Citizen Committee Report on Capping the Eisenhower Expressway in Oak Park

I-290 in Oak Park, IL

City Square Park /
I-93 in Charlestown, MA

Margaret T. Hance Park /
I-10 Papago Freeway, Phoenix, AZ

February 2003

Cap the IKE Working Group for the
Eisenhower Expressway Citizens Advisory Committee

February 4, 2003

Lawrence B. Christmas, Chair
Eisenhower Citizen Advisory Committee
Village of Oak Park
123 Madison Street
Oak Park, Illinois 60302

RE: Citizen Committee Report on Capping the Eisenhower Expressway in Oak Park

It is our pleasure to submit this report on highway capping projects in response to the charge received by you dated September 30, 2002. The intent of the report was to describe the implications for a potential cap of the Eisenhower Expressway through Oak Park gleaned from other communities' experiences. The report is the result of the volunteer effort of several Oak Park citizens, with relevant professional experience, referred to as the Cap The Ike Working Group.

From the almost forty (40) capping projects, either completed, in-progress or proposed throughout the United States, the Cap The Ike Working group researched documentation, reports, websites and even communicated with personnel involved with similar projects to develop the content of the report. The report briefly outlines the existing impacts of the expressway to our community as well as provides summary information on the lessons learned about the processes, funding, technical requirements, physical and political challenges, project results and opportunities necessary or desirable in undertaking a capping project of this nature.

While acknowledging that such a capping project requires an enormous amount of dedication, creative problem solving and collaboration to see its fruition, the information in this report is evidence that not only can it be done, it has been done.

Utilizing the Illinois Tomorrow grant funding, our recommendation is to proceed in the development and solicitation of a Request For Proposal for the creation of a full-blown planning study for capping the expressway through Oak Park. Upon the selection of the appropriate consultant/s, the process in which such the study is to be created must involve the input of the citizens, community groups, and related public agencies.

The Village of Oak Park is renowned for its forward-thinking and has proven in the past that no challenge is too great if the end result means the betterment of its citizens and the whole of the community. Given the planned reconstruction and possible expansion of the Eisenhower expressway, there will be no better time for the Village and its citizens to dedicate themselves to the commitment of pursuing to the fullest the opportunity of capping the expressway in Oak Park.

We appreciate the opportunity to participate in this endeavor and look forward to continuing our assistance in this project upon your request.

Most sincerely,

Fred Brandstrader, AIA
Cap The Ike Working Group - Chair

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Part I: Introduction and Purpose of Study

" Capping the expressway would be great but won't it cost too much?"

"Isn't it too difficult to design and build a cap over the expressway?"

Above are two very common reactions to the notion of capping the Eisenhower expressway. The Cap the Ike Working Group (CIWG) was formed in late 2002 to help answer these and other questions. The purpose of the group is to assist the Oak Park Eisenhower Expressway Citizens Advisory Committee, the Village of Oak Park and fellow citizens in studying the potential application of the cap concept in Oak Park. The volunteer work group is composed of several Oak Park citizens with related professional backgrounds in architecture, landscaping, engineering and law, three of whom also serve on the full Advisory Committee. Within a finite period of time, the group's mission was to gather and review information on other cap-related projects across the country (see Appendix "A" - Comparable Cap Projects), and to report on how the elements, characteristics and lessons-learned from those projects could be applied to Oak Park. The group met on a monthly basis to discuss capping information they gathered during their investigation. This report is the culmination of the group's research.

It should be noted that for this report, "capping" is meant to describe the process of covering a part of or the whole highway by a structure to provide a continuous space over depressed highway lanes. The structure connects both sides of the highway at grade level with the highway operating underneath. The

structural element of a cap is typically a concrete slab that is overlain with earth to create a vegetative cover or park space, or other uses such as buildings, bike or pedestrian lanes or parking. Highway caps are also known as “decks” or “lids” or “covers”. A discussion about the cap is pertinent now because of the planned reconstruction of the Eisenhower by the Illinois Department of Transportation (IDOT), as the Eisenhower is reaching its approximately fifty-year life span. It should be clearly understood that the idea of the cap in Oak Park does not require the endorsement of the IDOT’s concept to expand the expressway. However, to be most feasible, any cap proposal must be included in the current planning and design phase for reconstruction of the Eisenhower Expressway.

As is evident by the number of cap projects completed in other cities, a new approach to highway transportation projects has emerged in recent years. This new approach is reflected in the comments of Bill Hayden, Engineer, Community Relations, Arizona Department of Transportation as he describes the cap project in Phoenix:

> *The city as a whole now looks at this project, particularly the Deck Park area, as a showcase for Phoenix. It is not just a highway project; it is an essential element of the fabric of the City of Phoenix, aside from just a transportation facility. ….the design features and the environmental mitigation factors have become the template for our decision-making and design for the other valley freeways. What we found, however, is the highway business is evolving. Attitudes have changed. Our position of how can we provide the most efficient, effective and certainly cost-efficient facility is now tempered with the reality that in today’s society, if you don’t recognize that the public is interested and wants to be involved in what you’re doing and you don’t provide them that opportunity, you will probably find yourself in financial problems, legal problems and generally there can be a very strong resistance by the public against facilities. If the transportation departments continue to pursue that rationale, they’ll find themselves having a great deal of difficulty, and in many cases, the*

*inability to complete projects. [*For the entire interview, visit http://www.thenewi64.org].

Other communities are adopting this new approach to expressway projects as well. Tony Hartzel of the The Dallas Morning News wrote two articles detailing the new approach being utilized in Dallas: *Project Pegasus May Return Buried Brook to Ground Level*" and "*Downtown Dallas Highways May Go Underground*", (dated April 28, 2002). In the former article, he writes:

> *The Texas Department of Transportation has started working on the future look of Interstate 30. …One option would be to make the highway a tunnel. Parks would be built atop the freeway. A companion idea is to bring Mill Creek back to the surface as an additional amenity south of downtown.* …"There already is a lot of interest in making the area more vibrant," *Dallas City Council member Sandy Greyson said.* "We may have an opportunity that we would lose if we don't consider it."

In the latter article, Mr. Hartzel continues:

> *But highway planners also have a third option – creating a tunnel along I-30 and leaving room for parks and walkways on top as a way to bridge downtown and the Cedars neighborhood to the south…Crape myrtles, Bermuda grass and a restored Mill Creek on top of and beside a tunnel could blur downtown's boundaries. The central business district would be connected to long-neglected areas on downtown's fringes…Building freeway tunnels to create more open space at ground level has never been done in Dallas. But the practice is gaining popularity nationwide as the first generation of interstate highways nears replacement age and their divisive effects are being reconsidered….* "You've got to get rid of the moat effect of the freeways," *said David Biegler, chairman of the Central Dallas Association, whose group has been briefed on Project Pegasus. "We are going to ask the question, 'What will be done for future freeways to get rid of that effect?'*

Similarly, the Missouri Department of Transportation has outlined these objectives and new approaches on their website for the I-64/US-40 project in St. Louis:

Designing The New I-64: A Clean Slate I-64 could become a new St. Louis landmark.

- *Create a highway that is visually pleasing, that reflects the culture and character of the communities through which it passes;*
- *Work within our existing property lines wherever possible in areas east of I-170;*
- *Have communities define the roadway, rather than the roadway defining the communities*
- *Ultimately, we hope to create a distinct look for The New I-64 that clearly reflects a St. Louis touch in the design.*
- *Highways of this kind are designed to last 50 years. US 40 has exceeded its lifespan. The transportation investments made half a century ago have paid wonderful dividends. It is time, once again, to re-invest in our future.*

With its visionary track record, the Village of Oak Park is renowned for great civic achievements and foresight in planning, some of which include:

- Establishment of the nations first Fair Open Housing Ordinance in 1968, a period when civil rights issues were gripping the entire country
- Designation as an All American City in 1976, an example of Oak Park being a model city standing out in a vast metropolitan region
- A grid based community plan that emphasizes neighborhood level access to transit, stores, parks, churches, and schools, now being heralded by "Neo-classical" planners as the proper way to zone and develop communities
- Raising the freight and passenger rail railroad viaducts to eliminate grade crossing conflicts
- Using underground reservoirs instead of water towers to enable positive land use options such as parks on top of scarce publicly controlled land

- Negotiation of design resolutions of center-lane ramps and sub-grade roadways in the Eisenhower expressway, which, per the 1950's Interstate Highway System standards, was considered innovative expressway design.

Oak Park has proven its ability to embrace initiatives that at first seem unrealistic, even Herculean, and create solutions resulting in the enrichment and enhancement of the entire community.

While the design of the Eisenhower Expressway in the 1950's may have addressed anticipated problems associated with highways at the time, the system of limited access highways was widely seen then as a positive wave of the future. As documented by the Oak Leaves local paper at the time, one Realtor who gave a talk in Oak Park heralded the oncoming age of cars, highways, and the economic growth at interchanges such construction would bring -- even urging people to reorient their homes to look out upon the expressway to watch modern cars travel by. However, after the original slew of highway projects were built in the 1950's and 60's across the country, there became a growing recognition of the negative impacts of highway projects on communities.

A more environmentally conscious nation, as evinced by the passage of the National Environmental Protection Act, challenged major federal project designers to address the needs of communities and consider the impacts on them during planning. An August 23, 2001, article in the New York Times

documents the reassessment the impacts of highways through inner areas stating:

> *The freeways built after WWII did take long-distance through traffic away from crowded city streets…, but in many cases they also devastated cities by dividing downtowns in two, isolating waterfronts and even obliterating entire neighborhoods.*

As these highways reach their expected lifespan, the value and impacts of the highways are being reconsidered. More community sensitive projects are being built in their place. The article cites examples such as:

- Fort Worth, TX tearing down the elevated I-30 freeway
- Milwaukee, WI replacing its Park East Freeway with a handsome boulevard
- Boston, MA reconnecting its downtown to the waterfront creating 36 acres of land in its Big Dig project

Charles Lockwood, the author of the New York Times article, suggests using money made available from most recent federal transportation legislation for more "progressive schemes." He concludes:

> *Other cities should use Boston's growing pains as a lesson for their own plans, not as an excuse for timidity. They have nothing to lose but the freeways that divide them.*

The Cap the Ike Working Group took this charge to heart as it proceeded with its work. Upon convening and reviewing the scope of its duties, the members of the Working Group were curious as to the feasibility of applying a capping concept to the Eisenhower Expressway. As the work group delved into the research process, including an existing IDOT report on capping the

expressway in Oak Park dating back to 1987, they were surprised by the number of capped expressways either completed or being planned across the nation.

The Working Group documented twenty (20) projects completed or under construction and a growing number in the planning stages. The Lighthouse Avenue Tunnel: Customs House Plaza in Monterey, California, completed in 1969, is one of the earliest examples of a capped highway. Moreover, a prime example of how federal legislation has been use to transform highway planning is that of Mercer Island, Washington. Using what was then new federal environmental legislation in the 1970's, Mercer Island filed lawsuits and fought highway expansion until its community needs were met with a massive capping and widened bridge project in that community. Now highway projects in Washington approach transportation planning on a comprehensive basis -- incorporating analysis of highway and transit approaches to address congestion in conjunction with assessments of community enhancement and consideration of highway capping projects as built-in parts of plans for corridors such as the Trans Lake Washington Project.

