COUNTY OF RENFREW

BY-LAW NUMBER 76-24

A BY-LAW TO AMEND BY-LAW 59-02 CORPORATE POLICIES AND PROCEDURES FOR THE CORPORATION OF THE COUNTY OF RENFREW

WHEREAS on November 27, 2002 the Corporation of the County of Renfrew enacted By-law No. 59-02, a By-law to establish Corporate Policies and Procedures for the County of Renfrew;

AND WHEREAS it is deemed desirable and expedient to amend the said By-law for the purpose of establishing a new policy and/or amending an existing policy and/or removing an existing policy;

NOW THEREFORE the Council of the Corporation of the County of Renfrew hereby enacts as follows:

1. THAT the following policy attached to this By-law be hereby enacted as an amendment to the said By-law 59-02:

    - Policy GA-14 – Infrastructure Expansion.

2. THAT this By-law shall come into force and take effect upon the passing thereof.

READ a first time this 16th day of May 2024.

READ a second time this 16th day of May 2024.

READ a third time and finally passed this 16th day of May 2024.

PETER EMON, WARDEN

GWEN DOMBROSKI, CLERK

Corporate Policies and Procedures				
DEPARTMENT: General Administration				**POLICY #:** GA-14
POLICY: Infrastructure Expansion				
DATE CREATED: May 2024	**REVIEW DATE:**	**REVISION DATE:**	**COVERAGE:** All Departments	**PAGE #:** 1 of 10

POLICY STATEMENT

The County of Renfrew's (the County) infrastructure provides a transportation network for traffic other than local trips and provides a level of service somewhat lower than that of the King's highway system, but significantly higher than that of local road system. The County maintains an Asset Management Plan (AMP) for all of its Capital Assets to ensure that the transportation network is maintained to a set level of service. The County's Long Term Financial Plan (LTFP) is maintained to ensure that the required funds are available to meet the fiscal operational and capital needs of the County. However, local municipalities are responsible for certain infrastructure, even if it should be located within the County's Right of Way (ROW), including but not limited to infrastructure in relation to pedestrians, water supply, and sanitary facilities. Additionally, growth within a local municipality could result in existing County Roads no longer meeting capacity or other local needs of that municipality and the County does not collect revenue specifically from, or allocated to, growth and development. Therefore, clearly defined responsibilities and cooperation between the County and the respective local municipalities are beneficial in planning and executing capital projects where infrastructure from both entities can efficiently be included to realize cost savings and facilitate growth needs.

POLICY SCOPE

This Policy is applicable in establishing how and when a local municipality may request to have infrastructure included in a County planned capital project and in determining the responsibility for costs of portions of that project. Predetermining the proportion of costs to be allocated to each entity in projects with shared infrastructure on projects anticipated where works are included in the County's Asset Management Plan (AMP) will assist in planning and allocating appropriate funding needs ahead of time. If a local municipality should desire a greater scope of work than is planned, and/or desire works of greater scope than would fall under County responsibility as per the Municipal Act, the local municipality shall share in the cost of work items included in the respective capital project.

This Policy champions the County's AMP, promotes cooperation between the County and local municipalities, and provides a means for which growth may be supported within individual municipalities through appropriately planned and shared expansion of infrastructure within the County's ROW.

County Council may, if deemed advisable, make exceptions to this Policy.

POLICY DEFINITIONS

For the purposes of this policy, the following definitions apply:

County – The Municipal Corporation of the County of Renfrew.

Local Municipality – the lower tier municipality in which the County's infrastructure is located.

Major Scope Change – a change in the scope of work for a project from what was included in the County's AMP, which is estimated to increase the costs for which the County is responsible by more than 50%.

Minor Scope Change – a change in the scope of work for a project from what was included in the County's AMP, which is estimated to increase the costs for which the County is responsible by less than 50%.

Plan Year – the year in which an asset is included in the most recent version of the County's AMP.

POLICY CONTENT

By appropriately planning, and providing means for requesting, capital projects supporting the expansion of County infrastructure in order to support growth within a municipality; the County will not hinder the growth of local municipalities, can share in the costs related to expansion of infrastructure, and will permit growing local municipalities to appropriately provide input on and plan with the County's AMP. This Policy sets the standards to which this may be achieved.

PROCEDURE

1. **Asset Management Plan and Requests**

The County of Renfrew maintains a 10 Year Capital Asset Management Plan for its transportation infrastructure, which is reviewed and updated (as required) annually. The County's updated Capital Asset Management Plans for Roads and Structures shall be shared with all local municipalities annually following approval by County Council. Assets included in the AMP, which may include cost sharing with a local municipality, shall be clearly identified as such in the AMP and shall have estimated cost share allocations as per Section 2 of this Policy, which shall be further developed through detailed design and a Class A cost estimate for the plan year of the project.

1.1 **Local Municipality Participation in County Planned Projects**

If a local municipality should desire to include works falling under their responsibility, and it is located within the County's ROW in a planned capital project, with no anticipated resulting increase in cost to the County; the local municipality must notify the Director of Public Works and Engineering in writing of this desire no later than January 31 of the plan year for the project. If inclusions of the additional works are accepted by the County, County staff shall coordinate inclusion of specific items for the local municipality in the Request for Tenders (RFT) for the capital project. Prior to issuing the RFT, the County shall provide the finalized RFT documents to the local municipality for review and input. Upon closure of the RFT, and prior to award, the County shall circulate the lowest overall total tender submission prices to the local municipality for acceptance of the costs associated with the items under their responsibility. If the local municipality should accept the costs, the specific items shall be included in the contract and the local municipality shall be invoiced by the County following payment for the particular items to the successful Contractor.

