THE ASSET MANAGEMENT PLAN FOR THE CITY OF KENNEDALE

2014

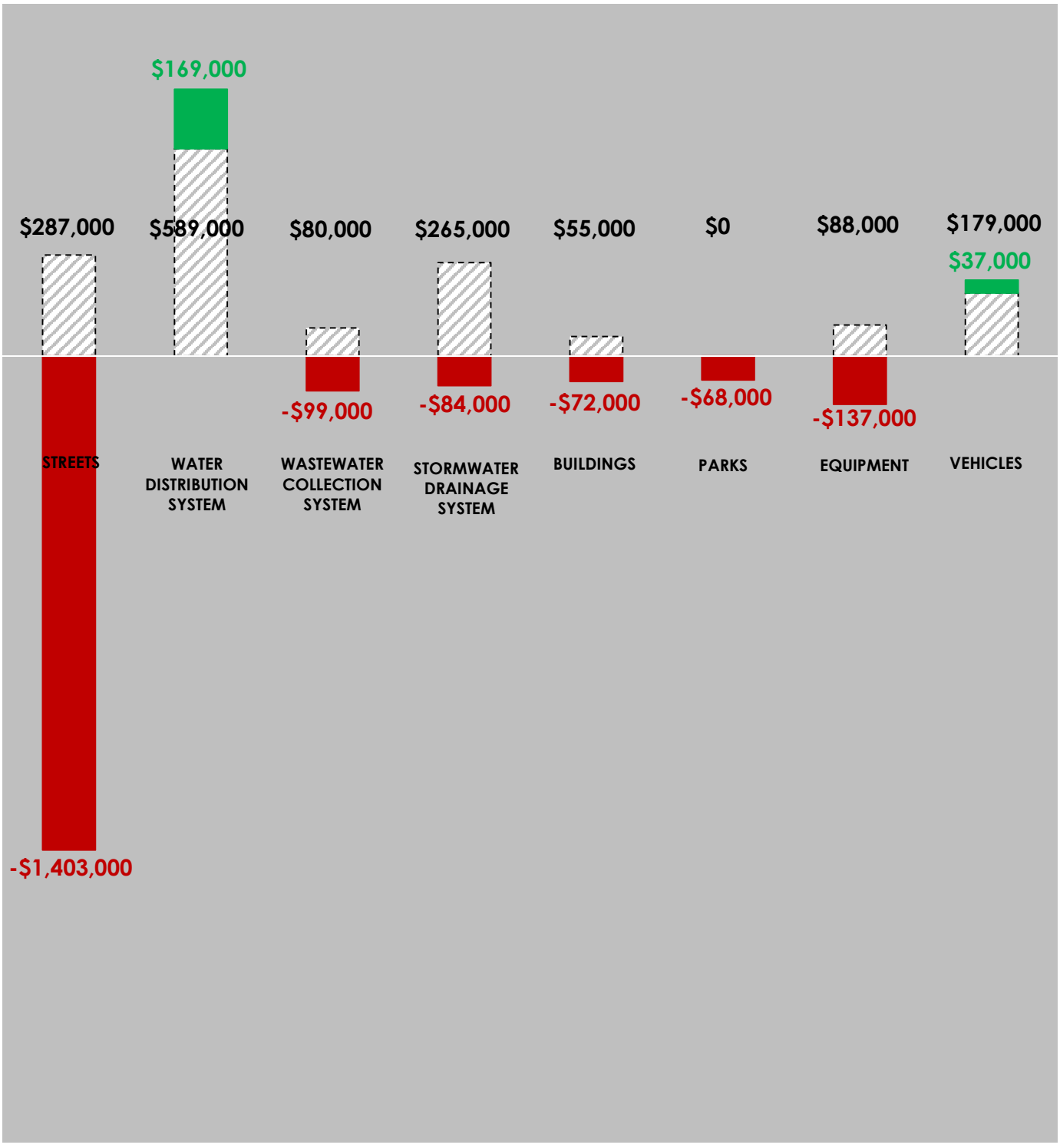
THE CITY OF KENNEDALE
405 MUNICIPAL DRIVE
KENNEDALE, TX, 76060

SUBMITTED APRIL 2015
BY PUBLIC SECTOR DIGEST
148 FULLARTON STREET, SUITE 1410
LONDON, ONTARIO, N6A 5P3

State of the Infrastructure

The City of Kennedale

AVERAGE ANNUAL FUNDING REQUIRED **vs.** AVERAGE ANNUAL FUNDING AVAILABLE



Total Annual Deficit: $1,657,000

Annual Funding Available

Annual Funding Deficit

Annual Funding Surplus

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May 7, 2015

The Honorable Brian Johnson, Mayor and Members of the City Council,

Bob Hart, City Manager
City of Kennedale
405 Municipal Drive
Kennedale, TX, 76060

We are pleased to submit the 2014 Asset Management Plan (AMP) for The City of Kennedale. This AMP will serve as a strategic, tactical, and financial document, ensuring the management of the municipal infrastructure follows sound asset management practices and principles, while optimizing available resources and establishing desired levels of service. Given the broad and profound impact of asset management on the community, and the financial & administrative complexity involved in this ongoing process, we recommend that senior decision-makers from across the organization are actively involved in its implementation.

The performance of a community's infrastructure provides the foundation for its economic development, competitiveness, prosperity, reputation, and the overall quality of life for its residents. As such, we are appreciative of your decision to entrust us with the strategic direction of its infrastructure and asset management planning, and are confident that this AMP will serve as a valuable tool. We also appreciate the contributions of the UTA Capstone class and city staff in compiling the assets and financial data, a significant undertaking.

Sincerely,
The Public Sector Digest Inc.

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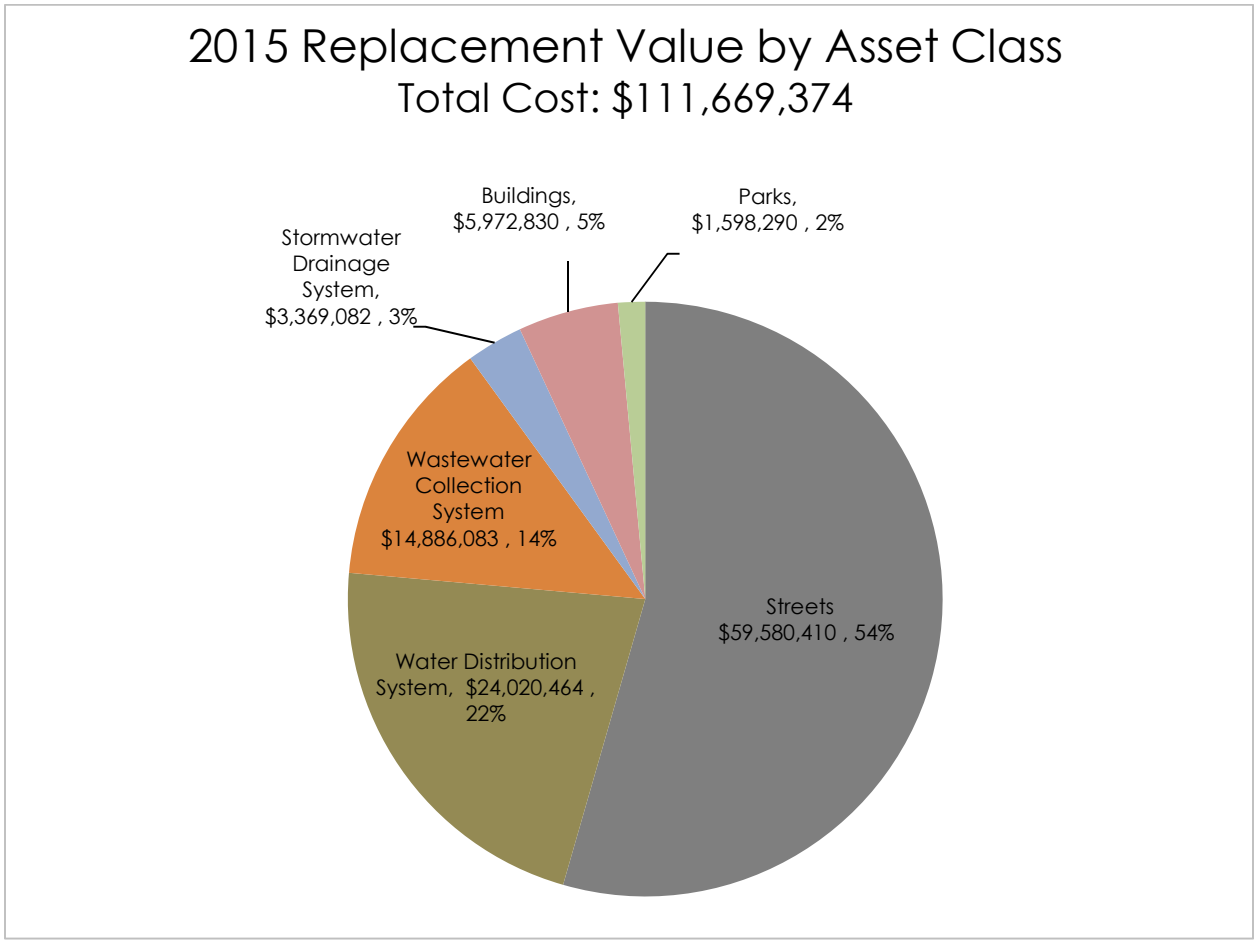
1.0 Executive Summary

The performance of a community's infrastructure provides the foundation for its economic development, competitiveness, prosperity, reputation, and the overall quality of life for its residents. Reliable and well-maintained infrastructure assets are essential for the delivery of critical core services for the residents of a city.

A technically precise and financially rigorous asset management plan, diligently implemented, will mean that sufficient investments are made to ensure delivery of sustainable infrastructure services to current and future residents. The plan will also indicate the respective financial obligations required to maintain this delivery at established levels of service.

This Asset Management Plan (AMP) for the City of Kennedale will serve as a strategic, tactical, and financial document, ensuring the management of the municipal infrastructure follows sound asset management practices and principles, while optimizing available resources and establishing desired levels of service. Given the expansive financial and social impact of asset management on both a city, and its residents, it is critical that senior decision-makers, including department heads as well as the chief executives, are strategically involved.

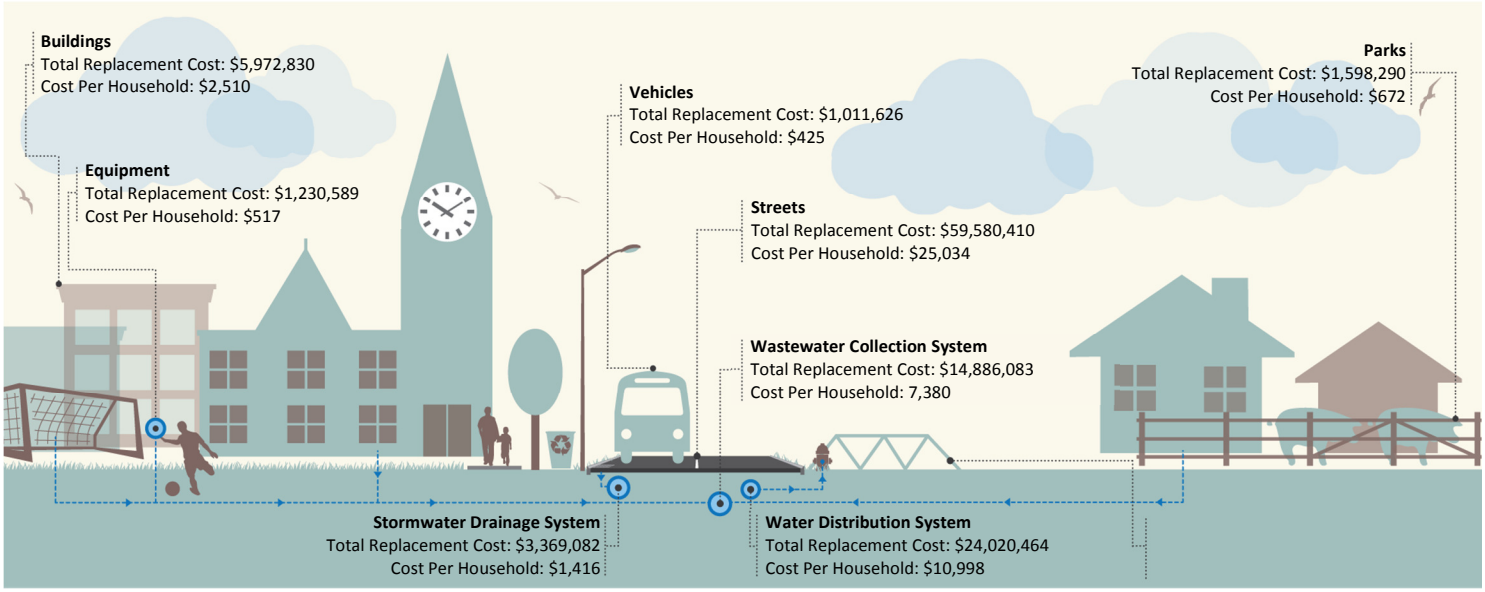
Measured in 2015 dollars, the replacement value of the asset categories analyzed totaled approximately **$111.6 million** for the City of Kennedale.



While the city is responsible for the strategic direction, it is the taxpayer in Kennedale who ultimately bear the financial burden. As such, a 'cost per household' (CPH) analysis was conducted for each of the asset categories to determine the financial obligation of each household in sharing the replacement cost of the city's assets. Such a measurement can serve as an excellent communication tool for both the administration and the council in communicating the importance of asset management to the resident. The diagram below illustrates the total CPH, as well as the CPH for individual asset categories.

Infrastructure Replacement Cost Per Household

Total: $48,951 per household



In assessing the city's state of the infrastructure, we examined, and graded, both the current condition of the asset categories (Condition vs. Performance), as well as the city's financial capacity to fund the asset's average annual requirement for sustainability (Funding vs. Need). We then generated the city's infrastructure report card based on these ratings for each asset category addressed. The city received a **cumulative GPA of** '**C**', with an **annual infrastructure deficit of $1,657,000.**

Kennedale received its highest grade of 'B+' in Condition vs. Performance in its parks assets, followed by a 'B' in both its streets and stormwater infrastructure. Its lowest grade, an 'F', was assigned in its equipment asset class. However, this asset category has a relatively minor financial value. The city received a 'D' and a 'C' in its vehicles and buildings assets respectively, indicative of disrepair. Kennedale's streets comprise the highest percentage of its infrastructure portfolio. For this category, the city received a grade of 'B'. Although the grade itself is of relatively minor concern, there is an accumulated backlog of needs to be addressed within the next five years totaling approximately $9.1 million.

The city's grades in Funding vs. Need were inconsistent, and of concern. Kennedale received an 'F' in five of the eight asset classes analyzed in this document, including its streets with an annual deficit of $1.4 million. However, the city receive an 'A' in its water distribution and vehicles assets, with an annual surplus in each class.

In order for an asset management plan to be effectively put into action, it must be integrated with financial planning and long-term budgeting. Scenarios have been developed that would enable Kennedale to achieve full funding within 5 to 10 years for the following: tax funded assets, including streets, buildings,

parks, equipment, and vehicles and; rate funded assets, including the city's water distribution, wastewater collection, and stormwater drainage system.

The average annual investment requirement for streets, buildings, parks, equipment, and vehicles is $2,252,000. Annual revenue currently allocated to these assets is $609,000 leaving an annual deficit of $1,643,000. To put it another way, these infrastructure categories are currently funded at twenty-seven percent of their long-term requirements. Kennedale has annual tax revenues of $4,254,000 in 2014. Full funding would require an increase in tax revenue of 29.9 percent over time.

Taking account the compounding effect of tax increases, it is recommended that a 17 year option which involves full funding being achieved over 17 years by:

a) during the phase-in period, reallocating the surplus in vehicles to categories that have a deficit.
b) increasing tax revenues by 2.0% each year for the next 17 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

The average annual investment requirement for wastewater collection, water distribution, and stormwater systems is $948,000. Annual revenue currently allocated to these assets for capital purposes is $934,000 leaving an annual deficit of $14,000. As a result, these infrastructure categories are currently funded at ninety-nine percent of their long-term requirements. In 2014, Kennedale has annual sanitary revenues of $1,175,000, water revenues of $1,998,000, and stormwater drainage revenues of $265,000. The wastewater collection system has an infrastructure deficit of $99,000, the water distribution system has a surplus of $169,000, and the storm drainage system has a deficit of $84,000.

It is recommended a combination of an immediate transfer option as well as phased-in rate increases which involve full funding being achieved immediately by:

a) increasing rate revenues by 8.4% for sanitary services resulting in a $99,000 increase in sanitary revenue and the elimination of the deficit in this category.
b) decreasing rate revenues by 5.0% for water services resulting in a $99,000 decrease in water revenue (thus offsetting the increase in a).
c) increasing rate revenues by 3.2% for storm drainage services each year for the next 10 years solely for the purpose of phasing in full funding to this asset category.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the changes recommended above. We realize that this will add to the water services surplus, but this surplus should be reserved until further study confirms the surplus is not needed.

Surplus from water collection services can be allocated to wastewater collection services to minimize or eliminate the associated deficit. Water rates are considered adequate for the current year.

Reserves can certainly mitigate the financial burden as they play a critical role in long-term planning. At the City of Kennedale, the following guidelines are in place in the City's financial management policy:

1. **General Fund:** 25 percent of expenditures
2. **General Debt Service Fund:** 10 percent of expenditures
3. **Water/Sewer Fund (Working Capital):** 25 percent of expenditures
4. **Water/Sewer Debt Service Fund:** Compliance with Bond Covenants
5. **Economic Development Corporation Fund:** 25 percent of expenditures

Nonetheless, due to the relatively low level of reserves available for the tax based asset categories covered by this asset management plan, the scenarios developed in this report do not draw on those reserves during the phase-in period to full funding. The results of this plan, coupled with Kennedale's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for emergency situations until annual funding and reserves are built to desired levels.

2.0 Introduction

This asset management plan will serve as a strategic, tactical, and financial document ensuring the management of the municipal infrastructure follows sound asset management practices and principles, while optimizing available resources and establishing desired levels of service. The following asset classes are addressed in this asset management plan:

1. **Streets:** Residential, collector, and minor arterial streets
2. **Water Distribution System:** Water mains, hydrants, facilities
3. **Wastewater Collection System:** Wastewater/sewer mains and manholes
4. **Stormwater Drainage System:** Stormwater drainage lines, ditches, flume, and inlets
5. **Buildings:** Administration, recreation, fire, police, library/community center, and senior center
6. **Parks:** Parks & playgrounds, fencing, lighting, signage, trails and equipment
7. **Equipment:** Miscellaneous departmental equipment
8. **Vehicles:** Community Development, police, fire, EMS, and public works

At a strategic level, within the State of the Current Infrastructure section, it will identify current and future challenges that should be addressed in order to maintain sustainable infrastructure services on a long-term, life cycle basis.

It will outline a Desired Level of Service (LOS) Framework for each asset category to assist the development and tracking of LOS through performance measures across strategic, financial, tactical, operational, and maintenance activities within the organization.

At a tactical level, within the Asset Management Strategy section, it will develop an implementation process to be applied to the needs-identification and prioritization of renewal, rehabilitation, and maintenance activities, resulting in a 10 year plan that will include growth projections.

At a financial level, within the Financial Strategy section, a strategy will be developed that fully integrates with other sections of this asset management plan, to ensure delivery and optimization of the 10 year infrastructure budget.

Through the development of this plan, all data, analysis, life cycle projections, and budget models will be provided through the Public Sector Digest's CityWide suite of software products. The software and plan will be synchronized, will evolve together, and therefore, will allow for ease of updates, and annual reporting of performance measures and overall results.

This will allow for continuous improvement of the plan and its projections. It is therefore recommended that the plan be revisited and updated on an annual basis, particularly as more detailed information becomes available.

2.1 Importance of Infrastructure

Municipalities throughout Texas, large and small, own a diverse portfolio of infrastructure assets which in turn provide a varied number of services to their residents. The infrastructure, in essence, is a conduit for the various public services the city provides, e.g., the roads supply a transportation system; the water distribution system supplies a clean drinking water service. A community's prosperity, economic development, competitiveness, image, and overall quality of life are inherently and explicitly tied to the performance of its infrastructure.

2.2 Asset Management Plan (AMP) - Relationship to Strategic Plan

The major benefit of strategic planning is the promotion of strategic thought and action. A strategic plan spells out the direction of the City's resource allocation, ensuring alignment to the strategic priorities and objectives. It will help identify priorities and guide how municipal tax dollars and revenues are spent into the future.

The strategic plan usually includes a vision and mission statement, and key organizational priorities with alignment to objectives and action plans. Given the growing economic and political significance of infrastructure, the asset management plan will become a central component of most municipal strategic plans, influencing city priorities, objectives, and actions.

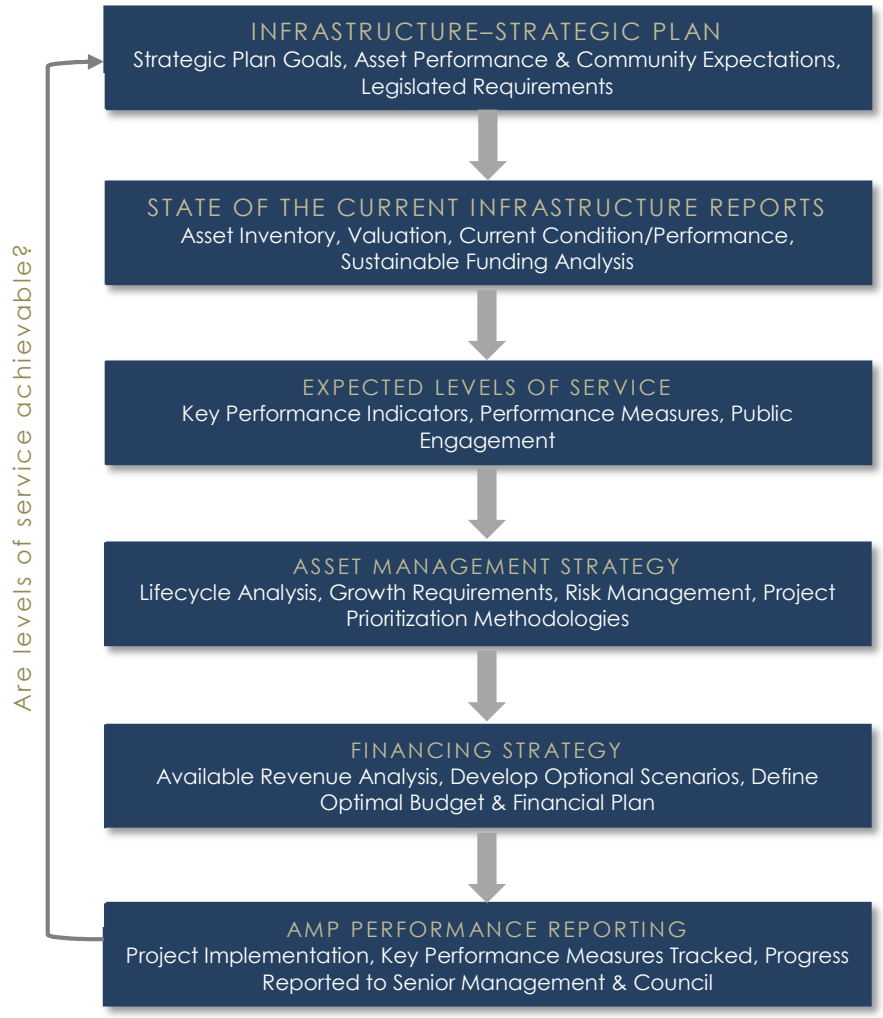
2.3 AMP - Relationship to other Plans

An asset management plan is a key component of the city's planning process linking with multiple other corporate plans and documents. For example:

- **The Comprehensive Plan** – The AMP should utilize and influence the land use policy directions for long-term growth and development as provided through the Comprehensive Plan.
- **Long Term Financial Plan** – The AMP should both utilize and conversely influence the financial forecasts within the long-term financial plan.
- **Capital Budget** – The decision framework and infrastructure needs identified in the AMP form the basis on which future capital budgets are prepared.
- **Infrastructure Master Plans** – The AMP will utilize goals and projections from infrastructure master plans and in turn will influence future street and utility master plan recommendations.
- **Ordinances, standards, and policies** – The AMP will influence and utilize policies and ordinances related to infrastructure management practices and standards.
- **Regulations** – The AMP must recognize and abide by industry practices and state regulations.
- **Business Plans** – The service levels, policies, processes, and budgets defined in the AMP are incorporated into operating budgets, management strategies, and performance measures.

2.4 Purpose and Methodology

The following diagram depicts the approach and methodology, including the key components and links between those components that embody this asset management plan:



It can be seen from the above that a city's infrastructure planning starts at the highest level of management with ties to the strategic plan, alignment to the community's expectations, and compliance with industry and government regulations.

Then, through the State of the Infrastructure analysis, overall asset inventory, valuation, condition and performance are reported. In this initial AMP, due to a lack of current condition data for many of the asset classes, present performance and condition are estimated by using the current age of the asset in comparison to its overall useful design life. In future updates to this AMP, accuracy of reporting will be significantly increased through the use of holistically captured condition data. Also, a life cycle analysis of needs for each infrastructure class is conducted. This analysis yields the sustainable funding level, compared against actual current funding levels, and determines whether there is a funding surplus or deficit for each infrastructure program. The overall measure of condition and available funding is finally scored for each asset class and presented as a star rating (similar to the hotel star rating) and a letter grade (A-F) within the Infrastructure Report Card.

From the lifecycle analysis above, the city gains an understanding of the level of service provided today for each infrastructure class and the projected level of service for the future. The next section of the AMP provides a framework for a city to develop a Desired Level of Service (or target service level) and develop performance measures to track the year-to-year progress towards this established target level of service.

The Asset Management Strategy then provides a detailed analysis for each infrastructure class. Included in this analysis are best practices and methodologies from within the industry which can guide the overall management of the infrastructure in order to achieve the desired level of service. This section also provides an overview of condition assessment techniques for each asset class; life cycle interventions required, including those interventions that yield the best return on investment; and prioritization techniques, including risk quantification, to determine which priority projects should move forward into the budget first.

The Financing Strategy then fully integrates with the asset management strategy and asset management plan, and provides a financial analysis that optimizes the 10 year infrastructure budget. All revenue sources available are reviewed, such as the ad-valorem tax levy, debt allocations, rates, reserves, grants, sales tax, development charges, etc., and necessary budget allocations are analyzed to inform and deliver the infrastructure programs.

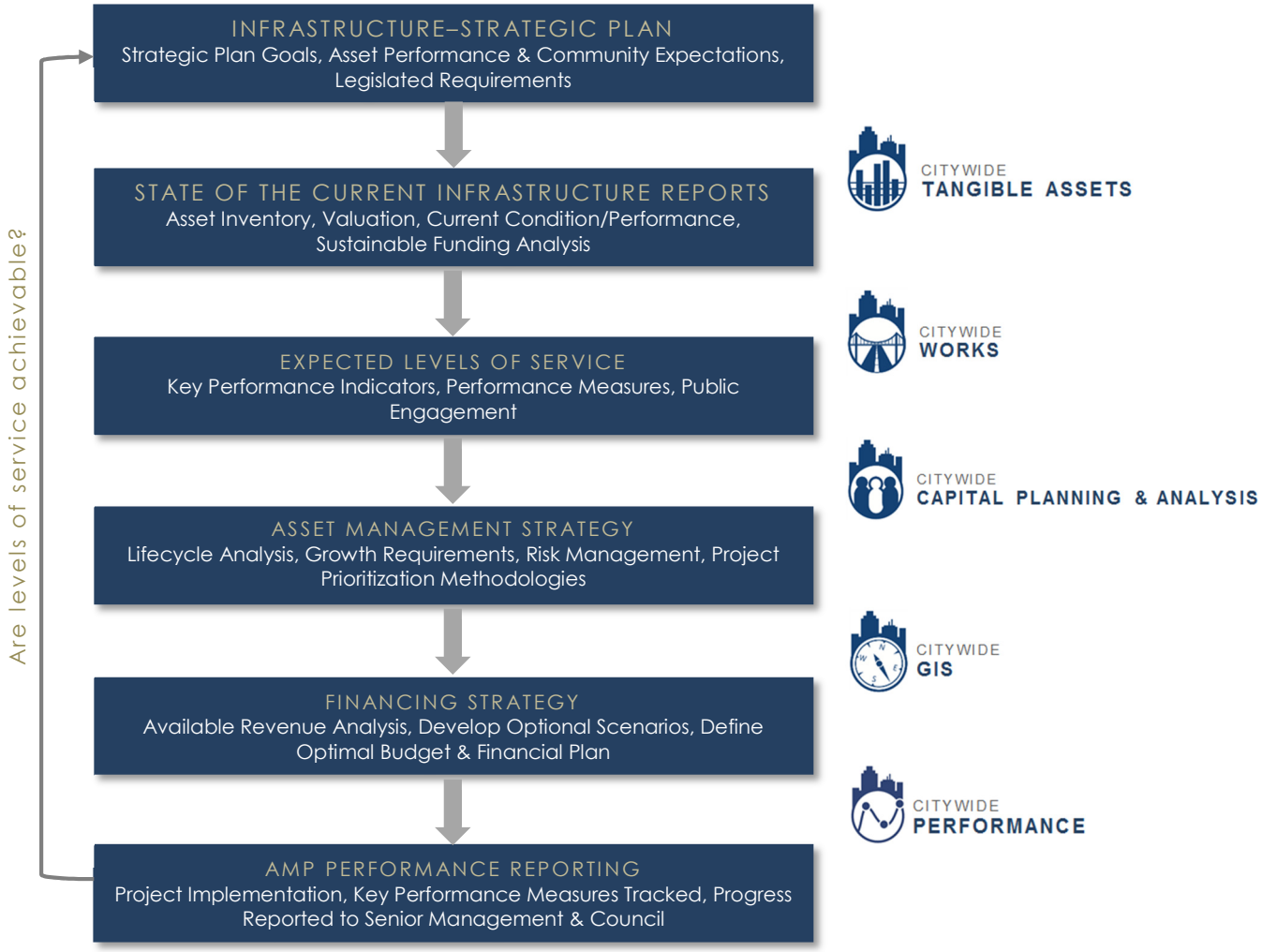
Finally, in subsequent updates to this AMP, actual project implementation will be reviewed and measured through the established performance metrics to quantify whether the desired level of service is achieved or achievable for each infrastructure class. If shortfalls in performance are observed, these will be discussed and alternate financial models or service level target adjustments will be presented.

2.5 CityWide Software alignment with AMP

The plan will be built and developed hand in hand with a database of municipal infrastructure information in the CityWide software suite of products. The software will ultimately contain the city's asset base, valuation information, life cycle activity predictions, costs for activities, sustainability analysis, project prioritization parameters, key performance indicators and targets, 10 year asset management strategy, and the financial plan to deliver the required infrastructure budget.

