3.6 Water Network

D	F	F
CONDITION vs. PERFORMANCE GRADE	FUNDING vs. NEED GRADE	INFRASTRUCTURE REPORT CARD GRADE

3.6 Water Network

3.6.1 What do we own?

Armstrong is responsible for the following water network inventory which includes approximately 11km of water mains:

Water Network Inventory

Asset Type	Asset Component	Quantity
Water Network	Hydrant	41.00
	Treatment Plant	1.00
	Water Valve	97.00
	Waterline - Local (50mm)	130 m
	Waterline - Local (100mm)	906 m
	Waterline - Local (150mm)	9,450 m
	Waterline - Local (203mm)	745.70 m

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

3.6.2 What is it worth?

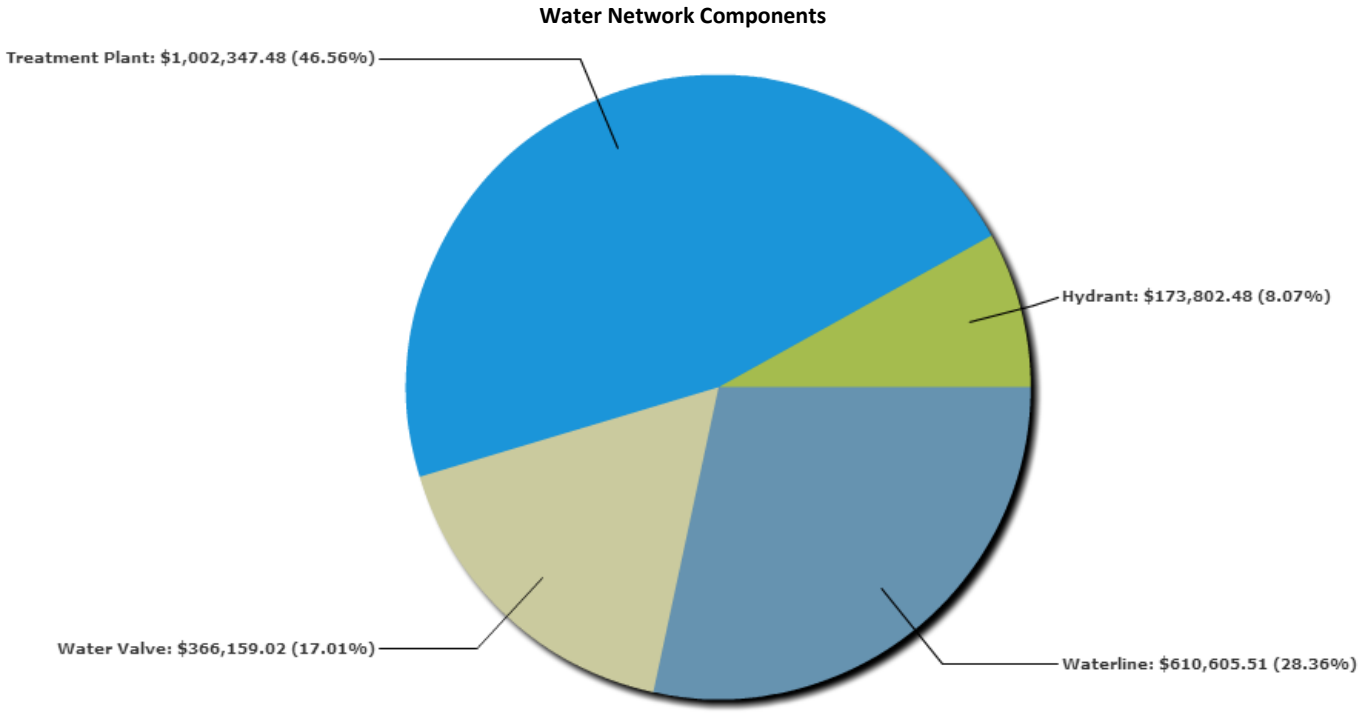
The estimated replacement value of the water network, in 2014 dollars, is approximately $2.2 million. The cost per household for the water network is $5,741 based on 375 households.

Water Network Replacement Value

Asset Type	Asset Component	Quantity	2014 Unit Replacement Cost	2014 Overall Replacement Cost*
Water Network	Hydrant	41.00	NRBCPI	$173,802
	Treatment Plant	1.00	NRBCPI	$1,002,347
	Water Valve	95.00	NRBCPI	$366,159
	Waterline - Local (50mm)	130 m	NRBCPI	$1,677
	Waterline - Local (100mm)	906 m	NRBCPI	$11,953
	Waterline - Local (150mm)	9,450 m	NRBCPI	$390,070
	Waterline - Local (203mm)	745.70m	NRBCPI	$206,906
				$2,152,914

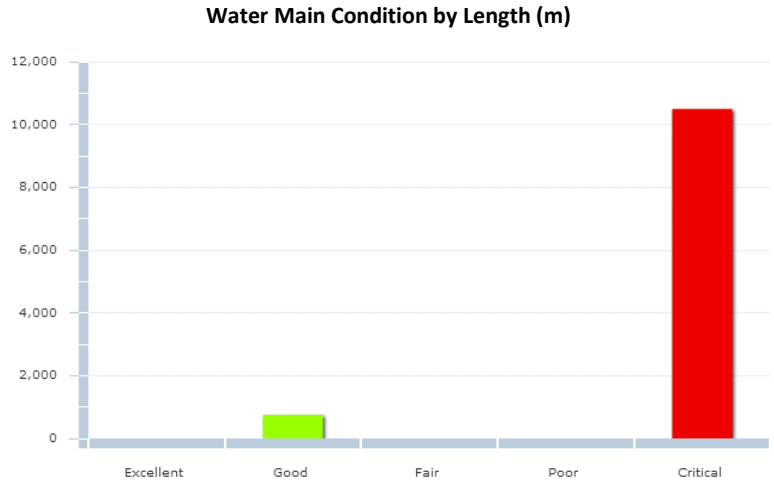
***Note**: Replacement Cost as of 2014-02-28 using NRBCPI inflation measure

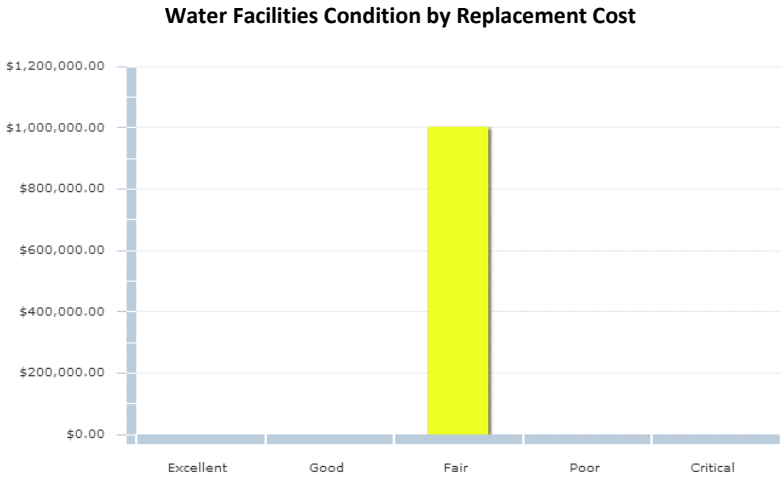
The pie chart below provides a breakdown of each of the network components to the overall system value.



3.6.3 What condition is it in?

Based on age data analysis only, approximately 93% of the township's water mains are in critical condition, where 100% of its facilities are in fair condition. As such, the township received a Condition vs. Performance rating of 'D'.





3.6.4 What do we 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 network 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

3.6.5 When do we need to do it?

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.

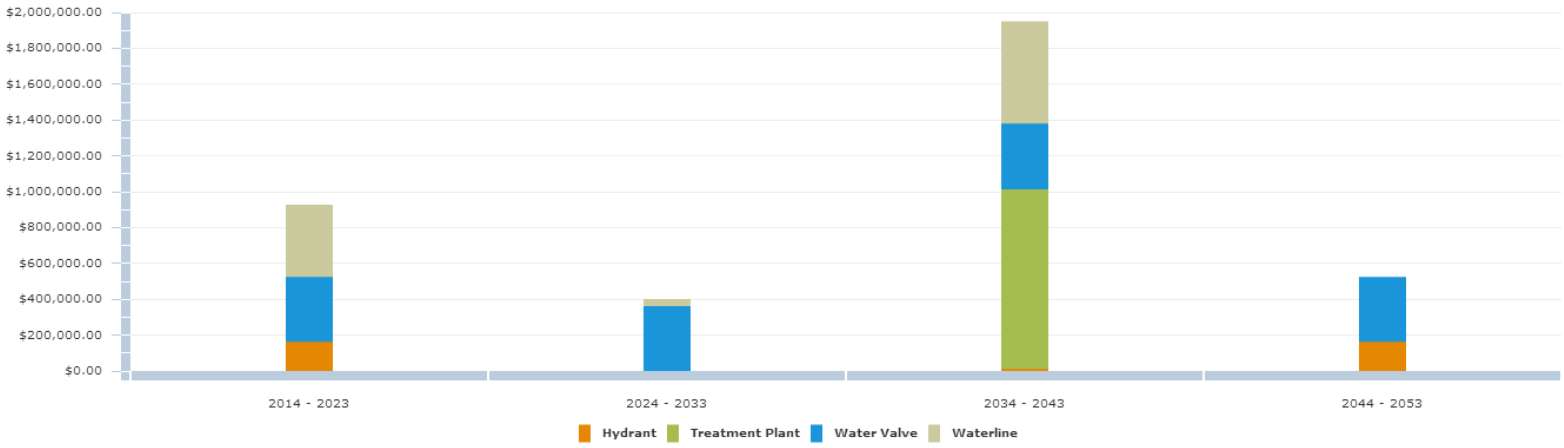
Asset Useful Life in Years

Asset Type	Asset Component	Useful Life in Years
Water Network	Hydrant	30
	Treatment Plant	40
	Water Valve	10
	Waterline - Local	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.

Water Network Replacement Profile



3.6.6 How much money do we need?

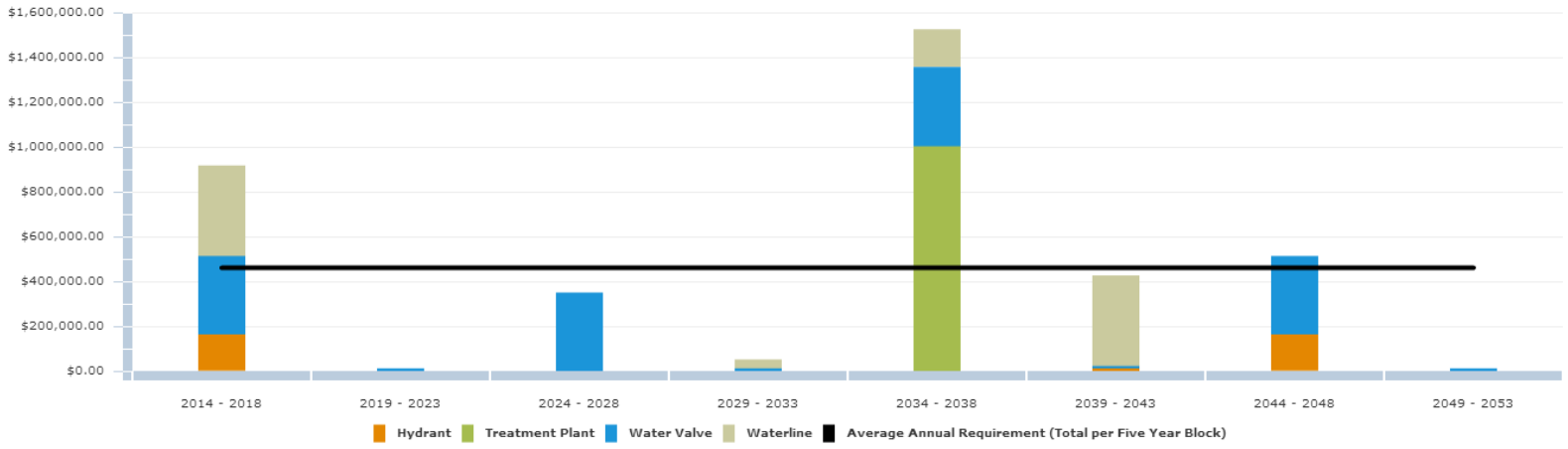
The analysis completed to determine capital revenue requirements was based on the following assumptions:

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 do you need to do it?" section above.
3. All values are presented in 2014 dollars.
4. The analysis was run for a 40 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.6.7 How do we reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Armstrong's water network is approximately **$92,000**. Based on Armstrong's current annual funding of **$0**, there is a **deficit of $92,000**. As such, the township 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, based on age analysis only, Armstrong's water distribution network is in critical condition, while the facilities are in fair condition. This has generated a backlog of needs for the distribution network totaling over $900,000 in the next 5 years. It should be noted, however, that the useful life for water mains is projected at 25 years, while industry standards are usually 80 years. The valves and hydrants have low useful life projections also. Increasing the useful life will reduce the immediate requirements listed above. In addition, a study to better understand field condition should be implemented to optimize the short and long term budgets based on actual need. This is discussed further in the Asset Management Strategy portion of this Asset Management Plan.

