Roads Information Session

Infrastructure Services

November 20, 2023

Where you belong

Right of Ways, Road Structures & Municipal Comparitors

Know Your Numbers!

97
Structures

58
Bridges

39
Culverts

536 km
Municipal Drains

81 km
Storm Sewers

324 km
Total Roads

276 km
Hard Surfaced

48 km
Gravel

124 km
Asphalt

152 km
Tar & Chip

9
PW Operators

1
Mechanic

1429
Streetlights

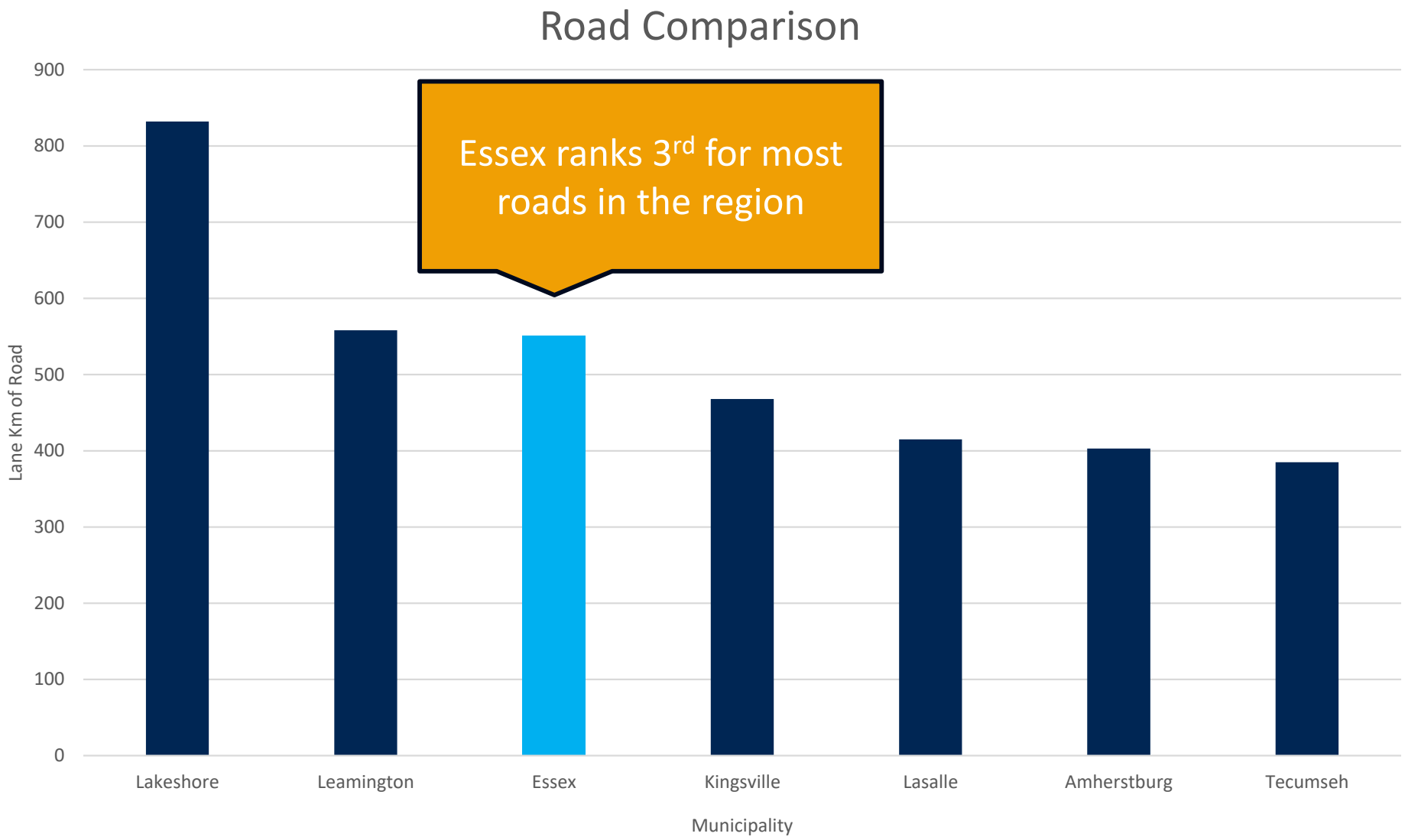
5
Traffic Signals

2,736
Street signs

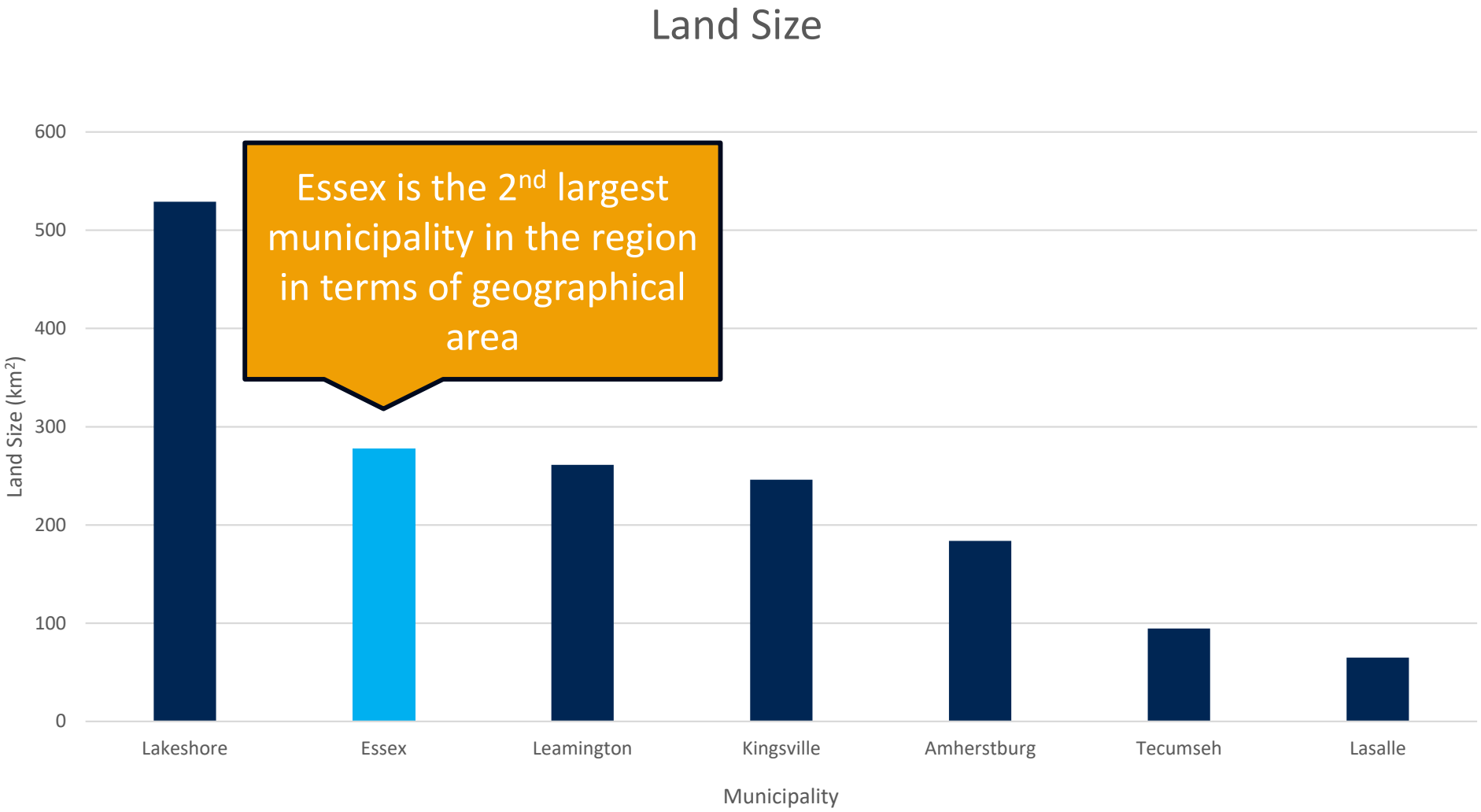
51 km
Sidewalk

essex

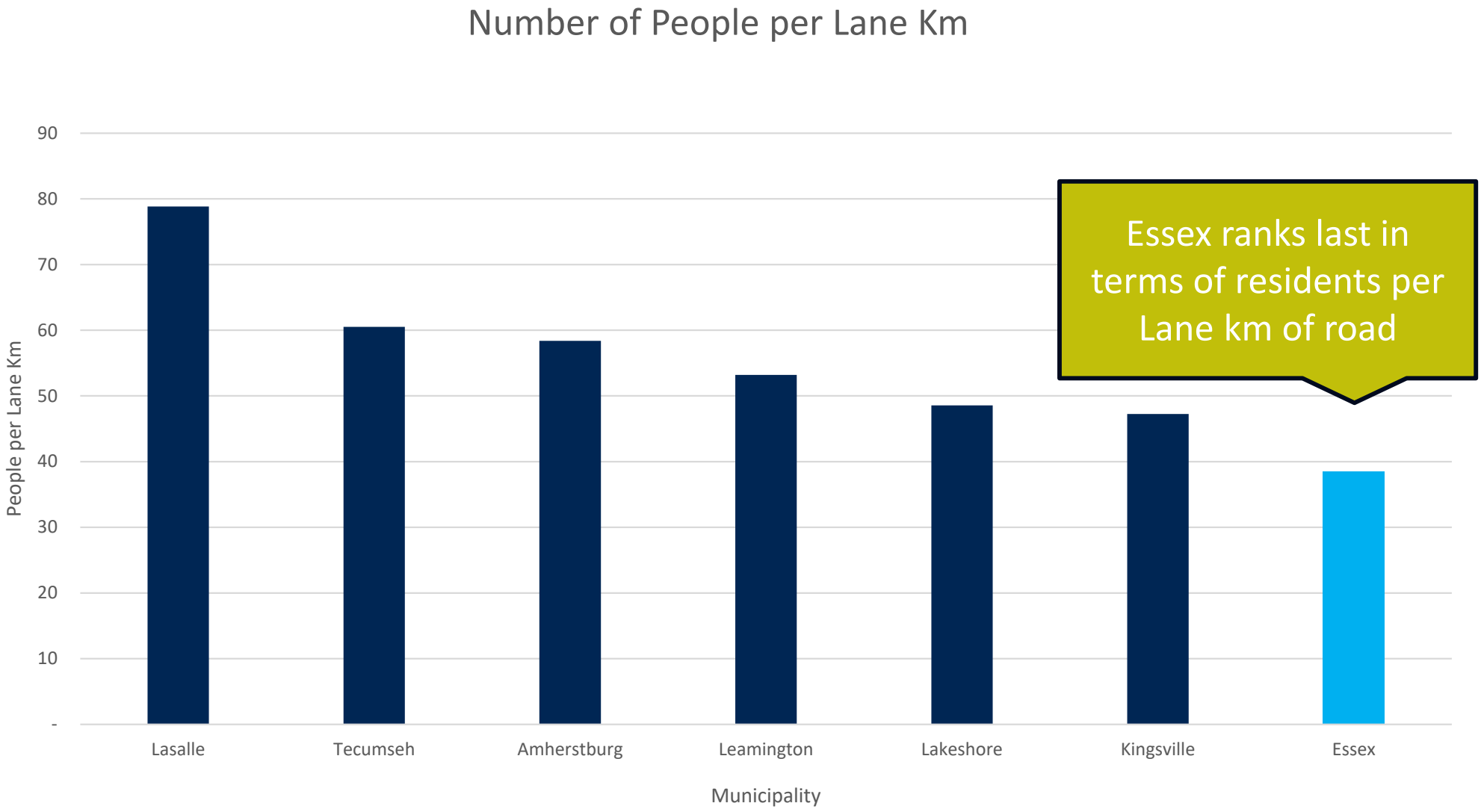
Regional Comparators



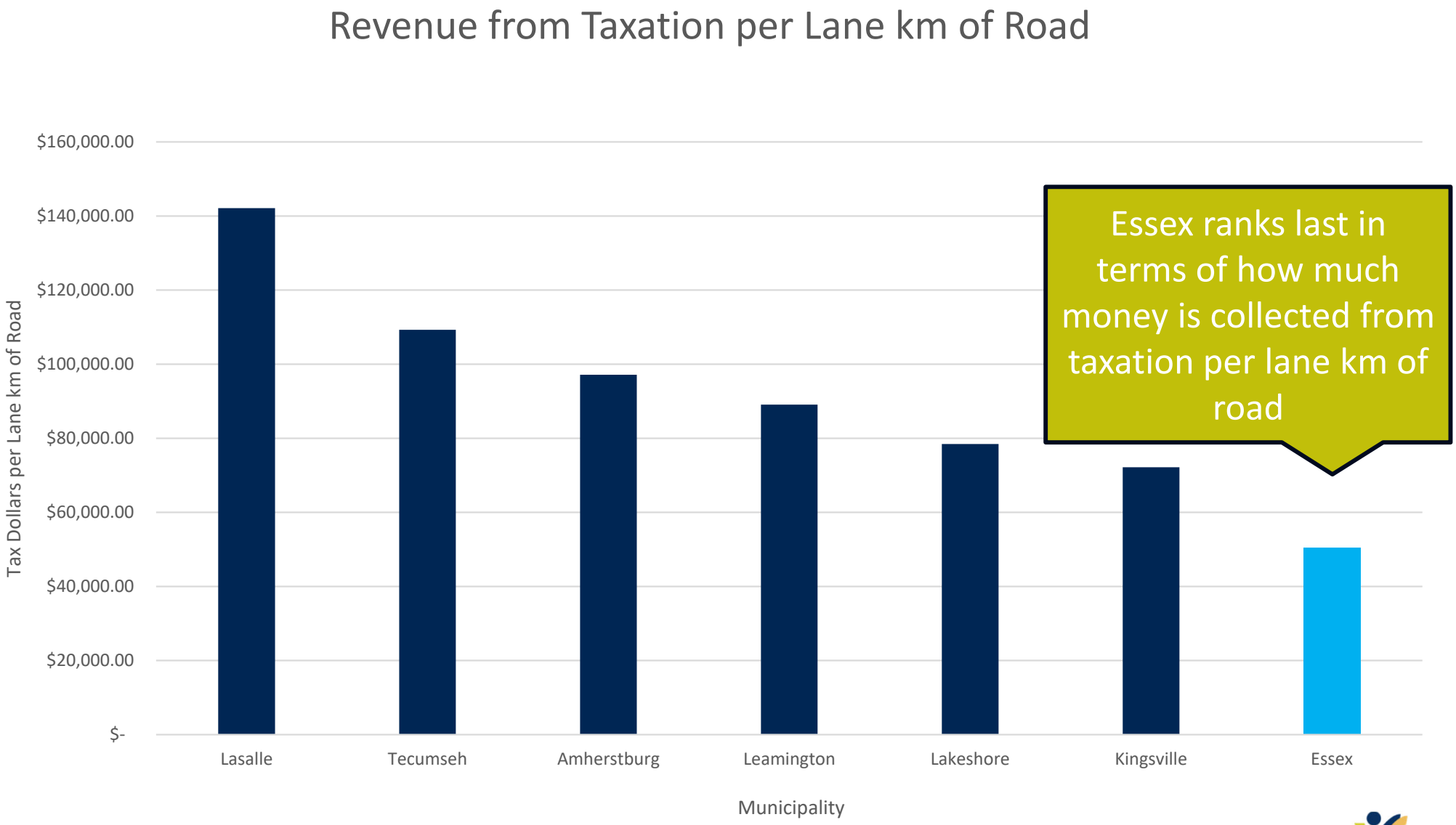
Regional Comparators



Regional Comparators

