

SIDEWALKS & RAMPS

ASSET MANAGEMENT PLAN

2025

CITY OF FORT COLLINS



PLANNING, DEVELOPMENT, AND
TRANSPORTATION

Document Control	Asset Management Plan
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This Asset Management Plan may be used as a supporting document to inform an overarching Transportation Infrastructure Strategic Asset Management Plan.

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1.0 STATE OF INFRASTRUCTURE REPORT (SOIR) CARD

1.1 Executive Summary

The City of Fort Collins initiated the development of an asset management system for effective management of the assets in the six service areas: streets, bridges, traffic devices, sidewalks & ramps, railroad crossings, and transit & parking facilities. In addition to other components, the asset management system includes the development of an asset management plan for each of the six service areas. An asset management plan is developed following four steps: (I) define the state of the infrastructure, (II) determine the level of service, (III) devise an asset management strategy, and (IV) develop a financing strategy. This report discusses the development of the state of the infrastructure or infrastructure report card for the sidewalks & ramps service area.

The infrastructure report card for the sidewalks & ramps service area is developed following four steps:

1. Capture asset inventory.
2. Conduct condition assessment.
3. Calculate age and remaining useful life.
4. Complete asset valuation.

For Step 2, the condition assessment utilizes existing condition data and ADA rating data from the 2024 GIS Database export and provided by the City of Fort Collins. This data is assumed to have been collected in 2012-2013 and updated periodically with new development installations. For ramps, no existing condition data was available, so the nearest adjacent sidewalks data was used instead. A new data analysis is expected to be performed within the next few years. The cumulative sidewalks inventory includes 917 miles, and the cumulative ramps inventory includes 24,863 ramps. For Step 3, not enough information was available in GIS to determine the age and remaining useful life.

A letter grade (A through F) was assigned to each service area to reflect its performance in relation to established level of service goals within the following categories: Condition versus Performance and Funding versus Needs.

The Condition versus Performance category illustrates the average condition of all assets within that service area against the level of service goal(s). A letter grade of “A” indicates an average at or above what is specified within the goal, whereas an “F” signifies that the average condition is well below the established goal.

Condition vs. Performance		
Railroad Crossings Rating	Letter Grade	Description
C	A – Very Good	New or recently rehabilitated; performance beyond goal.
	B – Good	Minor deterioration or defects; performance meets goal.
	C – Fair	Moderate deterioration or defects; performance slightly below goal.
	D – Poor	Serious deterioration or defects; performance well below goal, remediation required.
	F – Very Poor	Critical deterioration, possibly closed or out of service; performance yields asset unusable.

The Funding versus Needs category indicates how well the current level of funding allows the city to reach its level of service goals with respect to required asset replacement or rehabilitation needs. A letter grade of “A” represents a funding level at or above what is required by the level of service goals and may indicate an opportunity to strengthen goals. A letter grade of “F” indicates that a large increase in funding is required to meet the current level of service goals, or that the goals need to be greatly reduced based on current funding levels.

Funding vs. Needs		
Bridges and Culverts Rating	Letter Grade	Description
D	A – Very Good	Funding exceeds requirement for current goals; consider strengthening goals.
	B – Good	Funding adequate to meet current goals.
	C – Fair	Minor increase to funding required to meet current goals.
	D – Poor	Funding inadequate for current goals; consider reducing goals.
	F – Very Poor	Funding greatly inadequate for current goals; Goal revision or large improvement to funding source(s) required.



SIDEWALKS

917 Miles

C – Fair 2.84

\$ 600 M

RAMPS

24,863 Ramps

C – Fair 2.58

\$ 124 M



1.2 Approach

The State of Infrastructure Report (SOIR) card for the sidewalks & ramps service area is developed based on the following core asset management questions. Each question focuses on a specific aspect of the asset management domain. Each question results in creating a specific deliverable discussing and representing a fundamental component required for effective asset management planning. These deliverables are developed through extensive discussions held in meetings, workshops, and presentations.

- **What assets do we own? (Asset Inventory Management):**
Refers to the identification, categorization, quantification, and recording of assets.
- **What is the condition of assets? (Asset Condition Assessment):**
Refers to assessing the overall condition of assets in terms of the physical condition, capacity condition, and funding level. Due to limited information on the capacity and funding levels, only physical condition is considered in the assessment presented in this report. In subsequent revisions, all three factors will be considered in the asset condition assessment.
- **Are the assets accessible? (Asset Accessibility Assessment):**
Refers to assessing the overall compliance of assets in terms of the Americans with Disabilities Act of 1990 (ADA).
- **What is the expected Useful Life or Service Life of asset? (Asset Useful Life Expectancy):**
Refers to the expected useful life of assets is defined to estimate the remaining useful life that is required for asset management planning.
- **What is the worth of assets? (Asset Valuation):**
Refers to the asset worth in terms of the asset replacement cost. The overall value of the asset portfolio is determined by estimating the cost required to replace them.

A detailed discussion is presented towards the end of the report to identify gaps in the current SOIR card and propose recommendations to address them.

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 1.2.

Table 1.2: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
City Council	<ul style="list-style-type: none"> • Represent needs of community/shareholders, • Allocate resources and provide high level oversight to deliver strategic objectives and plans, • Ensure sustainable service delivery, • Communicate City strategic objective and measures.
City Leadership	<ul style="list-style-type: none"> • Ensuring council’s policy direction through day-to-day management of city functions, including oversight of City operating departments. • Implementation of annual budget

Key Stakeholder	Role in Asset Management Plan
	<ul style="list-style-type: none"> • Ensure effective delivery of services consistent with council direction.
PDT Directors	<ul style="list-style-type: none"> • Communicate needs of community/shareholders, • Approve bi-annual budget offers to meet community needs and planning efforts, • Approve department strategy, policy, plans and procedures, and status of asset management program.
City Engineer	<ul style="list-style-type: none"> • Represent needs of Engineering Department to PDT Directors, • Assist with policy, processes, and budgets. • Assist with establishing levels of service
Special Projects Manager	<ul style="list-style-type: none"> • Assist with development of objectives, measures, targets/goals, • Review budget to manage lifecycle costs, • Assist with establishing levels of service for asset infrastructure.
External Committees, Boards, or Groups	<ul style="list-style-type: none"> • Communicates with the community to identify and express concerns related to transportation issues, • Help develop or identify solutions related to levels of service, performance measures, or asset infrastructure.