1.2 **Scope Change Requests to County Asset Management Plan**

A local municipality may request a change in scope for works included in the County's AMP for a County asset located within their municipal boundary. If a local municipality should request consideration for a minor change in the scope of work included in the County's AMP, they must do so in writing to the Director of Public Works and Engineering no later than January 31 of the year prior to the planned start of construction. If a local municipality should request consideration for a

major change in scope of work included for an asset in the County's AMP, they must do so in writing to the Director of Public Works and Engineering no later than January 31, three (3) calendar years prior to the planned start of construction. For example, if the plan year for a project is 2030, the local municipality must submit a request for minor change in scope no later than January 31, 2029 and must submit a request for major change in scope no later than January 31, 2027.

Should County staff estimate that a minor change in scope may actually be a major change, it shall be further reviewed with the local municipality requesting the change. A request for major change in scope for a project may result in a change to the planned construction start date.

All requests for change in scope which may increase the costs to the County, shall be presented to the appropriate Standing Committee with a recommendation. If approval to proceed with the increased scope for the project is received, County staff shall consult with staff from the local municipality throughout each stage of the project; confirming scope, ensuring design meets the requirements of both parties, developing the cost share formula, developing cost estimates, approving the RFT documents, approving the award of contract, reviewing construction deficiencies, and reviewing warranty requirements. If the request for change in scope, and associated additional costs to the County, should not be approved, or recommended for approval; the local municipality may request that the additional works proceed; however, they shall be responsible for the additional costs.

2. **Project Responsibilities and Cost Share**

Where responsibility for works within a County ROW has not been defined by this Policy, the Municipal Act shall be referenced to define responsibility.

2.1 **Project Management**

Management of a project, including but not limited to soliciting Consultant services, design (coordination or undertaking), tendering, and construction supervision; shall be anticipated to be the responsibility of the party estimated to have the greatest share of overall project costs. For example, if the County should be estimated to be responsible for 70% of the overall project cost; they shall be the lead for the project and be responsible for managing the project. However, staff from both the local municipality and the County shall have input and be included in all stages of

the project, including but not limited to: project scope or concept development, Consultant selection (if required), design (reviewing at all stages), RFT approval, tender review/award recommendation, construction, final walkthrough, and warranty review.

The costs of County staff time for a project shall be the responsibility of the County and costs of the local municipality's staff time shall be the responsibility of the local municipality.

2.2 **Rehabilitation of Existing Infrastructure to Similar Geometry and Alignment**

Within the County of Renfrew's existing ROW, the County shall be responsible for the below portions of costs associated with the overall project:

a) Design, where design can be completed by County staff;
b) 50% of Design of County infrastructure, where Consultant services are required for the overall project design due to water, sanitary, pedestrian or other infrastructure that is responsibility of the local municipality;
c) The road structure, including surface material(s), base, and sub-base;
d) Granular shouldering and/or curbs;
e) Paved boulevard behind curbs up to 0.5m in width;
f) Hardened shoulders up to desired width per County Policy PW-01, Roadway Classification and Design;
g) Roadside safety infrastructure, including guiderail, barriers, and medians;
h) Ditching;
i) The County's share of costs associated with storm sewers and related catch basins/maintenance holes (repairs, replacements, resetting, etc.), calculated per below formula:

$$\frac{\text{Theoretical Pipe Diameter Needed to Accommodate CRD}}{\text{Actual Pipe Diameter Needed to Accommodate Full Drainage Area}} \times 100\%$$

where CRD = County Road Drainage;

j) 50% of re-setting sanitary maintenance holes and watermain chambers when works are undertaken on behalf of the County;
k) Traffic signals and infrastructure related/connected to the traffic signal; and
l) Liability or cost of legal services associated with unforeseen circumstances arising from the construction project.

The local municipality shall be responsible for the below portions of costs associated with the overall project:

a) Sidewalks/Pedestrian Pathways;
b) Pedestrian Crossings/PXOs;
c) Streetlights;
d) The local municipalities share associated with works on storm sewers and related catch basins/maintenance holes (repairs, replacements, resetting, etc.) calculated as 100% minus the calculated County percent in the formula through 2.2 d) above;
e) 50% of re-setting sanitary maintenance holes and watermain chambers, when works are undertaken on behalf of the County, 100% otherwise;
f) Works on watermain, sanitary sewers, and related maintenance holes/chambers (repairs, replacements, etc.) not included under 2.2 j) above; and
g) Any additional increases to scope for construction of pedestrian related infrastructure (pedestrian paths, multi-use pathways, new sidewalks, etc.) as requested in writing for inclusion by the local municipality.