As working group members talked to representatives of these and other projects, they applied individual perspectives and applied knowledge from their respective work experiences. The committee was encouraged to hear that in the end, although the process was long, varied, costly and difficult, without exception the communities were very pleased with the cap projects and the benefits created thereby.

The early leaders in the field have already addressed and met the design challenges of building over expressways. Oak Park can learn from these efforts and join the growing number of cities seeking to better the quality of life of their citizens. Many in Oak Park have long desired a way to reconnect the community and address the long-standing negative impacts caused by the original highway construction. As the Illinois Department of Transportation now considers reconstruction or expansion of the expressway through Oak Park, it is appropriate that Oak Park, in conjunction with state and federal agencies, further examine the concept of capping the Eisenhower expressway through the community.

PART II: Summary of Other Cap Project Examples

There are currently at least twenty (20) cap projects that have been completed or are in progress in the United States. There are approximately twenty (20) cap projects in the U.S. that have been proposed, which are in various stages of planning, approvals and funding. The following map graphic illustrates some of the locations of other cap projects.

Fig. 1: Partial Distribution of Cap Projects throughout the United States (from the Sacramento, CA. Downtown to the Riverfront Reconnection Research Study prepared by Parson Brinkerhoff Quade & Douglas)

For a more detailed listing of comparable projects and their related information, refer to Appendix A. Following is a summary list of these projects.

Completed / In-Progress Projects include:

- Phoenix, AZ: I-10 Papago Freeway – Margaret T. Hance Park
- Mercer Island, WA: I-90 Completion Project
- Duluth, MN: I-35 Extension: Lake Place & Leif Erickson Park
- Cincinnati, OH: Fort Washington Way and Lytle Park
- Charlestown, MA: City Square Park and Tunnel
- Hartford, CT: I-91/I-84 Interchange: Riverfront Plaza & Founders Bridge
- Oak Park, MI: I-696 Walter P. Reuther Freeway Victoria & Rothstein Parks
- Southfield, MI: I-696 Walther P. Reuther Freeway Park
- Boston, MA: I-93 Central Artery Tunnel, Copley Place
- Atlantic City, NJ: Brigantine Connector
- Reno, NV: I-80 Platform
- Rosslyn, VA: Gateway Park and I-66 Extension
- Philadelphia, PA: Commerce Square
- Washington D.C.: The Portals
- Monterey, CA: Monterey Tunnel Project
- San Diego, CA: MidTown Center over I-15
- Seattle, WA: Freeway Park and Convention Center
- New York City, NY: Park Avenue and Trans-Manhattan Expressway
- Brooklyn, NY: Brooklyn/Queens Expressway Promenade
- Chicago, IL.: Millennium Park over IC rail lines

Proposed Projects include:

- Seattle, WA: Trans-Lake Washington Project / SR520 Corridor
- Sacramento, CA: I-5 Decking Research Study
- Dallas, TX: I-35 / I-30 Pegasus Project / Trinity River
- St. Louis, MO: I-64/US40
- La Canada Flintridge, CA: Liberty Project
- Brooklyn, NY: Gowanus I-278 Expressway Tunnel
- Portland, OR: Bridge the Divide & Cap I-405
- Pasadena, CA: I-710 Extension
- Bakersfield, CA: SR-178 Extension
- Glenwood Springs, CO: Freeway Decking Project
- Vail, CO: Freeway Decking Project
- New Haven, CT: I-95 Haven Harbor Access Feasibility Study
- Washington D.C.: I-395 Third Street Tunnel
- Medina, WA: Freeway Decking Project
- Manhattan, NY: Miller Highway Project
- Gresham, OR: Mount Hood Parkway
- Chicago, IL: south Grant Park cap over the IC rail lines
- Chicago, IL: cap over I-90/94 through Near West Loop / Greek town
- Chicago, IL: cap over I-55 to connect West Loop and U. of Chicago
- New York City, NY: park / residential cap over entrance/exits of Brooklyn-Battery Tunnel

More detail on certain projects follows with information obtained by Cap the IKE

Working Group members.

PROJECT EXAMPLE 1a: I-71 Fort Washington Way, Cincinnati, OH.
Cap/Tunnel Description: (2) Full and (2) mini caps / 1200' tunnel length
Estimated completion: 2005
Estimated cost: $58M ($46M for complete caps and $12M for landscaping
Funding (for cap foundation pilings): 60% City general fund / 20% County / 20% Private

Fig. 2a: Existing I-71 Fort Washington Way with cap area designated

Fig. 2b: Rendering of proposed caps over Fort Washington Way

PROJECT EXAMPLE 1b: I-71 Lytle Park, Cincinnati, OH.

Cap/Tunnel Description: 2.3-acre park cap on cut & cover tunnel (links I-71 to FWW)
Completed: 1970

Funding: 90% private funds
Costs: Not Available

Fig. 3a: Lytle Park (highlighted) over I-71 tunnel

Fig. 3b: I-71 tunnel entrance under Lytle Park

PROJECT EXAMPLE 2: Lighthouse Ave. Tunnel / Customs House Plaza,Monterey, CA.

Cap / Tunnel Description: 1,000 foot cut and cover tunnel
Completed: 1969
Funding: 100% Federal funds - Below sea level tunnels – easement/ property ownerships (combination city/state/ private) issues
Costs: Not Available

Fig. 3a: Lighthouse Ave. Tunnel – has extensive pumping / collection storm water system due to below sea level

Fig. 3b: Customs House Plaza –cap structure supports Monterey maritime Museum, Heritage Harbor Center, 92) story office/retail complex

Fig. 3c: Customs House Plaza

Fig. 3d: Customs House Plaza

PROJECT EXAMPLE 3: I-35 Duluth, MN. Lake Place and Leif Erickson Parks [see Appendix H for more detailed project description) - honored by FHWA]

Cap/Tunnel Description: (4) cut & cover tunnels (over highway & railroads) totaling .75 mile, added 13 city blocks
Completed: 1992 (last phase)
Costs: $220M for decks and green space
Funding: 90% Fed funds primarily from fed & state motor fuel tax (user fees) -$74M from interstate substitution (I-sub) funds, 10% State funds

Fig. 4c: Lake Place Park

Fig. 4d: Lake Place Park

Fig. 4a: Leif Erickson Park

Fig. 4b: Leif Erickson Park

NOTE: These projects added 13 city blocks and were a catalyst for restructuring Duluth-area economy from industrial to tourism basis.

PROJECT EXAMPLE 4: Margaret T. Hance Park / I-10 Papago Freeway in Phoenix, AZ.

Cap/Tunnel Description: .5 mile long cut & cover tunnel w/ 29-acre park on cap, which consists of 19 side-by-side bridges
Completed: 1992 (park grand opening)
Costs: $100M (for capping structures) / $5M (for park)
Funding: 92% FHWA / 8% State for capping structure – 100% City funds for Hance Park

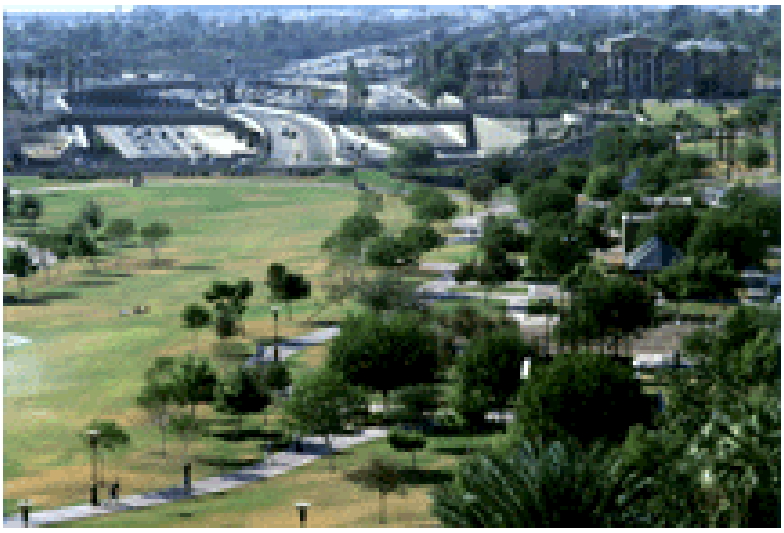


Fig. 5a: Margaret T. Hance Park over the 1-10 Papago Freeway

Fig. 5b: Margaret T. Hance Park site map

PROJECT EXAMPLE 5: Riverfront Plaza and Founders Bridge, Hartford CT.

Cap/Tunnel Description: 1.5-acre park cap spanning expressway/railroad/flood control walls. Also a 1100 ft long Cantilevered bridge extension
Completed: 2000 (final phase)
Costs: $24M Riverfront Plaza and dock / $91M for highway
Funding: 22% CTDOT, 62% FHWA/ ISTEA Grants, 12% USHUD, 4%Private

Fig. 6a: Site map of riverfront development

Fig. 6b: Riverfront Plaza

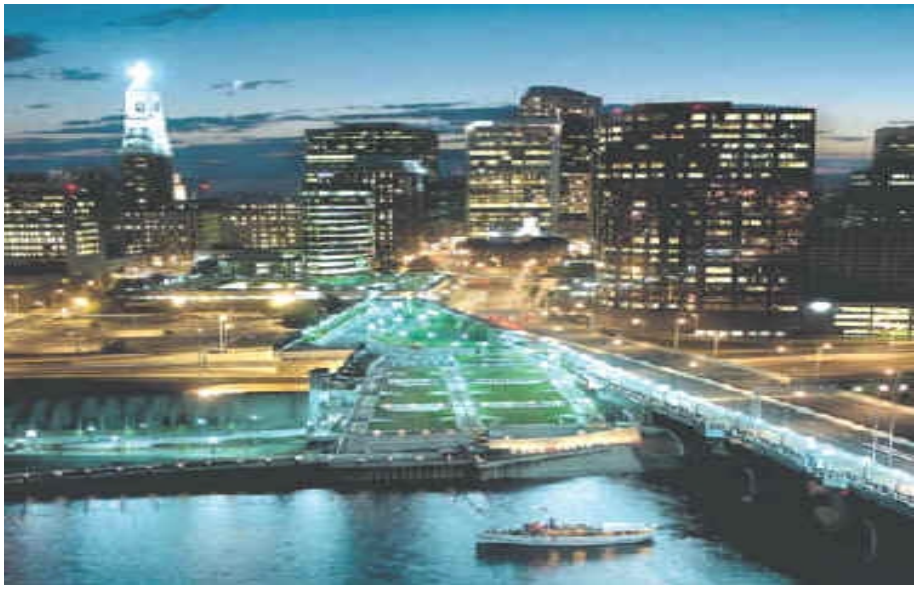


Fig. 6c: Riverfront Plaza and Founders Bridge

PROJECT EXAMPLE 6: I-93 Central Artery Tunnel, Boston, MA.

