Ministry of Transportation and Infrastructure

Heritage Significance and Conservation Opportunities for the Highway 99 Corridor and the George Massey Tunnel

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Background

Highway 99 and the George Massey Tunnel were conceived and constructed as a modern transportation system that would open up the communities to the south of Vancouver and provide an easy and quick link to significant transportation hubs including Vancouver International Airport, the Peace Arch and Pacific Canada-United States border crossings, the B.C. Ferries terminal at Tsawwassen, Deltaport and the Boundary Bay Airport. It is a vital goods movement route that fuels local, regional, provincial and national economies, and a key access point for businesses in Delta, Surrey, Richmond, and Tsawwassen First Nation. Together, these are two significant heritage features that help tell the story of the social, political and transportation history of the Lower Mainland and the Province of British Columbia (B.C.).

The purpose of this high-level heritage assessment study is to provide historical information about the development and evolution of the Highway 99 corridor and the George Massey Tunnel, along with an assessment of their heritage significance. It addresses the surface portion of the highway, along with its context, from Bridgeport Road in Richmond to the Peace Arch border crossing in White Rock.

1 Ministry of Transportation and Infrastructure. George Massey Tunnel Replacement Project – Project Definition Report.
Bridgeport to Border: The Highway 99 Corridor and the George Massey Tunnel

2.1 Brief History of the Corridor and Tunnel

Highway beginnings: crossing the Fraser

In the early history of BC’s Lower Mainland, the Fraser River served as the major transportation link in the region, with farm settlement oriented towards the river and few passable roads. As Vancouver emerged as the urban centre, the Fraser was transformed from a transportation link to a barrier to north and southbound travel.

For many years, the Fraser River barrier was overcome by a system of ferries (connected to early roads) such as those that transported passengers to and from New Westminster; Ladner in Delta and Steveston and Woodward’s Landing in Richmond. Originally passenger-only ferries, the increase in population in the early 1900s emphasized the need for vessels that could carry wagons and cars.

By the late 1890s the North Arm bridges bridge crossings - Marpole, Queensborough and Fraser Avenue - had been constructed across the Fraser, River and by 1904 a combined traffic and railway bridge spanned the river at New Westminster. Settlements developed near these river crossings and farming spread across the agricultural land of the river delta.

Of the Fraser River ferry crossings, the Ladner-Woodward’s Landing run was one of the busiest, soon seen as insufficient, and the province, prior to World War I, was under pressure by residents for the construction of a bridge crossing at this location. By 1931, the demand for crossing had reached the point that conventionally-sized river ferries took over the route, causing even longer traffic backups on No. 5 Road in Richmond and in Ladner Townsite in Delta.

Construction here would have to wait. In 1933 a bill was passed in the provincial legislature that made the government a partner in a private toll bridge project to cross the Fraser near Ladner, to be completed in 1935. The government was to share in deficits and profits, and construct a first-class highway from the Douglas border crossing near Blaine to the new bridge. Construction efforts were being mobilized when the 1933 provincial election brought Liberal Thomas Dufferin (Duff) Pattullo in as premier. Pattullo championed a new bridge at New Westminster and the Richmond-Ladner bridge project was abandoned.

Roads to highways: the 1950s

Across North America, the first generation of roads was mostly bypassed by extensive highway construction beginning in the 1950s. With a few war-related exceptions, road building in British Columbia had essentially been put on hold for
the duration of World War II. Spending on road building commenced once again in 1945 on the Hope-Princeton Highway and the Hart Highway connecting the Peace River region. In 1950, the federal government began construction on the Trans Canada Highway.

Following this province-wide trend, Highway 99 was constructed as a response to population growth, expanding suburbanization and increased traffic throughout the Lower Mainland. Existing transportation facilities were being severely overtaxed and an additional crossing was required to match the growth of commercial, residential and industrial expansion in the greater Vancouver area, particularly to the south.

The original route from Vancouver to Richmond, Delta and Surrey, and ultimately the US border, was via Kingsway, the Patullo Bridge at New Westminster and King George or the Pacific Highway in Surrey. The east-west route through Delta was by the Ladner Trunk Road, and north-south in Richmond, by No. 2 and No. 5 Roads, and the Ladner ferry. A 1955 traffic study acknowledged the increased traffic problems because of the rapid suburban development to the east and south of Vancouver, and an enormous growth of traffic across the Patullo Bridge. The report acknowledged the need for rational plan that integrated highways with economic urban development.

A factor in the construction of Highway 99 and the Tunnel was a study conducted in 1956 that integrated the need for a South Arm crossing with projected future transportation and land use needs for industry and housing. Based on land use and construction techniques available at the time, the study also concluded that a tunnel would be less costly than a high-level bridge.

Three provincial orders-in-council were issued in 1958 authorizing the British Columbia Toll Highways and Bridges Authority to construct the Oak Street Bridge and the Deas Island Tunnel, and that they be connected as a single system by Highway 99. Ultimately, the four-lane highway would traverse Delta, Surrey and White Rock to the border crossing at Peace Arch.

Land organization for the construction of the Oak Street Bridge had gotten underway in 1954. That bridge was opened in 1957, the Deas Island Tunnel in 1959, and the completion of the highway link to the U.S. boundary (known also as the Vancouver-Blaine Highway and the Deas Throughway) in 1962. Highway 17 to the Tsawwassen ferry terminal was completed in 1960. The now-historic Pacific Highway that originally connected Vancouver to the south and the US border via Kingsway, New Westminster and Surrey devolved into a more local road.

Highway 99 was part of the growing network of roads established by Premier Bennett that opened up the Lower Mainland and the province for car tourism, with the U.S. as its destination. By the 1950s, more and more families were able to afford...
an automobile, and holiday trips were no longer dependent on public transportation. The growth of tourism in B.C. was affected by increased spending power, available leisure time and the dramatic improvement in the province’s transportation infrastructure. Today, Highway 99 maintains its important economic and tourism connection with Interstate 5 at the international border. Fittingly, the number of the highway is derived from the old U.S. Route 99, now Interstate 5, with which the highway originally connected.

**Provincial involvement**

In 1952, a Social Credit government under premier William A.C. Bennett came to power. The Bennett era was characterized by a change in economic policy across B.C., with a focus on infrastructure expansion and construction. Bennett’s government benefitted from rising wages, material prosperity and a growing self-confidence across the province. During Bennett’s tenure, more money was spent building roads and highways than in the entire history of the province. Premier Bennett had an able advocate in his Minister of Transportation, Philip Gagliardi. By 1956, with growing public support for a tunnel, Gagliardi and Premier Bennett announced plans for the construction of the Deas Island Tunnel.