2.3 **Urbanization of a Rural Cross-Section**

The urbanization of a County Road where a rural cross-section is prevalent may be necessitated through growth/development along that particular section of road, or in the surrounding area of the local municipality. Where reconstruction to an urban cross-section, from an existing rural cross-section is planned on a County Road section, the County shall be responsible for the below portions of costs associated with the project:

a) 50% of design by a Consultant;
b) The road structure, including surface material(s), base, and sub-base;
c) Hardened shoulders or clear space up to desired width per County Policy PW-01;
d) Roadside safety infrastructure, including guiderail, barriers, and medians;
e) Granular shouldering and/or curbs;

f) Paved boulevard behind curbs up 0.5m in width;
g) Ditching;
h) 50% of supply and installation of storm sewer infrastructure (drywells, pipes, maintenance holes, catch basins, storm ponds, etc.) as required for County Road Drainage;
i) Traffic signals and infrastructure related/connected to the traffic signal; and
j) Property purchases up to the desired ROW width per County Policy PW-01 or where required to support the above referenced infrastructure falling under the County's responsibility.

The local municipality shall be responsible for the below portions of costs associated with the project where reconstruction to an urban cross-section, from an existing rural cross-section is planned on a County Road section:

a) 50% of design by a Consultant;
b) Sidewalks/Pedestrian Pathways;
c) Pedestrian Crossings/PXOs;
d) Streetlights;
e) 50% of supply and installation of storm sewer infrastructure (drywells, pipes, maintenance holes, catch basins, storm ponds, etc.) as required for County Road Drainage;
f) Supply and installation of sanitary sewer infrastructure (pipes, maintenance holes, etc.) and watermain infrastructure (pipe, chambers);
g) Property purchases in excess of the desired ROW width per County Policy PW-01, where not required to support infrastructure falling under the County's responsibility;
h) Any additional increases to scope for construction of pedestrian related infrastructure (pedestrian paths, multi-use pathways, new sidewalks, etc.) as requested in writing for inclusion by the local municipality; and
i) Liability or cost of legal services associated with unforeseen circumstances arising from the construction project.

2.4 **Expansion of Existing Infrastructure**

The expansion of County infrastructure may be necessitated through growth/ development along a particular section of road, or in the surrounding area of the local municipality. Where expansion is planned on a County infrastructure, the County shall be responsible for the below portions of costs associated with the project:

a) Design – except where substantially required to facilitate new pedestrian, sanitary, or watermain infrastructure;
b) The road structure, including surface material(s), base, and sub-base;
c) Granular shouldering and/or curbs;
d) Hardened shoulders or clear space up to desired width per County Policy PW-01;
e) Roadside safety infrastructure, including guiderail, barriers, and medians;
f) Ditching;
g) Where existing storm sewer must be repaired, rehabilitated, or replaced, the County's share of costs associated with storm sewers and related catch basins/maintenance holes (repairs, replacements, resetting, etc.), calculated per below formula:

$$\frac{\text{Theoretical Pipe Diameter Needed to Accommodate CRD}}{\text{Actual Pipe Diameter Needed to Accommodate Full Drainage Area}} \times 100\%$$

where CRD = County Road Drainage;

h) Where new storm sewer infrastructure is to be constructed and was not previously present (such as for twinning of a roadway), 50% of supply and installation of storm sewer infrastructure (drywells, pipes, maintenance holes, catch basins, storm ponds, etc.) as required for County Road Drainage;
i) 50% of re-setting existing sanitary maintenance holes and watermain chambers when works are undertaken on behalf of the County;
j) Traffic signals and infrastructure related/connected to the traffic signal;
k) Property purchases up to the desired ROW width per County Policy PW-01 or where required to support the above referenced infrastructure falling under the County's responsibility; and
l) 50% of liability or cost of legal services associated with unforeseen circumstances arising from the construction project.

Where expansion is planned on a County infrastructure, the local municipality shall be responsible for the below portions of costs associated with the project:

a) Sidewalks/Pedestrian Pathways;
b) Pedestrian Crossings/PXOs;
c) Streetlights;
d) Where existing storm sewer infrastructure is present, share associated with works on storm sewers and related catch basins/maintenance holes (repairs, replacements, resetting, etc.) calculated as 100% minus the calculated County percent in the formula through 2.4 g) above;
e) Where new storm sewer infrastructure is to be constructed and was not previously present (such as for twinning of a roadway), 50% of supply and installation of storm sewer infrastructure (drywells, pipes, maintenance holes, catch basins, storm ponds, etc.) as required for County Road Drainage;
f) 50% of re-setting sanitary maintenance holes and watermain chambers, when works are undertaken on behalf of the County, 100% otherwise;
g) Works on existing watermain, sanitary sewers, and related maintenance holes/chambers (repairs, replacements, etc.);
h) Any additional increases to scope for construction of pedestrian related infrastructure (pedestrian paths, multi-use pathways, new sidewalks, etc.) as requested in writing for inclusion by the local municipality; and
i) 50% of liability or cost of legal services associated with unforeseen circumstances arising from the construction project.

2.5 **Maintenance**

With the exception of where an Agreement is in place which supersedes, the County shall be responsible for the maintenance items below within the County's ROW:

a) Road surface maintenance, including but not limited to, plowing, salting, sanding, and patching;
b) Spring sweeping (urban areas);
c) Storm sewer infrastructure inspection, cleaning, and repair;
d) Ditching/ditch cleanout;
e) Mowing;
f) Brushing; and

g) Liability or cost of legal services associated with unforeseen circumstances arising from the above maintenance items.

