion from SI units to U.S. customary units during post-processing introduced rounding errors in some measurements.	– Standardize unit conversions within software to reduce processing inconsistencies.
ICC-IMS	– Obstructions (e.g., parked cars, overgrown vegetation) limited the ability of the SST to access all segments, requiring manual navigation around obstacles.	– Deploy drones or additional SST units to complement coverage in obstructed areas. – Incorporate pre-clearing processes to remove obstructions where feasible.
	– Averaging data over 4-foot intervals sometimes masked localized non-compliance.	– Reduce reporting intervals to smaller slabs (e.g. 2 feet) for greater granularity.
	– Environmental noise (debris, shadows) interfered with the accuracy of vertical displacement and horizontal separation detection algorithms.	– Use higher-resolution lasers and accelerometers. – Train ML models to differentiate between true sidewalk defects and noise.

Vendor Identified Issues with Data Collection in Pilot Areas

The table below identifies challenges specific to each pilot area, categorized by location, vendor issues, and environmental or technical barriers encountered.

Table 10. Vendor Technology Data Collection Issues

Pilot Area	Location	Category	Vendors with Issues	Challenges
1	Grand Ave. from Pico to Olympic Blvd.	Commercial/Major Pedestrian and Vehicular Transit Corridor	Citian/NV5, DeepWalk, ICC-IMS	– Obstructions from high pedestrian and vehicle traffic (Citian/NV5, DeepWalk). – Shadowing caused by tall buildings disrupted GPS and LiDAR (DeepWalk, Citian/NV5). – Manual navigation required in obstructed areas (ICC-IMS).
2	S. Grand Ave. from W. 5th St. to W. 2nd St.	City Hall/Downtown	Citian/NV5, DaxBot, DeepWalk	– Dense urban environment caused shadowing and incomplete scans (Citian/NV5, DeepWalk). – GPS signal loss impacted positional accuracy (DeepWalk, DaxBot). – High pedestrian activity required multiple passes (Citian/NV5, DaxBot).
3	S. Flower St. from W. 12th St. to Venice Blvd.	Regional Commercial/ Downtown	Citian/NV5, DeepWalk, DaxBot, Bureau Veritas	– Vehicle-based systems struggled with shadowing and obstructions (Citian/NV5, DeepWalk). – Shadows caused false positives for barriers (DaxBot). – Aggregated 10-foot segments masked localized non-compliance (Bureau Veritas).
4	San Rafael Ave. from Mount Washington Dr. to W. Ave 37th & W. Ave 37th from San Rafael Ave. to Mayfair Dr.	Hillside/Rural	Bureau Veritas, ICC-IMS	– Difficulty capturing steep slopes and cross-slopes (Bureau Veritas, ICC-IMS). – Irregular terrain affected calibration and sensor accuracy (Bureau Veritas, ICC-IMS).
5	N. Ave 52nd from Granada St. to Monte Vista St.	Historic	ICC-IMS, DaxBot	– Non-standard materials like cobblestones caused measurement inconsistencies (ICC-IMS). – Environmental noise (e.g., debris) interfered with displacement detection (DaxBot).
6	S. Flower St. from Venice Blvd. to W. 9th St.	Urban Residential	Citian/NV5, DeepWalk, Bureau Veritas	– Urban obstructions (e.g., parked cars, vegetation) led to incomplete scans (Citian/NV5, DeepWalk). – Aggregation masked small issues (Bureau Veritas). – Shadowing and GPS drift caused errors in positional accuracy (DeepWalk).

Key Take Aways

- **Environmental and Urban Factors:** Shadowing, obstructions, and environmental noise (e.g., debris, vegetation) remain significant barriers to accurate data collection, particularly in dense urban areas and irregular terrains.
- **Technology-Specific Challenges:** Limitations such as GPS signal loss, calibration issues, and unit conversion errors highlight the need for integrated solutions like multi-sensor systems and automated calibration.
- **Reporting Granularity:** Aggregating data into large intervals (e.g., 10 feet) obscures localized compliance issues. Reducing intervals to smaller segments improves precision.
- **Targeted Solutions:** The proposed solutions, including AI-driven filtering, higher-resolution sensors, and expanded QA processes, address vendor-specific weaknesses and enhance overall reliability.

