Case Studies of Urban Freeways for *The I-81 Challenge*





Syracuse Metropolitan Transportation Council

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Cover photos (clockwise from top left): Octavia Boulevard, San Francisco, CA; Whitehurst Freeway, Washington, DC; Westside Highway, New York, NY; Route 183, Austin, TX; Cleveland Memorial Shoreway, Cleveland, OH; Marquette Interchange, Milwaukee, WI.

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CASE STUDIES FOR *THE I-81 CHALLENGE*

OVERVIEW

About *The I-81 Challenge*

As many people in Onondaga County are learning, portions of I-81 are nearing the end of their lifespan. This is particularly true of the elevated sections of the highway in downtown Syracuse. Over the next decade, these portions of the road will need to be replaced, reconstructed, removed, or otherwise changed. Given this reality, the Syracuse region, including the road's owner, the New York State Department of Transportation (NYSDOT), is faced with a challenge: what should be done with I-81.

This discussion has already started. In fact, government officials, local organizations, and members of the public have already offered numerous ideas about the future of I-81: remove the elevated portion (the viaduct) and replace it with a boulevard, route traffic onto I-481 and decommission I-81 between the I-481 interchanges, bury the elevated portion underground and cover it with a park, or rebuild the viaduct at a higher elevation with a more attractive design. Ultimately, the region is still several years from a final decision on the future of I-81 – a choice this large must involve the whole community in a thoughtful, deliberative dialogue. But these ideas provide a starting point for the official I-81 decision-making process, which is beginning right now.

In the Fall of 2009, the New York State Department of Transportation (NYSDOT) and the Syracuse Metropolitan Transportation Council (SMTC) launched *The I-81 Challenge*, the official process to determine the future of I-81 in the greater Syracuse region. Together, these two entities are trying to engage the community in developing and evaluating options for the future of the highway. *The I-81 Challenge* will consider the needs of and impacts to the entire I-81 corridor within the SMTC's planning area, from the southern boundary of Onondaga County to just over 6 miles into southern Oswego County[i]. This report – as just one element of *The I-81 Challenge* – focuses on potential outcomes for the viaduct section in downtown Syracuse. This report is intended to provide information about the range of outcomes, processes, and alternatives considered by other regions facing similar challenges.

Challenges Faced by Other Regions

Freeways have been constructed through the downtowns of many cities across the United States. Many of these highways were constructed in the 1960s or 1970s, and were intended to ensure economic viability in an era when suburban growth, along with car ownership and use, was accelerating. It was feared that without the direct connections that highways provided, the cities would die. At the time, there were differing opinions about these decisions to locate highways through the centers of cities; in hindsight, there are decidedly mixed conclusions as to whether the highways have done more harm or good. Some argue that urban highways resulted in collateral damage in the form of environmental, social, aesthetic, and economic impacts on the city, contributing to the decline of these urban areas in recent decades. Others emphasize the positive role that these highways play in providing access to downtowns and moving people and goods regionally.

Many of these highways are now over fifty years old and are in need of major investment. In some cities, this has been viewed as an opportunity to address any negative impacts associated with the first generation of urban highway construction, and, depending on the highway's role in the regional transportation

[i] The SMTC's official Metropolitan Planning Area includes all of Onondaga County plus small portions of Oswego and Madison Counties.

network, to broadly reconsider the future infrastructure and mobility needs of the city and the region. However, addressing the challenge of an aging urban highway can be a very difficult and sometimes contentious issue. There are many potential options and impacts to consider.

Today's regulatory environment adds to the complexity of such a decision. Unlike the era when much of our interstate highway system was built, consultation with a far broader range of interests and individuals and consideration of a broader range of alternatives are now mandated by law. While this may make it more difficult to develop and implement changes to our urban highways, the required processes also ensure that large decisions such as these are made in a more inclusive and comprehensive manner than they were in the past.