Cap / Tunnel Description: 30 acres of cap in CBD (25 acre for park/open and 5 acres commercial development), 2900 foot long tunnel for 8-10 lane expressway
Estimated Completion: 2013
Funding: multiple Federal and State agencies
Costs for capping project alone are not available

Fig. 7a: rendering of proposed cap area in CBD

Fig. 7b: model section of proposed cap/ tunnel in CBD

PROJECT EXAMPLE 7: City Square Park, Charlestown, MA.

Cap / Tunnel Description: 1-acre park cap over tunnel
Completed: 1998
Costs: $2M park cap only / $110m tunnel-highway
Funding: 60% State Funds (DOT and Dept. of Environmental Mgt.) /20% Federal

Fig. 8a: City Square Park aerial

Fig. 8b: City Square Park

NOTE: Park cap was a catalyst for residential resurgence and urban revitalization with a 22% increase in property values in one year of the completed park.

PROJECT EXAMPLE 8: Completion of Interstate 90 from Bellevue across Lake

Washington through Mercer Island to Seattle

Cap / Tunnel Description: (2) landscaped caps (28-acres) at either end of a 7-mile, 8-lane expressway corridor, covering about 20% of project / (2) widened over-pass bridges with landscaping
Completed: 1985
Costs: $300M for parks / costs for only capping structure not available
Funding: 90% Federal funds / 10% other

Fig. 9a: One of the park caps over I-90 in Washington

Fig. 9b: Tunnel entrance with deck above

Project Timeframes –

Most of the projects took a substantial period of time to go from concept development to completion. Those projects with more private funding and less layers of public involvement took less time, although these projects were typically smaller in overall scope of work. Some examples are:

Margaret T. Hance Park (29.5 –acres) / I-10 Papago Freeway Tunnel (.5 mile long) in Phoenix, AZ.:

- 1981- Freeway construction began and Park Concept developed
- 1985 - Park Planning began / first Cap Committee appointed / ADOT-FHWA-City of Phoenix agreed to join funding of project
- 1988 - Intergovernmental agreement signed between ADOT and City of Phoenix
- 1989 - Council approved park plans
- 1990 - Freeway construction completed / Park cap construction began
- 1992 - Grand opening of park on April 25, 1992

Lake Place & Leif Erickson Park over I-35 in Duluth, MN. :

- 1976 - citizen group, Citizens for Integration of Highway and Environment, began introduction of capping study to the I-35 Multiple Use and Joint Corridor Development Study
- 1992 - last phase of park cap / tunnel completed

Riverfront Plaza (1.5-acre park over I-91) and Founders Bridge in Hartford, CT:

- 1981 - Plan for reconnecting the community to the riverfront was approved
- 2000 - Last phase (of 7) completed

City Square Park and Rte.1/ I-93 Tunnel in Charlestown, MA.:

1974 - citizen group, North Area Task Force, began lobbying the State to "bury" the highway interchange
1994 - Park cap completed

Atlantic City - Brigantine Connector (2.2 mile long cut and cover tunnel) in Atlantic City, NJ. : (*Note: 2/3 State funding and 1/3 private funding)*

1995 - announcement of plans for connector and tunnel by State and NJDOT
1998 - Construction began
2001 - Grand Opening on July 27, 2001

The Portals, mixed-use development over rail lines, in Washington D.C.: *(Note: 100% privately funded)*

1988 - planning process began
1990 - construction completed

Pre-Cap Existing Conditions of Other Projects –

- *There are several other project examples with caps that span depressed expressway corridors that divide communities with residential areas adjacent to the expressway.*
- *Several project examples had to address the design issue of retaining grade and/or sub-grade water.*
- *Many other cap projects involved the relocation or lowering of an existing expressway, which precipitated the concept of capping the relocated expressway.*

Typical Design Elements of Other Cap Projects –

- The most common design elements in the cap projects researched were those that facilitated a reconnection of areas within the community that had been previously divided. Some were in suburban communities

through which a highway into the central city was located, including Mercer Island, Washington, Oak Park, Michigan and Southfield, Michigan. The Charlestown, Massachusetts example is also similar as a neighborhood community within the City of Boston but outside the central city.

- Several of the cap projects included various structures built on top of the cap, ranging from libraries, retail space, school, residential, and conference facilities to museums, office space and mechanical ventilation elements.
- Most cap projects included a park component. Typical features are playgrounds, playing fields, sculptural monuments and gardens. Common park-related elements also included such as open landscaped areas, hard-scaped plazas and pedestrian / bicycle paths.
- A few cap projects incorporated access to a waterfront and included boat docks, terraces, observation decks and river-walks.
- Several cap projects addressed noise abatement issues at tunnel openings with landscaped or decorative sound walls.

Tunnel Safety -

Depending on the size and volume of the tunnel, the major elements to be addressed regarding tunnel safety include:

- Life Safety - fire standpipe system / heat and smoke detectors, manual fire alarm pull boxes, fire extinguishers

- Ventilation
- Emergency Evacuation – fire exit doors / railings / elevated walkways
- Lighting
- Signage
- Video monitoring surveillance - CCTV
- Communications - radio, emergency wall phones,
- Drainage – fire fighting and storm water run-off

Some cap projects that incorporate the above-mentioned safety elements are:

- Atlantic – Brigantine Connector (NJ.) tunnel: .4 mile long, two tubes for 2-lane of traffic per tube
- Mercer Island (WA.) tunnel: Sections of a 7 mile long stretch of highway
- Central Artery Tunnel- Big Dig (MA.) tunnel: through Boston's central business districts
- I-10 Papago Freeway (AZ.) tunnel: .5 mile long.

  In fact, the I-10 Papago Freeway Tunnel in Arizona utilizes a Freeway Management System to monitor freeway with roadway sensors and closed-circuit cameras. When sensors detect a slowdown, personnel in a Traffic Operations Center can instantly look at the roadway and assess the problem. The proper assistance can be sent immediately. Also utilizes Message Boards administered from a Traffic Operations Center. These displays alert motorists to hazards and delays, suggest detours, and provide estimated travel times. Unlike radio traffic reports, a message board broadcasts constantly and can catch all motorists passing a single point. For more information on the tunnel system go to http://www.azfms.com to view camera /images and a graphic display of traffic conditions for the Phoenix metro area.

Tunnel Ventilation -

A cap itself would provide some air quality benefit to the immediately adjacent area. Any cap constructed with a length of more than roughly 500-800 feet would require mechanical ventilation (for example ceiling mounted jet fans); those of shorter length would not likely require mechanical venting. With a mechanically vented cap, gaseous pollutants would be collected and released from vents located somewhere on top of the cap. On the Mercer Island cap, the ventilation stacks are architecturally integrated into the design of the park. Ventilation elements could also be incorporated into other new structures (for example parking or commercial buildings) built on the cap.

Total emissions to the region can be further altered utilizing a mechanically filtered ventilation system that uses a control device to reduce pollutant emissions. Two popular filtration systems being used in countries like Japan, Norway and Australia are electrostatic precipitators and NO_2 gas conversion plants.

Utilizing either natural or mechanical ventilation, a cap should result in reduced concentrations of pollutants in the vicinity of the cap as long as the design and location of the venting system and openings are optimized to consider traffic and meteorological conditions. For particulate emissions, there is even an even greater likelihood for reduced air quality impacts to areas directly next to the capped structure, because re-entrained particles will face a great

obstacle to entering adjacent neighborhoods. As with gaseous pollutants, some smaller particles will be dispersed out either end of the capped area, but larger particles will settle out.

[For more information see Appendix J - Facilitator's Report on the International Workshop on Tunnel Ventilation].

Air Rights issues –

Determination of ownership and appraised value for easements, rights-of-ways and air rights can be difficult and require cooperation of many agencies. In some of the cap projects research, air rights were transferred to the cap projects without cost, while others the cost for the air rights usage was substantial. Depending on how the airspace above the highway is going to be used (for example public parking, transit center connection, relates to how the usage rights are transferred. [For more information see Appendix C - USDOT/FHWA Title 23 US Code excerpts; Appendix D - USDOT/FHWA Title 23 Code of Federal Regulation; Appendix E – FHWA Real Estate Services; and, Appendix F – Illinois Compiled Statures Chapter 605 Roads and Bridges].

Community involvement throughout the project / Community response to project:

In every cap project researched that involved public funding, local citizen participation was a major component in the success of the project. This participation ranged from bringing issues to the forefront that impacted the initial project scope and continual observation of the execution of the project program. Typically, citizen participation was an effort coordinated with local, state and federal agencies.

As stated above, the working group found that, overall, community response to the finished product for those projects studies was very positive. Typically, communities felt the cap project objectives of neighborhood re-connection, revitalization and environmental mitigation objectives were met with the anticipated positive impact. However, a valuable lesson can be learned from the cap project over I-80 in Reno, Nevada, where immediate post-completion response was that of dissatisfaction due to the poor financial and programmatic pre-planning. The initial development plans for elements on top of the cap failed, which required many years to overcome. This experience further emphasizes the necessity of a thorough consideration by all in the planning stages.

As described in an online article, "*Success in Dallas: Style Matters Quality design ends decades of dissent over rebuilding the North Central Freeway* " about the North Central Freeway in Dallas, community involvement is key.

> North Central is another project that would not have gone forward without a high level of community involvement. Numerous proposals to rebuild the highway failed over decades due to a lack of public support. When the

community finally united behind the concept of urban design, consensus created momentum. John Kelly, a District Engineer for TxDOT, states “In my opinion, I think that a highway that is properly designed – and I’m saying functionally from a traffic operation standpoint but also from the aesthetics standpoint – and its properly integrated into the adjacent community, I think it can be a real asset to the community….and can really enhance economic development along that corridor.” Walt Humann, a Dallas Businessman states, “We could have built a very utilitarian freeway, and there were some folks who said that’s we should do because you could free up some additional dollars. But by building quality into the freeway, it lasts longer. By building aesthetics and taking a little additional expense, you substantially enhance the quality of the driver and the adjacent property owner’s life. And lastly, from an urban design and planning standpoint, we want to create an environment that people enjoy living in…There’s been a huge impact on economic development all along the corridor, from a commercial standpoint – significant increases in occupancy rates, in rent rates, in economic development. Along the Central corridor in residential communities, there has been a dramatic improvement in the quality of life.

