

## **Appendix B.9**

# **Track Plan/Systems Operation Plan**

## **Track Plan**



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# Hamilton Rapid Transit Preliminary Design and Feasibility Study

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## B-LINE

### TRACK PLAN REPORT

Version: 1.0



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# Hamilton Rapid Transit Preliminary Design and Feasibility Study

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**B-LINE**

**TRACK PLAN REPORT**

Version: 1.0

September 2011



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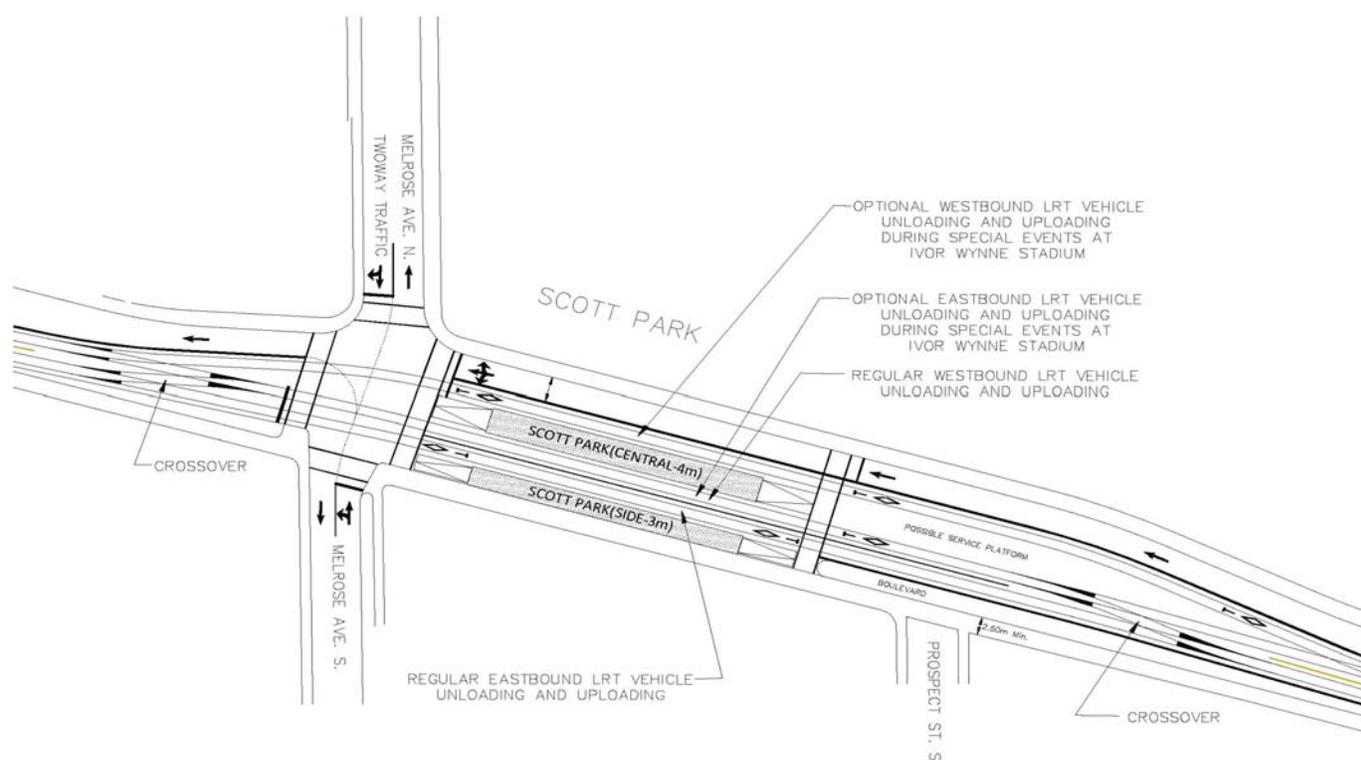
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## 1.0 Introduction

The total length of B-Line is approximately 14 km. There are 18 stops with spacing between them varying from 0.4 km (between Delta and Ottawa) to 1.7 km (between Parkdale and Nash).

## 2.0 Configuration

Five (5) stops are with central platform (McMaster University Terminal, First Place, Wentworth, Sherman and East Gate Terminal) 11 stops are with opposing side platforms and 2 stops (Parkdale and Nash) are with staggered side platforms. The Scott Park stop has a combination of a side and central platform. The side platform is 3 m wide and serves one eastbound track, while the central platform is 4 m wide with two tracks on either side; the southern track serves as a westbound track during regular operation and as an eastbound track during special events, and the northern track is used as a westbound track during special events only (See Figure 1).



**Figure 1: Track Configuration at Scott Park Stop**

The City of Hamilton (COH) has not finalized yet its choice of the Maintenance and Storage Facility (MSF) location. This represents a challenge in developing the track plan and defining the operational parameters of the system. For the purposes of defining a track plan for the Preliminary Design, the City of Hamilton has instructed that the MSF connection should be assumed to join the B-Line route in Segment 3, between Scott Park and Parkdale Avenue (as defined in Section 4.1.1 below).

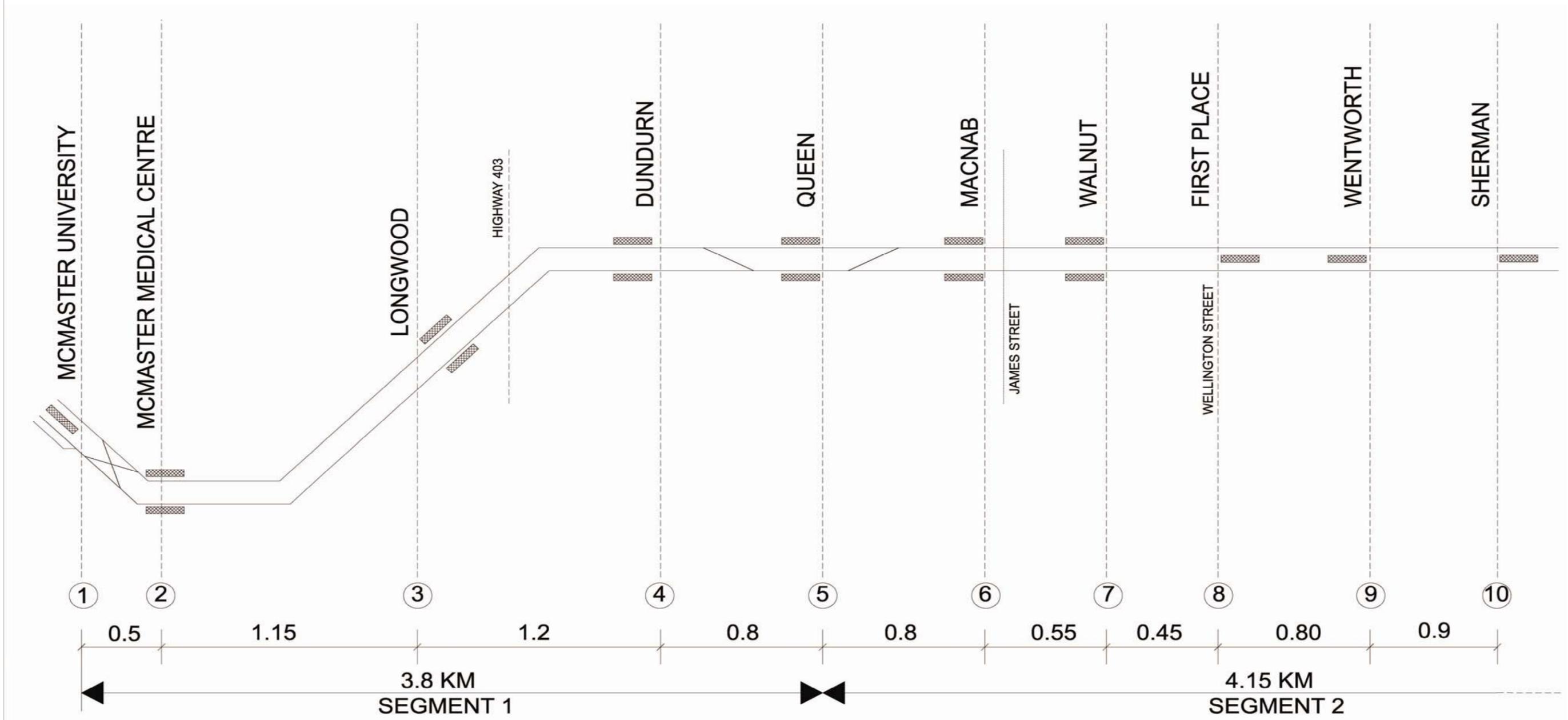
The base configuration of the so described track plan is shown in Figure 2.