1.2.1 Goals and Objectives of Asset Ownership

Our goal for managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers.

The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing, and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

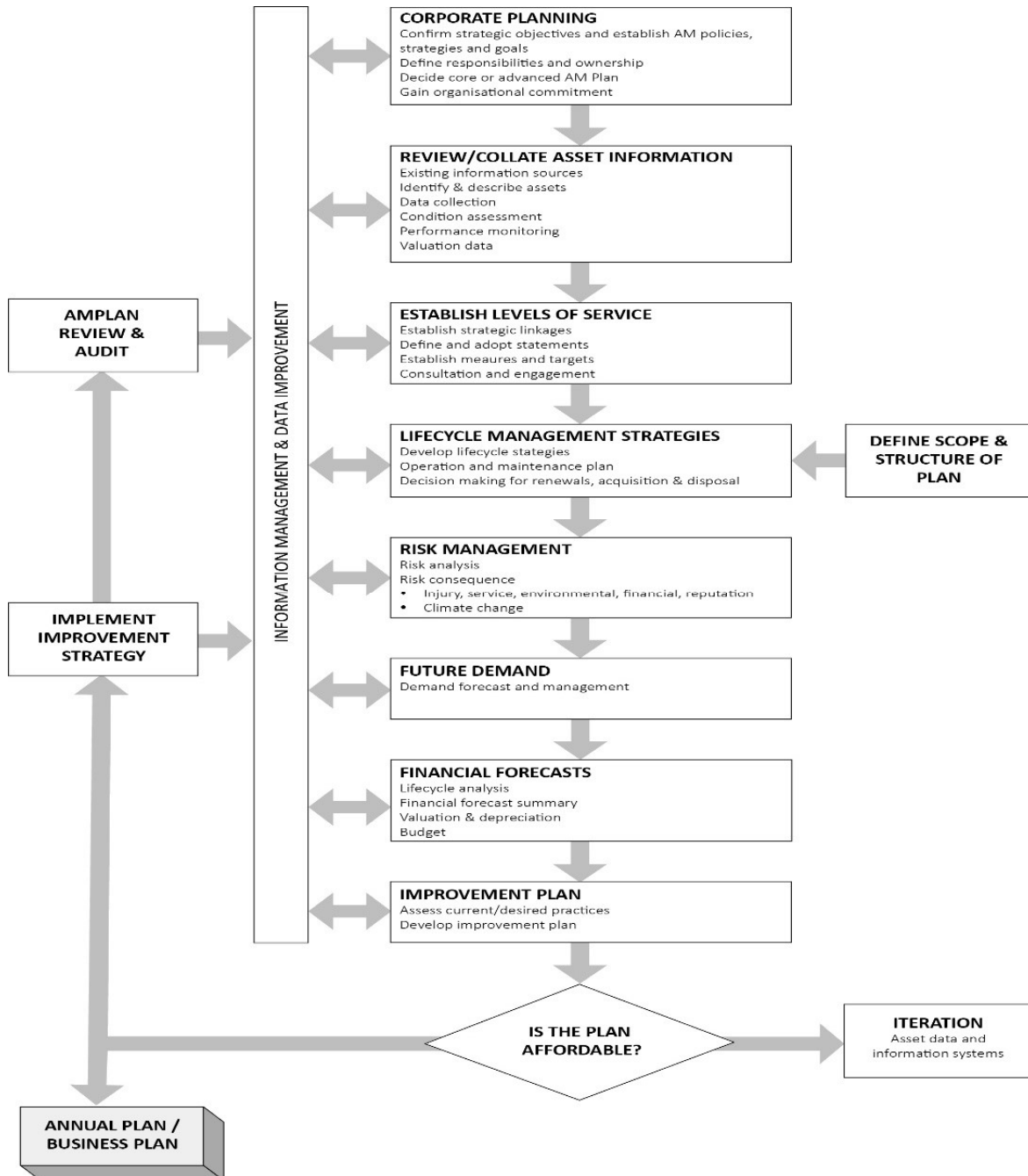
- Levels of service – specifies the services and levels of service to be provided,
- Risk management – what are the associated risks and consequences,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,

- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015
- ISO 55000

Road Map for preparing an Asset Management Plan



1.3 Inventory

The City's GIS database contains 38,638 sidewalks assets, totaling 917 miles, and 24,863 ramp assets. The locations of all sidewalk assets are shown in Figure 1.3-1 below, while the locations of all ramp assets are shown in Figure 1.3-2 below.