With the exception of where an Agreement is in place which supersedes, the local municipality shall be responsible for the maintenance items below within the County's ROW:

a) Sidewalk and pedestrian pathway surface maintenance, including but not limited to, snow plowing, snow removal, salting, sanding, and patching;
b) Snow removal, including from parking lanes and roadside;
c) Watermain and sanitary sewer infrastructure inspection, cleaning, and repair; and
d) Liability or cost of legal services associated with unforeseen circumstances arising from the above maintenance items.

3. **Agreement**

On acceptance of conceptual scope of work, and anticipated share of costs, between the County and the local municipality; a Memorandum of Understanding shall be executed between the two parties detailing the cost formula to be utilized (based on Section 2 requirements above). The Memorandum of Understanding shall be required to be in place before moving forward with design for the project – this may be up to calendar years prior to the plan year, or before January 31 of the plan year for the project, dependant on the complexity of the project.

Following the tendering process, and prior to award of the contract, a formal Cost Sharing Agreement shall be executed between the County and the local municipality stating the cost sharing formula, with percentage of each item to be paid by each party, as well as liability associated with each item. Award of the contract shall proceed after the Cost Sharing Agreement has been executed.

APPENDICES:

A. Template Memorandum of Understanding
B. Template Cost Sharing Agreement
C. County Policy PW-01

Corporate Policies and Procedures				
DEPARTMENT: Public Works and Engineering				**POLICY #:** PW-01
POLICY: Roadway Classification and Design				
DATE CREATED: April 2001	**REVIEW DATE:** February 2023	**REVISION DATE:** May 2023	**COVERAGE:** All County Roads	**PAGE #:** 1 of 11

POLICY STATEMENT

The County of Renfrew (County) believes that a roadway network performs most efficiently and effectively when the roads comprising that network are designed, built and operated to serve their intended purposes.

A classification system designates roads into different groups according to the type of service each group is intended to provide. By grouping roads with similar function and adopting a consistent set of standards, the County of Renfrew can improve transportation planning, road design, road maintenance, and road operations.

Therefore, this Policy dictates hierarchical systems of roadway classification, which shall apply to all roadways in the County Road system for maintenance and design.

POLICY DEFINITIONS

Arterial: Roads whose primary function is to move traffic. Property access is very much a secondary consideration and may be restricted. A distinction may be made between major and minor arterials depending on the volume and nature of the traffic.

Collector: Roads whose function is both traffic movement and property access. A balanced approach between these often conflicting needs is to be taken.

Laneways: Roads typically found in an urban environment providing access to the rear of properties in the town core areas.

Local Roads: Roads whose function is primarily to provide access to property. Traffic movement is very much a secondary consideration.

Rural Roads: Roads passing through largely undeveloped areas and having an open drainage system.

Seasonal Roads: Roads typically of the rural variety which are not maintained during the winter months. In the months during which the roads are accessible they serve the same function as a local road.

Semi-Urban Roads: Roads passing through areas where the degree of development is approaching full development along a substantial portion of its length and may include those portions within an urban municipality or settlement. Such roads generally have an open drainage system but may be approaching or meeting warrants for drainage by closed (piped) systems. For Design Classification purposes, these roads are grouped with Rural Roads.

Significant Weather Event: An approaching or occurring weather hazard with the potential to pose a significant danger to users of the roads within a municipality.

Urban Roads: Roads passing through areas where the degree of development is at or near full development along a substantial portion of its length and shall include those portions of road within an urban municipality or settlement. Such roads generally consist of curbs and gutters adjacent to the travelled portion of the road. Drainage is generally accommodated by a closed (piped) system.

POLICY CONTENT

1.0 MAINTENANCE CLASSIFICATIONS

Ontario Regulation 239/02, Minimum Maintenance Standards for Municipal Highways, under the Municipal Act provides a classification system for roads which must be used in establishing the minimum maintenance standards for all municipal roads.

The County shall annually review the classifications of County Road sections based on Regulation 239/02 and ensure the 'maintenance classification' for each section of road is up to date. The County also has approved 'Roadway Service Standards' which were developed to meet or exceed the requirements of Regulation 239/02. The County shall adhere to the requirements of the County Roadway Service Standards, as amended.

2.0 DESIGN CLASSIFICATIONS

For design and asset management planning purposes, all roads in the County's Road system shall be classified according to their roadside environment and function within the system. In establishing the design classification of County Road sections, the characteristics provided in Table 1 and Table 2 shall be used for rural roadways and urban roadways respectively.

The characteristics for design classifications of County Roads dictated in Table 1 and Table 2 have been adapted from the Transportation Association of Canada (TAC) Geometric Design Manual. Table 1 and Table 2 of this Policy are for establishing the design classification for County Roads only. When undertaking design for County Roads or considering requests which would result in changes to County Roads, the additional restrictions recommended by the TAC Geometric Design Manual for each road classification shall be taken into consideration.

The Design Classifications shall be used to establish consistent minimum design criteria and target lifecycle Best Practices for County Roads.

The Director of Public Works and Engineering, or designate, shall maintain the roadway ongoingly. Major review and updates to this Policy shall be undertaken in conjunction with each rationalization update, which is to be conducted every five years, or as directed by County Council.