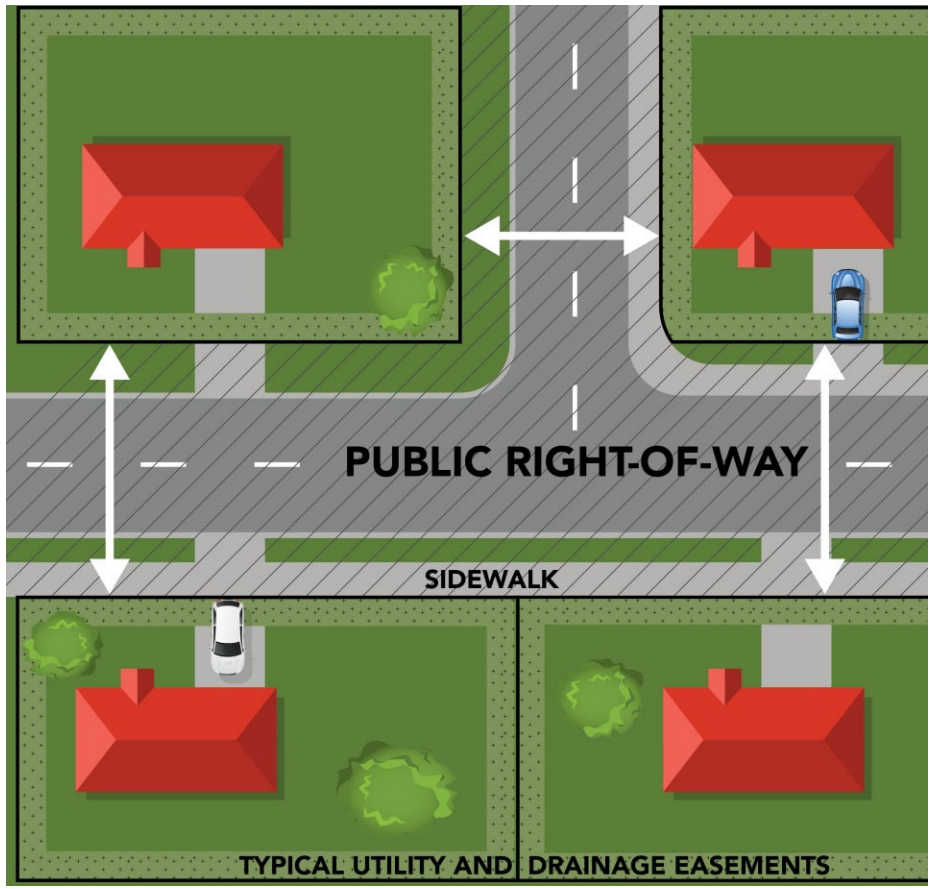


Regional Comparators



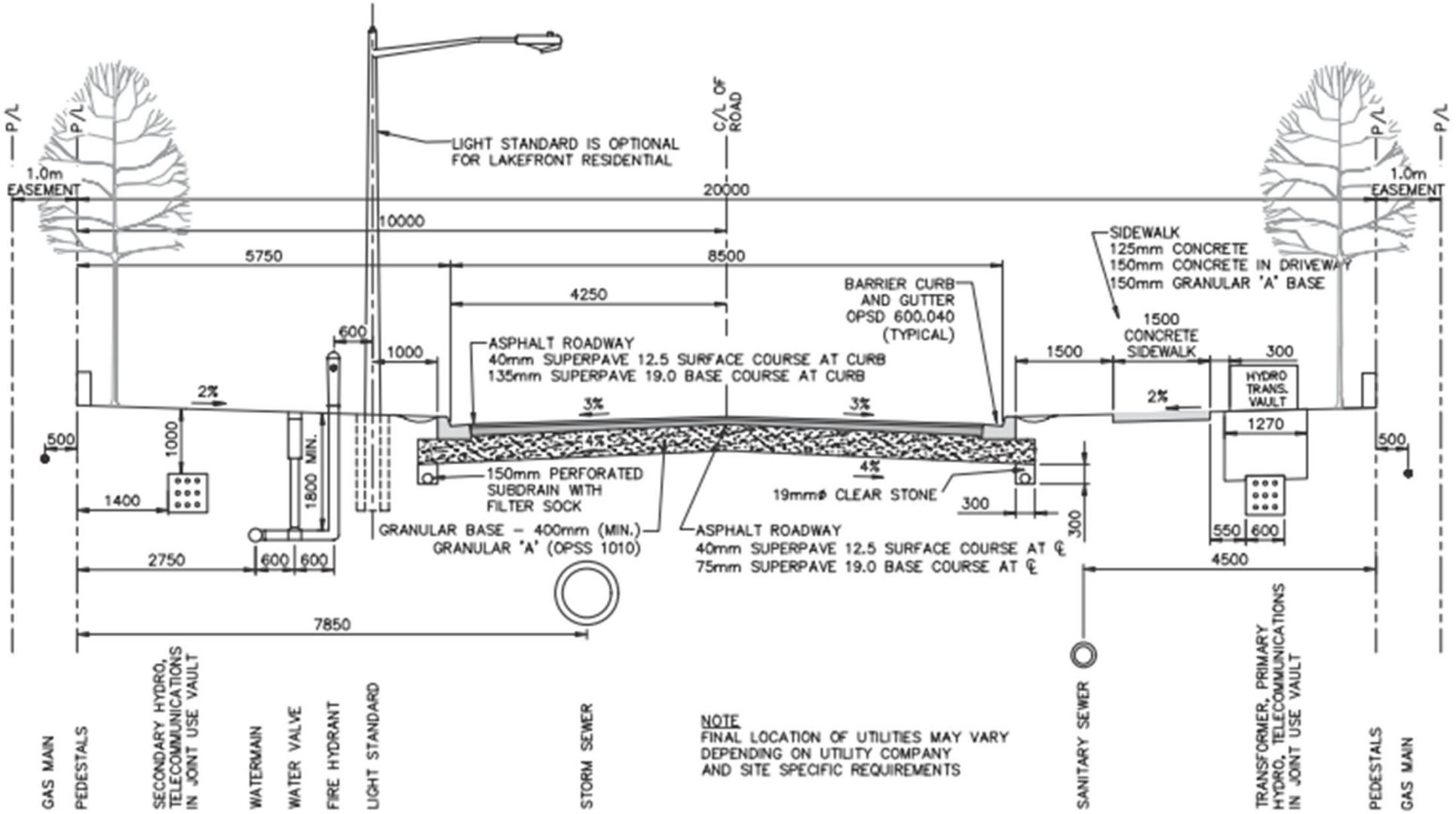
Municipal Right of Way

- Municipality owned land
- Also commonly referred to as *Road Allowance,* or *Highway*
- Common Purpose
  - Movement of people and vehicles
  - Access to private property
  - Transmission of municipal services



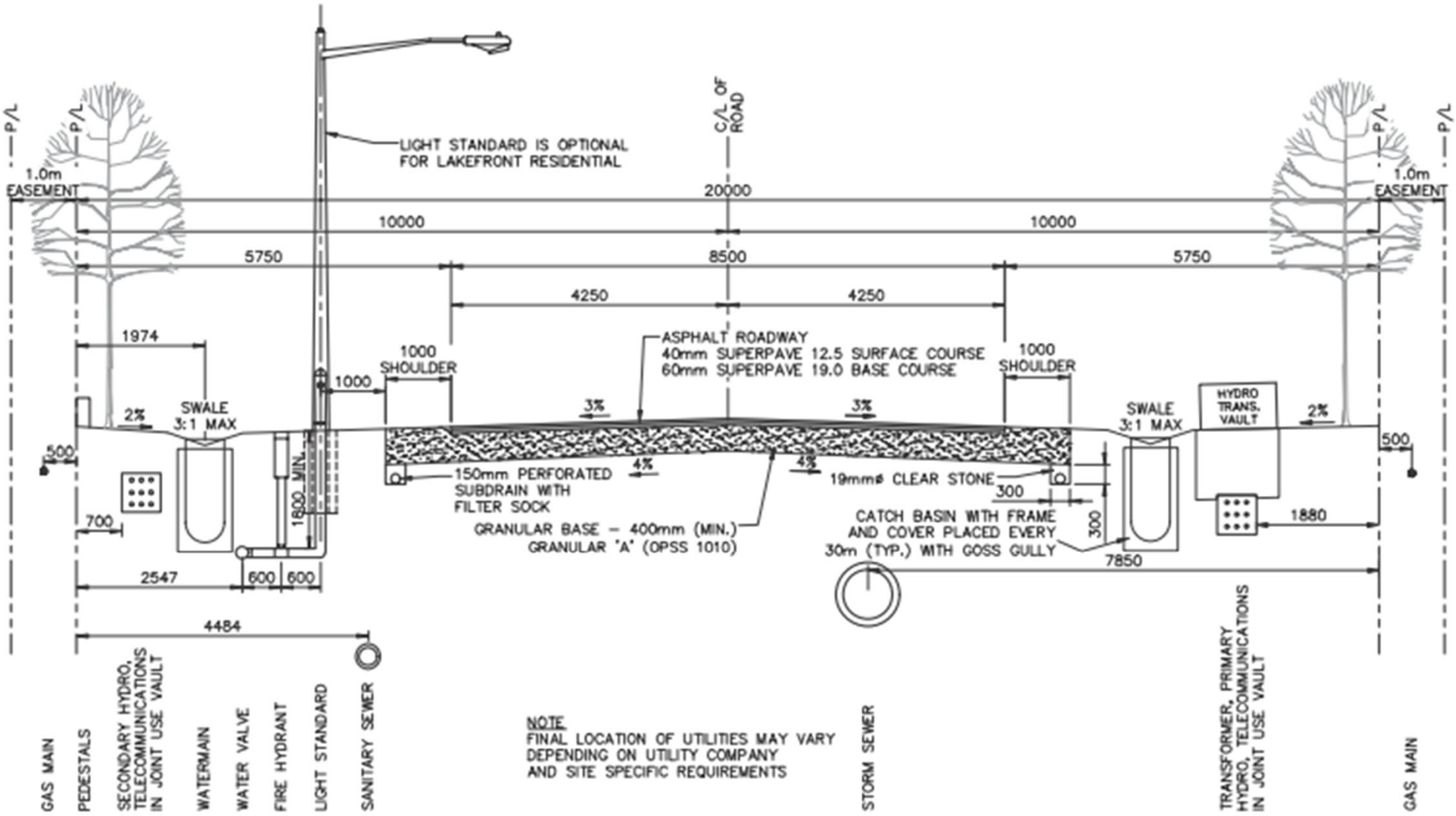
Town of Essex Right of Ways

Urban Cross-Section



Town of Essex Right of Ways

Semi-Urban Cross-Section



Types of Roads in Essex

Owned, Assumed Roads

- Town owns the lands;
- Town maintains these roads; and
- Roads meet town standards for road allowance width and road design.