It should also be noted, within the detailed 10 year infrastructure plan, the Township has identified the Earlton Water Treatment Plant Filter Refurbishment, at a cost of $215,000, as a priority project.

3.6.8 Recommendations

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

1. A more detailed study to define the current condition of the water network should be undertaken as described further within the "Asset Management Strategy" section of this AMP.

2. Also, a detailed study to define the current condition of the water treatment plant and its components (structural, architectural, electrical, mechanical, process, etc.) should be undertaken, as collectively it accounts for approximately 46% of the water infrastructure's value.

3. The useful life projections used by the township should be reviewed for consistency with industry standards.

4. Once the above studies are complete, a new performance age should be applied to each water main and an updated "current state of the infrastructure" analysis should be generated.

5. An appropriate % 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.

6. The Infrastructure Report Card should be updated on an annual basis.

3.7 Sanitary Sewer Network

B	F	D
CONDITION vs. PERFORMANCE GRADE	FUNDING vs. NEED GRADE	INFRASTRUCTURE REPORT CARD GRADE

3.7 Sanitary Sewer Network

3.7.1 What do we own?

The inventory components of the sanitary sewer network are outlined in the table below. The entire Network consists of approximately 8 km of sewer main.

Sanitary Sewer Inventory

Asset Type	Asset Component	Quantity
Sanitary Sewer Network	Manhole	106.00
	Pumpstation	1.00
	Sanitary Forcemain	588.80 m
	Sewer Structure	45.70 m
	Sewerline - Local (200mm)	6,089.18 m
	Sewerline - Local (250mm)	133.70 m
	Sewerline - Local (350mm)	87.40 m
	Sewerline - Local (375mm)	791.10 m
	Sewerline - Local (450mm)	712.30 m

The Sanitary Sewer Network data was extracted from the Tangible Capital Asset module of the CityWide software application.

3.7.2 What is it worth?

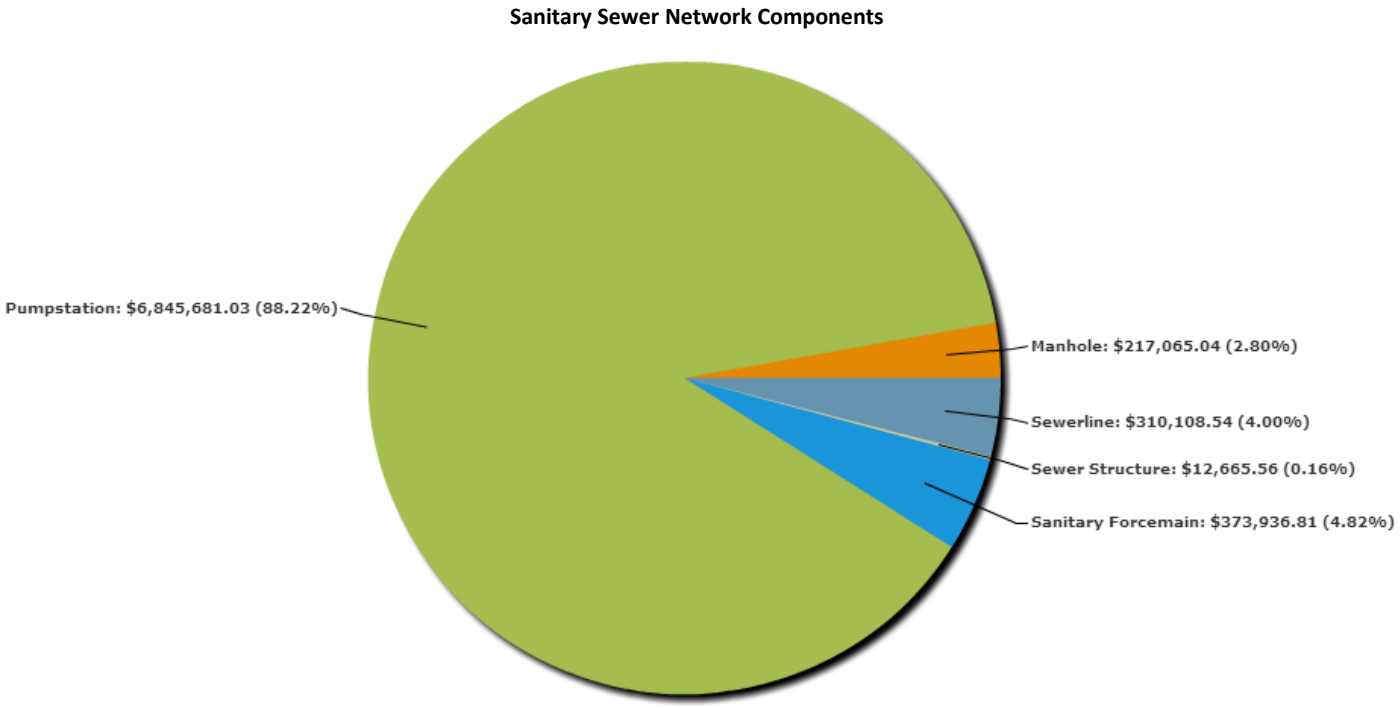
The estimated replacement value of the sanitary sewer network, in 2014 dollars, is approximately $7.8 million. The cost per household for the sanitary network is $20,692 based on 375 households.

Sanitary Sewer Replacement Value

Asset Type	Asset Component	Quantity	2014 Unit Replacement Cost	2014 Overall Replacement Cost*
Sanitary Sewer Network	Manhole	101.00	NRBCPI	$217,065
	Pumpstation	1.00	NRBCPI	$6,845,681
	Sanitary Forcemain	588.8 m	NRBCPI	$373,937
	Sewer Structure	45.70 m	NRBCPI	$12,666
	Sewerline - Local (200mm)	6,089.18 m	NRBCPI	$175,207
	Sewerline - Local (250mm)	133.70 m	NRBCPI	$8,704
	Sewerline - Local (350mm)	87.40 m	NRBCPI	$6,933
	Sewerline - Local (375mm)	791.10 m	NRBCPI	$62,759
	Sewerline - Local (450mm)	712.30 m	NRBCPI	$56,504
				$7,759,457

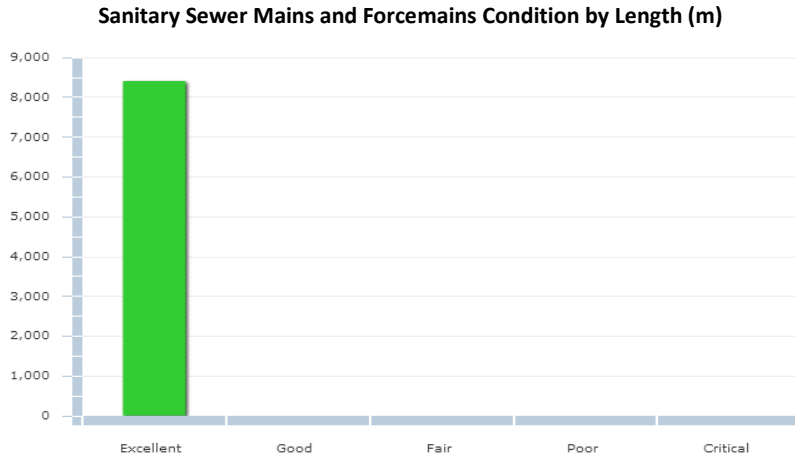
***Note**: Replacement Cost as of 2014-02-28 using NRBCPI inflation measure

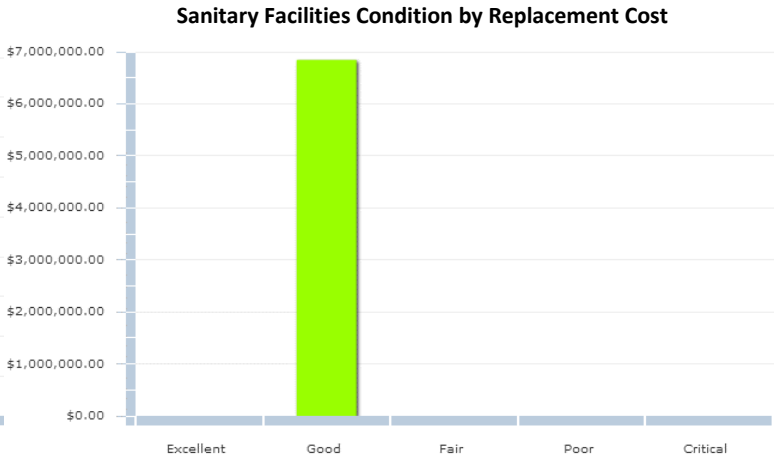
The pie chart below provides a breakdown of each of the network components to the overall system value.



3.7.3 What condition is it in?

Based on age data analysis alone, 100% of the township's sanitary sewer mains, forcemains, and treatment facilities are in good to excellent condition. As such, the township received a Condition vs. Performance rating of 'B'.





3.7.4 What do we 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 sanitary sewer network 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

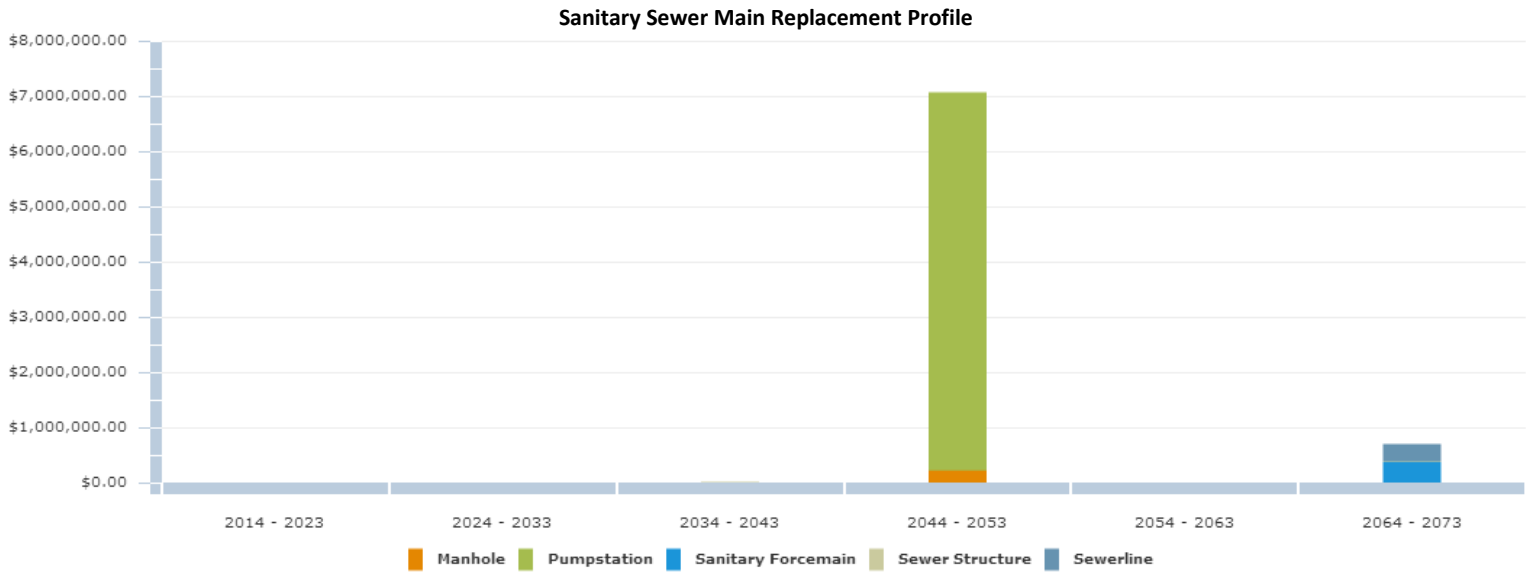
3.7.5 When do we need to do it?

