1.0 INTRODUCTION

This document comprises the Construction Environmental Management Plan (CEMP) for the Richmond Airport Vancouver Rapid Transit System Project (RAVP). The CEMP is a requirement of the Environmental Assessment Certificate (Attachment 1-1), issued under British Columbia's *Environmental Assessment Act*.

RAVP is being developed as a public-private partnership. The public sector is represented by RAV Project Management Ltd. (RAVCo), a wholly-owned subsidiary of the Greater Vancouver Transportation Authority ("TransLink"). The private sector element, or Concessionaire, is InTransit BC. InTransit BC has allocated responsibility for design and construction of the project to SNC-Lavalin Inc. which will function as engineering, procurement and construction contractor (EPC). The CEMP has been prepared by EPC as a key instrument to define environmental compliance requirements of the project for the various contractors that will complete the design-build phase, and to aid them in meeting those requirements.

This introduction provides a summary description of RAVP, plus information on the objectives, scope and formatting of the CEMP.

1.1 SUMMARY DESCRIPTION OF RAV PROJECT

The Richmond Airport Vancouver Rapid Transit Project (RAVP) is a rail rapid transit system linking downtown Vancouver with Richmond Centre, with a connection to the Vancouver International Airport (YVR) on Sea Island (Fig. 1-1).

Long-term plans to address population growth while maintaining liveability at the regional level and in areas serviced by the Richmond/Airport/Vancouver corridor included those set out in the GVRD Livable Region Strategic Plan (LRSP) (1966), the City of Vancouver's CityPlan (1995), the City of Richmond Official Community Plan (OCP) (1999), and the Vancouver International Airport Authority (VIAA) Master Plan (1996). RAVP is consistent with the rapid transit concept envisioned in each of those plans as a viable means of addressing the challenges associated with increasing commuter traffic.

The RAVP system will be approximately 19.5 km long and will include up to 18 stations. The system alignment is shown in Figure 1-1. The RAVP will consist of an electric rail transportation system with electrical current supplied via a line feed rail (*i.e.* third rail system) at 750 volts (DC). The line is equipped with an Automatic Train Control (ATC) System with a maximum operational speed of 80 km/h.

The initial fleet will consist of 44 vehicles (36 in regular service and eight spares), providing a system capacity of 6,680 passengers per hour per direction (pphpd) using two vehicles at 360-second headways on each of the Richmond and Airport segments, and overlapping for 180-second headways north of Bridgeport Station. The ultimate capacity of