### 3.0 Regular Operations

In accordance with the Operational parameters, 19 vehicles will have to be deployed for the morning peak period operation between the hours of 4.30 am to 6.30 am. Based on the assumption that the MSF will be between Scott Park and Parkdale, 17 vehicles will be heading west and 2 vehicles will be heading east. With headways along the MSF outgoing track averaging 5 min.

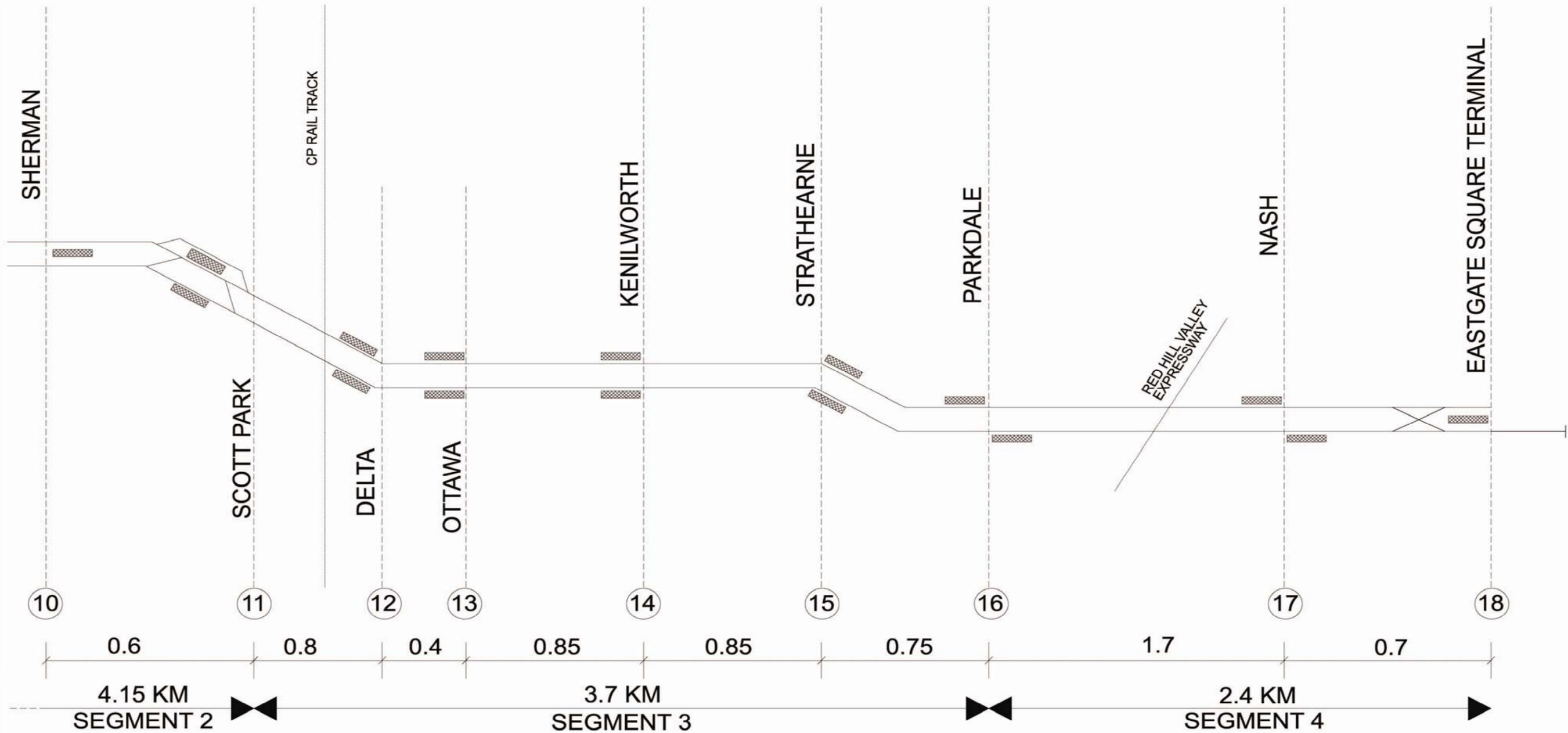
Ideally the connection point of the MSF track to the main line track should fully serve all moves for a direct deployment/withdrawal to/from service. Revenue operations of newly deployed trains can start from the stop closest to the MSF track connection to the east and west, similarly withdrawal of service will occur also at this same stop, such will required due timely notifications to system patrons at the terminal stations.

A cross-over along the MSF access track is required for downgraded operations (see Section 4.0 below)



**FIGURE 2**  
**HAMILTON LRT B-LINE TRACK PLAN (PART 1)**

N.T.S.



NOTE: MAINTENANCE AND STORAGE FACILITY ACCESS TRACKS LOCATION TO BE DETERMINED.  
ASSUMED TO BE WITHIN SEGMENT #3 AS PER CITY OF HAMILTON INSTRUCTION.

**FIGURE 2**  
**HAMILTON LRT B-LINE TRACK PLAN (PART 2)**

N.T.S.