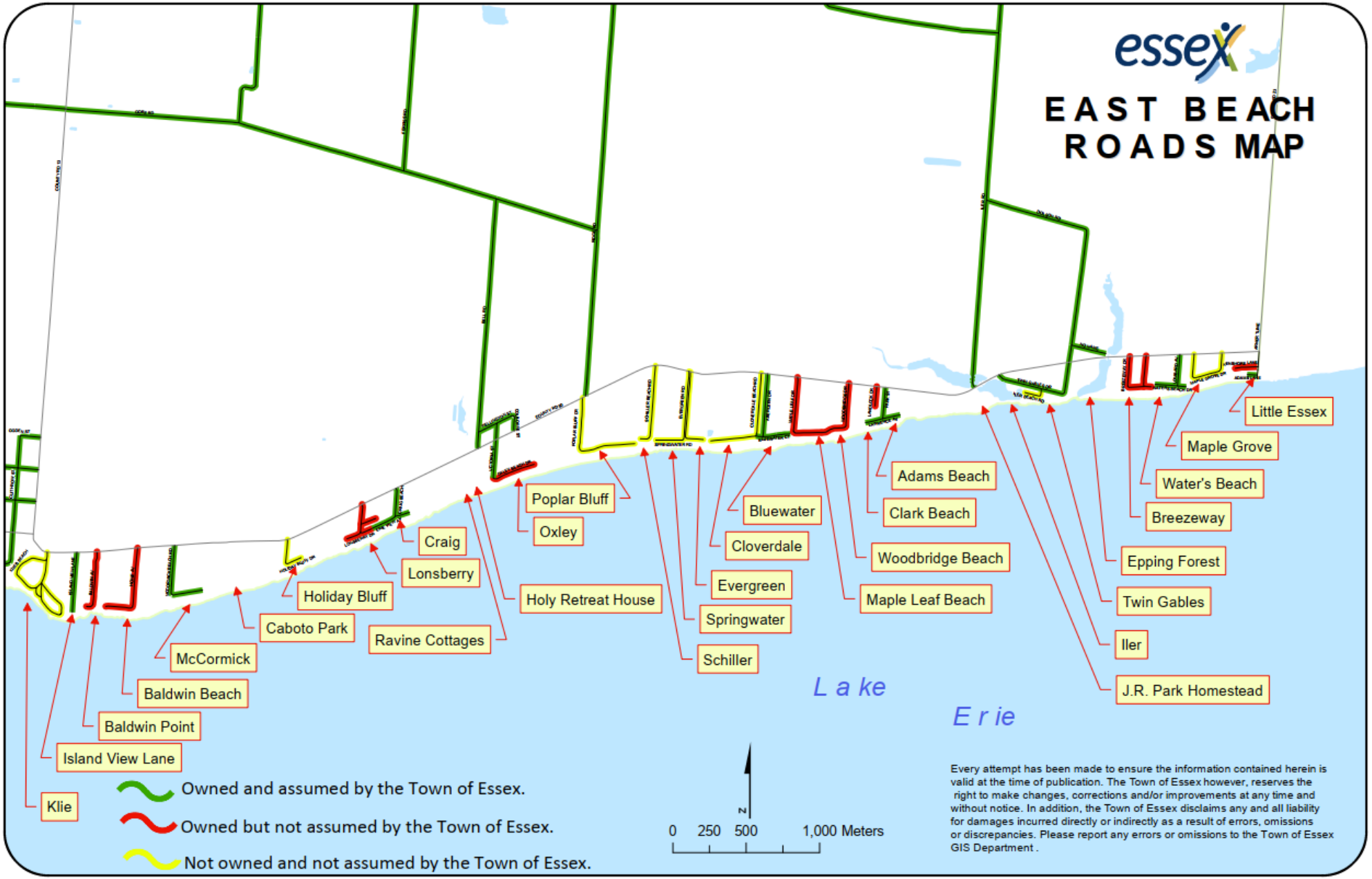
Owned, Not Assumed

- Town owns the lands;
- Town maintains these roads at a minimum standard; and
- Road does not meet town standards for road allowance width and/or road design.

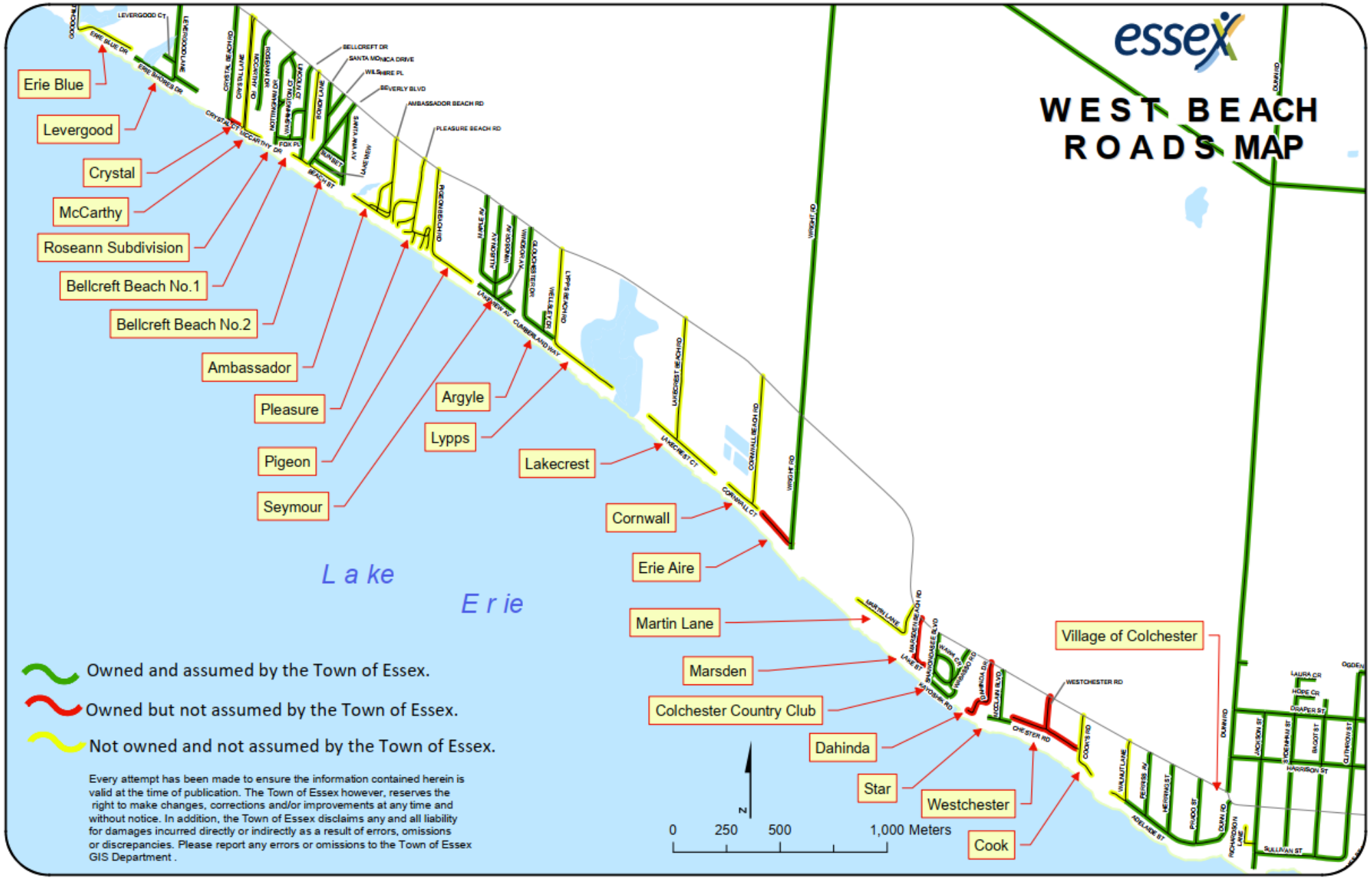
Private Roads

- Town does not own the lands;
- Town does not maintain these roads; and
- Are typically owned by a person or homeowners association.

Types of Roads in Essex

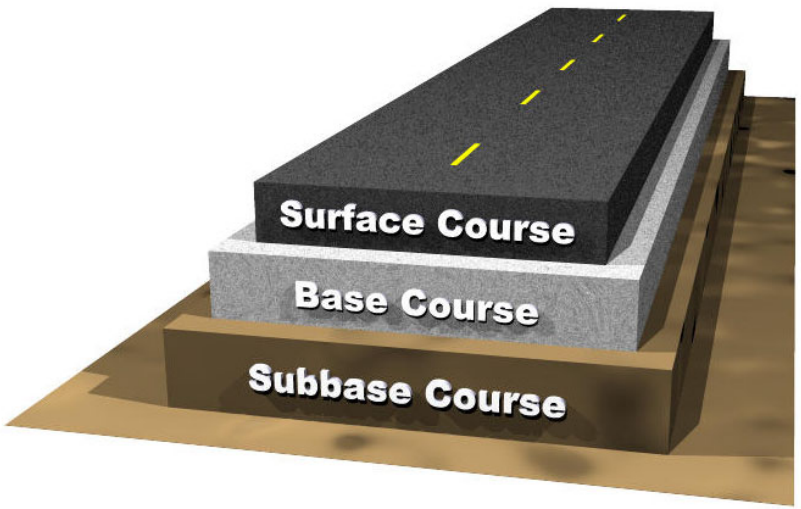


Types of Roads in Essex



Urban Pavement Standard

Asphalt



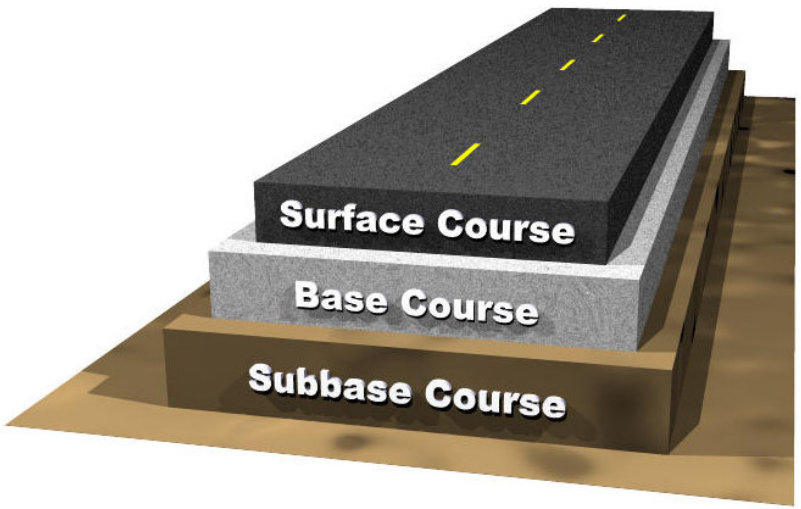
Approx.
$205,000
per km

Single lift;
No milling/removal;
No Profiling of road;
No culverts or shouldering.

- Typically made from a base course and surface (wearing) course
- Made from Asphalt Cement (AC), Aggregate & Sand
- Typically used on high volume traffic roads
- Typical lifecycle of 15-20 years.

Urban Pavement Standard

Asphalt



- Maintenance of Asphalt Roads include:
  - Crack Sealing
  - Patching
  - Mill and Pave
    - Replacement of surface course

Rural Pavement Standard

Tar & Chip

Approx.
$105,000
per km

Three lifts;
No Profiling of road;
No Pulverizing/Removal;
No culverts or shouldering.

- Layer of Asphalt Cement (AC) with embedded aggregate
- Typically used on low volume traffic roads with minor deviations in existing platform
- Rural roads receive 3 lifts
- Typical lifecycle of 7 years

Rural Pavement Standard

Tar & Chip

- Maintenance of Tar & Chip Roads include:
  - Crack Sealing
  - Spray Patching (Edge repair)
  - Surface Overlay

Rural Pavement Improvement

Recycled Paving

Approx.
$350,000
per km

Includes 3 lifts of Tar & Chip;
No profiling of road;
No culverts or shouldering.