Unexpected Outcomes

The Phase I: Pilot revealed several unexpected challenges in the integration of vendor-submitted data into StreetsLA's OpenGov Cartegraph EAM system. These issues primarily stemmed from compatibility challenges between proprietary systems, varying data standards and can be overcome with improved data deliverables.

Addressing these challenges is essential to ensure that the City can efficiently and accurately manage ADA and PROWAG compliance assessments while maintaining data integrity.

Compatibility Challenges Between Proprietary Systems

One of the key challenges encountered was the integration of vendor data into the existing OpenGov Cartegraph EAM system. Many vendors rely on proprietary data formats, tools, and processes that are not directly compatible with the City's EAM infrastructure. This mismatch led to delays in data processing and increased the need for manual adjustments to align vendor deliverables with system requirements.

Key Issues	Recommended Solutions
■ Non-standard file formats and naming conventions. ■ Limited interoperability of vendor-specific software. ■ Inconsistent attribute mapping for critical data points.	■ Require vendors to deliver data in a predefined OpenGov-compliant schema to ensure consistency and compatibility. ■ Establish clear integration protocols for vendors, including required formats, units, and attribute standards. ■ Use ETL (Extract, Transform, Load) tools to automate the mapping and alignment of vendor data into OpenGov systems.

Data Quality Issues Identified in Vendor Submissions

During the evaluation process, several data quality issues emerged, which posed significant challenges for achieving accurate and reliable compliance assessments. These issues included missing values, measurement inconsistencies, and structural errors that required extensive post-processing.

1. Null Fields in Data Submissions

Many datasets contained fields with missing or null values, particularly for critical attributes such as sidewalk width, slope measurements, and compliance status.

Impact	Recommendations
■ Null fields compromise the integrity of compliance assessments, creating gaps in essential data points ■ Manual post-processing is required to estimate missing values or flag incomplete segments, adding significant time and labor to the data integration process.	■ Implement mandatory field validation during data collection to ensure all critical attributes are populated. ■ Use pre-submission validation tools to detect and correct null fields before data delivery. ■ Require vendors to submit a summary report validating the completeness of their datasets.

2. Inconsistent Width and Path Conditions

Data revealed discrepancies where the reported travel path width exceeded the recorded sidewalk width, suggesting errors in measurement or data entry.

Impact	Recommendations
■ Such inconsistencies undermine the reliability of the collected data, leading to inaccurate compliance evaluations. ■ Manual review and correction of errors result in delays and increased collection and analysis costs.	■ Introduce automated validation checks to verify the logical relationship between travel path and sidewalk width during data collection. ■ Require vendors to submit a QA report that documents identified discrepancies and the steps taken to resolve them before final data submission.

3. Data Structure Issues Requiring Manipulation

Vendor-submitted data often exhibited structural inconsistencies, including:

- Non-standard naming conventions for attributes.
- Use of incorrect or mismatched units (e.g., SI units instead of U.S. customary units).
- Formats are incompatible with OpenGov Cartegraph, requiring extensive manipulation for integration.

Impact	Recommendations
■ Structural errors complicate data integration workflows, necessitating time-consuming ETL processes to reformat, align, and validate data. ■ Inconsistent schemas increase the risk of errors during transformation, impacting the reliability of the final dataset.	■ Enforce the use of a predefined OpenGov-compliant schema that standardizes naming conventions, units of measurement, and file formats. ■ Integrate automated ETL tools to handle minor structural adjustments while flagging significant discrepancies for manual resolution. ■ Conduct pre-delivery data reviews to ensure vendor submissions adhere to the required schema and standards.