The software and plan will be synchronized, and will evolve together year-to-year as more detailed information becomes available. This synchronization will allow for ease of updates, modeling and scenario building, and annual reporting of performance measures and results. This will allow for continuous improvement of the plan and its projections. It is therefore recommended that it is revisited and updated on an annual basis.

The following diagram outlines the various CityWide software products and how they align to the various components of the AMP.



3.0 State of the Infrastructure (SOTI)

3.1 Objective and Scope

Objective: To identify the state of the city's infrastructure today and the projected state in the future if current funding levels and management practices remain as they are.

The analysis and subsequent communication tools will outline future asset requirements, start the development of tactical implementation plans, and ultimately assist the organization to provide cost effective sustainable services to the current and future community.

The approach was based on the following key industry state of the infrastructure documents:

- GFOA Best practice, February 2011
- GFOA Advisory Circular, October 2002
- GFOA Asset Maintenance and Replacement, March 2010
- GFOA Technology in Capital Planning and Management, October 2011
- Canadian Infrastructure Report Card
- City of Hamilton's State of the Infrastructure reports
- Other Ontario Municipal State of the Infrastructure reports

The above reports are themselves based on established principles found within key, industry best practices documents such as:

- American Society of Civil Engineering Manuals (U.S.A.)
- The International Infrastructure Management Manual (Australia / New Zealand)
- The National Guide for Sustainable Municipal Infrastructure (Canada)

Scope: Within this State of the Infrastructure report, a high level review will be undertaken for the following asset classes:

1. **Streets:** Residential, collector, and minor arterial streets
2. **Water Distribution System:** Water mains, hydrants, storage facilities, and meters
3. **Wastewater Collection System:** Wastewater/sewer mains and manholes
4. **Stormwater Drainage System:** Stormwater drainage lines, ditches, flume, and inlets
5. **Buildings:** Administration, parks, fire, police, library/community center, and senior center
6. **Parks:** Parks & playgrounds, fencing, lighting, signage, trails and equipment
7. **Equipment:** Miscellaneous departmental equipment
8. **Vehicles:** Community development, police, fire, EMS, and public works

3.2 Approach

The asset classes above were reviewed at a very high level due to the nature of data and information available. Subsequent detailed reviews of this analysis are recommended on an annual basis, as more detailed condition assessment information becomes available for each infrastructure category.

3.2.1 Base Data

In order to understand the full inventory of infrastructure assets within Kennedale, all tangible capital asset data was loaded into the CityWide Tangible Asset™ software module. This database now provides a detailed and summarized inventory of assets as used throughout the analysis within this report and the entire Asset Management Plan.

3.2.2 Asset Deterioration Review

The city has supplied condition data for all streets, hydrants, and stormwater drainage, and parks. The condition data recalculates a new performance age for each individual asset and, as such, a far more

accurate prediction of future replacement can be established and applied to the future investment requirements within this AMP report.

For those assets without condition data, i.e., water mains, wastewater collection mains, facilities, equipment, and vehicles, the deterioration review will rely on the 'straight line' amortization schedule approach provided from the accounting data. Although this approach is based on age data and useful life projections, and is not as accurate as the use of detailed condition data, it does provide a relatively reliable benchmark of future requirements.

3.2.3 Identify Sustainable Investment Requirements

A gap analysis was performed to identify sustainable investment requirements for each asset category. Information on current spending levels and budgets was acquired from the finance department, future investment requirements were calculated, and the gap between the two was identified.

The above analysis is performed by using investment and financial planning models, and life cycle costing analysis, embedded within the CityWide software suite of applications.

3.2.4 Asset Rating Criteria

Each asset category will be rated on two key dimensions:

- **Condition vs. Performance**: Based on the condition of the asset today and how well performs its function.
- **Funding vs. Need**: Based on the actual investment requirements to ensure replacement of the asset at the right time, versus current spending levels for each asset group.

3.2.5 Infrastructure Report Card

The dimensions above will be based on a simple 1–5 star rating system, which will be converted into a letter grading system ranging from A-F. An average of the two ratings will be used to calculate the combined rating for each asset class. The outputs for all municipal assets will be consolidated within the CityWide software to produce one overall Infrastructure Report Card showing the current state of the assets.

Grading Scale: Condition vs. Performance

Based on the condition of the asset today and how well it performs its function.

Star Rating	Letter Grade	Color Indicator	Description
★★★★★	A		**Excellent**: No noticeable defects
★★★★	B		**Good**: Minor deterioration
★★★	C		**Fair**: Deterioration evident, function is affected
★★	D		**Poor**: Serious deterioration. Function is inadequate
★	F		**Critical**: No longer functional. General or complete failure

Grading Scale: Funding vs. Need

Based on the actual investment requirements to ensure replacement of the asset at the right time, versus current spending levels for each asset group.

Star Rating	Letter Grade	Description
★★★★★	A	**Excellent**: 91 to 100% of need
★★★★	B	**Good**: 76 to 90% of need
★★★	C	**Fair**: 61 to 75% of need
★★	D	**Poor**: 46 – 60% of need
★	F	**Critical**: under 45% of need

3.2.6 General Methodology and Reporting Approach

The report will be based on the seven key questions of asset management for Sustainable Municipal Infrastructure:

- What does the city own and where is it? (inventory)
- What is it worth? (valuation / replacement cost)
- What is its condition / remaining service life? (function & performance)
- What needs to be done? (maintain, rehabilitate, replace)
- When does the city need to take action? (useful life analysis)
- How much will it cost? (investment requirements)
- How does the city ensure sustainability? (long-term financial plan)

The above questions will be answered for each asset category in the following report sections.

3.3 Streets

D

INFRASTRUCTURE REPORT CARD GRADE

3.3 Streets

3.3.1 What does the city own?

As shown in the summary table below, streets comprise approximately 42 miles of road.

Streets Inventory		
Asset Type	Asset Component	Quantity/Units
Streets	Residential	179,016 ft
	Arterial	43,795 ft

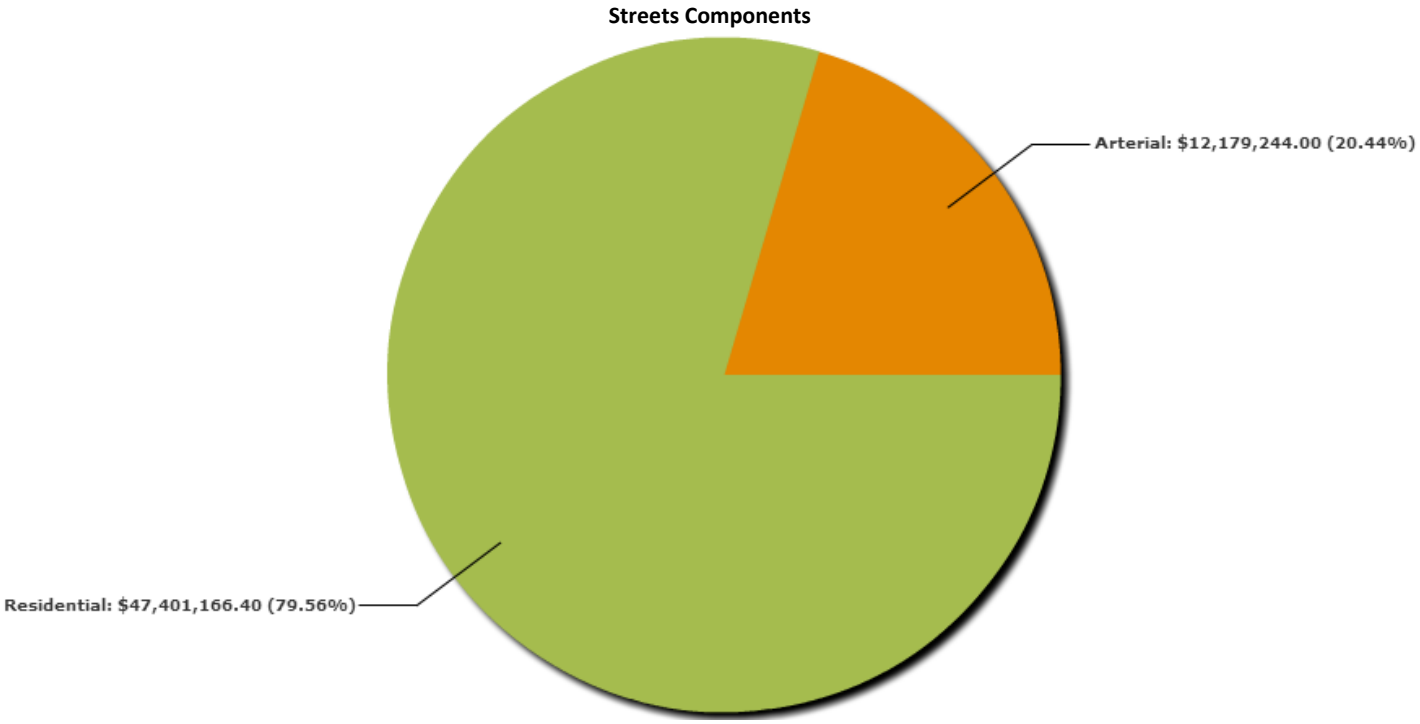
The streets data was extracted from the Tangible Capital Asset module of the CityWide software suite.

3.3.2 What is it worth?

The estimated replacement value of all streets, in 2015 dollars, is approximately $59.6 million. The cost per household for the street network is $25,034 based on 2,380 households.

Streets Replacement Value				
Asset Type	Asset Component	Quantity/Units	2015 Unit Replacement Cost	2015 Overall Replacement Cost*
Streets	Residential	179,016 ft	User-Defined	$47,401,166
	Arterial	43,795 ft	User-Defined	$12,179,244
				$59,580,410

The pie chart below provides a breakdown of streets relative to the overall system value.



3.3.3 What condition is it in?

Approximately ninety percent of all streets, based on field condition data, is in fair to excellent condition. As a result, the city received a Condition vs. Performance rating of 'B'.

3.3.4 What does the city need to do to it?

There are generally four distinct phases in an asset's life cycle that require specific types of attention and lifecycle activity. These are presented at a high level for the streets below. Further detail is provided in the "Asset Management Strategy" section of this AMP.

Addressing Asset Needs

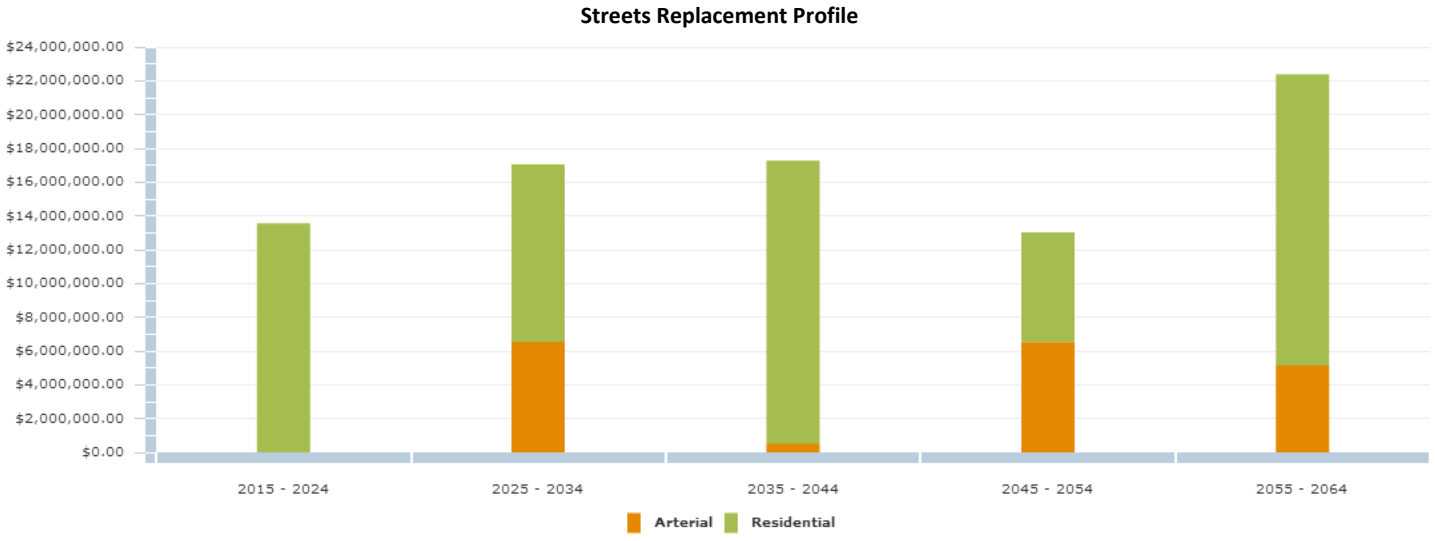
Phase	Lifecycle Activity	Asset Life Stage
Minor maintenance	Activities such as inspections, monitoring, sweeping, winter control, etc.	1st Qtr
Major maintenance	Activities such as repairing pot holes, grinding out roadway rutting, and patching sections of road.	2nd Qtr
Rehabilitation	Rehabilitation activities such as asphalt overlays, mill and paves, etc.	3rd Qtr
Replacement	Full road reconstruction	4th Qtr

3.3.5 When does the city need to take action?

For the purpose of this report, 'useful life' data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets. These needs are calculated and quantified in the system as part of the overall financial requirements.

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life
Streets	Residential	20, 50
	Arterial	20, 50



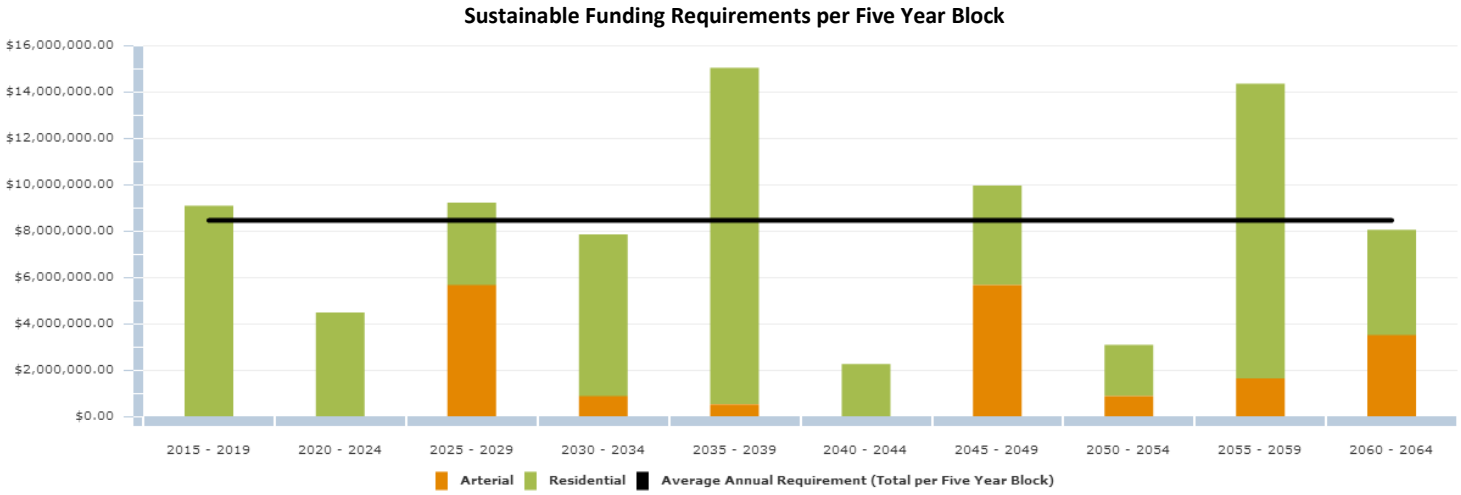
3.3.6 How much money does the city need?

The analysis completed to determine capital revenue requirements was based on the following constraints and assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section.
2. The timing for individual road replacement was defined by the replacement year as described in the "When does the city need to take action?" section.
3. All values are presented in 2015 dollars.
4. The analysis was run for a 50 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.3.7 How does the city reach sustainability?

Based upon the above parameters, the average annual revenue required to sustain Kennedale's streets is approximately **$1,690,000**. Based on Kennedale's current annual funding of **$287,000**, there is an annual **deficit of $1,403,000**. As such, it received a Funding vs. Need rating of 'F' based on a weighted star rating of 0 stars. The following graph illustrates the expenditure requirements in five year increments against the sustainable funding threshold line.



In conclusion, based on assessed condition, the majority of street infrastructure is in fair to excellent condition. There is a backlog of needs to be addressed within the next 5 years totaling approximately $9.1 million. The condition assessment data, along with risk management strategies, should be reviewed together to aid in prioritizing overall needs for rehabilitation and replacement and assist with optimizing the long and short term budgets. Further detail is outlined within the "asset management strategy" section of this asset management plan.

3.3.8 Recommendations

The city received an overall rating of 'D' for its streets, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- The condition assessment data, along with risk management strategies, should be reviewed together to aid in prioritizing overall needs for rehabilitation and replacement.
- A tailored life cycle activity framework should be also be developed by the City as outlined further within the "Asset Management Strategy" section of this AMP.
- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.

3.4 Water Distribution System

B

INFRASTRUCTURE REPORT CARD GRADE

3.4 Water Distribution System

3.4.1 What does the city own?

Kennedale is responsible for the following water distribution system inventory which includes approximately 48 miles of water mains:

Water Distribution System Inventory

Asset Type	Asset Component	Quantity/Units
Water Distribution System	Water Pipe (1.5 inch)	3,644.62 ft
	Water Pipe (2 inch)	7,079.26 ft
	Water Pipe (6 inch)	73,576.03 ft
	Water Pipe (8 inch)	92,372.76 ft
	Water Pipe (10 inch)	7,301.84 ft
	Water Pipe (12 inch)	44,870.42 ft
	Water Pipe (16 inch)	26,532.19 ft
	Hydrants	487
	Equipment	6
	Facilities	27
	Vehicles	14

The water distribution system data was extracted from the Tangible Capital Asset module of the CityWide software suite.

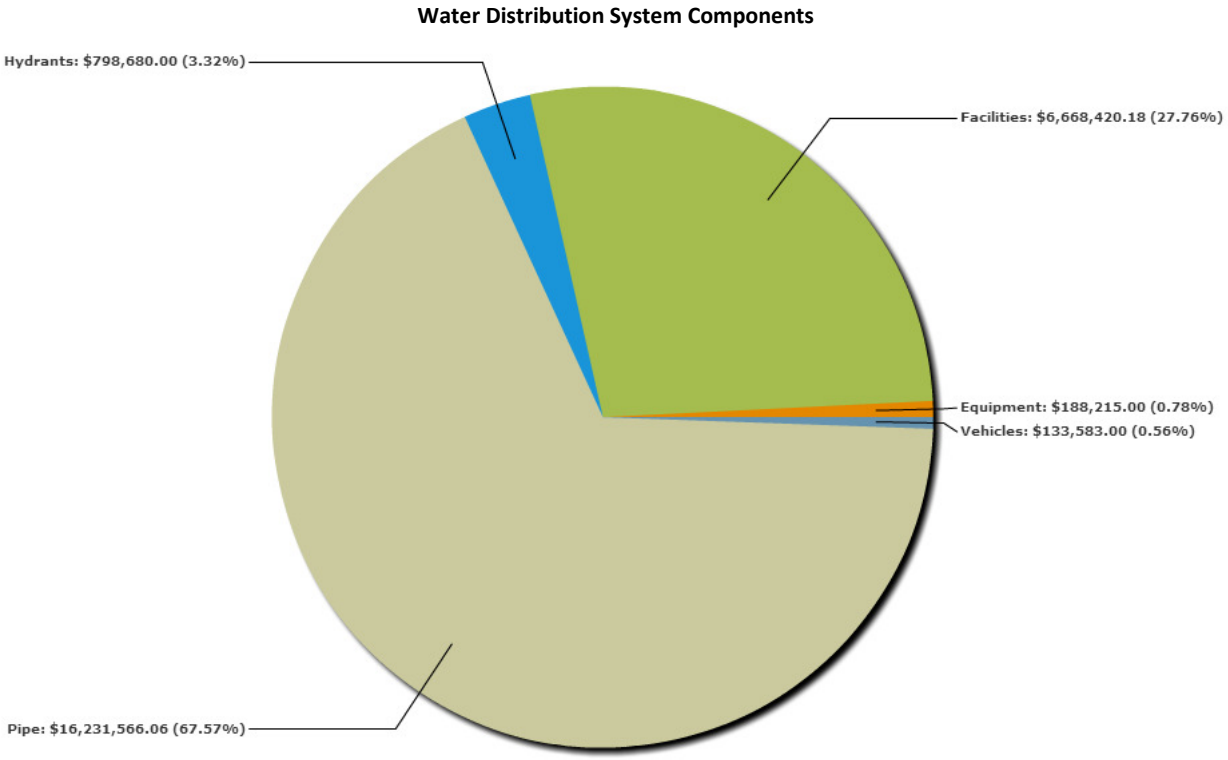
3.4.2 What is it worth?

The estimated replacement value of the water distribution system, in 2015 dollars, is approximately $23.7 million. The cost per household for the water distribution system is $10,851 based on 2,184 households.

Water Distribution System Replacement Value

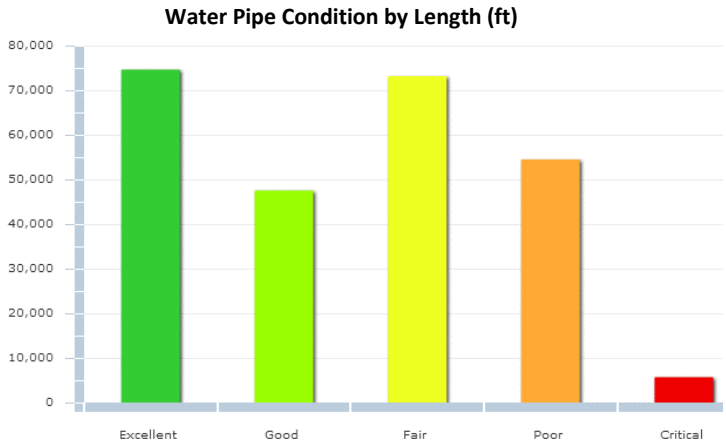
Asset Type	Asset Component	Quantity/Units	2015 Unit Replacement Cost	2015 Overall Replacement Cost*
Water Distribution System	Water Pipe (1.5 inch)	3,644.62 ft	User-Defined	$153,075
	Water Pipe (2 inch)	7,079.26 ft	User-Defined	$297,329
	Water Pipe (6 inch)	73,576.03 ft	User-Defined	$3,090,196
	Water Pipe (8 inch)	92,372.76 ft	User-Defined	$5,283,722
	Water Pipe (10 inch)	7,301.84 ft	User-Defined	$522,082
	Water Pipe (12 inch)	44,870.42 ft	User-Defined	$3,849,883
	Water Pipe (16 inch)	26,532.19 ft	User-Defined	$3,035,280
	Hydrants	487	User-Defined	$798,680
	Equipment	6	User-Defined	$188,215
	Facilities	27	User-Defined	$6,668,420
	Vehicles	14	User-Defined	$133,583
				$24,020,465

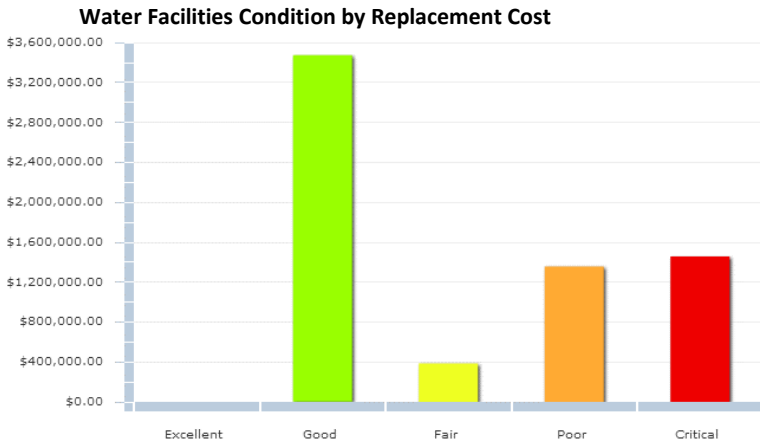
The pie chart below provides a breakdown of each of the system components to the overall system value.



3.4.3 What condition is it in?

Based on age based condition, approximately seventy-six percent of the city's water mains are in fair to excellent condition, while twenty-four percent are poor or critical condition. Nearly forty-two percent, by replacement value, of the city's facilities assets are in poor to critical condition. As such, the city received a Condition vs. Performance rating of 'C'.





3.4.4 What does the city need to do to it?

There are generally four distinct phases in an asset's life cycle. These are presented at a high level for the water distribution system below. Further detail is provided in the "Asset Management Strategy" section of this AMP.

Addressing Asset Needs

Phase	Lifecycle Activity	Asset Age
Minor Maintenance	Activities such as inspections, monitoring, cleaning and flushing, hydrant flushing, pressure tests, visual inspections, etc.	1st Qtr
Major Maintenance	Such events as repairing water main breaks, repairing valves, replacing individual small sections of pipe etc.	2nd Qtr
Rehabilitation	Rehabilitation events such as structural lining of pipes and a cathodic protection program to slow the rate of pipe deterioration.	3rd Qtr
Replacement	Pipe replacements	4th Qtr

3.4.5 When does the city need to take action?

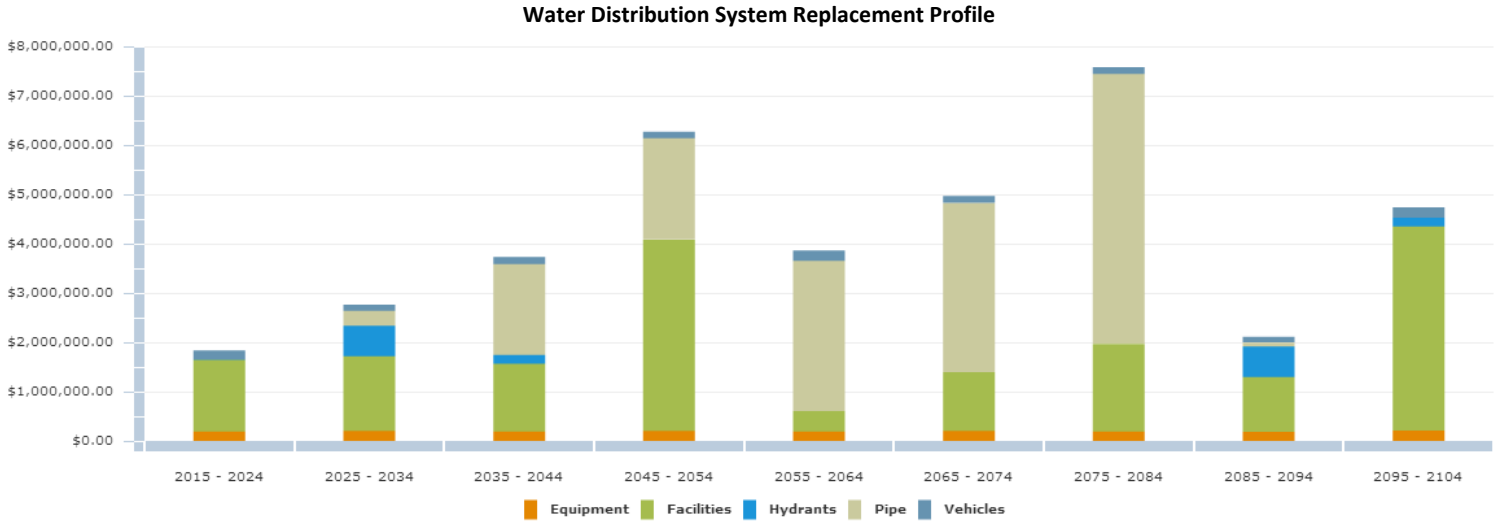
For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of assets, which are calculated in the system as part of the overall financial requirements.

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life (Years)
Water Distribution System	Water Pipe (1.5 inch)	80
	Water Pipe (2 inch)	80, 90
	Water Pipe (6 inch)	80, 90
	Water Pipe (8 inch)	80, 90
	Water Pipe (10 inch)	80, 90
	Water Pipe (12 inch)	80, 90
	Water Pipe (16 inch)	80
	Hydrants	60
	Equipment	10
	Facilities	20, 25, 50
	Vehicles	8, 10, 12

As field condition information becomes available in time, the data should be loaded into the CityWide system in order to increasingly have a more accurate picture of current asset age and condition, therefore, future replacement requirements.

The following graph shows the current projection of water distribution system replacements based on the age of the assets only.



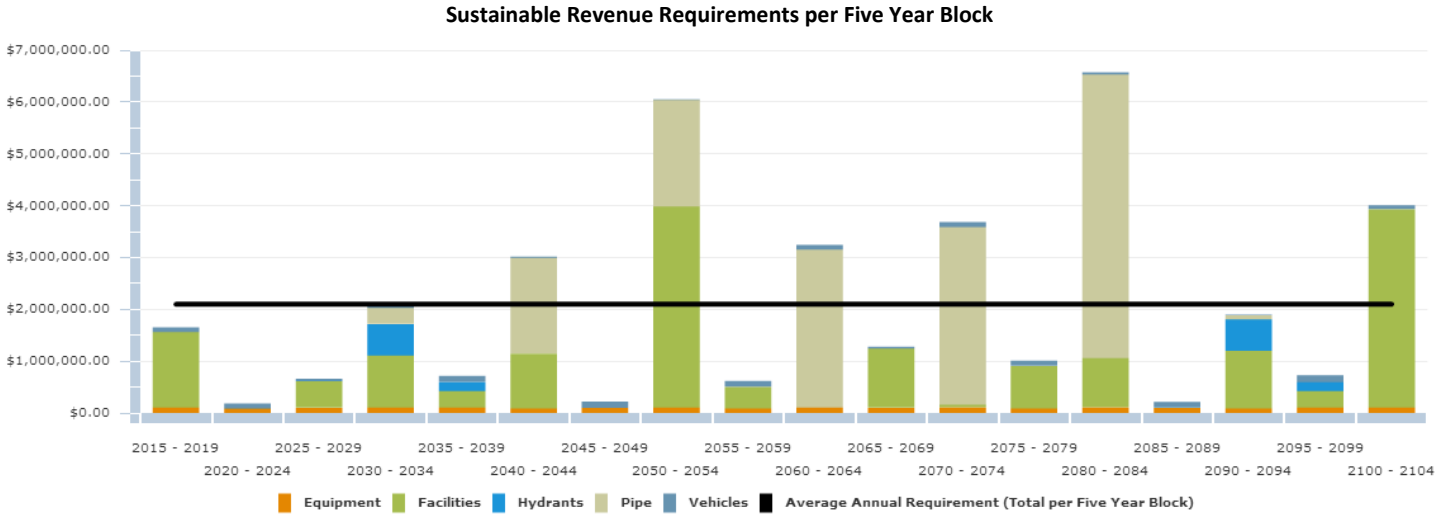
3.4.6 How much money does the city need?