This experience was echoed in Arizona with the Margaret T. Hance Park and I-

10 Papago Freeway project is described by “The New I-64" website, "Ideas in

Action" link:

Because of public support for the design, the Papago Freeway overcame obstacles that would kill most highway projects. The highway was built through some of the oldest and most historic neighborhoods in Phoenix; it also ran through two ancient archaeological sites, which were salvaged before construction. Woven from the very fabric of its surroundings, the Papago Freeway runs seamlessly through the middle of downtown Phoenix. From above, sound walls and landscaping conceal the recessed roadway. Pedestrian and bicycle crossings are plentiful. In the heart of downtown, the freeway actually disappears for half a mile, tunneling beneath a 13-acre park built over the road. The Papago Freeway is an aesthetic, economic and cultural success. It is the project other cities regularly point to when new urban highways are being planned. The Papago Freeway is recognized as the pioneer project for modern-day urban freeway design. It remains a sterling example of what can be accomplished when planners and the public work together. [http://www.thenewi64.org/1c1_az.jsp]

Lessons Learned / Project Results:

Some key lessons learned from the completed cap projects researched include:

- Incorporate timing of cap project with planned highway project for cost and construction disruption benefits
- Have the community define the roadway, rather than the roadway defining the community
- Determine the potential range of costs in the pre- planning phase and carefully assess the air right leases
- Incorporate public/private partnerships throughout process
- Develop a thorough accessibility plan during construction phase
- Design the cap for maximum weight capacity to handle all program requirements of all agencies that will be using the cap
- Address safety of workers over rail lines during construction
- Address speeding through tunnel
- Proper design of drainage systems for both tunnel and cap above
- Plant the appropriate tree/ landscaping for the amount of dirt on cap
- Incorporate sufficient waterproofing for cap when landscaping and ponds are incorporated into the design
- Lighting design is crucial at tunnel openings and to manage energy costs

Some of the results from the completed cap projects researched include:

- Public support enabled the project to happen and had impact on design
- Cap was catalyst for revitalization and rebirth to the adjacent community
- Reconnected community
- Provided access to waterfronts and business districts
- Major tourist attraction
- Commercial development on cap leveraged construction costs
- Improved air quality
- Improved amenities (parks and parking structures, which generated revenue)
- Increase in property value in the adjacent community

PART III: Financing

Perhaps the most common reaction to the concept of capping the expressway in Oak Park relates to the cost. The concern is that such a project could not be accomplished because it would cost too much and funding would not be available. This was also a common initial reaction that had to be overcome in the communities where cap projects have actually been completed.

The FHWA provided all or a major portion of the funding for most of the cap projects examined. In these cases, federal funding was required due to the fact that environmental mitigation issues needed to be addressed in order for the planned roadway project to move forward. Title 23 of the US Code Section 149 (b) provides:

> Eligible Projects.--Except as provided in subsection (c), a State may obligate funds apportioned to it under section 104(b)(2) for the congestion mitigation and air quality improvement program only for a transportation project or program if the project or program is for an area in the State that is or was designated as a nonattainment area for ozone, carbon monoxide, or particulate matter under section 107(d) of the Clean Air Act (42 U.S.C. 7407(d)) and classified pursuant to section 181(a), 186(a), 188(a), or 188(b) of the Clean Air Act (42 U.S.C. 7511(a), 7512(a), 7513(a), or 7513(b)) or is or was designated as a nonattainment area under such section 107(d) after December 31, 1997.

Federal and state law requires the level and severity of environmental mitigation issues to be assessed in an Environmental Assessment and/or the more detailed Environmental Impact Statement (EIS), which is performed by the state highway department overseeing the project. As part of the Phase I study IDOT is conducting regarding the Eisenhower Expressway, an Environmental Assessment, and potentially an EIS will be performed by IDOT for the planned

roadway renovation and proposed HOV lane project, which could provide the basis for federal funding. However, it should be noted that while the main cap structure was paid for by state and federal highway funds in most cases, the municipality or private interest involved contributed to the costs of building public or commercial elements on top of the cap.

Federal funding may also be made available base on noise abatement measures. Federal law provides:

> (a) Federal funds may be used for noise abatement measures where:
>
> (1) A traffic noise impact has been identified,
>
> (2) The noise abatement measures will reduce the traffic noise impact, and
>
> (3) The overall noise abatement benefits are determined to outweigh the overall adverse social, economic, and environmental effects and the costs of the noise abatement measures.
>
> * * *
>
> (c) The noise abatement measures listed below may be incorporated in Type I and Type II projects to reduce traffic noise impacts. The costs of such measures may be included in Federal-aid participating project costs with the Federal share being the same as that for the system on which the project is located, except that Interstate construction funds may only participate in Type I projects. 23 CFR772.13(a) and (c). [See Appendix D.2 for noise abatement requirements].

Federal and State highway formula funding resources are not the only mechanism available for funding a capping project. It may be possible to combine capital resources from a variety of entities. A cooperative effort of this

nature could improve the probability that the project comes to fruition, while lessening the financial burden on any one source.

Other potential sources of funding are:

- Grant programs – federal/state discretionary grant programs (HUD, DOT), U.S Interior Department (for areas containing parks), U.S. and Illinois Department of Commerce.
    1. For example, there are several DOT programs such as the Congestion Mitigation and Air Quality, Enhancement, FHWA Safety programs that could be used to added specific elements to the project.
    2. Another example is set forth in Title 23 of the US Code which provides:

       > In addition to other grants authorized by this chapter, the Secretary may make grants in any fiscal year to those States, political subdivisions thereof, and nonprofit organizations which develop innovative approaches to highway safety problems in accordance with criteria to be established by the Secretary in cooperation with the States, political subdivisions thereof, and such nonprofit organizations as the Secretary deems appropriate. 12 USC407(a).

- Related agencies – Since the CTA, PACE could conceivably benefit from improvements of the nature that could take place as a result of the cap in Oak Park such as rebuilt intermodal transit stations, funding for proportionate/related construction costs could be available through those agencies sources for transit or inter-modal opportunities
- Capital reallocation from planned Village projects which could be re-aligned into the cap design program (i.e. parking garages)

- Federal, state or county loan –

    1. St. Louis County agreed to lend the City of St. Louis $45M for new baseball stadium. The County would be re-paid via hotel/motel room tax. This option assumes a revenue source would be created on top of the cap.

    2. Title 23 of the US Code provides:

        In general.--A State may loan to a public or private entity constructing or proposing to construct under this section a toll facility or non-toll facility with a dedicated revenue source an amount equal to all or part of the Federal share of the cost of the project if the project has a revenue source specifically dedicated to it. Dedicated revenue sources for non-toll facilities include excise taxes, sales taxes, motor vehicle use fees, tax on real property, tax increment financing, and such other dedicated revenue sources as the Secretary determines appropriate. 23 USC129A.7a.

- Tax Increment Financing (TIF) – This option assumes a revenue source involving private development would be created on top of the cap.
- Local Improvement District/Tax Abatement – New private properties created by the project could form a local improvement district, or adjacent business district that directly benefits from the type of improvements made.
- Corporate Sponsorship – This was done successfully for Millennium Park and raised a substantial amount of capital.
- Private development
- Public/Private partnership – e.g., ReCapture is a private non-profit organization in Hartford, Connecticut that was created to operate, maintain

and oversee the new plaza that spans I-91 as well as other riverfront parks-amenities.

As set forth below, when developing the overall budget, three major areas must be addressed:

1. Planning and construction
2. Air rights/related easements and granting permission to use rights of way
3. Maintenance.

Taken in order, the above areas can be broken down further as follows:

1. Planning and Construction:
    a. Develop / Distribute / Selection of RFP for required consultants
    b. Legal fees for developing consultant contracts
    c. Feasibility Studies
    d. Developing the Program Requirements
    e. Design Development
    f. Pre-construction Costs for cost estimating / scheduling / developing temporary construction plan (barricades, detours, access, etc.)
    g. Construction Phase
    h. Post Construction
2. Air Rights / Related Easements and Granting Use of Rights of Way:

a. The two main issues regarding air rights are the authorization for use of the land created in the air space and determining the reasonable appraisal value of the newly created land.
b. Typically cap areas that are dedicated to public use (parks, museum, parking, etc.) were not affected by air right valuation
c. Valuation of air rights for private development could be discounted to compensate for the additional costs of building over the expressway versus on raw land.
d. Air rights for private use can be leased rather than sold which would have a financial impact to developers underwriting proformas
e. If the capping project is part of a larger transportation project, there might be more opportunity for cooperation in resolving air right issues.

3. Maintenance:
    a. The most common model would have tunnel maintenance and monitoring costs as the responsibility of state transportation agency
    b. Park and municipal area maintenance costs could be covered via revenue generated from the increase in property value from both residential and commercial properties and

related property taxes. As mentioned above, another possibility for park maintenance is a private, non-profit organization like Riverfront Recapture in Hartford, Connecticut, which was created to operate, maintain and oversee the new plaza that spans I-91, as well as other riverfront parks-amenities.

c. Private developers would be responsible for maintenance of their developments.

Based on cap project cost estimates completed in 2001 for studies of projects in California and Washington State, a unit cost for the deck construction of a deck including park areas was approximately $350 per square foot. The ultimate cost of a cap in Oak Park will vary depending on how much of the expressway is capped through Oak Park. Because each situation is different, an estimate specifically geared to the Oak Park project must be developed. The program requirements for a cap impact both the square footage area and the design of the cap, which, in turn, affect the unit cost of construction. In addition, the $350 per square foot estimated for the above projects cannot be directly applied to Oak Park even on a general basis without further refinement. The cost for IDOT's work in Oak Park may be different than the other cases due to the fact that the Eisenhower is already depressed in this area, and already has retaining walls that may be able to be reused, thus sparing some of the typical costs of a cap project. This estimated cost per square foot for other projects also does not subtract out the cost of the work that would be assumed to already occur as part

of the IDOT Eisenhower reconstruction. Project or project elements such as bridge rebuilding that could serve to support a cap may need to be done anyway as a requirement of the Eisenhower project and should not be considered a cost of the cap itself. For reference, the Eisenhower cuts through approximately 8000 feet through Oak Park and is approximately 300 feet wide on average through Oak Park, with the narrowest point occurring at Oak Park Avenue.

PART IV: Applications to Oak Park, IL.

Why do we need a cap and what is the existing impact of the expressway on our community?

There are two primary reasons the expressway should be capped through Oak Park:

a) The **mitigation** of environmental impacts,

b) A **re-connection** of the community, which currently is divided by the expressway “ditch”.

Fig. 10a: I-290 from Home Ave. ped. bridge (east view)

Fig. 10b: I-290 from Ridgeland Ave. bridge (west view)

Mitigation of environmental impacts:

The expressway already greatly impacts the community in a number of ways defined by NEPA (National Environmental Policy Act) and FHWA (Federal Highway Administration). In its present condition, air pollutant emissions and noise from expressway traffic are major contributors to the serious health

hazards of the large residential community that lives along the expressway. Approximately 21,736 people, or 41% of Oak Park's total population of 52,524 (per the 2000 US Census), live within 4-5 blocks of the expressway. This community also includes five (5) schools, seven (7) day care centers, twelve (12) Churches, one (1) Branch Library, one (1) Fire Station, one (1) Conservatory, one (1) Historic District, two (2) business districts (one being the heart of the village's artistic community) and eleven (11) neighborhood parks – three (3) of which directly abut the expressway.