Key Insights

- **Data Compatibility:** Vendors must align their data outputs with OpenGov Cartegraph requirements to streamline integration and reduce manual interventions.
- **Data Quality Assurance:** Implementing robust validation protocols and automated tools during data collection can significantly minimize errors such as null fields and inconsistencies.
- **Predefined Standards:** A standardized schema for data submissions will improve consistency, reduce processing delays, and ensure seamless integration.
- **Automated Workflows:** Leveraging automated ETL tools and validation checks will enhance efficiency while maintaining data integrity across all systems.

Need for Predefined OpenGov-Compliant Schemas for Vendor Data Submissions

Overview

The integration of vendor-provided data into the StreetsLA OpenGov EAM system is critical for streamlining operations, maintaining data accuracy, and ensuring compliance with ADA and PROWAG standards. However, the lack of standardized, OpenGov-compliant data schemas for vendor submissions has introduced challenges, including delays in data processing, inconsistencies in format and structure, and additional costs for post-processing workflows.

To address these issues, LABOE could create a predefined OpenGov-compliant schema as a requirement for all vendor data submissions. These schemas would provide clear guidelines on data formats, attribute structures, and submission protocols, ensuring seamless integration with the OpenGov EAM system.

Challenges Without Predefined Schemas

The following are possible challenges to using vendor provided data without transformation into an OpenGov compliant schemas:

1	**Inconsistent Data Formats**	■ Vendors deliver data in varying formats (e.g., point data, aggregated segments) and units (e.g., SI units vs. U.S. customary units), requiring extensive transformations. ■ Mismatched attribute naming and field structures complicate data mapping and processing.
2	**Delayed Integration**	■ Significant time is spent on converting, cleaning, and validating data to make it compatible with OpenGov EAM. ■ Manual intervention is required to address gaps, inconsistencies, and schema mismatches.
3	**Increased Cost and Effort**	■ Additional resources are needed for ETL workflows to process and align vendor data with OpenGov requirements. ■ Errors introduced during transformations lead to rework and higher costs.
4	**Data Gaps and Quality Issues**	■ Shadowing, obstructions, and aggregation methods result in incomplete or inconsistent datasets that are difficult to reconcile with OpenGov EAM standards.

Benefits of Predefined OpenGov-Compliant Schemas

The following are anticipated benefits to transforming vendor submitted data into OpenGov compliant data schemas:

1	**Data Structure**	■ Segment-based or linear models that align with OpenGov's GIS and EAM data architecture.
2	**Attribute Naming and Format**	■ Standardized field names (e.g., SegmentID, VerticalDisplacement, RunningSlope). ■ Consistent units for all measurements (e.g., inches, percent).
3	**Validation Rules**	■ Predefined thresholds for compliance (e.g., maximum vertical displacement). ■ Mandatory fields to ensure completeness (e.g., no null values for compliance attributes).
4	**Submission Guidelines**	■ Accepted file formats (e.g., CSV, shapefiles, geodatabases). ■ Metadata requirements (e.g., collection date, equipment used, operator notes).

Recommendations

The following recommendations outline strategies for improving data collection, quality assurance, PROW pedestrian facilities inventory and assessment execution, and management processes for future citywide PROW pedestrian facility assessments. These recommendations aim to ensure accuracy, scalability, and efficiency in achieving ADA and PROWAG compliance while leveraging advanced technologies and robust data management practices.

Collection Technologies

To support a scalable and cost-effective citywide inventory of pedestrian facilities, the following technologies should be considered:

MTLS LiDAR with AI Processing

MTLS (Mobile Terrestrial Laser Scanning) with AI-powered processing is the preferred technology for large-scale and citywide PROW pedestrian facility condition assessments.

Advantages	Use Case
■ High accuracy and scalability across extensive areas. ■ AI integration ensures automated analysis for PROWAG compliance. ■ Cost-effective for capturing additional assets (e.g., trees, barriers) from LiDAR data without requiring additional surveys. ■ Seamless integration with GIS and EAM systems.	■ Ideal for comprehensive citywide assessments, particularly where data collection must be efficient and repeatable.

