Part II: Robert Moses Parkway: Its Current Purpose and Future Prospects
As mentioned in the previous section of this study, the Robert Moses Parkway currently exists as two discrete and disconnected sections. The southern section extends from the western terminus of the LaSalle Expressway to the intersection of Buffalo Avenue and John B. Daly Boulevard, and remains a four lane divided highway. This southern section of the RMP is not being addressed in this study. The northern section of the RMP extends from Main Street (Route 104) in the City of Niagara Falls to its northern terminus at Lake Road (Route 18) in Youngstown. The southern six miles of this northern portion of the RMP, from the intersection with First and Main Streets in Niagara Falls to the interchange at Center Street and Ridge Road in Lewiston, are addressed in this study. The southbound lanes of this portion of the RMP were closed to vehicular traffic in 2001. Two-way traffic was established on the former northbound lanes in this area (through re-striping and other minor modifications), and the former southbound lanes were dedicated to pedestrian use. However, the former southbound lanes were never substantially modified for this new purpose, and still have the appearance of a closed (and unmaintained) roadway. Little has been done to create a truly inviting, pedestrian-oriented atmosphere.

Although the modified pedestrian access is an improvement over the original condition of the parkway, its uninviting atmosphere is symptomatic of a larger problem that cannot be fully addressed while the RMP remains in place. Since construction of the RMP, adjoining neighborhoods have been cut off from direct access to the Niagara gorge and rim. The parkway has essentially cut these neighborhoods off from what should be their unique and accessible waterfront. The majority of adjacent neighborhood streets dead-end at the parkway, where they meet a chain link fence intended to interrupt direct access to the rim or gorge by local residents. Although the adjacent parks are open to the public, local residents who live within yards of the gorge and its rim are not encouraged to directly and informally enjoy this natural resource. Even if this fence barrier is ignored (as indicated by holes cut in the fence), one must then cross over two lanes of 45 mph traffic to access any of the parkland.

Even with the closure of the southbound lanes, the RMP has continued to operate well below its capacity. According to a Traffic Impact Assessment report prepared by GTS Consulting (Traffic Report, Appendix D), most of the RMP carries less than 250 vehicles in either direction during the morning and evening peak hours (8-9 a.m. and 4-5 p.m., respectively). All of the intersections within the study area (including Route 104 and Lockport Street) were shown to be operating with excess capacity as well. Using both modeling techniques and on-site travel runs, the Traffic Report finds that the average trip between Niagara Falls and Lewiston takes an average of 9-10 minutes along the RMP.

The majority of traffic using the RMP today consists of commuters travelling between downtown Niagara Falls and suburban communities to the north. The parkway is also used by a limited number of visitors, although I-190 accommodates more of the through-traffic bound directly for the Canadian border. As shown in the Existing Circulation Map in Appendix D, the RMP does provide access to the destination points along its route. However, such access is redundant, as most of these points are also served by routes other than the RMP, including Route 104, Portage Road, 11th Street/Highland Avenue, and Hyde Park Boulevard.
A. Full Removal

Since the reconfiguration of traffic and pedestrian lanes, various changes to the RMP have been proposed and debated, including full removal. Currently the debate revolves around the usefulness of the RMP in its current condition compared to an alternative and more fruitful use of the Niagara gorge rim. Central to this debate is the distribution of the vehicles that currently use the RMP. Fewer than 250 vehicles utilize the RMP in either direction during peak hours each day. Given the excess roadway capacity that exists along this and other adjacent corridors (such as Lewiston Road/Route 104, which essentially parallels the RMP for the entire six miles from Lewiston to Niagara Falls), the RMP has clearly outlived its usefulness as a vehicular thoroughfare (See Existing Circulation Map in Appendix D).

The following discussion focuses on the costs of removing the parkway compared to the benefits of restoring the gorge rim to its natural condition, and allowing residents and visitors to enjoy this unique natural resource.

Full removal of the RMP, as advocated by this Study and illustrated in the Restoration Concept (see Figure 3.0), would involve decommissioning the roadway from the Rainbow Bridge to Center Street in Lewiston. The decommissioning proposed for the RMP is essentially a two-step process. The first step is roadway removal, which involves removing and disposing of the pavement/hardscape. This effort will call for significant one-time costs and the redistribution of traffic currently using the parkway. However, the costs of removal must be considered in comparison to the costs associated with maintaining the RMP in its current condition as a limited access parkway. Redistribution of traffic currently using the RMP to alternative roadways also needs to be evaluated in terms of the volume of displaced traffic and the capacity of alternate routes to accommodate this traffic. The second step in decommissioning the RMP focuses on alternative uses of the land once the parkway is removed. This study strategically focuses on the restoration of the Niagara gorge rim, including the land formerly occupied by the RMP, to natural ecological communities that are available for public recreational use. Ecological restoration would involve restoring natural topography and drainage, restoring/improving soil conditions, developing a non-motorized recreational trail, and restoring/establishing native plant communities along the gorge rim.

A discussion of road removal costs compared to the long term cost of road maintenance is set forth below, followed by a discussion of the redistribution of RMP traffic. Case studies of other successful road closure/removal projects are presented, along with a summary of the benefits of alternate use of the gorge rim. Part III of this study includes a detailed discussion of the environmental and economic benefits of restoring the former roadway to native ecological communities.