Figure 1.3-1: Sidewalks GIS

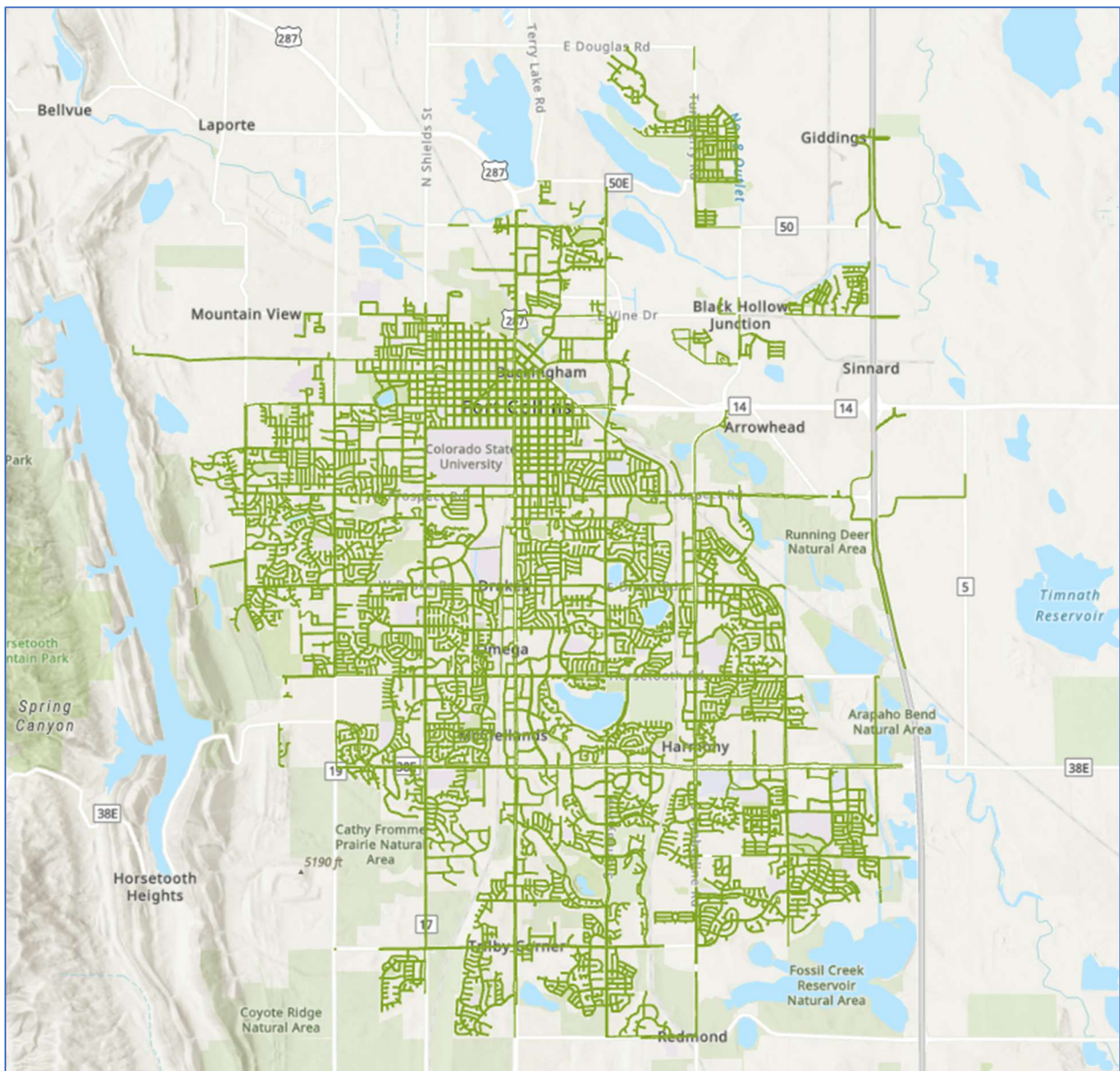
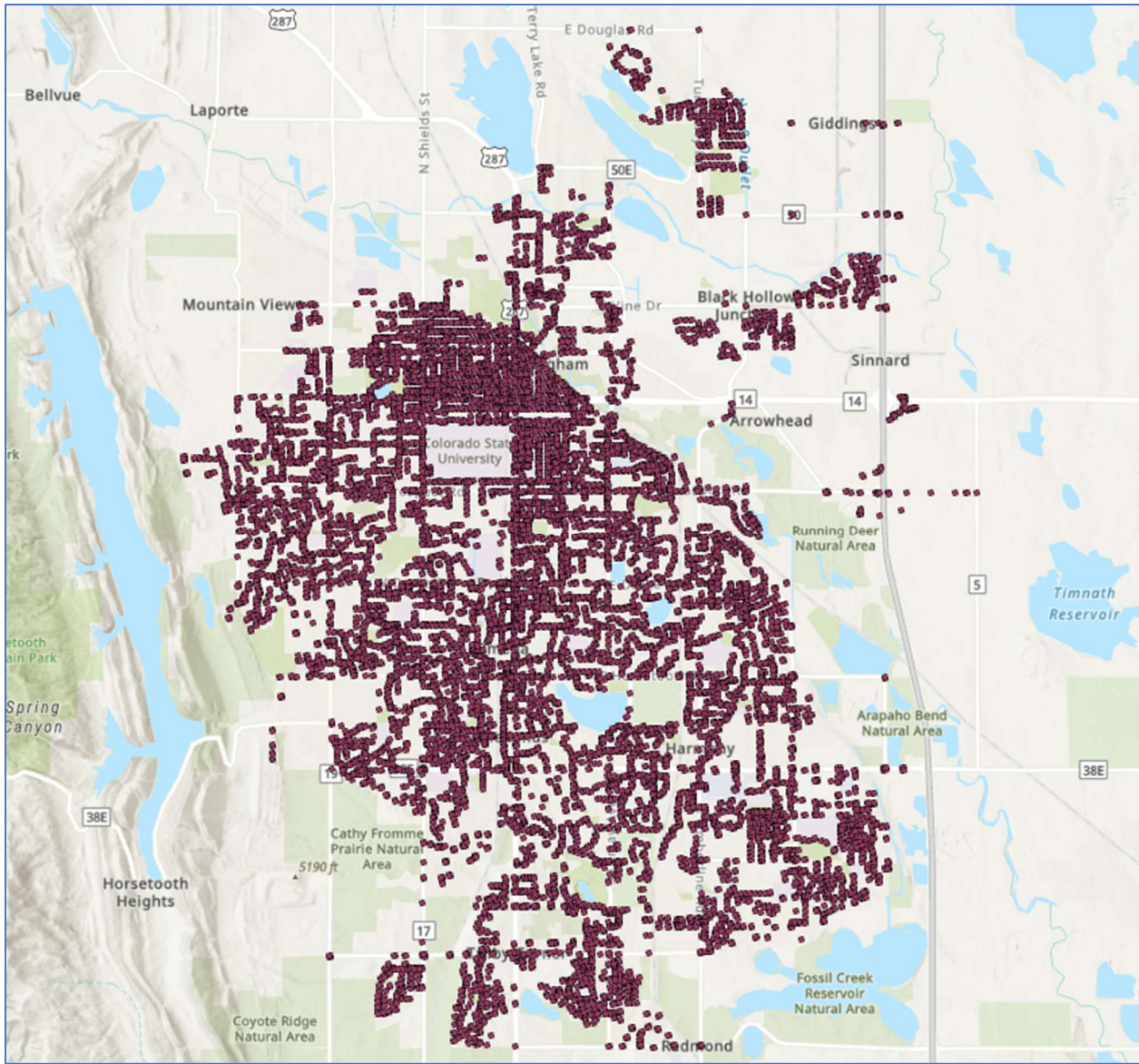


Figure 1.3-2: Ramps GIS



1.4 Condition

The asset management best practices emphasize the use of three criteria for condition assessment of assets, including physical condition vs. performance, capacity condition vs. need, and funding vs. need. Due to the lack of detailed information about capacity and funding levels, the team decided to exclude capacity and funding criteria from this first-ever asset management plan and infrastructure report card. In the next revision, all three criteria will be used for the condition assessment of infrastructure.