Table 1
RURAL ROAD DESIGN CLASSIFICATIONS

TAC Classification (County Design Class)	Freeway (R4)	Arterial (R3)	Collector (R2)	Local (R1)
AADT	≥12,000	<12,000	<5,000	<1,000
Posted Speed (km/h)	50 – 120	50 – 90	40 – 80	40 – 80
Connections	freeways, arterials	freeways, arterials, collectors	arterials, collectors, locals	collectors, locals

Table 2
URBAN ROAD DESIGN CLASSIFICATIONS

TAC Classification (County Design Class)	Freeway / Expressway (U4)	Major Arterial (U4)	Minor Arterial (U3)	Collector (U2)	Local (U1)	Lane (U1)
AADT	>12,000	12,000 – 30,000	<12,000	<5000	<3,000	<500
Posted Speed (km/h)	80 – 110	50 – 80	40 – 80	40 – 80	≤50	≤30

TAC Classification (County Design Class)	Freeway / Expressway (U4)	Major Arterial (U4)	Minor Arterial (U3)	Collector (U2)	Local (U1)	Lane (U1)
Connections	freeways, arterials	freeways, arterials, collectors	freeways, arterials, collectors	arterials, collectors, locals	collectors, locals	locals, lanes

3.0 DESIGN STANDARDS

Design standards for roads relate to safety and the longevity of the road in its current and future uses. The design standards for County Roads have been developed to ensure consistency across all sections in the system and that the design and construction of County Roads is becoming of their purpose, improving safety for all users.

3.1 Minimum and Desired Standards

The design standards for County Roads are based on the design classification of the individual road sections and have been developed incorporating MTO Design Manuals, the TAC Geometric Design Guide for Canadian Roads, and AASHTO Guide to Design of Pavement Structures. The minimum and desired standards considered in the design of County Road sections shall be as per Table 3.

Table 3
Minimum and Desired Design Standards

Standard	Rural		Urban	
	Minimum	Desired	Minimum	Desired
Design Speed (km/h)	R1 – 60 R2-R4 – 80	90	50	60
Lane Width (m)	3.25	3.5	3.25	3.5
Hardened Shoulder / Clearance Width (m)	0.5	R1 and R2 – 1.0 R3 and R4 – 1.5	0.1	1.0
Overall Shoulder Width (m)	1.5	2.0	N/A	N/A
Alignment Adequacy	Fair with Warning Signs	Good	Fair with Warning Signs	Good

Standard	Rural		Urban	
	Minimum	Desired	Minimum	Desired
Right of Way (ROW) Width (m)	20	26	20	26
Surface Composition (mm of HMA)	R1 – 30 R2 – 80 R3 – 120 R4 – 130	R1 – 50 R2 – 100 R3 – 130 R4 – 140	U1 – 50 U2 – 80 U3 – 120 U4 – 130	U1 – 80 U2 – 100 U3 – 130 U4 – 140
Base Composition	150mm Granular 'A' over 350mm Granular 'B' or equivalent sub-base			

*Unless identified otherwise, values apply to all Design Classifications
*HMA = Hot Mix Asphalt

The County's Asset Management Plan does not incorporate growth and typically project costs are based on rehabilitation to similar geometry. As such, though capacity is evaluated during road section evaluations, it is not considered during design of a road section. Where minimum design standards are determined to not being met on a road section, efforts shall be made to have this corrected during design and construction on that road section and budgeted for accordingly.

When determining the design standard to be utilized, the County shall consider a twenty (20) year forecast of growth in traffic based on historical data. A typical value to be utilized is a growth rate of 1.5% unless determined otherwise based on increased growth in certain areas of the County.

3.2 Desired Road Cross-Sections

Included as Appendix A is a drawing illustrating the desired typical cross-sections for each design class. Circumstances may arise where the dimensions shown in the desired cross-sections may not be met; however, the proposed altered cross-section shall provide equivalent or greater strength of the corresponding desired typical cross-section and meet all other minimum design standards for the design classification of the road.

4.0 BEST PRACTICES

Best Practices should be structured with the goal that the right treatment takes place during the correct conditions for the lifecycle of a road in order to ensure that the return on investments in the County Road system is maximized. Achieving the recommended Best Practices outlined in this section may be limited due to the availability of funding or the prioritization of safety improvements. However, these Best Practices shall be used as a guideline when updating the County's Capital Asset Management Plan for Roads.

4.1 Road Improvement Methods

There are various types of improvement methods available in order to improve the condition of roads, and others continue to be developed. County of Renfrew staff shall continue to monitor new improvement methods which come available in the market and may present opportunities for Council consideration to pilot methods which may be considered viable economically and of benefit to County Roads.

The typical improvement methods currently considered on County Roads are provided in Table 4.

Table 4
Available Road Improvement Strategies

Improvement Type	Typical Improvements	General Description
Maintenance	- Crack Sealing; - Patching	Operational maintenance to seal cracks and patch potholes.
Preventative Maintenance	- Microsurfacing; - Surface Treatment Overlay; - Slurry Seal	Capital 'maintenance' to seal the roadway and prolong the service life of asphalt.
Minor Rehabilitation	- HMA Overlay; - Mill and Pave	Capital resurfacing to prolong service life of road overall. Will include drainage improvements.
Major Rehabilitation	- Pulverize and Pave; - Base and Surface	Capital replacement of surface with base rehabilitation and/or

Improvement Type	Typical Improvements	General Description
		stabilization. Will include drainage improvements.
Reconstruction	- Full Reconstruction; - Partial Reconstruction	Replacement of surface, unsuitable base material, and drainage infrastructure.