B. Removal Costs

A variety of studies have examined road removal costs within different contexts (Bagley, 1998; Switalski et al., 2004; Coffin, 2004; Hoornbeek and Schwarz, 2009; Preservation Institute, 2011). While overall cost figures may be found for previous highway removal projects, these figures provide only a very rough guide in estimating the potential cost of RMP demolition and removal. The costs surrounding each road removal project must be viewed in light of their unique circumstances, project setting, scope, and geographic extent. Total cost figures for road removal projects frequently include the cost of redevelopment initiatives, additional right-of-way purchases, and the redistribution of roadspace. They are also influenced by the local labor market, the nature and availability of various funding sources, and the extent of rehabilitation to both the built and natural environments. As a result, the range in project costs (from $25 million in...
Milwaukee to $900 million in Seoul) provides only a general range as a guide for estimating the cost of RMP removal (Congress for the New Urbanism, 200; Park, 2007).

An examination of regional transportation construction data provides more useful information. The New York State Department of Transportation (NYSDOT) compiles annual contract values in their Regional Weighted Average Awarded Price Report (NYSDOT, 2010). This report details unit prices paid by the state over the previous year (which are detailed per line item), for each contract awarded through individual NYSDOT regions. The average prices paid by the state for several appropriate line items are used in Tables 1 and 2 below to estimate the potential cost of RMP removal and maintenance. It should be noted the cost of excavation and basic re-grading alone may not be as expensive as some might fear. In fact, the full removal of traffic would ease restrictions regarding excavation methods and equipment, and thus lower anticipated costs. The price of excavation would likely be further reduced without the need to manage traffic in the project area or keep the sub-base and right-of-way in drivable condition.

### Table 1: Base Cost Estimates of Excavation and Fill

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity/Dimensions</th>
<th>Unit Price</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes to be excavated</td>
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</tr>
<tr>
<td>Total excavated width per lane</td>
<td>13 feet</td>
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<td></td>
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<tr>
<td>Pavement area per lane mile</td>
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<tr>
<td>Total pavement area</td>
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<tr>
<td>Assumed max. depth of excavation</td>
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<tr>
<td>Estimated total excavation volume</td>
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<tr>
<td>Approx. unit price of excavation</td>
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<td></td>
</tr>
<tr>
<td>Estimated excavation subtotal</td>
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<tr>
<td>Depth of embankment-in-place</td>
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<tr>
<td>Estimated embankment subtotal</td>
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<tr>
<td>Depth of topsoil</td>
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<td>Estimated topsoil placement subtotal</td>
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<td>Depth of compost</td>
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<td><strong>Excavation &amp; fill total estimate</strong></td>
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<td><strong>$3,824,758</strong></td>
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</table>

*Based on NYS DOT (2010) figures.

As shown in Table 1, based on NYSDOT figures, the estimated cost of excavation is $14.50 per cubic yard. At an excavation depth of 24 inches, replaced with embankment, topsoil, and composted materials at 18, 5, and 1 inches, respectively, the total cost for excavation and soil replacement along the 6-mile segment of the RMP proposed for removal would be approximately $3.8 million. This figure does not account for disposal costs associated with demolition debris, which would include concrete, asphalt, and steel. These disposal costs could be significantly reduced if debris were diverted from landfills to material reclamation facilities, where they may be recycled for use as aggregate, landscape materials, pipe bedding, or other end products.

To put removal costs in context, the construction and maintenance costs associated with the alternative of reconstructing the RMP to accommodate continued vehicular traffic must also be considered. The existing RMP corridor is slated for complete reconstruction within the coming years, as the roadbed and surface materials have reached the end of their functional lifespan. Therefore, any potential long-term maintenance estimates should be added to the near-term cost of roadway reconstruction, which could range substantially depending on the design chosen. The City of Niagara Falls has recently estimated the cost of roadway reconstruction from Main Street to Findlay Drive at approximately $28 million (City of Niagara Falls, 2009b). As that segment is roughly one-third the length of the RMP removal addressed in this study, it may be assumed that full reconstruction of this 6-mile segment could cost three times this amount. However, acknowledging the potential for economies of scale in construction, it may be
reasonable to assume a more conservative estimate of $55.5 million, twice the amount estimated for the smaller area examined by the City.

The maintenance responsibilities for a newly constructed roadway would also be substantial. The NYSDOT does not compile annual maintenance costs per roadway; regional roadway maintenance budgets are distributed on a “triage” basis (meaning that they are applied on an as-needed basis according to highest priority). However, regional NYSDOT budget estimates do provide an indication of the annual maintenance costs for typical asphalt-over-concrete facilities, as shown in Table 2 (NYSDOT, 2011).

The estimates shown in Table 2 assume the near-term replacement of the existing RMP with an asphalt-over-concrete roadway, as well as periodic maintenance projects (e.g. replacement of asphalt overlay), which are reasonably assumed to be required every 20 years. In addition, such a roadway would eventually require full replacement after approximately 50 years. Like the estimates for roadway removal, these costs also exclude some important components, such as sign and guiderail maintenance, public safety patrols, and periodic debris removal. In addition, the direct economic costs only tell part of the story: pesticide and herbicide application, habitat fragmentation, damage to roadside flora and fauna from road salt, and the nonpoint-source pollution associated with runoff from impervious surfaces also represent substantial costs to the community, both economically and ecologically. Those costs notwithstanding, the estimates presented here serve to highlight some of the major economic elements of RMP maintenance.