Asset life expectancy depends on several factors, including installation practices (poor vs. good workmanship), maintenance practices (preventive vs. reactive), treatment timing, and asset usage. An asset gets deteriorated much earlier in its lifecycle, and its life expectancy is much shorter when proper attention is not given to these factors. It is important for the asset owners to establish and implement a comprehensive condition assessment program. In the absence of such a program, a good starting point is to use the remaining useful life of assets to represent the condition of an asset.

Sometimes, the asset age information is missing, and in lieu, expert opinion is used. In the expert opinion approach, experts subjectively assess the condition of assets based on explicit and tacit knowledge.

The sidewalk condition is taken directly from the 2023 GIS database export provided by Fort Collins, and used the scale shown in Table 1.4-1. For ramps, no condition data was available in the 2023 GIS database export, so the nearest adjacent sidewalks condition was used instead with the same scale shown in Table 1.4-1. Since the condition data available did not use a typical 5-value scale (A - Very Good, B - Good, C - Fair, D - Poor, F - Very Poor), the GIS values were supplemented using the available ADA compliance data as shown in Table 1.4-1 below. Assets with missing data are conservatively assumed to fall under the “Poor” condition or “not ADA compliant”.

Table 1.4-1: Condition Index

Report Card Grade	GIS Condition	ADA Compliance
A – 1 (Very Good)	Good	Compliant
B – 2 (Good)	Good	Not Compliant or Missing
C – 3 (Fair)	Fair	Compliant
D – 4 (Poor)	Fair	Not Compliant or Missing
	Poor or Missing	Compliant
F – 5 (Very Poor)	Poor or Missing	Not Compliant or Missing

The overall report card grade for sidewalks is “C – Fair”. A breakdown of the report card grades is shown below in Figure 1.4-1 and Figure 1.4-2.

Figure 1.4-1 Sidewalk Grade Miles

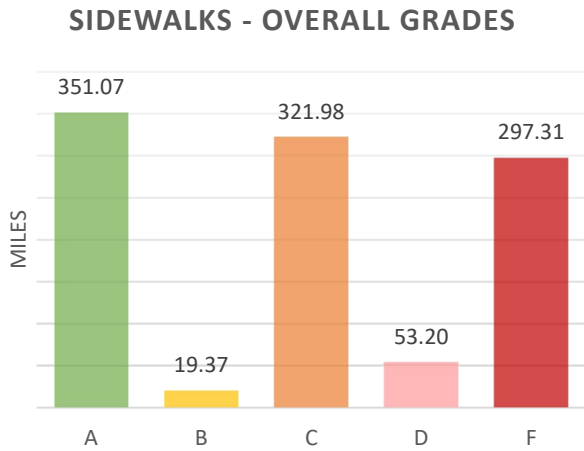
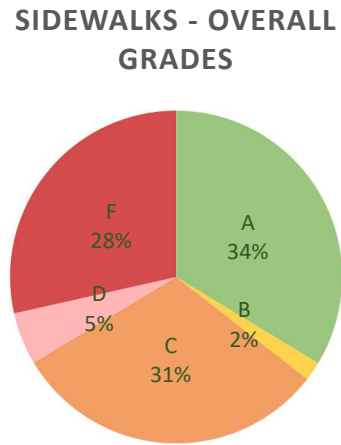


Figure 1.4-2 Sidewalk Grade Percentages



A breakdown of the GIS Condition ratings of all sidewalks is shown in Figures 1.4-3 and 1.4-4 below.

Figure 1.4-2 Sidewalk Condition Miles

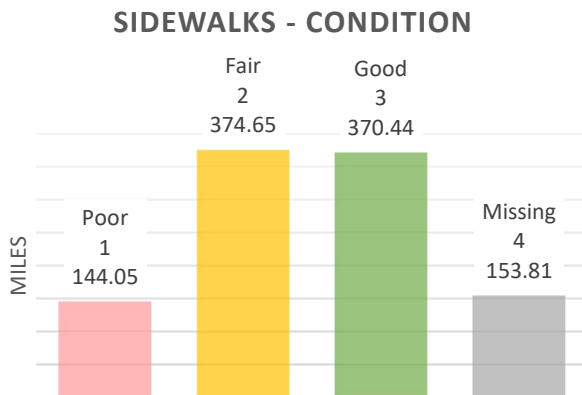
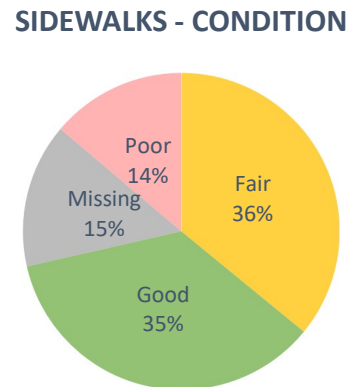


Figure 1.4-1 Sidewalk Condition Percentages



A breakdown of the ADA compliance of all sidewalks is shown in Figures 1.4-6 and 1.4-5 below.