PathVu or DaxBot for Targeted Assessments

For localized or high-precision assessments, PathVu's cart-based systems and DaxBot's autonomous robotic technology are recommended.

Advantages	Use Case
■ **PathVu:** Provides detailed profiling with actionable remediation recommendations (e.g., grinding, pruning). ■ **DaxBot:** Delivers advanced voxel mapping for complex environments requiring highly detailed measurements.	■ Suitable for smaller, challenging areas, such as historic districts, high-pedestrian zones, or areas with irregular terrain.

Facilities and Attributes Collected

To ensure compliance with PROWAG standards and address city-specific needs, the following facilities and attributes must be collected:

Facility	Attributes
Sidewalks	Travel path width, running slope, cross slope, vertical displacements, surface conditions (e.g., cracks, gaps).
Curb Ramps	Detectable warnings, ramp slope, flare slopes, gutter counter slope, width, and obstructions.
Other Pedestrian Facilities	Passenger loading zones, transit stops, crosswalks, staircases, pedestrian signals, and hard barriers.
Obstructions and Barriers	Includes vegetation encroachments, tree roots, debris, and physical barriers affecting accessibility.

By capturing these attributes with a standardized approach, the City can ensure comprehensive data collection that informs prioritization of repairs and upgrades.

Data Collection Planning

Effective data collection planning is essential for ensuring accuracy, reducing delays, and maintaining compliance with data quality standards. The following steps should be considered:

Automated Quality Assurance Processes	■ Implement automated real-time validation tools during data collection to flag anomalies (e.g., null fields, data gaps, errors). ■ Use AI/ML algorithms to analyze collected data for consistency and accuracy before submission.
Predefined Data Standards	■ Develop and enforce a standardized data schema that aligns with OpenGov EAM requirements, ensuring consistency across all vendor submissions. ■ Include mandatory fields for critical attributes to reduce manual intervention during post-processing.
Project Timeline and Milestones	■ Define clear project timelines with milestones for data collection, validation, and integration. ■ Include checkpoints for vendor compliance reviews and mid-project QA audits.

Data Collection Execution

The execution phase must emphasize efficiency, real-time monitoring, and vendor accountability to maintain high data quality standards.

Parallel Data Validation	■ Implement parallel validation workflows where vendor-collected data is continuously cross-checked with control datasets or sample audits. ■ Use real-time QA dashboards to monitor fieldwork progress and flag errors during collection.
Vendor Training and Oversight	■ Conduct pre-project training for vendors to ensure consistency in data tagging, unit conversions, and compliance with the City's standards. ■ Assign oversight personnel to audit vendor performance and address emerging issues during data collection.
Field-Based Corrections	■ Introduce field-based tools that allow immediate corrections for critical anomalies, reducing post-processing time. ■ Ensure that vendors document and submit field correction logs for accountability.

Data Management

Robust data management practices are crucial for integrating vendor-submitted data into StreetsLA's OpenGov EAM system efficiently and accurately.

Centralized Data System	■ Adopt a centralized staging database for all collected inventory data. This ensures consistency in tracking, validation, and reporting before final integration into OpenGov. ■ Use automated ETL workflows to standardize data formats, resolve inconsistencies, and ensure seamless ingestion.
Incremental Data Updates	■ Implement incremental updates for large-scale projects to avoid overwhelming the system with excessive data processing. ■ Periodic data uploads ensure timely identification and correction of errors.
Data Quality Monitoring	■ Use automated tools to identify missing fields, structural issues, and validation errors during the data ingestion process. ■ Provide vendors with QA scorecards that track data quality metrics (e.g., match rate accuracy, error rates).
Reporting and Analytics	■ Develop real-time dashboards that provide insights into data quality, vendor performance, and compliance progress. ■ Enable reporting capabilities to prioritize critical repairs and track upgrades.