The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for each water main replacement was defined by the replacement year as described in the "When does the city need to take action?" section above.
3. All values are presented in 2015 dollars.
4. The analysis was run for a 90 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.4.7 How does the city reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Kennedale's water distribution system is approximately **$420,000**. Based on Kennedale's current annual funding of **$589,000**, there is a **surplus of $169,000**. Given this surplus, the city received a Funding vs. Need rating of 'A' based on a weighted star rating of 5 stars. The following graph presents five year blocks of expenditure requirements against the sustainable funding threshold line.



Based on age based condition, approximately seventy-six percent of the city's water mains are in fair to excellent condition, however nearly forty-two percent of the city's facilities assets are in poor to critical condition. There are needs to be addressed within the next 5 years totaling approximately $1.6 million. A condition assessment program should be established to aid in prioritizing overall needs for rehabilitation and replacement and to assist with optimizing the long and short term budgets. Further detail is outlined within the "asset management strategy" section of this AMP.

3.4.8 Recommendations

The city received an overall rating of 'B' for its water distribution system, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- A more detailed study to define the current condition of the water distribution system should be undertaken as described further within the "Asset Management Strategy" section of this AMP.
- Also, a detailed study to define the current condition of the water facilities and their components (structural, architectural, electrical, mechanical, process, etc.) should be undertaken, as collectively they account for twenty-eight percent of the water distribution system's value.
- Once the above studies are complete, a new performance age should be applied to each asset and an updated "current state of the infrastructure" analysis should be generated.
- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.
- The city just completed a water and wastewater utility master plan by Freese & Nichols Engineering Firm in 2014.

3.5 Wastewater Collection System

D

INFRASTRUCTURE REPORT CARD GRADE

3.5 Wastewater Collection System

3.5.1 What does the city own?

The inventory components of the wastewater collection system are outlined in the table below. The entire system consists of approximately 48 miles of sanitary mains.

Wastewater Collection System Inventory

Asset Type	Asset Component	Quantity/Units
Wastewater Collection System	Sewer Pipe (6 Inch)	122,238 ft
	Sewer Pipe (8 Inch)	85,470 ft
	Sewer Pipe (10 Inch)	5,997 ft
	Sewer Pipe (12 Inch)	37,848 ft
	Sewer Pipe (15 Inch)	811 ft
	Sewer Pipe (18 Inch)	3,558 ft

The Wastewater Collection System data was extracted from the Tangible Capital Asset module of the CityWide software application.

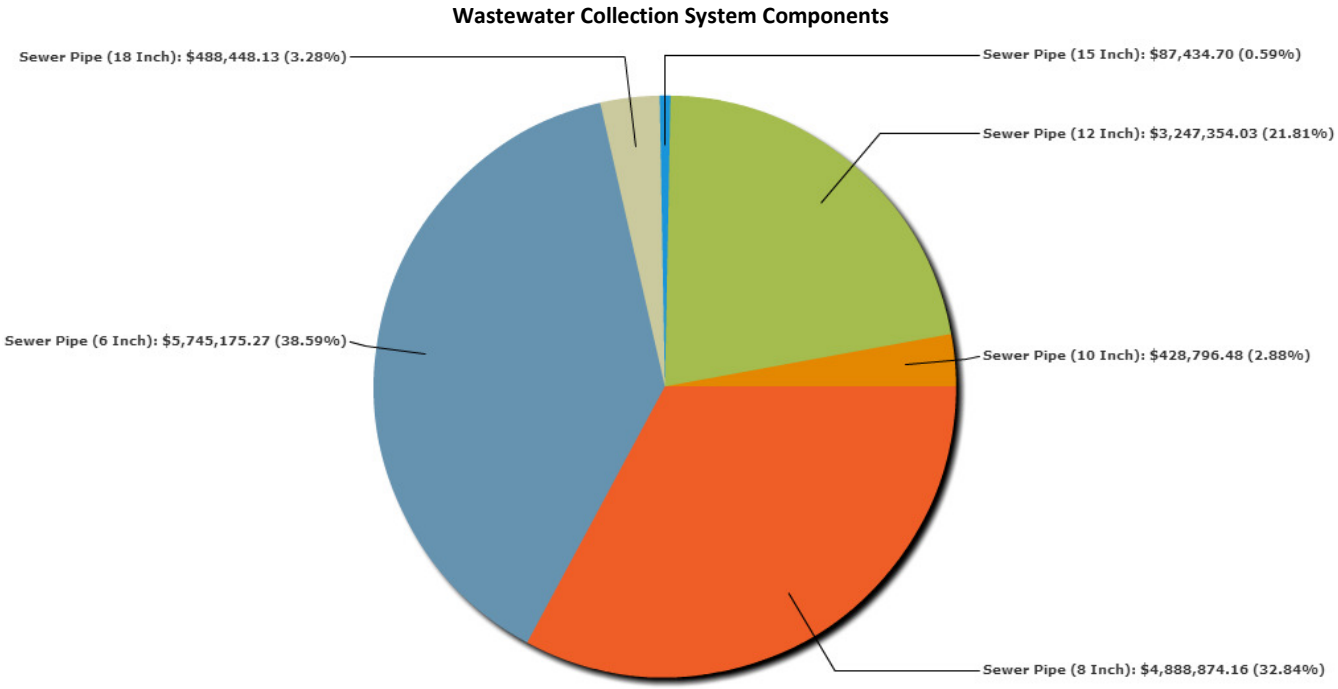
3.5.2 What is it worth?

The estimated replacement value of the wastewater collection system, in 2015 dollars, is approximately $14.9 million. The cost per household for the wastewater collection is $7,380 based on 2,017 households.

Wastewater Collection System Replacement Value

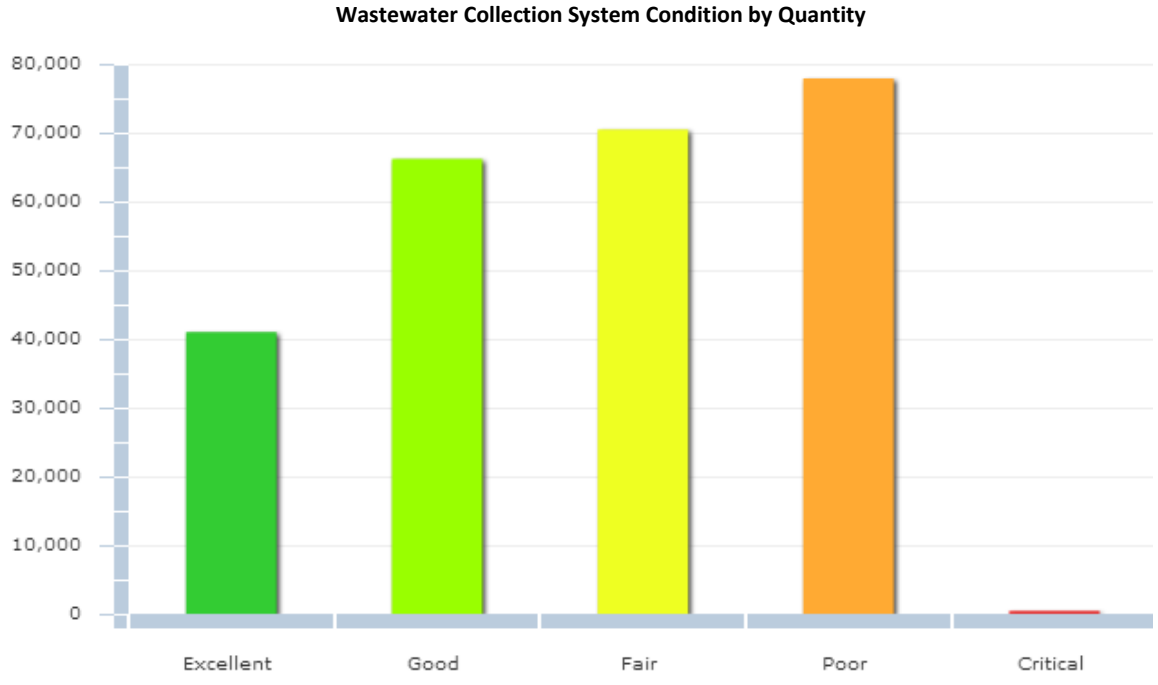
Asset Type	Asset Component	Quantity/Units	2015 Unit Replacement Cost	2015 Overall Replacement Cost
Wastewater Collection System	Sewer Pipe (6 Inch)	122,238 ft	User-Defined	$5,745,175
	Sewer Pipe (8 Inch)	85,470 ft	User-Defined	$4,888,874
	Sewer Pipe (10 Inch)	5,997 ft	User-Defined	$428,796
	Sewer Pipe (12 Inch)	37,848 ft	User-Defined	$3,247,354
	Sewer Pipe (15 Inch)	811 ft	User-Defined	$87,435
	Sewer Pipe (18 Inch)	3,558 ft	User-Defined	$488,448
				$14,886,083

The pie chart below provides a breakdown of each component of the wastewater collection system.



3.5.3 What condition is it in?

Approximately sixty-nine percent of the city's sewer pipes are in fair to excellent condition, based on age data only, with approximately thirty-one percent in poor or critical condition. As such, the city received a Condition vs. Performance rating of 'C'.



3.5.4 What does the city need to do to it?

There are generally four distinct phases in an assets life cycle. These are presented at a high level for the wastewater collection system below. Further detail is provided in the "Asset Management Strategy" section of this AMP.

Addressing Asset Needs		
Phase	Lifecycle Activity	Asset Life Stage
Minor Maintenance	Activities such as inspections, monitoring, cleaning and flushing, zoom camera and CCTV inspections, etc.	1st Qtr
Major Maintenance	Activities such as repairing manholes and replacing individual small sections of pipe.	2nd Qtr
Rehabilitation	Rehabilitation events such as structural lining of pipes are extremely cost effective and provide an additional 75 plus years of life.	3rd Qtr
Replacement	Pipe replacements	4th Qtr

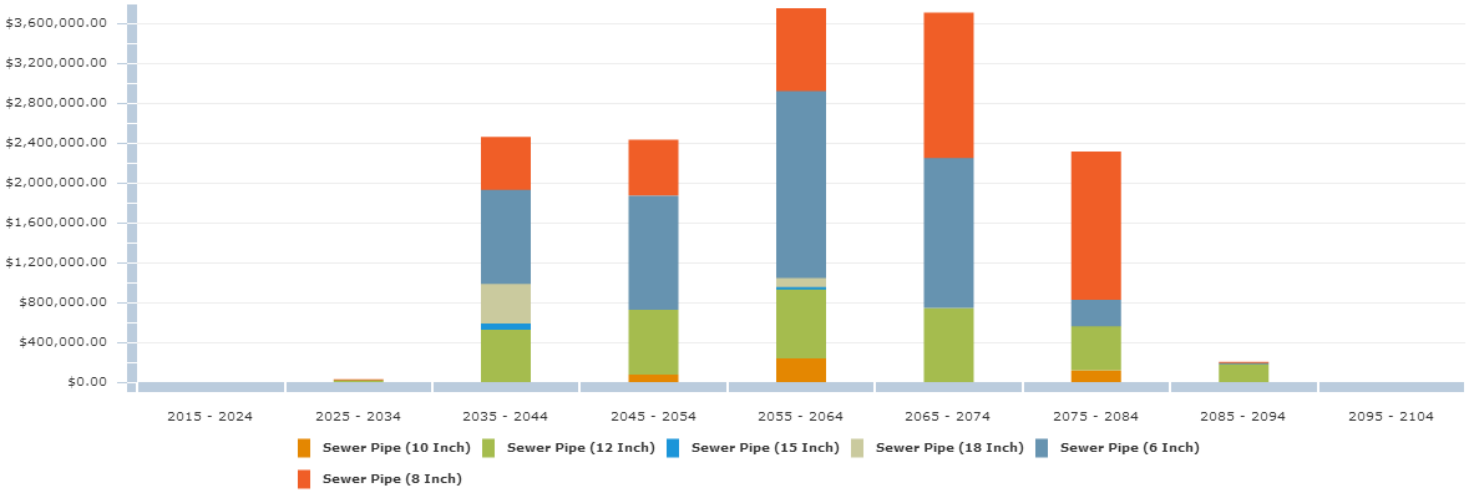
3.5.5 When does the city need to take action?

For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial requirements.

Asset Useful Life in Years		
Asset Type	Asset Component	Useful Life
Wastewater Collection System	Sewer Pipe (6 Inch)	80, 90
	Sewer Pipe (8 Inch)	80, 90
	Sewer Pipe (10 Inch)	80, 90
	Sewer Pipe (12 Inch)	80, 90
	Sewer Pipe (15 Inch)	80, 90
	Sewer Pipe (18 Inch)	80, 90

As field condition information becomes available in time, the data should be loaded into the CityWide system in order to increasingly have a more accurate picture of current asset performance age and, therefore, future replacement requirements. The following graph shows the current projection of the replacement of wastewater collection mains based on the age of the asset only.

Wastewater Collection System Replacement Profile



3.5.6 How much money does the city need?

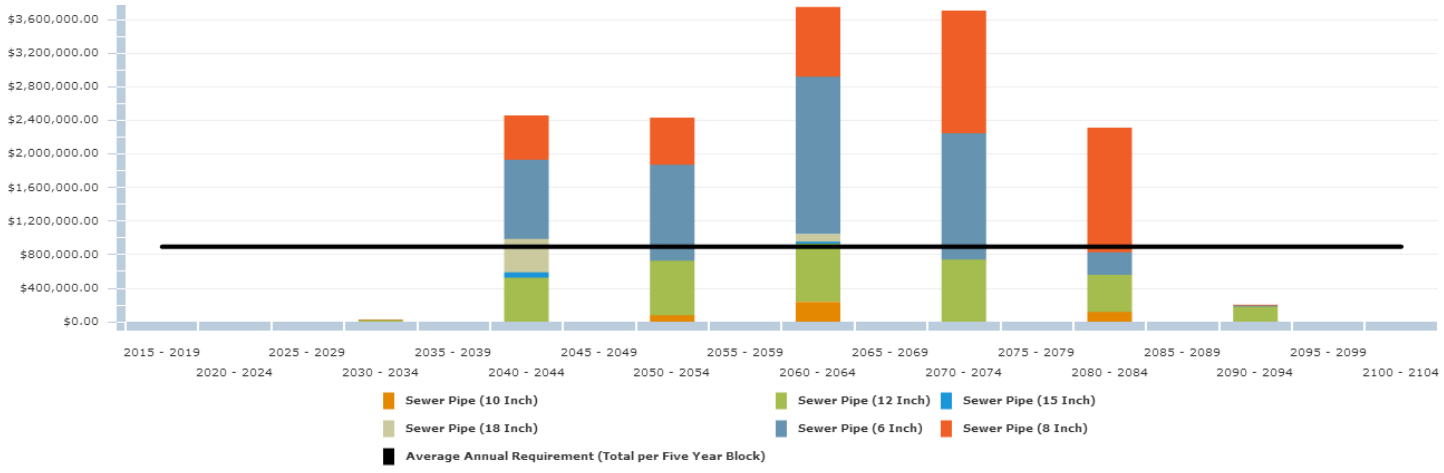
The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for individual sewer line replacement was defined by the replacement year as described in the "When does the city need to take action?" section above.
3. All values are presented in 2015 dollars.
4. The analysis was run for a 90 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.5.7 How does the city reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Kennedale's wastewater collection system is approximately **$179,000**. Based on Kennedale's current annual funding of **$80,000**, there is an annual **deficit of $99,000**. Given this deficit, the city received a Funding vs. Need rating of 'F' based on weighted star rating of 1 stars. The following graph presents five year blocks of expenditure requirements against the sustainable funding threshold line.

Sustainable Revenue Requirements per Five Year Block



In conclusion, the wastewater collection system infrastructure assets are in fair condition based on age data analysis only. As such, there are not any immediate needs over the next 5 years. However, based on age data alone many pipes are getting close to the end of their design lives. A condition assessment program should be established to aid in prioritizing overall needs for rehabilitation and replacement and to assist with optimizing the long and short term budgets. Further detail is outlined within the "asset management strategy" section of this AMP.

3.5.8 Recommendations

The city received an overall rating of 'D' for its wastewater collection system, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- A condition assessment program should be established for the wastewater collection system to gain a better understanding of current condition and performance as outlined further within the "Asset Management Strategy" section of this AMP.
- Once the above study is complete or underway, the condition data should be loaded into the CityWide software and an updated "current state of the infrastructure" analysis should be generated.
- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.

3.6 Stormwater Drainage System

C

INFRASTRUCTURE REPORT CARD GRADE

3.6 Stormwater Drainage System

3.6.1 What does the city own?

The inventory components of the stormwater drainage system are outlined in the table below. The entire system consists of approximately 3.7 miles of stormwater main.

Stormwater Drainage System Inventory

Asset Type	Asset Component	Quantity
Stormwater Drainage System	Stormwater Pipe (12-15 inch)	555 ft
	Stormwater Pipe (16-21 inch)	2,720 ft
	Stormwater Pipe (24 inch)	8,289 ft
	Stormwater Pipe (27 inch)	1,921 ft
	Stormwater Pipe (30 inch)	1,441 ft
	Stormwater Pipe (32-36 inch)	2,775 ft
	Stormwater Pipe (39-42 inch)	915 ft
	Stormwater Pipe (48-51 inch)	1,186 ft
	Stormwater Pipe (54 inch)	70 ft
	Culverts	22
	Ditch	36 miles
	Flume	200 ft
	Inlet	201

The stormwater drainage system data was extracted from the Tangible Capital Asset module of the CityWide software suite.

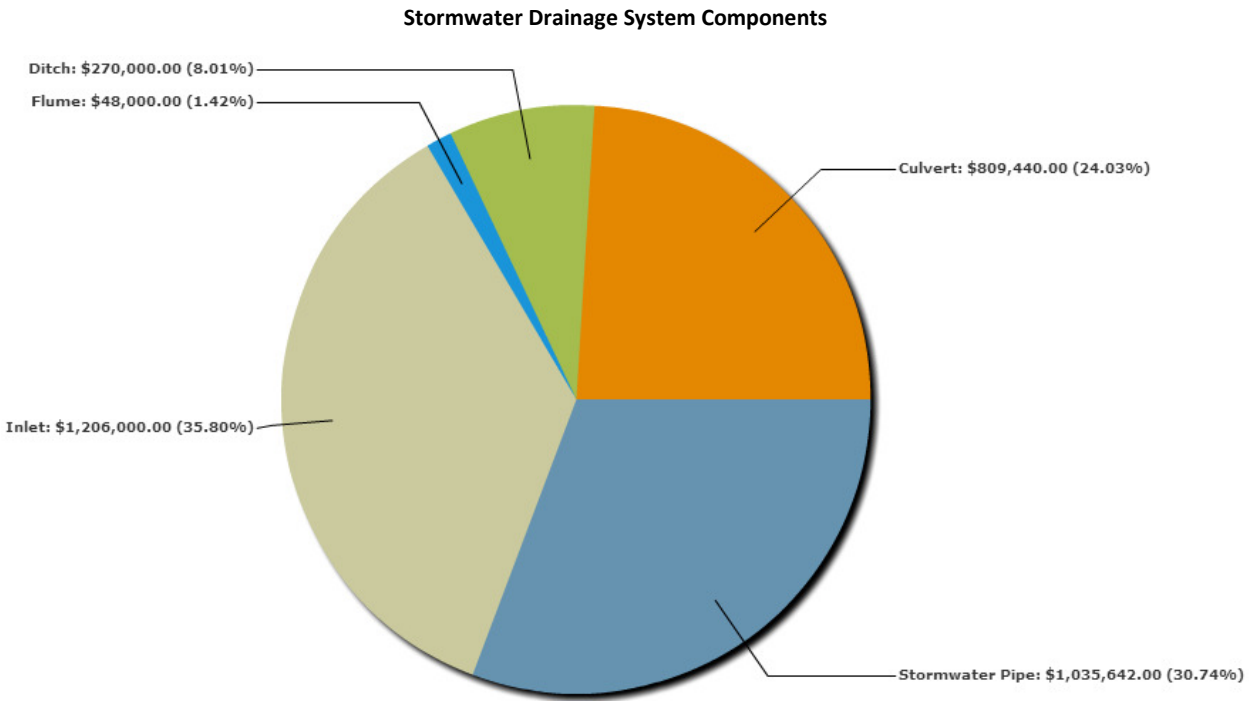
3.6.2 What is it worth?

The estimated replacement value of the stormwater drainage system, in 2014 dollars, is approximately $3.3 million. The cost per household for the stormwater drainage system is $1,416 based on 2,380 households.

Stormwater Drainage System Replacement Value

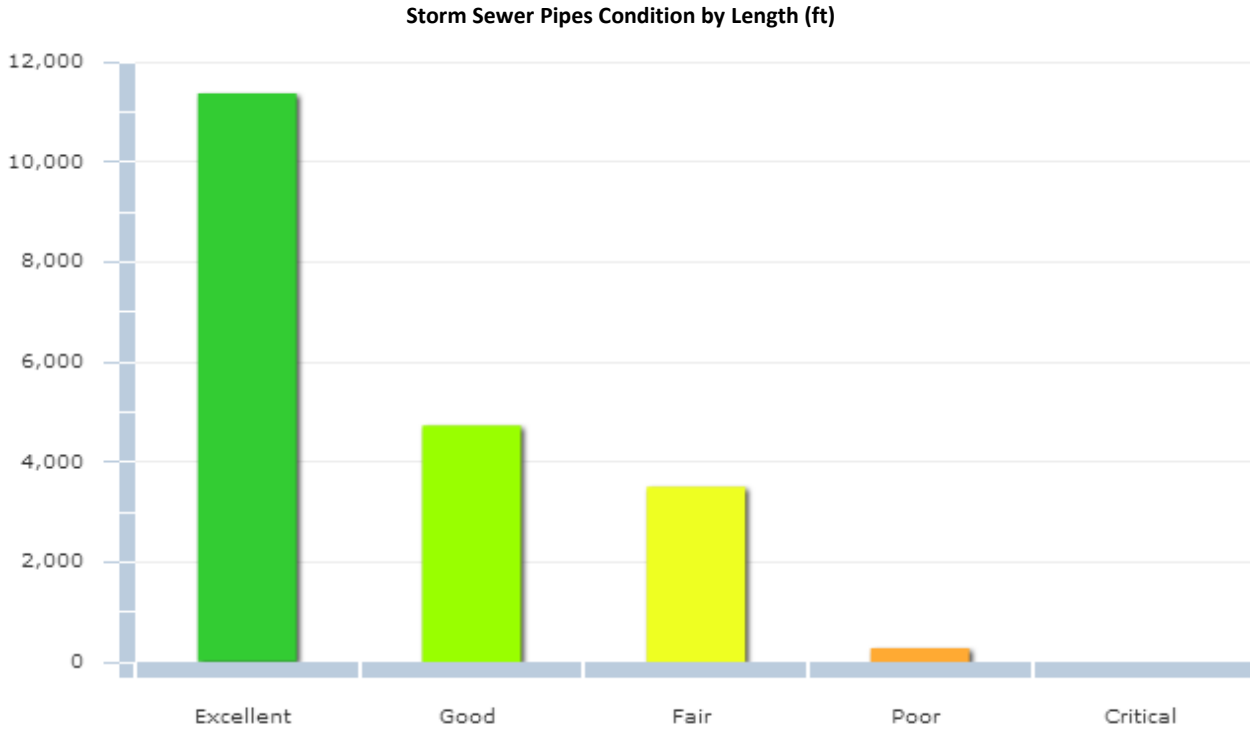
Asset type	Asset component	Quantity/units	2015 Unit Replacement Cost	2015 Overall Replacement Cost
Stormwater Drainage System	Stormwater Pipe (12-15 inch)	555 ft	User-Defined	$15,175
	Stormwater Pipe (16-21 inch)	2,720 ft	User-Defined	$97,800
	Stormwater Pipe (24 inch)	8,289 ft	User-Defined	$356,427
	Stormwater Pipe (27 inch)	1,921 ft	User-Defined	$90,287
	Stormwater Pipe (30 inch)	1,441 ft	User-Defined	$73,443
	Stormwater Pipe (32-36 inch)	2,775 ft	User-Defined	$185,225
	Stormwater Pipe (39-42 inch)	915 ft	User-Defined	$77,025
	Stormwater Pipe (48-51 inch)	1,186 ft	User-Defined	$130,460
	Stormwater Pipe (54 inch)	70 ft	User-Defined	$9,800
	Culverts	22	User-Defined	$809,400
	Ditch	36 miles	User-Defined	$270,000
	Flume	200 ft	User-Defined	$48,000
	Inlet	201	User-Defined	$1,206,000
				$3,369,082

The pie chart below provides a breakdown of each component of the stormwater drainage system.



3.6.3 What condition is it in?

Based on assessed condition ratings, eighty-seven percent of the city's stormwater pipes and one hundred percent of culverts are in good to excellent condition. As such, the city received a Condition vs. Performance rating of 'B'.



3.6.4 What does the city need to do to it?

There are generally four distinct phases in an assets life cycle. These are presented at a high level for the stormwater drainage system below. Further detail is provided in the "Asset Management Strategy" section of this AMP.

Addressing Asset Needs

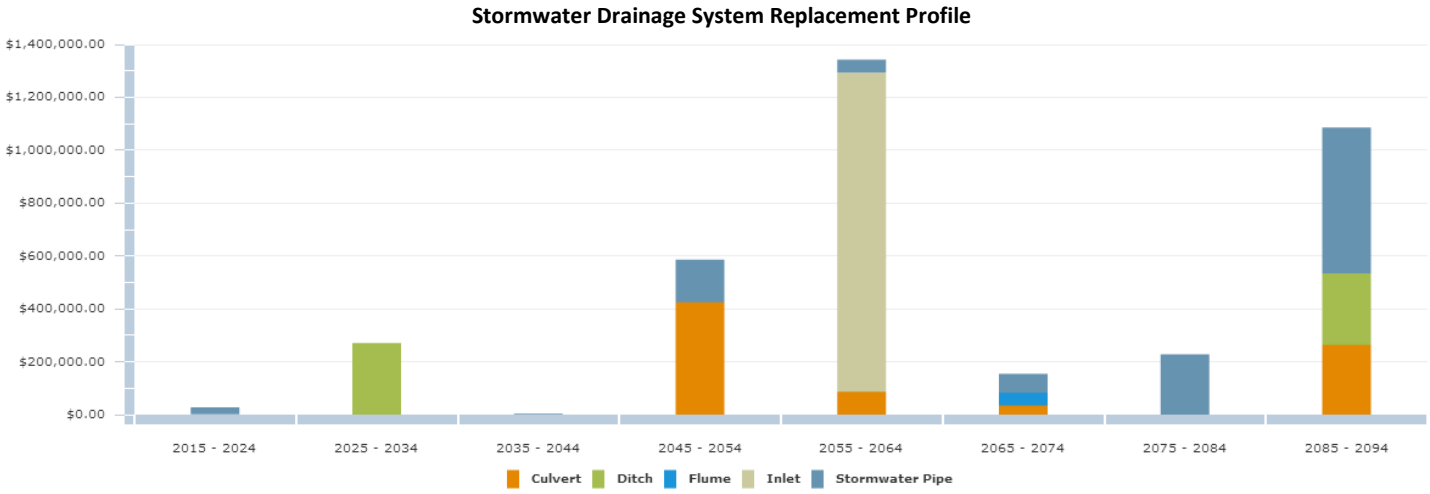
Phase	Lifecycle Activity	Asset Age
Minor Maintenance	Activities such as inspections, monitoring, cleaning and flushing, zoom camera and CCTV inspections, etc.	1st Qtr
Major Maintenance	Activities such as repairing manholes and replacing individual small sections of pipe.	2nd Qtr
Rehabilitation	Rehabilitation events such as structural lining of pipes are extremely cost effective and provide an additional 75 plus years of life.	3rd Qtr
Replacement	Pipe replacements	4th Qtr

3.6.5 When does the city need to take action?

For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial requirements.

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life
Stormwater Drainage System	Stormwater Pipe (12-15 inch)	80
	Stormwater Pipe (16-21 inch)	30, 80
	Stormwater Pipe (24 inch)	30, 80
	Stormwater Pipe (27 inch)	80
	Stormwater Pipe (30 inch)	80
	Stormwater Pipe (32-36 inch)	30, 80
	Stormwater Pipe (39-42 inch)	80
	Stormwater Pipe (48-51 inch)	80
	Stormwater Pipe (54 inch)	80
	Culverts	80
	Ditch	60
	Flume	80
	Inlet	60



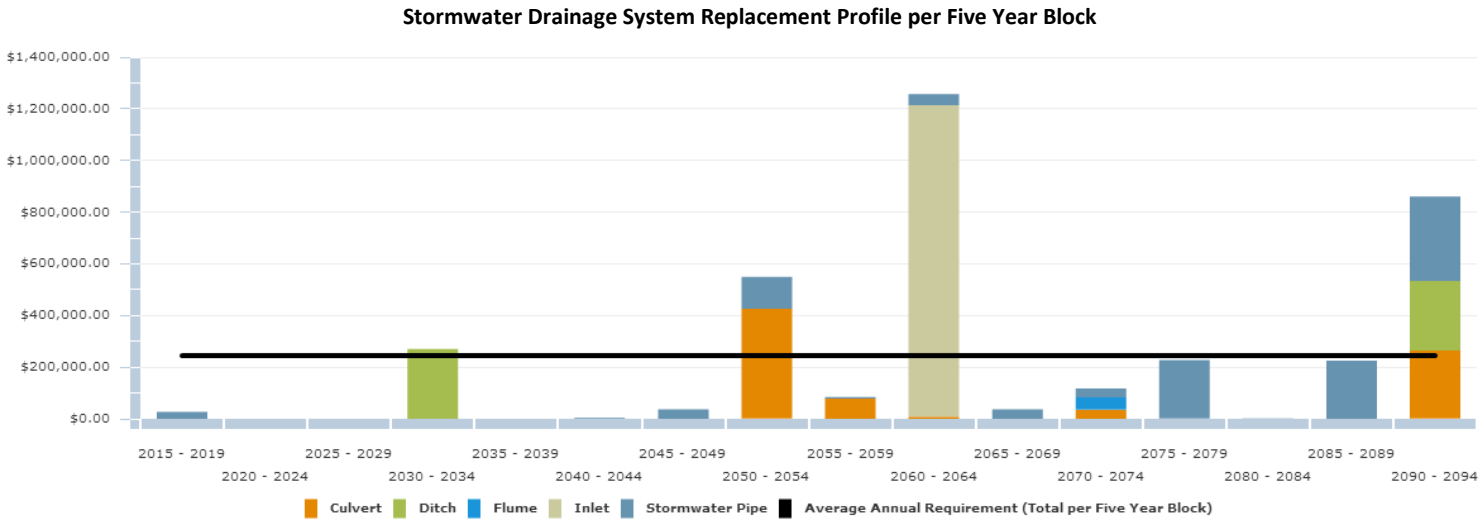
3.6.6 How much money does the city need?