Each improvement type provides certain benefits when applied at the appropriate time in the lifecycle of a roadway; however, there are also certain restrictions which must be considered when planning road improvements as provided below.

Maintenance improvements are typically relatively the lowest cost improvement type and provide the greatest return on investment (ROI) if undertaken as soon as necessary. Maintenance improvements, early in the lifecycle of the road surface, will prevent accelerated deterioration of the surface from water infiltration and freeze-thaw action. However, undertaking maintenance later in the lifecycle of the road, when the Pavement Condition Index (PCI) has fallen below 85, should only be considered as a holding pattern as it would no longer provide the increased service life it would if done sooner. Maintenance improvements should be planned to occur throughout the life of a road as needed but prioritized 4 – 5 years after a new surface is applied via minor rehabilitation, major rehabilitation, or reconstruction.

Preventative maintenance improvements are typically the lowest cost Capital improvement which can be undertaken on roads. Preventative maintenance treatments will seal all cracks in the surface of the roadway to prevent water infiltration and significantly decrease deterioration from freeze-thaw action. However, undertaking preventative maintenance on a roadway with a PCI below 70, poor drainage, evident base issues, or poor alignment should only be considered as a holding pattern as it would not substantially improve the roadway or extend its service life. In order to maximize ROI, preventative maintenance should be planned to occur 8 – 10 years after a new surface is applied via minor rehabilitation, major rehabilitation, or reconstruction, when the PCI is 70 – 85.

Minor rehabilitation improvements typically come at a mid-range cost but can substantially prolong the service life of a road if completed at the right time in its lifecycle. Minor rehabilitation will provide a new surface and added strength to the roadway. However, undertaking minor rehabilitation on a roadway where there is evident base issues or where the PCI has fallen below 50 should only be considered as a holding pattern as it would only temporarily improve the road condition and relatively low service life extension for the expense. In order to maximize ROI, minor rehabilitation should be planned to occur 18 – 22 years after a new surface is applied via major rehabilitation, or reconstruction (8 – 14 years after preventative maintenance), when the PCI of the road is 50 – 65.

Major rehabilitation improvements typically come at a higher-range cost but will completely replace the road surface and substantially prolong the service life of a road so long as the base granular of the road are structurally sound. However, a greater treatment than major rehabilitation should be considered if there are poor alignments, a large amount of urban drainage infrastructure in poor condition, or substantial base issues over a large section of the road. In order to maximize ROI, major rehabilitation should be planned take place after the PCI has fallen below 45.

Reconstruction is the highest relative cost road improvement type on any road class. It will require complete removal and replacement of the existing surface, a substantial amount of base granular, and most if not all drainage infrastructure. Reconstruction should only be considered on roads with poor alignment, completely deteriorated/poor base structure, poor drainage infrastructure, and/or where minimum design standards cannot be achieved using another method. In order to maximize ROI, reconstruction (if required) should be planned to occur after the PCI has fallen below 40.

4.2 Lifecycle Management

Managing the lifecycle of a roadway involves following Best Practices, to ensure that the treatment being applied for a particular section of road is appropriate for the condition and design standard for the road, and that it is the most cost-efficient treatment at that stage in the road's lifecycle.

Figure 1 below, provides a graphical comparison of three different lifecycle scenarios, comparing the age of a road with its condition. The three different scenarios are as follows:

- "Do Nothing" – lifecycle of a newly constructed road where no improvement takes place at any point throughout its design life;
- "No Major or REC" – lifecycle of a newly constructed road where no large capital costs are incurred through Major Rehabilitation or Reconstruction and only Preventative Maintenance or Minor Rehabilitation takes place throughout the design life of the road; and
- "Best Practices" – lifecycle of a newly constructed road where the 'return on investment' is prioritized and the most beneficial improvement type takes place at the correct moment in the design life of the road.

It should be noted that reconstruction should still be considered where a roadway has significant base issues, unsafe alignment, or other issues which cause the road section to not meet minimum design standards. Following reconstruction, the lifecycle could then be managed to target the Best Practices scenario.