Figure 1.4-5: Sidewalks ADA Miles

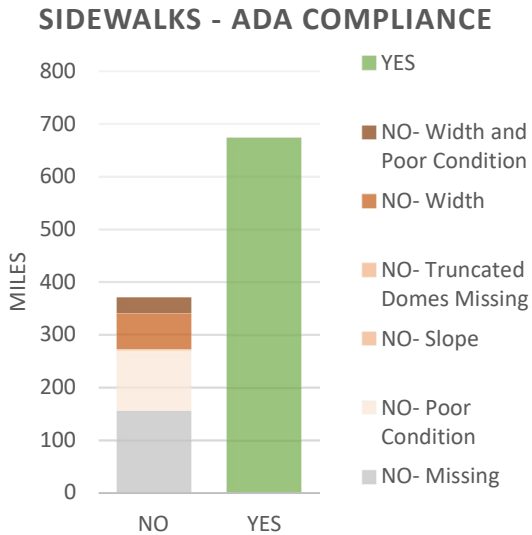
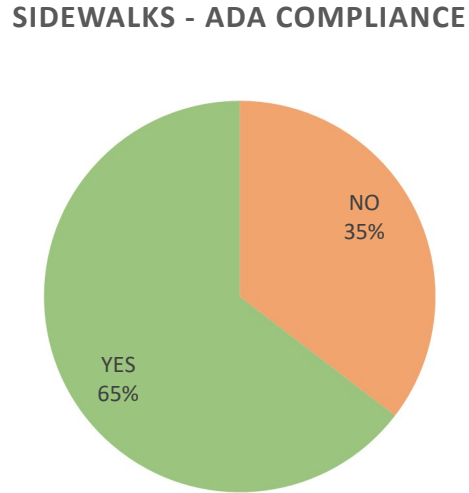


Figure 1.4-6: Sidewalk ADA Percentages



The overall report card grade for ramps is “C – Fair”. A breakdown of the report card grades is shown below in Figure 1.4-7 and Figure 1.4-8.

Figure 1.4-7 Ramps Grade Count

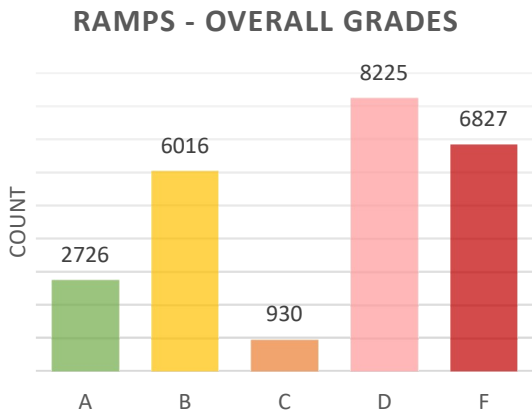
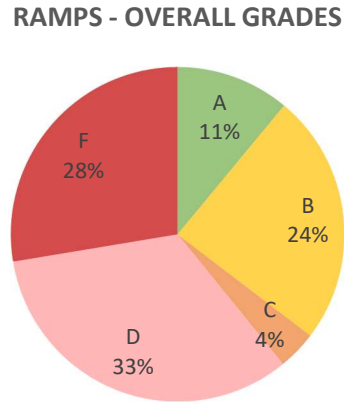


Figure 1.4-8 Ramps Grade Percentages



A breakdown of the GIS condition of all ramps is shown in Figures 1.4-9 and 1.4-10 below.

Figure 1.4-9 Ramps Condition Count

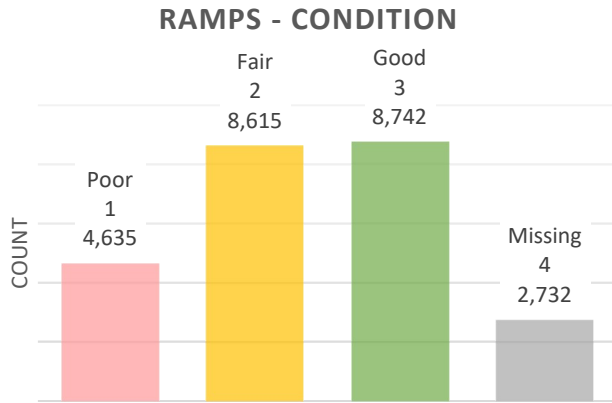
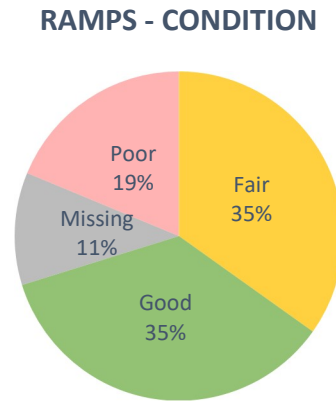


Figure 1.4-10 Ramps Condition Percentages



A breakdown of the ADA compliance of all ramps is shown in Figures 1.4-11 and 1.4-12 below.

Figure 1.4-3 Ramps ADA Count

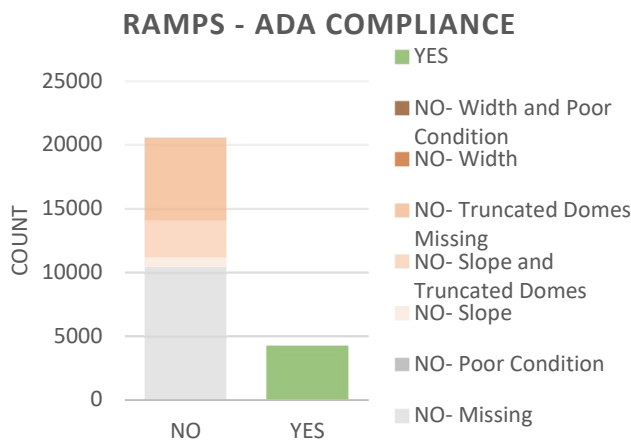
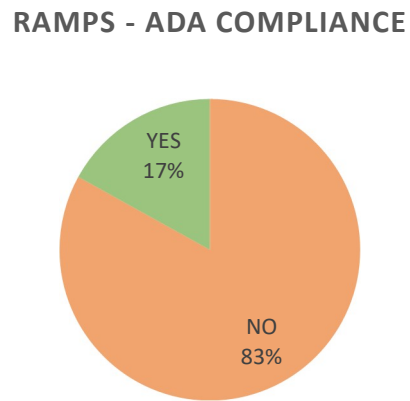


Figure 1.4-12 Ramps ADA Percentages



1.5 Life Expectancy

Less than 4% of sidewalks contained age data in the GIS database provided, while Ramps contained no age data. Material type is also missing for all sidewalks & ramps assets. This missing data prevents the development of accurate remaining asset life. The Federal Highway Administration (FHWA) provides the following expected life expectancies:

- Concrete: 80 years
- Bricks/Pavers: 80 years
- Asphalt: 40 years

1.6 Valuation

Asset valuation refers to the worth of an asset or asset portfolio at any given point in time. It is a process of estimating the present worth of tangible capital assets like roads, alleys, sidewalks, and curbs and gutters.