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
Sanitary Sewer Network	Manhole	40
	Pumpstation	40
	Sanitary Forcemain	60
	Sewer Structure	30
	Sewerline - Local	60

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 sanitary sewer main replacements based on the age of the asset only.



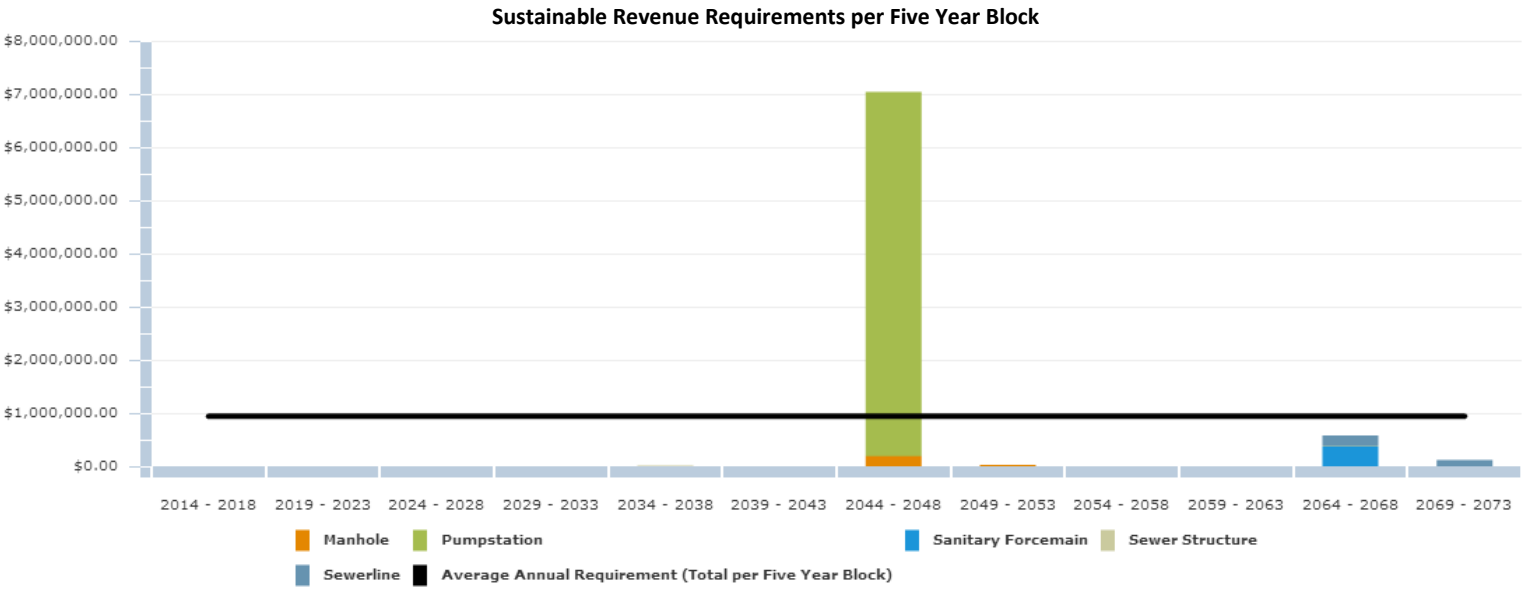
3.7.6 How much money do we need?

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 main replacement was defined by the replacement year as described in the "When do you need to do it?" section above.
3. All values are presented in 2014 dollars.
4. The analysis was run for a 60 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.7.7 How do we reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Armstrong's sanitary sewer network is approximately **$188,000**. Based on Armstrong's current annual funding of **$0**, there is an annual **deficit of $188,000**. As such, the township 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 sanitary sewer network, mains and facilities, from an age based analysis only, are in good to excellent condition. There are very few replacement requirements to be addressed. However, a condition assessment program should be established to aid in the understanding of actual field condition, assist 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 township received an overall rating of 'F' for its sanitary sewer network, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

1. A condition assessment program should be established for the sanitary sewer network to gain a better understanding of current condition and performance as outlined further within the "Asset Management Strategy" section of this AMP.
2. Also, a detailed study to define the current condition of the sanitary pump station (structural, architectural, electrical, mechanical, process, etc.) should be undertaken, as collectively it accounts for approximately 90% of the sanitary infrastructure's value.
3. Once the above studies are 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.
4. An appropriate % 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.
5. The Infrastructure Report Card should be updated on an annual basis.

3.8 Storm Sewer Network

C+	F	F
CONDITION vs. PERFORMANCE GRADE	FUNDING vs. NEED GRADE	INFRASTRUCTURE REPORT CARD GRADE

3.8 Storm Sewer Network

3.8.1 What do we own?

The inventory components of the Storm Sewer Collection system are outlined in the table below. The entire network consists of approximately 2.3 km of sewer mains.

Storm Sewer Network Inventory (Detailed)

Asset Type	Asset Component	Quantity
Storm Sewer Network	Catchbasin	44.00
	Sewer Structure	126,278.64 m
	Sewerline	2,270.75 m

The storm sewer network 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 the storm sewer network, in 2014 dollars, is approximately $573 thousand. The cost per household for the storm sewer network is $1,528 based on 375 households.

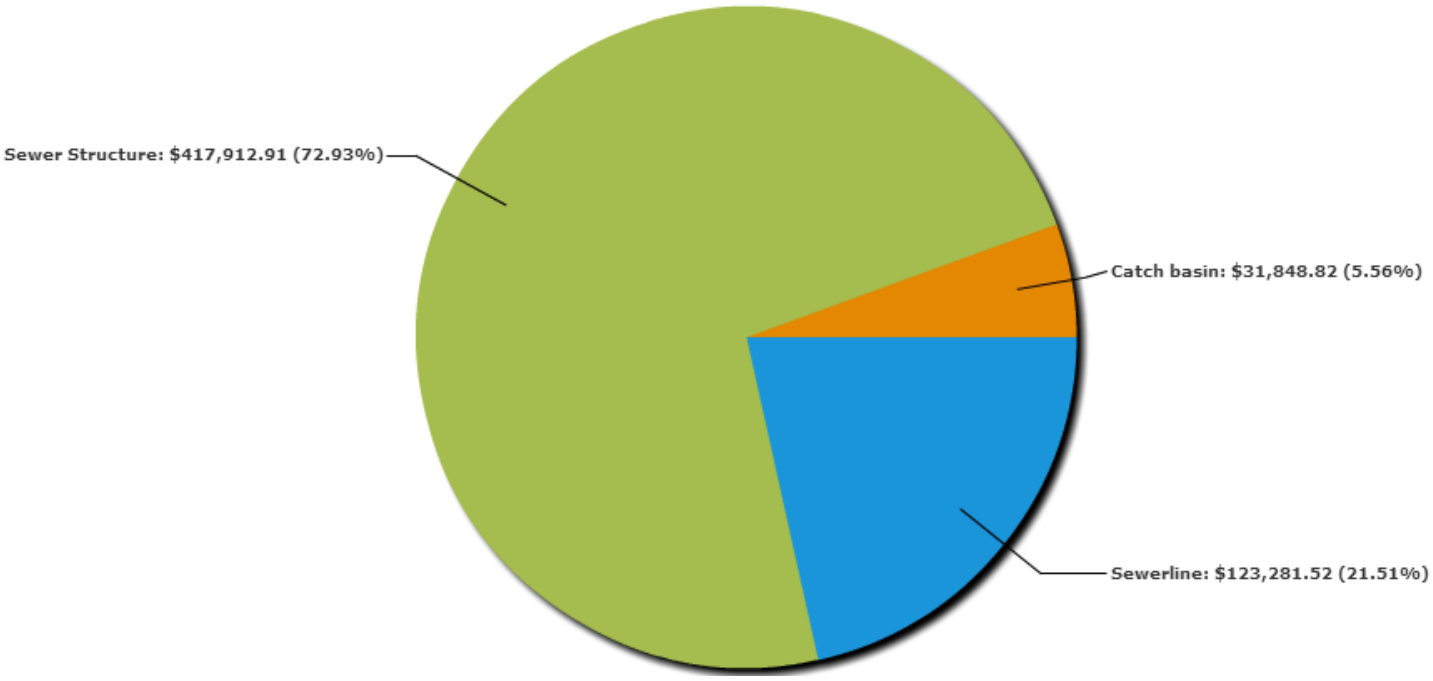
Storm Replacement Value

Asset Type	Asset Component	Quantity	2014 Unit Replacement Cost	2014 Overall Replacement Cost*
Storm Sewer Network	Catchbasin	44.00	NRBCPI	$31,849
	Sewer Structure	126,278.64 m	NRBCPI	$417,913
	Sewerline - Local (200mm)	47 m	NRBCPI	$800
	Sewerline - Local (250mm)	235 m	NRBCPI	$12,627
	Sewerline - Local (300mm)	427.75 m	NRBCPI	$23,629
	Sewerline - Local (400mm)	145 m	NRBCPI	$8,010
	Sewerline - Local (500mm)	931 m	NRBCPI	$51,426
	Sewerline - Local (700mm)	485 m	NRBCPI	$26,790
				$573,044

***Note**: Replacement Cost as of 2014-02-28 using NRBCPI inflation measure

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

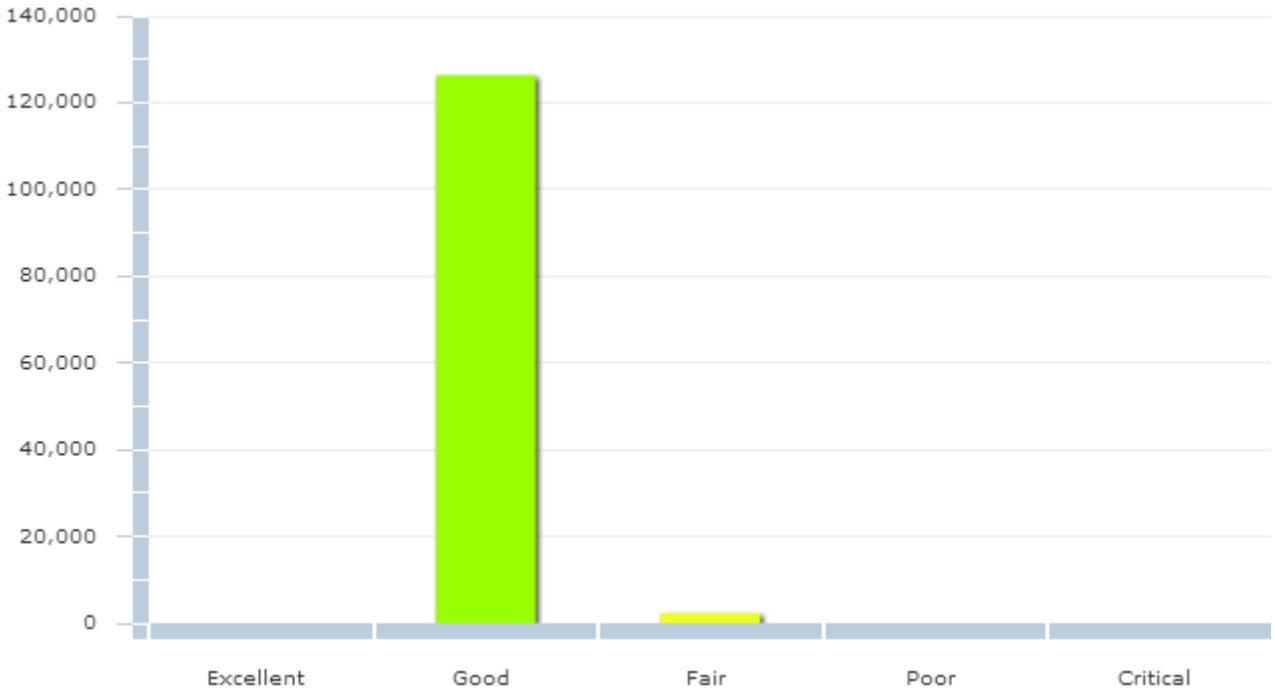
Storm Sewer Network Components



3.8.3 What condition is it in?

Based on age analysis only, 100% of the township's storm sewer mains are in fair to good condition. As such, the township received a Condition vs. Performance rating of 'C+'.