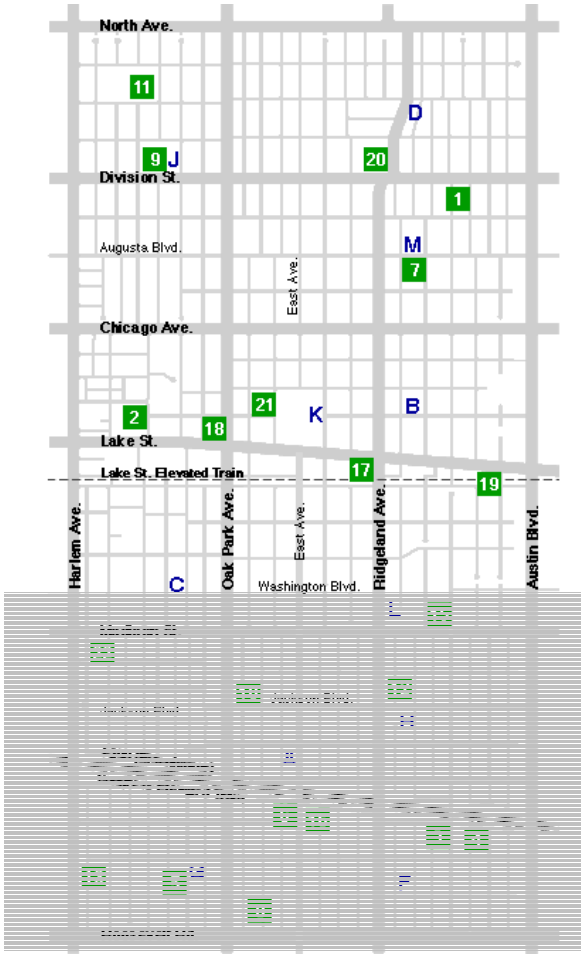


Fig. 11: Visitors Map of Oak Park, Illinois)

As demonstrated in the past, and as indicated by IDOT's future projections (a 35% increase over the next 17 years in traffic load per the Chicago Area Transportation Study's 2020 Regional Transportation Plan), the amount of traffic on the expressway will to increase as time goes on, particularly if additional lanes are added. Capping the expressway, with proper noise barriers at the tunnel entrances and appropriate ventilation systems throughout the tunnel, will improve the air quality and eliminate most of the noise pollution along the Eisenhower Expressway as it traverses this residential corridor.

The adverse impacts of the expressway on the public health, welfare, safety and environment extend not only to the communities immediately adjacent to the expressway, but to those communities located within a 6 to 65 mile radius of the expressway, depending upon whether the air pollutant particulate is course or fine. More specifically, the health and environmental impacts include significant exposure to ozone, nitrogen oxides (NOx), carbon monoxide (CO), particulate matter (PM), hydrocarbons (HC), noise pollution, diesel emissions and at least 20 other carcinogenic substances contained in particle or other emissions from vehicles or road dust as well as impacts to visibility, wildlife and water quality. The EPA has determined that exposure to NOx emissions causes respiratory effects such as altered lung function, increased incidences of acute respiratory illness and lung tissue damage. Similar adverse cardiac and respiratory effects are caused by exposure to CO and PM. The EPA and the International Agency for Research on Cancer have concluded that diesel exhaust is a probable human carcinogen.

Thirty-three (33%) percent of the Village population currently resides within a Diesel Hot Spot as identified by the American Lung Association in their 1999 report “Dirty Diesel Hot Spots”, which also ranks Oak Park as 6th on a list of Chicago area municipalities living in Diesel Hot Spots. These diesel emissions (and other fine particulates) are capable of penetrating other parts of the community within a 65-mile radius from the expressway corridor before settling into the environment.

Impacts to air quality are not the only adverse health effects from the existing expressway. In 1981 and 1987 studies were conducted that measured noise pollution along the Eisenhower expressway through Oak Park. Both studies found noise levels well in excess of the maximum levels identified by the USEPA and the criteria levels set by FHWA. Also in 1987, fifty-eight percent (58%) of the 1000+ residents surveyed found the level of expressway noise objectionable and reported some effect upon their health and/or lifestyle. Since the amount of traffic has steadily increased since the 1987 survey, there is little doubt that noise and air pollutants have increased correspondingly. In addition to reducing air-borne pollutants and noise pollution, a cap over the Ike can reduce the volume of storm runoff from the highway below. The degree of pollutant reduction will depend on the size of the cap. The cap will intercept rainwater falling on the Ike resulting in less storm runoff. Since storm runoff from the Eisenhower drains to the Des Plaines River, the cap will partially mitigate some of the adverse effects on water quality that result from the Eisenhower. Additionally, under NEPA, the environmental impacts of a highway project are

viewed as the cultural, historical, economic development, and sociological impacts of the federally funded project, all of which the Eisenhower has affected in Oak Park.

Reconnection of a revitalized community:

Capping the expressway will reconnect a village divided by the insertion of the sub-grade expressway. In its present state, there is an approximately 300 foot wide by 1.5-mile long ditch that runs through the residential neighborhoods and business districts. By ”removing” the ditch, a cap would reconnect and enhance the divided community by providing opportunities to improve village amenities, such as:

- Additional park space of which Oak Park is drastically lacking by any measure
- Additional parking facilities to accommodate the parking-deprived business districts and serve as Kiss-n-Ride facilities
- Improved transit centers for both CTA and PACE systems
- Expand and improve bicycling and walking paths

Reconnecting the neighborhood will also vastly improve the safety of the approximately 1000 school-aged children who traverse the expressway daily to access the schools, parks, cultural and religious institutions that are adjacent to the expressway. Incorporation of the cap project into the community would also create an opportune time to analyze the neighborhood traffic patterns and congestion.

Figure 3 – Conceptual Illustration of a Cap in Oak Park, Illinois

Some of the cap projects examined were located in communities facing issues strikingly similar to those present here, such as the need for mitigation of environmental (such as air and noise) issues, the reduction of physical barriers, the need to enhance the community aesthetic and to increase open space. Cooperation between local, state and federal agencies was crucial to every project. Moreover, as in Oak Park, the involvement of community citizen groups was critical, not just as watchdog groups but also as active participants in the process.

In communities where the caps were constructed, aspirations were achieved similar to those sought here, such as, reconnecting a divide by "bridging" people and places, and rejuvenating economic development adjacent to the cap thereby benefiting the community at large.

Moreover, a number of the benefits that a cap would bring to Oak Park directly align with many of the Village's present concerns, including:

- Preserving, enhancing and maintaining quality housing in a balanced residential environment with increases in public health, safety and property value via elimination of the existing negative impacts of the "exposed" expressway. As has been seen in other communities where caps have been built, the project's success reportedly resulted in major property value increases and generated reinvestment in properties located adjacent to the cap project.
- Establishing state-of-the-art, multi-modal transportation centers at strategic points with new bicycle, CTA, PACE and Kiss-n-Ride stations

and a reduction in congestion on local roads traversing over the expressway

- Expanding tax base revenue through economic development with the reconnection/enhancement of the business districts
- Increasing tourism by developing a coherent district / campus with better access to both existing historic and cultural sites and points of interest as well as possible future sites that could be developed on and around the cap. Possibilities include:
    - A monumental architectural feature to signify the cap/tunnel as the Gateway to the West (referring to Daniel Burnham's plan).
    - An upscale hotel/conference center developed on the cap along Austin Ave. that overlooks Columbus park and ties into the nearby historic and cultural districts
    - Additional park space could enable the development of a cohesive park system including pedestrian and bicycle paths that connect Columbus Park – Barrie Park – Rehm Park – Forest Park.
    - A commercial ice rink, like the facility in the western suburbs (i.e. The Edge in Bensenville or 7 Bridges in Woodridge), which can be used for both public use as well as private rental use.
    - Additional playing fields and sports amenities could attract additional regional events, tournaments, etc.

- Reducing pollutant emissions, protecting parks, gardens, natural sites, historic and architectural treasures
- Reducing freight train noise and odors

The environmental benefits to the community from capping the expressway support the efforts of the Village and the region to promote cleaner air and attain compliance with the Clean Air Act. The cap would also contribute to the improvement of air quality as called for in other regional plans, like NIPC's Strategic Plan. In April 2004, more stringent federal ozone standards are planned to go into effect. Oak Park and the Chicago area are already out of compliance and will continue to be so as traffic inevitably increases. A cap with proper ventilation and filtration will have a major effect in reducing the particulate matter emissions and be a step toward compliance.

PART V: Recommendations

As a recent recipient of the Illinois Tomorrow grant, the Village should initiate the planning process with input from the community and other affected agencies (see Appendix I – Illinois Tomorrow grant Agreement *DRAFT* Scope of Services). In the examples researched, every project experienced cooperation between local, state and federal agencies. No project had a single entity that controlled the entire fate of the project.

The planning process should include:

- The creation of comprehensive goals and objectives for the entire project.
- The development of a list for several design concepts and options which can later be reduced to 2 or 3 possibilities based on the feasibility of all concepts put forth.
- An analysis of the factors such a project would address as part of IDOT's Environment Assessment (and/or the Environmental Impact Statement) from IDOT in order to establish final design concepts.
- The development of both an overall project budget, that includes order-of-magnitudes costs for remaining concepts in consideration, and overall project schedule.

Upon submission of this report, it is recommended that the Cap the Ike Working Group should continue to assist the Village with the development of a Request For Proposal (RFP) document. The Working Group has reviewed the Illinois Tomorrow Grant agreement *DRAFT* Scope of Services (see Appendix I) with IDOT, which, upon approval, can then be included in an RFP to be distributed to qualified consultants and competitive selection. Instead of using IDOT to conduct the study as was done in 1987, an impartial analysis of capping possibilities is recommended. IDOT's wishes and opinions with regard to a cap in Oak Park may not necessarily align with those of the Village. Rather, a complimentary blend of independent third party professional consultants, selected through a competitive RFP process, would best enable the development of a study that is well rounded and unbiased.

The most reiterated advice from those involved in other capping projects was to allow ample time for the development of the **program requirements** for the usage of the cap. The program drives the design, cost, construction techniques and schedule. All agencies (local, regional, state and federal) should be involved in the developing the full range of *program requirements* in a collaborative coordinated manner. The further into the design and construction process the project moves, the more difficult and expensive it is to change the program requirements, and the greater the propensity for design oversights to occur thereby resulting in grave financial impact and flaws in the functionality of the end product.

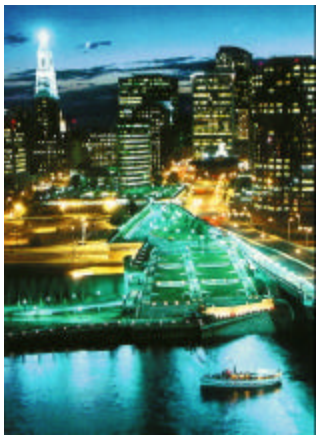
As with the other projects studied, the entire process needed to guide a cap to fruition will be challenging and will span a substantial period of time as the project moves from development and planning to completion. However, as proved by other municipalities, if the community remains dedicated to the mission, and if public and private agencies agree to cooperate on developing creative solutions, great opportunities can be realized.