As shown in Table 2, full roadway reconstruction from Main Street in Niagara Falls to Center Street in Lewiston is estimated to cost $55.5 million. The estimated annual cost of mowing the shoulders and median along the 6-mile span of the RMP proposed for removal is $18,000. Likewise, the estimated annual costs of salting, plowing, and patching that portion of the RMP currently used for vehicular travel are $18,000, $15,000, and $2,040, respectively. These maintenance responsibilities total $53,040 per year, or more than $2.1 million over a 40 year time frame (considered to be a reasonable planning period). In

<table>
<thead>
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<th>Table 2: Base Cost Estimates of Maintenance and Repair</th>
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<tr>
<td><strong>Maintenance</strong></td>
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<tr>
<td><strong>Repair</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td><strong>Total reconstruction, maintenance &amp; repair cost estimate:</strong></td>
</tr>
</tbody>
</table>

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*Estimate taken from City of Niagara Falls, 2009b.
*Based on maintenance and repair figures in NYSDOT (2011) estimates.
*Average cost per lane mile between state personnel and contracted personnel.
*Mowing cost assumes two shoulders and one grassed median.
addition, two overlay replacements (at an estimated $1.53 million each) within the next 40 years would bring the total maintenance and replacement costs for this portion of the RMP to approximately $4.8 million.

These figures do not account for inflation or the “time value” of money. Because of these factors and other uncertainties (such as long-term volatility in the cost of materials), it is very difficult to estimate full structural replacement costs so far in advance; however, it is safe to presume that the costs presented above represent a reasonable minimum estimate.

Based on the assumptions described above, the one-time cost of removal compares favorably to the cost of RMP reconstruction, maintenance and repair over the next 40 years. Although additional financial obligations related to the ecological restoration of the roadspace must also be considered, the ancillary economic benefits of such restoration lend additional support to this proposal. These benefits are discussed in further detail in Part III.

C. Redistribution of Traffic

1. Impact on Local Transportation Network and Adjoining Neighborhoods

Closure of the RMP will necessarily cause north/south traffic currently using the parkway to be diverted to alternative routes. As mentioned previously, there are several alternative north/south roadways that run parallel to the parkway that offer suitable alternative routes for vehicular traffic. The closest and more direct routes, which are available to all vehicles (commercial and noncommercial), are Whirlpool Drive and Route 104/Lewiston Road. Hyde Park Boulevard and Highland Avenue may also accommodate the diverted traffic (see Appendix D, Existing Circulation Map and Figure 2: Proposed Circulation Map). No matter the chosen route, the diversion of RMP traffic is not expected to generate unmanageable impacts on these roadways, due to a combination of low RMP traffic levels and excess capacity in the local roadway network. In fact, these two factors allowed for the permanent closure of two lanes of the parkway in 2001, as discussed previously. This portion of the RMP has been used in such a manor for the last 10 years, without a significant increase or disruption to traffic on adjacent routes.

Nonetheless, area residents may voice concern over the level of impact that full closure of the parkway could have on traffic levels in the adjacent neighborhoods. To assist in our assessment of potential traffic impacts, the Traffic Report prepared by GTS Consulting (Appendix D) examined the travel time, running time, delay time, running speed, and travel speed of vehicular traffic on the RMP. The Traffic Report also determined travel times and speeds on alternate routes if the RMP were to be closed. Based on the travel runs completed, the average trip between Niagara Falls and Lewiston was calculated to take about 9-10 minutes when traveling on the RMP. With the closure of this route, travel times would increase by approximately three minutes and take about 12-13 minutes in total, using Route 104 or alternative routes. Travel times between Irving Drive and Portage Road on the Route 104, Hyde Park Boulevard or Highland Avenue routes are all generally consistent, in the range of 7-8 minutes. It is estimated that the majority of the diverted traffic will use Route 104 for the entire trip between Lewiston and Niagara Falls, given that it is the shortest route in terms of both distance and travel time. Personal interpretation of travel speed and delay will also have some impact on the routes chosen. The higher travel speeds on Highland Avenue will draw some of the diverted trips since the increased distance does not significantly increase the overall travel time. Use of Hyde Park Boulevard to Lockport Street would be expected to be minimal given the poor road
conditions along Lockport Street, as well as the three consecutive stops signs at Niagara Avenue, Cleveland Avenue and South Avenue which create a feeling of longer travel time. Based on these conclusions, it is anticipated that approximately 70% of the Robert Moses Parkway traffic will divert to Route 104 and 30% will divert to Highland Avenue (see detailed discussion in Appendix D).