The asset management best practices, guides, and manuals specify two approaches for asset valuation: net book value (used for financial reporting), and replacement cost (used for financial planning).

The net book value is determined based on the historical cost, which includes all the costs associated with the acquisition, construction, development, or betterment of assets at the time of ownership. The net book value is the original acquisition cost less accumulated depreciation, depletion, or amortization. In the domain of asset management, the net book value is not used for the infrastructure renewal planning because many assets are long-lived and are fully depreciated in the financial statement but still in service.

The replacement cost is the amount of dollars required at any given point in time to replace various tangible capital assets. The replacement cost valuation approach is preferred for asset management financial planning as it represents a true picture of the financial requirements for capital improvements. The replacement cost valuation is useful for assets having relatively long useful lives like water, wastewater, and transportation infrastructure. Compared to net book value, the replacement cost approach is more representative of future capital needs and more useful for decision-making. Replacement values are used to estimate potential investments for asset management purposes. The replacement values are the preferred indicator of cost used to estimate expenditures that will be required when assets reach the end of their useful lives.

To determine the replacement cost of assets, the 2022 CDOT cost data book was used to derive a typical per square yard cost for concrete sidewalk, and typical per each cost for ramps. The existing width and length data in GIS was used to determine the total sidewalk area. If no width data was available, 5 feet was assumed for the width measurement. Since the City GIS does not include sufficient data for ramps, the typical ramp was assumed to be approximately 3 square yards.

2.0 LEVEL OF SERVICE (LOS) METRICS

2.1 Customer Level of Service (LOS) Metric

Customer Value	Organizational Level of Service Objectives (Org. Objectives)	Customer Level of Service (Measures)	Customer Level of Service (Performance)	Customer Level of Service (Frequency)	Customer Level of Service (Target)
Quality Is the service of sufficient quality?	Sidewalk/Ramp network is high quality and well-maintained.	Network average condition	Fair	Annual	"Fair" or better
Quantity and Scope Is the service of sufficient quantity and adequate coverage?	Sidewalk/Ramp network is free of missing gaps.	% arterial street network with sidewalks	77%	Annual	100%
		% of missing sidewalks within low-income census tracts	13%	Annual	0%
		% of missing sidewalks within a ¼ mile of high-demand pedestrian areas	80%	Annual	0%

Customer Value	Organizational Level of Service Objectives (Org. Objectives)	Customer Level of Service (Measures)	Customer Level of Service (Performance)	Customer Level of Service (Frequency)	Customer Level of Service (Target)
Legislative Does the service meet legal requirements?	Sidewalk/Ramp network is compliant with regulations, organizational policies, and procedures.	Compliance with ADA and PROWAG standards	79%	Upon ADA Transition Plan Updates	100% to the maximum extent feasible, with exceptions noted
Reliability/Functionality How predictable is the service? How operational is the service?	Sidewalk/Ramp network is functionally and structurally adequate.	# unplanned sidewalk/ramp closures	0	Ongoing	< 5 per year
		Length of pedestrian detours	430 ft	Ongoing	< 1/4 mile 50% of the time
Sustainability Does the service fit with future needs?	Sidewalk/Ramp network supports economic, social, and environmental needs.	% sidewalk network with 5' minimum width	71%	Annual	100%
Accessibility Can the service be easily accessed and used?	Sidewalk/Ramp network provides adequate access for pedestrians.	% sidewalk/ramp network compliant with ADA and PROWAG standards	17%	Ongoing	100% to the maximum extent feasible, with exceptions noted

Customer Value	Organizational Level of Service Objectives (Org. Objectives)	Customer Level of Service (Measures)	Customer Level of Service (Performance)	Customer Level of Service (Frequency)	Customer Level of Service (Target)
Health and Safety Does the service pose a risk to health and safety?	Sidewalk/Ramp network is safe for users.	Time to remedy horizontal/vertical inconsistencies in sidewalk/ramp network	TBD	Ongoing	7 calendar days after notice 75% of the time
		Time to clear sidewalk/ramp network of snow	12-24 hours	Per Storm Event	24 hours after each storm event
Affordability/Cost Efficient Does the service offer best value for the money?	Plan, design, implement, and maintain sidewalk/ramp network in an efficient manner.	Annual operating costs to maintain sidewalk/ramp network	\$2,400,000	Annual	TBD
Customer Services/Responsiveness Does the organization promptly engage and reply to customers?	Respond promptly to customers.	Customer response center tracking metric?	Within 5 days	Per complaint	Within 5 days

2.2 Technical Level of Service (LOS) Metric

Customer Value	Organizational Level of Service Objectives (Org. Objectives)	Technical Level of Service (Measures)	Technical Level of Service (Performance)	Technical Level of Service (Frequency)	Technical Level of Service (Target)
Quality Is the service of sufficient quality?	Sidewalk/Ramp network is high quality and well-maintained.	SF sidewalk new or maintained per year	154,787 SF	Annual	150,000 SF
Quantity and Scope Is the service of sufficient quantity and adequate coverage?	Sidewalk/Ramp network is free of missing gaps.	LF infill sidewalk installed per year	6,143 LF	Annual	5,280 LF
Legislative Does the service meet legal requirements	Sidewalk/Ramp network is compliant with regulations, organizational policies, and procedures.	% non-compliant ramps repaired/replaced with annual pavement programs	100%	Annual	100%
Reliability/Functionality How predictable is the service? How operational is the service?	Sidewalk/Ramp network is functionally and structurally adequate.	% projects with advance notice of planned sidewalk/ramp closures	100%	Annual	100%

Customer Value	Organizational Level of Service Objectives (Org. Objectives)	Technical Level of Service (Measures)	Technical Level of Service (Performance)	Technical Level of Service (Frequency)	Technical Level of Service (Target)
Sustainability Does the service fit with future needs?	Sidewalk/Ramp network supports economic, social, and environmental needs.	% newly installed sidewalk is 5' minimum width	94.5%	Annual	100%
Accessibility Can the service be easily accessed and used?	Sidewalk/Ramp network provides adequate access for pedestrians.	# ramps repaired/replaced with annual pavement programs	493	Annual	200?
Health and Safety Does the service pose a risk to health and safety?	Sidewalk/Ramp network is safe for users.	# tripping hazards repaired per year	1,145	Annual	TBD
Affordability/Cost Efficient Does the service offer best value for the money?	Plan, design, implement, and maintain sidewalk/ramp network in an efficient manner.	Annual operating costs to maintain sidewalk/ramp network	\$2,400,000	Annual	TBD
Customer Services/Responsiveness Does the organization promptly engage and reply to customers?	Respond promptly to customers.	Customer response center tracking metric?	Within 5 days	Per complaint	Within 5 days

3.0 DECISION MAKING STRATEGY

3.1 Background Overview

Figure 3.1-1 Decision Making Flow Chart



The general decision-making process is shown above in Figure 3.1-1. Detailed information for each step is outlined below.