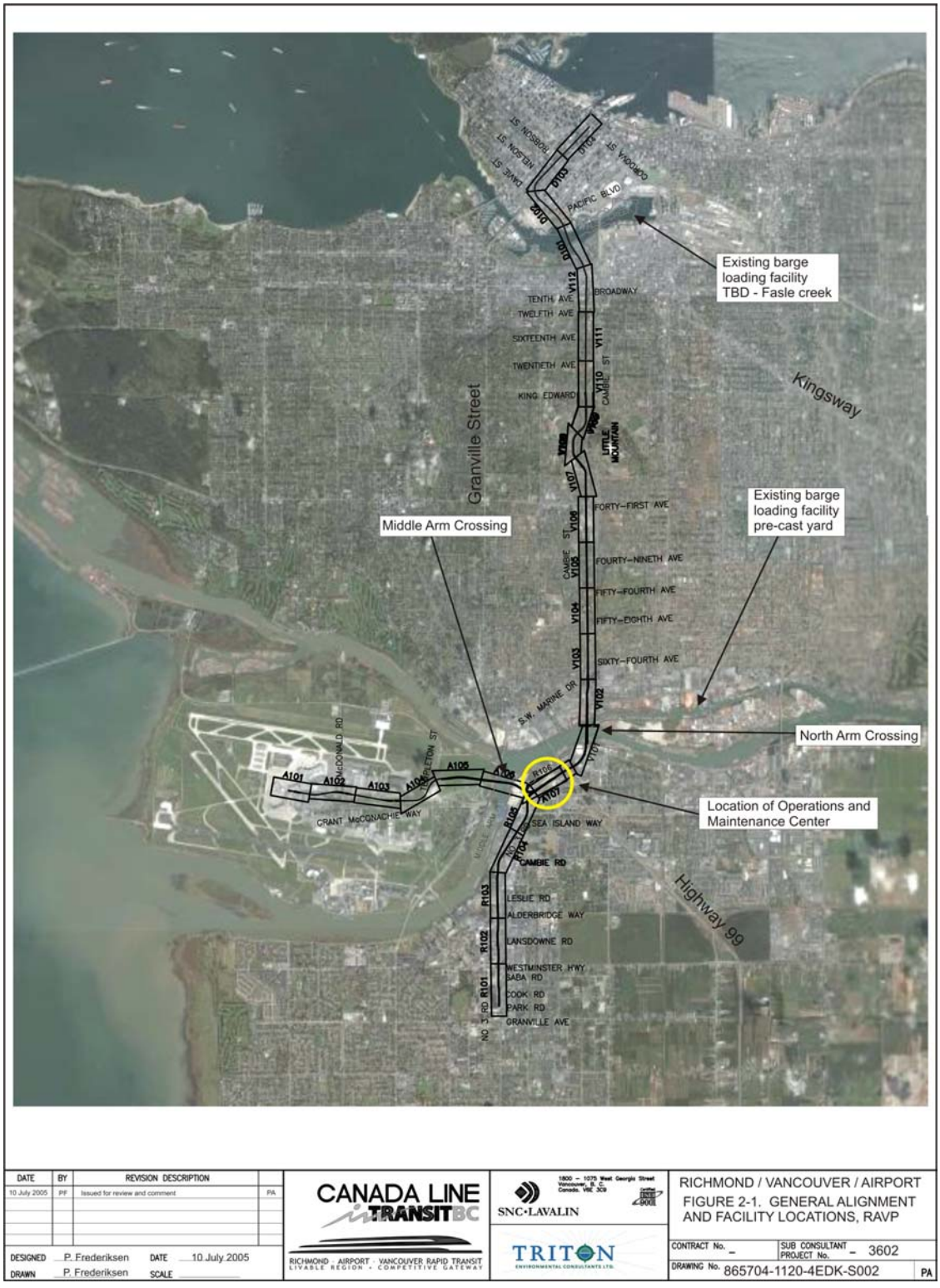

Figure 1-1. General alignment and facility locations, RAV

the system will be 15,000 pphpd using three-vehicle train at 240-second headways on each of the Richmond and Airport segments and overlapping for 120-second headway north of the Bridgeport Station. Passenger capacity is expected to be at least 167 passengers per vehicle or 334 passengers per train.

Capacity between Bridgeport and Richmond Centre, and between Bridgeport and the Airport, is anticipated to be 3,340 pphpd. These services will merge between Bridgeport and Waterfront to provide an anticipated combined capacity of 6,680 pphpd.

Section 1.3 provides a summary of the scope of construction for the RAVP while Section 2.0 provides more detail on the major construction activities.

1.2 CEMP OBJECTIVES

CEMP is intended as a practical tool to assure and facilitate environmental compliance of construction at the site level. The required level of environmental compliance is driven by:

- Conditions of the EAC including the Table of Owner's Commitments and Assurances (Attachment 1-2);
- Environmental requirements of the Concession Agreement between RAVCo and InTransit BC;
- Conditions of permits, licenses and approvals (PLAs);
- Applicable environmental legislation, regulation, standards, codes of practice and guidelines;
- Agreements with, or requirements from, affected municipalities and the Vancouver International Airport Authority;
- Municipal plans and initiatives such as City of Richmond Environmental Sensitive Area (ESA) guidelines;
- Agreements with other stakeholders;
- SNC-Lavalin Inc. Corporate Environmental Policies
- Other environmental requirements.

In case of conflict or contradiction between the above compliance objectives, the EAC and the "Table of Commitments and Assurances" (Attachment 1-2) will be paramount in guiding implementation of the CEMP.

The CEMP will help achieve environmental compliance in two main ways:

- Identifies both general and specific (*i.e.* activity specific and/or site specific) environmental "goal posts" that the contractors are required to comply with; and,
- Provides tools or resources (*e.g.* suggested methods or techniques) to facilitate attainment of minimum environmental requirements and in some cases enhance environmental performance.