Summary

These recommendations establish a structured approach to improving PROW pedestrian facility assessments across the City of Los Angeles. By leveraging advanced technologies, refining QA processes, and centralizing data management, the City can achieve:

- High-accuracy, scalable assessments.
- Improved vendor accountability and performance.
- Efficient integration of data into OpenGov EAM.
- Actionable insights for prioritizing ADA and PROWAG compliance repairs.

Implementing these strategies will ensure that pedestrian infrastructure evaluations are cost-effective, reliable, and capable of addressing the City's long-term accessibility goals.

Quality Assurance

Ensuring the accuracy, reliability, and completeness of vendor-submitted data is critical for achieving ADA and PROWAG compliance. The following Quality Assurance (QA) approach is designed to address challenges identified during data collection, post-processing, and integration into StreetsLA's OpenGov EAM system. This approach leverages automated tools, real-time validation processes, and structured vendor accountability to maintain high standards throughout the assessment lifecycle.

OBJECTIVE

Establish clear expectations and standards before data collection begins to prevent errors and ensure vendor readiness.

Vendor Training and Onboarding	■ Conduct mandatory pre-project training for all vendors to ensure familiarity with the City's data collection requirements, including naming conventions, formats, and validation processes. ■ Provide training on handling environmental challenges such as obstructions, shadows, and debris.
Predefined Schema Standards	■ Enforce the use of a standardized OpenGov-compliant schema, including required attributes, units, and file formats. ■ Include automated pre-submission validation tools to detect structural issues and null fields before data collection.
Automated Data Validation	■ Develop real-time dashboards that provide insights into data quality, vendor performance, and compliance progress. ■ Enable reporting capabilities to prioritize critical repairs and track upgrades.

Vendor QA Reporting

Mandate that vendors submit detailed QA reports outlining:

- Identified errors and discrepancies.
- Steps taken to correct issues during post-processing.
- Summary of QA validation results (e.g., match rates, error rates).

Data Structure Validation

- Verify adherence to standardized naming conventions, formats, and units of measurement (e.g., U.S. customary units).
- Flag and resolve structural inconsistencies, such as non-standard attribute names or incompatible formats.