The Syracuse region is not alone in facing this situation. This report tells the stories of some of the other cities and regions that have faced challenges comparable to that of Syracuse and the I-81 corridor. All of the cases included in this report involve the major reconstruction or reconfiguration of an urban limited access highway. Some are completed projects, and others are in various stages of planning and public discussion. Although there may only be a few cases that are directly comparable to the I-81 corridor, all of these projects can offer insight into some aspect of *The I-81 Challenge.*

Outcomes of Urban Freeway Projects

The case studies presented here offer a wide array of options for consideration as we begin to explore possibilities for the future of I-81 in Syracuse. Common outcomes that have been considered include:

- **Reconstruct an elevated highway**: The East-West Expressway, an elevated toll highway through downtown Orlando, was recently reconstructed using design techniques that reduced the potential negative impacts of the highway. These included raising the elevation of the highway to reduce noise and shadowing, treating the piers and abutments with public art installations, and designing the space under the highway for active, creative uses. For embanked sections (i.e. constructed on fill rather than on a structure or viaduct), terracing and landscaping were used to soften and enhance the highway's appearance.

- **Bury the highway**: Boston's Big Dig provides a recent example of tunneling a major interstate highway under the center of a historic city. While the Big Dig has resulted in the creation of open space and improved traffic flow, the costs and complexity of the project have also been enormous. For Seattle's Alaskan Way Viaduct and Brooklyn's Gowanus Expressway, favored alternatives include deep bored tunnels to serve through traffic, combined with improved surface streets and transit service. Deep bored tunnels have less impact during construction than the "cut and cover" type employed in Boston, but typically only serve through traffic and do not provide intermediate access points.

- **Depress the highway:** Fort Washington Way/I-71 in Cincinnati was reconfigured as a narrow, depressed highway, which allowed numerous wide at-grade street crossings that improved the connectivity of the city's street system and opened the Ohio Riverfront to development. Several cities have "capped" their depressed highways with parks (as in Seattle's "Freeway Park"), or with development (as in the Union Station district in Columbus, OH).

- **Relocate the highway**: Rhode Island's I-Way project involved relocating the elevated I-195 highway from downtown Providence to a nearby industrial corridor. This opened up valuable redevelopment areas and is allowing the city to reconnect parts of the downtown street grid. It is often difficult to find a new alignment for a highway in a dense urban area due to the potential for localized impacts and opposition.

- **Remove the highway and replace with a boulevard**: Three cases where freeways were replaced with a boulevard, including the Embarcadero and Central Freeway in San Francisco and the West Side Highway in New York City, occurred after the highways were closed due to unexpected infrastructure failures. There were no plans in place to reconstruct the freeways, so the cities had to adapt to life without the highways. As time

went on, public support for replacing the freeways declined, and eventually each was replaced by a surface street. The aging Park East Freeway in Milwaukee was converted to a boulevard rather than reconstructed, allowing for redevelopment of the city's riverfront.

Lessons from the Case Studies

These case studies can offer many lessons for *The I-81 Challenge*. No single case study offers the answer for I-81 and the Syracuse region. Many of the examples cited in this document are not Interstate facilities, which may limit their applicability to I-81, since the Interstate designation carries with it certain design standards and functional characteristics that do not need to be considered for non-Interstate facilities. The cases here are meant to present a set of ideas for the community to think about as a starting point in the dialogue about the future of I-81.

Urban Traffic Circulation and Mobility

Each of the cases describes a unique situation in terms of a highway's importance in providing access to a downtown and serving long distance through travel. There are diverse situations among these case studies in terms of traffic volumes, growth rates, and transportation alternatives (i.e. robust mass transit, street network capacity, or bypass routes). While none are identical, most of these offer some parallels to *The I-81 Challenge*.

Some of the cases illustrate the concept of "induced demand," in which traffic responds relatively quickly to available highway capacity. This is most often demonstrated in cases where a highway is constructed or expanded, and cars seem to arrive out of nowhere to use the new road, quickly exceeding traffic volume forecasts. The converse is also true, and the cases of freeway closures have shown that traffic can be highly adaptable, making use of alternate routes when necessary.[1] Under the right circumstances – a dense urban street grid, other parallel highways, or a well-developed transit network - the impacts of a freeway closure can be greatly minimized as people find other ways to get to their destinations.

The most successful projects integrate highway, street, and transit improvements to focus broadly on urban mobility. Boston's Big Dig was accompanied by a parallel effort to significantly upgrade and expand the transit system, both to mitigate the short-term impacts of construction and to provide a long-term supplement to the highway system. Seattle's Alaskan Way Viaduct process included developing an Urban Mobility Plan for the downtown area first, so that all alternatives could work toward the goals established in the plan. In order to successfully plan the future of I-81, consideration should be given to the city and the region's overall urban mobility goals.