The Traffic Report concluded that even with the assumption that 70% of the diverted traffic would use Route 104, the closure of the parkway will not significantly increase traffic volumes on adjacent roadways in the area, and that the increases will generally not be noticeable to motorists currently using these alternate routes. This is due to the fact that the existing usage of the RMP is very low during both the morning and evening peak hours. During the morning peak hour, traffic volume increases on alternate routes are projected to be very low. With closure of the RMP, an additional 1-4 vehicles per minute are predicted in each direction in the southern and northern sections of Route 104 and approximately 12 vehicles per minute are predicted in each direction in the middle section of Route 104. During the evening peak hour, the volume increases are predicted to be in the range of 2-4 vehicles per direction per minute in the southern section of Route 104, and 2-3 vehicles per direction per minute in the middle and northern sections. On Highland Avenue, traffic volume increases are expected to be approximately one vehicle or less per minute per direction. The largest traffic increase will occur on Route 104 near Military Drive during the evening peak hour. Additional detail on the re-distributed traffic volumes expected in the area during the morning and evening peak hours is presented in Appendix D.

The Traffic Report also included a capacity analysis, to identify the potential impacts that the diverted traffic may have at various intersections on the existing roadway network. This analysis indicated that the traffic volume increases would generally have minimal impact on traffic operations in the area, with most intersection Levels of Service being maintained at the existing condition during both the morning and evening peak hours. Intersections in the City of Niagara Falls would continue to operate at overall Levels of Service B or better with all individual movements continuing to operate at Levels of Service C or better during both peak hours. The two northern intersections of Route 104 with Hyde Park Boulevard/University Drive and Military Road would both continue to operate at Level of Service C or better during both peaks with all individual movements operating at Levels of Service D or better (see Appendix D for additional information on Levels of Service). In summary, given the low existing traffic volumes in the area on both the RMP and Route 104, there is excess capacity to easily accommodate the predicted increase in traffic volumes on adjacent roadways if the RMP is closed.

In addition to the redistribution of traffic, closure and removal of the parkway opens up opportunities for the local residential neighborhoods to reconnect with the Niagara gorge rim as a naturalized park. With removal of the RMP, fencing between the parkway and adjacent neighborhoods could be removed, and new vehicular and pedestrian circulation patterns and access points could be established. A proposed circulation plan is shown in Figure 2. As indicated in this figure, strategically located “soft entries” to the gorge rim (without parking) could provide access for adjacent residents. The creation of clearly identified visitor gateways (with designated parking) would allow tourists and other visitors to easily access the restored gorge rim. Instead of being an afterthought to a vehicle-oriented landscape, pedestrian access throughout the area would appear purposeful and welcoming. Both pedestrian and vehicular access to existing destination areas would be improved with greater clarity and separation between modes. New pedestrian access would be provided in the area of the Earl W. Brydges Artpark and the Niagara Escarpment, where none currently exists. Native planting features along key entry roads could be used to integrate an ecologically restored gorge rim with adjacent neighborhoods.
2. Case Studies- Highway removal

As with any traffic reconfiguration proposal, it is useful to examine previous efforts that involved removing segments of urban road networks, to consider the impacts that have been experienced elsewhere. In the decades following the mid-century expansion of urban freeways, there have been a number of notable urban highway removal projects throughout the United States and abroad. Each situation is unique; public opinion, project cost, and revitalization success stories are all influenced by the relative strength of regional economies, transportation networks, and local leadership. However, four of these projects provide valuable insight into the viability and potential benefits of the complete removal of the RMP, due to similarities in the setting, purpose, and/or existing infrastructural conditions of the projects.

Harbor Drive, Portland, Oregon- Until 1974, Harbor Drive was a high-traffic thoroughfare running along the length of the Willamette River in Portland, Oregon. The Annual Average Daily Traffic (AADT) on the road was estimated at 25,000 prior to removal, and the number of vehicles was projected to grow to 90,000 by 1990. Then-Governor Tom McCall proposed a removal plan to compete with three options for an increased roadway footprint. The removal plan was selected and implemented, removing six lanes from three miles of the waterfront, and opening up 37 acres for a waterfront park. Because commuters were given ample notice and adequate re-routing options, the widely anticipated gridlock never materialized. Traffic engineers for the city noted at the time that the removal project did not cause a single ripple in the City's transportation network. The waterfront acreage was dedicated to a riverfront park that became a catalyst project for the City's revitalization throughout the 1980s and 1990s (Preservation Institute, 2011).

Cheonggyecheon Highway, Seoul, South Korea- The elevated Cheonggyecheon Highway bisected a formerly bustling business district in Seoul, South Korea. The highway alignment followed what had been the Cheonggyecheon Stream, which was channelized and buried in the construction of the six-lane roadway. The project removed 3.6 miles of the highway, while daylighting and providing public access to the stream. A fraction of the highway's capacity was accommodated by two surface boulevards aligned along each bank of the exposed stream. The project was an enormous undertaking, but the reward has outweighed the risk; the improvement of the business district and the public use of a historically significant natural resource have revitalized an important piece of Seoul's cultural heritage. At an estimated traffic volume of 169,000 AADT, many people predicted that the removal of the highway would wreak havoc on the local transportation network. However, in summarizing the project for the World Federation of Engineering Organisations, project engineers noted that local traffic conditions actually got better. Traffic information systems were established, and a well-executed public information campaign helped to publicize transportation options. Adjacent routes accommodated the increased use in bus ridership, and traffic guides helped to direct drivers through nearby intersections. Despite some congestion at the outset of demolition, engineers noted that “the great traffic disaster that had been so widely feared never occurred… (in) several respects, the traffic flow system in the center of the city was improved.” (Park, 2007)