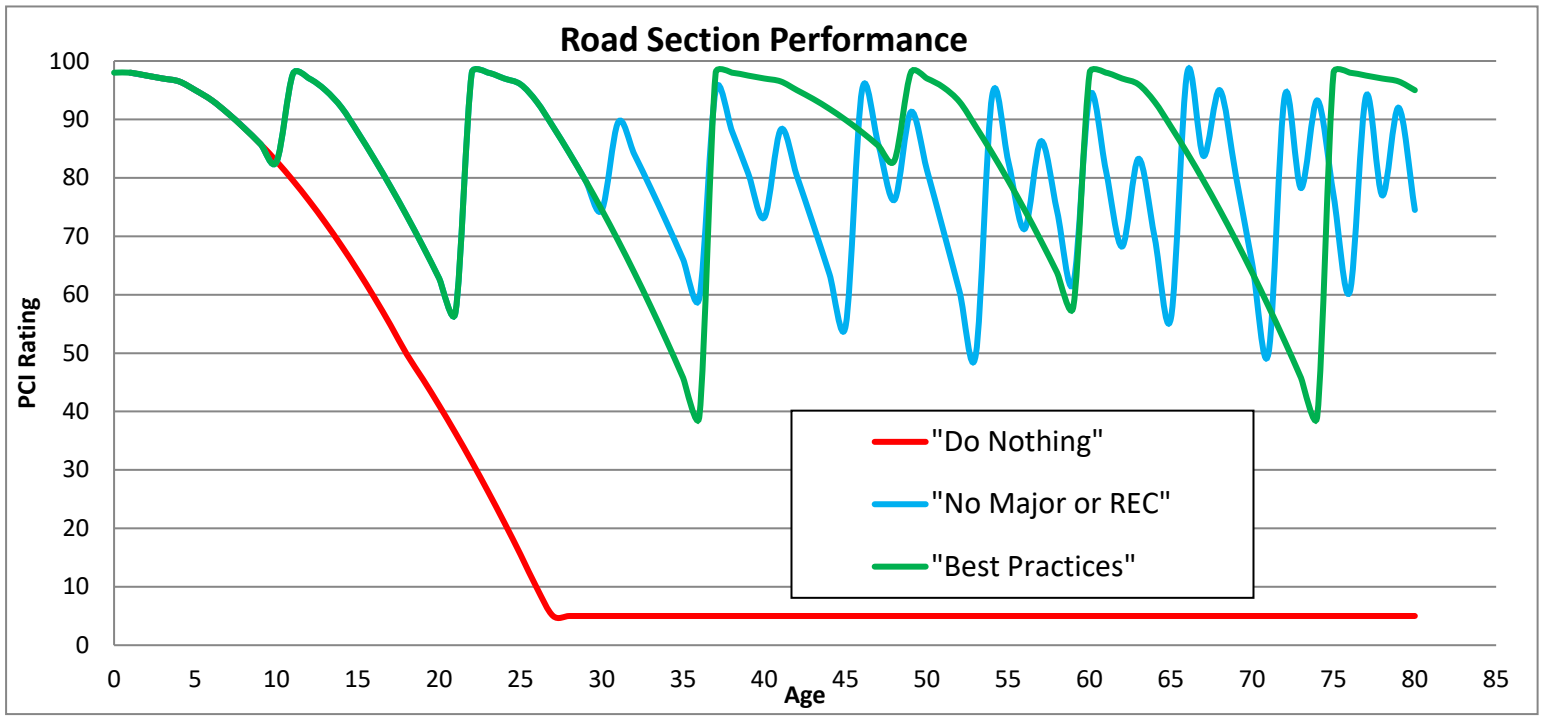
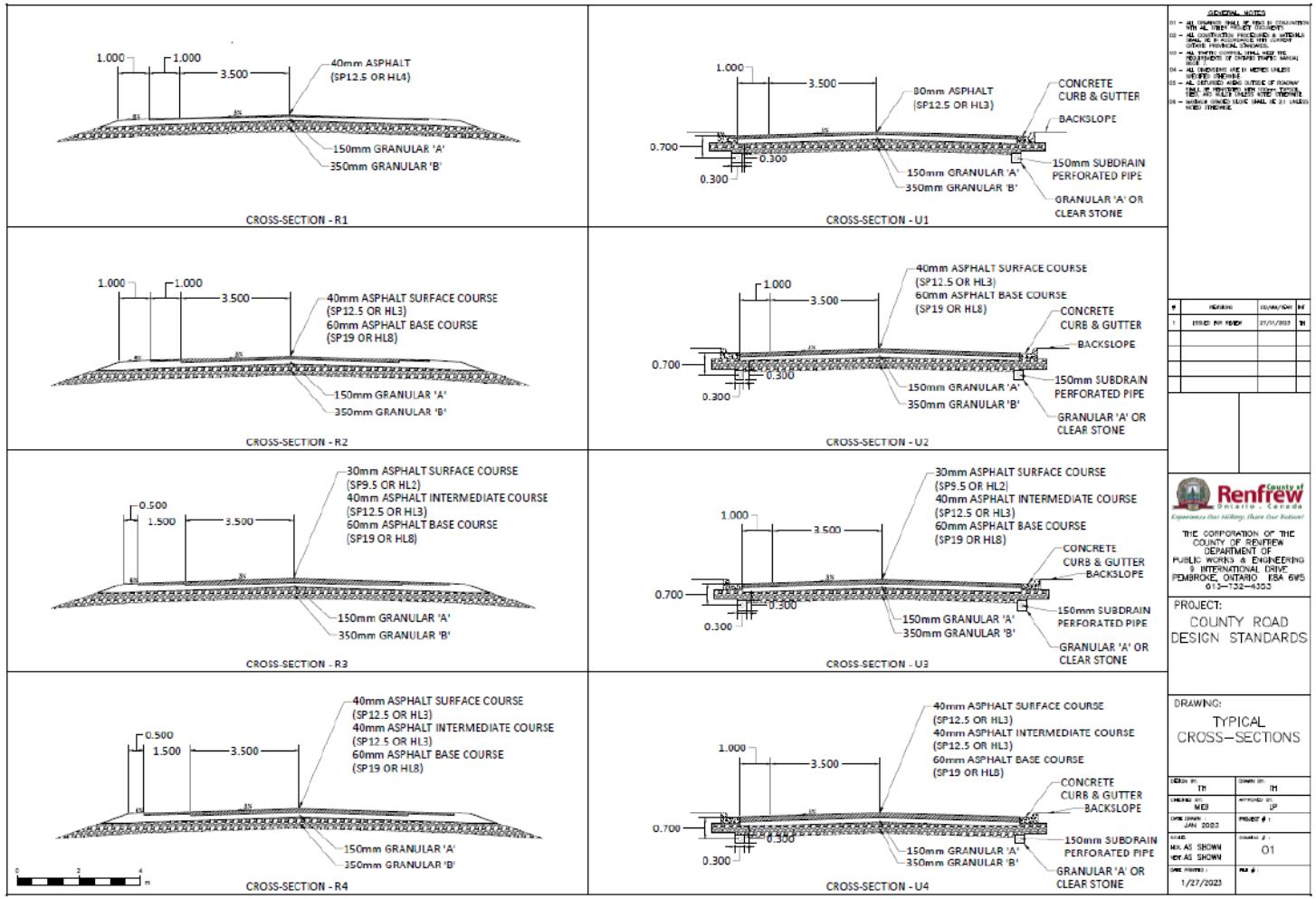