Urban Design and Economic Development

The era of interstate highway construction resulted in many new highways in downtown urban areas that were intended to aid the local economy by making them more accessible. Years later, it is clear that these highways had both positive and negative effects. Freeways can play an important role in bringing workers and visitors to and from the downtown. Freeways also provide regional mobility, carry freight traffic, and bring economic benefits to a region. However, freeways are sometimes perceived by the community as responsible for urban blight and decline.[2] Economic and aesthetic considerations have been dominant factors in many projects involving reconstruction or reconfiguration of urban freeways, such as the Big Dig in Boston, the Embarcadero in San Francisco, and the Park East Freeway in Milwaukee (note that the latter two examples are not Interstate facilities). Substantial improvements to the urban environment have resulted, stimulating economic development or creating new public spaces.

Some projects, such as the I-71 improvements in Cincinnati, did not remove or bury the highway, but reduced its scale to make room for economic activity and urban redevelopment and lessen its barrier effect. Others, such as the East West Expressway in Orlando and the Marquette Interchange in Milwaukee, have included aesthetic enhancements, such as decorative concrete imprinting on the overpasses and murals depicting local historic events. These projects have just been completed, and while they have improved highway operations and increased capacity, it is too early to know if their design enhancements will be viewed as an improvement to conditions adjacent to these highways.

The Route 183 Freeway in Austin used piers for the elevated structure that have a much narrower base, and therefore allow more light penetration underneath the highway. Increasing the elevation of freeway viaducts can reduce the effects of noise and shadowing on the ground level. However, these facilities have fewer access points due to their higher elevation.

The "capping" of a depressed freeway offers additional possibilities to create a positive urban environment. While the Big Dig in Boston is the primary example included in this report, there are other smaller scale examples that may be relevant for I-81, including Seattle's "Freeway Park" on a depressed section of I-5, and Columbus, Ohio's Union Station shopping district, which is constructed over a depressed section of I-670 near downtown.

Planning and Decision-Making Process

The case studies represent a wide range of planning, decision-making, and political processes. Some of the freeway projects were the result of catastrophic structural failures, which forced an abbreviated planning and decision-making process on the community. Others have been the subject of protracted discussion, controversy, and changes in attitudes, which have made achieving consensus difficult. In several instances, city-wide votes were held to advise decision-makers of voters' preferences among competing alternatives.

Several projects stand out for their success in terms of public and stakeholder engagement, consensus-building, and, ultimately, efficient implementation. The processes for the I-Way in Providence and the Fort Washington Way/I-71 in Cincinnati were characterized by early consultation with a wide range of stakeholders and a balanced consideration of urban design, economic, and transportation concerns. These projects placed a priority on addressing the perceived negative impacts of the highways and included major urban redevelopment components. This approach served to generate enthusiasm and support from the broader community, providing momentum to carry the projects smoothly through funding and implementation.

Conversely, there are numerous examples of less harmonious and efficient planning processes. The earthquake-damaged Central Freeway in San Francisco was the subject of a great deal of controversy and dispute between the city and the California Department of Transportation (CalTrans). Voters weighed in three different times in community-driven ballot initiatives, with two votes in support of replacing the freeway with a boulevard, and one vote supporting freeway reconstruction.

The Gowanus Expressway example illustrates how a process can be derailed when the community is not engaged up-front in the process. The Gowanus project began in the 1980s as an engineering-driven reconstruction project, which did not adequately engage the community in its early stages. This resulted in a proposed alternative that focused solely on moving traffic and did not address any of the highway's negative community impacts. A coalition of local community organizations filed a lawsuit to stop the reconstruction of the viaduct. The project was subsequently re-started with the active involvement of a community stakeholder group.

Seattle's Alaskan Way Viaduct also experienced setbacks when reconstruction and tunnel alternatives, preferred respectively by the state and city, were both rejected in a city-wide vote. These alternatives both required the highway to be closed for five years, were perceived by many as too narrowly focused on moving cars, and were never compared to an alternative replacing the highway with a boulevard and streetcar line. After the vote, the project was re-started as a collaborative planning process including a broader range of participants and alternatives.