## 4.0 Downgraded Operations

Downgraded operations along the B-Line LRT involve operating the rest of the line when a segment is closed for accident investigations / emergency repairs.

The downgraded operations provided with the proposed track plan are based on the following criteria:

- No bi-directional revenue operations to be considered. This stems from the problems of traffic controls at intersections and the safety issues with the other road users (drivers and pedestrians) not expecting reverse moves.
- The closed segment could be served by shuttle emergency bus services ;
- If the closure extends beyond the operational time of the system, the vehicles which cannot access the MSF will be parked overnight at pre-determined stops.

### 4.1 Proposed Segments for Downgraded Operations

#### 4.1.1 Segments Definition

It is proposed to break the 14 km main line into 4 segments, as indicated in Figure 1:

- Segment 1 : between McMaster University and Queen : 3.8 km and 4 stops;
- Segment 2: between Queen and Scott Park : 4.15 km and 5 stops;
- Segment 3 : between Scott Park and Parkdale : 3.7 km and 4 stops;
- Segment 4 : between Parkdale and East Gate Terminal : 2.4 km and 1 stop

#### 4.1.2 Downgraded Operations Scenarios

**Segment 1 out of operation:** All operations continue between Queen St. and Eastgate stops. The short reversal at Queen is executed as follows:

- All passengers disembark from the westbound vehicles at Queen westbound platform
- The empty vehicle proceeds west and reverses through the cross-over located just west of Queen, arriving for loading at the eastbound platform of Queen Stop.

**Segment 2 out of operation:**

In the case of Segment 2 out of operation, downgraded operations can be carried out at the west end between McMaster University and Queen. Passengers at Queen travelling west need to be advised to move to the eastbound platform at Queen, which becomes the temporary terminal stop. Alternatively, the train can unload all passengers at the eastbound platform at the Queen stop and continue to the cross-over on the east side to reverse to the westbound platform of Queen.

Operations east of Scott Park can be carried out as follows: Westbound trains will empty on the centre platform at Scott Park, continue west to the cross-over and proceed through the cross-over to the eastbound track in order to maintain revenue operation.

**Segment 3 out of operation:** Due to the short distance (only one intermittent stop) of segment 4, no operations east of Parkdale should be carried out. Segments 1 and 2 can operate between McMaster University and Scott Park. At Scott Park the eastbound vehicles will empty at the Scott Park eastbound platform, continue eastbound and use the cross-over to reverse directions, and board on the centre platform to continue revenue operation.

**Segment 4 out of operation:** Operations continues between McMaster University and the stop just west of the connection to the MSF. The empty trains move onto the MSF entry track, reverse and using a cross-over may switch to the westbound direction.

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## **Systems Operation Plan**



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# Hamilton Rapid Transit Preliminary Design and Feasibility Study

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## B-LINE

### PRELIMINARY OPERATIONS & MAINTENANCE PLAN

Version: 1.0



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## B-LINE

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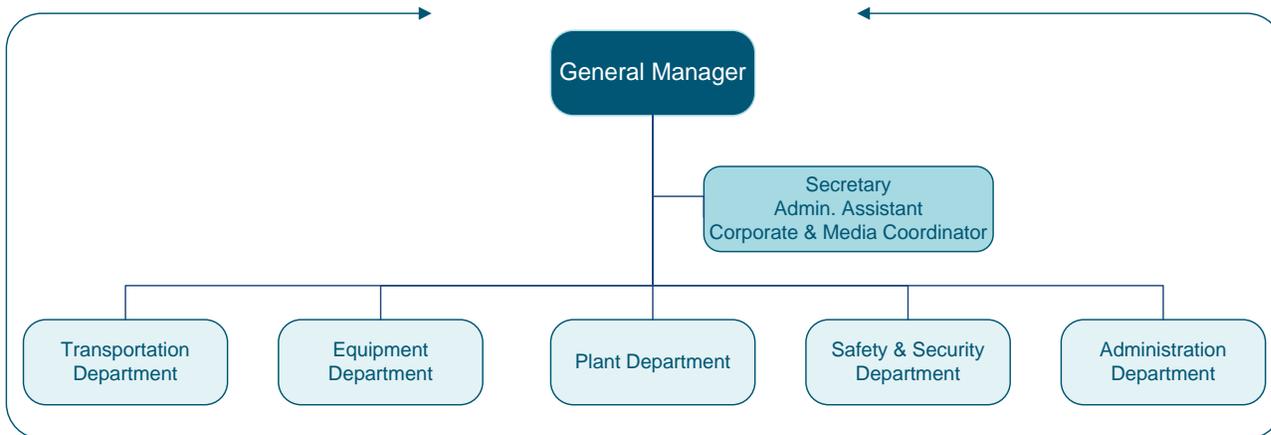
## Executive Summary

The City of Hamilton’s proposed B-Line will require a new operations and maintenance organisation as well as additional equipment. Adequate coordination is required to establish the organisation, as well as prepare for future operational growth and challenges.

The Preliminary Operations and Maintenance Plan (POMP) establishes an organisation based on typical operations and maintenance practices used worldwide.

The organisation established herein assumes a standalone staffing structure which aligns with the existing City organisation. Some of the functions identified may be carried out by current city staff, therefore reducing the number of staff required for the LRT; however, staff will have to be identified to carry out all appropriate functions.

The general organisation and hierarchy is shown below.



The above organisation will be sizable, requiring over 196 staff to carry out all of its functions.

## 1.0 Introduction

This Preliminary Operations and Maintenance Plan (POMP) is intended to illustrate ways in which the new organisation will structure itself, based on a primarily autonomous LRT Operations and Support structure. The discussions herein are restricted to the support requirements for the B-Line, but providing a framework, may be scaled to suit the expansion of the system.

The POMP provides a preliminary structure of the organization to operate the LRT system, it has been defined, on the assumption that it is a direct operating division of the City of Hamilton. However, the operating structure has not yet been decided and alternatives including a concession arrangement are possible.

The POMP outlines the elements which will be included in the Final Operations and Maintenance Plan to be developed during the detailed design phase. This plan is necessary to ensure that the transit system will meet the requirements of the public with respect to:

- Safety
- Security
- Reliability
- Travel Time
- Convenience
- Comfort
- Reasonable Cost

At the time of writing this report, the location of the maintenance and storage facility (MSF) has not been confirmed. For the purposes of this study, the location of the MSF has been assumed to be approximately 1.5km from the B-Line alignment and that assumption will form the basis for the non-revenue distances travelled.

## 2.0 System Operations

In order for any transit system to operate smoothly the needs of the users and the restrictions on operations must be evaluated during the planning cycle. These needs and restrictions form the basis upon which an optimal system arrangement can be determined. During the preliminary design process for the B-Line significant data was gathered and analysed, and from this analysis the requirements for basic services, and staffing were determined.

### 2.1 Anticipated System Demand

The projected demand for the B-Line is given in the *Integrated Transit Systems Operations Plan*. This document also provides the initial and peak vehicles schedule whose numbers are used as a basis for this POMP.