- Green construction practice
- Reclaimed asphalt is mixed with emulsion and placed on existing road.
- Pretreatment may require asphalt profiling
- Road still requires surface treatment
- Typically used in applications where there is little sub-base, or other limiting factors (ie. concrete)
- Lifecycle of surface tar & chip is 7 years
- Increase in lifecycle of road base of 15-20 years

essex

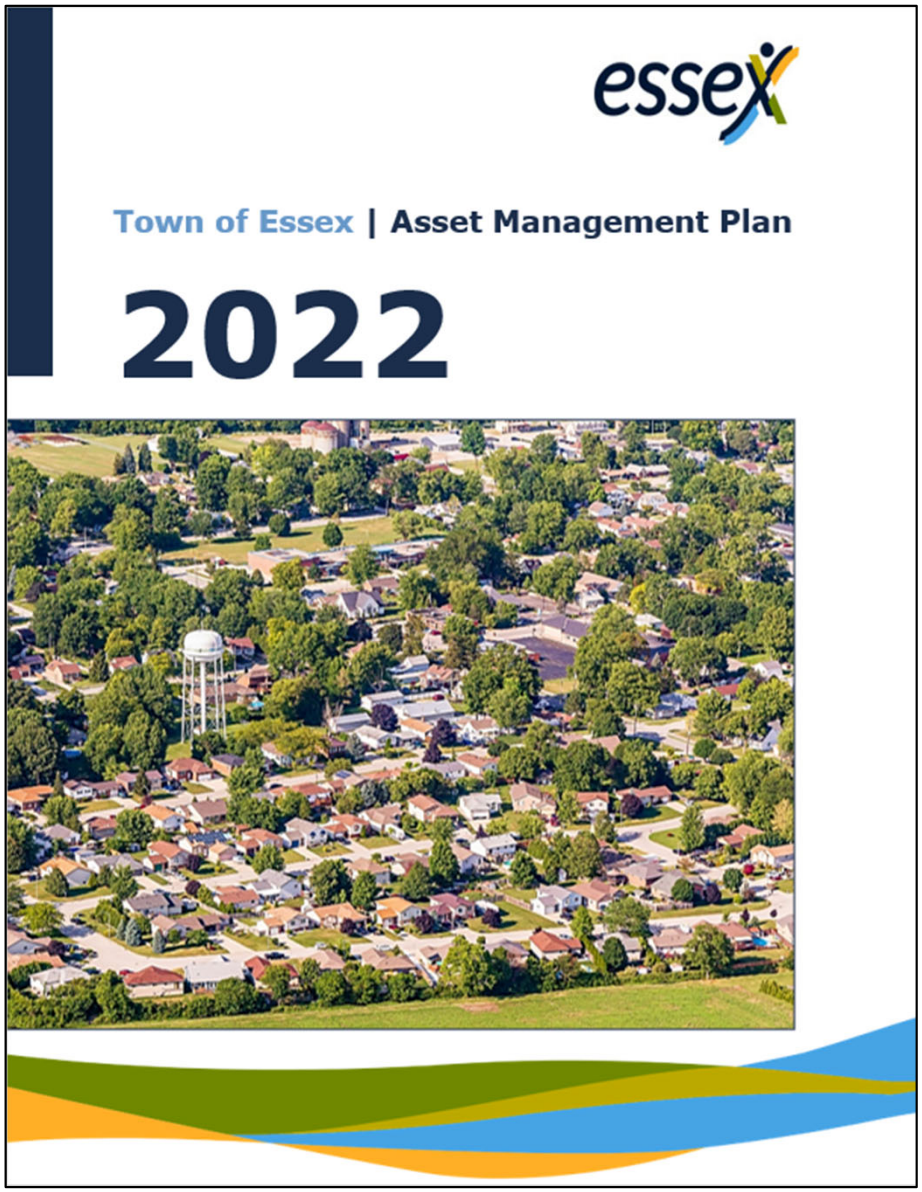
Rural Pavement Improvement

Recycled Paving

- Maintenance Includes:
  - Same as tar and chip
    - Crack Sealing
    - Spray Patching
    - Overlay

Asset Management & Funding

Asset Management Plan

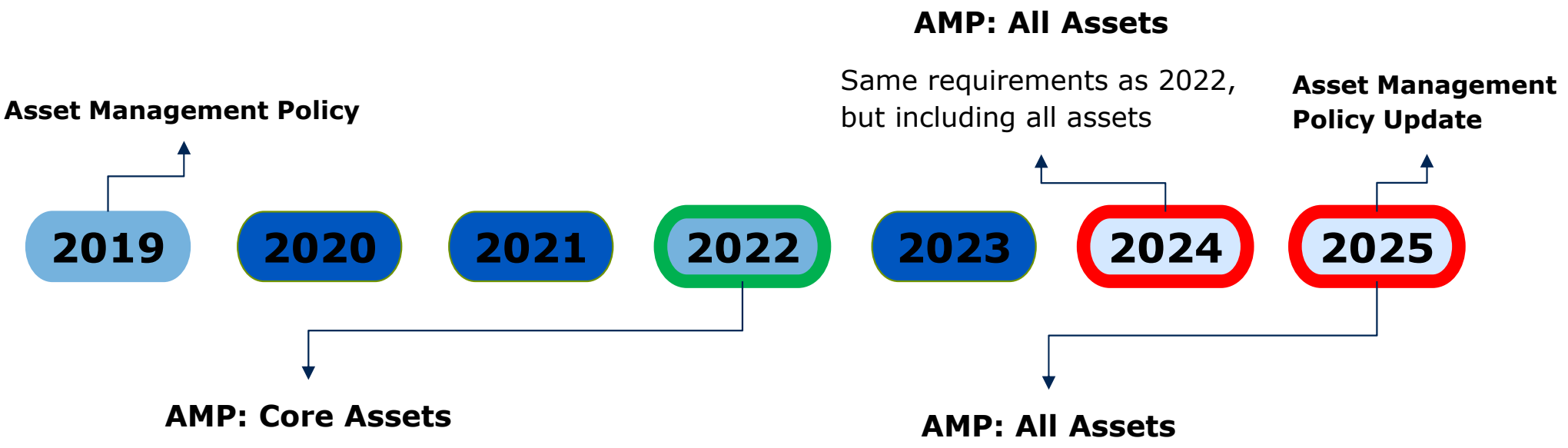


- O.Reg 588/17 Compliant (Core Assets)
- Includes vital analysis
  - Risk and Criticality
  - Lifecycle Strategies
  - Levels of Service

essex

Asset Management Plan

Ontario Regulation 588/17



1. Current levels of service
2. Inventory analysis
3. Lifecycle activities to sustain LOS
4. Cost of lifecycle activities
5. Population and employment forecasts
6. Discussion of growth impacts

1. Proposed levels of service for the next 10 years
2. Updated inventory analysis
3. Lifecycle management strategy
4. Financial strategy and addressing shortfalls
5. Discussion of how growth assumptions impacted lifecycle and financial strategy

Asset Management Plan

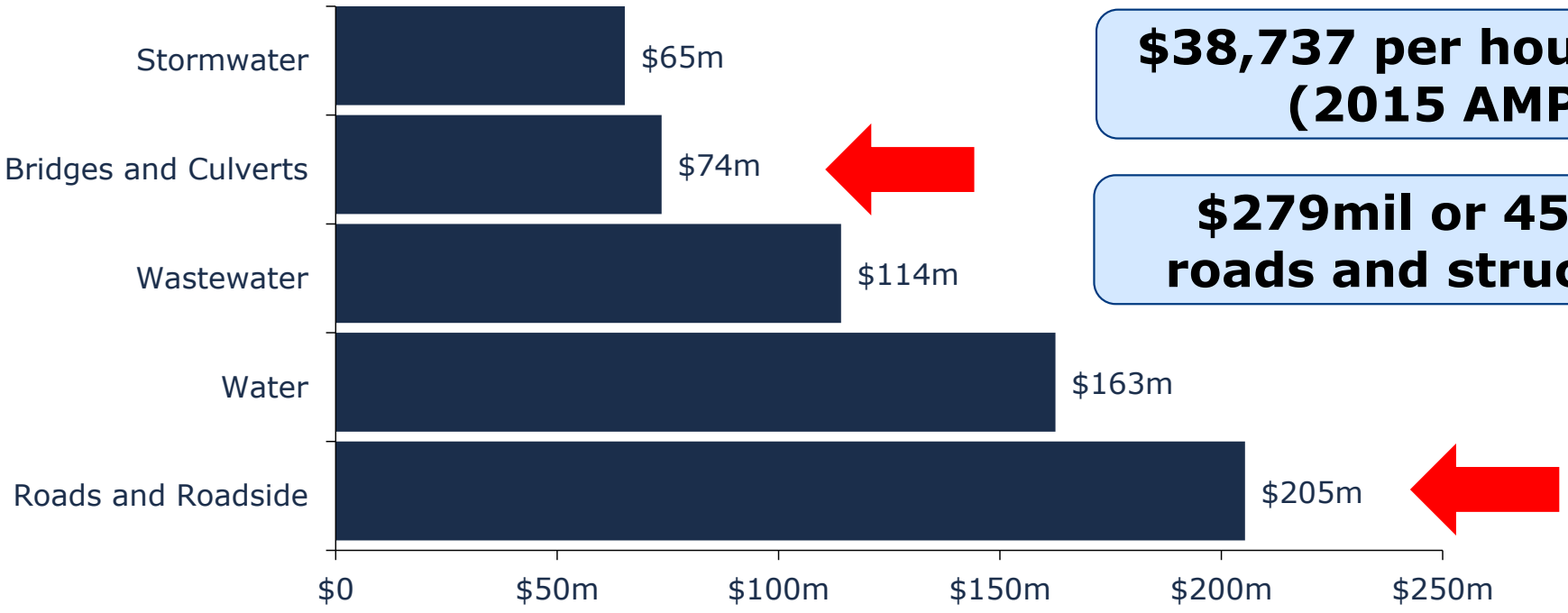
Replacement Costs

Total = $621 million

$74,003 per household (2022 AMP)

$38,737 per household (2015 AMP)