Storm Sewerline and Structure Condition by Length (metres)



3.8.4 What do we 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 storm sewer network 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

3.8.5 When do we need to do it?

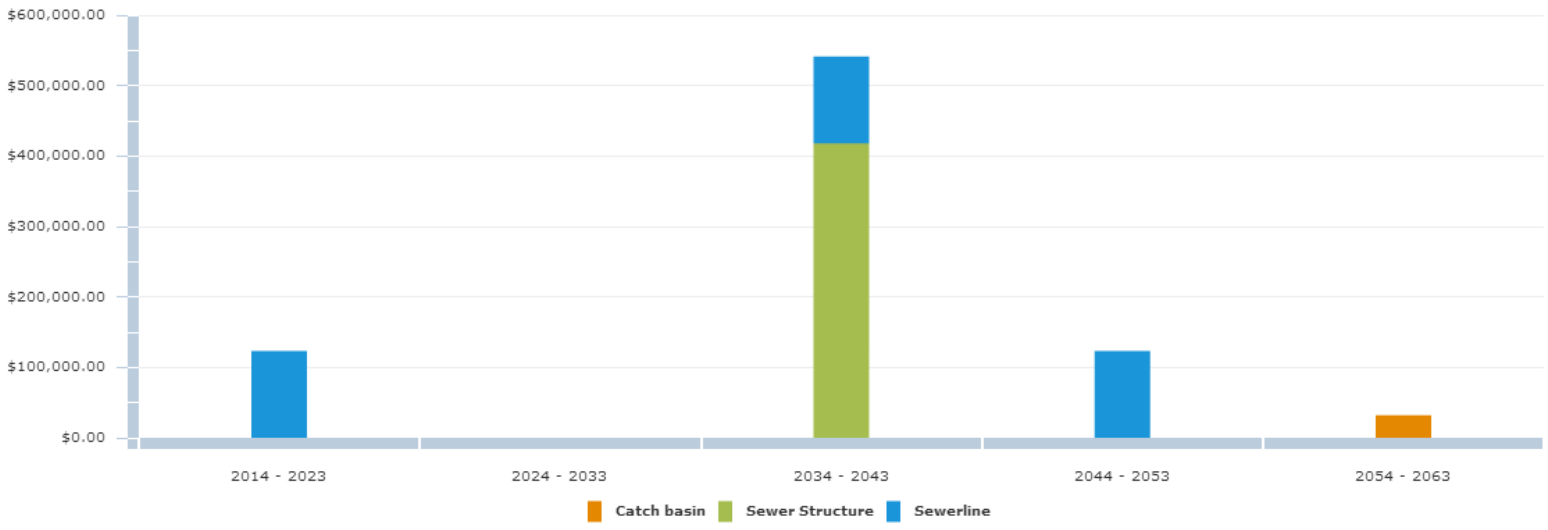
For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial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

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life in Years
Storm Sewer Network	Catchbasin	50
	Sewer Structure	30
	Sewerline	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 storm sewer main replacements based on the age of the asset only.

Storm Sewer Main Replacement Profile



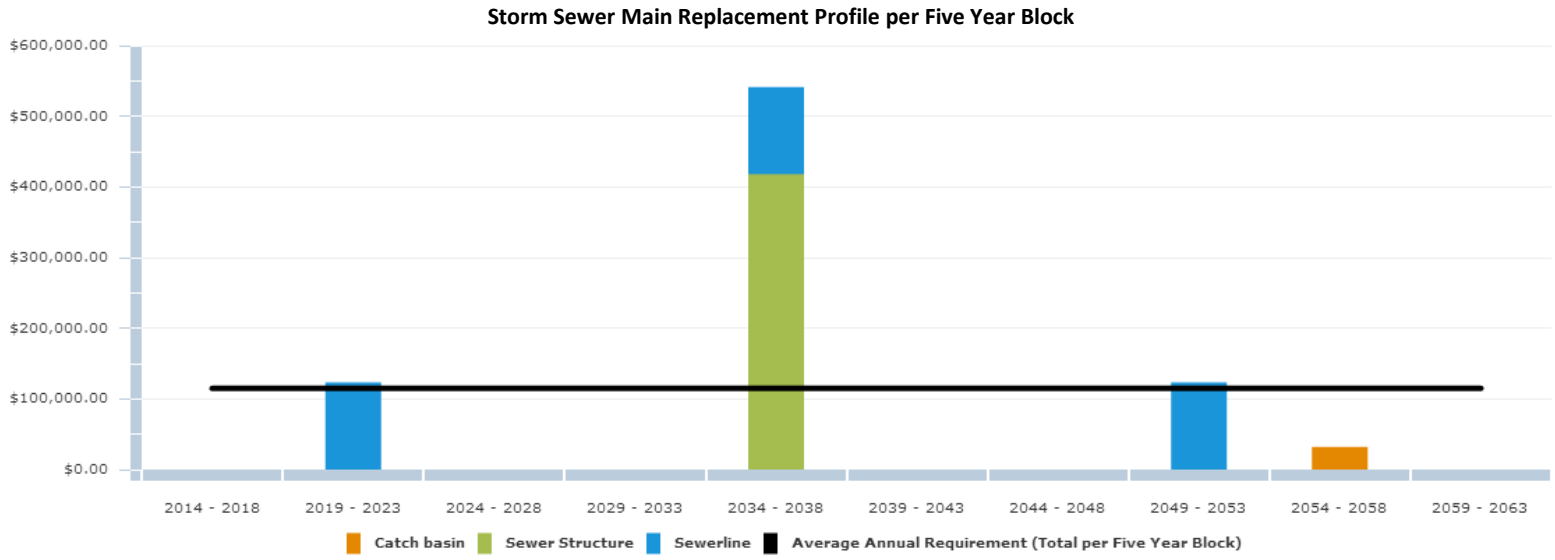
3.8.6 How much money do we need?

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 storm sewer main replacement was defined by the replacement year as described in the "When do you need to do it?" section above.
3. All values are presented in 2014 dollars.
4. The analysis was run for a 50 year period to ensure all assets went through one iteration of replacement, therefore providing a sustainable projection.

3.8.7 How do we reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain Armstrong's storm sewer network is approximately **$23,000**. Based on Armstrong's current annual funding of **$0**, there is an annual **deficit of $23,000**. As such, the township received a Funding vs. Need rating of 'F'.



In conclusion, Armstrong's storm sewer collection network, based on age data only, is generally in fair to good condition. It should be noted that the useful life for storm mains is projected at 15 years, while industry standards are usually 100 years. Increasing the useful life will reduce the immediate requirements listed above. In addition, future funds should be directed towards a condition assessment program, however, to gain a better understanding of current performance. A condition assessment program will aid in prioritizing overall needs for rehabilitation and replacement and will assist with optimizing the long term budget. Further detail is outlined within the "asset management strategy" section of this AMP.

3.8.8 Recommendations

The township received an overall rating of 'F' for its storm sewer network, calculated from the Condition vs. Performance and the Funding vs. Need ratings. Accordingly, we recommend the following:

1. A condition assessment program should be established for the storm sewer network to gain a better understanding of current condition and performance as outlined further within the "Asset Management Strategy" section of this AMP.

2. The useful life projections used by the township should be reviewed for consistency with industry standards.

3. 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.
4. An appropriate % 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.

5. The Infrastructure Report Card should be updated on an annual basis.

3.9 Buildings

C	F	F
CONDITION vs. PERFORMANCE GRADE	FUNDING vs. NEED GRADE	INFRASTRUCTURE REPORT CARD GRADE

3.9 Buildings

3.9.1 What do we own?

The table below outlines the township's facility inventory:

Facilities Inventory		
Asset Type	Asset Component	Quantity
Buildings	Administration	1.00
	Airport	8.00
	Cemetery	2.00
	Fire	1.00
	Recreation	7.00
	Storage	1.00

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

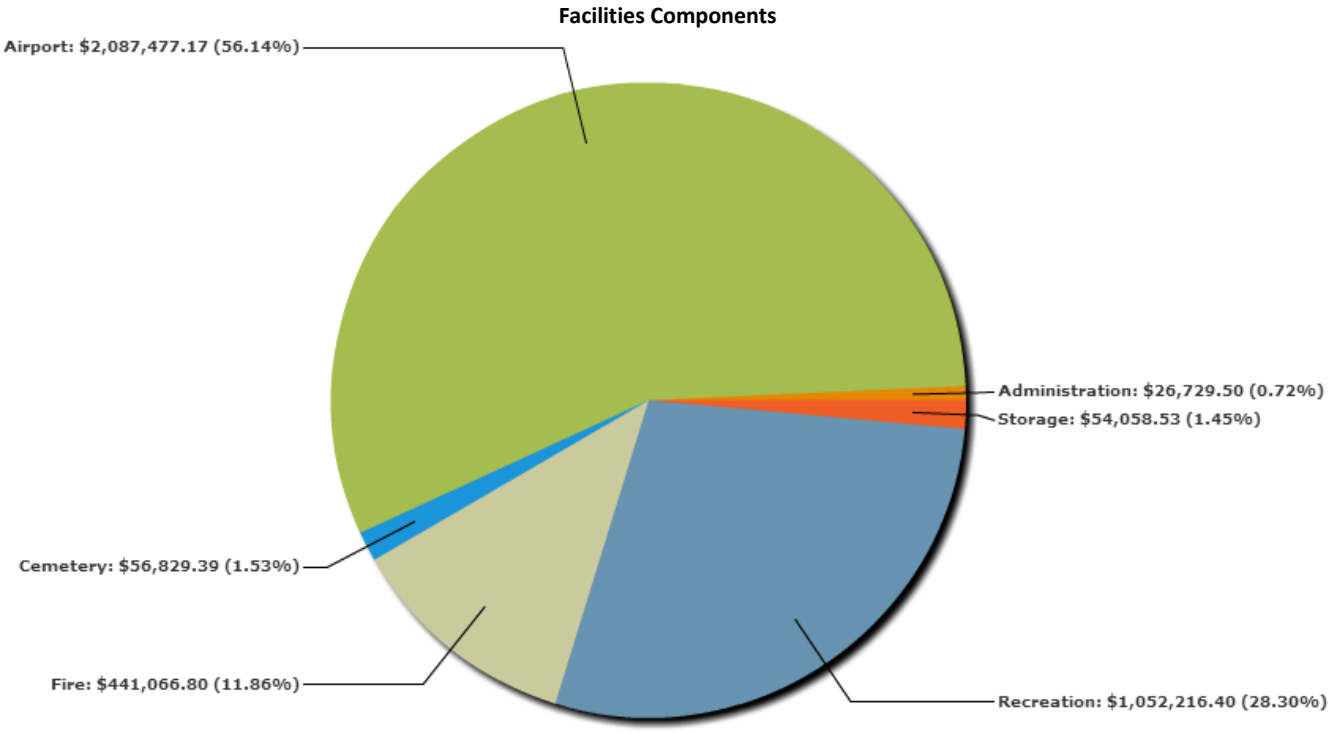
3.9.2 What is it worth?

The estimated replacement value of the township's facilities, in 2014 dollars, is approximately $3.7 million. The cost per household for Facilities is $6,950 based on 535 households.