The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for each stormwater pipe replacement was defined by the replacement year as described in the "When does the city need to take action?" section above.
3. All values are presented in 2015 dollars.
4. The analysis was run for an 80 year period to ensure all assets went through one iteration of replacement, therefore providing a sustainable projection.

3.6.7 How does the city reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Kennedale's stormwater drainage system is approximately **$349,000**. Based on Kennedale's current annual funding of **$265,000**, there is an annual **defecit of $84,000**. As such, the city received a Funding vs. Need rating of 'C' based on a weighted star rating of 5 stars.



In conclusion, Kennedale's storm pipes are largely in excellent condition. There are needs to be addressed within the next 5 years totaling approximately $27,000. Further management strategies and detail is outlined within the "asset management strategy" section of this AMP.

The stormwater drainage fee was adopted in 2010 by the city council to maintain the MS4 permit reporting requirement with the Texas Council on Environmental Quality (TCEQ) and the Environmental Protection Agency (EPA), maintaining stormwater assets, and to resolve localized flooding or drainage problems. The initial study identified 56 localized flooding or drainage projects totaling $11.8M or approximately $300,000 annually.

3.6.8 Recommendations

The city received an overall rating of 'C' for its stormwater drainage system, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- The condition assessment data, along with risk management strategies, should be reviewed together to aid in prioritizing overall needs for rehabilitation and replacement.
- Once the above study is complete or underway, the condition data should be loaded into the CityWide software and an updated "current state of the infrastructure" analysis should be generated.
- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.
- The City has contracted with the U.S. Army Corps of Engineers to conduct a section 205 Flood Control Study of Village Creek. Implementation of any recommendations will require substantial local funds beginning in 2018.

3.7 Buildings

D

INFRASTRUCTURE REPORT CARD GRADE

3.7 Buildings

3.7.1 What does the city own?

The table below outlines the city's buildings inventory:

Buildings Inventory

Asset Type	Asset Component	Quantity
Buildings	City Hall	1
	Chamber of Commerce	1
	Fire	4
	Library	1
	Parks	1
	Police	1
	Senior Citizen	1

The buildings data was extracted from the Tangible Capital Asset module of the CityWide software suite.

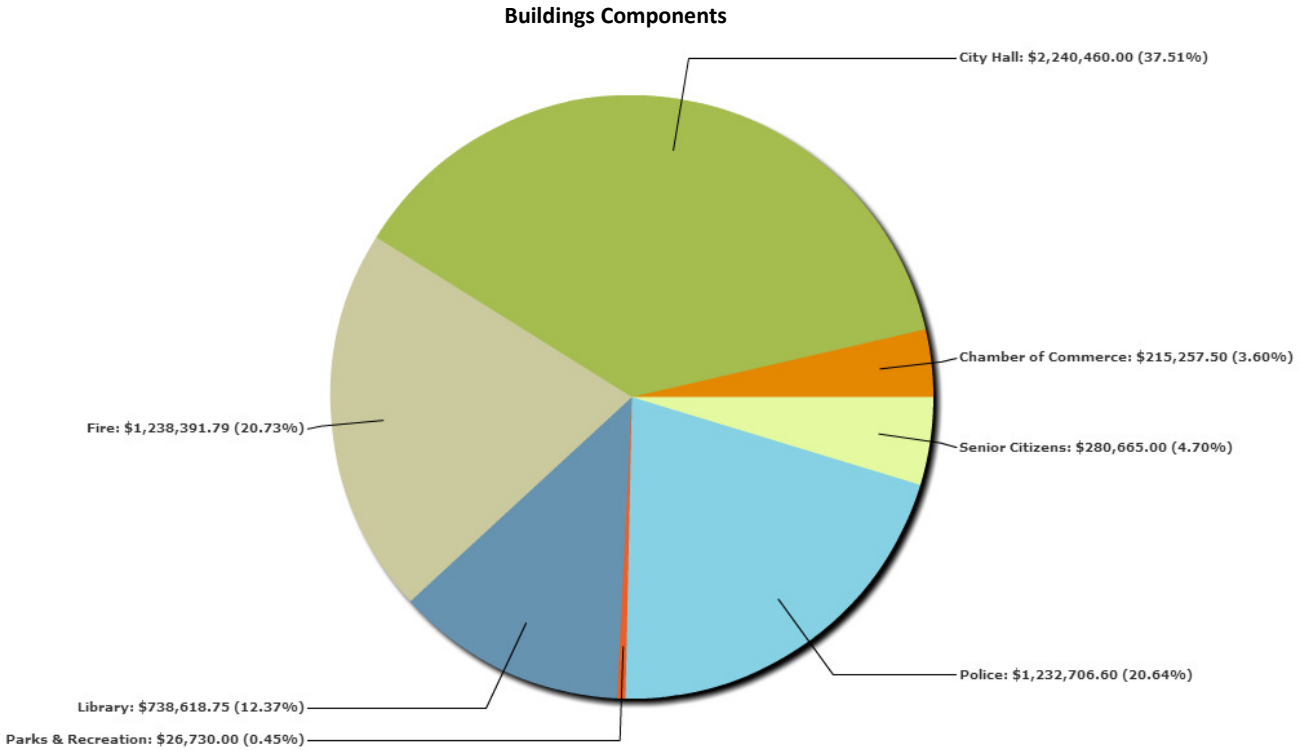
3.7.2 What is it worth?

The estimated replacement value of the city's buildings, in 2015 dollars, is approximately $11.3 million. The cost per household for buildings is $4,760 based on 2,380 households.

Buildings Replacement Value

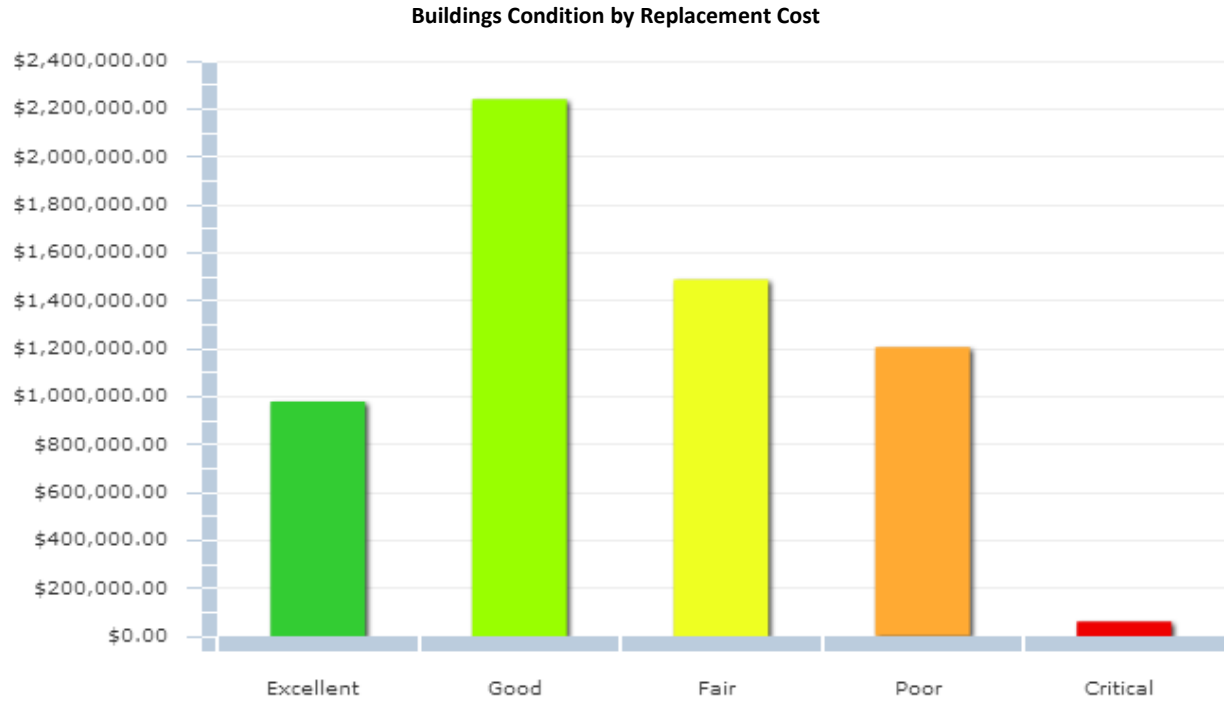
Asset Type	Asset Component	Quantity/Units	2015 Unit Replacement Cost	2015 Overall Replacement Cost
Buildings	City Hall	1	User-Defined	$2,240,460
	Chamber of Commerce	1	User-Defined	$215,258
	Fire	4	User-Defined	$1,238,392
	Library	1	User-Defined	$738,619
	Parks	1	User-Defined	$26,730
	Police	1	User-Defined	$1,232,707
	Senior Citizen	1	User-Defined	$280,665
				$5,972,830

The pie chart below provides a breakdown of each of the buildings components to the overall structures value.



3.7.3 What condition is it in?

Based on age data only, approximately seventy-nine percent of the city's buildings are in fair to excellent condition, while over twenty-one percent are in poor to critical condition. As such, the city received a Condition vs. Performance rating of 'C'.



3.7.4 What does the city need to do to it?

There are generally four distinct phases in an asset's life cycle. These are presented at a high level for the buildings below. Further detail is provided in the "Asset Management Strategy."

Addressing Asset Needs

Phase	Lifecycle Activity	Asset Age
Minor Maintenance	Planned activities such as inspections, monitoring, etc.	1st Qtr
Major Maintenance	Maintenance and repair activities, generally unplanned, however, anticipated activities that are included in the annual operating budget.	2nd Qtr
Rehabilitation	Major activities such as the upgrade or replacement of smaller individual facility components (e.g. windows)	3rd Qtr
Replacement	Complete replacement of asset components or a facility itself.	4th Qtr

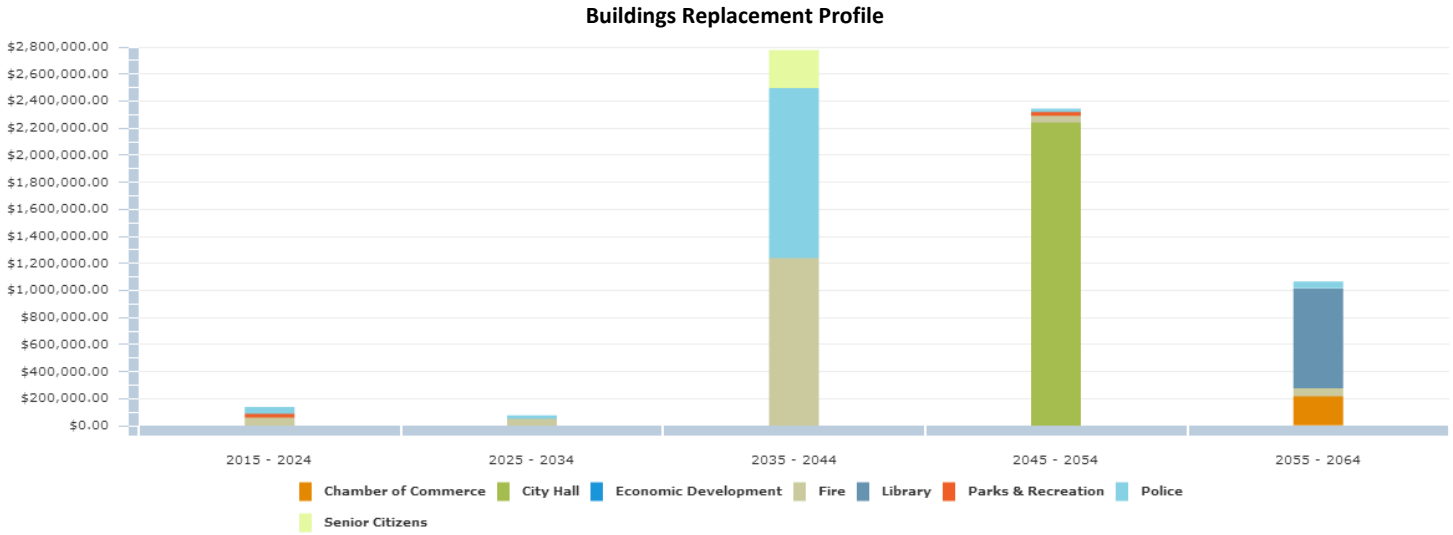
3.7.5 When does the city need to take action?

For the purpose of this report, 'useful life' data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial requirements.

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life in Years
Buildings	City Hall	50
	Chamber of Commerce	50
	Fire	7, 20, 50
	Library	50
	Parks & Recreation	25
	Police	7, 50
	Senior Citizen	50

The following graph shows the current projection of structure replacements based on the age of the asset only.



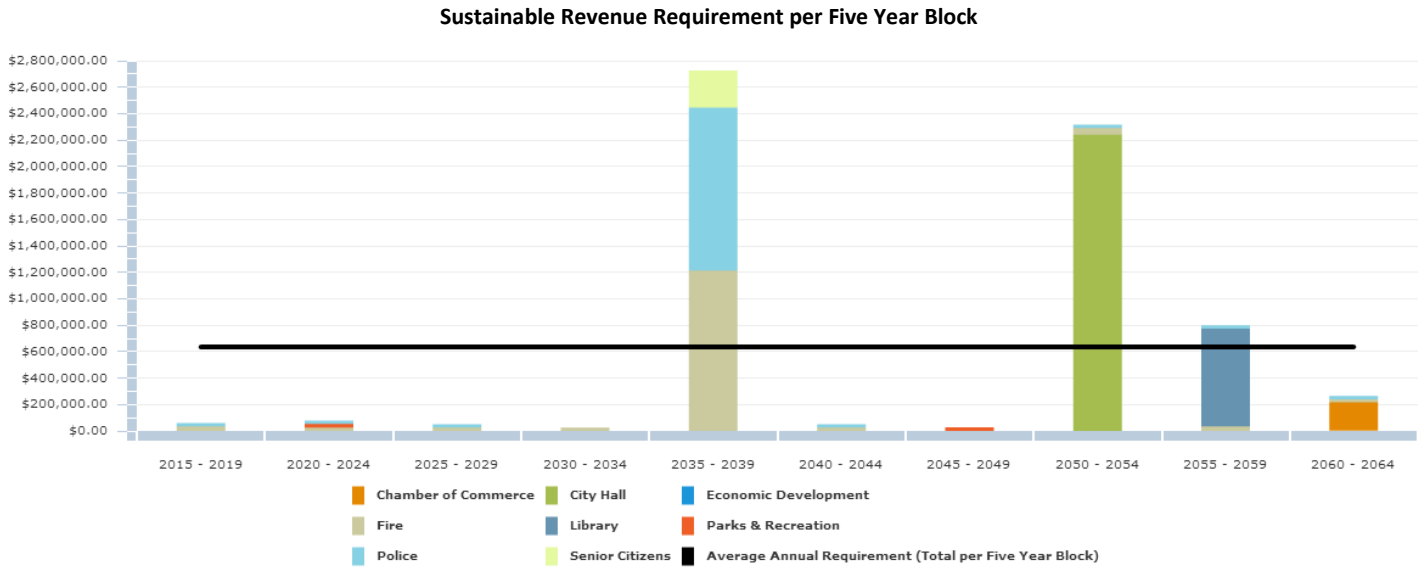
3.7.6 How much money does the city need?

The analysis completed to determine capital revenue requirements was based on the following constraints and assumptions:

1. Replacement costs are based upon the "What is it worth" section above.
2. The timing for each structure replacement was defined by the replacement year as described in the "When does the city need to take action?" section above.
3. All values are presented in 2015 dollars.
4. The analysis was run for a 50 year period to ensure all assets cycled through at least one iteration of replacement, therefore providing a sustainable projection.

3.7.7 How does the city reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Kennedale's buildings is **$127,000**. Based on Kennedale's current annual funding of **$55,000**, there is an annual **deficit of $72,000**. As such, the city received a Funding vs. Need rating of 'F'. The following graph presents five year blocks of expenditure requirements against the sustainable funding threshold line.



In conclusion, the city's buildings, based on age data only, are generally in fair condition, however, the economic development buildings are in poor condition. There are needs to be addressed within the next 5 years totaling approximately only $61 thousand. A condition assessment program should be established to aid in prioritizing overall needs for rehabilitation and replacement and to assist with optimizing the long and short term budgets. Further detail is outlined within the "asset management strategy" section of this AMP.

3.7.8 Recommendations

The city received an overall rating of 'D' for its buildings, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- A detailed study to define the current condition of the buildings and their components (structural, architectural, electrical, mechanical, site, etc.) should be undertaken, as described further within the "Asset Management Strategy."
- Once the above study is complete, a new performance age should be applied to each asset and an updated "current state of the infrastructure" analysis should be generated.
- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.

3.8 Parks

D

INFRASTRUCTURE REPORT CARD GRADE

3.8 Parks

3.8.1 What does the city own?

Kennedale is responsible for the following parks inventory:

Parks Inventory		
Asset Type	Asset Component	Quantity/Units
Parks	Benches	33
	Equipment	99
	Fencing	2
	Lighting	29
	Parks & Playgrounds	4
	Signage	10
	Trails	4

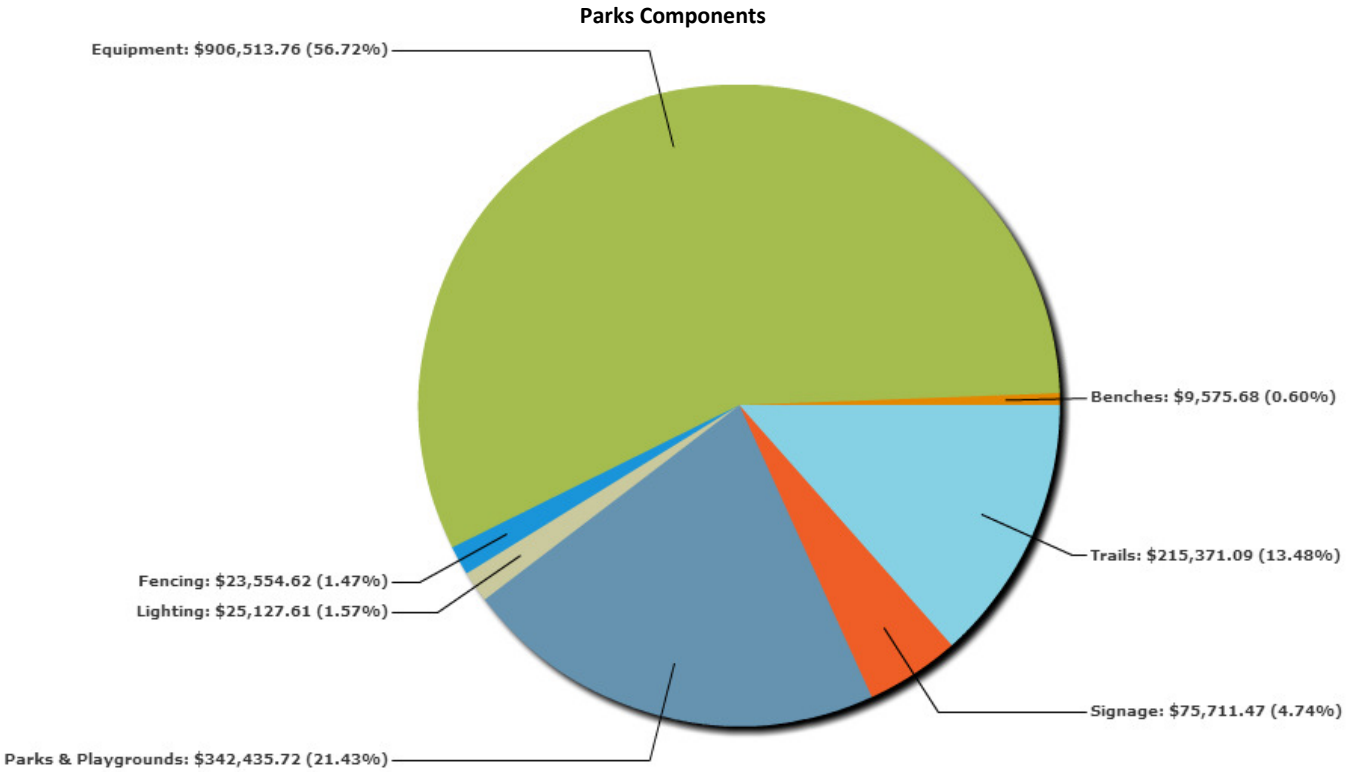
The parks data was extracted from the Tangible Capital Asset module of the CityWide software suite

3.8.2 What is it worth?

The estimated replacement value of all parks, in 2015 dollars, is $18 thousand. The cost per household for the Parks is $672 based on 2,380 households.

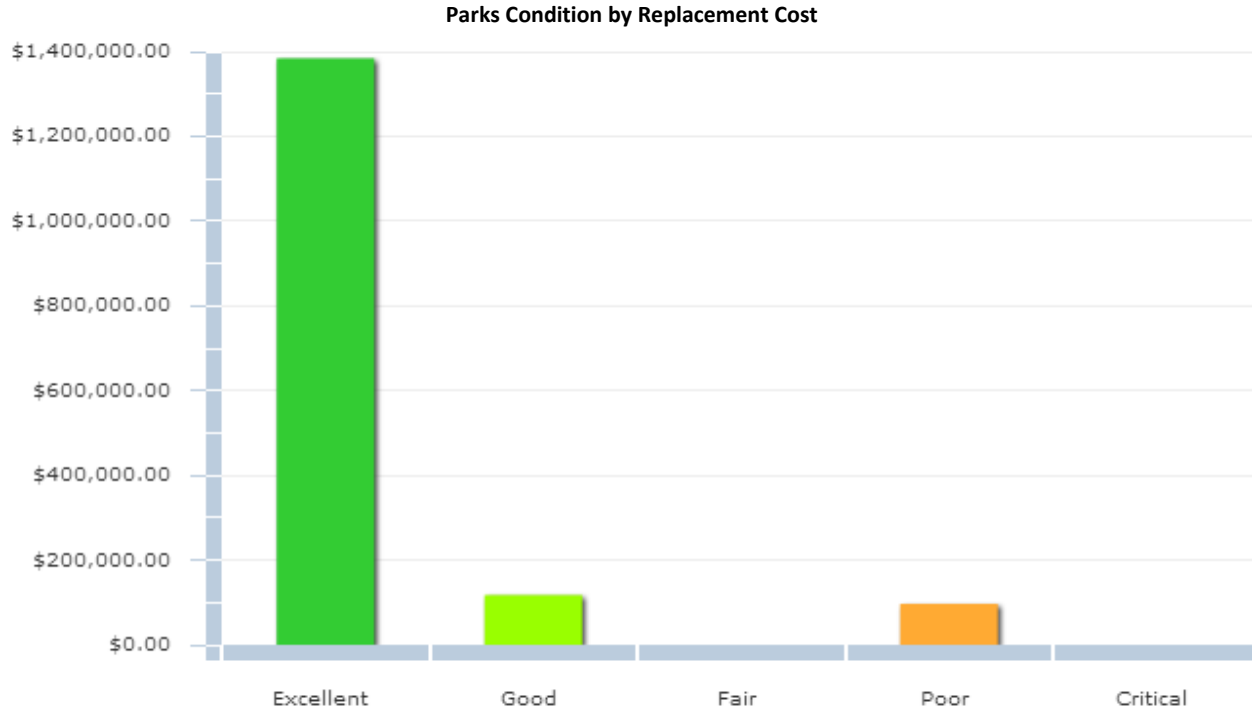
Parks Replacement Value				
Asset Type	Asset Component	Quantity/Units	2014 Unit Replacement Cost	2014 Overall Replacement Cost
Parks	Benches	33	CPI	$9,576
	Equipment	99	CPI	$906,513
	Fencing	2	CPI	$23,555
	Lighting	29	CPI	$25,128
	Parks & Playgrounds	4	CPI	$342,436
	Signage	10	CPI	$75,711
	Trails	4	CPI	$215,371
				$1,598,290

The pie chart below provides a breakdown of each component of parks.



3.8.3 What condition is it in?

Based on assessed condition data, ninety-four percent of the city's parks are in fair to excellent condition. As such, the city received a Condition vs. Performance rating of 'B+'.



3.8.4 What does the city need to do to it?

There are generally four distinct phases in an asset's life cycle. These are presented at a high level for the parks below. Further detail is provided in the "Asset Management Strategy" section of this AMP.

Addressing Asset Needs

Phase	Lifecycle Activity	Asset Age
Minor Maintenance	Planned activities such as inspections, monitoring, etc	1st Qtr
Major Maintenance	Maintenance and repair activities, generally unplanned, however, anticipated activities that are included in the annual operating budget.	2nd Qtr
Rehabilitation	Upgrades or rehabilitation of components to ensure continuation of service	3rd Qtr
Replacement	Full asset or component renewal or replacement	4th Qtr

3.8.5 When does the city need to take action?

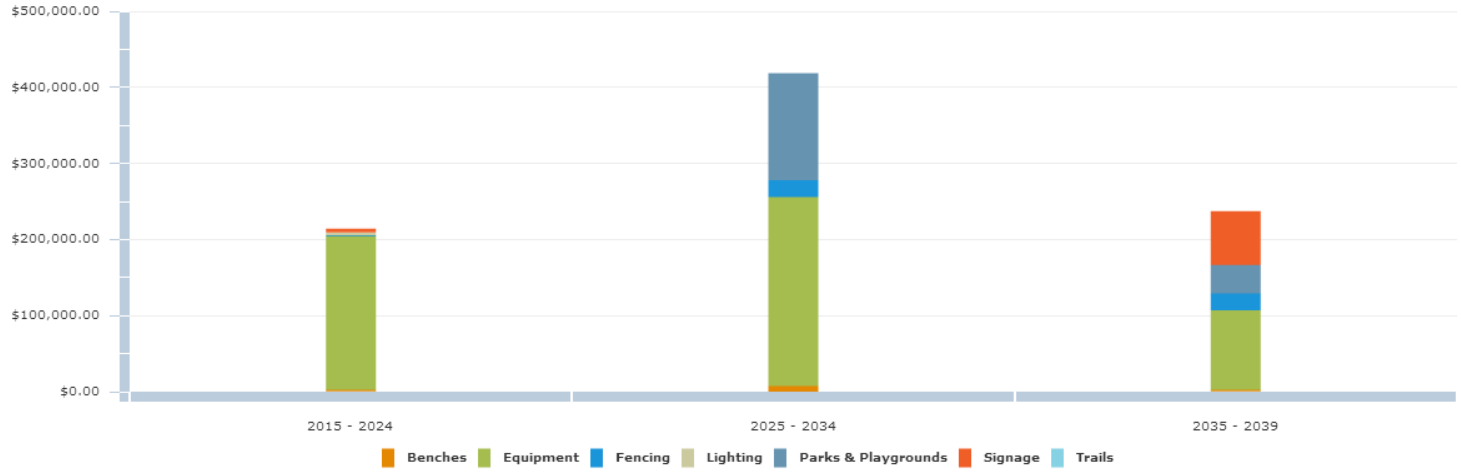
For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial requirements.

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life in Years
Parks	Benches	15
	Equipment	10, 15, 20, 25
	Fencing	10, 25
	Lighting	25
	Parks & Playgrounds	10, 15, 25
	Signage	20
	Trails	25

As field condition information becomes available in time, the data should be loaded into the CityWide system in order to increasingly have a more accurate picture of current asset age and condition, therefore, future replacement requirements. The following graph shows the current projection of water main replacements based on the age of the assets only.

Parks Replacement Profile



3.8.6 How much money does the city need?

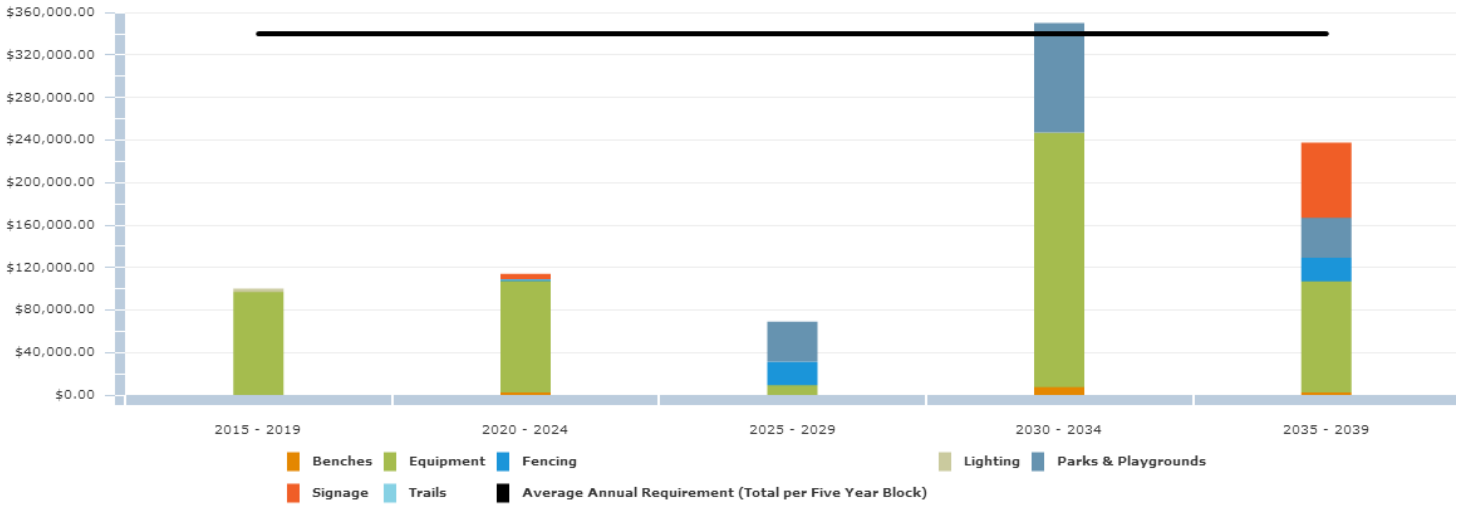
The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for individual water main replacement was defined by the replacement year as described in the "When does the city need to take action?" section above.
3. All values are presented in 2015 dollars.
4. The analysis was run for a 25 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.8.7 How does the city reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Kennedale's parks is approximately **$68,000**. Based on Kennedale's current annual funding of **$0**, there is a **deficit of $68,000**. Given this deficit, the city received a Funding vs. Need rating of 'F'. The following graph presents five year blocks of expenditure requirements against the sustainable funding threshold line.

Sustainable Revenue Requirements per Five Year Block



In conclusion, Kennedale's parks are in good to excellent condition, based on assessed condition data. There are needs to be addressed within the next 5 years totaling approximately $100,000. The condition assessment data, along with risk management strategies, should be reviewed together to aid in prioritizing overall needs for rehabilitation and replacement and assist with optimizing the long and short term budgets. Further detail is outlined within the "asset management strategy" section of this AMP.

3.8.8 Recommendations

The city received an overall rating of 'D' for its Parks, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- The condition assessment data, along with risk management strategies, should be reviewed together to aid in prioritizing overall needs for rehabilitation and replacement.
- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.

3.9 Equipment

F

INFRASTRUCTURE REPORT CARD GRADE

3.9 Equipment

3.9.1 What does the city own?

The inventory components of the equipment class are outlined in the table below.