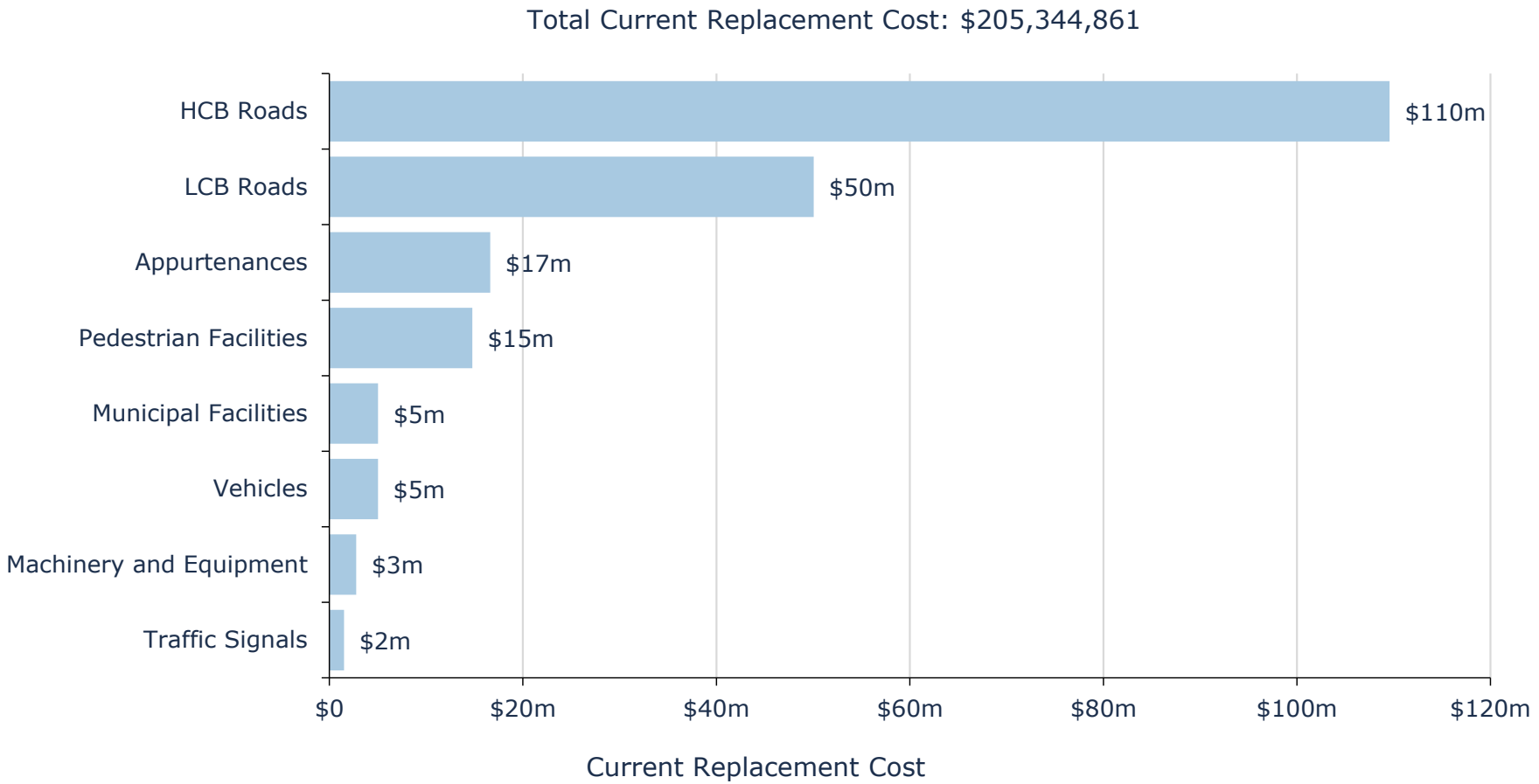
$279mil or 45% is roads and structures



Asset Management Plan

Replacement Costs

Gravel Roads not included

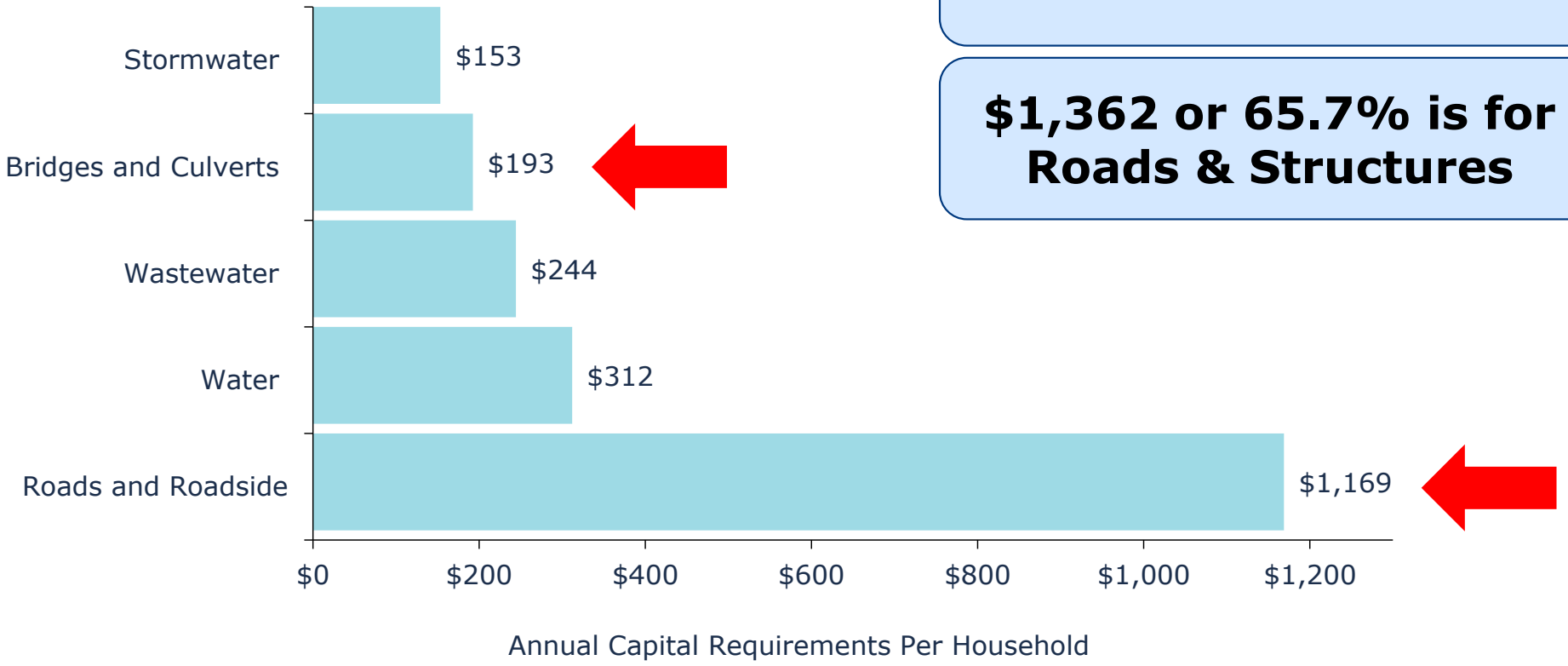


Asset Management Plan

Annual Capital Requirements per Household

$2,071 per household

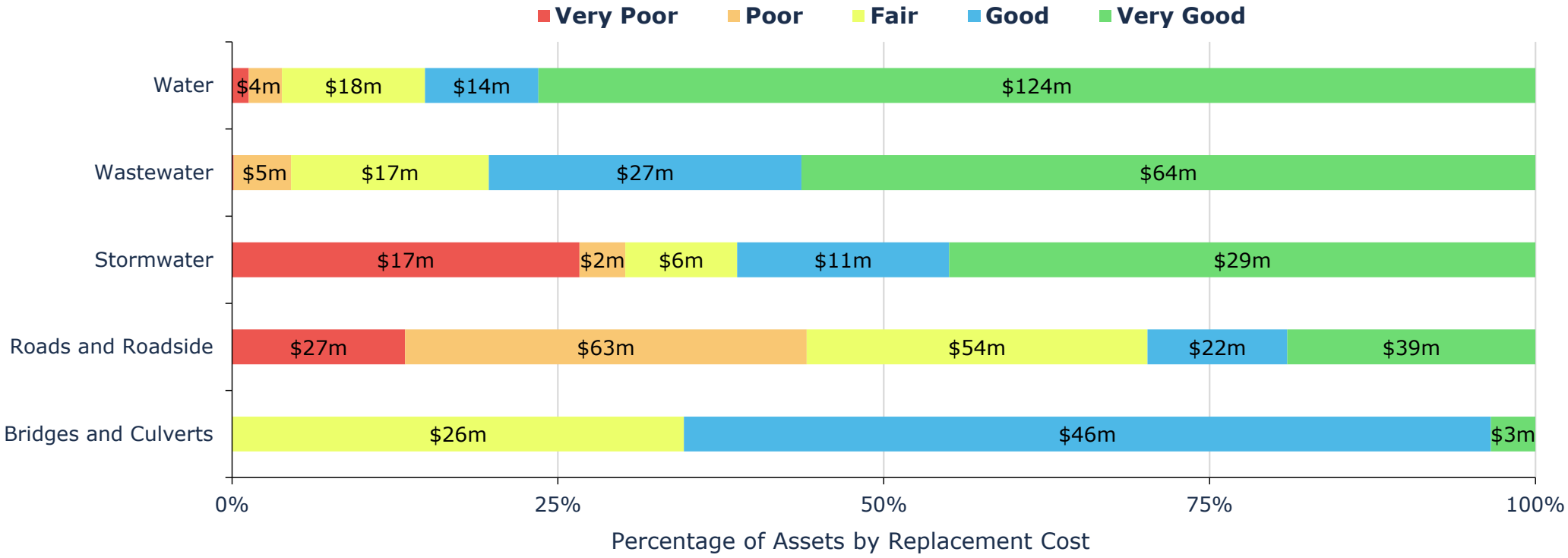
$1,362 or 65.7% is for Roads & Structures



Roads Condition

Overall Condition of Assets

80% assets are in fair or better condition



Roads make up the majority of Poor to Fair assets (Greatest lifecycle investment and maintenance needs)

Capital & Operations Decision Making

Capital Decision Making

Factors that are reviewed by Administration

- Lifecycle Analysis
- Pavement Condition
- Strategic Plan Initiatives
- Risk Analysis & Funding
- Other Servicing Needs
  - Wastewater Sewers
  - Stormwater Sewers and Floodproofing
  - Watermains
  - Bridges and Culvert Repairs/Replacements
  - Municipal Drainage
  - 3rd Party Utilities (Gas, Hydro, Telecom)
- Traffic Use & Road Hierarchy (Road Classification)
- Safety Needs and Features
- Future Growth Needs
- Development Impacts
- Operational Needs
- Active Transportation Needs
- Climate Change and Town CCAP
- Changes in Traffic Flows and Speed Limit Changes
- Speed Limits
- Equity amongst Wards (intentionally last)