Embarcadero Freeway, San Francisco, California- Having been badly damaged in the Loma Prieta earthquake of 1989, and highly unpopular since its construction, the Embarcadero Freeway was removed from San Francisco's waterfront in 1991. The project removed 1.5 miles of elevated freeway which separated a historic neighborhood from San Francisco Bay. The City replaced a portion of the freeway's capacity with a surface boulevard. Once again, claims of impending gridlock were not borne out in local roadway networks, despite an estimated 100,000 AADT. Investment in the public transportation system helped to carry the load, with transportation officials estimating an additional 30,000 transit passengers as a result of the project. In addition, adjacent waterfront properties have experienced significant revitalization as a result of their exposure. Historic structures have been improved, and there has been an increase in
commercial and residential investment. The area is now known as a hub for intermodal transportation, with improved vehicular, pedestrian, and light rail access (Preservation Institute, 2011).

**Park East Freeway, Milwaukee, Wisconsin** - Unlike the RMP, which runs parallel to a water feature, the Park East Freeway cut across the Milwaukee River. But like the RMP, the Park East Freeway also prevented the City of Milwaukee from a more productive and attractive engagement of its waterfront resources with adjacent neighborhoods. The elevated Park East occupied a city block’s worth of right-of-way, bisecting a neighborhood that had become badly blighted since construction of the highway, and disrupting the efficient flow of the local road network at its access ramps. Whereas these access ramps concentrated traffic at just three intersections, the reconfigured urban grid efficiently dispersed this traffic over more than two dozen streets. The removal of the Park East Freeway allowed for the re-use of a mile-long strip of urban land, much of it with improved access to the water, and became an economic catalyst for the revitalization of Milwaukee’s riverfront (Congress for the New Urbanism, 2011).

While each circumstance described above is unique, these projects share certain commonalities with the RMP proposal. Of particular relevance is the anticipation of traffic gridlock, an expectation shared in the case of the RMP, despite its comparatively small daily traffic volumes. As these case studies indicate, with appropriate planning and contingencies, highway capacity reductions (or outright removal) do not necessarily result in poorer levels of service or increased traffic on local roadways. This assertion is not merely anecdotal; engineers and researchers have noted the phenomenon of “disappearing traffic” in a series of capacity reduction projects both in the United States and abroad. The most comprehensive investigations of this phenomenon come from a group of British researchers, in their empirical study of 70 international cases of road capacity reduction, and a subsequent examination of public and professional perception of associated traffic impacts (Cairns et al., 1998, and Cairns et al., 2002, respectively). These researchers noted that:

“On balance, the data suggest that traffic reduction is a real phenomenon that occurs when roadspace for cars is reduced. Moreover, the scale of reduction can be quite substantial… in half the cases, over 11% of the vehicles which were previously using the road or the area where roadspace for general traffic was reduced, could not be found in the surrounding area afterwards. [There] may be a real reduction in capacity on the treated road or area, but this may be offset by adequate spare capacity on alternative routes or at other times of the day.”

In summary, various researchers suggest that traffic gridlock may not occur (and, in fact, flow may improve) if travelers are given adequate preparation and alternate transportation options. In addition, experience elsewhere indicates that the surrounding areas may experience many ancillary benefits as a result of new options for land use that emerge following roadway removal. Among these ancillary benefits are the potential beneficial re-use of the land, economic development, and potential savings that could be achieved by reducing the demand for roadway maintenance and reconstruction.
Four concepts were proposed by Wild Ones Niagara as possible ways to achieve specific desired improvements associated with the ecological restoration of the Niagara gorge rim. All of the proposed concepts are independent of the removal of the Parkway, but could enhance the overall experience of the visitor and/or success of the restoration effort. These concepts include the following:

- The development of a greenhouse and botanical education center over the lanes of the Robert Moses Parkway currently traversing the power plant. The intent behind this concept is to establish a greenhouse (and associated education center) for the propagation of native plant materials in or near the gorge rim, and to take advantage (directly or indirectly) of the energy generated by the power plant.
- The removal of blast and excavation debris left in the gorge as a result of the construction of NYPA’s access road through Devil’s Hole State Park, and the reuse of this debris for the construction of a pedestrian connector between the portions of the park bisected by this access road.
- The unplugging of drainage conduits in the Hyde Park Landfill outflow, for the purpose of recreating original hydrologic conditions within that section of the gorge rim and restoring a source of flora-sustaining water supply to Devil’s Hole State Park.
- The construction of an external elevator to the rooftop of Wroble Towers. The intent of this concept is to provide visitors a grand vista of the Niagara River and gorge from the building’s roof.

The feasibility of each proposed concept is discussed below, in light of the primary intent or goal behind the overall restoration concept. Alternative options are also presented, which may prove more efficient and/or effective given site constraints and development goals.