The increasing development of roads and highways throughout the province necessitated an increase in government services to manage them. The Department of Highways was established in 1955 with the enactment of the Department of Highways Act. Prior to this, the Highways Branch of the Department of Public Works was responsible for all functions relating to the management of highways. The mandate of the Department of Highways included the construction and maintenance of all government roads, bridges, ferries, wharves, and other works with respect to provincial highways. The Deas Island Tunnel was initially a toll crossing, a measure which the provincial government rescinded in 1963.

**Rural and suburban municipalities**

The two municipalities primarily influenced by the construction of Highway 99 and the Deas Island Tunnel were Richmond and Delta. Both communities began as fishing, canning and farming communities on either side of the Fraser River. The Tunnel’s eventual location would cross Deas Island, an island in Delta originally named for John Deas from South Carolina who built the Deas Island cannery on the site. In the 1890s, one-third of B.C.’s canned salmon production came from Delta, while Richmond’s cannery channel contained 15 operating canneries at its peak around 1900.

Significant time, effort, and capital were invested in improving soils for agricultural

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4 BC Archives Series GR-1585 Department of Highways.
production since the original settlement of the Fraser River delta. Areas in Richmond and Delta had to be diked and drainage ditches constructed before the land could be settled or farmed.

In the late 1950s and early sixties there was a fundamental change in farm management. The construction of the Deas Island Tunnel opened the land to easy access from neighbouring communities. In addition, expansion of specialty crops, advances in farming technology, and the expropriation of a significant area of farmland caused a shift in farm management practices.\(^5\)

Throughout Richmond and Delta, the location of residential and industrial development was being determined by street and highway access at distances from Vancouver’s core. By 1955, urban areas were expanding rapidly, strongly influenced by automobile access. Residential expansion in turn caused further congestion of arterial routes.

The opening of the Oak Street Bridge in 1957 had a major influence on the municipalities to the south, providing a much quicker and more direct route to Vancouver than the bridges to Marpole and Sea Island.\(^6\) This in turn stimulated land subdivision and the construction of suburbs, more pronounced in Richmond than in Delta, where early urban subdivision still clustered around Ladner.

The Tunnel and highway extended through areas of existing land use in Richmond, Delta and Surrey that were, in the 1950s, for the most part still rural agricultural lands. While urban development and subdivision had taken place around Ladner Townsite, Steveston and Bridgeport, much of the land was still divided into small agricultural properties consisting of parcels from one or two acres.

The construction of the freeway and Tunnel was not without human and social costs. A transportation project of this magnitude necessitated the acquisition of land for the right-of-way, for staging areas, and for storage of construction materials. Houses were auctioned off, agricultural land was expropriated in Richmond and farms subdivided in Delta.\(^7\)

**Tunnel visionary**

Another factor in the selection of a tunnel was the advocacy of George Massey. Massey immigrated to Canada from Ireland in the early 1930’s, settling in Ladner. Observing that the ferry service connecting Delta to Richmond and Vancouver was inadequate and likely unable to address future population growth, Massey co-founded the Lower Fraser River Crossing Improvement Association in 1948.

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\(^7\) Richmond Archives. Subdivision and expropriation plans. Delta Archives. “Mary Pybus halts highway construction.”
A staunch advocate for a tunnel crossing, for nearly 20 years he put his own time, energy and money into making an improved south Fraser crossing a reality. George Massey lived until 1964, in time to see his vision a reality. In 1967 the Deas Island Tunnel was renamed in his honour to celebrate his decades of hard work and dedication in improving Metro Vancouver’s infrastructure.

**Tunnel technology**

The approximately 630-metre long George Massey Tunnel was the first project in North America to use immersed-tube technology. It was patterned after the Maas Tunnel in Amsterdam which George Massey had seen and researched.

Six concrete segments, each measuring 105 metres in length and weighing 18,500 tons, were constructed in a dry dock on the Fraser River shore, then sealed and floated to the site, where they were sunk into place, secured together, and readied for use. The rectangular cross-section of the segments allowed a shallower tunnel that reduced the amount of dredging required. The floating and sinking process that moved the six segments into place was another technological feat.

The modernist-styled ventilator buildings, located at either end of the Tunnel, contain reversible fans which provide air for the air ducts that run along each side of the Tunnel, using a series of ventilation openings into the Tunnel for air circulation. The louvered design of the approaches and the regular flow of traffic assist with air circulation inside the Tunnel.

**Growing concerns**

In the 1970s, the provincial government and city councils in Richmond and Delta began receiving letters of complaint about the George Massey Tunnel, ranging from concerns about inadequate lighting that did not reflect off of the “dark and dingy” interior walls, the need for the Tunnel to be painted, reduced speed due to bad visibility, burned out and dirty overhead lights, and, not surprisingly, the congestion and traffic build-up on both the north and south approaches. Some of the amelioration to local concerns included a bicycle shuttle implemented in 1975 and counter-flow measures using a reversible-lane system in 1982.

Ultimately, the George Massey Tunnel would outlive its capacity. Although seismic upgrades, including installation of an advance-warning system, were made in 2006, the decision was made to replace the Tunnel with a new bridge. While the Tunnel is nearing the end of its useful life, the public can still appreciate the technical, social and historical aspects of Highway 99 and the Tunnel that served the Lower Mainland as part of a key transportation route and a unique driving experience for over half a century.

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8 Ministry of Transportation and Infrastructure. *George Massey Tunnel Replacement Project: Project Description and Key Areas of Study.* 2015.
Map of Richmond, Delta and part of Surrey prior to the Tunnel construction. The map shows the location of sloughs, the Woodward’s Landing - Ladner ferry route and Bridgeport Station on the route of the BCER. Bridgeport would develop into a busy commercial centre and the Richmond terminus of Highway 99. (Richmond Archives)

Construction of the Tunnel in 1957 showing the Highway 99 right-of-way stretching south through Delta towards Surrey. (Richmond Archives 1984-3-1)
Motorists' map of highways in the Lower Mainland in 1925. (City of Vancouver Archives)

Diagram of Tunnel element sinking operation. (Hall et al. 1957)
2.2 Historical Themes

Historical themes are defined as key ideas for describing a major historical force or process which has contributed to the history and evolution of a place. A thematic framework is a structure that uses themes to help conceptualize past events and to place sites, people and events into their historical context.