Facilities Replacement Value				
Asset Type	Asset Component	Quantity/Units	2014 Unit Replacement Cost	2014 Replacement Cost*
Buildings	Administration	1.00	NRBCPI	$26,730
	Airport	8.00	NRBCPI	$2,087,477
	Cemetery	2.00	NRBCPI	$56,829
	Fire	1.00	NRBCPI	$441,067
	Recreation	7.00	NRBCPI	$1,052,216
	Storage	1.00	NRBCPI	$54,059
				$3,718,378

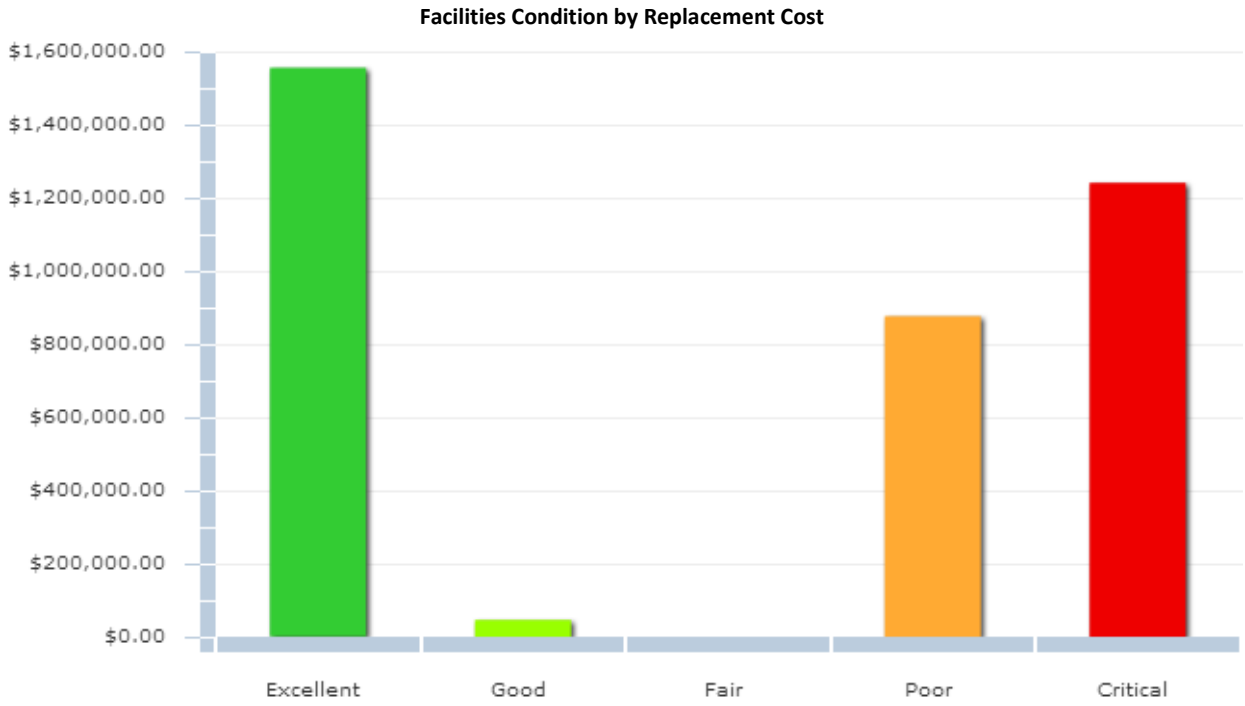
***Note**: Replacement Cost as of 2014-02-28 using NRBCPI inflation measure

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



3.9.3 What condition is it in?

Based on age analysis only, approximately 57% of the township's facilities are critical to poor condition, while the remainder are in good to excellent condition. As such, the township received a Condition vs. Performance rating of 'C'.



3.9.4 What do we 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 facilities 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	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

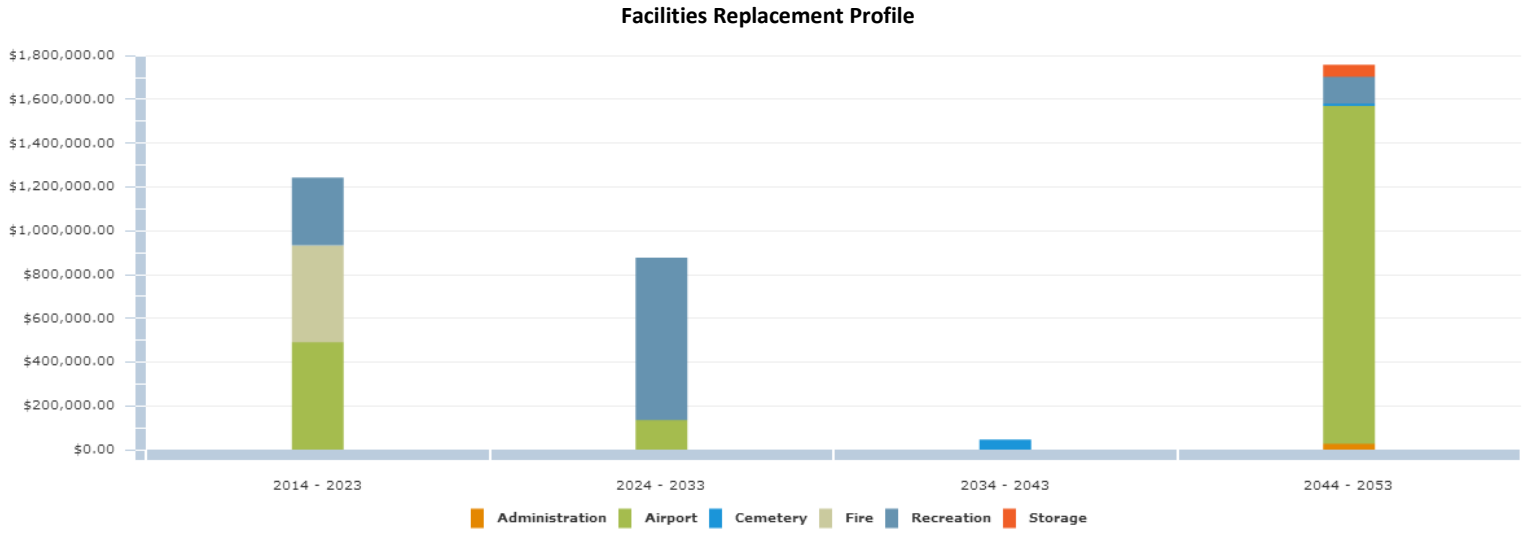
3.9.5 When do we need to do it?

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	Administration	40
	Airport	30, 40
	Cemetery	40
	Fire	40
	Recreation	30, 40
	Storage	40

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



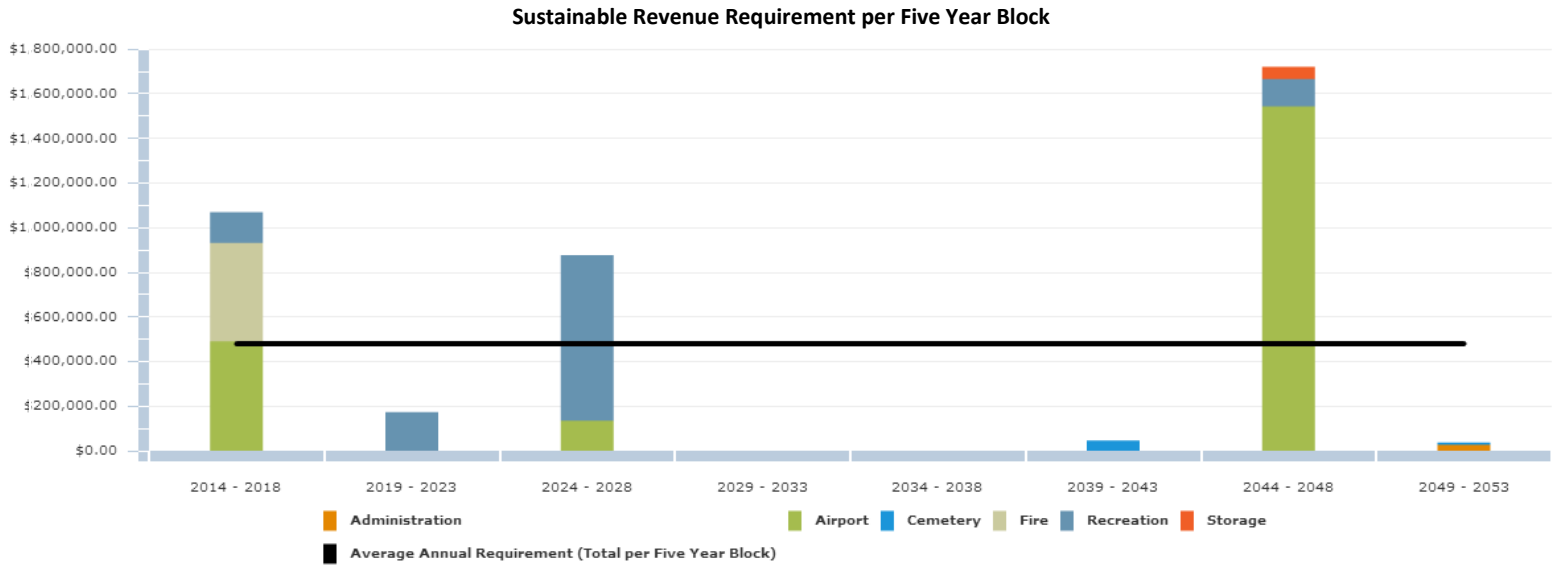
3.9.6 How much money do we need?

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

5. Replacement costs are based upon the "What is it worth" section above.
6. The timing for individual structure replacement was defined by the replacement year as described in the "When do you need to do it?" section above.
7. All values are presented in 2014 dollars.
8. The analysis was run for a 40 year period to ensure all assets cycled through at least one iteration of replacement, therefore providing a sustainable projection.

3.9.7 How do we reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain The Township of Armstrong's facilities is **$96,000**. Based on The Township of Armstrong's current annual funding of **$0**, there is an annual **deficit of $96,000**. As such, the township 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 township's facilities, based on age data only, have a significant percentage in critical or poor condition. There are needs to be addressed within the next 5 years totaling approximately $1.1 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.

3.9.8 Recommendations

The township received an overall rating of 'F' for its facilities, 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 facilities and their components (structural, architectural, electrical, mechanical, site, etc.) should be undertaken, as described further within the "Asset Management Strategy" section of this AMP.
- 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 % 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 Land Improvements

D	F	F
CONDITION vs. PERFORMANCE GRADE	FUNDING vs. NEED GRADE	INFRASTRUCTURE REPORT CARD GRADE

3.10 Land Improvements

3.10.1 What do we own?

The Township of Armstrong is responsible for the following land improvements inventory:

Land Improvements Inventory		
Asset Type	Asset Component	Quantity/Units
Land Improvements	Fencing	1.00
	Lighting	248.00

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

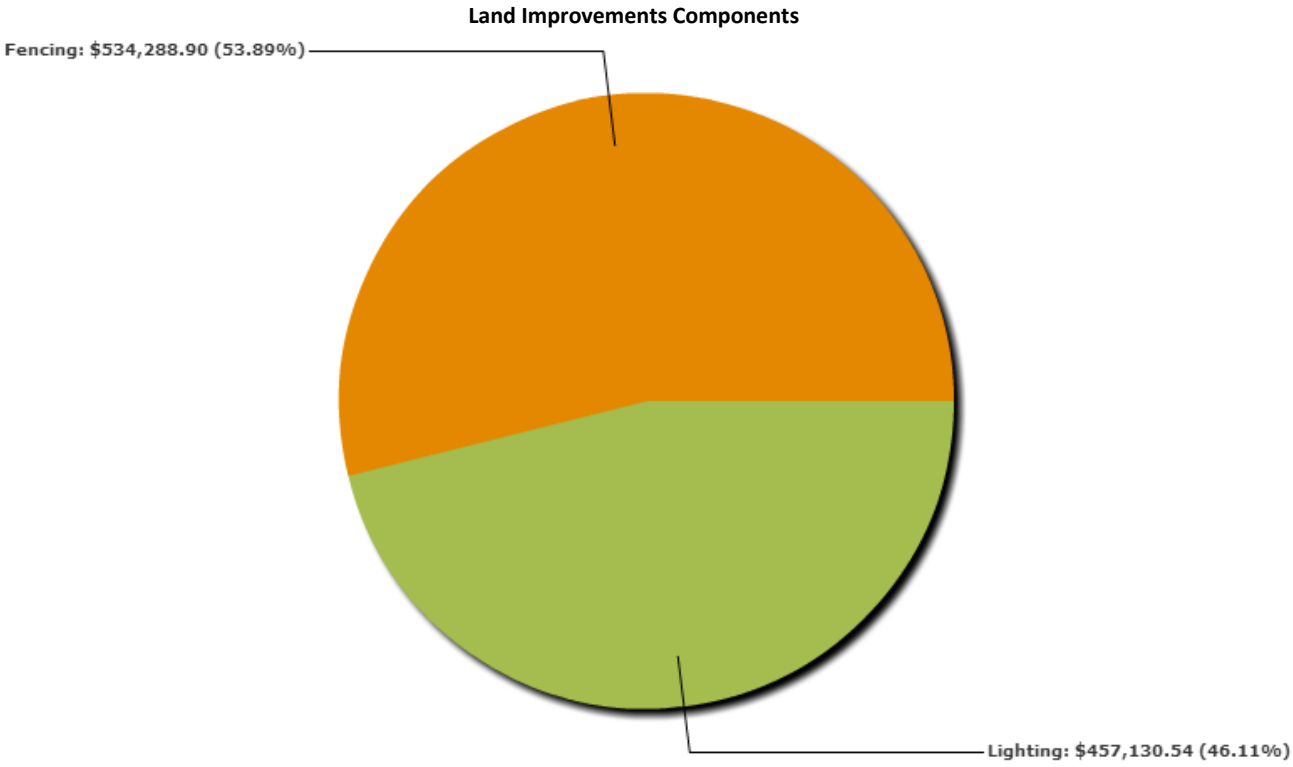
3.10.2 What is it worth?