One interesting model of incorporating community concerns into the decision-making process was used in the Bruckner/Sheridan project, in the South Bronx area of New York City. In earlier stages of this project, community members were not happy with the highly technical decision-making criteria that did not, in their view, adequately reflect local goals and concerns. However, it is sometimes impossible to develop numerical measures of important community criteria. A renewed effort was made to address this by convening a panel of local and state experts to rank alternatives based on qualitative criteria. For example, the panel was asked to rank

the alternatives in terms of how well community aesthetics were addressed. These rankings were then averaged into scores, allowing these aspects that are important yet difficult to measure to be on equal footing with more traditional criteria in the decision-making process.

These examples illustrate the importance of including a diverse range of stakeholders in the planning process and the benefit of identifying a broad range of alternatives from the start. An inclusive and comprehensive approach to the planning and decision-making process is likely to result in a more efficient process and a better outcome.

Success Stories

The projects that have proceeded most efficiently and effectively to implementation are those that recognized the importance of balancing the impacts of the highway on the urban environment, the economy, and the transportation network. Broad-reaching public engagement is also an essential component of a successful process. In the cases presented here, this type of approach tended to garner support from a large cross-section of the community and gave these efforts the momentum needed to proceed through a complex process of planning, design, and permitting.

Even in the best cases, these types of major projects take years to study, discuss, debate, and design. Many processes that ultimately resulted in successful projects did not necessarily move in a straight line from concept to implementation. The Syracuse region will need patience, persistence, and willingness to listen to all concerns in order to meet *The I-81 Challenge*.

Case Studies for *The I-81 Challenge*

This report does not present every possible case study, but is intended to cover a wide range of outcomes and design options. Each project involves a major highway in an urban area in the United States. The next page provides summary tables of the case studies for built projects and for projects that are still in the planning and design stage. The tables are followed, on subsequent pages, by descriptions of each case study.

The case study descriptions vary in length and detail, based on both the potential relevance of the project and the availability of reliable information. In each built project case, after a brief description, the following questions are addressed:

- What was the decision-making process?
- What were the outcomes?
- Are there parallels to *The I-81 Challenge*?
- What can we learn from this project, in terms of urban traffic circulation, economic development, and the political/public process?

For projects that are still in the planning and design stage, the project descriptions are followed by short discussions about what *The I-81 Challenge* can learn from the efforts underway in each case.

Following the case studies is a brief sampling of international examples. While it is not possible to compare these cases from abroad directly to our domestic examples, they do offer some compelling planning and design concepts and a different view of the role of freeways in cities.

Table 1: Urban Freeway Case Studies – Completed Projects

Highway	Type of Project	Inter-state?	Through traffic?	Vehicles /day	Length	Context	City	Year of completion	Cost (millions, in construction year $)*	Cost per mi. (million $ per mile)	City Population (at time of project)
Reconstruct the highway/new construction											
US 183 Viaduct	New elevated highway	no	yes	86,000	3.6 mi.	suburban	Austin, TX	1997	$ 281	$78	681,804
Marquette Interchange	Reconstructed an elevated highway interchange	yes	yes	300,000	n/a	downtown	Milwaukee, WI	2008	$ 810	n/a	602,191
East West Expressway	Reconstructed and widened an elevated highway	no	yes	140,000	16.0 mi	downtown	Orlando, FL	2008	$ 640	$40	213,223
Bury the highway											
I-93/Central Artery	Replaced an elevated highway with a tunnel	yes	yes	200,000	1.8 mi.	downtown	Boston, MA	2007	$ 15,000	$8333**	559,034
Depress the highway											
Fort Washington Way/I-71	Reconfigured a depressed highway	yes	yes	113,000	1.3 mi.	waterfront	Cincinnati, OH	2000	$ 146	$112	287,540
Relocate the highway											
I-195/The "I-Way"	Relocated an elevated highway and major interchange	yes	yes	152,800	0.5 mi.	waterfront	Providence, RI	2010	$ 610	$1,220	176,862
Remove the highway											
Park East Freeway	Removed an elevated highway and replaced with a boulevard	no	spur	40,000	1.0 mi.	waterfront	Milwaukee, WI	2003	$ 25	$25	596,974
Westside Highway	Removed an elevated highway and replaced with a boulevard	no	yes	140,000	4.7 mi.	waterfront	New York, NY	2001	$ 380	$81	7,894,862
US 99W/Harbor Drive	Removed an at-grade highway and replaced with a riverfront park.	no	yes	25,000	3.0 mi.	waterfront	Portland, OR	1974	n/a***	n/a	437,319
Embarcadero	Removed an elevated highway and replaced with a boulevard .	no	spur	61,000	1.6 mi.	waterfront	San Francisco, CA	2001	$ 171	$107	723,959
Central Freeway	Removed an elevated highway and replaced with a boulevard	no	spur	93,000	0.6 mi.	downtown	San Francisco, CA	2005	$ 50	$83	739,426