Thematic frameworks have a number of interconnected uses in the management of heritage and are often considered to be a tool for both a comprehensive contextual overview of heritage resources and for the comparative analysis of the relative significance of individual resources.

Themes that define the Highway 99 Corridor and the George Massey Tunnel:

Theme 1:

Connecting the South Fraser region

This theme addresses the role of the Highway 99 corridor and the George Massey Tunnel in connecting Greater Vancouver with the communities of the South Fraser and the U.S. border crossing. It considers the Tunnel and highway as part of a total highway system, as well as a link between smaller communities and neighbourhoods in the region and the province.

Theme 2:

Accommodating government and public interests

This theme is organized around the role of the several levels of government that were involved in the construction of the Tunnel and highway, and the infrastructure building advocated by the government of the day. It addresses the processes, legislation and economics associated with the Tunnel, as well as the involvement of the public and their thinking about the transportation corridor.

Theme 3:

An engineering feat

The design and construction of Highway 99 and the George Massey Tunnel can be considered an engineering feat of its time. This theme recognizes the planning of the highway and Tunnel as an integrated system and reflects visionaries such as George Massey and the engineers, technicians and workers who made highway and Tunnel happen. It also addresses the aesthetic design qualities of the Tunnel in the context of the post-war 1950s.
Drawing showing the general arrangement of the Tunnel. (B.C. Toll Highways & Bridges Authority 1957)

Drawing showing the “warping” or moving of Tunnel element 4 into place using a sinking rig and cables to hold it in place. (B.C. Toll Highways & Bridges Authority 1957)
2.3 Cultural Landscape of Corridor and Tunnel

The Highway 99 corridor and the George Massey Tunnel together comprise a large-scale cultural landscape that features many different physical characteristics. The highway and the Tunnel operate together as a system, having been conceived and designed to function as a single transportation corridor linking Vancouver to the U.S. border.

Identifying the cultural landscape components of the corridor and the Tunnel, based on standard practice, is a way of describing, documenting and understanding the complexity of the system and how it relates to the overall history of the route and its surrounding landscapes.

Natural systems and features

The Highway 99 corridor passes through or nearby a complexity of natural features. Highway and Tunnel construction has had an impact on, or adapted to, the physical constraints of the route's natural systems and features.

- Part of the Fraser River delta consisting of productive alluvial clay soil, peat bog and sandy loam
- Coastal Douglas-fir and Coastal Western Hemlock biogeoclimatic zones
- Fraser River, Nicomekl and Serpentine river ecosystems
- Slough ecosystems that exist on both the north and south sides of the river
- Boundary Bay tidal flats
- Burns Bog
- Tunnel location on the South Arm of the Fraser River

Spatial organization

The transportation system of Highway 99 and the Tunnel shows a collection of three-dimensional features organized in a particular way that was necessary for the movement of automobile traffic in this particular geographical location.

- Primary interchanges at Steveston Highway and Highway 17
- Other interchanges along the length of the route
- Relationship of the Tunnel to the overall alignment of Highway 99
- Two landmark endpoints of the highway: Bridgeport Road and Peace Arch border crossing
- Organization of the Tunnel component, including the arrangement and relationship of the Tunnel structure, approaches and ventilation buildings on their concrete podiums
- Vertical organization of the below-grade levels of the intake building

Land use

The highway and Tunnel pass through areas of different land uses, all of which contribute to its character.

- Current land use for transportation purposes, such as border, crossing airport, road and railway networks
A diversity of land uses along the highway route and Fraser River, including residential, industrial and agricultural uses

Features associated with land uses, such as subdivisions, drainage ditches, industrial parks, landfill

Recreational sites such as Deas Island Regional Park, Richmond Nature Park and Peace Arch Provincial Park, natural areas, golf courses

Circulation
Circulation patterns include the spaces, features and material finishes particular to the system of movement of the highway and Tunnel.

The extent of the Highway 99 right-of-way
Off ramps, on ramps and overpasses associated with the highway
Access roads to the Tunnel
Primary materials of concrete and asphalt
Recreational trails, such as Deas Island Regional Park and the Boundary Bay foreshore

Topography
Topography describes the three-dimensional configuration of the landscapes through which the highway and Tunnel pass.

Mostly flat topography, with highlands in the Surrey area
Generally north-south orientation of highway and Tunnel

Vegetation
The physical extent of the highway and tunnel bring it into contact with a variety of indigenous and introduced plant communities.

A wide and changing variety of natural and cultivated vegetation
Active farming and productive farm fields
Shelterbelts, hedges, forest, open grassland, Burns Bog

Buildings and structures
Buildings and structures associated with the highway and tunnel are features constructed primarily of sheltering activities related to human activity.

Buildings associated with diverse land uses along the route of Highway 99
Buildings at the Peace Arch border crossing
Structures in Peach Arch Provincial Park
Highway structure
Overpasses, bridges and ramps
Tunnel structure
Ventilation buildings and podium

Views
The highway and tunnel offer many diverse visual experiences in the landscape.

Views to the North Shore mountains
Views across flat agricultural fields
Internal views along roads and trails
- Views to a variety of land uses along the route
- The view of the Tunnel under the river from above
- Views north and south from the ventilation podium

**Constructed water features**
Built features associated with the highway and Tunnel that use water for utilitarian functions in the landscape.
- Dry dock that now functions as boat moorage
- Marinas and other water vessel related features
- Drainage ditches and swales along the highway

**Lost sites**
Lost sites associated with the highway and Tunnel consist of those places that no longer exist but still have meaning and significance.
- Sites associated with highway right-of-way and Tunnel disturbance
- Toll plaza, toll booth, underground passageway and administration building
- Historical sites such as the Woodward's Landing ferry infrastructure
- Roads and trails

**Small-scale landscape features**
Elements that provide detail and diversity for both function needs and aesthetic concerns along the highway.
- Fences, highway signs, drainage ditches, small-scale bridges, utility poles, hay bales

**Intangible features**
Intangible features are those which are more experiential than physical, but which still contribute to the heritage value of a place.
- Muffled sound of traffic within the Tunnel and in the side utility corridors
- The experience of travelling beneath the Fraser River
- The perceived change in air temperature while travelling through the Tunnel
- Stories and memories of the workers who built, managed and operated the Tunnel
Landscape features associated with Highway 99