The estimated replacement value of all land improvements, in 2014 dollars, is $991 thousand. The cost per household for the Land Improvements is $1,853 based on 535 households.

Land Improvements Replacement Value				
Asset Type	Asset Component	Quantity/Units	2014 Unit Replacement Cost	2014 Overall Replacement Cost*
Land Improvements	Fencing	1.00	NRBCPI	$534,289
	Lighting	248.00	NRBCPI	$457,131
				$991,420

***Note**: Replacement Cost as of 2014-02-28 using NRBCPI inflation measure

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?

Based on age analysis only, nearly 54% of the township's land improvements are in fair condition, with the remaining in critical condition. As such, the township received a Condition vs. Performance rating of 'D'.

3.10.4 What do we 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 land improvements 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

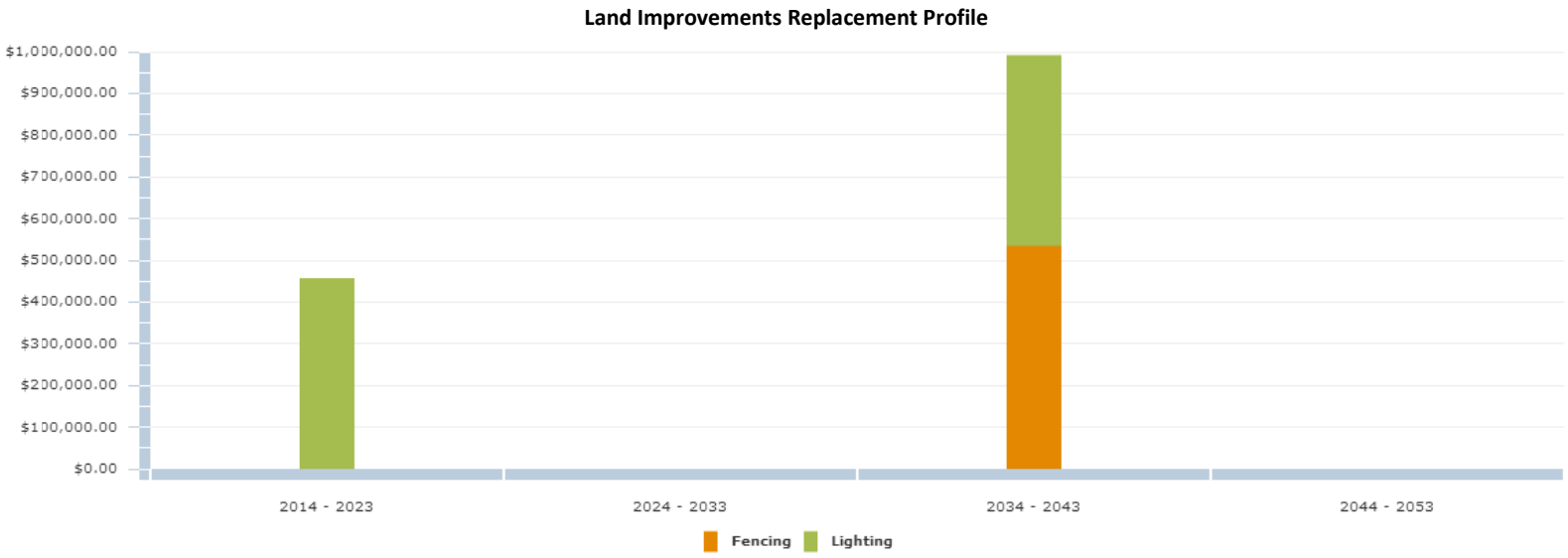
3.10.5 When do we need to do it?

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
Land Improvements	Fencing	40
	Lighting	20

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.



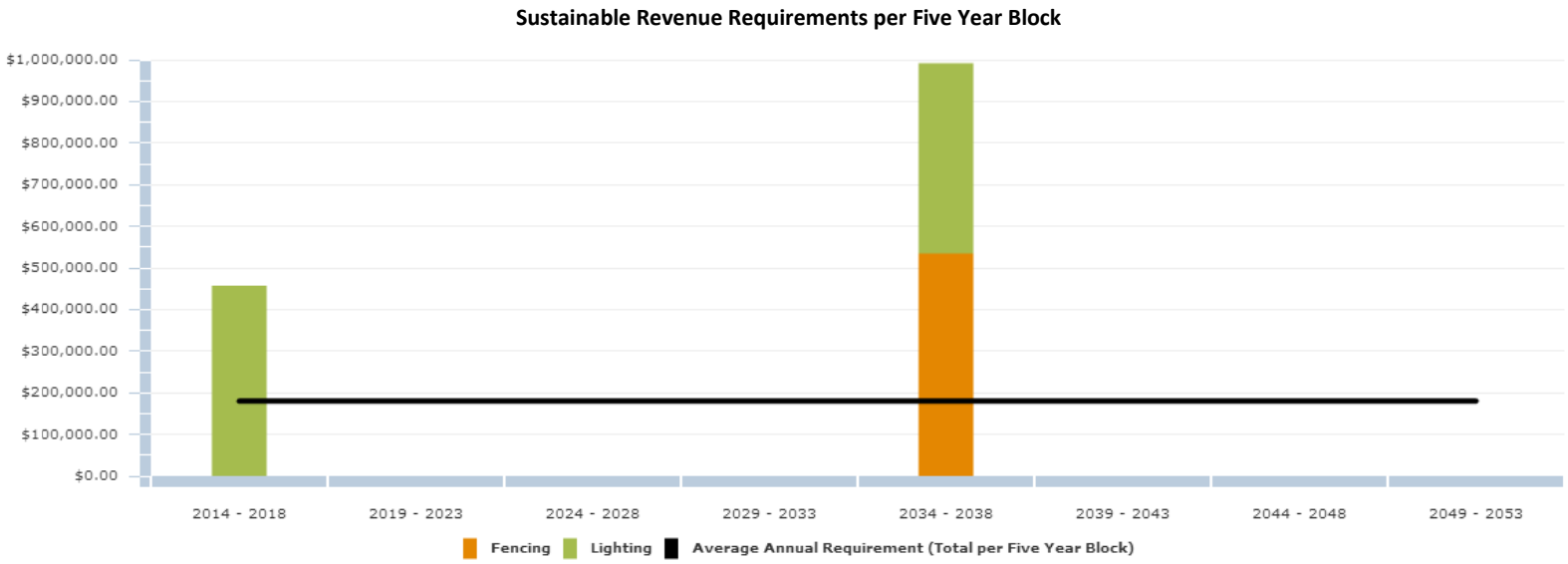
3.10.6 How much money do we need?

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 do you need to do it?" section above.
3. All values are presented in 2014 dollars.
4. The analysis was run for a 40 year period to ensure all assets went through at least one iteration of replacement, therefore providing a sustainable projection.

3.10.7 How do we reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain The Township of Armstrong's land improvements is approximately **$36,000**. Based on The Township of Armstrong's current annual funding of **$0**, there is a **deficit of $36,000**. Given this deficit, the township 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 Township of Armstrong's land improvements are in fair condition generally, based on age data only, with approximately 46% in poor or critical condition. There are needs to be addressed within the next 5 years totaling approximately $457 thousand, mainly associated with parking lots.

A condition 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. It should be noted, although the types of assets and infrastructure included within this category are unique and specialized, a general approach to condition assessment and life cycle management is discussed further in the Asset Management Strategy portion of this Asset Management Plan.

3.10.8 Recommendations

The township received an overall rating of 'F' for its Land Improvements, 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 Land Improvements should be undertaken as described further within the "Asset Management Strategy" section of this AMP.
- 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 % 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.

3.11 Machinery & Equipment

F	F	F
CONDITION vs. PERFORMANCE GRADE	FUNDING vs. NEED GRADE	INFRASTRUCTURE REPORT CARD GRADE

3.11 Machinery & Equipment

3.11.1 What do we own?

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

Machinery & Equipment Inventory

Asset Type	Asset Component	Quantity/Units
Machinery & Equipment	Airport	17.00
	Computers	21.00
	Electrical	1.00
	Fire Department	88.00
	Furniture	12.00
	Mechanical	27.00
	Medium Duty	1.00
	Printers	6.00

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

3.11.2 What is it worth?

The estimated replacement value of the equipment class, in 2014 dollars, is $1.4 million. The cost per household for the sanitary network is $2,666 based on 535 households.

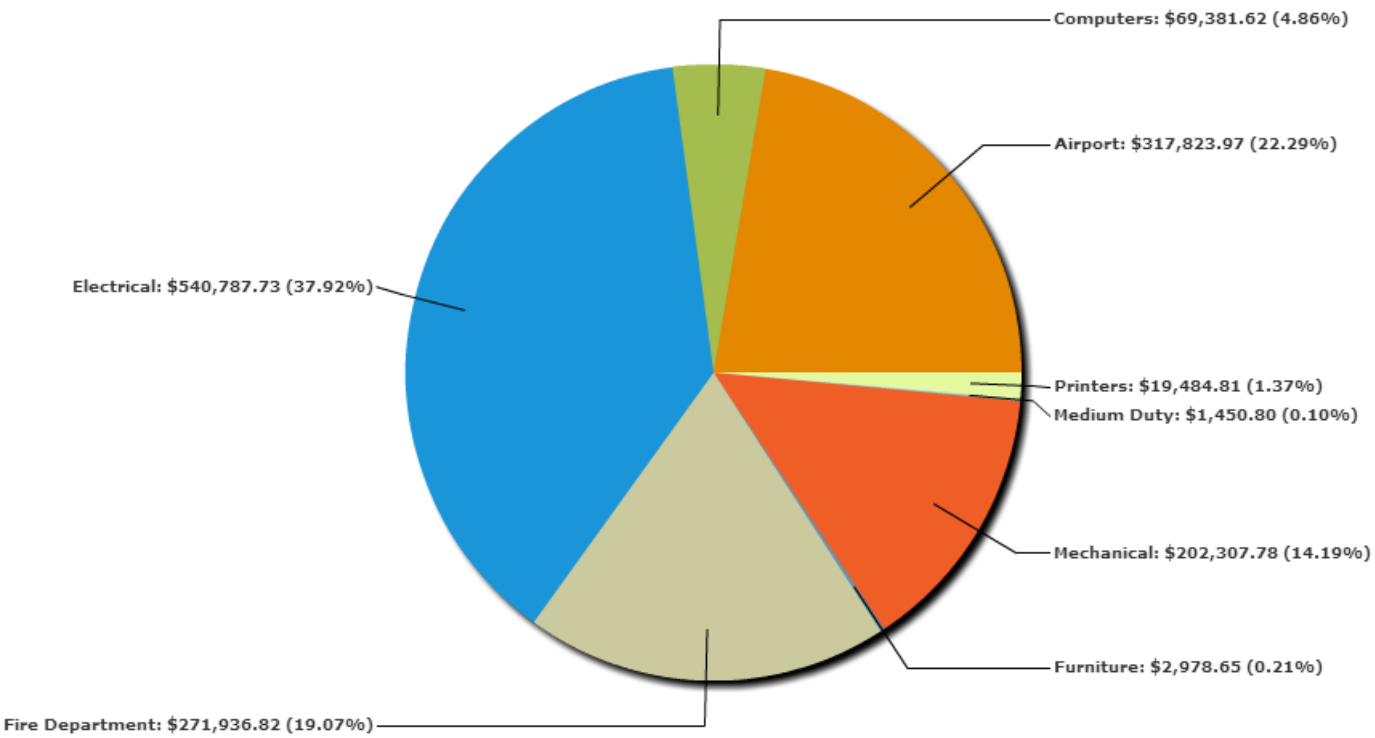
Machinery & Equipment Replacement Value

Asset Type	Asset Component	Quantity/ Units	2014 Unit Replacement Cost	2014 Overall Replacement Cost*
Machinery & Equipment	Airport	17.00	CPI Tables	$317,824
	Computers	21.00	CPI Tables	$69,382
	Electrical	1.00	CPI Tables	$540,788
	Fire Department	88.00	CPI Tables	$271,937
	Furniture	12.00	CPI Tables	$2,979
	Mechanical	27.00	CPI Tables	$202,308
	Medium Duty	1.00	CPI Tables	$1,451
	Printers	6.00	CPI Tables	$19,485
				$1,426,154