Equipment Inventory		
Asset Type	Asset Component	Quantity/Units
Equipment	Fire	3
	Police	1
	Streets	15
	Information Technology	274

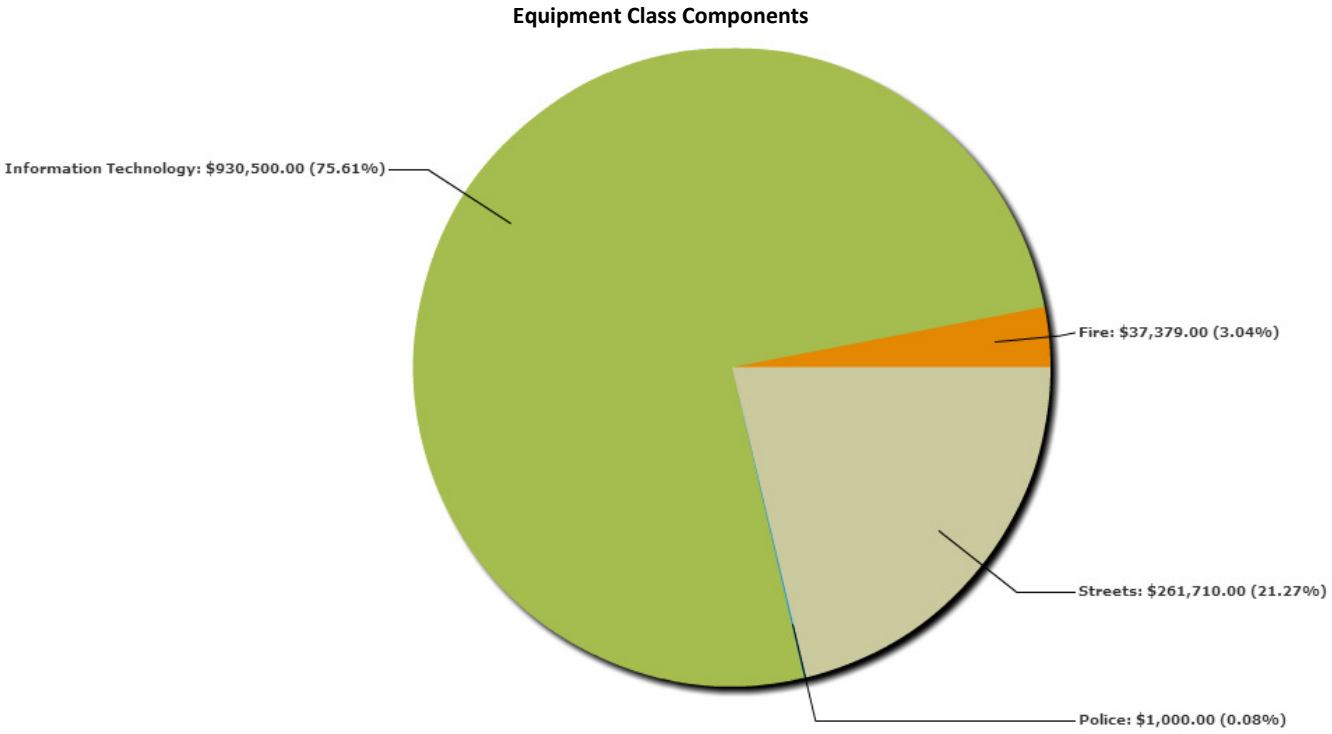
The equipment class data was extracted from the Tangible Capital Asset module of the CityWide software application.

3.9.2 What is it worth?

The estimated replacement value of the equipment class, in 2015 dollars, is $488,000. The cost per household for the equipment network is $596 based on 2,380 households.

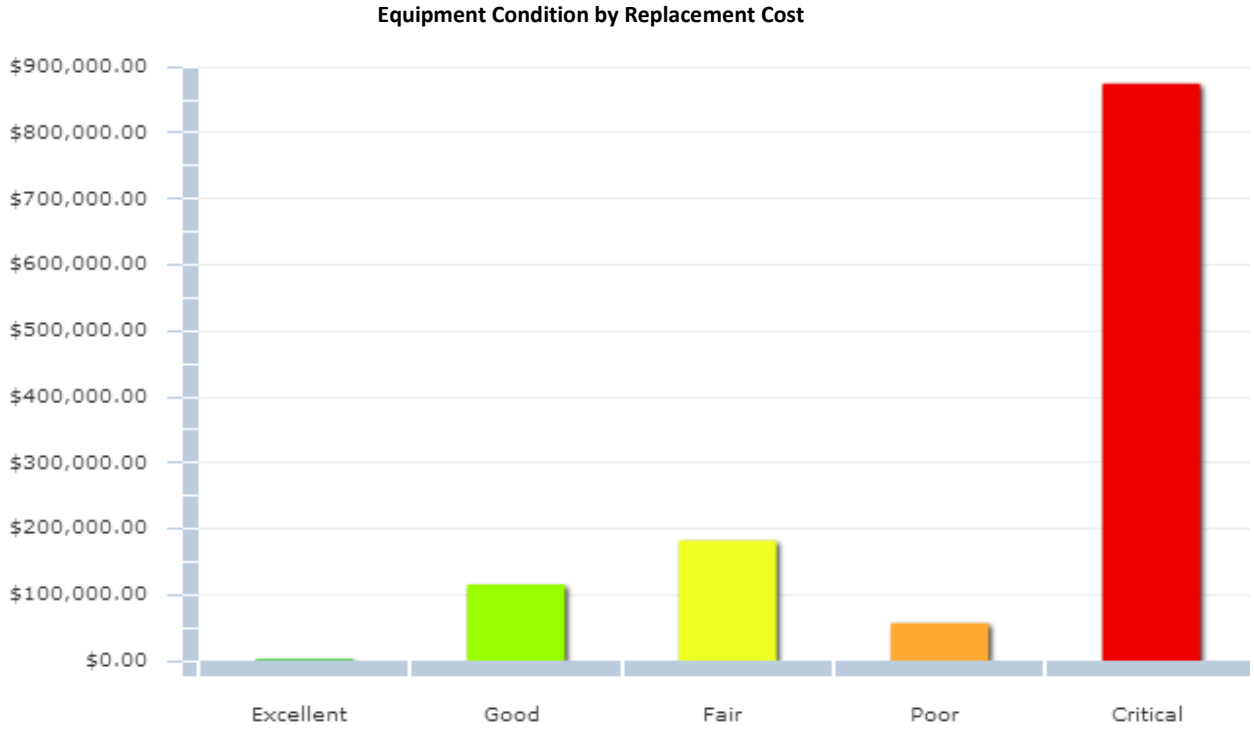
Equipment Replacement Value				
Asset Type	Asset Component	Quantity/ Units	2015 Unit Replacement Cost	2015 Overall Replacement Cost
Equipment	Fire	3	User-Defined	$37,379
	Police	1	User-Defined	$1,000
	Streets	15	User-Defined	$261,710
	Information Technology	274	User-Defined	$930,500
				$1,230,589

The pie chart below provides a breakdown of each of the network components to the overall system value.



3.9.3 What condition is it in?

Approximately seventy-six percent of the city's equipment is in poor to critical condition based on replacement cost. As such, the city received a Condition vs. Performance rating of 'F'.



3.9.4 What does the city need to do to it?

There are generally four distinct phases in an assets life cycle. These are presented at a high level for the equipment class below. Further detail is provided in the "Asset Management Strategy" section of this AMP.

Addressing Asset Needs

Phase	Lifecycle Activity	Asset Age
Minor Maintenance	Planned activities such as inspections, monitoring, etc	1st Qtr
Major Maintenance	Maintenance and repair activities, generally unplanned, however, anticipated activities that are included in the annual operating budget.	2nd Qtr
Rehabilitation	Upgrades or rehabilitation of components to ensure continuation of service	3rd Qtr
Replacement	Full asset or component renewal or replacement	4th Qtr

3.9.5 When does the city need to take action?

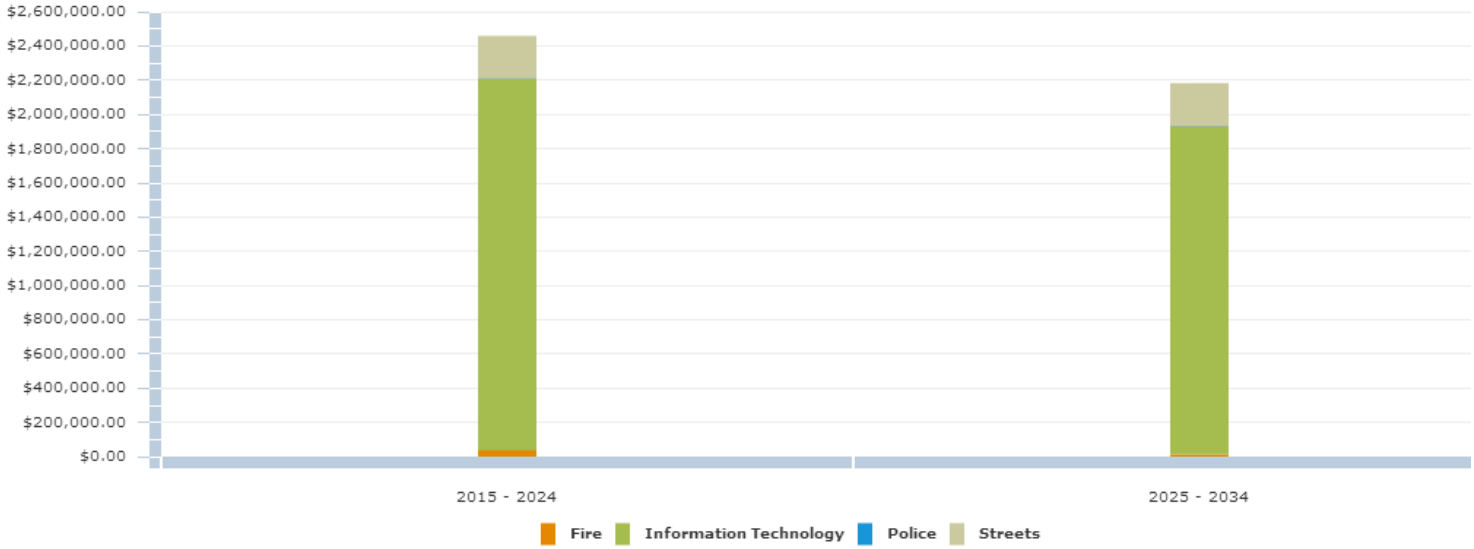
For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial requirements.

Asset Useful Life in years

Asset Type	Asset Component	Useful Life in Years
Equipment	Fire	6, 20
	Police	5
	Streets	6 - 20
	Information Technology	3 - 15

As field condition information becomes available in time, the data should be loaded into the CityWide system in order to increasingly have a more accurate picture of current asset performance age and, therefore, future replacement requirements. The following graph shows the current projection of Equipment main replacements based on the age of the asset only.

Equipment Replacement Profile



3.9.6 How much money does the city need?

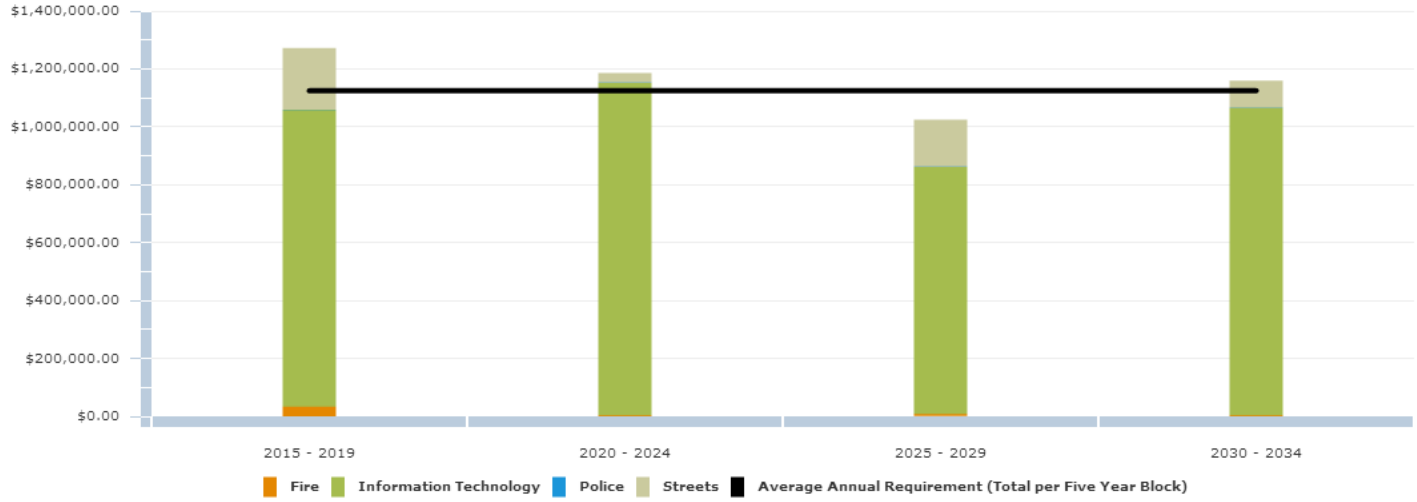
The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for individual equipment replacement was defined by the replacement year as described in the "When does the city need to take action?" section above.
3. All values are presented in 2015 dollars.
4. The analysis was run for a 20 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.9.7 How does the city reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Kennedale's equipment class is approximately **$225,000**. Based on Kennedale's current annual funding of **$88,000**, there is an annual **deficit of $137,000**. Given this deficit, the city received a Funding vs. Need rating of 'F'. The following graph presents five year blocks of expenditure requirements against the sustainable funding threshold line.

Sustainable Revenue Requirements per Five Year Block



In conclusion, approximately seventy-six percent of the equipment class, from an age based analysis only, is in poor to critical condition. There are replacement needs to be addressed within the next 5 years totaling approximately $1.3 million. A condition assessment program, along with risk management analysis, should be established for these assets to aid in prioritizing overall needs for rehabilitation and replacement and to assist with optimizing the long and short term budgets.

3.9.8 Recommendations

The city received an overall rating of 'F' for its Equipment class, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- A condition assessment program should be established for the Equipment class of assets to gain a better understanding of current condition and performance. This will assist with optimizing expenditures within the long and short term capital budgets.
- Once the above study is complete or underway, the condition data should be loaded into the CityWide software and an updated "current state of the infrastructure" analysis should be generated.
- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.

3.10 Vehicles

C+

INFRASTRUCTURE REPORT CARD GRADE

3.10 Vehicles

3.10.1 What does the city own?

The inventory components of the vehicles class are outlined in the table below.

Vehicles Inventory		
Asset Type	Asset Component	Quantity/Units
Vehicles	Administration	5
	Fire	8
	Police	17
	Public Works	16

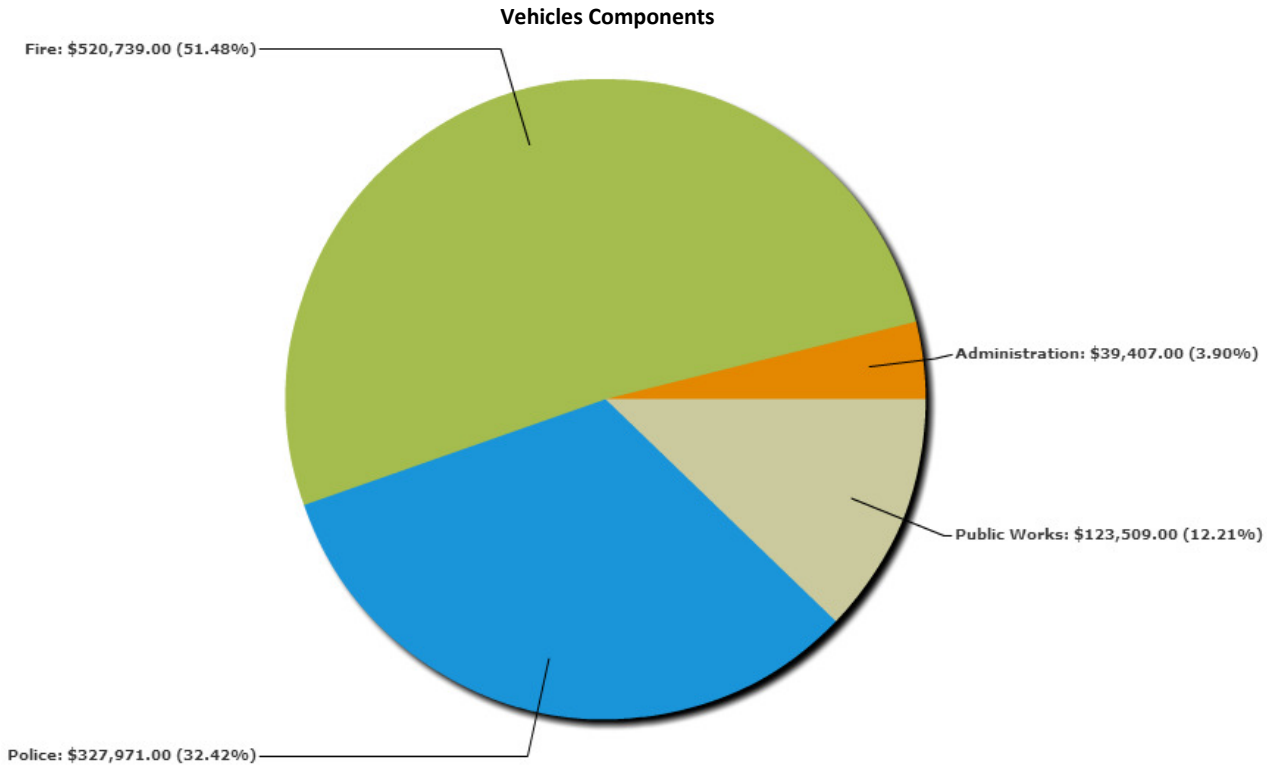
The vehicles class data was extracted from the Tangible Capital Asset module of the CityWide software suite.

3.10.2 What is it worth?

The estimated replacement value of the vehicles class, in 2015 dollars, is $1.1 million. The cost per household for the vehicles class is $481 based on 2,380 households.

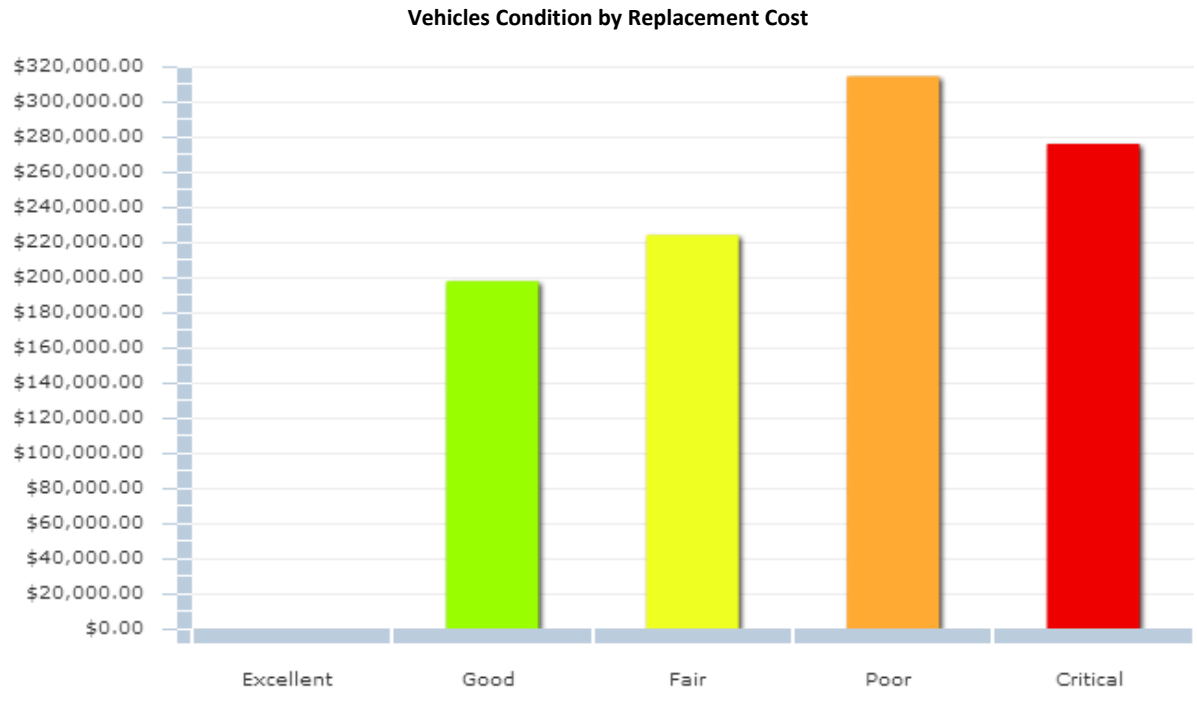
Vehicles Replacement Value				
Asset Type	Asset Component	Quantity/ Units	2015 Unit Replacement Cost	2015 Overall Replacement Cost
Vehicles	Administration	5	User-Defined	$39,407
	Fire	8	User-Defined	$520,739
	Police	17	User-Defined	$327,971
	Public Works	16	User-Defined	$123,509
				$1,011,626

The pie chart below provides a breakdown of each of the network components to the overall system value.



3.10.3 What condition is it in?

Nearly forty-two percent of the city's vehicles are in fair to excellent condition, with the remaining in poor to critical condition. As such, the city received a Condition vs. Performance rating of 'D'.



3.10.4 What does the city need to do to it?

There are generally four distinct phases in an assets life cycle. These are presented at a high level for the vehicles class below. Further detail is provided in the "Asset Management Strategy" section of this AMP.

Addressing Asset Needs

Phase	Lifecycle Activity	Asset Age
Minor Maintenance	Planned activities such as inspections, monitoring, etc	1st Qtr
Major Maintenance	Maintenance and repair activities – optimally anticipated activities that are included in the annual operating budget.	2nd Qtr
Rehabilitation	Upgrades or rehabilitation of components to ensure continuation of service	3rd Qtr
Replacement	Full asset or component renewal or replacement	4th Qtr

3.10.5 When does the city need to take action?

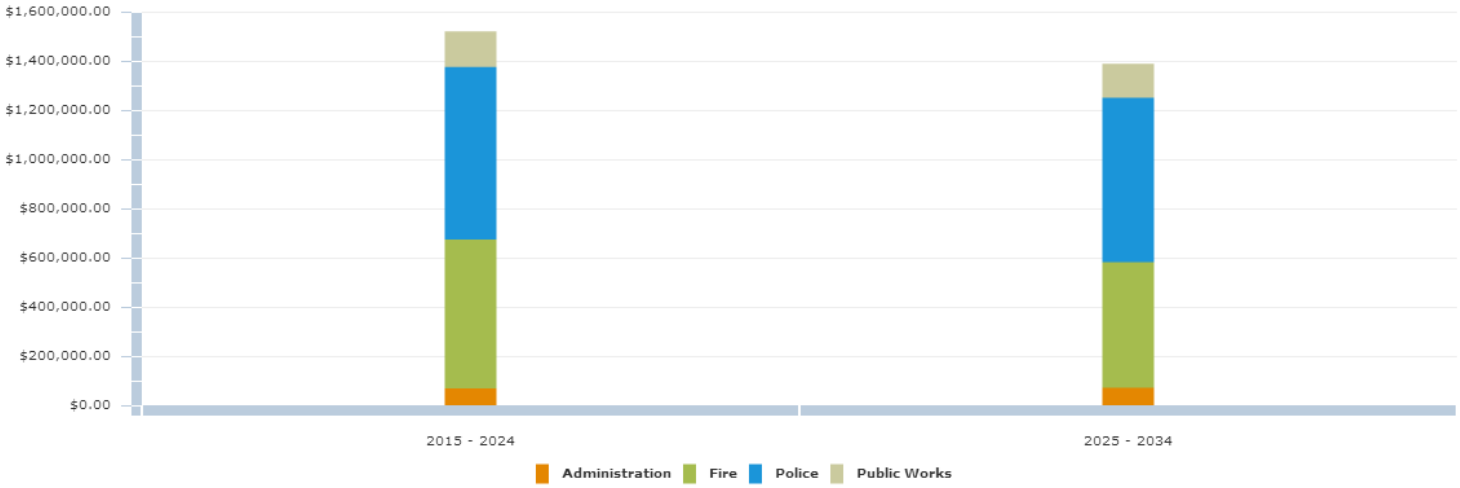
For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial requirements.

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life in Years
Vehicles	Administration	3 - 20
	Fire	5 - 20
	Police	3 - 8
	Public Works	8 - 12

As field condition information becomes available in time, the data should be loaded into the CityWide system in order to increasingly have a more accurate picture of current asset performance age and, therefore, future replacement requirements. The following graph shows the current projection of vehicle replacements based on the age of the asset only.

Vehicles Replacement Profile



3.10.6 How much money does the city need?

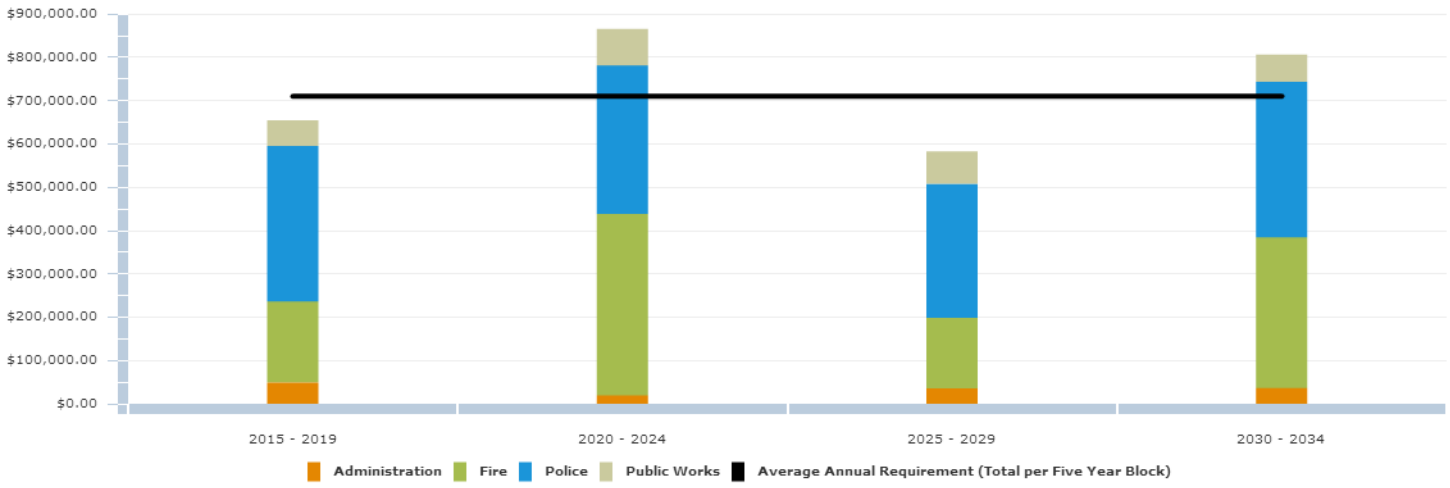
The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for individual vehicle replacement was defined by the replacement year as described in the "When does the city need to take action?" section above.
3. All values are presented in 2015 dollars.
4. The analysis was run for a 20 year period to ensure all assets went through one iteration of replacement, therefore providing a sustainable projection.

3.10.7 How does the city reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Kennedale's vehicles class is approximately **$142,000**. Based on Kennedale's current annual funding of **$179,000**, there is an annual **surplus of $37,000**. As such, the city received a Funding vs. Need rating of 'A'.

Vehicles Replacement Profile per Five Year Block



In conclusion, fifty-eight percent of Kennedale's fleet of vehicles, based on age data only, are in poor or critical condition, with the remaining forty-two percent in fair to excellent condition. There are replacement needs to be addressed within the next 5 years totaling approximately $654,000. If not already in place a preventative maintenance and life cycle assessment program should be established for these assets to aid in prioritizing overall needs for rehabilitation and replacement and to assist with optimizing the long and short term budgets. Further detail is outlined within the "asset management strategy" section of this AMP.

3.10.8 Recommendations

The city received an overall rating of 'C+' for its vehicles class, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

- An appropriate percentage of asset replacement value should be used for operations and maintenance activities on an annual basis. This should be determined through a detailed analysis of O & M activities and be added to future AMP reporting.
- The Infrastructure Report Card should be updated on an annual basis.

4.0 Infrastructure Report Card

CUMULATIVE GPA

C

Infrastructure Report Card

The City of Kennedale

1. Each asset category was rated on two key, equally weighted (50/50) dimensions: **Condition vs. Performance**, and **Funding vs. Need**.
2. See the "***What condition is it in***?" section for each asset category for its star rating on the Condition vs. Performance dimension.
3. See the "***How does the city reach sustainability?***" section for each asset category for its star rating on the Funding vs. Need dimension.
4. The 'Overall Rating' below is the average of the two star ratings converted to a letter grade.

Asset Category	Condition vs. Performance	Funding vs. Need	Overall Grade	Comments
Streets	**B** (4.2 Stars)	**F** (0 Stars)	**D**	Approximately ninety percent of all streets, based on field condition data, is in fair to excellent condition. As a result, the city received a Condition vs. Performance rating of 'B'. The average annual revenue required to sustain Kennedale's streets is approximately **$1,690,000**. Based on Kennedale's current annual funding of **$287,000**, there is an annual **deficit of $1,403,000**.
Water Distribution System	**C+** (3.3 Stars)	**A** (5 Stars)	**B**	Based on age based condition, approximately seventy-six percent of the city's water mains are in fair to excellent condition. However, based on replacement value, nearly forty-two percent of the city's buildings assets are in poor to critical condition. As such, the city received a Condition vs. Performance rating of 'C+'. The average annual revenue required to sustain Kennedale's water distribution system is approximately **$385,000**. Based on Kennedale's current annual funding of **$589,000**, there is a **surplus of $169,000**.
Wastewater Collection System	**C** (3.3 Stars)	**F** (1 Star)	**D**	Approximately sixty-nine percent of the city's sewer pipes are in fair to excellent condition, based on age data only. As such, the city received a Condition vs. Performance rating of 'C'. The average annual revenue required to sustain Kennedale's wastewater collection system is approximately **$179,000**. Based on Kennedale's current annual funding of **$80,000**, there is an annual **deficit of $99,000**.
Stormwater Drainage System	**B** (4.0 Stars)	**C** (3 Stars)	**C**	Based on assessed condition ratings, eighty-seven percent of the city's stormwater pipes and one hundred percent of culverts are in good to excellent condition. As such, the city received a Condition vs. Performance rating of 'B'. The average annual revenue required to sustain Kennedale's stormwater drainage system is approximately **$349,000**. Based on Kennedale's current annual funding of **$265,000**, there is an annual **defecit of $84,000**.