### 2.2 System Operating Parameters

The analysis of the system requirements determined that to meet the present and future needs of the City of Hamilton, the B-Line must meet the following basic performance requirements:

Specification	Unit
Total Length of Service	13.9 km
Travel Time One Way	32 min
Operational Speed	25.3 km/h
Terminal Layover Time	6 min
Round Trip Time	76 min

Table 2-1 - System Performance Requirements

### 2.3 Operations Scenarios

The proposed initial Service Plan for the B-Line is shown in **Table 2-2**.

Period	Weekday Hours	Headway minutes	Saturday Hours	Headway minutes	Sunday/Holiday Hours	Headway minutes
Early	0500 - 0700	7.5	0500 - 0900	10.0	0500 - 1100	10.0
AM Peak	0700 - 1000	4.0	-	-	-	-
Midday	1000 - 1400	6.0	0900 - 1800	6.0	1100 - 1800	7.5
PM Peak	1400 - 1830	4.0	-	-	-	-
Evening	1830 - 0130	7.5	1800 - 0130	7.5	1800 - 0030	10.0

Table 2-2 - Operating Schedule and Headway Requirements

In order to achieve the system performance shown above the fleet required is 22 vehicles, including operational and stand-by vehicles. The number of vehicles in operation required based on the headways per the operating schedule is listed in **Table 2-3** below.

Headway minutes	Vehicles in Operation	Stand-by Spares
4.0	19	3
6.0	13	2
7.5	10	2
10.0	8	1

**Table 2-3 - Fleet Deployment Requirements**

Analysis of the operating parameters, operating schedule, and fleet size has indicated the anticipated vehicle trips, distances travelled, and operating hours both daily and annually. These results are summarized in **Table 2-4** below.

	Average Operating Day	Annual
<b>1 Total Round Trips</b>	213	77,813
<b>2 Fleet Vehicle Distances Travelled</b>		
Revenue Service (km)	5,644	2,060,021
Non-Revenue Service (km)*	80	97,571
<b>Total (km)</b>	5,723	2,157,592
<b>3 Fleet Vehicle Operating Hours</b>		
Revenue Service (hrs)	270	98,563
Non-Revenue Service (hrs)	3	3,252
<b>Total (hrs)</b>	273	101,815

\* Maintenance circulation at MSF are not included, MSF assumed 1.5 km from main line

**Table 2-4 - Estimated Trips, Distance travelled (in Kilometres), and Vehicle Hours Based on Preliminary Operations Schedule**

### 3.0 Operations Plan

The objective of any System Operator is to provide a safe, reliable, clean and efficient transit service to its customers, as reflected in the Operators' organisational structure

Although the planned transit service does not provide revenue service on a 24-hour basis, the organisation must be designed recognizing that certain activities, such as security and some maintenance if required, will have to be undertaken on a 24-hour basis. Also, certain functions can only be performed when the system is shut down, e.g. rail and overhead catenary maintenance.

Additionally, it is more efficient and cost effective to undertake vehicle inspections and maintenance in the periods when few or no vehicles are required for revenue service and the remainder of the fleet is available for maintenance such as during late evenings, nights and weekends. The organisational structure and staffing schedules need to be developed to reflect this type of maintenance.

### 3.1 Organisation

In order to operate efficiently, the organisation structure will be developed to clearly identify areas of responsibility and lines of authority. The organisation charts shown in the following Figures 3.1 - 3.6 reflect this important concept.

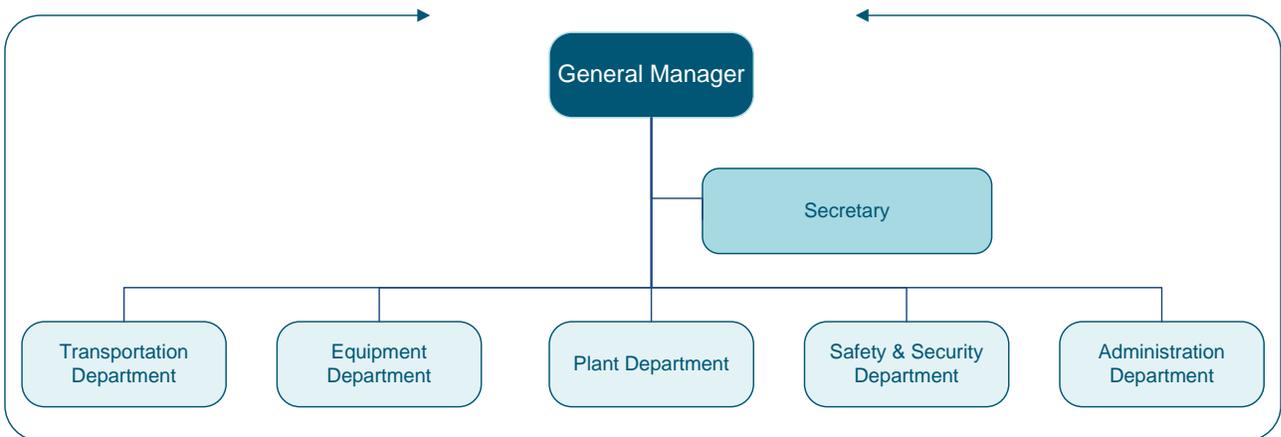
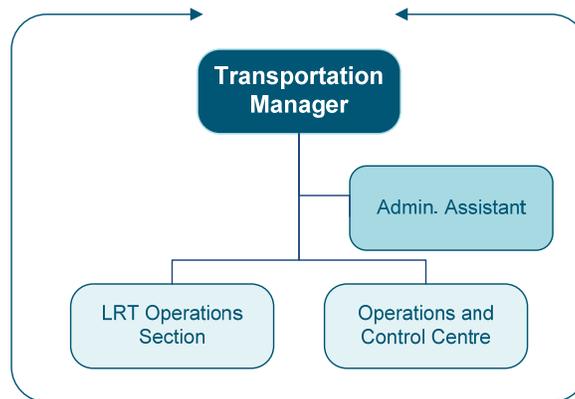


Figure 3-1 - Proposed Operations and Maintenance (O&M) Organisational Structure

#### 3.1.1 General Manager's Office

The General Manager is responsible for organising and providing management direction to the transit staff. This office coordinates the activities of the Operations Departments and the Administration Department and is responsible for the performance of all aspects of the transit service.