APPENDIX A.1

I-5 Decking Research Study

INVENTORY OF COMPARATIVE DECKING PROJECTS

Prepared May 15, 2001







Prepared for:

City of Sacramento
Economic Development Department and
Public Works Department

INVENTORY OF COMPARATIVE DECKING PROJECTS

Summary Report

This document was prepared in support of the

I-5 DECKING RESEARCH STUDY

for the

CITY OF SACRAMENTO
Economic Development Department
Public Works Department

by

PARSONS BRINCKERHOFF QUADE & DOUGLAS
400 SW 6th Avenue, Suite 802
Portland, Oregon 97204
(503) 274-8772

May 15, 2001

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*(Note: Projects indicted in **bold** are most applicable to Sacramento's I-5 Decking Research Study)*

OVERVIEW

"Decking" is the process of constructing a usable structural space above a new or existing roadway, rail line, water body or other transportation system. A "deck" is also often referred to as a lid, cap, platform, cut and cover tunnel, cantilever, or bridge widening.

The idea of decking is a very old concept. Communities have been doing it over roadways, railways, and water bodies for centuries, mostly as an effort to maintain or reconnect neighborhoods that would otherwise be cut off from each other or from a major civic resource. It is through the realized efforts and commitment of cities around the world that the city of Sacramento can glean valuable lessons learned. The city can use these past experiences to better understand ways in which it can reconnect its own downtown with the Sacramento riverfront.

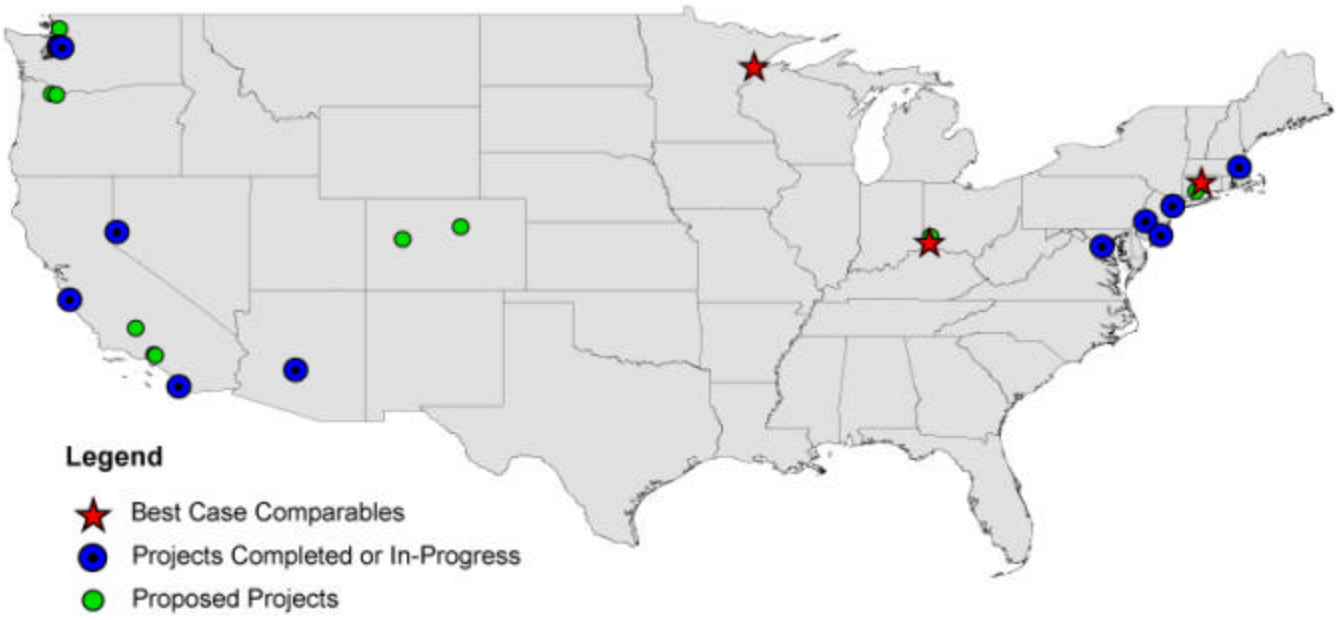
Successful decking efforts are as diverse in scope as they are widespread in location. Exemplary projects exist in notable locations like the Capital Mall in Washington, D.C. Some are as close by as Monterey, California; others as far away as Barcelona, Spain. And some are located in places as unexpected as Duluth, Minnesota. Decking projects range greatly in construction cost and time-frame, depending in part on the scale of the project and on the amount of political and public support they garnered.

The following projects provide a sampling of some of the unique benefits that can be achieved through the decking process. It is intended as a resource to learn about how other urban areas reclaimed their communities and solved tough connectivity issues. This inventory is not intended to be an exhaustive report on all the decking projects throughout the world, nor a comprehensive case study, but rather a guide to some of the projects built to date or currently under construction.

INVENTORY OF FREEWAY DECKING PROJECTS

This inventory highlights a sampling of twenty decking projects across the United States. The projects range from passive parks to active sports and recreation centers and from small-scale residential housing to high-rise office complexes. Also included in this inventory are another 15 or so projects that have been proposed, but not yet funded, as well as a few examples that are located in Europe and South America. The following map shows the distribution of decking projects that have been researched to date throughout the United States.

DISTRIBUTION OF DECKING PROJECTS THROUGHOUT THE UNITED STATES



Projects Completed or In-Progress, in the United States

- Phoenix, AZ: I-10 Papago Freeway
- Monterey, CA: Monterey Tunnel Project
- San Diego, CA: Mid-City I-15
- Hartford, CN: I-91/I-84 Interchange: Riverfront Plaza & Founders Bridge
- Boston, MA: I-93: Central Artery/Tunnel, Copley Place, and Prudential Center
- Charlestown, MA: CANA Project: City Square Park and Tunnel
- Duluth, MN: I-35 Extension: Lake Place & Leif Erickson Park
- Reno, Nevada: I-80 Platform
- Atlantic City, NJ: Brigantine Connector
- New York City, NY: Park Avenue and Trans-Manhattan Expressway
- Brooklyn, NY: Brooklyn/Queens Expressway Promenade
- Cincinnati, OH: Fort Washington Way and Lytle Park
- Philadelphia, PA: Commerce Square
- Mercer Island, WA: I-90 Completion Project
- Seattle, WA: Freeway Park and Convention Center
- Washington DC: The Portals

Projects Proposed, But Not Yet Funded or Approved

- Bakersfield, CA: SR-178 Extension
- La Canada Flintridge, CA: Liberty Project
- Pasadena, CA: I-710 Extension
- Glenwood Springs, CO: Freeway Decking Project
- Vail, CO: Freeway Decking Project
- New Haven, CT: I-95 - Haven Harbor Access Feasibility Study
- Brooklyn, NY: Gowanus I-278 Expressway Tunnel
- Manhattan, NY: Miller Highway Project
- Gresham, OR: Mount Hood Parkway
- Portland, OR: Bridge the Divide & Cap I-405
- Medina, WA: Freeway Decking Project
- Washington, D.C: I-395 Third Street Tunnel

Projects Completed or In-Progress, Outside of the United States

- London, England: Bishopsgate
- London, England: Canary Wharf – London Dockyards
- Paris, France: Pont Au Change
- Florence, Italy: Ponte Vecchio
- Amadora, Portugal: Amadora Central Station
- Barcelona, Spain: Moll De La Fusta
- Barcelona, Spain: Ronda De Dalt
- Berne, Switzerland: N6 Motorway
- Sao Paolo, Brazil: Anhangabau Valley Park

LESSONS LEARNED

Many lessons can be learned from the decking projects summarized in this inventory. Following is a list of the top ten.

1. The public involvement process can have major impact on the final design and community benefit of a decking project.
2. Variable tunnel lighting controls provide adequate levels of illumination, saves money, and is safe.
3. Timing the construction of a decking project with needed highway reconstruction can help create an opportunity to build high a quality park and major civic improvements by leveraging the reconstruction/rehabilitation of the existing freeway.
4. Air rights leases can be difficult to assess for fair market value. It's a good idea to talk with people who have negotiated the process before.
5. It's best to plan for a maximum weight on top of a deck so there's more flexibility with what can be put on top. This eliminates the need to add or re-do supports/reinforcements later.
6. Use the word "mitigation" as often as possible when applying for grants and funding (the word has "legal pregnancy").

7. Brainstorm what to do in the interim, in between time when the foundation is complete and when the design is actually built.
8. Determine what the potential range of costs is *first.*
9. Good interdepartmental communication system is key.
10. Cut and cover construction can easily accommodate multi-story buildings over deck, with a potential for leveraging costs of freeway construction as well.

I-10 Papago Freeway: Hance Deck Park

Phoenix, Arizona

Description:

The final section of Interstate 10, the Papago Freeway in Phoenix, was constructed in 1990. Part of it was built as a depressed freeway, covered by 19 side-by-side bridges that form the foundation for a 29-acre urban park. Constructed in the heart of downtown Phoenix, the ½-mile long cut and cover tunnel allows the freeway to disappear beneath the Margaret T. Hance Park, which was built on top of the deck to establish a connection between the neighborhoods bisected by the freeway. The tunnel is monitored 24-hours per day by video camera and off-site staff.

The park spans several blocks and is divided by Central Avenue into two distinct areas. On one side is an open play area, playground, and picnic area with grills and sand volleyball. On the other side is a brick entryway and fountain at the base of the Phoenix Public Library and a partially completed Japanese Friendship Garden. When completed, the Gardens will be located on 3 acres of the park and will include a Tea House, a koi fishpond, and a strolling walkway.

Considered the heart of Phoenix's downtown cultural center, Deck Park is the city's second-largest downtown park. The park has spurred recent efforts to revitalize the surrounding downtown area, including the construction of a new library, new market rate and affordable housing projects, and the expansion or renovation of nearly all the area's museums.

Proposals to build a downtown freeway in Phoenix had been debated for decades – the original 1966 design called for a roadway elevated more than 100 feet above ground. However, because of public support for the current design, the Papago Freeway overcame obstacles that would kill most highway projects. The highway was built through some of the oldest and most historic neighborhoods in Phoenix; it also ran through two ancient archaeological sites, which were salvaged before construction.

Today, the Papago Freeway is an aesthetic, economic, and cultural success. The project, particularly the park deck area, is thought of as a showcase for Phoenix; not just a highway project, but also an essential element of the fabric of the City of Phoenix.

Deck Details:

- ½-mile long cut and cover tunnel, consisting of 19 side-by-side bridges that form the foundation for a 29-acre urban park. Deck pad is 6 to 8 feet deep.