Lifecycle Analysis

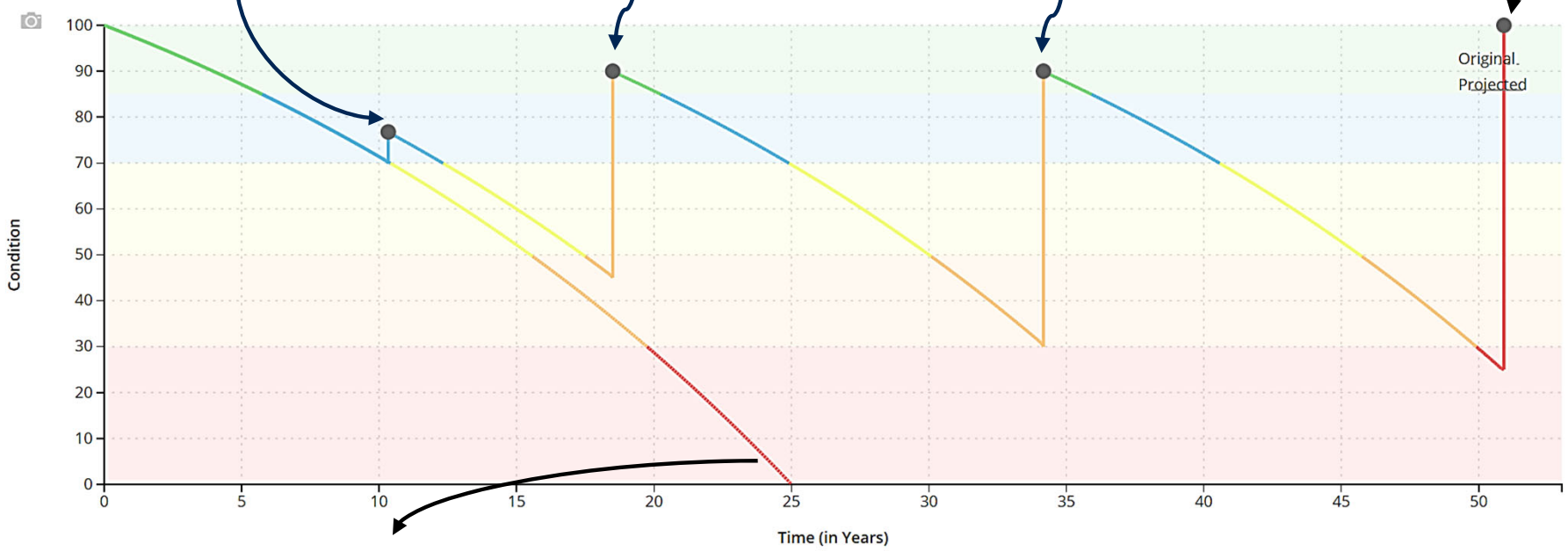
Lifecycle Strategies for a Paved Road

Road Reconstruction
(with lifecycle activities)
$3,578,221

Crack Sealing

Mill and Pave

Asphalt Full Depth Removal

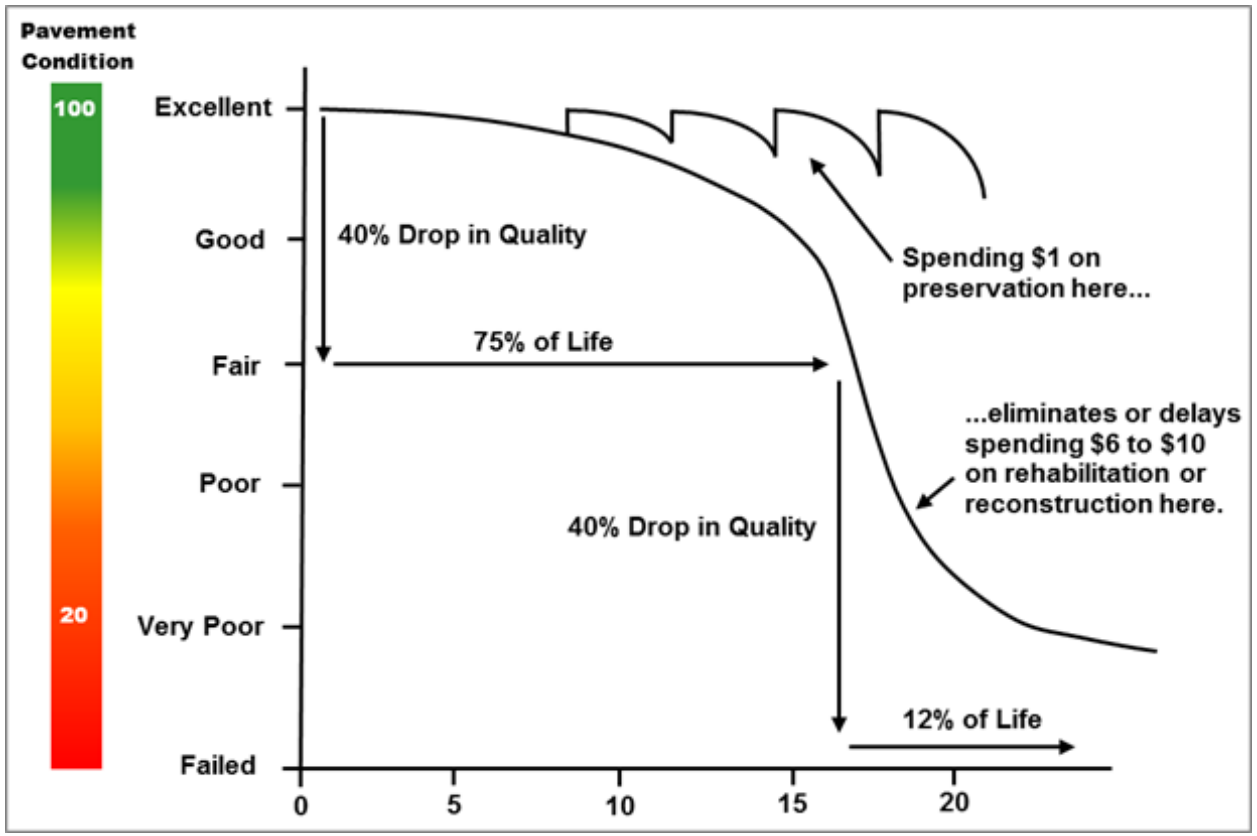


No Maintenance/Lifecycle
Activities
(end of life replacement only)
$4,382,778

Cost Benefit = $804,557

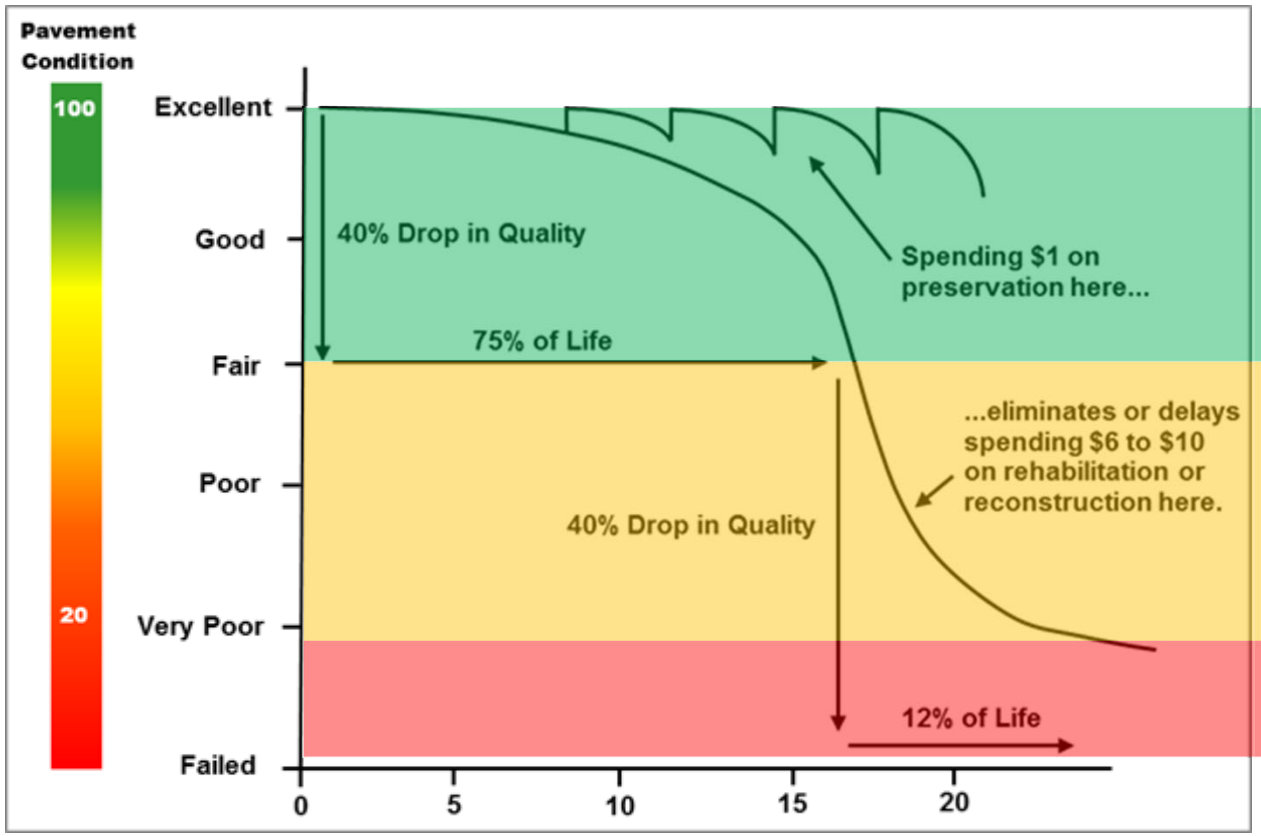
Lifecycle Analysis

Lifecycle Strategies for a Paved Road



Lifecycle Analysis

Lifecycle Strategies for a Paved Road



Preventative Maintenance — $
- Crack Sealing
- Patching
- Overlay

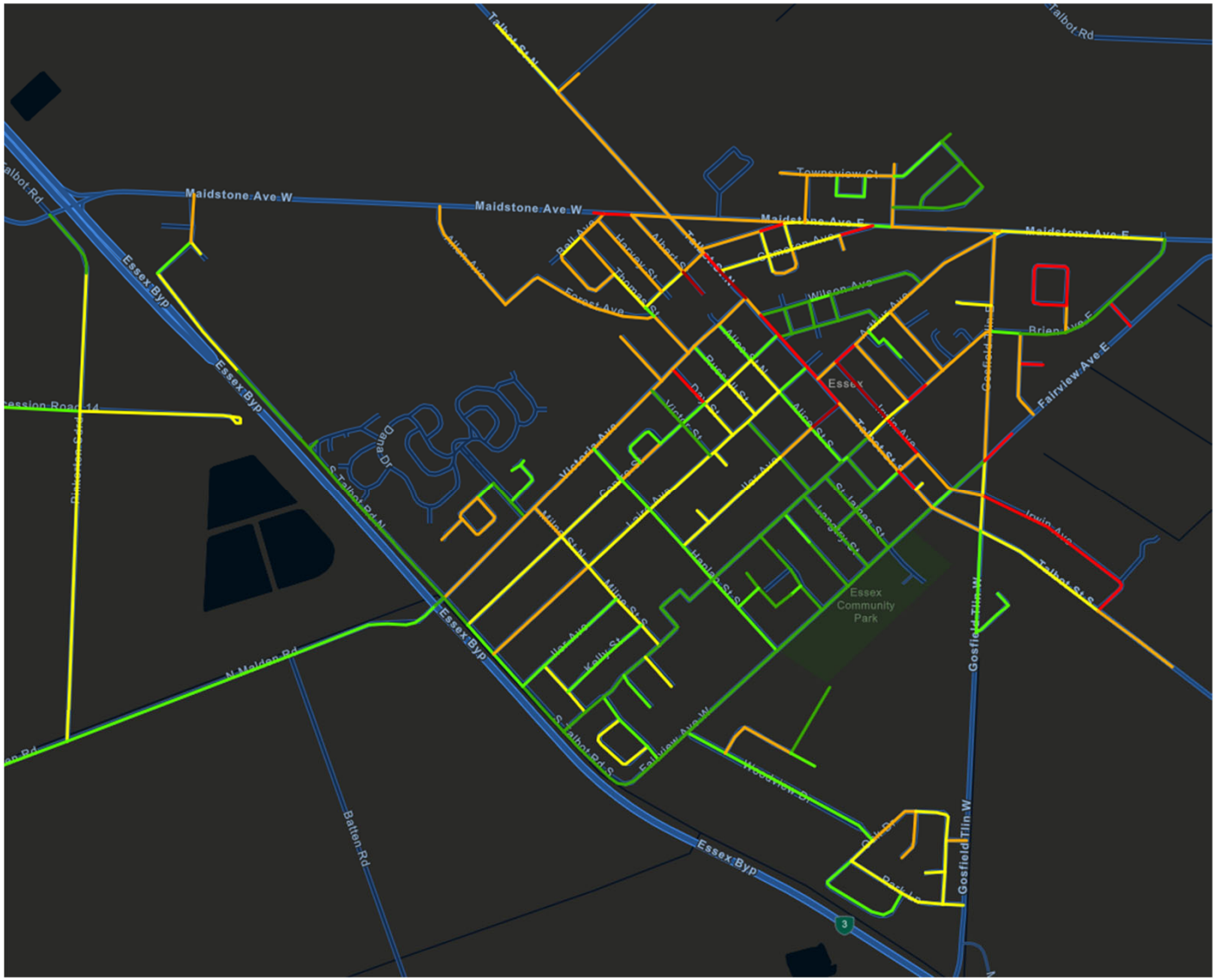
Rehabilitation — $$$$
- Mill and Pave
- Full Depth Removal (FDR)
- Pulverize and Pave
- Cold-Recycle Pave

Reconstruction — $$$$ $$$$
- Full Depth Reclamation

RECOMMENDED TREATMENT

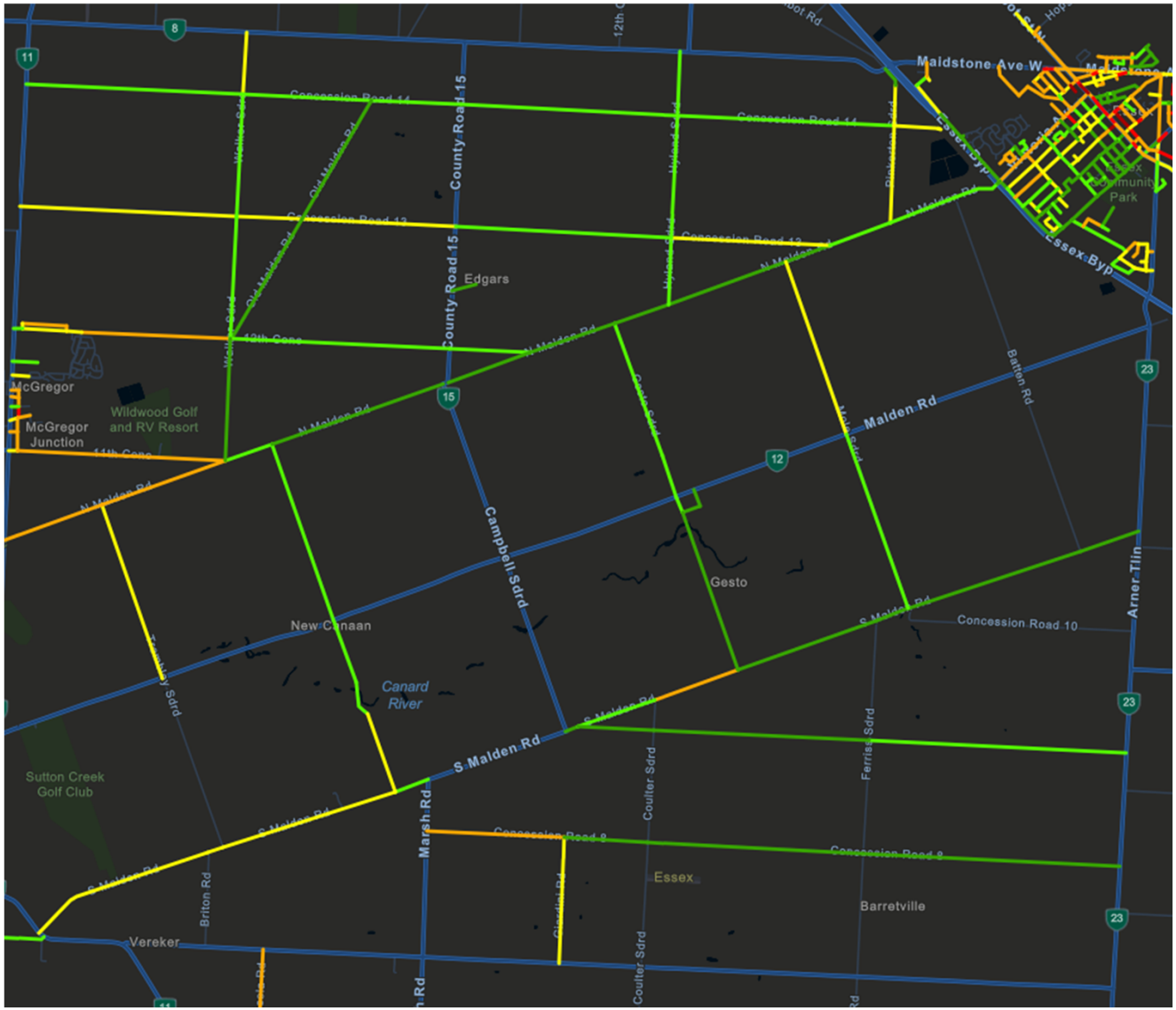
Pavement Condition

Ward 1



Pavement Condition

Ward 2



Pavement Condition Index

PCI

- Excellent (85 - 100)
- Good (70 - 85)
- Fair (55 - 70)
- Poor (40 - 55)
- Very Poor (25 - 40)
- Serious (10 - 25)
- Failed (0 - 10)