3.2 Asset Inspection & Inventory

- The COFC performs or contracts out all inspection and data collection activities. All data collected is stored in GIS.
- Sidewalk and Ramp assets are assigned condition values 1 to 5, where 1 is infrastructure in Very Good condition and 5 is infrastructure in Very Poor condition. Assessment is based on subjective visual observation. The COFC anticipates moving toward an objective approach similar to the Pavement Condition Index (PCI) that is used for streets and roadway assets.
- An ADA compliance and condition assessment was completed in 2013. ADA projects with new improvements are continually added to the GIS database as they are completed.

3.3 Asset Prioritization

- The Council has priority given to arterial streets with missing sidewalks. Formerly prioritized maintenance on existing sidewalks and ramps. Plan to return to maintenance/rehabilitation project selection once missing sections along arterials have been constructed.
- If, under the prioritization process, two different assets tie in condition score, then the priority is adjusted based off high use areas around schools/bus stops/etc.

3.4 Project Selection

3.4.1 Strategic and Corporate Goals

This AM Plan is prepared under the direction of the City of Fort Collins' vision, mission, goals and objectives.

Our vision is:

“We foster a thriving and engaged community through our operational excellence and culture of innovation.”

Our mission is:

“Exceptional Service for an Exceptional Community.”

Strategic goals have been set by the City of Fort Collins City Plan and Strategic Plan. The relevant goals and objectives and how these are addressed in this AM Plan are summarized in Table 3.4.1.

Table 3.4.1: Goals and how these are addressed in this Plan

Goal	Objective	How Goal and Objectives are addressed in the AM Plan
Transportation & Mobility 1	Make significant progress toward the City’s Vision Zero goal to have no serious injury or fatal crashes for people walking, biking, rolling, or driving in Fort Collins.	Reviews functionality, condition, and service capacity of sidewalks and identifies the necessary budget to improve those conditions.
Transportation & Mobility 2	Increase Transfort access and ridership by ensuring the City’s transit services provide safe, reliable and convenient alternatives to driving.	Perform condition assessments while prioritizing functionality, service capacity, and associated risks to access bus stops.

3.4.2 Project Categorization

- Maintenance activities include paver resets and installation of truncated domes.
- Rehabilitation activities include grinding for trip hazards.
- Reconstruction performed depending on severity of ADA non-compliance.
- Presently, there is no set process for Disposal activities.

3.4.3 Project Coordination

- Streets’ asphalt maintenance program determines the adjacent concrete maintenance work which includes the concrete curbs, sidewalks, and ramps. Concrete work is performed one year in advance of asphalt maintenance work.
- Ramps are reconstructed ADA complaint if impacted by other departments.

3.5 Forecasting

3.5.1 Financial Planning

- \$14 Million over 10 years allocated for the Pedestrian program dedicated to funding new installations of

sidewalks and ramps. No separate fund for maintenance and rehabilitation nor inspection and inventory work. Presently, all funding goes to new construction for arterials without sidewalks.

- General Improvement District does not provide funding for ADA improvements.
- Other departments fund reconstruction activities when work impacts sidewalks and ramps.

3.5.2 Lifecycle Analysis

- Presently, there is no forecasting process defined and no deterioration curves have been developed for Sidewalk and Ramp assets.
- NAMS+ toolkit to be used for future AM forecasting but will require estimated age data to be collected via inspection.

3.5.3 Risk Management Planning

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

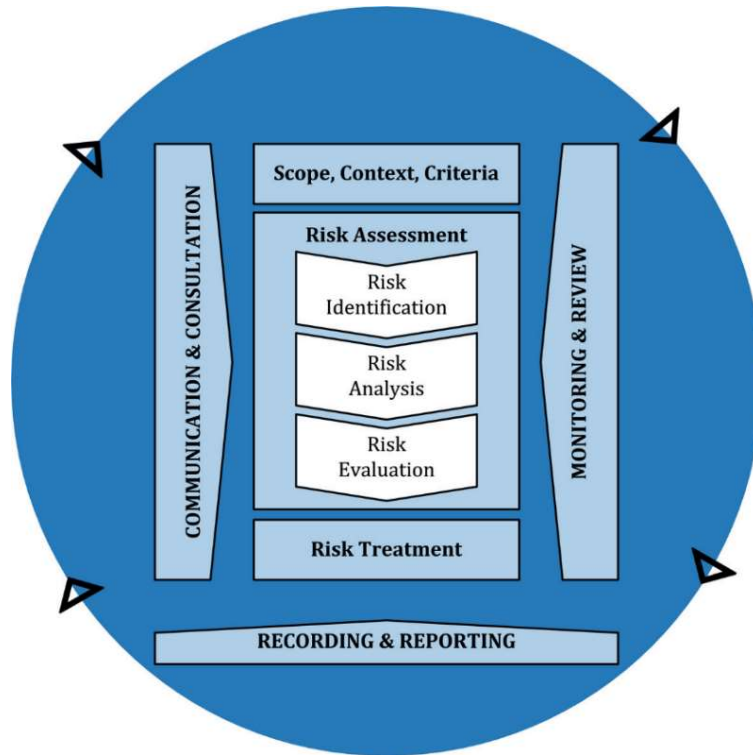
3.5.4 Risk Assessment

The risk management process used is shown in Figure 6.2 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

Fig 3.5.4: Risk Management Process – Abridged



Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 3.5.4. It is essential that these critical risks and costs are reported to Planning Development & Transportation Directors.