- Oak Street Bridge
- Bridgeport Road
- Richmond Nature Park
- CN Railway tracks
- Burns Bog
- Slough landscape
- Deas Island Regional Park
- Vancouver Landfill
- Village of Ladner
- Boundary Bay Airport
- Boundary Bay Dyke Trail
- Greenhouses
- CN Railway tracks to Deltaport
- BC Ferry terminal
- Serpentine River and Fen
- Agricultural land patterns: fields, ditches, fences, dykes
- Nicomekl River
- Suburban development patterns
- Peace Arch Provincial Park and Douglas border crossing
- To Blaine, Washington
Landscape features associated with George Massey Tunnel

- Commercial development
- Steveston Highway interchange
- Realigned CN Railway tracks
- Former location of dry dock
- Rice Mill Road
- BC Ferries
- North and south Tunnel causeway and ventilation podiums
- Marina and boat launch
- South Arm marshes
- Crescent Slough
- Suburban land development patterns
- Canadian Fishing Company, former location of Canada Rice Mill
- Fraser Wharves
- Fraser River
- Deas Slough
- Still-existing agricultural lands
- Access to Deas Island Regional Park
- Crescent Slough
- River Road
- Deas Island causeway
- Highway 17A interchange
- Still-existing agricultural lands
Statement of Significance

People want to preserve the past because it is believed to have both intrinsic and extrinsic value. The past can have value in itself, such as telling a story about what went before us, or it can have values beyond itself, such as promoting economic benefit or self-sufficiency. It can be represented through tangible remains in the form of records, artifacts, artwork, buildings and structures, entire cities and landscapes, or it can be transmitted through intangible expressions in the form of memories, traditions, laws, stories, perceptions, experiences and other ways. Often the two are interconnected, with tangible resources acting as signifiers for intangible heritage.

Heritage values for historic resources are the products of social norms, beliefs, customs, ethics, and practices, as are all values in society. Heritage values are generally grouped into the categories of aesthetic, historical, scientific, educational, cultural, spiritual and social values.

Highway 99 Corridor (Vancouver-Blaine Highway, Fraser-Delta Throughway) and the George Massey Tunnel

Description

The Highway 99 corridor is a portion of highway and associated right-of-way that stretches south from Bridgeport Road in Richmond and culminates at the Peace Arch crossing on the B.C. - Washington border. The highway passes through four municipalities including Richmond, Delta, Surrey and White Rock, through a variety of agricultural, natural, urban and suburban landscapes. It crosses three rivers, the South Arm of the Fraser, Nicomekl, and Serpentine. Designed for four lanes of traffic, the highway has an asphalt driving surface, is bisected by vehicular, pedestrian and railway underpasses, ramps and has numerous directional and informational signs along its length.

The George Massey Tunnel is a 630-metre long concrete vehicular passageway submerged beneath the bed of the South Arm of the Fraser River connecting Richmond and Delta. The Tunnel emerges at its southern terminus in Deas Island Regional Park. The Tunnel itself consists of six cast-in-place concrete tubes flanked by reinforced concrete approaches on either end, 457 metres in length on the Richmond side and 335 metres on the Delta side.

At either end of the Tunnel, above and with views to the Tunnel’s access causeways, are identical, ventilation buildings, consisting of a concrete air intake building and vertical, metal-clad exhaust stacks, with three levels of building located underground.

What is a Statement of Significance?

A statement of significance is a declaration of heritage value that briefly and concisely explains what a historic place is and why it is important. It identifies the values that make the place significant to a community. It then describes the features of the place, tangible and intangible, that express those values, key aspects of the place that must be protected in order for the historic place to continue to be important.

The statement of significance consists of three sections:

1. **Description** explains what the historic place consists of in physical terms, where it is located, and identifies its boundaries.

2. **Heritage Value** explains why the place is of value to the community, province, territory or nation.

3. **Character-defining Elements** set out the key features that should be conserved in order to maintain the heritage value of the place.

A statement of significance supports responsible, values-based heritage planning and management. It allows those responsible for a historic place to know why the place is valued, and which features are important for retaining that value, leading to informed decisions about its future.
Values

The Highway 99 Corridor and the George Massey Tunnel together have cultural, historical, scientific, aesthetic and social value as part of the Lower Mainland's transportation history, as an enduring transportation feat, as a driving experience for residents and tourists, and as a key route and landmark bridging Richmond, Delta, and points south to the U.S. border.

Highway 99 and the innovative George Massey Tunnel together reflect the spirit and promise of British Columbia and the Lower Mainland, and the vision and technical achievements of those who were involved in its advocacy, planning, design and construction. The highway and Tunnel encapsulate local and provincial determination and growth through economic development, agriculture, tourism and residential accommodation. The highway and Tunnel opened up Delta and Richmond to the rest of the region and helped solidify access via automobile, including transit vehicles, to Vancouver Island and the United States.

Constructed during the 1950s, Highway 99 Corridor and the George Massey Tunnel are part of the automobile culture of the twentieth century. The cultural thinking of this time facilitated the expansion of the current highway system and associated infrastructure. Through this expansion the outlying communities of Richmond and Delta became readily accessible, leading to the development of the current residential and commercial communities.

The Tunnel is a symbol of the effect of the automobile on the Lower Mainland and to Highway 99, the Vancouver-Blaine Highway on which it is located. While the Pacific Highway through New Westminster to Vancouver via Kingsway was originally as the principal vehicular route from the south, its importance dwindled with the emergence of Highway 99 as an alternative route from Vancouver to the U.S. border from the 1950s onward. The George Massey Tunnel provides a significant visual reminder of the critical shifts in transportation that changed the landscape to the south.

The Highway 99 corridor has known archaeological sites within its vicinity, giving the corridor significant cultural value.

The construction of the Tunnel is a reflection of a particular time in B.C. history, as well as the political situation seen in the length of time it took for the project to become reality. Prior to its construction, many new crossing schemes to alleviate congested ferry traffic had been suggested, beginning with the 1927 Act for a toll bridge from Ladner to Lulu Island. It was only with the election of a Social Credit government in 1952, with William A.C. Bennett as Premier and PA Gagliardi as Minister of Public Works that the construction of the Tunnel and highway was achieved. This was an era in the province in which major infrastructure projects
were conceived and built, part of a grand vision for British Columbia in the 1950s. The Highway 99 corridor is significant as part of the deliberately designed, cohesive transportation system that included the George Massey Tunnel and the Oak Street Bridge as a means of efficiently connecting Vancouver to the south Fraser River communities of Richmond, Delta, Surrey and White Rock, and to the state of Washington in the U.S.