### A. Greenhouse and Education Center

The ecosystem that has evolved along the rim has done so in a very particular context of climate tolerance, codependence with other flora and fauna, and adaptation among species. As such, a true restoration of the RMP corridor cannot be achieved through the simple importation of nominally similar species; all members of a single species may not have the specific characteristics required to thrive in this ecosystem. Restoration will require the support of professionals and volunteers dedicated to the propagation and stewardship of local ecotypes that have adapted to this particular environment.

The centerpiece of this support should take the form of a greenhouse and botanical education center located in or directly adjacent to the study area. The greenhouse would provide the conditions necessary for the propagation of native species. Within a protected environment, seedlings are protected from predation, incidental pollution, and competition for solar energy and hydration (especially important, given the abundance of non-native invasive species in the Study Area). Ideally, seedlings would be transferred from the greenhouse to an on-site nursery prior to their eventual transfer into appropriate ecological communities throughout the gorge rim. This would further ensure their viability in the particular ecological and climatic conditions of the surrounding area. Given such an opportunity to propagate, the native stock may do so in abundance, further supporting the restoration of the corridor.

Of course, such an operation cannot run itself. Initial staff resources may include (but are not limited to) botanists, field ecologists, and horticulturalists. As the facility grows and needs become more complex, outreach staff may be added to deliver educational initiatives to local schools and volunteers. Administrators would be required to assist professional staff, as would employees for transportation, maintenance, and the general labor required of such facilities. Financial support for the greenhouse, though not detailed herein,
could be generated from agencies including NYPA and OPRHP, both of whom may stand to gain from the potential for positive public relations.

There are several locations throughout Study Area that could be appropriate for the location of the greenhouse and its attendant facilities. A number of issues must be considered in weighing the advantages and disadvantages of each, including the following:

- Proximity to areas being restored
- Pedestrian and vehicular access
- Environmental health and safety
- Solar exposure
- Growth medium (within organic/topsoil/subsoil layers, ground-level raised beds, or on tabletops)
- Constructability

Given these theoretical constructs, three sites within or directly adjacent to the Study Area are considered for the feasibility of siting a greenhouse, outdoor nursery, and botanical education center: NYPA lands along the north shore of the forebay, the cleared portion of DeVeaux Woods State Park, and the existing portion of the RMP traversing the power plant.

**NYPA forebay property:**

The NYPA owns and manages approximately 400 acres adjacent to the power plant and forebay. Along the northern shore of the forebay, there are more than 30 acres of underutilized land that could accommodate the greenhouse facilities.

- **Proximity:** Though adjacent to the current Study Area, this land is not the most centralized site available. As shown in the Restoration Concept (Figure 3.0), the restored corridor is narrowest throughout the section of the RMP to the south of the dam, widening only briefly to the north of the dam along the I-190 interchange before becoming narrow again north of the Lewiston-Queenston Bridge. As such, the closest sections of the corridor would not be the sections requiring the most intensive restoration focus. This would increase transportation requirements between the greenhouse and individual portions of the restoration project, which is not ideal.

- **Access:** Closure of the RMP would not influence the suitability of this site in terms of vehicular access, as north-south access via Route 104/ Lewiston Road would be maintained. However, in terms of neighborhood connectivity and walkability, this site is not ideal. The lands surrounding this site are hemmed in by an interstate and a commuter route. The interior area features a limited number of residences and pedestrian facilities; it is among the least dense of any neighborhood from which the greenhouse could draw potential local visitors.

- **Health and safety:** The NYPA lands are directly in between a cemetery and the power plant’s forebay. Human health is likely not threatened by soil vapors or other environmental health risk factors commonly found within the region, as the site is not identified as a source of contamination by state or federal authorities. However, public use of the forebay is strictly prohibited, a barrier which could render the site inconvenient at best, or unusable at worst, for such a facility. While public use of the water is certainly not a precondition of the greenhouse, local, state, and federal authorities would likely not authorize increased access along the adjacent land either, citing safety and security concerns.

- **Exposure:** Given the size of the site, it can be assumed that any number of solar orientations could be easily achieved by greenhouse structures. At this latitude, an east-west orientation would best
capture the greatest amount of solar energy along the southern face of the structure; however, certain site or growing conditions might make an alternative orientation more ideal.

- **Growth medium:** Pending soil tests for contamination, drainage, and other physical and chemical characteristics, this site is likely suitable for any growth medium.
- **Constructability:** The twin barriers of NYPA ownership and federal regulatory oversight of the forebay would likely render any construction proposals moot. Security concerns at this high-profile power facility are at extremely high levels in recent years. Assuming these barriers could be overcome, and that the authorities would allow a proposal such as this to gain traction, it is safe to assume that the approval process would be lengthy and cost-prohibitive.

**DeVeaux Woods State Park:**

The cleared areas within DeVeaux Woods State Park include mowed lawns and a number of existing structures which are either underutilized or abandoned. These areas are directly adjacent to Whirlpool State Park, one of the more prominent nodes along the corridor. As shown in the Restoration Concept (Figure 3.0), restoration of the RMP will connect the forested sections of these two parks, which feature some of the oldest tree species in the region.