1.3 SCOPE

The CEMP scope is limited to construction. A separate environmental management plan will be developed for the operational phase of the project. The latter will address environmental protection during operations, such as operational procedures to prevent pollution of surface water by de-icing agents such as ethylene glycol. The scope of construction addressed in the CEMP includes:

- Roadwork and utility relocations
- Construction staging areas and facilities
- Tunnelling by tunnel boring machine (TBM)
- Cut-and-cover tunnel construction
- Elevated guideway construction (including substructure and superstructure works)
- At grade guideway construction
- Fraser River bridges (including crossings of the North and Middle Arms)
- Other stream crossings (including crossings of open drainage ditches)
- Prefabrication of concrete guideway segments
- Station construction
- Track installation
- Electrical substation construction, including interconnections to BC Hydro's system
- Operating systems installation
- Operation and Maintenance Center
- Various other construction activities required to properly integrate the new line with existing infrastructure

1.4 CEMP FORMAT

The CEMP is organized in the following modules:

- Introduction (Section 1);
- Summary of Construction (Section 2) — describes the main categories of construction;
- Environmental Administration including the Environmental Quality Management Plan (Section 3) — describes environmental management processes in the context of the overall administration of design and construction;
- Component Environmental Plans (Sections 4 to 14 inclusive) — see below
- References (Section 15); and
- Appendices containing source material.

1.4.1 Component Plans

The Component Plans comprise:

- Environmental Education and Awareness Plan (Section 4);
- Air Quality and Dust Control Plan (Section 5);
- Noise Management Plan (Section 6);
- Surface Water Quality and Sediment Control Plan (Section 7);
- Contaminated Sites and Soil Management Plan (Section 8);
- Hazardous Materials Management Plan (Section 9);
- Solid Waste Management Plan (Section 10);
- Spill Prevention and Emergency Response Plan (Section 11);
- Archaeological Monitoring Plan (Section 12);
- Habitat Mitigation / Compensation Plan (Section 13); and
- Landscape Design and Restoration Plan (Section 14).

There is inherent overlap in content between some Component Plans. The CEMP attempts to minimize redundancy by providing cross-reference between Component Plans where necessary or appropriate.

The Component Plans are formatted consistently as much as possible. Generally, the Component Plans each contain the following subsections:

- Introduction;
- Other Relevant Plans — cross-reference to other relevant Component Plans or documentation);
- Potential Impacts of Construction — a brief summary of potential adverse effects of construction;
- Regulatory/Institutional Requirements — List of reference documents that contain applicable environmental constraints and criteria (relevant source material is contained in the appendices);
- Environmental Management — includes three subsections;
  - Environmental Best Practices (lists required or recommended environmental protection requirements and measures i.e. environmental "goalposts");
  - Key Environmental Performance Indicators (provides specific requirements, often quantitative, against which environmental performance at the site level will be monitored or audited)
  - Monitoring (outlines expected monitoring focus and/or effort).

Existing information from prior assessments, investigations, reports and engineering design is included in the CEMP where necessary to further define environmental requirements or otherwise aid in achieving environmental compliance.

1.4.2 Appendices

Appendices contain relevant source material including key excerpts from applicable legislation, regulations, standards, guidelines and codes of practice referenced in the main body of the CEMP. Documentation that was consulted in developing source material included the following:

Provincial Acts and Regulations:

- *Water Act* (1996)
- *Fish Protection Act* (1997)
- *Heritage Conservation Act* (1996)
- *BC Health Act* (1996) *Sanitary Regulations*

Federal Acts and Regulations:

- *Fisheries Act* (1985)
- *Species at Risk Act* (2002)
- *Navigable Waters Protection Act* (1985)
- *Transportation of Dangerous Goods Act* (1992)

- *Local Government Act* (1996)
- *Wildlife Act* (1996)
- *Environmental Management Act* (2003)
- *Transport of Dangerous Goods Act* (1996)
- *Fire Services Act* (1996) *British Columbia Fire Code Regulations*

Standards, Guidelines and Best Management Practices (BMPs):

- Canadian Environmental Quality Guidelines (CCME, 2003b)
- GVRD: Best Management Practices Guide for Stormwater (Gibb *et al.*, 1999)
- Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (Wright and Hopky, 1998)
- Standards and Best Practices for Instream Works (MWLAP, 2004)
- BC Approved Water Quality Guidelines (Ministry of Environment, 2001)
- Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 2003a)
- Best Management Practices for Pile Driving and Related Operations (BC Marine and Pile Driving Contractors Association, 2003)
- 2004 Standard Specifications for Highway Construction (MOT, 2004)

The appendices provide a convenient environmental resource for use both in the office and in the field.

1.5 UPDATING THE CEMP

The CEMP is a living document that will be modified as required to reflect design development and refinement of construction planning or methods. The CEMP may also be modified as a result of possible changes in environmental conditions, requirements, priorities or other factors.

The modular organization of the document will allow revisions to be easily formatted and assimilated into the existing CEMP (e.g. page number changes for a particular section will not affect page numbering in other sections).