It is important for its association with the history and growth of the municipalities it passes through, and for its accessibility to routes leading to other areas of the Lower Mainland and the province, such as Hope and the B.C. interior. The corridor represents the physical north-south transportation connections and Canada-U.S. relations in its final culmination at 0 Avenue at the international border at Peace Arch Provincial and State Parks.

The land uses seen while travelling the Highway 99 corridor reflect the diversity of the local communities through which the route passes. Both the land route of the highway and the Fraser River show the significant industrial development that has occurred over time, including logging, milling, landfill, canneries, log storage and container traffic. Subdivision development for residential use, commercial centres and recreational features such as golf courses and parks are also part of the corridor. At the same time, needed land acquisition for the construction of the highway created considerable physical and social change for some residents and agricultural enterprises along the route. Yet while development and expansion have changed the land use and visual quality in the vicinity of the Highway 99 corridor over time, much of the landscape still has the original rural character and working farms typical of this primarily agricultural region.

The Tunnel itself is significant for its location on the South Arm of the Fraser River, replacing the original Woodward’s Landing - Ladner ferry service that began in 1913. Originally running from Ladner to Steveston, the ferry was the result of community petitions and negotiation with the provincial government. Before ceasing operation with the opening of the George Massey Tunnel, the ferry saw increasing traffic over the years as Richmond and Delta developed into thriving communities.

The Tunnel is significant for its association with a number of people and institutions, such as George Massey and the Lower Fraser River Crossing Improvement Association. A lay-person and marine retail operator, Massey played a major role in advocating for a tunnel based on one in Rotterdam, Netherlands and was involved in the project through to its completion and opening in 1959. Also significant in affecting the construction of the Tunnel was Premier T.D. Pattullo, representing New Westminster, and an advocate for a bridge in that city in 1933, rather than a crossing at Ladner.
Considered an engineering feat in its time, the Tunnel has scientific and technical value and interest for its process, design, engineering and construction methods. It is also important for the collaboration of the highway and Tunnel’s designers and engineers, and the many local contractors and suppliers involved in its construction.

Traffic control, pumping water and ventilation of the Tunnel are the major industrial processes and systems associated with its operation. The development of the dry-dock area, which greatly impacted the surrounding landscape, was an essential part of the process as a means to cast the Tunnel's concrete sections. The use of water pumped in to the approach structures in order to float the sections into place, the excavation of the trench on the floor of the Fraser River, the sinking of the sections using a custom designed sinking rig anchored in place and the weighting of the elements with a rock mattress are all highly significant technical processes used for the George Massey Tunnel construction.

Many of the parts used in the construction of the Tunnel had to be custom made and designed, such as the steel connecting hooks that hold the Tunnel's concrete sections together. The remaining equipment inventory, such as electrical systems, lighting, communications, instrumentation panels, large-scale pumps and other assorted tools and equipment are highly significant in understanding the operation of the Tunnel. Also important is the presence of technicians and other day-to-day workers involved in its ongoing management, maintenance and control.

Aside from its technological significance, the structure of the Tunnel and associated infrastructure have aesthetic values that encompass the physical structure and surrounding landscapes. The Tunnel itself is significant for its elegant pre-cast concrete panels and graduated lighted louvres.

The twin ventilation buildings (intake and exhaust stacks) on either side of the Tunnel, whose form reflects their design to house fans and controls related to ventilation, lighting and traffic, are important as the most visible and prominent elements of the Tunnel. While their main characteristics, such as the openness of the louvres and the height of the stacks are based on their ventilation function, the shape of the louvres and the multi-faceted design of the stacks was chosen based on appearance. The buildings exhibit a distinctly modernist characteristic fully appropriate to their time.

The Tunnel and corridor have social value for their role in the development of suburban communities in Richmond and Delta, and further south. These communities were the beginning of a commuter culture and the 1950s ideal of a single family home in the suburbs. They also reflect the growing tourism industry in British Columbia facilitated by the automobile, and the freedom of the automobile for driving holidays, particularly seen in the ease of access to the U.S.
The name change from Deas Island to George Massey Tunnel in 1969 at the request of the community is a significant gesture to honour the man considered to be primarily responsible for the Tunnel's construction.

**Character-defining Elements**

**Highway 99 (Vancouver-Blaine Highway, Deas Island Throughway) Corridor**

- Alignment of the highway
- Highway medians, some of them vegetated
- Two landmark endpoints of the highway: Bridgeport Road and Peace Arch border crossing
- Natural features such as rivers, sloughs and Boundary Bay
- Significant views to the North Shore mountains, across open landscapes, to Burns Bog rise and south to Boundary Bay
- Transportation routes including railways, roads, trails, airports
- Transportation infrastructure including overpasses (vehicular, railway and pedestrian), on and off-ramps, access roads
- A variety of land uses
- Agricultural features such as barns, greenhouses, agricultural fields, drainage ditches, market gardens
- Urban landscape features such as commercial developments, housing and subdivisions
- Industrial features
- Recreational features such as parks, including Peace Arch Provincial Park, hiking and walking trails and golf courses
- Heritage and cultural features along the route
- Small scale elements including:
  - Vegetation such as shelter-belts, hedges, forest, open grassland, Burns Bog
  - Fences
  - Signs

**George Massey Tunnel**

**Site and landscape**

- Location on the South Arm near the original route of the Woodward’s Landing - Ladner ferry
- Deas Island Regional Park, access causeway and Deas and Green sloughs
- Adjacent land uses such as the Canfisco plant, the B.C. Ferries repair facility and pump-stations
- Nearby residential properties
- Views along the Tunnel corridor, through the Tunnel and to the surrounding landscape
Tunnel and associated infrastructure