- **Proximity:** This site is approximately halfway between the northern and southern termini of the Study Area. It features very direct access to one of the most spatially expansive sections of the restoration plan, at the confluence of the two parks. As one of the most likely candidates for the first phases of restoration, this site would also be free of deconstruction staging facilities sooner than most other sections of the parkway.
- **Access:** Vehicular access to this site would still be served by the existing Route 104/ Lewiston Road. The proposed realignment of vehicular access to Whirlpool State Park is directly to the south of this site at Findlay Drive. Pedestrian access is ideal, as the park boundary is surrounded by residential neighborhoods and walkable streets with sidewalks.
- **Health and safety:** This site does not present any immediately known health and safety concerns beyond the possible concern of generated traffic. As with any high-profile node within the restored gorge rim, it is expected (and indeed, hoped) that the restoration will bring with it an increased level of visitation. Still, it is assumed that any traffic generated specifically by the greenhouse facilities would be minimal and limited to standard business hours of operation.
- **Exposure:** Like the NYPA-owned lands to the north, this property is large enough to accommodate various solar orientations. The advantage of this site is the proximity to one of the largest “receiving” areas; any outdoor exposure experienced by the incubated species will feature the same microclimatic conditions as those found in the forests at Whirlpool and DeVeaux Woods State Parks.
- **Growth medium:** Also like the NYPA site, this site is likely suitable for any growth medium, pending standard soil tests. The cleared areas of the park offer many options for the placement of a nursery facility.
- **Constructability:** The DeVeaux Woods site offers the most ideal scenario of the three for general constructability. Like the NYPA property, there remains a barrier of public land ownership to overcome; however, unlike the NYPA property, one of the central mandates of state-owned parkland is to encourage public use. There is ample room for staging, some of which may have been used for roadway deconstruction, and roadways to the interior cleared sections are already in place. Perhaps the biggest advantage would appear to be the underutilized structures. While the greenhouse portion of the proposal will require new construction at all three sites, this site offers
ample existing infrastructure to house administrative offices, maintenance staff/equipment and the educational outreach facility. Indeed, some of the structures have served as school buildings in the past. With upgrades and retrofitting, an opportunity exists to take advantage of these structures for adaptive re-use.

**Robert Moses Niagara Power Plant:**

A third option would be to construct a greenhouse atop the Robert Moses Niagara Power Plant, in the path of the RMP right-of-way. The structure, including both the north and south approaches, is approximately a half mile in length. The top of the power plant stands almost 400 feet above the Niagara River below.

- **Proximity:** Like the adjacent NYPA property along the forebay, the power plant is not in the most central location along the corridor relative to the major restoration nodes. While some have suggested that a greenhouse atop the facility could capitalize on waste heat emissions, this potential is mitigated by the efficiency nature of hydroelectric power generation. As a non-thermal generation source, the hydropower facility does not generate a substantial amount of waste heat. Even if the facility's waste heat were able to keep the greenhouse supplied with warm air through the winter, the added construction costs associated with this site (addressed below) would likely offset any potential savings.

- **Access:** Of the three locations considered here, the power plant is the least convenient for vehicular and pedestrian access. Pedestrian access requirements could be met via the elevated walkway over Route 104/ Lewiston Road. However, as the productive capacity of the greenhouse increases, so will the need for access by service vehicles (for deliveries, construction, and maintenance), which will need to drive into the site, park, and turn around. While this may not generate much local traffic (as discussed above), it does translate into certain spatial demands that will be exceedingly difficult to meet given the narrow nature and dramatic topography of the site. While the parking lot along the south shore of the forebay may suffice for staff and visitors, it will not meet the needs of service vehicles.

- **Health and safety:** While the view is impressive, the power plant site comes with the most substantial safety and security concerns, to the extent that its consideration will likely be rendered moot by the regulating authorities. The Federal Energy Regulation Commission (FERC), which regulates the plant's security operations, considers increased public access to power facilities to pose higher security risks. FERC has increased the security requirements for relicensing critical infrastructure (including hydroelectric power plants) in recent years, citing elevated homeland security concerns. As the NYPA facility is the largest producer of electricity in New York State, it is extremely unlikely that NYPA and/or FERC would be willing to invest the resources necessary to fully mitigate the risks associated with increased levels of public foot traffic atop the power plant.

- **Exposure:** While the top of the power plant is certainly free from the obstruction of shade from trees, it would only accommodate a north-south greenhouse orientation. As discussed above, this exposure is not ideal, given the latitude of the facility.

- **Growth medium:** A greenhouse atop the power plant would only accommodate tabletop structures for plant propagation (or raised beds over concrete, functionally similar to the tabletop medium). With no soils below, drainage demands would require the use of a structural system. In addition, the power plant site offers no options for an on-site nursery.

- **Constructability:** The power plant is the least convenient site for greenhouse constructability. Assuming that the regulating authorities and ownership would allow for such plans to move forward, the approval process would likely be more cost-prohibitive for this site than any other
non-contaminated site in the region. The mobility of construction vehicles would be restricted by the narrow site dimensions as grade changes would preclude the ability of large vehicles to easily turn around on-site. Assuming that the concrete structure would serve as the greenhouse foundation, any boring or saw cuts into the concrete for the placement of columns or other structural members would be severely restricted.