Table 3.5.4: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Sidewalk Network	Loss of funding source	H	Budget Offers, Highway Use Tax Funds, Special Tax (CCIP)	M	\$15 Million over 10 years
Sidewalk Network	Missing Gaps	H	Complete missing gaps with new sidewalk	L	\$72.5 Million
Sidewalk Network	Non-ADA Compliant Sidewalks	H	Construction of compliant sidewalks along critical routes	L	\$118 Million
Sidewalk Network	Non-ADA Compliant Ramps	H	Construction of compliant ramps along critical routes	L	\$47 Million
Sidewalk Network	Access to schools, transit stops, grocery stores, and healthcare facilities within a ¼ mile	H	Repair or construct new ADA compliant sidewalks and ramps	L	\$117 Million
Sidewalk Network	Missing or Non-ADA Compliant sidewalks within low-income Census tracts	M or H	Construction of new and/or compliant sidewalks within low-income Census tracts	L	\$23 Million

* The residual risk is the risk remaining after the selected risk treatment plan is implemented.

3.5.5 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarized in Table 3.3.1 Failure modes may include physical failure, collapse or essential service interruption.

Table 3.5.5: Critical Assets

Critical Asset(s)	Failure Mode	Impact
Non-ADA compliant sidewalks or missing sidewalk gaps along arterial roadways	Missing gaps, unsafe sidewalk conditions, or non-ADA compliant sidewalks.	Providing a safe location for the movement of people, being able to provide alternative modes of travel, and ADA accessibility. Limits the movement of people and/or access to higher priority locations.
Sidewalks providing access to schools, transit stops, grocery stores, and healthcare facilities.	Missing gaps, unsafe sidewalk conditions, or non-ADA compliant sidewalks.	Limits the movement of people and/or access to higher priority locations.
Non-ADA compliant sidewalks or missing sidewalk gaps located within low-income Census tracts.	Missing gaps, unsafe sidewalk conditions, or non-ADA compliant sidewalks.	Providing a safe location for the movement of people, being able to provide alternative modes of travel, and ADA accessibility. Limits the movement of people and/or access to higher priority locations.

By identifying critical assets and failure modes an organization can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

3.5.6 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to ‘withstand a given level of stress or demand’, and to respond to possible disruptions to ensure continuity of service.

Resilience recovery planning, financial capacity, climate change risk assessment and crisis leadership.

Our current measure of resilience is shown in Table 3.5.6 which includes the type of threats and hazards and the current measures that the organization takes to ensure service delivery resilience.

Table 3.5.6: Resilience Assessment

Threat / Hazard	Assessment Method	Current Resilience Approach
Maintaining the sidewalk network in a state of good or fair condition.	Condition Assessment	<ul style="list-style-type: none"> • 15-year condition assessment. • Review use of de-icing material that may impact concrete structural integrity. • Review code for trees planted within certain distance of sidewalk. • Installing appropriate expansion materials.

4.0 RECOMMENDATIONS

1. A complete set of the sidewalks & ramps assets is not presently inventoried and represented in the GIS database. The sidewalks & ramps inventory needs to be expanded to include missing and incomplete data such as asset material, age, condition, square footage, & ADA compliance.
2. ADA compliance data for sidewalks & ramps contained inconsistent data between different ADA fields. Recommend consolidation/verification of correct ADA compliance status.
3. Due to the non-availability of sufficient data, data trends are not established and reported in the current report. To establish data trends, at least three data points (years of data) for each analysis component are required. Include data trends in the subsequent reports when sufficient data is available.
4. The best practice is to assess the condition of assets based on three perspectives, including physical condition, capacity condition, and funding level. Due to limited information on the capacity and funding level, only physical condition is considered for asset condition assessment. In the subsequent revisions, for the condition assessment of assets, all three factors need to be considered.
5. Presently, the conditions of sidewalks are assessed qualitatively using subjective assessment based on a three-rating system (Good, Fair, and Poor). In this approach, assessment is done subjectively by visually examining the videos and images. For long-term investment planning, Asset Condition Index (ACI) based assessment is required, which uses a similar five-rating system (Very Good, Good, Fair, Poor, and Very Poor) that is based on a scale of 0 (Very Poor) to 100 (Very Good). Each sidewalk segment is rated objectively by assigning an ACI value of 0 to 100. Ramp conditions were determined using adjacent sidewalk conditions since no condition data for ramps was available.
6. Inflation and operation & maintenance costs are not included in the current Asset model to keep it simple. These factors need to be included to refine the model.
7. Develop formal criteria for differentiating between Maintenance vs. Rehabilitation vs. Reconstruction.
8. Create treatment strategies using deterioration curves and defined Maintenance, Rehabilitation, & Reconstruction activities for useful life of assets.

APPENDIX A – AGE AND EXPERT OPINION-BASED RATINGS

Ratings	Definition
<p>A – Very Good – 1 Fit for the future (81-100)</p>	<p>The infrastructure in the system or network is generally in excellent condition; typically, new or recently rehabilitated, and meets capacity needs for the future. A few elements show signs of general deterioration that require attention. Facilities meet modern standards for functionality and are resilient to withstand most disasters and severe weather events.</p>
<p>B – Good – 2 Adequate for now (61-80)</p>	<p>The infrastructure in the system or network is in good to excellent condition; some elements show signs of general deterioration that require attention. A few elements exhibit significant deficiencies. Safe and reliable, with minimal capacity issues and minimal risk.</p>
<p>C – Fair – 3 Requires attention (41-60)</p>	<p>The infrastructure in the system or network is in fair to good condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies in conditions and functionality, increasing vulnerability to risk.</p>
<p>D – Poor – 4 At risk (21-40)</p>	<p>The infrastructure in the system or network is in poor to fair condition; mostly below standard with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. Condition and capacity are of serious concern with strong risk of failure.</p>
<p>F – Very Poor – 5 Failing/critical, unfit for sustained service (0-20)</p>	<p>The infrastructure in the system or network is in very poor, unacceptable condition with widespread, advanced signs of deterioration. Many of the components of the system exhibit signs of imminent failure.</p>