- Form of the precast concrete tubes including traffic through-ways and access passageways containing utilities, fans and sump pumps
- Tunnel approaches with concrete side walls
- Functional arrangement of Tunnel, approaches, highway, and ventilation structures
- Overhead louvres that allow gradual darkness
- Use of materials, particularly cast-in-place concrete
- Wood access doors
- Overhead lighting
- Prominent ventilation buildings and self-supporting dams including
  - Concrete platform with railing
  - Trap door for access to three floors below
  - Deliberate modernist design aesthetic
  - Concrete construction of the air intake building
  - Shape of the concrete louvres on the air intake building
  - Metal-clad material on the exterior of the exhaust air stacks
  - Cylindrical form of the exhaust air stacks
- Interior features of the ventilation buildings including
  - Three storeys of air intake building constructed below grade
  - Original layout of rooms
  - Original open metal staircases
  - Interior entry doors
  - Large-scale pumping equipment
  - Ventilator systems
  - Electrical panels, instrumentation and controls

Intangible

- Muffled sound of traffic within the Tunnel and in the side utility corridors
- The experience of travelling beneath the Fraser River
- The perceived change in air temperature while travelling through the Tunnel
- Stories and memories of the workers who built, managed and operated the Tunnel
Heritage Conservation and Interpretation

Heritage conservation in British Columbia is an umbrella term encompassing a number of approaches or measures that can be taken to conserve the value of historic places. It is a land-use decision-making process that takes into consideration the embodiment of values in its historic places and helps manage change that integrates the conservation of historic places into development. This values-based approach ensures informed decision-making that takes into account the heritage significance of a place. Heritage conservation includes any actions or processes that are aimed at safeguarding the character-defining elements of a cultural resource so as to retain its heritage value and extend its physical life.

Heritage conservation is generally thought of as the restoration or rehabilitation of a building or landscape; however, there are many methods or combinations of methods to conserve the heritage value of a historic place. This may involve stabilization, preservation, rehabilitation, restoration, salvage, interpretation or a combination of these or other actions or processes. In some cases, interpretive planning alone can assist in the ongoing retention of heritage significance and value without a great deal of surviving physical fabric.

Interpretation is the process of communicating messages about cultural and natural heritage, or telling stories about a place, that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource. Interpretive presentation can relate to the way a place exists today, or can evoke the past through an understanding of how it has been used, seen, touched, smelled or tasted, giving impact to evocative stories and meanings. The range of interpretive techniques is vast, and can include interpretive signs, the retention of parts of buildings or structures, interpretive interventions designed into new construction, hands-on displays, audio and visual elements, site furnishings or public art.

Best practice implementation of conservation opportunities is based on The Standards and Guidelines for the Conservation of Historic Places in Canada, particularly Section 3: Standards for the Conservation of Historic Places in Canada, and Section 4.4: Guidelines for Engineering Works, including Civil, Industrial and Military Works.

Recognizing the range of heritage values identified in Section 3.1 of this report, the purpose of this section is to identify opportunities for profiling identified heritage values associated with the Highway 99 corridor and the George Massey Tunnel that can potentially be integrated with the Project.

It is recognized that it will not be possible to retain all heritage elements due to right-of-way requirements, decommissioning and infrastructure removal limitations.
and other factors. Where reasonable and affordable, the Tunnel’s character-defining elements may be conserved. Where physical conservation is not feasible, interpretation will be applied.

In this context, the table on page 27 summarizes the conservation and interpretive opportunities to be considered in conjunction with the project, including the assumption that the south ventilation exhaust shaft will be retained in situ, and an interpretive program is developed to acknowledge the heritage values of the Tunnel and the Highway 99 corridor identified in this document. The opportunities focus on the corridor as a whole, the Tunnel specifically, and the interpretive potential and intangible features of the Tunnel and corridor.
<table>
<thead>
<tr>
<th>Heritage Values</th>
<th>Character-defining elements</th>
<th>Conservation and interpretation opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Highway 99 corridor reflects the historical diversity and geographical features of the communities through which the route passes.</td>
<td>• Alignment of the highway&lt;br&gt;• Natural features&lt;br&gt;• Historical and current land uses and characteristics&lt;br&gt;• Transportation routes and infrastructure&lt;br&gt;• Viewscapes&lt;br&gt;• Landscape features along the route</td>
<td>• Retain and enhance character-defining landforms that are not required for road right-of-way.&lt;br&gt;• Identify and interpret the past land uses seen throughout the corridor and recognize those that have endured over time.&lt;br&gt;• Highlight the physical, social and geopolitical events and changes that have occurred during and after the construction of Highway 99.</td>
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<td>The George Massey Tunnel is significant for its location, function, for its form of construction responding to its location, and its role in replacing the Woodward's Landing - Ladner ferry that ran from 1913 until the Tunnel was completed.</td>
<td>• Location on the South Arm of the Fraser River&lt;br&gt;• Fraser River and sloughs&lt;br&gt;• Tunnel elements&lt;br&gt;• Roadway, Tunnel approaches and access corridors&lt;br&gt;• Functional arrangement of Tunnel and ventilation structures&lt;br&gt;• Overhead louvres that allow gradual darkness&lt;br&gt;• Use of contemporary materials&lt;br&gt;• Wood doors</td>
<td>• Retain character-defining elements where feasible and practical so they can be used for interpretation.&lt;br&gt;• Document, using accepted standards, the Tunnel, approaches, and other character-defining elements to retain a record of their physical and intangible characteristics.&lt;br&gt;• Collect stories and memories about the Tunnel from the public.&lt;br&gt;• Communicate the historical importance of the former ferry service and its role in the transportation history of the Lower Fraser River communities and the Lower Mainland region.</td>
</tr>
<tr>
<td>Deas Island Regional Park is located on the Delta side of the South Arm and is the access and egress point for the southern end of the Tunnel.</td>
<td>• Deas Island Regional Park&lt;br&gt;• Views of the Tunnel and Highway 99 from the park</td>
<td>• Provide interpretation that presents information about Highway 99, the Tunnel, the ventilation buildings and the bridge within the park context.</td>
</tr>
<tr>
<td>The highway corridor and Tunnel are significant for their association with a number of people and institutions, highway and tunnel advocate George Massey and the Lower Fraser River Crossing Improvement Association, and the many builders, engineers, maintenance and management workers.</td>
<td>• Location on the South Arm of the Fraser River&lt;br&gt;• Construction of a tunnel structure rather than a bridge&lt;br&gt;• Stories and memories of the workers who built, managed and operated the Tunnel</td>
<td>• Incorporate stories that feature the work and ideas of people who were involved with, or have knowledge of the construction and operation of the Tunnel and Highway 99.</td>
</tr>
<tr>
<td>Heritage Values</td>
<td>Character-defining elements</td>
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</table>
| The design of the Tunnel and its associated infrastructure for meeting functional transportation needs, its aesthetic appeal and the use of a design style and materials specific to its time period. | • Elegant pre-cast concrete panels and graduated lighted louvres  
• Deliberate modernist design aesthetic | • Illustrate the idea and examples of the modernist style evolving in the 1950s as it was applied to industrial works and the aesthetic use of materials. |
| Considered an engineering feat in its time, the Tunnel has scientific and technical interest for its process, design, engineering and construction methods. The ventilation buildings and surrounding concrete platform are important for their contribution to the operation and management of the Tunnel. | • Precast concrete Tunnel tubes and equipment  
• Tunnel approaches with concrete side walls  
• Functional arrangement of Tunnel, approaches, highway, and ventilation structures  
• Prominent ventilation buildings, podium and self-supporting dams  
• Cylindrical form of air exhaust stacks  
• Ventilation building interior features  
• Remaining functional and process equipment  
• Intangible elements | • Retain character-defining elements where feasible and practical so they can be used for interpretation.  
• Identify for the visitor the important associated elements and landscape features and heritage-related views from this location.  
• Document through drawings, photographs and artifact inventory the interior of the ventilation buildings.  
• Illustrate the process of floating and sinking the Tunnel elements. |