Pavement Condition

Ward 3

Pavement Condition Index

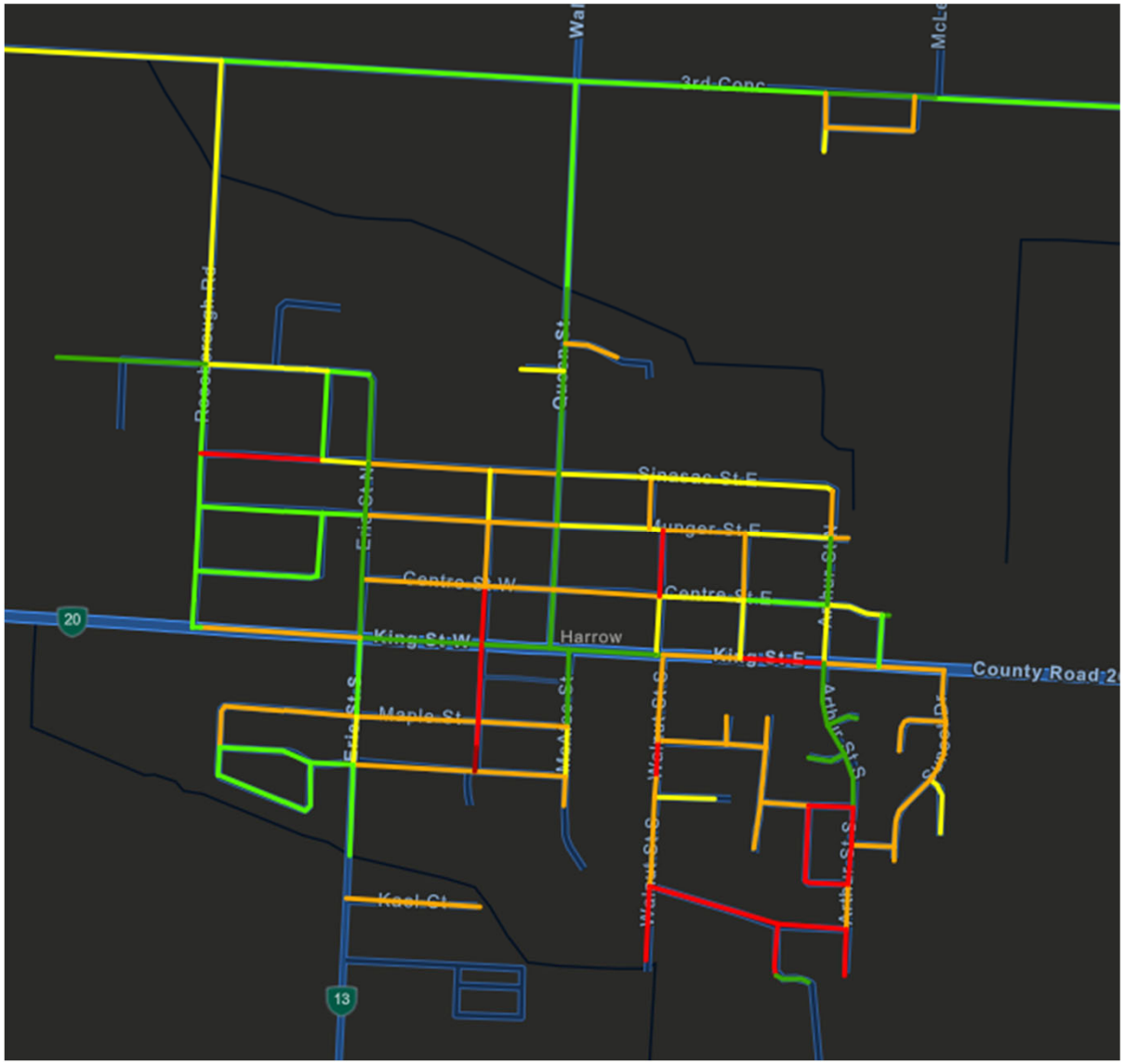
PCI

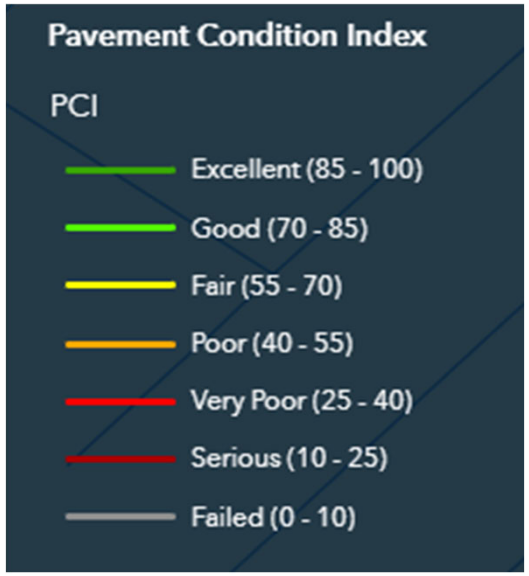
- Excellent (85 - 100)
- Good (70 - 85)
- Fair (55 - 70)
- Poor (40 - 55)
- Very Poor (25 - 40)
- Serious (10 - 25)
- Failed (0 - 10)

essex

Pavement Condition

Ward 4





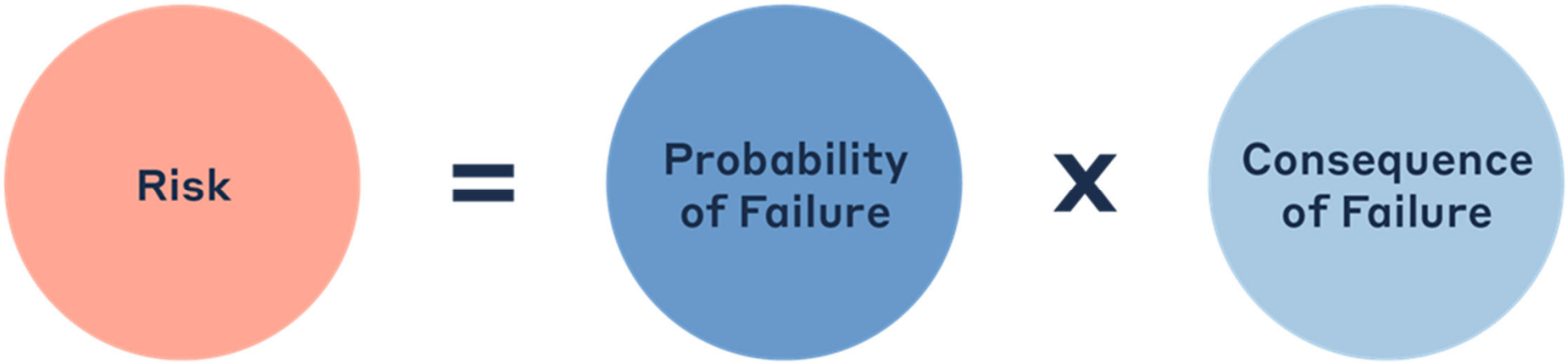
Strategic Plan

Goal: *Embrace asset management best practices to build, maintain and continuously improve our municipally owned infrastructure.*

- Complete a Roads Master Plan (+ active transportation) to establish future transportation network requirements.
- Review current capital forecasting and procurement policies/practices to better align infrastructure projects costs to budgeting.
- Move forward on roads projects already approved by Council, including Maidstone/Talbot intersection improvements and Hanlan extension.
- Complete a 10-year Roads Forecast with a prioritized list of required future roads projects and projected costs.
- Implement a "Rebuilding Essex Roads" dedicated capital levy to fund road rebuilding projects based on the Town's asset management plan.

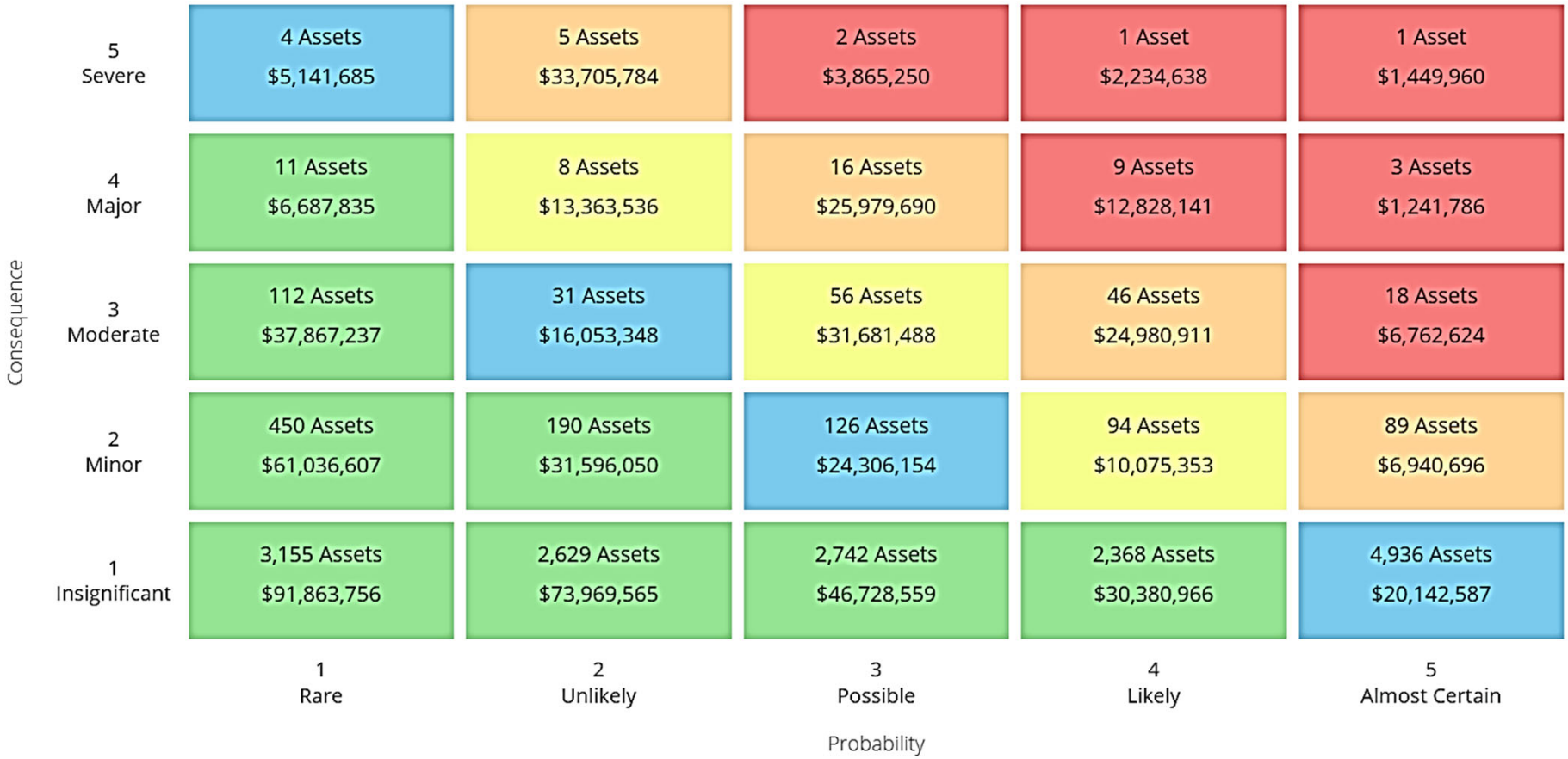
Risk Analysis

- Replacement Cost
- AADT
- Road Design Class
- Pipe Diameter
- Asset Function



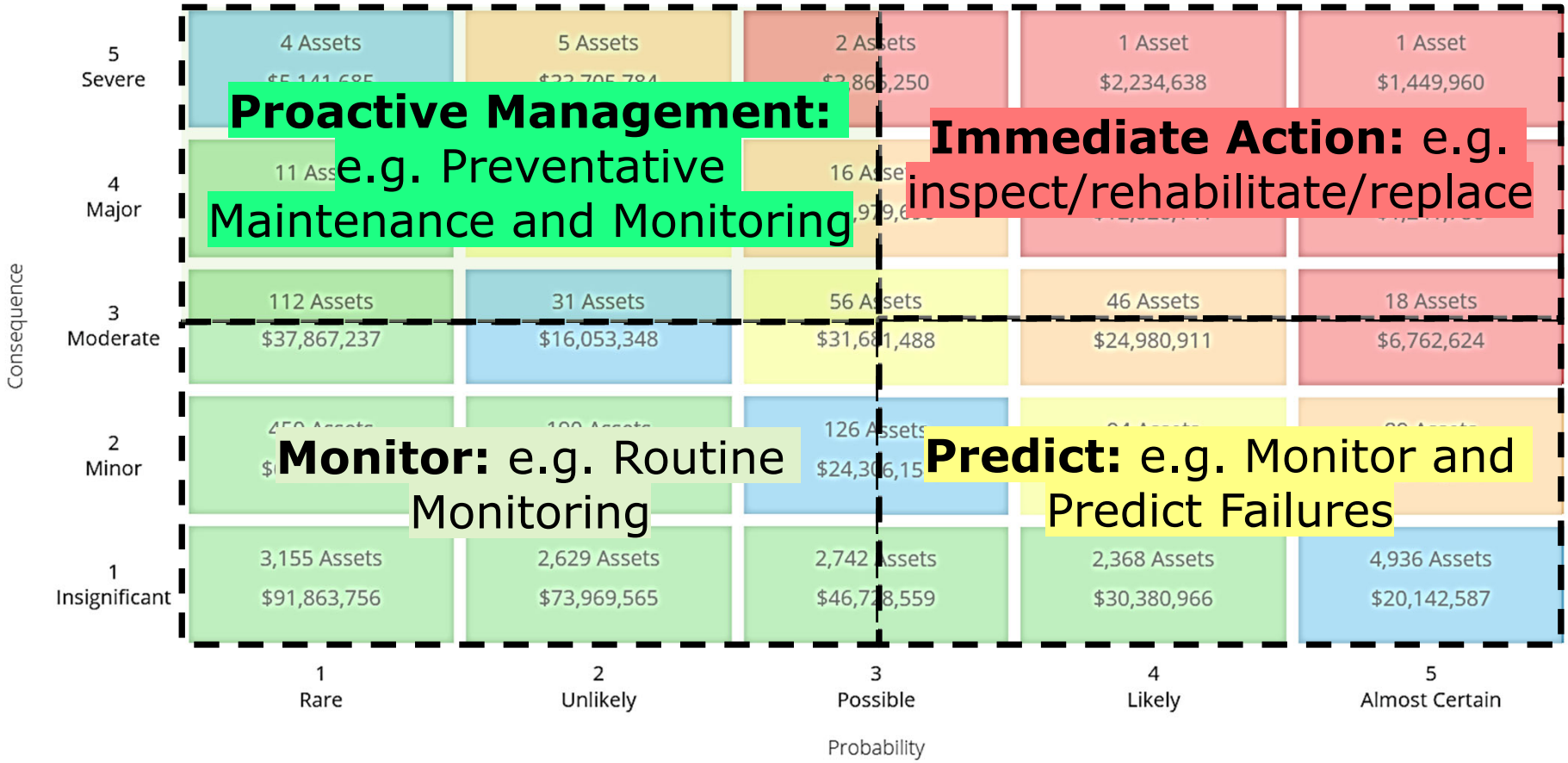
- Asset Condition
- Service Life Remaining
- Pipe Material

Risk Analysis



Risk Analysis

Identify which assets pose the highest risk to delivering objectives and use this data to drive the capital planning process