### 3.1.2 Transportation Department



**Figure 3-2** - Proposed Transportation Department Organisational Structure

The Transportation Department is responsible for the daily operation of the system and supplying service to its customers. This includes:

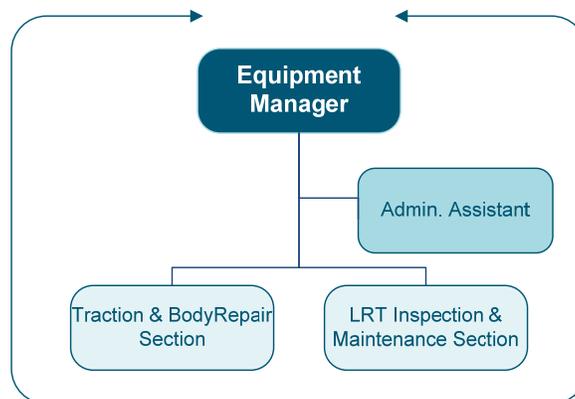
- Operating the LRT vehicles; and
- Monitoring, supervising, and controlling the service from Central Control.

The employees of this department are the representatives of the LRT B-Line Operator who deal with the customers and therefore should be easily identifiable, i.e. dressed in corporate uniforms.

These employees work in shifts, seven days a week. They provide varying levels of service, to meet the travelling demands of the public.

The organisational structure of the Transportation Department reflects the type of work to be undertaken, staffing requirements and the duration of service to be provided.

### 3.1.3 Equipment Department



**Figure 3-3** - Proposed Equipment Department Organisational Structure

The Equipment department is responsible for vehicles maintenance and servicing. This includes everything that is required to provide safe, reliable and clean vehicles for revenue service.

On a scheduled basis, all vehicles will undergo safety tests and inspections. Some tests and inspections will be carried out on a daily basis, while others will take place on a mileage-operated basis or calendar basis. On a daily basis, the inspection will include a visual check of all exposed components and subsystems to verify that there are no obvious defects. Additionally, a functional test will be performed to verify that all vehicles systems are fully operational.

A preventative maintenance program will be developed based on mileage-operated or calendar basis and manufacturers recommendations. There will be a number of schedules, i.e. monthly, quarterly and annually, when the vehicle will be put in the maintenance shop for various lengths of time.

A program for major overhauls will also be needed. This will be based on operational experience and manufacturers recommendations. It will include major component replacement and a very intensive vehicle body inspection. The major overhaul program will also address the repair/rebuilding of the components replaced so that they can be re-used on another vehicle.

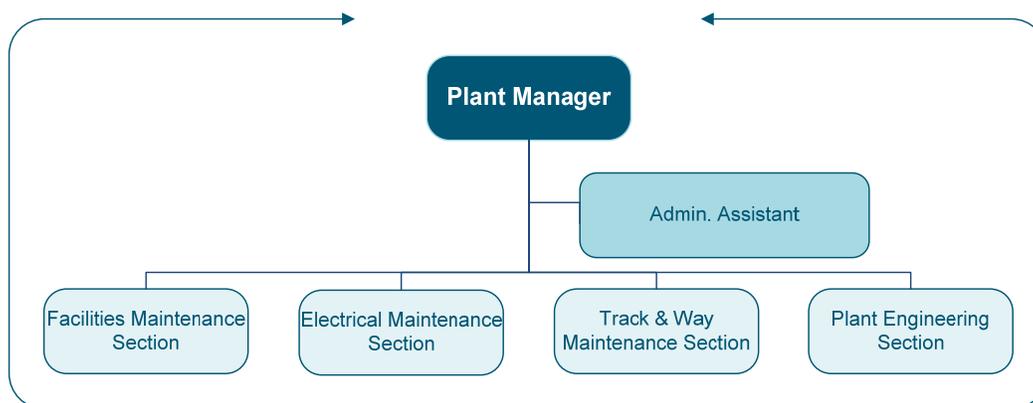
On-line maintenance staff will handle LRT vehicle problems during revenue service. If the problem cannot be solved by the line mechanics, the train will be taken out of service and a replacement (change-off) will be arranged from the spares on standby. In the event of a major problem which causes a service delay the primary objective will be to safely remove the train from the system. This could mean storing the train in the tail tracks or on-line track storage until after revenue service, when it will be moved to the maintenance facilities.

Wheel turning, to restore the true profile and correct flat spots, will be done during one of the scheduled maintenance periods and on an as-required basis.

The organisational structure for the Equipment Department is developed recognizing the types of work to be undertaken: staffing requirements, facilities available, vehicle availability, and time of day the work is to be performed.

It is anticipated that engineering works related to the vehicles themselves will be a part of the manufacturer's services during the warranty period. Subsequent to the warranty period those engineering services are best contracted to the manufacturer on a retainer basis.

### 3.1.4 Plant Department



**Figure 3-4 - Proposed Plant Department Organisational Structure**

The Plant Department is responsible for the maintenance of the fixed assets. These includes:

- The stops;
- Tracks and right-of-way; and
- Shops, offices and yards.

The employees of this department include all the building trades; carpenters, plumbers, painters, electricians, etc., plus the specialized maintenance personnel to deal with communication systems, electronic equipment repair and traction power equipment.

Employees in this department also provide janitorial services at the stops, offices, shops, etc.

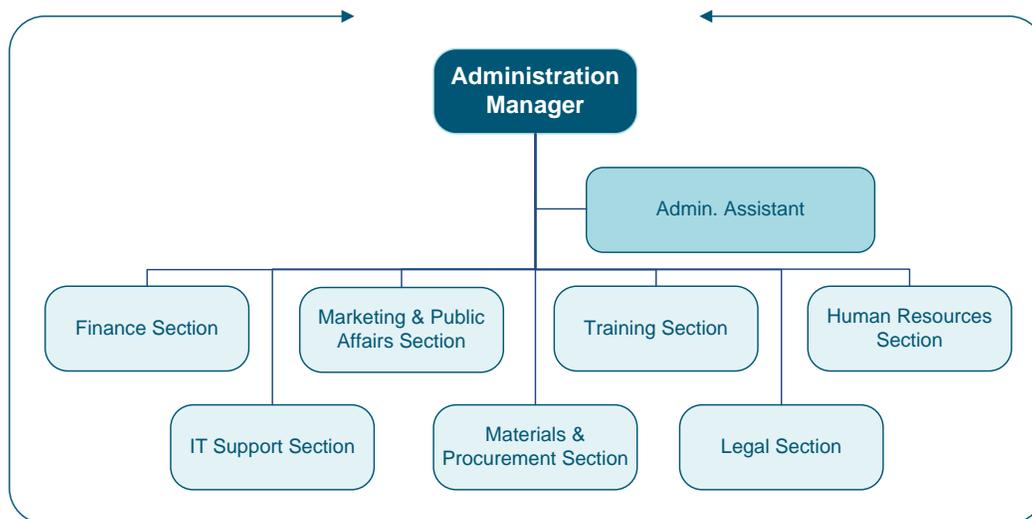
Some of the work undertaken by this department is done on an as-required basis, such as plumbing repairs, while other work is done on a scheduled basis. The department therefore must be organized so that it can handle both emergency and scheduled work as well as have a management information system to track both.

The department will also have an engineering group, which will provide electrical, structural and architectural services, plus track and right-of-way engineering.