Biodiversity of Richmond, British Columbia. *Natural History Bibliography*. http://ibis.geog.ubc.ca/richmond/city/RichmondNaturalHistoryReferences.html


British Columbia Toll Highways and Bridges Authority. *Deas Island Tunnel*. No date.


City of Richmond Archives. *George Massey Tunnel*. www.historypin.org/attach/uid26288/tours/all/


Massey, George. *Why the Lower Fraser River Crossing Improvement Association was Formed*. Ladner B.C., 1948.


Appendices

Appendix A: Glossary of heritage terms

Canadian Register of Historic Places
The pan-Canadian list of historic places of local, provincial, territorial and national significance. The Register is administered by the Government of Canada, in collaboration with provincial and territorial governments. Historic registers can be created by local governments. Historic places on local government registers are submitted to B.C. Heritage Branch for placement on the B.C. and Canadian heritage registers.

Character-defining elements
The materials, forms, location, spatial configurations, uses and cultural associations or meanings that contribute to the heritage value of a historic place, and which must be retained in order to preserve its heritage value.

Conservation
All actions or processes that are aimed at safeguarding the character-defining elements of a cultural resource so as to retain its heritage value and extend its physical life. This may involve stabilization, preservation, rehabilitation, restoration, interpretation or a combination of these or other actions or processes.

A listing of potential conservation treatments can be found in Appendix B, Approaches to Heritage Conservation.

Cultural landscape
Any geographical area that has been modified, influenced, or given special cultural meaning by people.

- Designed cultural landscapes were intentionally created by human beings.
- Organically evolved cultural landscapes developed in response to social, economic, administrative, or religious forces interacting with the natural environment. They fall into two sub-categories:
  - Relict landscapes in which an evolutionary process came to an end. Its significant distinguishing features are, however, still visible in material form.
  - Continuing landscapes in which the evolutionary process is still in progress. They exhibit significant material evidence of their evolution over time.
- Associate cultural landscapes are distinguished by the power of their spiritual, artistic, or cultural associations, rather than their surviving material evidence.

Cultural landscape characteristics
Features of a cultural landscape, used in a system of classification, that describe the tangible and intangible elements of a historically significant landscape and which individually and collectively embody landscape character and assist in understanding heritage value.

Designation
The classification of real property in whole or in part under Part 27, Division 4, Section 967 of the Local Government Act, if a local government considers that the property has heritage value or heritage character.
Heritage character
The heritage character of a place or community is formed by the synthesis of all of its heritage values. Heritage character is the overall effect produced by traits or features which give a property or area a distinctive quality, appearance and sense of place that distinguishes it from other areas in a municipality or region.

Heritage inventory
A listing of heritage resources that a community, local government, group or individual has identified as having heritage value, based on particular criteria. Listing on a heritage inventory does not require formal recognition by local government and does not imply protection of a heritage resource.

Heritage register - B.C. Register of Historic Places
The official provincial list of historic places in British Columbia that have been formally recognized for their heritage value by local governments, regional governments and/or the Province, using heritage conservation powers available in the Local Government Act or other legislation. Listing on a heritage register allows the local government to access heritage conservation tools.

Heritage resource / heritage feature / historic place
A structure, building, group of buildings, district, landscape, landscape feature, industrial site, artifact, archaeological site or any other place or feature that embodies or contributes to the historical significance of a place and which has been recognized as having heritage value.

Heritage value
The aesthetic, historic, scientific, cultural, social or spiritual importance or significance of a place as recognized by a community for past, present or future generations. The heritage value of a historic place is embodied in its character-defining materials, forms, location, spatial configurations, uses and cultural associations or meanings.

Intangible heritage
The practices, representations, expressions, knowledge, skills, stories, memories, – as well as the instruments, objects, artefacts and cultural spaces associated with them, that communities, groups and individuals recognize as part of their cultural heritage or the heritage of a place.

Intangible heritage includes the perceptions experienced at a historic site that are integral to the appreciation of the place, including sight, sound, touch, taste and smell.

Standards and Guidelines for the Conservation of Historic Places in Canada
A Canadian benchmark for heritage conservation practice in this country offering results-oriented guidance for sound decision-making when planning for, intervening on and using historic places. The document establishes a consistent, pan-Canadian set of conservation principles and guidelines for conserving Canada’s historic places.

Statement of Significance
A statement that identifies the description, heritage value, and character-defining elements of a historic place. A statement of significance is required in order for a historic place to be listed on a local, provincial or Canadian Register of Historic Places.
### Appendix B: Approaches to heritage conservation

When developing heritage conservation approaches, consider: “Has the heritage place, element or feature any significance? If so, what?” Conservation decision making for a historic place and its component parts is based on an understanding of significance and specific character-defining elements. The following table illustrates the broad range of possible conservation approaches that can be used in combination and with the guidance of the *Standards and Guidelines for the Conservation of Historic Places in Canada*.