***Note**: Replacement Cost as of 2014-01-01 using CPI (ON) inflation measure

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

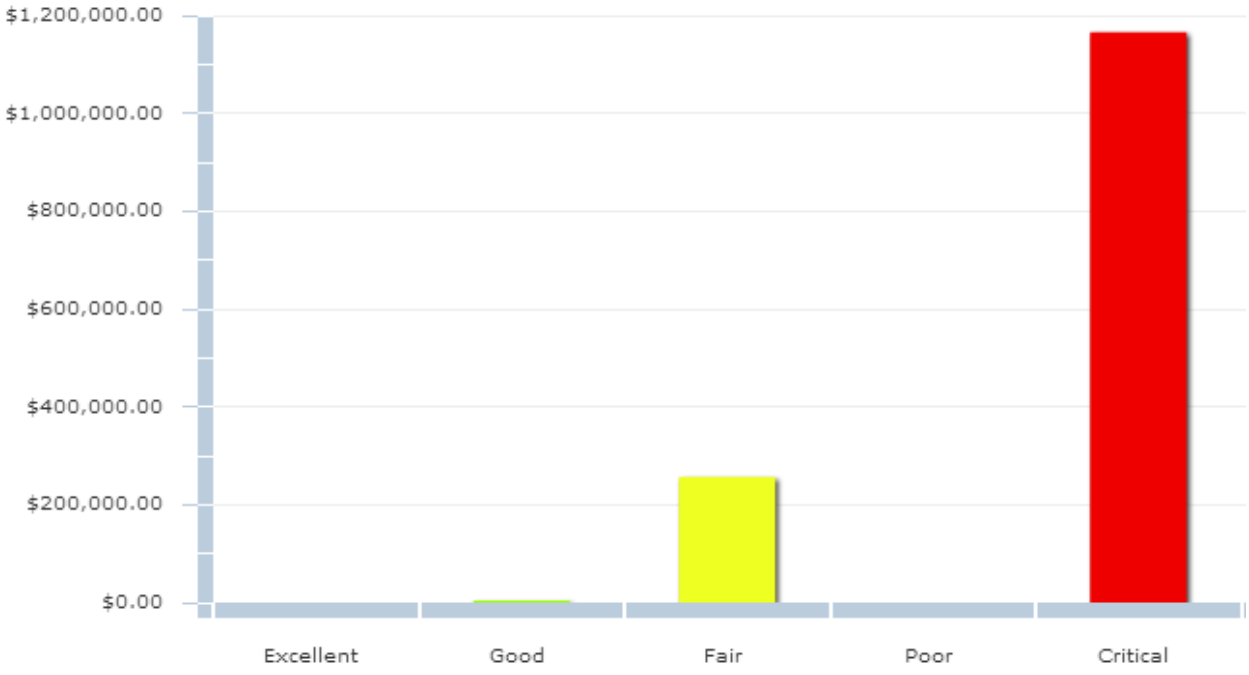
Machinery & Equipment Class Components



3.11.3 What condition is it in?

Based on age analysis only, approximately 82% of the township's machinery & equipment is in critical to poor condition. As such, the township received a Condition vs. Performance rating of 'F'.

Machinery & Equipment Condition by Replacement Cost



3.11.4 What do we 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

3.11.5 When do we need to do it?

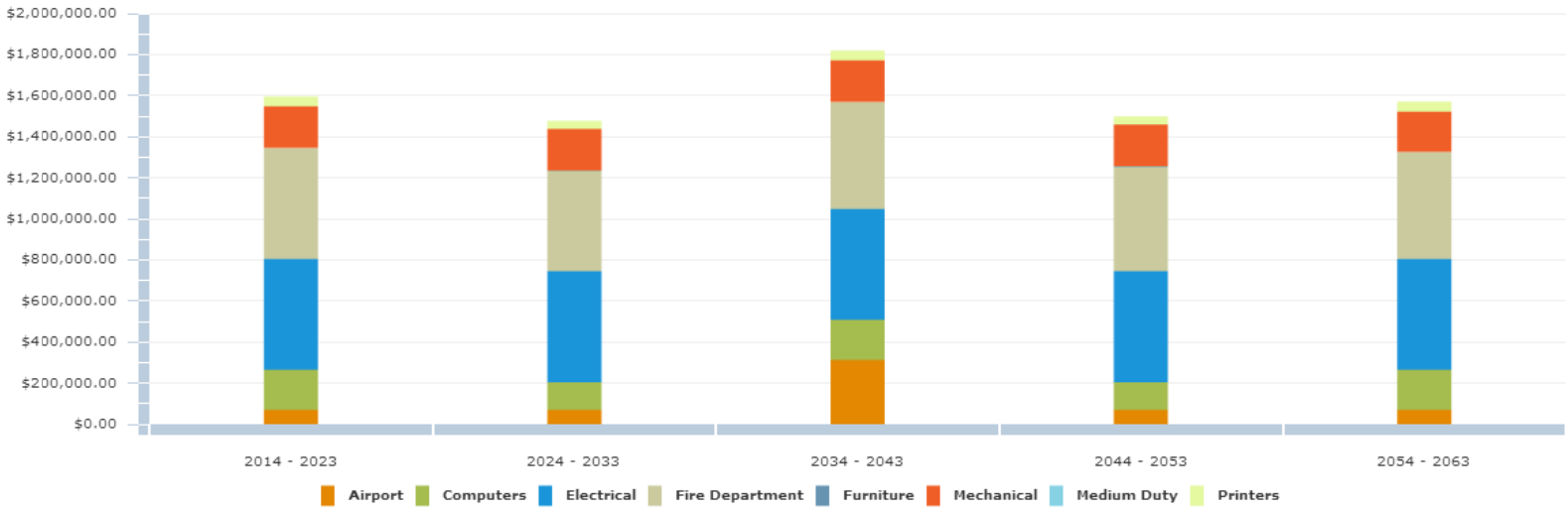
For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial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

Asset Useful Life in years

Asset Type	Asset Component	Useful Life in Years
Machinery & Equipment	Airport	10, 12, 15, 40
	Computers	4, 10
	Electrical	10
	Fire Department	2, 3, 4, 5, 10
	Furniture	10, 20
	Mechanical	10, 12, 50
	Medium Duty	50
	Printers	4, 5

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.

Machinery & Equipment Replacement Profile



3.11.6 How much money do we need?

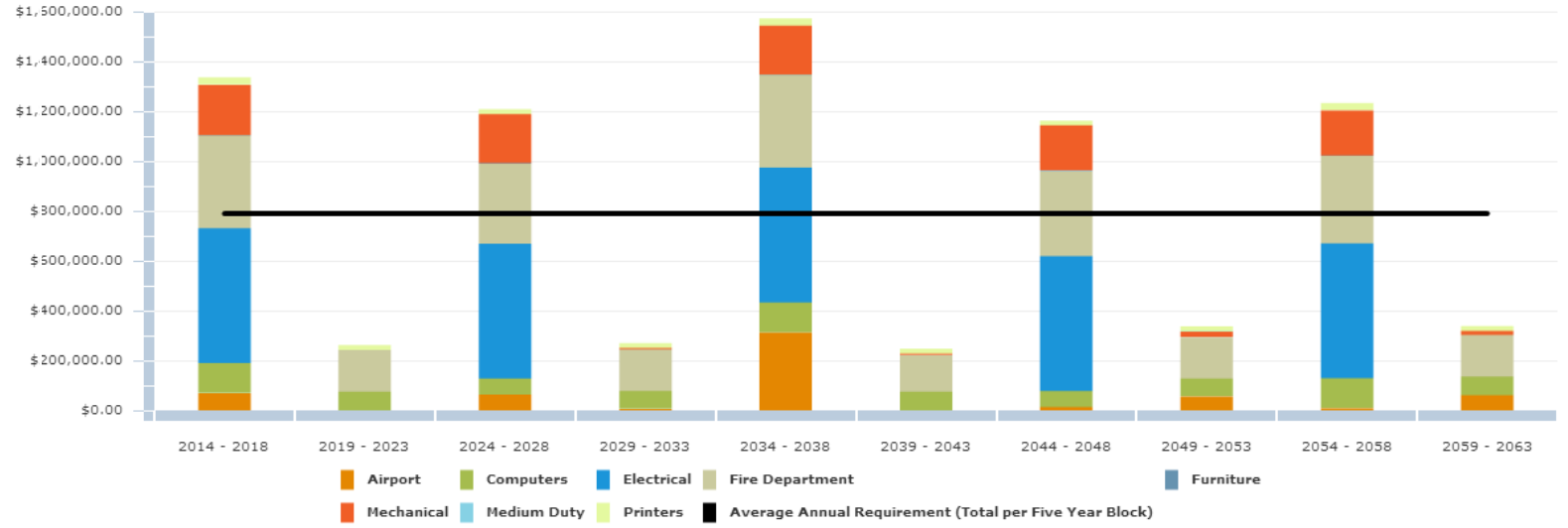
The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for individual sewer main replacement was defined by the replacement year as described in the "When do you need to do it?" section above.
3. All values are presented in 2014 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.

3.11.7 How do we reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain The Township of Armstrong's equipment class is approximately **$158,000**. Based on The Township of Armstrong's current annual funding of **$0**, there is an annual **deficit of $158,000**. Given this deficit, the township 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 82% of the equipment class, from an age based analysis only, is in poor or critical condition. There are replacement needs to be addressed within the next 5 years totaling approximately $1.3 million. A condition 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.

3.11.8 Recommendations

The township 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 % 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.

3.12 Vehicles

F	F	F
CONDITION vs. PERFORMANCE GRADE	FUNDING vs. NEED GRADE	INFRASTRUCTURE REPORT CARD GRADE

3.12 Vehicles

3.12.1 What do we own?

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

Vehicles class Inventory (Detailed)		
Asset Type	Asset Component	Quantity/Units
Vehicles	Heavy Duty	4.00
	Medium Duty	1.00
	Light Duty	5.00
	Rescue Vehicles	3.00

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

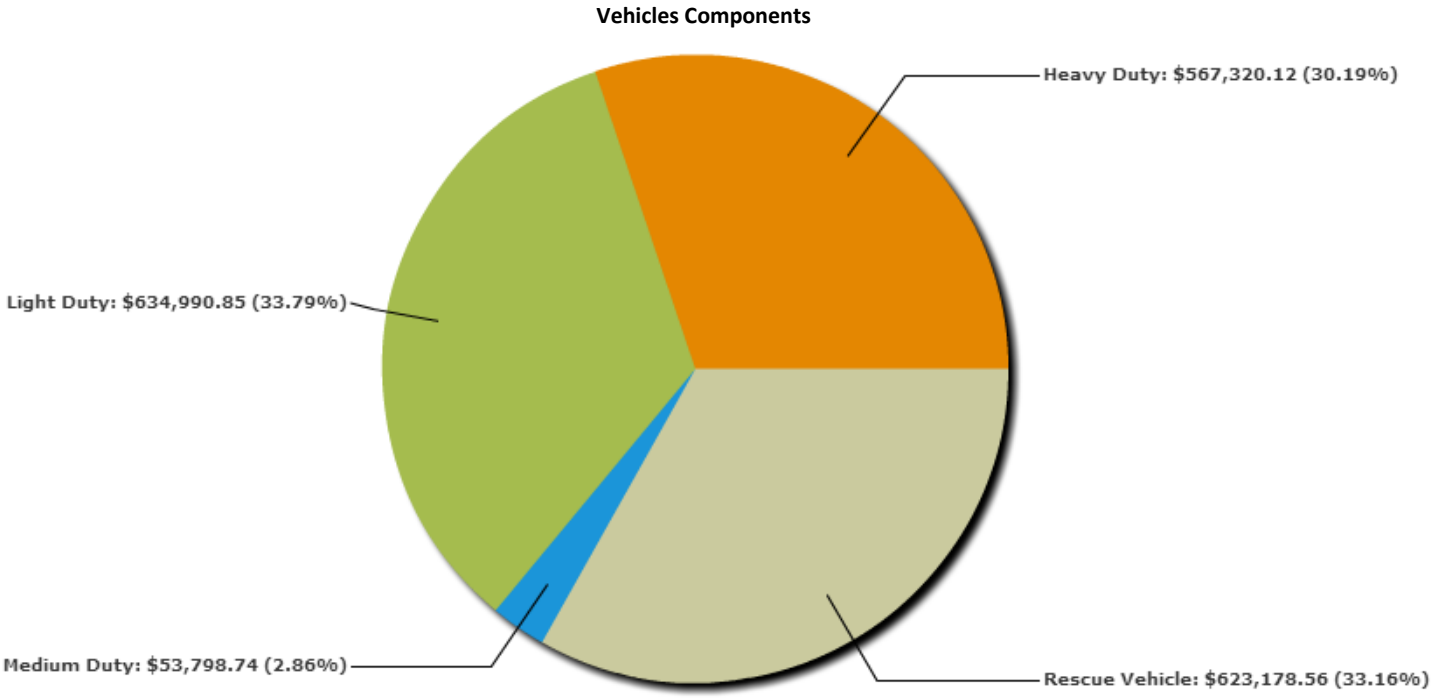
3.12.2 What is it worth?