Asset Category	Condition vs. Performance	Funding vs. Need	Overall Grade	Comments
Buildings	**C** (3.5 Stars)	**F** (0 Stars)	**D**	Based on age data only, approximately seventy-nine percent of the city's buildings are in fair to excellent condition. As such, the city received a Condition vs. Performance rating of 'C'. The average annual revenue required to sustain Kennedale's buildings is **$127,000**. Based on Kennedale's current annual funding of **$55,000**, there is an annual **deficit of $72,000**.
Parks	**B+** (4.7 Stars)	**F** (0 Stars)	**D**	Based on assessed condition data, 94 percent of the city's parks are in fair to excellent condition. As such, the city received a Condition vs. Performance rating of 'B+'. The average annual revenue required to sustain Kennedale's Parks is approximately **$68,000**. Based on Kennedale's current annual funding of **$0**, there is an annual **deficit of $68,000**.
Equipment	**F** (1.6 Stars)	**F** (1 Star)	**F**	Approximately seventy-six percent of the city's equipment is in poor to critical condition based on replacement cost. As such, the city received a Condition vs. Performance rating of 'F'. The average annual revenue required to sustain Kennedale's equipment class is approximately **$225,000**. Based on Kennedale's current annual funding of **$88,000**, there is an annual **deficit of $137,000**
Vehicles	**D** (2.3 Stars)	**A** (5 Stars)	**C+**	Nearly forty-one percent of the city's vehicles are in fair to excellent condition, with the remaining in poor to critical condition. As such, the city received a Condition vs. Performance rating of 'D'. The average annual revenue required to sustain Kennedale's vehicles class is approximately **$142,000**. Based on Kennedale's current annual funding of **$179,000**, there is an annual **surplus of $37,000**.

5.0 Desired Levels of Service

Desired levels of service are high level indicators, comprising many factors, as listed below, which establish defined quality thresholds at which municipal services should be supplied to the community. They support the organization's strategic goals and are based on customer expectations, statutory requirements, standards, and the financial capacity of a city to deliver those levels of service.

Levels of Service are used:

- to inform customers of the proposed type and level of service to be offered;
- to identify the costs and benefits of the services offered;
- to assess suitability, affordability and equity of the services offered;
- as a measure of the effectiveness of the asset management plan
- as a focus for the AM strategies developed to deliver the required level of service

In order for a city to establish a desired level of service, it will be important to review the key factors involved in the delivery of that service, and the interactions between those factors. In addition, it will be important to establish some key performance metrics and track them over an annual cycle to gain a better understanding of the current level of service supplied.

Within this first Asset Management Plan, key factors affecting level of service will be outlined below and some key performance indicators for each asset type will be outlined for further review. This will provide a framework and starting point from which the city can determine future desired levels of service for each infrastructure class.

5.1 Key factors that influence a level of service:

- Strategic and Corporate Goals
- Legislative Requirements
- Expected Asset Performance
- Community Expectations
- Availability of Finances

5.1.1 Strategic and Corporate Goals

Infrastructure levels of service can be influenced by strategic and corporate goals. Strategic plans spell out where an organization wants to go, how it's going to get there, and helps decide how and where to allocate resources, ensuring alignment to the strategic priorities and objectives . It will help identify priorities and guide how municipal tax dollars and revenues are spent into the future. The level of importance that a community's vision is dependent upon infrastructure, will ultimately affect the levels of service provided or those levels that it ultimately aspires to deliver.

5.1.2 Legislative Requirements

Infrastructure levels of service are directly influenced by many legislative and regulatory requirements. These may be established at the federal, state or local level are all legislative requirements that prevent levels of service from declining below a certain standard.

5.1.3 Expected Asset Performance

A level of service will be affected by current asset condition, and performance and limitations in regards to safety, capacity, and the ability to meet regulatory and environmental requirements. In addition, the design life of the asset, the maintenance items required, the rehabilitation or replacement schedule of the asset, and the total costs, are all critical factors that will affect the level of service that can be provided.

5.1.4 Community Expectations

Levels of services are directly related to the expectations that the general public has from the infrastructure. For example, the public will have a qualitative opinion on what an acceptable street looks like, and a quantitative one on how long it should take to travel between two locations. Infrastructure costs are projected to increase dramatically in the future, therefore it is essential that the public is not only

consulted, but also be educated, and ultimately make choices with respect to the service levels that they wish to pay for.

5.1.5 Availability of Finances

Availability of finances will ultimately control all aspects of a desired level of service. Ideally, these funds must be sufficient to achieve corporate goals, meet legislative requirements, address an asset's life cycle needs, and meet community expectations. Levels of service will be dictated by availability of funds, or elected officials' ability to increase funds, or the community's willingness to pay.

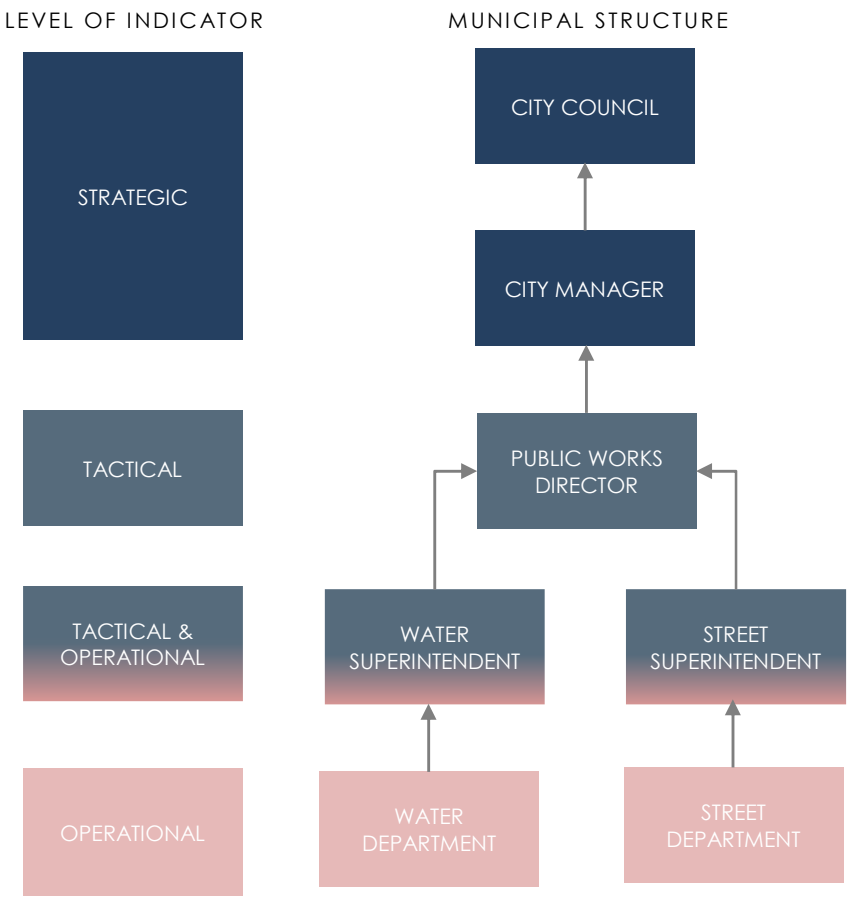
5.2 Key Performance Indicators

Performance measures or key performance indicators (KPIs) that track levels of service should be specific, measurable, achievable, relevant, and timebound (SMART). Many good performance measures can be established and tracked through the CityWide suite of software products. In this way, through automation, results can be reviewed on an annual basis and adjustments can be made to the overall asset management plan, including the desired level of service targets.

In establishing measures, a good rule of thumb to remember is that maintenance activities ensure the performance of an asset and prevent premature aging, whereas rehab activities extend the life of an asset. Replacement activities, by definition, renew the life of an asset. In addition, these activities are constrained by resource availability (in particular, finances) and strategic plan objectives. Therefore, performance measures should not just be established for operating and maintenance activities, but also for the strategic, financial, and tactical levels of the asset management program. This will assist all levels of program delivery to review their performance as part of the overall level of service provided.

This is a very similar approach to the "balanced score card" methodology, in which financial and non-financial measures are established and reviewed to determine whether current performance meets expectations. The "balanced score card", by design, links day to day operations activities to tactical and strategic priorities in order to achieve an overall goal, or in this case, a desired level of service.

The structure of accountability and level of indicator with this type of process is represented in the following table, modified from the InfraGuide's best practice document, "Developing Indicators and Benchmarks" published in April 2003.



As a note, a caution should be raised over developing too many performance indicators that may result in data overload and lack of clarity. It is better to develop a select few that focus in on the targets of the asset management plan.

Outlined below for each infrastructure class is a suggested service description, suggested service scope, and suggested performance indicators. These should be reviewed and updated in each iteration of the AMP.

5.3 Street System

5.3.1 Service Description

The city's street system comprises approximately 42 miles of residential and arterial streets.

Together, the above infrastructure enables the city to deliver transportation and pedestrian facility services and give people a range of options for moving about in a safe and efficient manner.

5.3.2 Scope of Services

- **Movement** – providing for the movement of people and goods.
- **Access** – providing access to residential, commercial, and industrial properties and other community amenities.
- **Recreation** –providing for recreational use, such as walking, cycling, or special events such as parades.

5.3.3 Performance Indicators (reported annually)

Performance Indicators (reported annually)	
Strategic Indicators	■ Percentage of total reinvestment compared to asset replacement value ■ Completion of strategic plan objectives (related to transportation)
Financial Indicators	■ Annual revenues compared to annual expenditures ■ Annual replacement value depreciation compared to annual expenditures ■ Total cost of borrowing compared to total cost of service ■ Revenue required to maintain annual network growth
Tactical Indicators	■ Percentage of streets rehabilitated / reconstructed ■ Value of bridge / large culvert structures rehabilitated or reconstructed ■ Overall road condition index as a percentage of desired condition index ■ Overall bridge condition index as a percentage of desired condition index ■ Annual adjustment in condition indexes ■ Annual percentage of network growth ■ Percent of paved road lane mile where the condition is rated poor or critical ■ Number of bridge / large culvert structures where the condition is rated poor or critical ■ Percentage of streets replacement value spent on operations and maintenance ■ Percentage of bridge / large culvert structures replacement value spent on operations and maintenance
Operational Indicators	■ Percentage of streets inspected within last 5 years ■ Percentage of bridge / large culvert structures inspected within last two years ■ Operating costs for paved roads per lane mile ■ Operating costs for gravel roads per lane mile ■ Operating costs for bridge / large culvert structures per square foot ■ Number of resident requests received annually ■ Percentage of resident requests responded to within 24 hours

5.4 Water / Wastewater / Stormwater Systems

5.4.1 Service Description

The city's water distribution system comprises 48 miles of water main, 487 hydrants and various facilities. The wastewater collection system comprises 48 miles of wastewater collection mains. And the stormwater drainage system comprises 3.7 miles of storm main, 36 miles of ditches, 200 feet of flume and 201 feet of inlet structures.

Together, the above infrastructure enables the city to deliver a potable water distribution service, and a waste water and storm water collection service to the residents of the city.

5.4.2 Scope of services

- The provision of clean safe drinking water through a distribution system of water mains and pumps.
- The removal of waste water through a collection system of wastewater collection mains.
- The removal of storm water through a collection system of stormwater pipes, and catch basins

5.4.3 Performance Indicators (reported annually)

Performance Indicators (reported annually)	
Strategic Indicators	■ Percentage of total reinvestment compared to asset replacement value ■ Completion of strategic plan objectives (related water / sanitary / storm)
Financial Indicators	■ Annual revenues compared to annual expenditures ■ Annual replacement value depreciation compared to annual expenditures ■ Total cost of borrowing compared to total cost of service ■ Revenue required to maintain annual network growth ■ Lost revenue from system outages
Tactical Indicators	■ Percentage of water / wastewater / stormwater system rehabilitated / reconstructed ■ Overall water / wastewater / stormwater drainage condition index as a percentage of desired condition index ■ Annual adjustment in condition indexes ■ Annual percentage of growth in water / wastewater / stormwater drainage ■ Percentage of mains where the condition is rated poor or critical for each system ■ Percentage of water / wastewater / stormwater system replacement value spent on operations and maintenance
Operational Indicators	■ Percentage of water / sanitary / storm network inspected ■ Operating costs for the collection of wastewater per mile of main. ■ Number of wastewater main backups per 100 miles of main ■ Operating costs for storm water management (collection, treatment, and disposal) per mile of drainage system. ■ Operating costs for the distribution/ transmission of drinking water per mile of water distribution pipe. ■ Number of days when a boil water advisory issued by the medical officer of health, applicable to a municipal water supply, was in effect. ■ Number of water main breaks per 100 miles of water distribution pipe in a year. ■ Number of resident requests received annually per water / wastewater / stormwater drainage Percentage of resident requests responded to within 24 hours per water / wastewater / stormwater drainage

5.5 Buildings and Facilities

5.5.1 Service Description

The City's buildings and facilities enable the City to perform administrative functions and also provide social, cultural, recreational and educational amenities for the community at large.

5.5.2 Scope of services

- Administrative (offices)
- Social (community centers)
- Recreational (recreation centers)
- Educational (library)

5.5.3 Performance Indicators (reported annually)

Performance Indicators (reported annually)	
Strategic Indicators	■ Percentage of total reinvestment compared to asset replacement value ■ Completion of strategic plan objectives (related to facilities)
Financial Indicators	■ Annual revenues compared to annual expenditures ■ Annual replacement value depreciation compared to annual expenditures ■ Repair and maintenance cost per square foot ■ Energy, utility and water cost per square foot
Tactical Indicators	■ Percentage of component value replaced ■ Overall facility condition index as a percentage of desired condition index ■ Annual adjustment in condition indexes ■ Annual percentage of new facilities (square feet) ■ Percent of facilities rated poor or critical ■ Percentage of facilities replacement value spent on operations and maintenance
Operational Indicators	■ Percentage of facilities inspected within the last 5 years ■ Number/type of service requests ■ Percentage of resident requests responded to within 24 hours

5.6 Parks and Open Spaces

5.6.1 Service Description

The City's parks and open spaces and related infrastructure provide recreation and conservation of natural resources, and ultimately contribute to the City's natural form, character and scenic value.

5.6.2 Scope of services

- Parks & playgrounds
- Trails
- Natural Open Spaces

5.6.3 Performance Indicators (reported annually)

Performance Indicators (reported annually)	
Strategic Indicators	■ Percentage of total reinvestment compared to asset replacement value ■ Completion of strategic plan objectives (related to parks)
Financial Indicators	■ Annual revenues compared to annual expenditures ■ Annual replacement value depreciation compared to annual expenditures ■ Cost per capita for supplying parks / trails, etc. ■ Maintenance cost per square foot
Tactical Indicators	■ Overall park condition index as a percentage of desired condition index ■ Annual adjustment in condition indexes ■ Annual percentage of new parkland ■ Percent of parkland and infrastructure rated poor or critical ■ Percentage of replacement value spent on operations and maintenance ■ Parkland per capita
Operational Indicators	■ Percentage of park and infrastructure inspected within the last 5 years ■ Number/type of service requests ■ Percentage of resident requests responded to within 24 hours

5.7 Vehicles

5.7.1 Service Description

The city's diverse fleet of vehicles provides support to multiple departments as part of their delivery of various public programs and services to the residents.

5.7.2 Performance Indicators (reported annually)

Performance Indicators (reported annually)	
Strategic Indicators	■ Percentage of total reinvestment compared to asset replacement value ■ Completion of strategic plan objectives (related to fleet)
Financial Indicators	■ Annual revenues compared to annual expenditures ■ Annual replacement value depreciation compared to annual expenditures ■ Operating and maintenance cost per fleet category ■ Fuel costs per fleet category
Tactical Indicators	■ Percentage of all vehicles replaced ■ Average age of fleet vehicles ■ Percent of vehicles rated poor or critical ■ Percentage of fleet replacement value spent on operations and maintenance
Operational Indicators	■ Average downtime per fleet category ■ Average utilization per fleet category and/or each vehicle ■ Ratio of preventative maintenance repairs vs reactive repairs ■ Percent of vehicles that received preventative maintenance ■ Number/type of service requests ■ Percentage of resident requests responded to within 24 hours

6.0 Asset Management Strategy

6.1 Objective

To outline and establish a set of planned actions, based on best practice, that will enable the assets to provide a desired and sustainable level of service, while managing risk, at the lowest life cycle cost.

The Asset Management Strategy will develop an implementation process that can be applied to the needs identification and prioritization of replacement, rehabilitation, and maintenance activities. This will assist in the production of a 10 year plan, including growth projections, to ensure the best overall health and performance of the city's infrastructure.

This section includes an overview of condition assessment techniques for each asset class; the life cycle interventions required, including interventions with the best ROI; and prioritization techniques, including risk, to determine which priority projects should move forward into the budget first.

6.2 Non-Infrastructure Solutions and Requirements

The city should explore which non-infrastructure solutions should be incorporated into the budgets for all programs within this AMP. Non-Infrastructure solutions are such items as studies, policies, condition assessments, consultation exercises, etc., that could potentially extend the life of assets or lower total asset program costs in the future.

Typical solutions for a city include linking the asset management plan to the strategic plan, growth and demand management studies, infrastructure master plans, better integrated infrastructure and land use planning, public consultation on levels of service, and condition assessment programs. As part of future asset management plans, a review of these requirements should take place, and a portion of the capital budget should be dedicated for these items in each programs budget.

It is recommended, under this category of solutions, that the city implement holistic condition assessment programs for all asset categories. This will lead to greater understanding of infrastructure needs, enhanced budget prioritization methodologies, and at the defined path required to achieve sustainable infrastructure programs.

6.3 Condition Assessment Programs

The foundation of good asset management practice is based on having comprehensive and reliable information on the current condition of the infrastructure. Municipalities need to have a clear understanding regarding performance and condition of their assets, as all management decisions regarding future expenditures and field activities should be based on this knowledge. An incomplete understanding about an asset may lead to its premature failure or premature replacement.

Some benefits of holistic condition assessment programs within the overall asset management process are listed below:

- Understanding of overall system condition leads to better management practices
- Allows for the establishment of rehabilitation programs
- Prevents future failures and provides liability protection
- Potential reduction in operation / maintenance costs
- Accurate current asset valuation
- Allows for the establishment of risk assessment programs
- Establishes proactive repair schedules and preventive maintenance programs
- Avoids unnecessary expenditures
- Extends asset service life therefore improving level of service

- Improves financial transparency and accountability
- Enables accurate asset reporting which, in turn, enables better decision making

Condition assessment can involve different forms of analysis such as subjective opinion, mathematical models, or variations thereof, and can be completed through a very detailed or very cursory approach.

When establishing the condition assessment of an entire asset class, the cursory approach (metrics such as good, fair, poor, critical) is used. This will be a less expensive approach when applied to thousands of assets, yet will still provide up to date information, and will allow for detailed assessment or follow up inspections on those assets captured as poor or critical condition later.

The following section outlines condition assessment programs available for road, bridge, wastewater, and water distribution systems that would be useful for the city.

6.3.1 Pavement Network Inspections

Typical industry pavement inspections are performed by consulting firms using specialised assessment vehicles equipped with various electronic sensors and data capture equipment. The vehicles will drive the entire street network and typically collect two different types of inspection data – surface distress data and roughness data.

Surface distress data involves the collection of multiple industry standard surface distresses, which are captured either electronically, using sensing detection equipment mounted on the van, or visually, by the van's inspection crew. Examples of surface distresses are:

- **For asphalt surfaces**
  alligator cracking; distortion; excessive crown; flushing; longitudinal cracking; map cracking; patching; edge cracking; potholes; ravelling; rippling; transverse cracking; wheel track rutting

- **For concrete surfaces**
  coarse aggregate loss; corner 'C' and 'D' cracking; distortion; joint faulting; joint sealant loss; joint spalling; linear cracking; patching; polishing; potholes; ravelling; scaling; transverse cracking

Roughness data capture involves the measurement of the roughness of the road, measured by lasers that are mounted on the inspection van's bumper, calibrated to an international roughness index.

Most firms will deliver this data to the client in a database format complete with engineering algorithms and weighting factors to produce an overall condition index for each segment of roadway. This type of scoring database is ideal for upload into the CityWide software database, in order to tag each road with a present condition and then further life cycle analysis to determine what activity should be completed on which road, in what timeframe, and to calculate the cost for the work will be completed within the CityWide system.

The above process is an excellent way to capture road condition as the inspection trucks will provide detailed surface and roughness data for each road segment, and often include video or street imagery. A very rough industry estimate of cost would be about $160 per linear mile of road, which means it would cost the city approximately $5,440 for the 42 centerline miles of streets.

Another option for a cursory level of condition assessment is for municipal road crews to perform simple windshield surveys as part of their regular patrol. Many municipalities have created data collection inspection forms to assist this process and to standardize what presence of defects would constitute a good, fair, poor, or critical score. Lacking any other data for the complete street network, this can still be seen as a good method and will assist greatly with the overall management of the streets. The CityWide Works software has a road patrol component built in that could capture this type of inspection data during road patrols in the field, enabling later analysis of rehabilitation and replacement needs for budget development.

It is recommended that the city establish a pavement condition assessment program and that a portion of capital funding is dedicated to this.

6.3.2 Bridges & Culverts (greater than 10 feet) Inspections

Structure inspections must be performed by, or under the guidance of, a structural engineer, should be performed on a biennial basis (once every two years), and include such information as structure type, number of spans, span lengths, other key attribute data, detailed photo images, and structure element by element inspection, rating and recommendations for repair, rehabilitation, and replacement.

The best approach to develop a 10 year needs list for the city's structure portfolio would be to have the structural engineer who performs the inspections to develop a maintenance requirements report, and rehabilitation and replacement requirements report as part of the overall assignment. In addition to refining the overall needs requirements, the structural engineer should identify those structures that will require more detailed investigations and non-destructive testing techniques. Examples of these investigations are:

- Detailed deck condition survey
- Non-destructive delamination survey of asphalt covered decks
- Substructure condition survey
- Detailed coating condition survey
- Underwater investigation
- Fatigue investigation
- Structure evaluation

Through the inspections and additional detailed investigations, a 10 year needs list will be developed for the city's bridges.

The 10 year needs list developed could then be further prioritized using risk management techniques to better allocate resources. Also, the results of the inspections for each structure, whether BCI (bridge condition index) or general condition (good, fair, poor, critical) should be entered into the CityWide software to update results and analysis for the development of the budget.

6.3.3 Wastewater System Inspections (Wastewater & Stormwater)

The most popular and practical type of wastewater and storm pipe assessment is the use of Closed Circuit Television Video (CCTV). The process involves a small robotic crawler vehicle with a CCTV camera attached that is lowered down a maintenance hole into the sewer line to be inspected. The vehicle and camera then travels the length of the pipe providing a live video feed to a truck on the road above where a technician / inspector records defects and information regarding the pipe. A wide range of construction or deterioration problems can be captured including open/displaced joints, presence of roots, infiltration & inflow, cracking, fracturing, exfiltration, collapse, deformation of pipe and more. Therefore, sewer CCTV inspection is a very good tool for locating and evaluating structural defects and general condition of underground pipes.

Even though CCTV is an excellent option for inspection of sewers it is a fairly costly process and does take significant time to inspect a large volume of pipes.

Another option in the industry today is the use of Zoom Camera equipment. This is very similar to traditional CCTV, however, a crawler vehicle is not used but in it's a place a camera is lowered down a maintenance hole attached to a pole like piece of equipment. The camera is then rotated towards each connecting pipe and the operator above progressively zooms in to record all defects and information about each pipe. The downside to this technique is the further down the pipe the image is zoomed, the less clarity is available to accurately record defects and measurement. The upside is the process is far quicker and significantly less expensive and an assessment of the manhole can be provided as well. Also, it is important to note that eighty percent of pipe deficiencies generally occur within 65 feet of each manhole. The following is a list of advantages of utilizing Zoom Camera technology:

- A time and cost efficient way of examining wastewater systems;
- Problem areas can be quickly targeted;
- Can be complemented by a conventional camera (CCTV), if required afterwards;
- In a normal environment, 20 to 30 manholes can be inspected in a single day, covering approximately 1 mile of pipe;
- Contrary to the conventional camera approach, cleaning and upstream flow control is not required prior to inspection;
- Normally detects eighty percent of pipe deficiencies, as most deficiencies generally occur within 65 feet of manholes.

The following table is based on general industry costs for traditional CCTV inspection and Zoom Camera inspection; however, costs should be verified through local contractors. It is for illustrative purposes only but supplies a general idea of the cost to inspect Kennedale's entire wastewater and stormwater.

Wastewater Inspection Cost Estimates

Wastewater System	Assessment Activity	Cost	Metres of Main / # of Manholes	**Total**
Wastewater	Full CCTV	$3 (per ft)	255,922 feet	**$767,766**
	Zoom	$300 (per mh)	984 manholes*	**$295,200**
Stormwater	Full CCTV	$3 (per m)	19,872 feet	**$59,616**
	Zoom	$300 (Per mh)	76 manholes*	**$22,800**

* *Manhole numbers estimated based on one man hole per 260 feet*

It can be seen from the above table that there is a significant cost savings achieved through the use of Zoom Camera technology. A good industry trend and best practice is to inspect the entire system using Zoom Camera technology and follow up on the poor and critical rated pipes with more detail using a full CCTV inspection. In this way, inspection expenditures are kept to a minimum, however, an accurate assessment on whether to rehabilitate or replace pipes will be provided for those with the greatest need.

It is recommended that the city establish a wastewater condition assessment program and that a portion of capital funding is dedicated to this.

In addition to receiving a video and defect report of each pipe's CCTV or Zoom camera inspection, many companies can now provide a database of the inspection results, complete with scoring matrixes that provide an overall general condition score for each pipe segment that has been assessed. Typically pipes are scored from 1 – 5, with 1 being a relatively new pipe and 5 being a pipe at the end of its design life. This type of scoring database is ideal for upload into the CityWide software database, in order to tag each pipe with a present condition and then further life cycle analysis to determine what activity should be done to which pipe, in what timeframe, and to calculate the cost for the work will be completed by the CityWide system.

6.3.4 Water Distribution System inspections

Unlike wastewater pipes, it is very difficult to inspect water pipes from the inside due to the high pressure flow of water constantly underway within the water distribution system. Physical inspections require a disruption of service to residents, can be an expensive exercise, and are time consuming to set up. It is recommended practice that physical inspection of water pipes typically only occurs for high risk, large transmission pipes within the system, and only when there is a requirement. There are a number of high tech inspection techniques in the industry for large diameter pipes but these should be researched first for applicability as they are quite expensive. Examples are:

- Remote eddy field current (RFEC)
- Ultrasonic and acoustic techniques
- Impact echo (IE)
- Georadar

For the majority of pipes within the distribution system gathering key information in regards to the pipe and its environment can supply the best method to determine a general condition. Key data that could be used, along with weighting factors, to determine an overall condition score are listed below.

- Age
- Material Type
- Breaks
- Hydrant Flow Inspections
- Soil Condition

Understanding the age of the pipe will determine useful life remaining, however, water pipes fail for many other reasons than just age. The pipe material is important to know as different pipe types have different design lives and different deterioration profiles. Keeping a water main break history is one of the best analysis tools to predict future pipe failures and to assist with programming rehabilitation and replacement schedules. Also, most municipalities perform hydrant flow tests for fire flow prevention purposes. The readings from these tests can also help determine condition of the associated water main. If a hydrant has a relatively poor flow condition it could be indicative of a high degree of encrustation within the attached water main, which could then be flagged as a candidate for cleaning or possibly lining. Finally, soil condition is important to understand as certain soil types can be very aggressive at causing deterioration on certain pipe types.

It is recommended that the city develop a rating system for the mains within the distribution system based on the availability of key data, and that funds are budgeted for this development.

Also, it is recommended that the city utilize the CityWide Works application to track water main break work orders and hydrant flow inspection readings as a starting point to develop a future scoring database for each water main.

6.3.5 Facility inspections

The most popular and practical type of facility assessment involves qualified groups of trained industry professionals (engineers or architects) performing an analysis of the condition of a group of facilities, and their components, that may vary in terms of age, design, construction methods, and materials. This analysis can be done by walk-through inspection, mathematical modeling, or a combination of both. But the most accurate way of determining the condition requires a walk-through to collect baseline data.

The following 5 asset classifications are typically inspected:

- **Site Components –** property around the facility and includes the outdoor components such as utilities, signs, stairways, walkways, parking lots, fencing, courtyards and landscaping.
- **Structural Components –** physical components such as the foundations, walls, doors, windows, roofs.
- **Electrical Components –** all components that use or conduct electricity such as wiring, lighting, electric heaters, and fire alarm systems
- **Mechanical Components –** components that convey and utilize all non-electrical utilities within a facility such as natural gas pipes, furnaces, plumbing, ventilation, and fire extinguishing systems
- **Vertical movement –** components used for moving people between floors of buildings such as elevators.

The data collection on the above components typically includes: type and category of component; estimated age; current condition; estimated repair, rehabilitation or replacement date; and estimated cost for the repair, rehabilitation or replacement.

Once collected this type of information can be uploaded into the CityWide software database in order for short and long term repair, rehabilitation and replacement reports to be generated to assist with programming the short and long term maintenance and capital budgets.

In addition, reports can be generated for each facility that accumulate all current repair, rehabilitation and replacement requirements and generate a facility condition index (FCI) for the overall facility. This allows senior management to assess the overall state of the facilities portfolio and determine which facilities have the greatest overall needs.

The FCI of a facility is represented as a percentage and is calculated by taking the total replacement costs of components in a given year and dividing that figure by the total replacement value of the facility itself. A high FCI value reflects a high replacement requirement and therefore a poor condition facility.

A facility with an FCI of less than 5% is in good condition, between 5% and 10% is in fair condition, between 10% and 30% poor condition, and over 30% is considered critical condition.

$$\text{F. C. I. (Facility Condition Index)} = \frac{\text{Replacement Requirement in a Given Year}}{\text{Replacement Value of an Asset}}$$

Good < 5%, Fair 5 – 10%, Poor 10% - 30%, Critical > 30%

6.3.6 Parks and Open Spaces

There is currently no industry standard in place for the process or protocols in regards to the inspection of parks and their associated infrastructure. However, through the emergence of asset management as a discipline within North America, many municipalities are inspecting their parks with a similar approach to that of a facility condition inspection. The approach works well because the inspection is completed on a component by component basis. A facility has an external shell with many internal components that have unique life cycle requirements (i.e. foundation, windows, HVAC unit, etc.) and a park has an external boundary containing many internal components with unique life cycle requirements also (i.e. fences, pathways, bleachers, sport fields, etc.).
The park inspection will involve qualified groups of trained industry professionals (engineers or landscape architects) performing an analysis of the condition of a group of parks and their components. The most accurate way of determining the condition requires a walk-through to collect baseline data.

The following key asset classifications are typically inspected:

- **Physical Site Components –** physical components on the site of the park such as: fences, utilities, stairways, walkways, parking lots, irrigation systems, monuments, fountains.
- **Recreation Components –** physical components such as: playgrounds, bleachers, back stops, splash pads, and benches.
- **Land Site Components** – land components on the site of the park such as: landscaping, sports fields, trails, natural areas, and associated drainage systems.
- **Minor Park Facilities –** small facilities within the park site such as: sun shelters, washrooms, concession stands, change rooms, storage sheds.