<table>
<thead>
<tr>
<th>Conservation approach</th>
<th>Definition</th>
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<tbody>
<tr>
<td><strong>Recording / Documenting</strong></td>
<td>Objectively describing - through oral, written, graphic, and photographic means - the present configuration and condition of an historic resource. This provides necessary basic data for the preparation of conservation research, analysis, design, and maintenance activities, as well as ensuring the historical or technical information contained in a site is not lost.</td>
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<tr>
<td><strong>Monitoring</strong></td>
<td>The systematic and regular inspection or measurement of the condition of the materials and elements of an historic place to determine their behavior, performance, and rate of deterioration over time. Monitoring is undertaken to ensure that adverse impacts on archaeological sites, buildings and structures, landscapes, and biological life-forms that could not be predicted or evaluated prior to site alteration or construction activities are addressed.</td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>The most primary form of conservation is a site and building maintenance program. It is the routine, cyclical, nondestructive actions necessary to slow the deterioration of an historic place. It entails periodic inspection; routine, cyclical, non-destructive cleaning; minor repair and refinishing operations; replacement of damaged or deteriorated materials that are impractical to save.</td>
</tr>
<tr>
<td><strong>Stabilization</strong></td>
<td>A minimum amount of work done to safeguard a resource from the elements and/or destruction and to protect the public from danger. This work may involve emergency structural reinforcing, cabling (with trees), protective coverings, or hoardings of a temporary nature. Stabilization is often undertaken in order to preserve character-defining elements for future heritage conservation work.</td>
</tr>
<tr>
<td><strong>Mothballing</strong></td>
<td>The temporary closure of a building or other structure to protect it from the weather and secure it from vandalism. It is intended to safeguard character-defining elements over an extended period until such time as it is decided to proceed with conservation work.</td>
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<tr>
<td>Conservation approach</td>
<td>Definition</td>
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<td><strong>Repair</strong></td>
<td>The process of returning a character-defining element to its prior condition when it has undergone changes attributed to failure, decline, wear, normal use, or abuse. A repair action does not alter or enhance the integrity, character, performance, or design intent of the heritage feature. Repair may include patching of existing components using technologically compatible materials and methods; limited replacement in-kind of components; complete replacement in kind of a component when the degree of change it has undergone precludes any other type of action.</td>
</tr>
<tr>
<td><strong>Preservation</strong></td>
<td>The action or process of protecting, maintaining, and/or stabilizing the existing materials, form, and integrity of a historic place or of an individual component, while protecting its heritage value.</td>
</tr>
<tr>
<td><strong>Restoration</strong></td>
<td>The process of accurately revealing, recovering, or representing the state of a historic place or of an individual component, as it appeared at a particular period in its history, as accurately as possible, while protecting its heritage value. Restoration is considered the primary treatment when the significance of a particular place during a particular time period significantly outweighs the loss of existing character-defining elements from other periods, and if there is substantial evidence of its appearance at an earlier time.</td>
</tr>
<tr>
<td><strong>Rehabilitation</strong></td>
<td>The action or process of making possible a continuing or compatible contemporary use of a historic place or landscape, or of an individual component, while protecting its heritage value. Rehabilitation makes possible an efficient contemporary use while retaining those portions and features which are significant to the resource's heritage values. New work is designed to be physically and visually compatible with and distinguishable from, the original historic place. For landscapes, rehabilitation is the most common intervention, as it allows changes necessary to satisfy present-day demands upon the site. In continued use rehabilitation, changes are made to a historic place that continues to be used for its original purpose. In adaptive re-use, the historic place is converted to a new use.</td>
</tr>
<tr>
<td><strong>Reconstruction</strong></td>
<td>A building, site feature, or artifact that no longer exists is reproduced with new construction that exhibits the shape, material, and detailing (and often construction methods) of the resource as it once appeared. Good documentary information without conjecture is essential in order to justify a reconstruction. With landscapes, planning should consider the age and arrangement of vegetation, allowing for growth and maintenance to continue an appearance that replicates the historical period.</td>
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<tr>
<td><strong>Conservation approach</strong></td>
<td><strong>Definition</strong></td>
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<tr>
<td>Replication</td>
<td>Making an exact copy of portions of an existing structure, feature, or artifact, usually to replace a missing or decayed component in order to maintain aesthetic unity and harmony. Replication is often used for cosmetic reasons in restoration work. If valuable cultural property is being threatened or damaged irretrievably by its environment, it may have to be moved to a more protected environment. A replica may be substituted in order to maintain heritage integrity and the unity of a site or building.</td>
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<tr>
<td>Renovation</td>
<td>Occurs when extensive changes and/or additions are made to an existing building internally and externally in order to ‘renew’ the structure. Cultural landscapes can also be renovated. These changes are often made in response to the need for more space, repair, general improvements, or lifestyle considerations.</td>
</tr>
<tr>
<td>Deconstruction or salvage</td>
<td>The process of retaining and protecting from deterioration historic fabric or elements that have been removed from their original context. Selected parts of a building or landscape are protected for renovation or reuse, consisting of actions to carefully dismantle and reassemble building, structure, or artifact; in situ if possible, but often ex situ on another site. This process is often undertaken out of structural necessity, for the protection of significant individual features from permanent loss, to repair deteriorated material, to observe historic construction techniques or protect materials for future re-use. The term also replies to natural heritage and landscape values such as plants.</td>
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<tr>
<td>Re-use or symbolic conservation</td>
<td>Re-using or reinstalling components of deteriorated buildings, structures or landscapes in-situ, elsewhere on the site or in another location. Symbolic conservation refers to the recovery of unique heritage resources and incorporating those components into new development, or using a symbolic design method to depict a theme or remembrance of the past.</td>
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<tr>
<td>Managed decline or ruinification</td>
<td>Allows a character-defining element to remain on site and slowly degrade or deteriorate rather than be moved or demolished. Over the long-term the natural forces of nature are used to allow the site to become a historic ruin. The first phase of managed decline typically involves carefully documenting the character-defining elements and then removing but storing in situ salvageable or unsafe parts of the building or structure. Documenting the process of decline is an important component of site interpretation.</td>
</tr>
</tbody>
</table>

| Interpretation | A process of communicating messages about cultural and natural heritage, or telling stories about a place, that forges emotional and intellectual connections between the interests of the audience and meanings inherent in the resource. The presentation can relate to the way the place is now, has been, used, seen, touched, smelled and tasted, giving impact to evocative stories and meanings. The range of interpretive techniques is vast, and can include such things as interpretive signs, the retention of parts of buildings or structures, interpretive interventions designed into new construction, site furnishings, landscape design, planting, artifacts, features embedded into the landscape, public art, hands-on techniques, audio, video and many others. |