B. Removal of Blast and Excavation Debris

Devil’s Hole State Park was bisected when the access road was constructed for the Niagara Power Project, and the northern portion of the park has been inaccessible by foot ever since. The goal behind this concept is to restore pedestrian access to all parts of Devil’s Hole State Park. This concept entails using the blast debris that was generated when the access road was constructed to build a new pedestrian connection over the road, thus allowing access to the northern portion of Devil’s Hole State Park. However, rather than disturb existing conditions and incur the costs associated with harvesting blast debris and constructing a new pedestrian connection, it is recommended that the existing vehicular bridge over the access road be repurposed as a multi-use trail for pedestrians and bikers. This alternative option is less disruptive of the existing parklands, and less costly. With appropriate landscape treatment, the repurposed structure could be both attractive and highly unique. Greening or naturalizing the new pedestrian section of the RMP can occur immediately.

C. Hyde Park Landfill Outflow

Due to the long term and active remediation measures at the Hyde Park Landfill (which includes 11 wells, three groundwater flow zones, and an extensive monitoring system), unplugging the drainage conduits to restore flora-sustaining hydrological conditions within the gorge is highly unlikely in the near term. While the daylighting of streams and recreation of historic hydrologic patterns is an important long-term goal, the contamination at the Hyde Park facility are such that the unplugging of drainage conduits is not a development that could take place without extensive changes to the existing remediation measures.

D. Wroble Towers Elevator

The intent behind this concept is to provide a platform from which one could obtain a unique, elevated view of the Niagara River and gorge. Adjacent to the Robert Moses Parkway is Wroble Towers, a 13-story public housing complex. The roof of one of these structures could provide a spectacular viewing deck. An elevator lift on the exterior of the building could also provide an interesting viewing opportunity while transporting viewers to the roof. Unfortunately, this concept presents many complexities. Immediate constraints include probable construction and maintenance costs, safety issues and liability. In addition, this concept would require public access to a residential housing facility; even if limited to areas outside of the structure, this may be an unwelcome development for those living in the building. To alleviate these constraints, while still meeting the intent of this concept, the Restoration Concept described in Part III of this study proposes an elevated trail along the existing RMP bridge nearby (see Figure 3.0). This alternative would retain the elevated portion of the Robert Moses Parkway, discontinue its use as a roadway, and repurpose it as a multi-use pedestrian trail. Repurposing the elevated portion of the RMP would eliminate the costs associated with bridge demolition, as well as those associated with planning, designing and
constructing an elevator and viewing deck at Wroble Towers. It would still provide visitors with an elevated vantage point from which to view one of the world’s most unique natural settings. Although the elevated portion of the RMP is not as high as the roof of the Wroble Towers, the freedom to leisurely experience the grand vista, at no additional expense, while walking/biking along the elevated trail would add immense value to the overall experience. Thus, this concept of an elevated Niagara Rim Trail (see Figure 3.5) was proposed in the Restoration Concept.
Given the favorable comparison of removal versus reconstruction and maintenance costs, coupled with excess capacity in the local transportation network, it is rational to consider alternative uses for the land along the Niagara gorge rim. Today the RMP essentially separates neighborhoods from the spectacular natural resource that is the Niagara gorge, and runs through three state parks, all of which predate the RMP. It hinders, rather than accommodates, the ability of tourists to appreciate the Niagara gorge, and has a variety of adverse impacts on the gorge, a natural feature of international significance. In light of the gorge rim’s unique natural setting, the RMP’s limited utility as a transportation corridor, and the opportunities for enhanced tourism and public appreciation of the Niagara gorge, the RMP should be fully removed to make way for a restored native ecosystem, a non-motorized recreational trail, and enhanced neighborhood connections.
Regional Economic Growth Through Ecological Restoration of the Niagara Gorge Rim

**Figure 2.1** Proposed Circulation Map

Sheet 1 of 3

Legend:
- **Park Setting**
- **Urban Setting**
- **Robert Moses State Parkway Alternative**
- **Pedestrian Corridors**
- **Connective Corridors**
- **Proposed Hiking Trail**
- **Existing Hiking Trail**
- **Proposed Neighborhood Pedestrian Link**
- **Destination Points**

**Legend:** Proposed Improvements

- **Park Setting**
- **Urban Setting**
- **Robert Moses State Parkway Alternative**
- **Pedestrian Corridors**
- **Connective Corridors**
- **Proposed Hiking Trail**
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**Figure 2.1**

- **Proposed Circulation Map**
- **Legend:**
  - **Park Setting**
  - **Urban Setting**
  - **Robert Moses State Parkway Alternative**
  - **Pedestrian Corridors**
  - **Connective Corridors**
  - **Proposed Hiking Trail**
  - **Existing Hiking Trail**
  - **Proposed Neighborhood Pedestrian Link**
  - **Destination Points**
Figure 2.3 Proposed Circulation Map

Legend:
- Proposed Improvements
  - Park Setting
  - Urban Setting
  - Robert Moses State Parkway Alternative
  - Pedestrian Corridors
  - Connective Corridors
  - Proposed Hiking Trail
  - Existing Hiking Trail
  - Proposed Neighborhood Pedestrian Link
  - Destination Points

Regional Economic Growth Through Ecological Restoration of the Niagara Gorge Rim