The data collection on the above components typically includes: type and category of component; estimated life cycle; estimated age; current condition; estimated repair, rehabilitation or replacement date; and estimated cost for the repair, rehabilitation or replacement.

Once collected this type of information can be uploaded into the CityWide software database in order for short and long term repair, rehabilitation and replacement reports to be generated to assist with programming the short and long term maintenance and capital budgets.

In addition, reports can be generated for each park that accumulate all current repair, rehabilitation and replacement requirements and generate a park condition index (PCI) for the overall park. This allows senior management to assess the overall state of the park portfolio and determine which parks have the greatest overall needs.

The PCI of a park is represented as a percentage and is calculated by taking the total replacement costs of components in a given year and dividing that figure by the total replacement value of the park itself. A high PCI value reflects a high replacement requirement and therefore a poor condition park.

A park with an PCI of less than 5% is in good condition, between 5% and 10% is in fair condition, between 10% and 30% poor condition, and over 30% is considered critical condition.

$$\text{P. C. I.} = \frac{\text{Replacement Requirement in a Given Year}}{\text{Replacement Value of an Asset}}$$

(Park Condition Index)

Good < 5%, Fair 5 – 10%, Poor 10% - 30%, Critical > 30%

6.3.7 Fleet Inspections and Maintenance

The typical approach to optimizing the maintenance expenditures of a city fleet of vehicles is through routine vehicle inspections, routine vehicle servicing, and an established routine preventative maintenance program.

Most, if not all, makes and models of vehicles are supplied with maintenance manuals that define the appropriate schedules and routines for typical maintenance and servicing and also more detailed restoration or rehabilitation protocols.

The primary goal of good vehicle maintenance is to avoid or mitigate the consequence of failure of equipment or parts. An established preventative maintenance program serves to ensure this, as it will consist of scheduled inspections and follow up repairs of vehicles and equipment in order to decrease breakdowns and excessive downtimes.

A good preventative maintenance program will include partial or complete overhauls of equipment at specific periods, including oil changes, lubrications, fluid changes and so on. In addition, workers can record equipment or part deterioration so they can schedule to replace or repair worn parts before they fail. The ideal preventative maintenance program would move further and further away from reactive repairs and instead towards the prevention of all equipment failure before it occurs.

Once a good preventative maintenance program is defined and scheduled for various categories and types of vehicles it becomes essential to have good software tools to track the scheduling and performance of the overall program. There are municipal maintenance software programs, such as CityWide, that are ideal for this purpose as they are designed to enable public works departments to prioritize, schedule and track projects including preventative maintenance schedules. In addition these software applications typically calculate resources utilized, inventory consumed, as well as direct and indirect labour, and will provide full management reporting.

It is recommended that a preventative maintenance routine is defined and established for all fleet vehicles and that a software application such as Citywide is utilized for the overall management of the program.

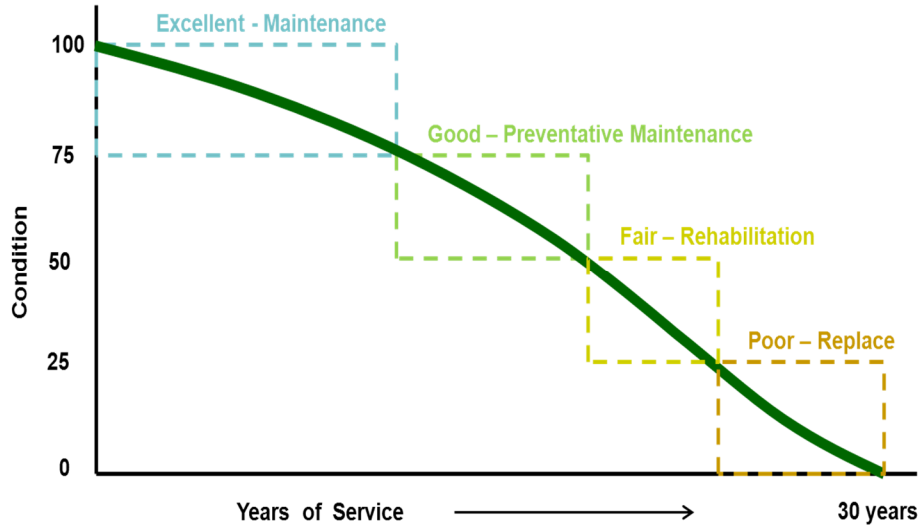
6.4 AM Strategy – Life Cycle Analysis Framework

An industry review was conducted to determine which life cycle activities can be applied at the appropriate time in an asset's life, to provide the greatest additional life at the lowest cost. In the asset management industry, this is simply put as doing the right thing to the right asset at the right time. If these techniques are applied across entire asset networks or portfolios (e.g., all streets), the city could gain the best overall asset condition while expending the lowest total cost for those programs.

6.4.1 Streets

The following analysis has been conducted at a fairly high level, using industry standard activities and costs for streets. With future updates of this Asset Management Strategy, the city may wish to run the same analysis with a detailed review of city activities used for roads and the associated local costs for those work activities. All of this information can be input into the CityWide software suite in order to perform updated financial analysis as more detailed information becomes available.

The following diagram depicts a general deterioration profile of a road with a 30 year life.



As shown above, during the street's life cycle there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; preventative maintenance; rehabilitation; and replacement or reconstruction.

The windows or thresholds for when certain work activities should be applied to also coincide approximately with the condition state of the asset as shown below:

Asset Condition and Related Work Activity: Streets

Condition	Condition Range	Work Activity
Excellent condition (Maintenance only phase)	100-76	■ maintenance only
Good Condition (Preventative maintenance phase)	75 - 51	■ crack sealing ■ emulsions
Fair Condition (Rehabilitation phase)	50 -26	■ resurface - mill & pave ■ resurface - asphalt overlay ■ single & double surface treatment (for rural roads)
Poor Condition (Reconstruction phase)	25 - 1	■ reconstruct - pulverize and pave ■ reconstruct - full surface and base reconstruction
Critical Condition (Reconstruction phase)	0	■ critical includes assets beyond their useful lives which make up the backlog. They require the same interventions as the "poor" category above.

With future updates of this Asset Management Strategy the city may wish to review the above condition ranges and thresholds for when certain types of work activity occur, and adjust to better suit the city's work program. Also note: when adjusting these thresholds, it actually adjusts the level of service provided and ultimately changes the amount of money required. These threshold and condition ranges can be easily updated with the CityWide software suite and an updated financial analysis can be calculated. These adjustments will be an important component of future Asset Management Plans, as the Province requires each city to present various management options within the financing plan.

The table below outlines the costs for various street activities, the added life obtained for each, the condition range at which they should be applied, and the cost of 1 year added life for each (cost of activity / added life) in order to present an apples to apples comparison. Local unit costs may vary and as such this analysis is for illustrative purposes only.

Street Lifecycle Activity Options

Treatment	Average Unit Cost (per sq. foot)	Added Life (Years)	Condition Range	Cost Of Activity/Added Life
Urban Reconstruction	$62	30	25 - 0	$2.07
Urban Resurfacing	$25	15	50 - 26	$1.67
Rural Reconstruction	$40	30	25 - 0	$1.34
Rural Resurfacing	$12	15	50 - 26	$0.8
Double Surface Treatment	$8	10	50 - 26	$0.8
Routing & Crack Sealing (P.M)	$0.6	3	75 - 51	$0.2

As can be seen in the table above, preventative maintenance activities such as routing and crack sealing have the lowest associated cost (per sq. foot) in order to obtain one year of added life. Of course, preventative maintenance activities can only be applied to a road at a relatively early point in the life cycle. It is recommended that the city engage in an active preventative maintenance program for all streets and that a portion of the maintenance budget is allocated to this.

Also, rehabilitation activities, such as urban and rural resurfacing or double surface treatments (tar and chip) for rural roads have a lower cost to obtain each year of added life than full reconstruction activities. It is recommended, if not in place already, that the city engages in an active rehabilitation program for urban and rural streets and that a portion of the capital budget is dedicated to this.

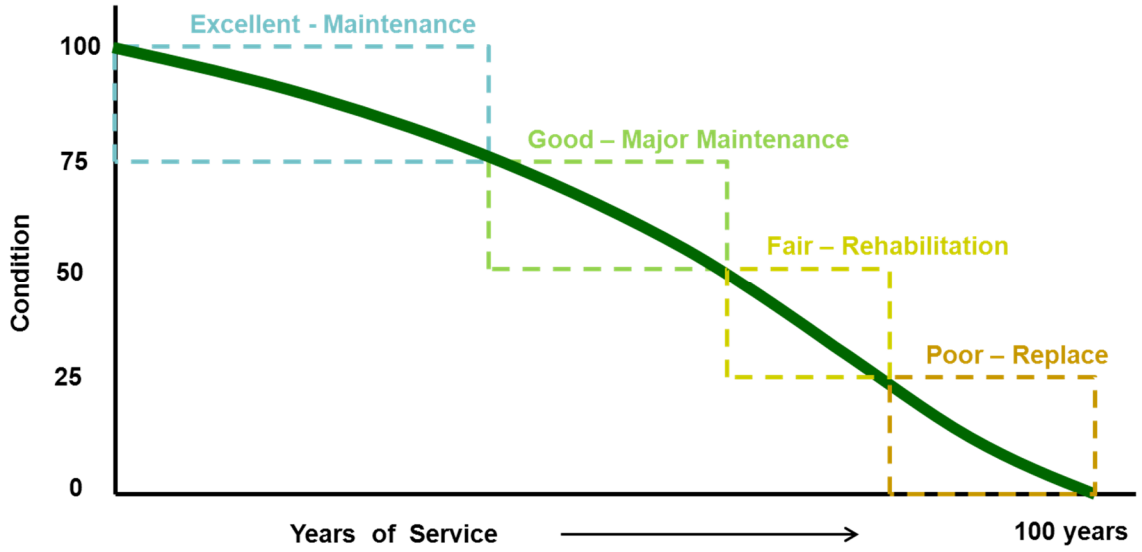
Of course, in order to implement the above programs it will be important to also establish a general condition score for each road segment, established through standard condition assessment protocols as previously described.

It is important to note that a "worst first" budget approach, whereby no life cycle activities other than reconstruction at the end of a roads life are applied, will result in the most costly method of managing streets overall.

6.4.2 Wastewater and Stormwater

The following analysis has been conducted at a fairly high level, using industry standard activities and costs for wastewater and stormwater rehabilitation and replacement. With future updates of this asset management strategy, the city may wish to run the same analysis with a detailed review of city activities used for wastewater pipes and the associated local costs for those work activities. All of this information can be input into the CityWide software suite in order to perform updated financial analysis as more detailed information becomes available.

The following diagram depicts a general deterioration profile of a wastewater pipe with a 100 year life.



As shown above, during the wastewater pipe's life cycle there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; major maintenance; rehabilitation; and replacement or reconstruction.

The windows or thresholds for when certain work activities should be applied also coincide approximately with the condition state of the asset as shown below:

Asset Condition and Related Work Activity: Wastewater Pipes		
Condition	Condition Range	Work Activity
Excellent condition (Maintenance only phase)	100-76	■ maintenance only (cleaning & flushing etc.)
Good Condition (Preventative maintenance phase)	75 - 51	■ mahhole repairs ■ small pipe section repairs
Fair Condition (Rehabilitation phase)	50 -26	■ structural relining
Poor Condition (Reconstruction phase)	25 - 1	■ pipe replacement
Critical Condition (Reconstruction phase)	0	■ critical includes assets beyond their useful lives which make up the backlog. They require the same interventions as the "poor" category above.

With future updates of this Asset Management Strategy the city may wish to review the above condition ranges and thresholds for when certain types of work activity occur, and adjust to better suit the city's work program. Also note: when adjusting these thresholds, it actually adjusts the level of service provided and ultimately changes the amount of money required. These threshold and condition ranges can be easily updated with the CityWide software suite and an updated financial analysis can be calculated. These adjustments will be an important component of future Asset Management Plans, as the province requires each city to present various management options within the financing plan.

The table below outlines the costs, by pipe diameter, for various wastewater pipe rehabilitation (lining) and replacement activities. The columns display the added life obtained for each activity, the condition range at which they should be applied, and the cost of 1 year added life for each (cost of activity / added life) in order to present an apples to apples comparison.

Wastewater pipe Lifecycle Activity Options				
Category	Cost (per foot)	Added Life	Condition Range	1 year Added Life Cost (Cost / Added Life)
Structural Rehab (foot)				
0 – 13 inch	$53	75	50 - 75	$0.70
13 – 25 inch	$86	75	50 - 75	$1.12
25 – 37 inch	$563	75	50 - 75	$7.50
> 37 inch	$537	75	50 - 75	$7.16
Replacement (foot)				
0 – 13 inch	$143	100	76 - 100	$1.43
13 – 25 inch	$220	100	76 - 100	$2.2
25 – 37 inch	$273	100	76 - 100	$2.73
> 37 inch	$447	100	76 - 100	$4.47

As can be seen in the above table, structural rehabilitation or lining of wastewater pipes is an extremely cost effective industry activity and solution for pipes with a diameter less than 25 inches. The unit cost of lining is approximately one half of replacement and the cost to obtain one year of added life is half the cost. For Kennedale, this diameter range would account for over one hundred percent of wastewater

collection pipes and approximately sixty-five percent of stormwater pipes. Structural lining has been proven through industry testing to have a design life (useful life) of 75 years. However, it is believed that liners will probably obtain 100 years of life (the same as a new pipe).

For wastewater pipes with diameters greater than 25 inches specialized liners are required and therefore the costs are no longer effective. It should be noted, however, that the industry is continually expanding its technology in this area and therefore future costs should be further reviewed for change and possible price reductions.

It is recommended, if not in place already, that the city engage in an active structural lining program for wastewater and stormwater pipes and that a portion of the capital budget be dedicated to this.

In order to implement the above, it will be important to also establish a condition assessment program to establish a condition score for each wastewater pipe within the wastewater and stormwater collection system, and therefore identify which pipes are good candidates for structural lining.

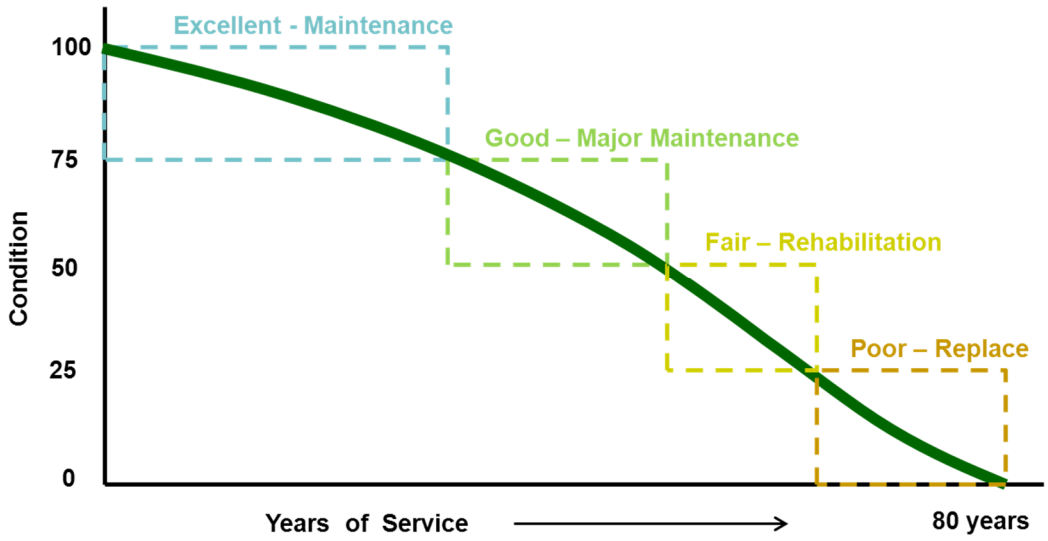
6.4.3 Bridges & Culverts (greater than 3m span)

The best approach to develop a 10 year needs list for the city's bridge structure portfolio would be to have the structural engineer who performs the inspections to develop a maintenance requirements report, a rehabilitation and replacement requirements report and identify additional detailed inspections as required. This approach is described in more detail within the "Bridges & Culverts (greater than 3m) Inspections" section above.

6.4.4 Water Distribution System

As with streets and wastewater above, the following analysis has been conducted at a fairly high level, using industry standard activities and costs for water main rehabilitation and replacement.

The following diagram depicts a general deterioration profile of a water main with an 80 year life.



As shown above, during the water pipe's life cycle there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; major maintenance; rehabilitation; and replacement or reconstruction.

The windows or thresholds for when certain work activities should be applied also coincide approximately with the condition state of the asset as shown below:

Asset Condition and Related Work Activity: Water Distribution Pipes

Condition	Condition Range	Work Activity
excellent condition (Maintenance only phase)	100-76	■ maintenance only (cleaning & flushing etc.)
good Condition (Preventative maintenance phase)	75 - 51	■ water main break repairs ■ small pipe section repairs
fair Condition (Rehabilitation phase)	50 -26	■ structural water main relining
poor Condition (Reconstruction phase)	25 - 1	■ pipe replacement
critical Condition (Reconstruction phase)	0	■ critical includes assets beyond their useful lives which make up the backlog. They require the same interventions as the "poor" category above.

Unlike wastewater rehabilitation technologies, water rehabilitation technologies still require some digging (known as low dig technologies, due to lack of access) and are actually more expensive on a life cycle basis. Therefore the costs of these activities have not been projected within this report. However, if the road above the water pipe is in good condition lining avoids the cost of road reconstruction still resulting in a cost effective solution.

It should be noted, that the industry is continually expanding its technology in this area and therefore future costs should be further reviewed for change and possible price reductions.

At this time, it is recommended that the city only utilize water main structural lining when the road above requires rehabilitation or no work.

6.4.5 Buildings and Facilities

The best approach to develop a 10 year needs list for the city's facility portfolio would be to have the engineers or architects who perform the facility inspections to also develop a complete portfolio maintenance requirements report and rehabilitation and replacement requirements report, and also identify additional detailed inspections and follow up studies as required. This may be performed as a separate assignment once all individual facility audits / inspections are complete. Of course, if the inspection data is housed or uploaded into the CityWide software, then these reports can be produced automatically from the system.

The above reports could be considered the beginning of a 10 year maintenance and capital plan, however, within the facilities industry there are other key factors that should be considered to determine over all priorities and future expenditures. Some examples would be functional / legislative requirements, energy conservation programs and upgrades, customer complaints and health and safety concerns, and also customer expectations balanced with willingness to pay initiatives.

Legislative requirements:

Texas Accessibility standards will govern many functional aspects of facility upgrades, renewal or new construction. Therefore policies, practices and procedures on providing goods and services to people with disabilities should be reviewed as part of the 10 year plan.

Building Codes are established to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. Building code requirements will become part of the 10 year plan.

The initial 10 year requirements listings produced from the facility audits / inspections should be reviewed to ensure capital replacements and upgrades are compliant with industry standards and legislation and project prioritizations and estimates should be adjusted accordingly.

Energy Conservation

There are significant savings to be achieved within a facility portfolio through the implementation of energy conservation programs and the associated industry incentives available upon the market. Some examples would be:

Mechanical & Structural components

- Improve mechanical systems by replacing old inefficient systems (e.g HVAC, boilers) with new high efficiency systems; investigate if incentives for these improvements are available from utilities, federal government, etc.
- Investigate the tightness and insulation of the building envelope in all properties and develop programs for improvement
- Reduce solar gain through windows with awnings or landscaping.
- Replace/upgrade all toilets with high efficiency toilets

Electrical components

- Install occupancy sensors
- Implement energy efficiency lighting using compact fluorescent light bulbs and install timers where appropriate to control outside lights
- Install fully programmable thermostats within all housing units

Energy conservation should be studied in detail for the entire facilities portfolio and upgrade and replacement programs should be implemented through the capital program as part of the 10 year plan.

Resident expectation and affordability or willingness to pay

As discussed within the "Desired Levels of Service" section of this AMP, levels of service are directly related to the expectations of the customer and also their ability to pay for a level of service.

Community facilities, such as recreation centers, in-door pools, senior centers, etc. are infrastructure service areas where customer surveys can be conducted to gain a better sense of what customer expectations are and to assist in the establishment of a standard level of provision or service. Information could be collected on: safety; security; esthetics; environment; comfort; affordability; cleanliness; functional use of space; etc. This would require a much more detailed review, however, the establishment of a level of service based on customer needs and expectations, while still balancing affordability, would directly affect the prioritization of programs and projects brought forward into the 10 year facility budget.

It is recommended that the city develop a life cycle framework for the facility portfolio based on a detailed review of the above factors and that the results are brought forward into future iterations of this AMP.

6.4.6 Parks and Open Spaces

The best approach to develop a 10 year needs list for the city's park and open space portfolio would be to have the engineers or landscape architects who perform the park inspections to also develop a complete portfolio maintenance requirements report and rehabilitation and replacement requirements report, and also identify additional detailed inspections and follow up studies as required. This may be performed as a separate assignment once all individual park audits / inspections are complete. Of course, if the inspection data is housed or uploaded into the CityWide software, then these reports can be produced automatically from the system.

It is important to note that the land site components within a park, trails and sports fields for instance, do not typically require full replacement, but instead a properly defined perpetual maintenance program that provides a defined level of service balanced to the overall use of those facilities. This could be provided as a separate assignment from a professionally trained landscape architect.

6.4.7 Vehicles

Life Cycle Requirements

The best approach to develop a 10 year needs list for the city's vehicles would first be through a defined preventative maintenance program as described in the "Fleet inspections and maintenance section", and secondly through an optimized life cycle vehicle replacement schedule. As previously described, the preventative maintenance program would serve to determine budget requirements for operating and minor capital expenditures for part renewal and major refurbishments and rehabilitations. An optimized vehicle replacement program will ensure a vehicle is replaced at the correct point in time in order to minimize overall cost of ownership, minimize costly repairs and downtime, while maximizing potential re-sale value. There is significant benchmarking information available within the Fleet industry in regards to vehicle life cycles which can be used to assist in this process. Once appropriate replacement schedules are established the short and long term budgets can be funded accordingly.

Fleet Utilization

One of the most critical factors in managing a fleet of vehicles and the associated costs is utilization. Over utilized vehicles may be used for additional shifts or operated in demanding environments while other vehicles are significantly under-utilized. To ensure preventative maintenance programs and vehicle replacement schedules are optimized, vehicle utilization must be managed and tracked.

A good performance indicator to assist with managing fleet utilization is tracking engine hours of actual vehicle usage, whether it's being driven or not, as miles driven is not always a meaningful way to assess whether a vehicle is being utilized fully. Better management of utilization can lower costs by reducing preventative maintenance for some vehicles, selling certain vehicles, encouraging vehicle pooling, outsourcing the use of certain vehicle types, and encouraging the use of employee vehicles.

6.5 Growth and Demand

Typically a city will have specific plans associated with population growth. It is essential that the asset management strategy should address not only the existing infrastructure, as above, but must include the impact of projected growth on defined project schedules and funding requirements. Projects would include the funding of the construction of new infrastructure, and/or the expansion of existing infrastructure to meet new demands. The city should enter these projects into the CityWide software in order to be included within the short and long term budgets as required.

6.6 Project Prioritization

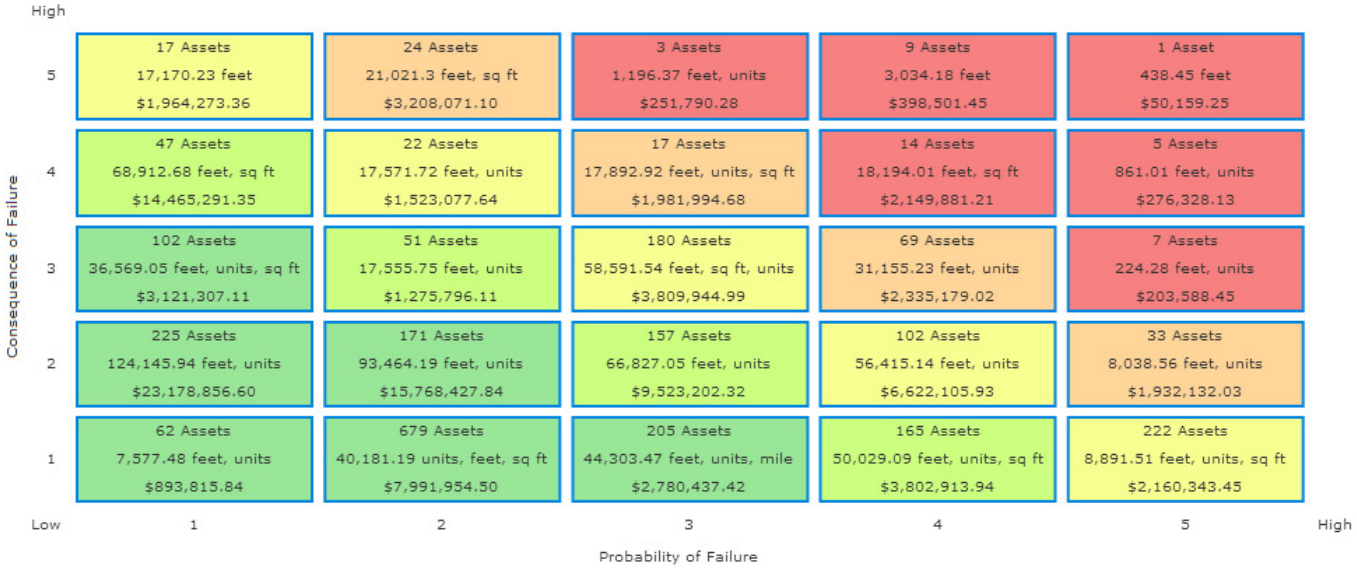
The above techniques and processes when established for the road, water distribution, wastewater collection systems will supply a significant listing of potential projects. Typically the infrastructure needs will exceed available resources and therefore project prioritization parameters must be developed to ensure the right projects come forward into the short and long range budgets. An important method of project prioritization is to rank each project, or each piece of infrastructure, on the basis of how much risk it represents to the organization.

6.6.1 Risk Matrix and Scoring Methodology

Risk within the infrastructure industry is often defined as the probability (likelihood) of failure multiplied by the consequence of that failure.

RISK = LIKELIHOOD OF FAILURE **x** CONSEQUENCE OF FAILURE

The likelihood of failure relates to the current condition state of each asset, whether they are in excellent, good, fair, poor or critical condition, as this is a good indicator regarding their future risk of failure. The consequence of failure relates to the magnitude, or overall effect, that an asset's failure will cause. For instance, a small diameter water main break in a sub division may cause a few customers to have no water service for a few hours, whereby a large trunk water main break outside a hospital could have disastrous effects. The following table represents the scoring matrix for risk:



All of the city's assets analyzed within this asset management plan have been given both a likelihood of failure score and a consequence of failure score within the CityWide software.

The following risk scores have been developed at a high level for each asset class within the CityWide software system. It is recommended that the city undertake a detailed study to develop a more tailored suite of risk scores, particularly in regards to the consequence of failure, and that this be updated within the CityWide software with future updates to this Asset Management Plan.

The current scores that will determine budget prioritization currently within the system are as follows:

All assets:
The Likelihood of Failure score is based on the condition of the assets:

Likelihood of Failure: **All Assets**	
Asset condition	Likelihood of failure
Excellent condition	Score of 1
Good condition	Score of 2
Fair condition	Score of 3
Poor condition	Score of 4
Critical condition	Score of 5

Streets (based on classification):
The consequence of failure score for this initial AMP is based upon the road classification as this will reflect traffic volumes and number of people affected. In time, Kennedale should include further classifications of road to the model.

Consequence of Failure: Streets	
Road Classification	Consequence of failure
Residential	score of 2
Arterial	score of 4

Wastewater Collection Pipes (based on diameter):
The consequence of failure score for this initial AMP is based upon pipe diameter as this will reflect potential upstream service area affected.

Consequence of Failure: Wastewater Collection System	
Pipe Diameter	Consequence of failure
0 – 6 inches	score of 1
6 – 8 inches	score of 2
8 – 12 inches	score of 3
12 – 15 inches	score of 4
15 inches and over	score of 5

Water Pipes (based on diameter):
The consequence of failure score for this initial AMP is based upon pipe diameter as this will reflect potential service area affected.

Consequence of Failure: **Water Distribution**	
Pipe Diameter	Consequence of Failure
Up to 2 inches	score of 1
2 – 6 inches	score of 2
6 – 8 inches	score of 3
8 – 12 inches	score of 4
12 inches and over	score of 5

Stormwater Drainage Pipes (based on diameter):
The consequence of failure score for this initial AMP is based upon pipe diameter as this will reflect potential upstream service area affected.