Key Results/Lessons Learned:

- Public support for park deck enabled freeway to be built through heart of city
- Deck Park has been catalyst for commercial and residential revitalization in surrounding area
- Waterproofing is a huge concern; deck has experienced some minor leakage from pond on top
- Good interdepartmental communication system is key. Special events must be monitored very closely, considering weight of special vehicles on deck, assemblage of temporary structures, etc. Any event planned or anything that will penetrate ground more than 3 feet must be approved by ADOT
- Lighting can be a potential problem when entering/exiting the tunnel
- Exit ramps are too sharp/too quick; accidents occur frequently
- Trees must be carefully and appropriately selected. On Deck Park, the trees have not grown to full height, possibly because there was not enough dirt for the type of tree (soil only 3-5 feet deep). Due to weight limitations, special fills are required; can't have solid soil.

Project Completion Status:

- Freeway completed 1990; Park deck completed 1992
- Japanese Tea House & Gardens – 30% complete by 2000; Phase II currently underway

Project Costs:

- $100 million for decking structures; $5 million for park
- City pays $300/year for a 50-year air rights lease from the State; City maintains all park facilities

Funding Sources:

- Deck structure – 92% FHWA (additional discretionary funds and 8% State funds
- Hance Deck Park – City funds
- Japanese Friendship Garden - partial funding through a voter-approved Cultural Bond Election, in 1988. Bond funds available in 1998 covered only partial cost of building the Gardens. A volunteer committee is currently raising additional $1 million in donations to complete the project.

Contacts:

- Bill Hayden, Arizona Dept of Transportation - Community Relations
  Phoenix, Arizona - (602) 712-7524, e-mail: whaden@dot.state.az.us
- Mark Lamm, City of Phoenix Parks and Recreation Dept - Special Facilities
  Phoenix, Arizona - (602) 262-4541

Additional Information:

http://www.thenewi64.org/1c1_az.htm
http://www.arizonaroads.com/urban/papago.htm
http://www.fhwa.dot.gov/byday/fhbd0810.htm
http://www.tfhrc.gov/pubrds/summer96/p96su28.htm
http://www.jgarden.org/gardens.asp?ID=426

Lighthouse Avenue Tunnel: Lower Plaza and Custom House

Monterey, California

Description:

Planning for Monterey's Lighthouse Avenue traffic tunnel began in 1962. The project was originally designed to keep through traffic out of the downtown area. Now complete, the decked structure supports several buildings, such as the Monterey Maritime Museum, Heritage Harbor Center, Customs House Plaza, and a two-story complex made up of offices and retail shops.

Completed in 1969, this is one of the first examples of a decking project on the West Coast. It was funded primarily by federal funds dedicated for urban renewal efforts. The biggest obstacles to completing the project were related to easements and property ownership issues. The land was owned by a combination of city, state, and private parties.

The tunnel/decking project has an extensive pumping and collection system for stormwater drainage and a network of ventilation fans.

Deck Details:

- 1,000-foot cut and cover tunnel

Key Results/Lessons Learned:

- Tunnel diverts traffic away from downtown and provides seamless connection to Fisherman's Wharf
- Major tourist attractions and revenue generating businesses are built on top of the deck
- Drainage is a significant issue. The Monterey tunnel is below sea level, the lowest part of the city. A major portion of downtown stormwater drains directly into the tunnel. If anything were to ever happen with the pumping system, the tunnel would flood. The City is currently considering modifications to the tunnel to mitigate this impact.
- Speeding through the tunnel can also be a big problem. Should identify ways ahead of time to mitigate it.
- Best to plan for maximum weight on the deck, so that there's more flexibility with what can be put on top. This will eliminate the need to have to go back and add additional supports/ reinforcement later.

Project Completion Status:

- Completed 1969

Project Costs:

- Not available

Funding Sources:

- 100% Federal funds

Contacts:

- Tom Reeves, City Engineer
  Monterrey, California
  (831) 646-3920

- Cathy Smith, Public Works Department
  Monterrey, California
  (831) 646-3920

- Jeff Krebs, Public Works – Operations and Maintenance
  Monterrey, California
  (831) 646-3927

Additional Information:

- Not available

I-15: Mid-City Bridge Widening and Park Deck

San Diego, California

Description:

When construction of Interstate 15 was first planned in the 1960s, a typing error on a federal form resulted in a funding deficit that halted the completion of the freeway through the inner city neighborhood of Mid-City. As a result, high traffic volumes increased on the community's surface arterials, causing significant damage to the neighborhood's cohesion and quality of life.

When funds were finally appropriated to complete the 2-mile segment of freeway, the proposed below grade freeway created a new problem of dividing the neighborhood from east from west with a deep canyon. The initial design went through a number of iterations (from a cut and cover tunnel to an 8-block deck to a single park deck). The process was highly politicized and included a major community involvement effort. In order to mitigate the impacts of the freeway, the community wanted the whole segment decked (approximately 8 blocks). But, due to funding limits, only one block was decked and a 4-acre park has been built on top. Mitigating efforts also included the widening of two bridges on either side, with 40 feet of buildable space. The bridges are designed to carry up to 2-story, light-frame structures.

The community is now trying to figure out how to use the buildable area on the two mini decks to help keep a continuous streetscape over the bridges so that the community is knitted together by the freeway instead of further divided. Future plans include transit-oriented development in support of the dedicated transit facilities already earmarked for this area, which would help to transform this area into the center of the community. Some concepts have included an elevator from the at grade transit platform in the center lane of the freeway or sky walks to the corners adjacent the freeway roadbed.

Deck Details:

- 4-acre passive community park deck
- 40-foot mini decks on either side of two bridge overpasses designed to carry up to 2-story light frame structures

Key Results/Lessons Learned:

- Build to full weight capacity. Even though planning and design had not been completed, mini decks were built with intent of putting structures on top to avoid having to redo anything later.
- Use the word mitigation as often as possible. Getting the park deck built was a mitigating factor to the freeway construction. The word mitigation has "legal pregnancy"; the more you can label the work you're doing as mitigation, the better. For this project it meant that Caltrans was obligated to do the work, and they already accepted that something would be built there to mitigate the impact of the freeway.
- Carefully assess air lease rates. The City's redevelopment agency in conjunction with the El Cajon Business Association signed a master lease agreement for the rights to lease and develop the deck. This way, the Caltrans won't have to continually be involved with leasing issues. The bad news is it still has to go through FHWA, which will be a 6-month review process.
- A difficult task is determining what to do in the interim, between when the foundation is complete and when the design is actually built. Caltrans spent $1 million to landscape the mini-decks, although this work may have to be torn up once the planning and design is complete. Might be best to leave it unfinished and save any interim funds for the real deal.
- Need to determine what the potential range of costs is first. In other words, determine what can really be built on top of the mini-decks.

Project Completion Status:

- Park deck and mini-decks completed by 2000
- First community workshop to plan design of mini decks scheduled for June 2001

Project Costs:

- $5 million for bridge widening

Funding Sources:

- $5 million in Federal demonstration funds for bridge widening
- $4.1M TEA-21 grant through SANDAG to do planning and design for bridge mini decks
- State funded technical mitigation of park deck (amount not available)

Contacts:

- Gary Weber, El Cajon Business Improvement Association
  San Diego, California
  619-282-1270

Additional Information:

www.theboulevard.org
www.midtowncenter.org

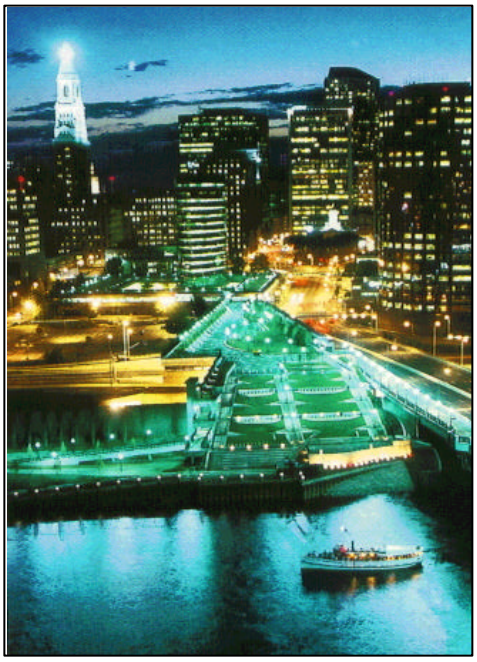
I-91/I-84 Interchange Improvement: Riverfront Plaza and Founders Bridge

Hartford, Connecticut

Description:

The I-84/I-91 Interchange Improvement project, also known as the Riverfront Plaza and Founders Bridge Reconstruction project, was part of an ambitious plan to revitalize Hartford's CBD. The 1981 plan to reconnect the community with the river enabled riverfront development to serve as a catalyst for urban rebirth. Improved pedestrian access to the riverfront and to East Hartford across the Connecticut River was considered essential to this revitalization effort.

Restoration of pedestrian access to the riverfront required lowering the 1-91 southbound viaduct to grade while maintaining traffic flow. This permitted the construction of the elevated 1.5-acre landscaped deck (Riverfront Plaza) that spans 1-91, the railroad, and the flood control walls, and includes a landscaped, platform-supported, terraced structure that steps down to the riverfront. A pedestrian and bicycle pathway over the river was incorporated into the Founders Bridge reconstruction.



Widening the 1,100-foot long Founders Bridge by encapsulating the existing piers facilitated the maintenance of traffic and minimized costly and environmentally disruptive foundation work in the Connecticut River. To widen the bridge, the two existing column pier bents were modified using post-tensioned cantilevered "wings" and the frame was restyled to an arched configuration to provide visual compatibility.

This project has resulted in the transformation of Hartford's riverfront into a national model for urban park systems and has created one of the region's most impressive recreational assets. This project exemplifies the benefits that can accrue to urban communities through the cooperative efforts of multi parties on major transportation related projects. This project restored riverfront access and the historic connection between Connecticut River and Hartford – Connecticut's capital city.