* For comparison, the programmed funds in the SMTC's 2007-2012 Transportation Improvement Program (the multi-year listing of federally-funded infrastructure projects in the Syracuse Metropolitan Area) total $306,117,056.

** This cost per mile calculation includes a tunnel under Boston Harbor in the total project cost, in addition to burying I-93.

*** Not available due to age of project.

Table 2: Urban Freeway Case Studies – Planning and Design Projects (Not Completed)

Highway	Type of Facility (existing)	Interstate?	Through traffic?	Vehicles /day	Length	Context	City	Stage	Estimated cost (millions)	City Population
Existing at-grade highways										
I-895/Sheridan Expressway	at grade highway	yes	yes	41,000	1.2 mi.	high density urban	Bronx, NYC, NY	EIS	$413	1,373,659
Cleveland Memorial Shoreway/Route 6 (West)	at grade highway	no	spur	45,000	8.0 mi.	waterfront	Cleveland, OH	planning	$77	596,974
Existing elevated highways										
Gowanus Expressway	elevated highway	yes	yes	198,000	3.8 mi.	high density urban	Brooklyn, NYC, NY	EIS	$2,400 – 12,800	2,528,050
Highway 99/Alaskan Way	elevated highway	no	yes	103,000	2.8 mi.	waterfront	Seattle, WA	EIS	$1,913	582,454
I-84/Hub of Hartford	elevated highway	yes	yes	172,000	1.0 mi.	downtown	Hartford, CT	planning	unknown	124,512
I-10/Claiborne Expressway	elevated highway	yes	yes	69,000	2.0 mi.	downtown	New Orleans, LA	planning	unknown	288,000
Whitehurst Expressway	elevated highway	no	yes	42,000	0.6 mi.	waterfront	Washington DC	planning	unknown	591,833
I-83/Jones Falls Expressway	elevated highway	yes	spur	55,000	1.0 mi.	downtown	Baltimore, MD	concept	$1,000	631,366
I-81 Viaduct	elevated highway	yes	yes	100,000	1.4 mi.	downtown	Syracuse, NY	planning	unknown	140,658

End Notes

[1] Traffic Impact of Highway Capacity Reduction, S Cairns, C Hass-Klau and PB Goodwin, ITE Journal, July 1998.

[2] The Genie in the Bottle: The Interstate System and Urban Problems, 1939-1957. Richard F. Weingroff, Public Roads Magazine, Turner Fairbanks Research Center, Federal Highway Administration. September/October 2000.

[3] Property Values and Highway Expansions: An Investigation of Timing, Size, Location and Use Effect. Siethoff and Kockleman, Presented at the 81st Annual Meeting of the Transportation Research Board, 2002.

[4] Big Dig pushes bottlenecks outward, Boston Globe, November 16, 2008.

[5] The Boston Indicators Project, www.bostonindicators.org.; The Boston Foundation Report on Transportation Indicators, http://www.tbf.org/uploadedFiles/10-Transportation.pdf

[6] *Freeway Deconstruction and Urban Regeneration in the United States*, Robert Cervero, University of California Transportation Center, 2006.

[7] *Gowanus Expressway Case Study*, prepared for the Gowanus Community Stakeholder Group, prepared by the Institute for Civil Infrastructure Systems at the Wagner Graduate School of Public Service, New York University, www.icinyu, 2006.

[8] Hartford I-84 Viaduct Study, Capital Region Council of Governments (CT), www.crcog.org.

[9] Unified New Orleans Plan (UNOP), Recovery Project Planning, District 4, Removal of I-10.