Consequence of Failure: **Stormwater Drainage**	
Replacement Value	Consequence of failure
Up to 18 inches	score of 1
18 – 27 inches	score of 2
27 – 36 inches	score of 3
36 – 48 inches	score of 4
48 inches and over	score of 5

Buildings: (based on valuation):
The consequence of failure score for this initial AMP is based upon the replacement value of the facility component. The higher the value, probably the larger and more important the component to the overall function of the facility and therefore probably the higher the consequential risk of failure:

Consequence of Failure: **Facilities**	
Replacement Value	Consequence of failure
Up to $50k	Score of 1
$51k to $100k	Score of 2
$101k to $500k	Score of 3
$501k to $2 million	Score of 4
Over $2 million	Score of 5

Parks: (based on valuation):
The consequence of failure score for this initial AMP is based upon the replacement value of the asset or component. The higher the value, probably the larger and more important the component and therefore probably the higher the consequential risk of failure:

Consequence of Failure: **Parks**	
Replacement Value	Consequence of failure
Up to $50k	Score of 1
$51k to $100k	Score of 2
$101k to $300k	Score of 3
$301k to $600k	Score of 4
Over $600k	Score of 5

Equipment: (based on valuation):
The consequence of failure score for this initial AMP is based upon the replacement value of the asset or component. The higher the value, probably the larger and more important the component and therefore probably the higher the consequential risk of failure:

Consequence of Failure: **Equipment**	
Replacement Value	Consequence of failure
Up to $10k	Score of 1
$10k to $20k	Score of 2
$20k to $40k	Score of 3
$40k to $80k	Score of 4
Over $80k	Score of 5

Vehicles: (based on valuation):
The consequence of failure score for this initial AMP is based upon the replacement value of the asset or component. The higher the value, probably the larger and more important the component and therefore probably the higher the consequential risk of failure:

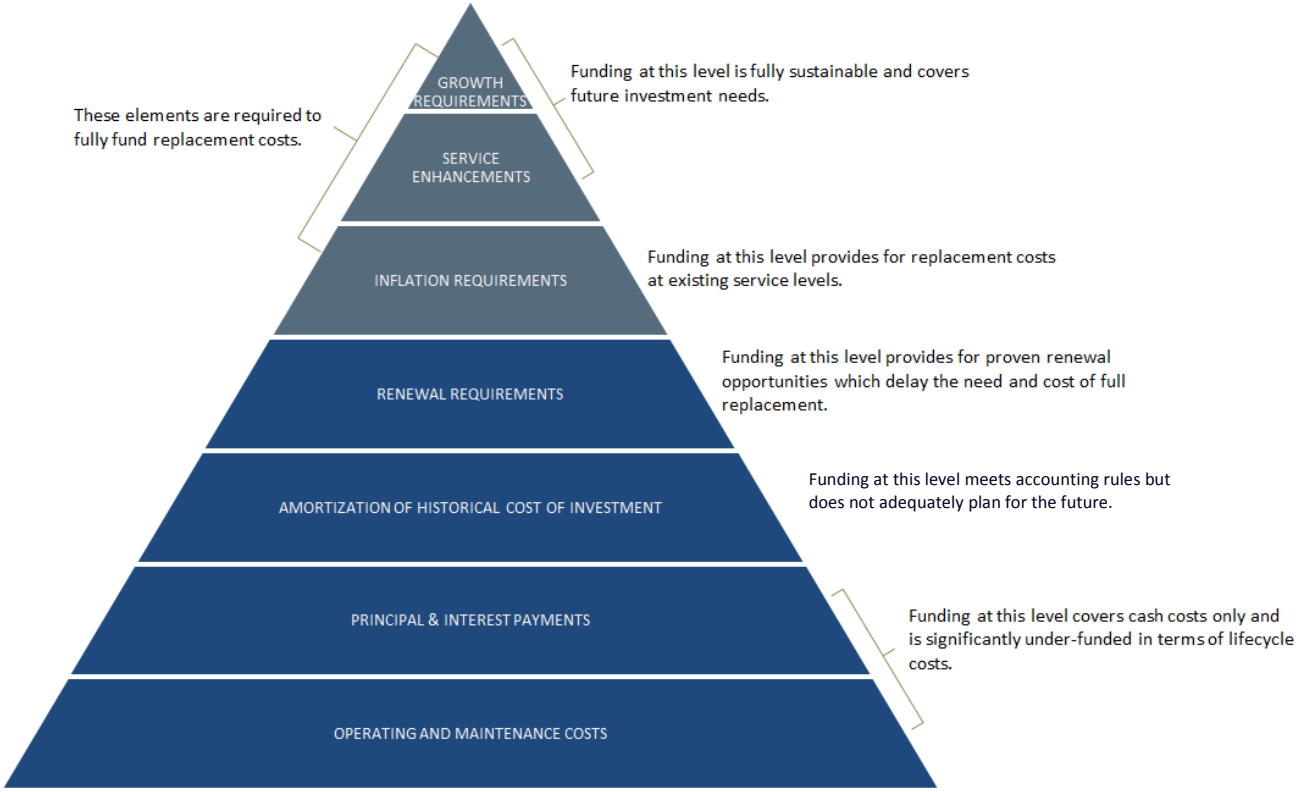
Consequence of Failure: **Vehicles**	
Replacement Value	Consequence of failure
Up to $20k	Score of 1
$21k to $75k	Score of 2
$76k to $150k	Score of 3
$151k to $300k	Score of 4
Over $300k	Score of 5

7.0 Financial Strategy

7.1 General overview of financial plan requirements

In order for an AMP to be effectively put into action, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the City of Kennedale to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

The following pyramid depicts the various cost elements and resulting funding levels that should be incorporated into AMPs that are based on best practices.



This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

a) the financial requirements (as documented in the SOTI section of this report) for:
- existing assets
- existing service levels
- requirements of contemplated changes in service levels (none identified for this plan)
- requirements of anticipated growth (none identified for this plan)

b) use of traditional sources of municipal funds:
- ad-valorem tax levies
- user fees
- reserves
- debt
- sales taxes

c) use of non-traditional sources of municipal funds:
   - reallocated budgets
   - partnerships
   - procurement methods

d) use of senior government funds:
   - grants

If the financial plan component of an AMP results in a funding shortfall, a specific plan should be included that demonstrates how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, a municipality's approach to the following should be evaluated:

a) in order to reduce financial requirements, consideration has been given to revising service levels downward
b) all asset management and financial strategies have been considered. For example:
   - if a zero debt policy is in place, is it warranted? If not, the use of debt should be considered.
   - do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

This AMP includes recommendations that avoid long-term funding deficits.

7.2 Financial information relating to the City of Kennedale's AMP

7.2.1 Funding objective

We have developed scenarios that would enable the City of Kennedale to achieve full funding within five to 20 years for the following assets:

a) **Tax funded assets:** Streets; Buildings; Equipment; Parks; Vehicles
b) **Rate funded assets:** Wastewater Collection System; Water Distribution System; Stormwater Drainage System

For each scenario developed we have included strategies, where applicable, regarding the use of tax revenues, user fees, reserves and debt.

7.3 Tax funded assets

7.3.1 Current funding position

Tables 1 and 2 outline, by asset category, the City of Kennedale's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Table 1. Summary of Infrastructure Requirements & Current Funding Available

Asset Category	Average Annual Investment Required	2015 Annual Funding Available				Annual Deficit/Surplus
		Taxes	Fees	Other	Total Funding Available	
Streets	1,690,000	0	287,000	0	287,000	1,403,000
Buildings	127,000	55,000	0	0	55,000	72,000
Equipment	225,000	0	0	88,000	88,000	137,000
Parks	68,000	0	0	0	0	68,000
Vehicles	142,000	0	0	179,000	179,000	-37,000
Total	**2,252,000**	**55,000**	**287,000**	**267,000**	**609,000**	**1,643,000**

7.3.2 Recommendations for full funding

The average annual investment requirement for the above categories is $2,252,000. Annual revenue currently allocated to these assets for capital purposes is $609,000 leaving an annual deficit of $1,643,000. To put it another way, these infrastructure categories are currently funded at twenty-seven percent of their long-term requirements.

In 2015, the City of Kennedale has annual tax revenues of $4,254,000. As illustrated in table 2, ***without consideration of any other sources of revenue***, full funding would require the following tax change over time.

Table 2. Tax Change Required for Full Funding

Asset Category	Tax Change Required for Full Funding
Streets	33.0%
Buildings	1.7%
Equipment	3.2%
Parks	1.6%
Vehicles	-0.9%
Total	**38.6%**

As illustrated in Table 1, there is currently $554,000 of non-tax revenue being allocated to the asset categories covered by this AMP. There are significant restrictions/capabilities to growing this non-tax revenue over time to assist in addressing the infrastructure deficit. Our analysis determined a best case scenario would be a total increase of $61,000 over 12 years. As a result, we have only included tax revenue changes to address the deficit. This would leave any growth of non-tax revenue available for other capital purposes.

By State law, the City of Kennedale is restricted to a maximum of 4.0% annual tax increases. Their analysis of future operating pressures demonstrates a need for 2.0% increases for operational requirements. That leaves an annual maximum of 2.0% available for addressing the infrastructure deficit.

As illustrated in table 9, the City of Kennedale's debt payments for these asset categories will be decreasing by $0 from 2015 to 2019 (five years) and by $20,000 from 2015 to 2024 (10 years). Our recommendations normally include capturing those decreases in cost and allocating them to the infrastructure deficit outlined above. However, we have not included those decreases in this AMP in order for them to be available for:

a) the City of Kennedale has growth requirements that will require future debt financing and resulting tax increases (in addition to the recommendations in this plan).
b) there may be requirements to finance projects through debt during the phase-in period to full funding.

Through Table 3, we have expanded the above information to present multiple options. Due to the significant increases required, we have provided phase-in options of up to 20 years:

Table 3. Revenue Options for Full Funding

	Tax Revenues				
	5 Years	10 Years	15 Years	17 Years	20 Years
Annual tax increases required – with compounding taken into account	6.8%	3.4%	2.2%	2.0%	1.7%
Annual tax increases required – without compounding	7.7%	3.9%	2.6%	2.3%	1.9%

Considering all of the above information, we recommend the 17 year option in Table 3 that takes into account the compounding effect of tax increases. This involves full funding being achieved over 17 years by:

d) during the phase-in period, reallocating the surplus in vehicles to categories that have a deficit.
e) increasing tax revenues by 2.0% each year for the next 17 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
f) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 17 years and provides financial sustainability over the period modeled (to 2050), the recommendations do require prioritizing capital projects to fit the resulting annual funding available. As of 2015, age based data shows a pent up investment demand of $9,080,000 for streets, $61,000 for buildings, $514,000 for equipment, $0 for parks and $235,000 for vehicles. Prioritizing future projects will require the age based data to be replaced by condition based data. Although our recommendations include no further use of debt (except for assets due to growth), the results of the condition based analysis may require otherwise.

7.4 Rate funded assets

7.4.1 Current funding position

Tables 4 and 5 outline, by asset category, the City of Kennedale's average annual asset investment requirements, current funding positions and funding increases required to achieve full funding on assets funded by rates.

Table 4. Summary of Infrastructure Requirements & Current Funding Available

Asset Category	Average Annual Investment Required	2015 Annual Funding Available				Annual Deficit/Surplus
		Rates	Less: Allocated to Operations	Other	Total Funding Available	
Wastewater Collection System	179,000	1,175,000	-1,125,000	30,000	80,000	99,000
Water Distribution System	420,000	1,998,000	-1,409,000	0	589,000	-169,000
Storm Drainage System	349,000	265,000	0	0	265,000	84,000
Total	**948,000**	**3,438,000**	**-2,534,000**	**30,000**	**934,000**	**14,000**

7.4.2 Recommendations for full funding

The average annual investment requirement for wastewater collection, water distribution and storm drainage is $948,000. Annual revenue currently allocated to these assets for capital purposes is $934,000 leaving an annual deficit of $14,000. To put it another way, these infrastructure categories are currently funded at ninety-nine percent of their long-term requirements.

As illustrated in Table 5, without consideration of any other sources of revenue, full funding would require the following changes over time:

Table 5. Rate Increases Required for Full Funding

Asset Category	Rate Change Required for Full Funding
Wastewater Collection System	8.4%
Water Distribution System	-8.5%
Storm Drainage System	31.7%

In 2015, the City of Kennedale has annual wastewater collection revenues of $1,175,000, annual water revenues of $1,998,000 and annual storm drainage revenues of $265,000. As outlined in Table 4, the wastewater collection system has an infrastructure ***deficit*** of $99,000, the water distribution system has a ***surplus*** of $169,000 and the storm drainage system has a ***deficit*** of $84,000.

Water rates could be decreased by 8.5% to eliminate the surplus in that category. However, we don't recommend eliminating the entire surplus at this early stage in infrastructure planning. A portion of the surplus from water distribution services can be allocated to wastewater collection services to minimize or eliminate the associated deficit. Water rates are considered adequate for the current year.

As illustrated in Table 9, the City of Kennedale's debt payments for water distribution services will be decreasing by $26,000 from 2015 to 2019 (five years) and by $26,000 from 2015 to 2024 (10 years). For wastewater collection and storm drainage, the amounts are $0 and $0 respectively. Our recommendations normally include capturing those decreases in cost and allocating them to the infrastructure deficit

outlined above. However, due to the City of Kennedale having growth requirements that will require debt, we have not included those decreases in this AMP.

Although not recommend, Table 6 outlines a more traditional approach to phasing in the funding issue.

Table 6. Phase-in Option vs. Transfer Option … Not Recommended

	Wastewater Collection System		Water Distribution System		Storm Drainage System	
	5 Years	10 Years	5 Years	10 Years	5 Years	10 Years
Annual rate change required	1.7%	0.8%	-1.7%	-0.9%	6.3%	3.2%

Considering all of the above information, we recommend a combination of the transfer option as described above plus phased-in rate increases. This involves full funding being achieved by:

e) increasing rate revenues by 8.4% for sanitary services resulting in a $99,000 increase in sanitary revenue and the elimination of the deficit in this category.
f) decreasing rate revenues by 5.0% for water services resulting in a $99,000 decrease in water revenue (thus offsetting the increase in a).
g) increasing rate revenues by 3.2% for storm drainage services each year for the next 10 years solely for the purpose of phasing in full funding to this asset category.
h) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the changes recommended above. We realize that this will add to the water services surplus, but this surplus should be reserved until further study confirms the surplus is not needed.

Notes:
1. Any increase in rates required for operations would be in addition to the above recommendations.

Although this option achieves full funding on an annual basis and provides financial sustainability over the period modeled (to 2050), the recommendations do require prioritizing capital projects to fit the resulting annual funding available. As of 2015, age based data shows a pent up investment demand of $0 for sanitary services, $1,512,000 for water services and $27,000 for storm drainage services. Prioritizing future projects will require the age based data to be replaced by condition based data. Although our recommendations include no further use of debt (except for assets due to growth), the results of the condition based analysis may require otherwise.

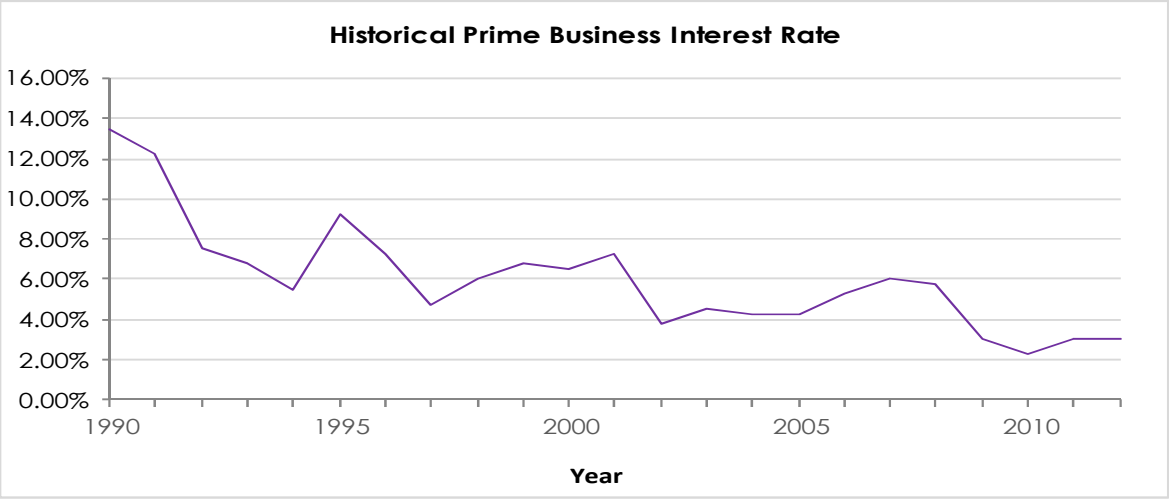
7.5 Use of debt

For reference purposes, Table 7 outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0% over 15 years would result in a twenty-six percent premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not take into account the time value of money or the effect of inflation on delayed projects.

Table 7. Total Interest Paid as a % of Project Costs

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



As illustrated in Table 7, a change in 15 year rates from 3% to 6% would change the premium from twenty-six percent to fifty-four percent. Such a change would have a significant impact on a financial plan.

Tables 8 and 9 outline how the City of Kennedale has historically used debt for investing in the asset categories as listed. There is currently $1,545,000 of debt outstanding for the assets covered by this AMP. In terms of overall debt capacity, the City of Kennedale currently has $2,039,000 of total outstanding debt and $253,000 of total annual principal and interest payment commitments.

Table 8. Overview of Use of Debt

Asset Category	Current Debt Outstanding	Use Of Debt in the Last Five Years				
		2010	2011	2012	2013	2014
Streets	0	0	0	0	0	0
Buildings	0	0	0	0	0	0
Equipment	75,000	0	0	125,000	0	0
Parks	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total Tax Funded	75,000	0	0	125,000	0	0
Wastewater Collection System	0	0	0	0	0	0
Water Distribution System	1,470,000	154,000	0	1,540,000	182,000	0
Stormwater Drainage System	0	0	0	0	0	0
Total rate Funded	1,470,000	154,000	0	1,540,000	182,000	0
Total AMP Debt	1,545,000	154,000	0	1,665,000	182,000	0
Non AMP Debt	494,000	0	1,700,000	0	0	0
Overall Total	**2,039,000**	**154,000**	**1,700,000**	**1,665,000**	**182,000**	**0**

Table 9. Overview of Debt Costs

Asset Category	Principal & Interest Payments in the Next Five Years					
	2015	2016	2017	2018	2019	2024
Streets	0	0	0	0	0	0
Buildings	0	0	0	0	0	0
Equipment	20,000	20,000	20,000	20,000	20,000	0
Parks	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total Tax Funded	20,000	20,000	20,000	20,000	20,000	0
Wastewater Collection System	0	0	0	0	0	0
Water Distribution System	179,000	179,000	153,000	153,000	153,000	153,000
Stormwater Drainage System	0	0	0	0	0	0
Total Rate Funded	179,000	179,000	153,000	153,000	153,000	153,000
Total Amp Debt	199,000	199,000	173,000	173,000	173,000	153,000
Non Amp Debt	54,000	54,000	54,000	54,000	54,000	54,000
Overall Total	**253,000**	**253,000**	**227,000**	**227,000**	**227,000**	**207,000**

The revenue options outlined in this plan allow the City of Kennedale to fully fund its long-term infrastructure requirements (other than infrastructure required due to growth) without further use of debt. However, as explained in sections 7.3.2 and 7.4.2, the recommended condition rating analysis may require otherwise.

7.6 Use of reserves

7.6.1 Available reserves

Reserves play a critical role in long-term financial planning. The benefits of having reserves available for infrastructure planning include:

- the ability to stabilize tax rates when dealing with variable and sometimes uncontrollable factors
- financing one-time or short-term investments
- accumulating the funding for significant future infrastructure investments
- managing the use of debt
- normalizing infrastructure funding requirements

By infrastructure category, Table 10 outlines the details of the reserves currently available to the City of Kennedale.

Table 10. Summary of Reserves Available

Asset Category	Balance at December 31, 2014
Streets	0
Buildings	0
Equipment	0
Parks	0
Vehicles	0
Total Tax Funded	**0**
Water Distribution System	0
Wastewater Collection System	0
Stormwater Drainage System	0
Total Rate Funded	**0**

There is considerable debate in the municipal sector as to the appropriate level of reserves that a municipality should have on hand. At the City of Kennedale, the following guidelines are in place in the City's financial management policy:

1. **General Fund:** 25 percent of expenditures
2. **General Debt Service Fund:** 10 percent of expenditures
3. **Water/Sewer Fund (Working Capital):** 25 percent of expenditures
4. **Water/Sewer Debt Service Fund:** Compliance with Bond Covenants
5. **Economic Development Corporation Fund:** 25 percent of expenditures

Factors that municipalities should take into account when determining their capital reserve requirements include:

- breadth of services provided
- age and condition of infrastructure
- use and level of debt
- economic conditions and outlook
- internal reserve and debt policies.

As outlined in Table 10 there are no reserves available for use during the phase-in period to full funding. Having said that, the City of Kennedale's judicious use of debt in the past allows the scenarios to assume that, if required, available debt capacity can be used for high priority and emergency infrastructure investments in the short to medium-term.

7.6.2 Recommendation

As the City of Kennedale updates its AMP and expands it to include other asset categories, we recommend that future planning should include determining what its long-term reserve balance requirements are and a plan to achieve such balances.

8.0 Appendix A: Report Card Calculations

Key Calculations

1. "Weighted, unadjusted star rating":

(% of assets in given condition) x (potential star rating)

2. "Adjusted star rating"

(weighted, unadjusted star rating) x (% of total replacement value)

3. "Overall Rating"

$$\frac{\textit{(Condition vs. Performance star rating)} + \textit{(Funding vs. Need star rating)}}{2}$$

Grade Cuttoffs

1. Conditions vs Performance

Letter Grade	Star Rating
F	0
D	2
D+	2.5
C	2.9
C+	3.5
B	3.9
B+	4.5
A	4.9
A	5

2. Funding vs Need

Funding %	Star rating	Grade
0.0%	0	F
25.0%	1	F
46.0%	1.9	D
61.0%	2.9	C
76.0%	3.9	B
91.0%	4.9	A
100.0%	5	A

Streets: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$59,580,410	Segment replacement value	$59,580,410	Segment value as a % of total category replacement value	100.0%

Segment 1 (of 1)	Condition	Letter grade	Star rating	Quantity (ft) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Road base, surface, and sidewalks (excludes gravel and appurtenances)	Excellent	A	5	119,701	54%	2.7	4.2
	Good	B	4	51,410	23%	0.9	
	Fair	C	3	28,980	13%	0.4	
	Poor	D	2	17,120	8%	0.2	
	Critical	F	1	5,600	3%	0.0	
			Totals	**222,811**	**100%**	**4.2**	

Category star rating	Category letter grade
4.2	**B**

2. Funding vs. Need

Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$1,690,000	$287,000	17.0%	$1,403,000			**0.0**	**F**

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
4.2	0.0	**2.1**	**D**

Water Distribution System: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$22,899,986	Segment replacement value	$16,231,566	Segment value as a % of total category replacement value	70.9%

Segment 1 (of 3)	Condition	Letter grade	Star rating	Quantity (ft) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segement adjusted star rating
Water Pipes	Excellent	A	5	74,606	29%	1.46	2.49
	Good	B	4	47,485	19%	0.74	
	Fair	C	3	73,133	29%	0.86	
	Poor	D	2	54,499	21%	0.43	
	Critical	F	1	5,655	2%	0.02	
			Totals	**255,377**	**100%**	**3.51**	

Total category replacement value	$22,899,986	Segment replacement value	$6,668,420	Segment value as a % of total category replacement value	29.1%

Segment 3 (of 3)	Condition	Letter grade	Star rating	Replacement Cost ($) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segmentadjusted star rating
Facilities	Excellent	A	5	$0	0%	0.0	0.8
	Good	B	4	$3,471,154	52%	2.1	
	Fair	C	3	$385,358	6%	0.2	
	Poor	D	2	$1,356,440	20%	0.4	
	Critical	F	1	$1,455,469	22%	0.2	
			Totals	**$6,668,420**	**100%**	**2.9**	

Category star rating	Category letter grade
3.3	C

2. Funding vs. Need

Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$420,000	$589,000	140.2%	-$169,000			5.0	A

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
3.3	5.0	4.2	B

Wastewater Collection System: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$14,886,083	Segment replacement value	$14,886,083	Segment value as a % of total category replacement value	100.0%

Segment 1 (of 3)	Condition	Letter grade	Star rating	Quantity (ft) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segement adjusted star rating
Sanitary mains	Excellent	A	5	41,013	16%	0.80	3.3
	Good	B	4	66,202	26%	1.03	
	Fair	C	3	70,431	28%	0.83	
	Poor	D	2	77,917	30%	0.61	
	Critical	F	1	359	0%	0.00	
			Totals	**255,922**	**100%**	**3.3**	

Category star rating	Category letter grade
3.3	**C**

2. Funding vs. Need

Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$179,000	$80,000	44.7%	$99,000			**1.0**	**F**

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
3.3	1.0	**2.1**	**D**

Stormwater Drainage System: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$3,369,082	Segment replacement value	$1,035,642	Segment value as a % of total category replacement value	30.7%

Segment 1 (of 2)	Condition	Letter grade	Star rating	Quantity (m) of assets in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Storm Pipes	Excellent	A	5	11,363	57%	2.86	1.3
	Good	B	4	4,730	24%	0.95	
	Fair	C	3	3,499	18%	0.53	
	Poor	D	2	280	1%	0.03	
	Critical	F	1	0	0%	0.00	
			Totals	**19,872**	**1**	**4.37**	

Total category replacement value	$3,369,082	Segment replacement value	$2,015,440	Segment value as a % of total category replacement value	59.8%

Segment 2 (of 2)	Condition	Letter grade	Star rating	Quantity in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Culverts & Inlet	Excellent	A	5		0.0%	0.0	2.39
	Good	B	4	223	100.0%	4.0	
	Fair	C	3		0.0%	0.0	
	Poor	D	2		0.0%	0.0	
	Critical	F	1		0.0%	0.0	
			Totals	**223**	**100%**	**4.00**	

Total category replacement value	$3,369,082	Segment replacement value	$318,000	Segment value as a % of total category replacement value	9.4%

Segment 2 (of 2)	Condition	Letter grade	Star rating	Replacement Cost ($) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Ditch & Flume	Excellent	A	5	48,000	15.1%	0.8	0.31
	Good	B	4		0.0%	0.0	
	Fair	C	3	270,000	84.9%	2.5	
	Poor	D	2		0.0%	0.0	
	Critical	F	1		0.0%	0.0	
			Totals	**318,000**	**100%**	**3.30**	

Category star rating	Category letter grade
4.0	**B**

2. Funding vs. Need

Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$349,000	$265,000	75.9%	$84,000			**2.9**	**C**

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
4.0	2.9	**3.5**	**C**

Buildings: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$5,972,830	Segment replacement value	$5,972,830	Segment value as a % of total category replacement value	100.0%

Segment 1 (of 1)	Condition	Letter grade	Star rating	Replacement Cost ($) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Buildings	Excellent	A	5	979,189	16%	0.8	3.5
	Good	B	4	2,240,460	38%	1.5	
	Fair	C	3	1,487,868	25%	0.7	
	Poor	D	2	1,204,774	20%	0.4	
	Critical	F	1	60,538	1%	0.0	
			Totals	**5,972,829**	**100%**	**3.5**	

Category star rating	Category letter grade
3.5	C

2. Funding vs. Need

Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$127,000	$55,000	43.3%	$72,000			1.0	F

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
3.5	1.0	2.2	D

Parks: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$1,598,290	Segment replacement value	$1,598,290	Segment value as a % of total category replacement value	100.0%

Segment 1 (of 1)	Condition	Letter grade	Star rating	Replacement Cost ($) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Land Improvements	Excellent	A	5	1,384,293	87%	4.3	4.7
	Good	B	4	117,221	7%	0.3	
	Fair	C	3	-	0%	0.0	
	Poor	D	2	96,777	6%	0.1	
	Critical	F	1	-	0%	0.0	
			Totals	**1,598,290**	**100%**	**4.7**	

Category star rating	Category letter grade
4.7	B+

2. Funding vs. Need

Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$68,000	$0	0.0%	$68,000			0.0	F

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
4.7	0.0	2.4	D

Equipment: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$1,230,589	Segment replacement value	$1,230,589	Segment value as a % of total category replacement value	100.0%

Segment 1 (of 1)	Condition	Letter grade	Star rating	Replacement Cost ($) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Machinery & Equipment	Excellent	A	5	2,500	0%	0.0	1.6
	Good	B	4	115,098	9%	0.4	
	Fair	C	3	181,889	15%	0.4	
	Poor	D	2	56,844	5%	0.1	
	Critical	F	1	874,258	71%	0.7	
			Totals	**1,230,589**	**100%**	**1.6**	

Category star rating	Category letter grade
1.6	**F**

2. Funding vs. Need

Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$225,000	$88,000	39.1%	$137,000			**1.0**	**F**

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
1.6	1.0	**1.3**	**F**

Vehicles: City of Kennedale

1. Condition vs. Performance

Total category replacement value	$1,011,626	Segment replacement value	$1,011,626	Segment value as a % of total category replacement value	100.0%

Segment 1 (of 1)	Condition	Letter grade	Star rating	Replacement Cost ($) in given condition	% of Assets in given condition	Weighted, unadjusted star rating	Segment adjusted star rating
Vehicles	Excellent	A	5		0%	0.0	2.3
	Good	B	4	197,610	20%	0.8	
	Fair	C	3	224,021	22%	0.7	
	Poor	D	2	314,314	31%	0.6	
	Critical	F	1	275,681	27%	0.3	
			Totals	**1,011,626**	**100%**	**2.3**	

Category star rating	Category letter grade
2.3	D

2. Funding vs. Need

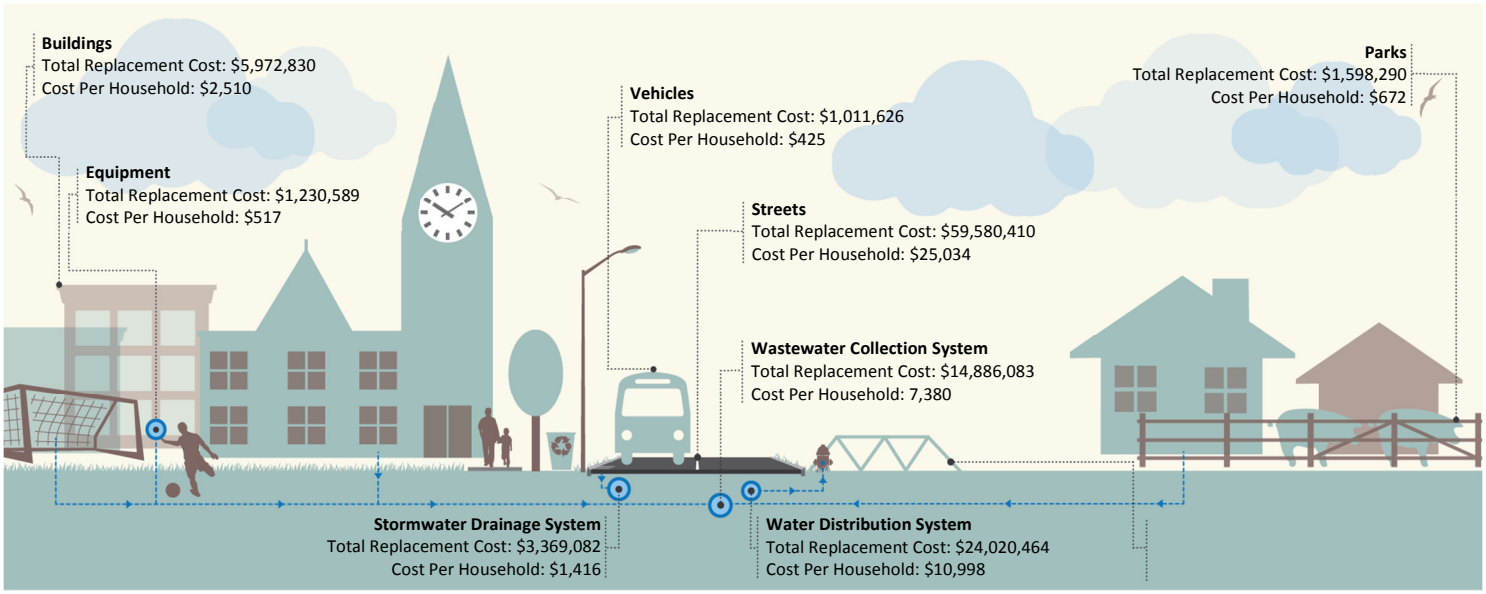
Average annual investment required	2015 funding available	Funding percentage	Deficit/(Surplus)			Category star rating	Category letter grade
$142,000	$179,000	126.1%	-$37,000			5.0	A

3. Overall Rating

Condition vs Performance star rating	Funding vs. Need star rating	Average star rating	Overall letter grade
2.3	5.0	3.7	C+

Infrastructure Replacement Cost Per Household

Total: $48,951 per household



Daily Investment Required Per Household for Infrastructure Sustainability