6.5 Appendix E – Project Participants

Organization	Participants
Needs Assessment Participants	
Bureau of Contract Administration (BCA)	George Espindola (Division Manager), Raoul Mendoza (Assistant Director)
Bureau of Engineering (BOE) GIS	Nathan Neumann (GIS Analyst), Kirk Bishop (GIS Supervisor 2)
City Forest Officer	Rachel Malarich, Clarissa Boyajian
Department on Disability (DOD)	Stephen Simon, Alison Everett
Hillside Study UCLA School of Engineering	Sven Malama (PhD Candidate), Sriram Narasimhan (Professor of Civil and Environmental Engineering)
LA Walks	Deborah Murphy (Founder), Alexandra Ramirez (Executive Director)
Department of Transportation (LADOT)	Tomas Carranza (Assistant General Manager), Rubina Ghazarian (Supervising Transportation Planner II), Crystal Killian (Senior Transportation Engineer), Monty Patel (Director of Systems), Zackery Campos (GIS Specialist)
City Planning	Emilee Leveque (Planning Assistant), Steven Katigbak (City Planner)
StreetsLA	Alice Kim (Senior Civil Engineer), Craig Shaw (Streets Maintenance Division Manager), Joseph Perman (GIS Supervisor), Bryan Ramirez (Street Tree Superintendent), Josue Cruz, David Miranda (UFD Division Manager), Hector Banuelos (UFD Manager Permits, Policy, and Admin.), Eric Gonzales (Streets Maintenance Operations Manager)
Outside Stakeholders	
Community Advisory Committee – City of LA Sidewalk Repair Program	Alex (LA Walks), Aziza Fellaque Ariouat (City of LA), Cydstro1, ddarvish, Deborah Murphy (LA Walks), Encshelleybilik, Holly Harper (City of LA) Jessica (Investing in Place), Joanne Montaggio, Rachel Malarich (City of LA), Richard Liu (City of LA), Sheila-hibm, Clarissa Boyajain (City of LA), Willowwhis9, Agnes Miranda (City of LA), Alison Everett (City of LA), Mary Nemick (City of LA), Teresa Villegas (City of LA), Ted Jordan (City of LA), Alfred Mata (City of LA)
Pedestrian Advisory Committee Meeting	Debroah Murphy, Matt Gertz (LADOT), Natalle Sparrow (BOE), Alex Remirez (LA Walks)
Sidewalk Repair Program Executive Steering Committee	Erika Griffin, Jennifer Lau, Heather Smith, John Popoch, Jeff Jacobberger, Robert Sewell, Cynthia Smith, George Espindola, Sunil Rajpal, Maricel El-Amin, Sarah Verin, Ted Jordan, Erich King, Teresa Villegas, Derrick Yoshida, Mary Nemick, David Miranda, Cecilia Castillo, Richard Liu, Stephanie Clements, Ted Allen, Stephen Simon, Aida Valencia, Salyna Cun, Eloisa Sarao, Gary Harris, Nichole Trujillo, Matias Farfan, John Reamer, Claudia Veronica Carrillo, Keith Mozee, Jeff Gutierrez, Alison Everett, Julia Sanchez de la Vega, Nick Lopez, David Hirano, Kristine Harutyunyan, Yolanda Chavez, Adena Hopenstand, Luis Torres, Eric Bruins, Felipe Chavez, Shirley Lau, Omar Braish, Natalie Sparrow, Daisy Bonilla, Madeleine Rackley, Edna Degollado, Matthew Shade, Geoffrey Straniere, Theresa Jimenez, Alexander Tagle, Janet Lavilles, Michael Allman, Alfred Mata, Gary Lee Moore, Jenny Fowler, Craig Gooch, Marcia Carrillo, Carlos Cueva, Elliot Choi, Antoinette Barrios, Juliet Gagar-Richards, Vanessa Guillen
Technical Advisory Committee (TAC)	
Walk More Bike More	Wendy Ortiz
Aliance for Community Transit	Carmina Calderon Santos
Disability Rights Advocate	Cynde Soto
LA Walks	Deborah Murphy
Mobility Justice	Kalayaan Mendoza

Survey – Participating Organizations

- 826LA
- Aerospace
- Athens on the Hill Homeowners Association
- Bel Air Glen
- Bentwood Community Council
- Beta Pi Sigma Sorority, Inc
- California Council of the Blind
- California Native Plant Society
- Caltrans
- Carl Mellinger Consulting LLC
- City of LA Mayor's Office
- City of Los Angeles, LADOT
- City of Los Angeles, BOE
- Congresswoman Nanette Diaz
- Crystal Clean Automotive Detailing LLC
- Disability Community Resource Center
- Environmental Justice Coalition for Water
- Esteem
- Evite
- Fehr & Peers
- First United Methodist Church of North Hollywood
- Fox Studios
- Golding + Lamothe
- Greater Cypress Park Neighborhood Council
- Greater Valley Glen Neighborhood Council
- Greater Wilshire Neighborhood Council
- Harbor Gateway North District 8
- Highland Park Neighborhood Council
- Hollywood Heights Association
- Holy Majesty-King Jesus, Holy Trinity
- Inman's Urban Walks
- Intum-inc
- Junta Vecinal Comunitaria de Pico-Union, Estacion de Policia Olimpic
- LA Stairstreet Advocates
- Labor Today International
- League of Women Voters
- League of Women Voters of Greater Los Angeles
- Los Angeles Bicycle Advisory Committee
- Los Angeles City Historical Society
- Los Angeles City Planning
- Los Angeles Climate Reality Project
- Los Angeles County Metropolitan Transportation Authority (Metro)
- Los Angeles Unified School District
- Los Feliz Neighborhood Council
- Loyola Marymount University
- Mount Washington Home Owners Alliance
- Narduli Studio
- Neighborhood Council of Westchester/Playa
- Nobody Drives in LA
- Northridge East Neighborhood Council