Figure 1 - Graphical comparison of road deterioration based on different Lifecycle Scenarios

Appendix A


1.000
1.000
3.500
40mm ASPHALT
(SP12.5 OR HL4)
150mm GRANULAR 'A'
350mm GRANULAR 'B'
CROSS-SECTION - R1
1.000
3.500
80mm ASPHALT
(SP12.5 OR HL3)
CONCRETE
CURB & GUTTER
BACKSLOPE
0.700
0.300
150mm SUBDRAIN
PERFORATED PIPE
150mm GRANULAR 'A'
350mm GRANULAR 'B'
GRANULAR 'A' OR
CLEAR STONE
CROSS-SECTION - U1
1.000
1.000
3.500
40mm ASPHALT SURFACE COURSE
(SP12.5 OR HL3)
60mm ASPHALT BASE COURSE
(SP19 OR HL8)
150mm GRANULAR 'A'
350mm GRANULAR 'B'
CROSS-SECTION - R2
40mm ASPHALT SURFACE COURSE
(SP12.5 OR HL3)
60mm ASPHALT BASE COURSE
(SP19 OR HL8)
1.000
3.500
CONCRETE
CURB & GUTTER
BACKSLOPE
0.700
0.300
150mm SUBDRAIN
PERFORATED PIPE
150mm GRANULAR 'A'
350mm GRANULAR 'B'
GRANULAR 'A' OR
CLEAR STONE
CROSS-SECTION - U2
0.500
1.500
3.500
30mm ASPHALT SURFACE COURSE
(SP9.5 OR HL2)
40mm ASPHALT INTERMEDIATE COURSE
(SP12.5 OR HL3)
60mm ASPHALT BASE COURSE
(SP19 OR HL8)
150mm GRANULAR 'A'
350mm GRANULAR 'B'
CROSS-SECTION - R3
30mm ASPHALT SURFACE COURSE
(SP9.5 OR HL2)
40mm ASPHALT INTERMEDIATE COURSE
(SP12.5 OR HL3)
60mm ASPHALT BASE COURSE
(SP19 OR HL8)
1.000
3.500
CONCRETE
CURB & GUTTER
BACKSLOPE
0.700
0.300
150mm SUBDRAIN
PERFORATED PIPE
150mm GRANULAR 'A'
350mm GRANULAR 'B'
GRANULAR 'A' OR
CLEAR STONE
CROSS-SECTION - U3
0.500
1.500
3.500
40mm ASPHALT SURFACE COURSE
(SP12.5 OR HL3)
40mm ASPHALT INTERMEDIATE COURSE
(SP12.5 OR HL3)
60mm ASPHALT BASE COURSE
(SP19 OR HL8)
150mm GRANULAR 'A'
350mm GRANULAR 'B'
CROSS-SECTION - R4
40mm ASPHALT SURFACE COURSE
(SP12.5 OR HL3)
40mm ASPHALT INTERMEDIATE COURSE
(SP12.5 OR HL3)
60mm ASPHALT BASE COURSE
(SP19 OR HL8)
1.000
3.500
CONCRETE
CURB & GUTTER
BACKSLOPE
0.700
0.300
150mm SUBDRAIN
PERFORATED PIPE
150mm GRANULAR 'A'
350mm GRANULAR 'B'
GRANULAR 'A' OR
CLEAR STONE
CROSS-SECTION - U4
GENERAL NOTES
THE CORPORATION OF THE
COUNTY OF RENFREW
DEPARTMENT OF
PUBLIC WORKS & ENGINEERING
9 INTERNATIONAL DRIVE
PEMBROKE, ONTARIO K8A 6W5
613-732-4353
PROJECT:
COUNTY ROAD
DESIGN STANDARDS
DRAWING:
TYPICAL
CROSS-SECTIONS
01
1/27/2023