The organisational structure of the Plant Department has been developed recognizing the varied types of work to be undertaken: staffing requirements; facilities to be maintained and the time of day the work is to be performed.

Some groups within the plant department may be managed using contracted staff, with appropriate requirements written into the contract requirements for the tasks allocated.

### 3.1.5 Administration Department



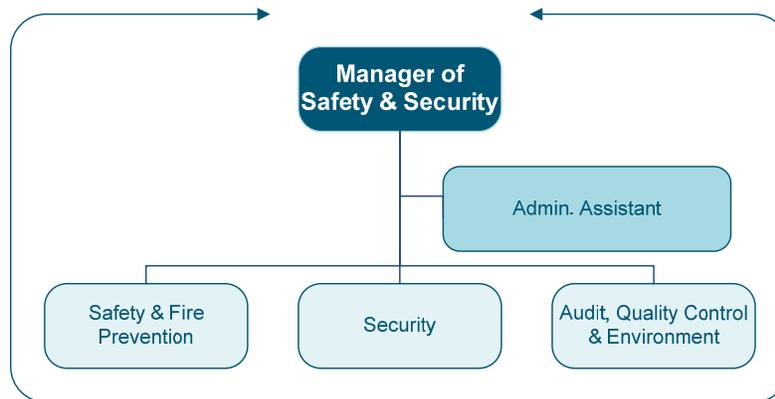
**Figure 3-5** - Proposed Administration Department Organisational Structure

The Administration Department is responsible for providing the following functions:

- Financial management, revenue collection (counting and sorting);
- Legal;
- Human resources;
- Materials and procurement (including warehouse operation);
- Marketing and public affairs – service planning; and
- IT support services.

The organisational structure for this department is developed recognizing the administration functions necessary for a successful operator.

### 3.1.6 Safety & Security Department



**Figure 3-6 - Proposed Safety & Security Organisational Structure**

The Safety and Security Department is responsible for the development and implementation of an effective program to ensure the safety and security of passengers and staff of the transit system and its facilities. The department will oversee the auditing, quality assurance and environmental monitoring for the transit system.

In addition, this department will be responsible for staffing the gates, yard patrol, the maintenance and storage facilities and the Administration building, thereby providing security to these facilities. The security staff will be responsible for security on the LRT vehicles.

The organisation structure has been developed to recognize the responsibilities of this department on a twenty-four hour, seven days a week basis.

## 3.2 Position Descriptions

### 3.2.1 General Manager's Office

#### General Manager

The General Manager will have the overall responsibility for the operation, maintenance and administration activities including:

- organizing and providing management direction to the operating, maintenance and administration functions;
- setting safety and performance goals and establishing procedures and guidelines to achieve them;
- corporate planning and budgeting;
- implementing and enforcing policy directives; and
- assessing challenges and trends and implementing corrective action where required.

This position requires a manager with experience in both an operating and administrative environment. The incumbent should have a University degree in Engineering or Business Administration.

### 3.2.2 Transportation Department

#### Transportation Manager

The Transportation Manager, reporting to the General Manager, will have the overall responsibility for operating the transit service. This includes the operation of trains and the Operations Control Center. The duties of this position will include:

- coordinating train operations activities;

- developing and enforcing safety and operating rules and procedures to provide a safe and customer-oriented transit system;
- reviewing operating performance and identifying changes needed to solve problems and improve performance;
- ensuring that abnormal and emergency contingency plans have been formulated, are in place, and evaluating the effectiveness of the plans after an emergency situation has occurred;
- supervising all transportation personnel and evaluating performance; and
- overseeing the training programs developed for Transportation Department employees.

This position requires a person with operations experience, preferably in transit. The incumbent should have a University degree in Engineering or Business Administration.

### LRT Operations Section

The drivers will report to the Operations Controller Console. The LRT system operators will be responsible for the actual on-line service, which will be provided twenty one (21) hours per day, seven (7) days a week.

The duties of the LRT Operations group include:

- ensuring safe and reliable operation of the vehicles;
- providing information and assistance to the customers;
- advising the Control Center of any emergencies on the line;
- assisting in evacuating passengers during an emergency or should an extended delay be encountered. (This would be on the advice of the Operations Control Center.); and
- providing support for crowd control during occasions of high demand in coordination with other external agencies (This would be on the advice of the Operations Control Centre);

### Operations and Control Centre

The Operations and Control Center will be staffed twenty-four (24) hours per day, seven (7) days a week. The duties of the Operations and Control Center group include:

- dispatching trains into and out of service;
- monitoring service and taking corrective action when necessary;
- setting up turn-back operations for extended delays and arranging alternative services;
- controlling track switches;
- receiving and processing all calls regarding maintenance of the system;
- monitoring the power distribution system and making power cuts, and line changes as necessary;
- overseeing the security activities on the system and advising security personnel of potential security problems on any of the LRT B-Line property; and
- communications with emergency response agencies.

The positions of Supervisors and Controllers should be filled by persons with at least a College/Technical Education.

The Vehicle Operator positions should have a minimum of a High School education.

The Control Center personnel should eventually come from the operations ranks, to provide the actual operations experience necessary to successfully undertake the duties of these positions. The education level should be a minimum of High School with encouragement to upgrade for future consideration for promotions.

### 3.2.3 Equipment Department

#### Equipment Manager

The Equipment Manager, reporting to the General Manager, will have the overall responsibility for directing all activities required to maintain the fleet of passenger vehicles. This includes a Maintenance and Storage Facility (MSF) with a major repair shop and yard operation, Equipment Engineering and running maintenance facilities for LRT vehicles. The duties of this position will include:

- developing and enforcing safety and maintenance rules and procedures;
- coordinating vehicle maintenance activity with the other operations departments to ensure that the required revenue and non-revenue vehicles are available when needed;
- reviewing vehicle operating performance and identifying changes needed to solve problems and improve performance;
- reviewing vehicle maintenance facilities to identify improved procedures, materials, equipment, etc.;
- supervising all equipment maintenance personnel and evaluating performance;
- overseeing the training programs developed for Equipment Department employees; and
- developing maintenance procedures for all equipment including scheduling and reporting systems.

This position requires a person with operations experience in heavy transit or manufacturing industry. The incumbent should have a University degree in Electrical or Mechanical Engineering.

#### LRT Inspection and Maintenance Section

This section through the Superintendent of LRT maintenance, reports to the Equipment Manager. This section is responsible for the inspection and maintenance of the vehicles on a scheduled and as required basis, including cleaning. The duties of this section include:

- carrying out, as per schedules and procedures, all inspections and maintenance work on the transit vehicles;
- carrying out all exterior and interior cleaning of the vehicles;
- keeping records of all inspections and work done for input to the maintenance management system;
- the delivery of vehicles between the yard and maintenance building, as required; and,
- making recommendations for improvement to procedures and materials.

Some of the Technician positions in the work force will require a College education. The minimum education requirements for all other positions should be a High School graduation.

