

**Transportation Association of Canada
Environmental Achievement Award
City Of Vancouver
National Works Yard**



**City of Vancouver
Engineering Services**
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Award Statement

Transportation systems are an essential part of our mobility. Even more important is the construction and maintenance of transportation infrastructure. Without them, the efficiency and safety of the system is compromised.

The National Yard award application focuses on the City's facilities and staff that ensure the efficient operation of the City's transportation system. The National Works Yard is a new sustainable facility that houses approximately 400 staff responsible for the construction and maintenance of the City transportation infrastructure. These staff are responsible for roads, sidewalks, bike paths, traffic signals, signage, road markings, street lighting, fleet fuelling and maintenance, and parking operations.

The new National Works Yard demonstrates the City's commitment to protecting and enhancing the environment in a unique way. The facility has a focus on sustainable design initiatives which reduces the environmental impact of the facility by focusing on a sustainable site, water efficiency, energy savings, materials selection, and indoor environmental quality.



Background

The City of Vancouver Engineering Services performs the public works function within the City of Vancouver. The City has a population of 550,000 covering a land area of 44 sq km. Engineering staff are responsible for all aspects of design, construction and long-term maintenance of the City's infrastructure such as roads, sidewalks, bike paths, traffic signals, signage, road markings, street lighting, fleet fuelling and maintenance, and parking operations.

A new works yard has been constructed as a replacement to one of the existing yards. The new yard will be a staging area for 400 City workers and will include five main buildings on five hectares. Two of the new buildings incorporate a high level of environmental sustainability.

The City's old maintenance yards were scattered around the City with outdated, inadequate facilities. The National Works Yard has consolidated a number of the City's operations providing improved coordination among staff and resources. The new yard supports the City's commitment to providing a safe and efficient transportation system that supports all modes of travel.

In the design of the new National Yard, a commitment was made to make it a sustainable facility that supports a sustainable transportation system. As the City's first LEED™ building, it is expected to achieve a Gold rating. The LEED™ Green Building Rating System defines "green buildings" by establishing a common standard of measurement.

Why is a sustainable building important to a sustainable transportation system?

Buildings have a tremendous impact on the environment. Research shows¹ that buildings account for: 36% of global energy consumption, 30% of global raw material consumption, and 12% of potable water consumption. Production and consumption of materials, water and energy all require transportation at some stage in the process. An overall reduction in their use has far reaching benefits.

A transportation system is essential to a city; its maintenance is even more critical. Development of a new works yard is seen as an opportunity to promote and implement the City's sustainability policies which address this impact.

Innovation and Excellence

The new works yard is innovative in that it is a comprehensive approach integrating LEED™ sustainability and serves as an educational tool for the City, private enterprise and local school programs. New practices have been

¹ Source: US Green Building Council

incorporated as regulatory pilots for the City's building officials. This will guide regulatory changes for future buildings.

Unlike typical buildings, this project:

- Applies sustainable building design to an industrial campus-type facility;
- Implements and measures sustainability;
- Will report back on costs and lessons learned;
- Is just the beginning and will serve as a model to guide future building designs;
- Specifically works to become part of the community; and,
- Is developed with school educational opportunities in mind.

Sustainable Design

The framework to guide this project has been LEED™ which is organized into five areas of building sustainability.

1. Sustainable Site
2. Water Efficiency
3. Energy & Atmosphere
4. Materials & Resources
5. Indoor Environmental Quality

Sustainable Sites

As part of the on site grading and adjacent road construction, excess asphalt millings from City projects were used in place of import sands and gravel. In addition to avoiding extraction of natural resources, over 20,000 tonnes of excess millings were put to use.



Sustainable site development also includes ensuring alternate transportation is available and encouraged for staff. As part of the yard development, heated indoor bike lockers are provided along with lockers and showers. Over one kilometre of pathways have been built to provide access to public transit. Priority is also given to car pool spaces for staff.

Water Efficiency

The initial project goal was to reduce potable water consumption by up to 30% over a model baseline. This goal has been exceeded with the measures now installed. Current estimate is a 60% reduction in water consumption. The savings are achieved with waterless urinals, ultra low flow dual flush toilets and

rain water recirculation to the toilets. Drought tolerant landscaping has been used to eliminate the need for any permanent irrigation.

Energy Conservation

The target for energy saving is 45 to 50% over the model baseline. This is achieved through the heating and lighting systems that have been installed. Heating is provided by a ground source heat system using a series of vertical wells 120 m deep and the constant temperature of the earth. Energy efficient lighting incorporating occupancy sensors are used throughout the buildings.

Materials & Resources

A construction waste management plan has been put into place. Over 95% of construction waste generated on-site has been recycled to date, greatly exceeding the initial target of 75%.

This project has a special focus on the recycled content of all building materials. The original goal was an overall minimum 50% recycled content. Final calculations are pending; however, we expect to exceed our goal.

Indoor Environmental Quality

This area of focus is on the workers in the building during construction and on the final occupants. Air quality is monitored and ventilation adjusted based on measured CO₂ concentrations. Ventilation is supplied at floor level to improve effectiveness. Materials such as paints, adhesives and carpets were specified to minimize gases released after installation.

Occupant comfort is designed into the building layout by providing access to views for 90% of the occupied spaces and providing generous natural lighting. Thermal comfort is enhanced with the use of radiant panels for heating office spaces. With radiant panels occupants feel warmer at a lower temperature further enhancing energy savings.

Site Efficiencies

A number of efficiencies have been achieved by consolidating and improving facilities. With a fleet of over 300 vehicles on site, a maintenance garage has been included. This avoids the shuttling of vehicles back and forth to a maintenance garage.



A new fuel dispensing system is provided on site. By filling the fleet at the start or end of shifts, unnecessary travel and fuel consumption is eliminated. The fuel control system automatically logs a vehicle odometer reading which links to a fleet management system. With this automation, the fleet maintenance schedule and vehicle operating efficiency is optimized.



Summary

The replacement of the City's old works yard has provided an excellent opportunity to demonstrate the far reaching effects of sustainable building construction. From energy savings to efficient fleet maintenance the City's staff involved in building and maintaining the City's transportation system all help to reduce the effect on the environment.