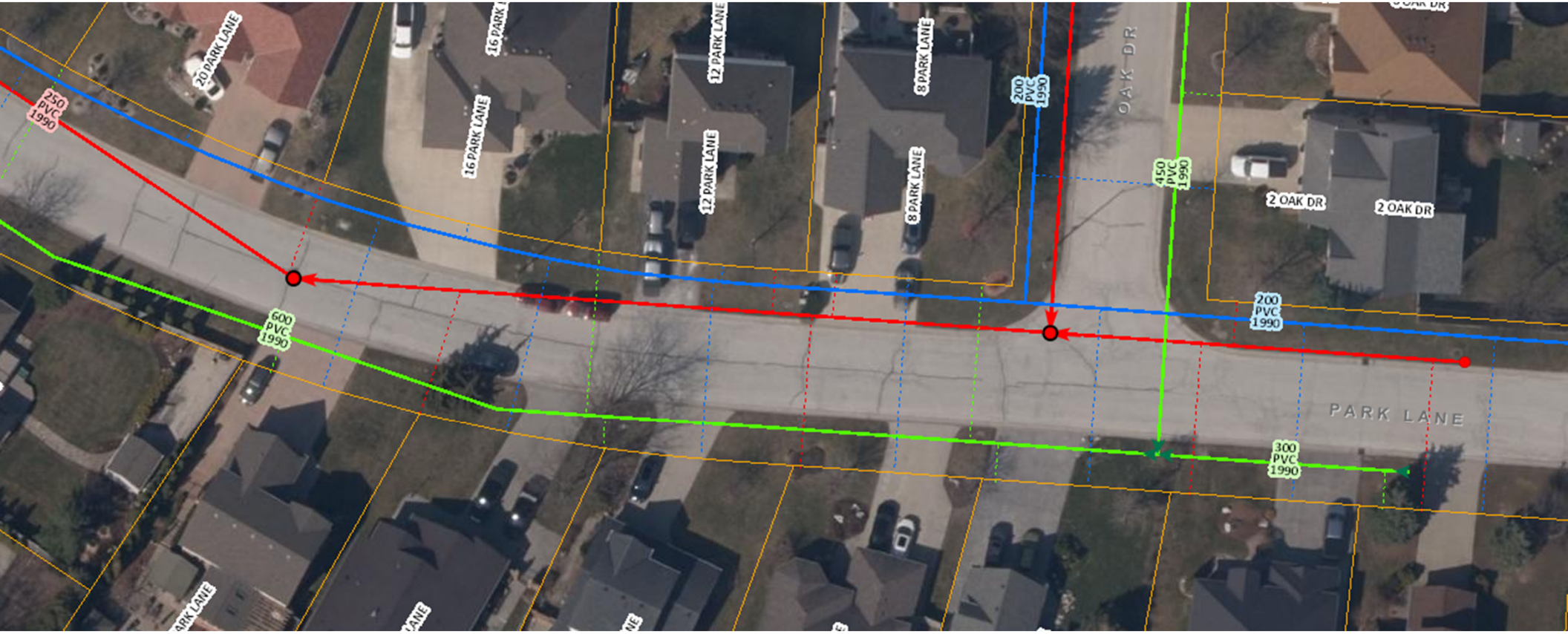


Other Servicing Needs

Examples

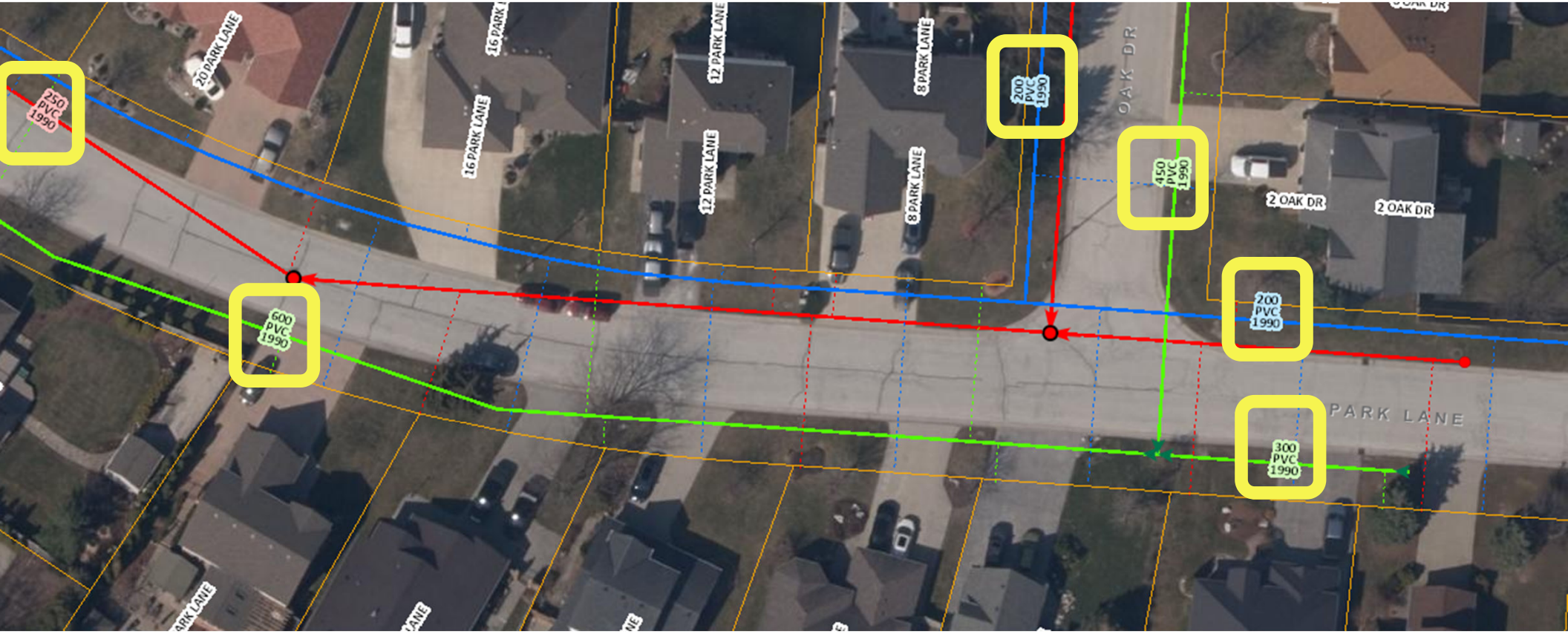
Other Servicing Needs

Examples



Other Servicing Needs

Examples



Roads Operations

Public Works Stats

695T
15% ↓
Asphalt Patching

489
4% ↓
Workorders Completed (2022)

18,000t
80% ↑
Stone Crushed

48t
4% ↓
Cold Patch

7,970t
3% ↑
Maintenance Stone Purchased

450
10% ↑
Signs Replaced (Since 2019)

Roads Maintenance

- Town is required to follow *Minimum Maintenance Standards*, O.Reg. 239/02 (MMS)
  - Established Maintenance **Standard** for all municipalities (no longer minimum)
  - Base line requirements for maintenance
  - Does not factor in Level of Service

Roads Maintenance

CLASSIFICATION OF HIGHWAYS							
Average Daily Traffic (No. of motor vehicles)	Posted or Statutory Speed Limit (kms per hour)						
	100	90	80	70	60	50	40 or less
53,000 or more	1	1	1	1	1	1	1
23,000 – 52,999	1	1	1	2	2	2	2
12,000 - 22,999	1	1	2	2	2	3	3
10,000 - 11,999	1	1	2	2	3	3	3
8,000 - 9,999	1	1	2	3	3	3	3
5,000 - 7,999	1	2	2	3	3	4	4
3,000 - 4,999	1	2	3	3	3	4	4
2,000 - 2,999	1	2	3	3	4	5	5
1,000 - 1,999	1	3	3	3	4	5	5
500 - 999	1	3	4	4	4	5	5
200 - 499	1	3	4	4	5	5	6
50 - 199	1	3	4	5	5	6	6
0 - 49	1	3	6	6	6	6	6

The Town only has road classes 3 through 6

Roads Maintenance

CLASSIFICATION OF HIGHWAYS							
Average Daily Traffic (No. of motor vehicles)	Posted or Statutory Speed Limit (kms per hour)						
	100	90	80	70	60	50	40 or less
53,000 or more	1	1	1	1	1	1	1
23,000 – 52,999	1	1	1	2	2	2	2
12,000 - 22,999	1	1	2	2	2	3	3
10,000 - 11,999	1	1	2	2	3	3	3
8,000 - 9,999	1	1	2	3	3	3	3
5,000 - 7,999	1	2	2	3	3	4	4
3,000 - 4,999	1	2	3	3	3	4	4
2,000 - 2,999	1	2	3	3	4	5	5
1,000 - 1,999	1	3	3	3	4	5	5
500 - 999	1	3	4	4	4	5	5
200 - 499	1	3	4	4	5	5	6
50 - 199	1	3	4	5	5	6	6
0 - 49	1	3	6	6	6	6	6

A majority of Essex roads fall into Class 4 & 5

Roads Maintenance

Examples of requirements under MMS:

	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5
PATROLLING FREQUENCY	3x every 7 days	2x every 7 days	1x every 7 days	1x every 14 days	1x every 30 days
SNOW ACCUMULATION - Roadways	Depth: 2.5 cm Time: 4 hrs	Depth: 5 cm Time: 6 hrs	Depth: 8 cm Time: 12 hrs	Depth: 8 cm Time: 16 hrs	Depth: 10 cm Time: 24 hrs
SNOW ACCUMULATION - Bike Lanes	Depth: 2.5 cm Time: 8 hrs	Depth: 5 cm Time: 12 hrs	Depth: 8 cm Time: 24 hrs	Depth: 8 cm Time: 24 hrs	Depth: 10 cm Time: 24 hrs
ICE FORMATION PREVENTION	Time: 6 hrs	Time: 8 hrs	Time: 16 hrs	Time: 24 hrs	Time: 24 hrs
	Also applies to bicycle lanes on a roadway				
TREATMENT - Icy Roadways	Time: 3 hrs	Time: 4 hrs	Time: 8 hrs	Time: 12 hrs	Time: 16 hrs
	Also applies to bicycle lanes on a roadway				
WEATHER MONITORING (*Section 3.1*)	Oct 1 - Apr 30: 1x every shift or 3x per day, whichever is greater, at intervals determined by municipality May 1 - Sept 30: 1x per day				
SNOW ACCUMULATION –Sidewalks After Snow accumulation has ended.	a) reduce snow to depth of ≤ 8 cm within 48 hrs; and b) provide a minimum sidewalk width of 1 metre. If depth is ≤8 cm, sidewalk is in state of repair. If depth is >8 cm while snowing, sidewalk is in state of repair until 48 hrs after accumulation ends				

Roads Maintenance

Examples of requirements under MMS:

	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5
PATROLLING FREQUENCY	3x every 7 days	2x every 7 days	1x every 7 days	1x every 14 days	1x every 30 days
SNOW ACCUMULATION - Roadways	Depth: 2.5 cm Time: 4 hrs	Depth: 5 cm Time: 6 hrs	Depth: 8 cm Time: 12 hrs	Depth: 8 cm Time: 16 hrs	Depth: 10 cm Time: 24 hrs
SNOW ACCUMULATION - Bike Lanes	Depth: 2.5 cm Time: 8 hrs	Depth: 5 cm Time: 12 hrs	Depth: 8 cm Time: 24 hrs	Depth: 8 cm Time: 24 hrs	Depth: 10 cm Time: 24 hrs
ICE FORMATION PREVENTION	Time: 6 hrs Also applies to bicycle lanes on a roadway	Time: 8 hrs	Time: 16 hrs	Time: 24 hrs	Time: 24 hrs
TREATMENT - Icy Roadways	Time: 3 hrs Also applies to bicycle lanes on a roadway	Time: 4 hrs	Time: 8 hrs	Time: 12 hrs	Time: 16 hrs
WEATHER MONITORING (*Section 3.1*)	Oct 1 - Apr 30: 1x every shift or 3x per day, whichever is greater, at intervals determined by municipality May 1 - Sept 30: 1x per day				
SNOW ACCUMULATION –Sidewalks After Snow accumulation has ended.	a) reduce snow to depth of ≤ 8 cm within 48 hrs; and b) provide a minimum sidewalk width of 1 metre. If depth is ≤8 cm, sidewalk is in state of repair. If depth is >8 cm while snowing, sidewalk is in state of repair until 48 hrs after accumulation ends				

Gravel Roads Maintenance

- Gravel Roads Maintenance
  - Grade each gravel road 2x per year (minimum)
  - Add stone where necessary
  - Add dust suppressant annually
  - Exploring the cost of watering/packing

Gravel Road Conversion

Cost of Hard Surfacing Gravel Roads

Cost of maintaining a kilometer of gravel road per year	$7,861
Cost of maintaining a kilometer of tar & chip road per year	$25,804
Cost Difference to Maintain a tar & chip road over gravel	$17,943
Addition annual **operating** cost to convert Town of Essex Gravel Roads (Does not factor any costs for the impact to existing operations such as shouldering, grading, etc)	$861,264
Approx **capital** Cost to convert all Town of Essex Gravel Roads to tar & chip (Does not factor inflationary costs, cost of financing, or costs borne by operations)	$6,240,000

essex

Questions?