#### Traction & Body Repair Section

The Traction and Body Repair Section reporting to the Manager of Equipment, will be responsible for the overhaul and repair to major subsystems of the LRT vehicles. This will include trucks, propulsion systems, pneumatics, air conditioners, doors, etc. The section will include a machine shop. The duties of this section will include:

- removing and replacing wheels;
- overhauling of trucks, motors, etc.;
- rebuilding subsystems such as brakes, pneumatic valves and controls;
- overhauling of air conditioning equipment, door controls and mechanisms;
- providing provisions or procurement for services of LRV body repairs;
- providing shop services to both Equipment and Plant Departments; and

- reviewing repair procedures and recommending improvements identified.

The Supervisor of this section should have at least a College education in Mechanical Technology preferably with shop machining knowledge. The Technicians should have a College education in Mechanical and Electrical Technology.

### 3.2.4 Plant Department

#### Plant Manager

The Plant Manager, reporting to the General Manager, will have overall responsibility for directing all activities required to maintain the right-of-way, structures and fixed facilities and equipment. The duties of this position will include:

- developing and enforcing safety and maintenance rules and procedures;
- coordinating the maintenance of the fixed facilities with the other operations departments to ensure that the facilities are available, when required;
- reviewing operating performance for the equipment maintained to identify changes needed to solve problems and improve service;
- reviewing the facilities and equipment to identify improved procedures, material, equipment, etc.;
- supervising all fixed asset maintenance personnel and evaluating performance; and
- overseeing the training programs developed for Plant Department employees.

This position requires a person with operating experience in heavy transit or manufacturing industry. The incumbent should have a University Degree in Electrical or Civil Engineering.

#### Facilities Maintenance Section

The Facilities Maintenance Section, reporting to the Plant Manager, will be responsible for the maintenance and upkeep of all buildings, structures, etc. This section will consist of building traders capable of plumbing, carpentry, painting and air conditioning. This section will also consist of cleaners. The duties of this section include:

- providing janitorial service for all stops;
- maintaining and upgrading of all stop facilities including the MSF;
- servicing all heating and air conditioning units in offices; and

The Supervisor of this section should have at least a College degree in Mechanical Technology.

As these trades are readily available from local specialist companies, it is here assumed that the services will be contracted out on as needed basis.

#### Electrical Maintenance Section

The Electrical Maintenance Section, reporting to the Plant Manager, will be responsible for the maintenance of all the electrical and electronic equipment at stops, buildings, right-of-ways, yards, substations, etc. The duties of this section include:

- maintaining the signal system;
- maintaining the traction power and stop service substations;
- maintaining the catenary;
- maintaining the wiring and cabling systems and building electrical services;
- maintaining the fare sales and validating equipment; and

- maintaining the communication and alarm systems.

The Supervisor of this section should have a University or College education in Electrical Engineering or Electrical Engineering Technology.

### Track and Way Maintenance Section

The Track and Way Maintenance Section, reporting to the Plant Manager, will be responsible for the maintenance of the right-of-way, yards and grounds-keeping. The duties of this section include:

- maintaining all main-line track including rails, switches, frogs, fasteners, etc.;
- maintaining of all yard track including rails, switches, frogs, fasteners, etc.;
- cleaning at track level;
- grounds-keeping and landscaping; and,
- conducting safety and training of the Maintenance of Way section personnel.

The supervisor of the section should have at least a College education in Civil Technology.

### Plant Engineering Section

The Plant Engineering Section, reporting to the Plant Manager, will be responsible for engineering studies as they relate to fixed assets. The duties and responsibilities of this section include:

- providing engineering support to Plant Operations for the maintenance and repair of all fixed facilities;
- reviewing preventative maintenance inspection reports to identify areas requiring attention;
- maintaining contact with equipment suppliers re: improvements, upgrades to existing equipment;
- assisting in troubleshooting for problems on major systems;
- assisting in developing preventative maintenance programs; and,
- undertaking periodic inspection of structures.

This section will include at least one Electrical Engineer and one Mechanical or Civil Engineer.

## 3.2.5 Administration Department

### Administration Manager

The Administration Manager, reporting to the General Manager, will have the overall responsibilities for the financial management, legal administration, human resources administration, training materials and procurement, marketing, public affairs, service planning, revenue operations and computer services, and will serve as the Controller for the organisation. The duties of this position will include:

- developing and maintaining the corporate financial system;
- issuing payment and other account transactions;
- reviewing accounts receivable and payable, and monitoring cash flow;
- overseeing recruiting and training programs;
- overseeing the materials procurement process and warehousing of materials;
- overseeing the revenue collection, counting and sorting functions;
- overseeing the legal and computer services functions; and,
- overseeing the negotiations of a collective agreement and monitoring adherence to the labour agreement during its term.

This position requires a person with a financial and business background. The incumbent should have a University degree in Finance or Business Administration.

### Finance Section

The Finance Superintendent will report directly to the Manager of Administration and will have overall financial management responsibility for the LRT B-Line Operator. The duties of this position will include:

- developing and maintaining a balance sheet and general ledger system;
- issuing payment and other account transactions;
- supervising accounts receivable and payable and monitoring cash flow;
- publishing the annual report for the LRT B-Line Operator; and
- monitoring pay disbursements.

This position requires a person with experience in the Corporate Finance field. The incumbent should have a University Degree in Business Administration and be a Chartered Accountant.

### Fare Collection & Distribution

The Fare Distribution Head Cashier will work within the Finance Section, reporting directly to the Finance Superintendent and will be responsible for duties including:

- coordinating ticket distribution and collection system, through the Fare Distributions and teller personnel;
- coordinating the computerized ticket data processing system; and
- maintaining ledger entries and other bookkeeping activities.

This position requires a person with a University or College Degree in Business Administration or Computer Science.

### Marketing & Public Affairs

The Marketing & Public Affairs, Service Planning position reporting to the Manager of Administration will be responsible for the overall marketing programs for the LRT B-Line Operator including:

- monitoring coordination with The City of Hamilton and other authorities such as GO Transit/Metrolinx as well as the responsible/designated person at the Hamilton Street Railway (HSR) and the Public Works Department.
- soliciting advertising to be placed in LRT B-Line vehicles and stops, thereby generating revenue.

These positions will require persons with a college/university education in marketing or public affairs.

### Human Resources

The Human Resources section position reporting to the Manager of Administration will be responsible for Human Resources for the LRT B-Line including:

- sourcing and hiring of new staff with approval of the General Manager;
- employee personnel development and labour compliance;
- keep personnel records for all employees; and
- establishing an industrial health service program and provide first aid type attention for minor injuries, etc. to employees.

These positions will require persons with training in recruiting and Human Resources. The clerk requires experience in record system management.

These services may be centralised within the larger City Human Resources Organisation.