Reflecting the phased scheduling of the project (Fig. 1-2), additional detailed information for Component Plans will also be provided in stages, in concert with design development and refinement of construction methods. Design and construction planning are currently being finalized for:

- North Arm and Middle Arm bridge crossings of the Fraser River
- Cambie Street cut-and-cover section
- Tunnel boring section

The first CEMP update, anticipated to be in September 2005, will provide more detailed environmental planning for each of the above three components. The first update will also provide a more complete submittal schedule for additional detailed information that will be added subsequently to various Component Plans.

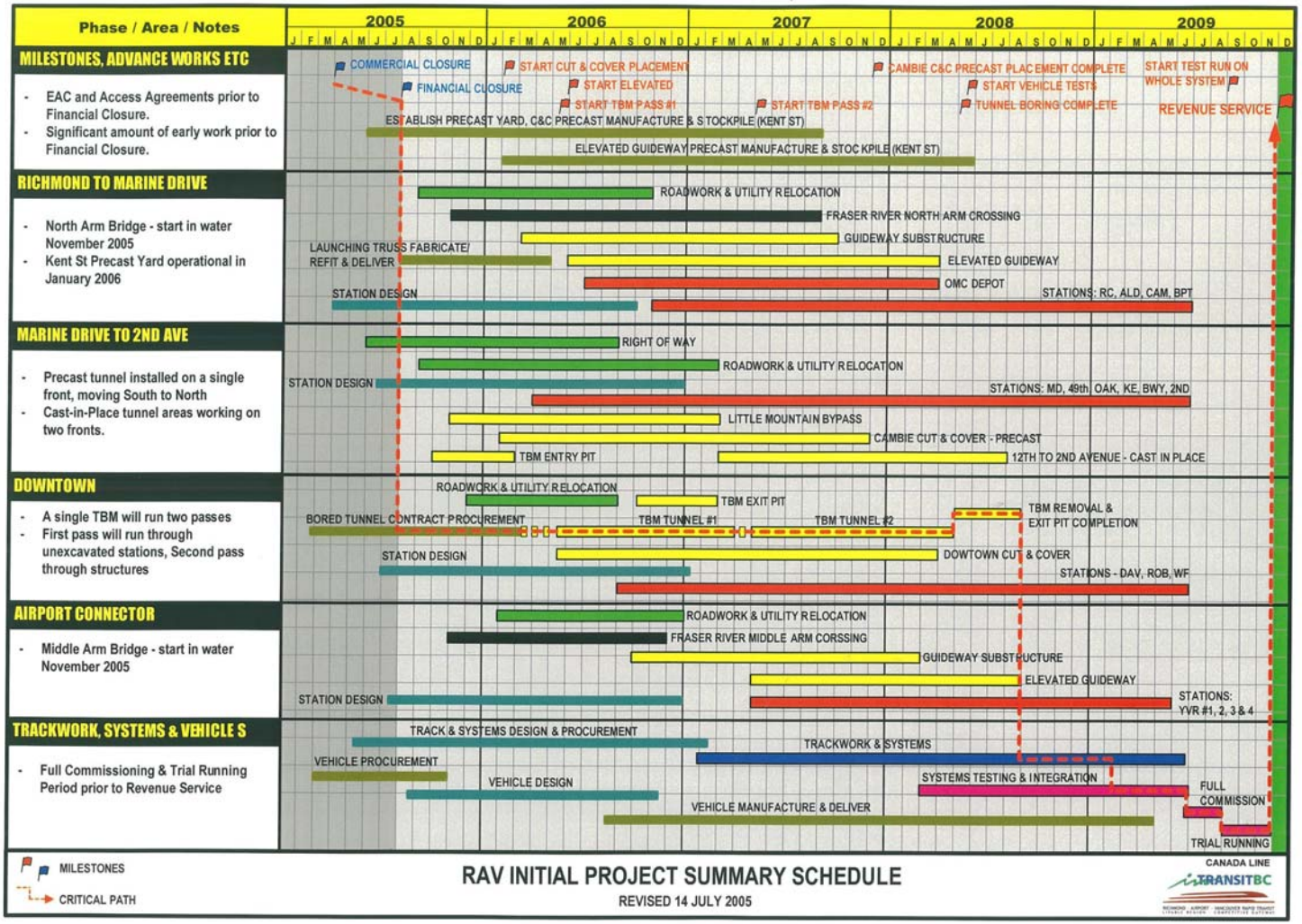

Figure 1-2. Initial Project Summary Schedule, RAV