The estimated replacement value of the rolling stock class, in 2014 dollars, is $1.9 million. The cost per household for the rolling stock class is $3,513 based on 535 households.

Vehicles Replacement Value				
Asset Type	Asset Component	Quantity/ Units	2014 Unit Replacement Cost	2014 Overall Replacement Cost*
Vehicles	Heavy Duty	4.00	CPI Tables	$567,320
	Medium Duty	1.00	CPI Tables	$53,799
	Light Duty	5.00	CPI Tables	$634,991
	Rescue Vehicles	3.00	CPI Tables	$623,179
				$1,879,289

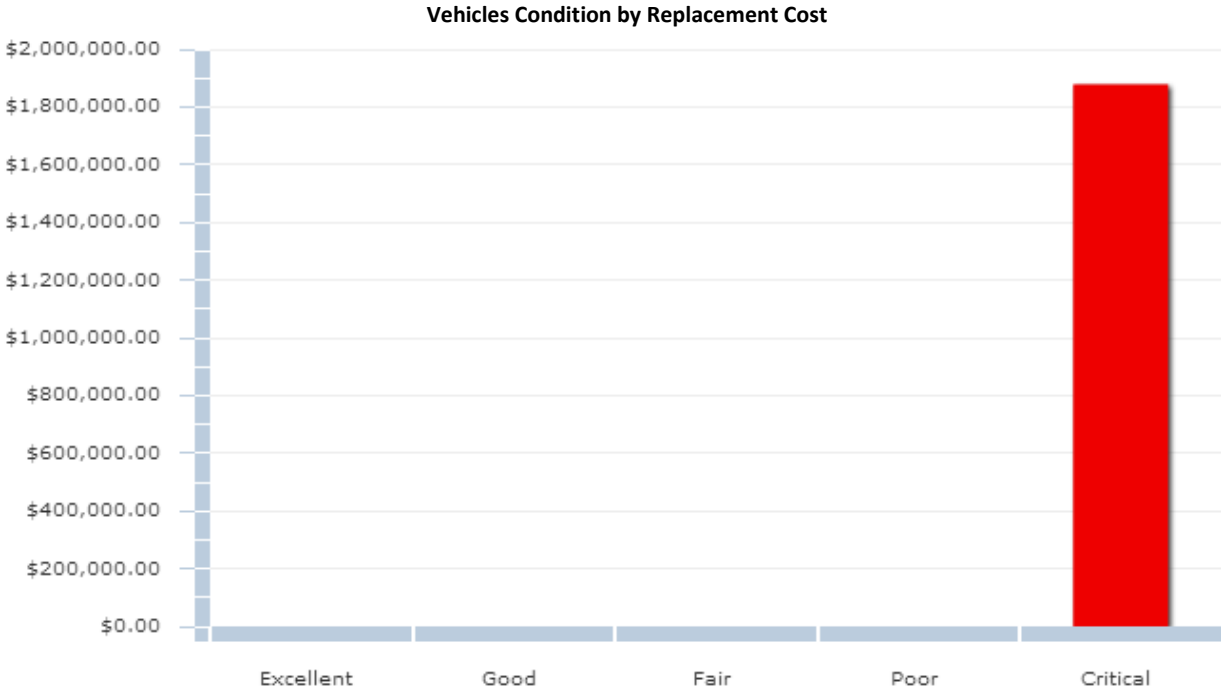
***Note**: Replacement Cost as of 2014-01-01 using CPI (ON) inflation measure

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



3.12.3 What condition is it in?

100% of the township's rolling stock is in critical condition based on age data only. As such, the township received a Condition vs. Performance rating of 'F'.



3.12.4 What do we 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 rolling stock 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

3.12.5 When do we need to do it?

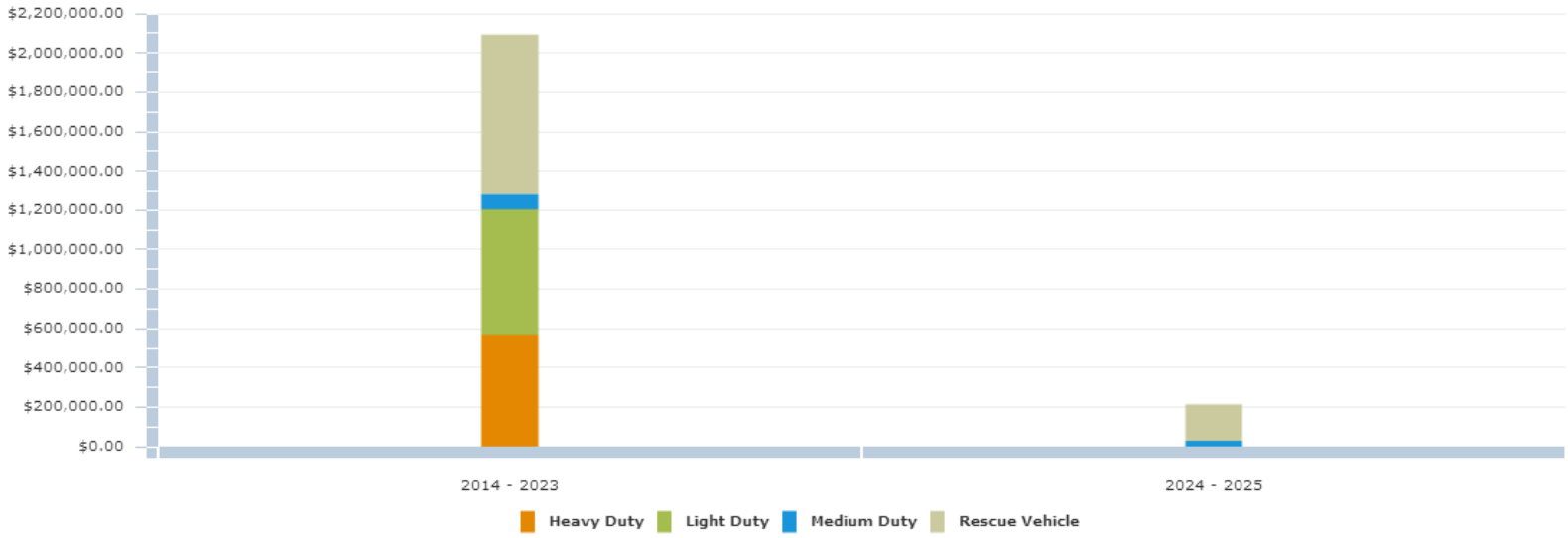
For the purpose of this report "useful life" data for each asset class was obtained from the accounting data within the CityWide software database. This proposed useful life is used to determine replacement needs of individual assets, which are calculated in the system as part of the overall financial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

Asset Useful Life in Years

Asset Type	Asset Component	Useful Life in Years
Vehicles	Heavy Duty	10, 12
	Medium Duty	5, 12
	Light Duty	10, 12
	Rescue Vehicles	5, 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 storm sewer main replacements based on the age of the asset only.

Vehicles Replacement Profile



3.12.6 How much money do we need?

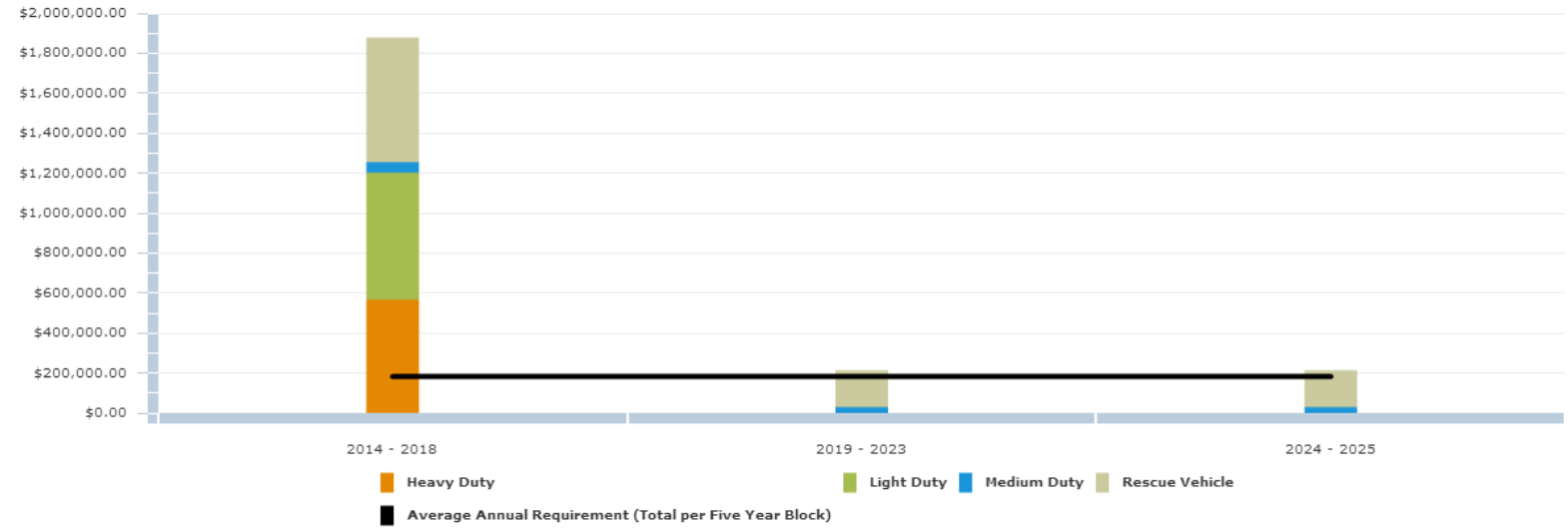
The analysis completed to determine capital revenue requirements was based on the following assumptions:

1. Replacement costs are based upon the unit costs identified within the "What is it worth" section above.
2. The timing for individual storm sewer main replacement was defined by the replacement year as described in the "When do you need to do it?" section above.
3. All values are presented in 2014 dollars.
4. The analysis was run for a 12 year period to ensure all assets went through one iteration of replacement, therefore providing a sustainable projection.

3.12.7 How do we reach sustainability?

Based upon the above assumptions, the average annual revenue required to sustain The Township of Armstrong's rolling stock class is approximately **$182,000**. Based on The Township of Armstrong's current annual funding of **$0**, there is an annual **deficit of $182,000**. As such, the township received a Funding vs. Need rating of 'F'.

Vehicles Replacement Profile per Five Year Block



In conclusion, The Township of Armstrong's fleet of vehicles, based on age data only, are in critical condition overall. There are replacement needs of the entire fleet to be addressed within the next 5 years totaling approximately $1.9 million. 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.

3.12.8 Recommendations

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

- A preventative maintenance and life cycle assessment program should be established for the rolling stock class 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 studies are complete or underway, the data should be loaded into the CityWide software and an updated "current state of the infrastructure" analysis should be generated.
- An appropriate % 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.