## IT Support Section

The IT Support section, reporting to the Administration Manager will be responsible for the in-house business computer systems. These duties will include:

- in conjunction with the user, selecting the necessary computer systems along with appropriate hardware and software to complete the systems tasks;
- analyzing and upgrade the computer systems and programs as necessary; and
- instructing users when upgrading is undertaken.
- Providing day to day support to users for IT systems issues.

The persons filling these positions should have a University or College Degree in Computer Science and some years of business experience in this field.

These services may be centralised within the larger City IT Services organisation; however, some degree of immediate local support is desirable.

## Materials & Procurement

The Materials & Procurement Section, reporting to the Administration Manager will be responsible for purchasing, receiving and warehousing (storing) all materials needed for the operation, maintenance and administration functions of the LRT B-Line Operator.

The section consists of a Senior Buyer (section head), Buyer and a Warehouse Clerk. The duties of the persons in this section include:

- issuing purchase orders for materials being purchased by the LRT B-Line Operator;
- expediting all purchase orders;
- receiving all materials ordered, checking for correctness and storing the material;
- notifying the department requesting the material when it arrives; and
- arranging for the sale of unwanted materials i.e. scrap, obsolete, etc.

These positions will require persons with previous purchasing and warehousing experience while other persons can be trained on the job i.e. warehouse persons. It would be preferred to have persons with a mix of University or College and High School education.

Some aspects of this section may be centralised within the City's larger Materials & Procurement organisation; however, the warehousing and shipping and receiving functions must be conducted locally.

## Legal Section

The Legal Section, reporting to the Administration Manager will be responsible for all legal actions taken by or actions against the LRT B-Line Operator.. The duties will include:

- advising the General Manager on all legal actions involving the LRT B-Line Operator.;
- preparing cases and representing the LRT B-Line Operator. in court;
- reviewing the wording on all contracts, both labour relations and contracts for equipment and services from a legal point of view; and
- reviewing all claims against the LRT B-Line Operator. and making recommendations on the handling of same.

The senior position requires a professional lawyer.

This service may be provided by the City's existing legal department.

## Training Section

The training section, reporting to the Administration Manager will be responsible for identifying the training needs of the HSR, implementing the training programs and recording their efficiency as per the objectives. Trainer will be assigned as per the following disciplines.

**Transportation trainer:** The trainer of this discipline will, in coordination with the manager of the transportation department, develop and implement training sessions to address the needs of the department aimed at improving operational efficiency.

**Equipment and Plant trainer:** The trainer of this discipline will, in coordination with the manager of the Plant department, develop and implement training sessions to address the needs of the department aimed at improving maintenance and procedures efficiency.

**Security trainer:** The trainer of this discipline will, in coordination with the manager of the safety and security department, develop and implement training sessions to address the needs of the department aimed at maintaining and improving the system safety and facilities security to the highest standards.

### 3.2.6 Safety and Security

#### Manager of Safety and Security

The Safety and Security Manager, reporting to the General Manager, will have the overall responsibility for safety monitoring, fire prevention, security activities, audit, quality assurance, and environmental monitoring. The duties of this position will include:

- developing and maintaining a monitoring system to track employee and customer accidents;
- developing a safety incentive program to recognize good safety efforts and results;
- developing and maintaining a fire prevention inspection, monitoring and recording system;
- reviewing the performance of the security forces and identifying problem areas and solutions;
- liaising with municipal police, fire and ambulance departments;
- directing the audit and quality assurance activities for the LRT B-Line Operator;
- directing the programs to monitor the environmental impacts of all LRT B-Line Operator activities and the action needed should environmental threats be discovered; and
- overseeing the training programs developed for Security Department employees.

This position requires a person with experience in the security or health field. The incumbent should have a University Degree in Science, Business Administration or Engineering.

#### Safety and Fire Prevention Section

The Safety and Fire Prevention Section, reporting to the Safety and Security Manager, is responsible for customer safety programs and fire safety within the transit system. The duties and responsibilities of this section includes:

- implementing and communicating passenger safety programs;
- monitoring employee safety programs;
- inspecting and testing related to the fire prevention program;
- providing constant surveillance of the company's properties and equipment; and
- compiling summaries of safety and fire incidents and issuing reports to management.

The safety and fire prevention manager should have a College education, as well as practical training in fire prevention.

## Superintendent of Security

The Superintendent of Security, reporting to the Safety and Security Manager, will be responsible for the day to day operation of the Security Group. The duties of this position will include:

- liaising with the Police and Emergency services;
- investigating special assignments;
- recording all security incidents; and
- investigating security problems and/or concerns and recommending solutions for corrective action.

This position requires a person with a College education, preferably in law enforcement.

## Audit, Quality Control, Environment

The Audit, Quality Control and Environment Section reporting directly to the Safety and Security Manager, will be responsible for monitoring departmental and corporate compliance. The duties of these positions will include:

- ensuring departments are fulfilling their mandate;
- ensuring suppliers are providing items equal to or better than specified and acceptable to end user; and
- ensuring the transit system is aware of changes to legislation regarding the environment and is complying with the requirements.

These positions require a person with a College education.

## 4.0 Maintenance Plan

The objective of the Maintenance Plan is to provide its Transportation Department with safe, reliable and clean LRT vehicles for transportation of its customers. Additionally, the Plan will provide for the proper maintenance of all fixed facilities, guide-ways, maintenance shops and yards and office facilities for its staff.

Normally all systems, when new, are procured with spares parts for the envisaged normal wear and tear of the system for a period of three years.

### 4.1.1 Track and Catenary Maintenance Schedule

A Table with the projected Rail and Special Trackwork Replacements has been prepared to show the approximate years, within a typical 30-year O & M period, in which various components of the track system will need replacing. If track is neglected and maintenance deferred then larger segments will have to be replaced within a shorter time frame.

The contact wire of the overhead catenary system will require scheduled inspections and periodic replacements. If the system is well maintained on an annual basis then replacement costs can be accommodated within the operations and maintenance budgets. The hereby presented POMP allows for staffing for such periodic inspections.

MATERIAL TO BE REPLACED	REPLACEMENT YEAR						
	7	10	13	16	20	25	30
Tangent Track Mainline						⌚	
Tangent Track stop Areas				⌚			
Tangent in Special Track Work			⌚			⌚	
Tangent Track Storage Yard							⌚
Curved Track Mainline	⌚		⌚		⌚		⌚
Curved Track Storage Yard					⌚		
Switch Points & Stock Rails Storage Yard				⌚			
Switch Points & Stock Rails Inline Locations			⌚			⌚	
Switch Points & Stock Rails Terminal	⌚			⌚		⌚	
Yard Turnouts		⌚			⌚		⌚
Frog's - Terminal S.T.W.	⌚		⌚		⌚		⌚
Frog's - Yard Turnouts		⌚			⌚		⌚
Frog's - Inline Locations			⌚			⌚	
Frog's - Yard				⌚			

**Note:**

The renewal year will vary +/- one/two years dependant on vehicle loading and service frequency

**Table 4-1 - Replacement Timeline for Trackwork Components**