Deck Details:

- 1.5-acre landscaped lid
- Cantilevered bridge extension – 1,100 feet long

Key Results/Lessons Learned:

- Timing the construction of the park deck with needed highway reconstruction created opportunity to build a high quality park and major civic improvements
- The non-profit group Riverfront Recapture, Inc., championed the riverfront revitalization effort since 1981. They learned how to harness power of public/private partnerships to serve as a catalyst for investment and redevelopment.
  - More than $16M in economic activity from events and attractions
  - More than $700M planned development projects adjacent to Plaza, including a convention center, hotel, retail and entertainment center, Science Center, and 400 housing units

Project Completion Status:

- Last of seven structures completed 2000

Project Costs:

- $115 million for the entire I-91/I-84 Interchange Project, including $24.6 million for Riverfront Plaza (decking, terraced lawn, and dock)

Funding Sources

- 22% State of Connecticut Department of Transportation ($5,502,300)
- 62% Federal Highway Administration ($11,349,500, plus $4,000,000 Federal ISTEA Grants)
- 12% US HUD funds ($2,900,000)
- 4% Private money through non-profit Riverfront Recapture, Inc. ($850,000)

Contacts:

- Marc Nicol, Director of Parks Planning and Development
  Hartford, Connecticut
  (860) 713-3131

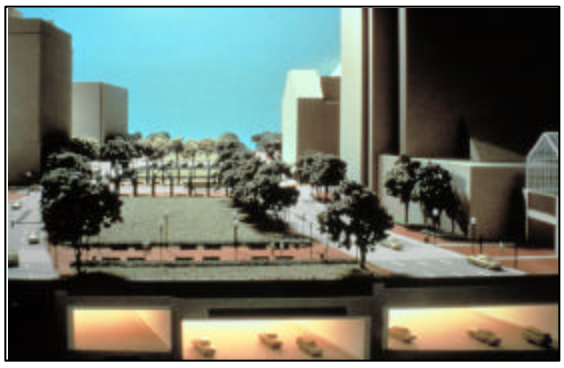
- Jim Connery
  Connecticut Department of Transportation
  (860) 594-2666

Additional Information:

http://www.acec.org/eea/eeaimages/Eeah12.jpg
http://www.acec.org/aceonline/Articles/eeaexcell6.htm
http://www.pps.org/urbanparks/Reprint_CP_text.html
http://www.riverfront.org/
http://www.fwdodge.com/dcp/NYCN/NYbestprojects/NYtopprj-007.html
http://www.dot.state.ct.us/BUREAU/eh/ehcn/road/63-376.htm
http://www.dallasnews.com/entertainment/267380_riverfront_21a.html

I-93: Central Artery/Tunnel

Boston, Massachusetts



Description:

The Central Artery/Tunnel (CA/T) Project, or "Big Dig", provides a solution to Boston's traffic problems and an opportunity to reconnect neighborhoods that were severed by the construction of the Central Artery through downtown Boston.

Currently under construction, the CA/T Project will remove the 1950's elevated, six-lane Central Artery viaduct (I-93) through Boston's CBD, as well as its double-decked Charles River Bridge and a portion of its elevated approaches. It will be replaced with an 8-10 lane underground highway beneath approximately 30 acres of linear park along the Artery corridor. Three quarters of the new corridor space will be designated as open space, with the rest planned for modest buildings. A total of 250 acres in all will be reserved for parks and open space throughout the project area. The CA/T project will also extend the I-90 (Massachusetts Turnpike) from its current terminus south of downtown Boston through Third Harbor Tunnel beneath South Boston and Boston Harbor to Logan Airport. The entire CA/T project spans 7.5 miles of highway.

Planning for the CA/T project began in 1986 and has been under construction since late 1991. The project is anticipated to be finished in 2013, including demolition of the elevated highway and restoration of the surface. The project's primary goals are to mitigate the barrier created by the old elevated highway, reconnect the neighborhoods that were severed by it, and improve the quality of life in the city beyond the confines of the new highway.

The project has created unprecedented opportunities for city building and rebuilding. Four types of development parcels will be available when the project is complete: air rights land, land under viaducts, residual

land adjacent to the highway, and the parcels set aside for tunnel ventilation structures. All of the land is publicly owned, but the city and state have committed to public-private partnerships where appropriate. The 30 acres of developable land in the air rights parcels above the new downtown tunnel are part of a joint development opportunity with state, city, and various private groups to join the downtown with the waterfront, both physically and visually. Proposals for up to six-story buildings, all with ground floor commercial uses are being considered during the planning process. Site preparation of the parcels will be the responsibility of the public sector, although real estate revenues and sales generated by the development could offset a good portion of the cost.

Deck Details:

- 2,900 foot long park covered tunnels

Key Results/Lessons Learned:

- Reconnected neighborhoods and improved accessibility in/out of downtown CBD
- Enhanced scenic aesthetic by providing more than 250 acres of parks and open space
- Provided access to the river by connecting downtown financial district and East Bay with river front
- Improved air quality through reduced traffic congestion

Project Completion Status:

- Completion estimated in 2013

Project Costs:

- $14 billion as of October 2000 (costs for decking project alone not available)

Funding Sources:

- Multiple federal and state agencies – TBD

Contact:

- John Romano
  CA/T
  (617) 951-6531

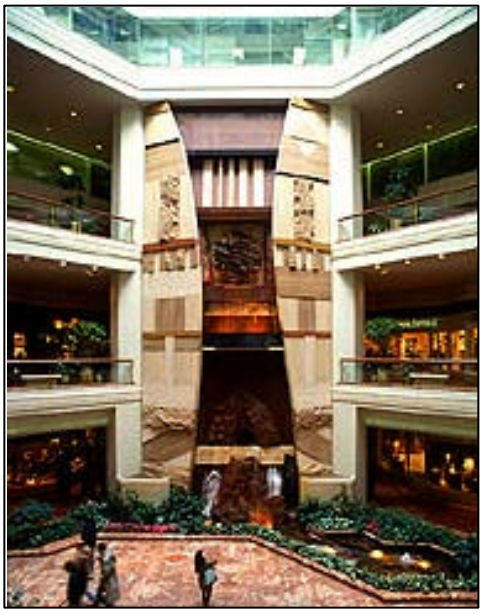
- Allan Hodges, AICP
  Parsons Brinckerhoff
  (617) 960-4890

Additional Information:

http://www.bigdig.com
http://www.mccormack.umb.edu/Publications/IssueBook/caTunnel.html
http://libraries.mit.edu/rotch/artery/
http://www.transdyn.com/HTML/App_Bul/Transporation/BostonCAT/index.htm
http://www.massturnpike.com/links_info.html
http://www.ctps.org/bostonmpo/resources/tip_01_06.pdf

Copley Place and Prudential Center

Boston, Massachusetts



Description:

Prudential Center

This was the first commercial project to reclaim old rail yards and seed the revival of Boston's Back Bay. Located on a 23 acre site between Boylston Street and Huntington Avenue in the heart of Back Bay, Prudential Center is adjacent to Hynes Convention Center, major hotels, shopping and residential areas, and a 2.2 million square foot office and retail complex. The Prudential Center is the largest mixed-use development in New England. Prudential tower has 52 stories and shares a multi-level retail complex of 486,428 square feet, and 2,680 underground parking spaces with the other buildings in the Prudential Center.

Copley Place

Completed in 1984, this office and retail project helped reconnect Boston's oldest neighborhoods in the Back Bay. The entire project comprises 9.5 acres, a portion of which is built on the air rights above the Massachusetts Turnpike, the Copley Square exit, and the railroad tracks. The mall totals 3.7 million square feet. At the time it was built, it was the largest single-phase private development in New England history. It is bound by the Westin Hotel, the Marriott Hotel, and Neiman-Marcus. Passages within connect the hotels with the multi-use complex associated with the Prudential Tower.

Copley Place is the result of a long and carefully executed public process. Tunney Lee, a professor of architecture at MIT, headed a Citizens Review Committee composed of lawyers from the Back Bay, activists from the South End, citywide architects and planners, and concerned local citizens. Questions of circulation, height, density, housing, land use, and design criteria were considered. Thus the developers were legally committed to incorporating the goals of the community in their final design.

The Copley/Prudential complex includes three hotels and a convention center along with office, retail, and residential uses. Along with four other adjacent hotels, one third of the city's hotel rooms are located here. Although it's physically set off from the street on super blocks, the complex does not segregate tourist activity from the city. It is surrounded by attractive neighborhoods and spectacular public spaces that bring visitors out into the streets. It is also heavily used by locals for shopping, eating, and entertainment.

Deck Details:

- A portion of the mixed-use complex at Copley Place is built on top of I-90 (Massachusetts Turnpike) and the rail yards.

Key Results/Lessons Learned:

- Reclaimed old rail yards, reconnected neighborhoods, and spurred revitalization of Boston's Back Bay
- Project is one of the largest mixed use developments in New England
- Public process will have major impact on the design and community benefit of any decking project

Project Completion Status:

- Completed 1984

Project Costs:

- Not available

Funding Sources:

- Not available

Contact:

- Randy Goldstein, Leasor
  Boston Properties
  (617) 236-3301

- Claude Hoops, Leasor
  Prudential Center
  (617) 236-3304

Additional Information:

http://www.iboston.org/buildings/building_index.html
http://www.greatestcities.com/boston/boston-2-a.html

Route 1/93 - CA/NA Project: City Square Park and Tunnel

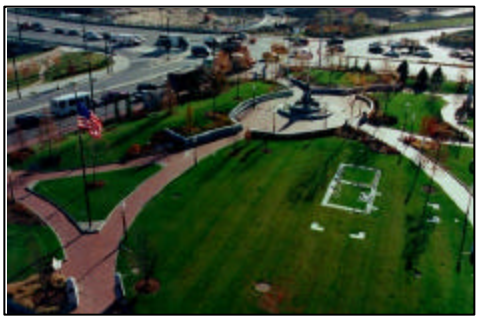
Charlestown, Massachusetts

Description:

The Central Artery/North Area (CA/NA) Project included the construction of new tunnels under Charlestown's City Square and demolition of the existing elevated highway structure that connected the Tobin Bridge to the Central Artery (interchange of Route 93 and 1).

The community participation process for this project concluded with the decision to utilize the newly cleared area for a public park. The 1-acre City Square Park was constructed partly over the tunnels and now provides clear, unobstructed views that have not been enjoyed since the overhead MBTA Orange Line was constructed in the 1950s.

City Square Park is thought of as the promise of the Central Artery/Tunnel Project. By opening the tunnels under City Square Park to traffic that formerly used the elevated ramps between the Tobin Bridge and Route 1/93, Charlestown's link to the waterfront was restored. The park features a sculptured fountain, an open lawn area, seating, a wide variety of trees, shrubs, and seasonal flowers, and an exhibit on the history of City Square. Boston landscape architectural firm, The Halvorson Company, in collaboration with sculptor David Phillips of Somerville, designed the park.



City Square Park is now a landmark that once was overshadowed (literally) by elevated train tracks and highways. The citizen-led group Friends of City Square Park and other residents of Charlestown succeeded in having them removed and replaced with a beautiful public park, which has since played a key role in the area's urban revitalization and residential resurgence. Property assessments, for example, rose by as much as 22% in one year since the completion of the park.

Deck Details:

- 1-acre park deck built over tunnels – part of CA/T Project

Key Results/Lessons Learned:

- Completion of the park reclaimed City Square as Charlestown's civic center and restored its link to the waterfront and its gateway to Boston
- City Square Park has served as catalyst for neighborhood gentrification and has sparked on-going urban revitalization in the surrounding area

Project Completion Status:

- Completed 1998

Project Costs:

- $2 million for construction of the 1-acre park deck ONLY
- $110 million for construction of tunnel and ramp demolition

Funding Sources:

- 60% State of Massachusetts Highway Department (Engineering and Construction Services) and Department of Environmental Management (Design and Project Management)
- 30% Federal funds

Contacts:

- Fred Yalouris
  Director of Surface Restoration for Project
  (617) 951-6400

- David Kruh
  Massachusetts Highway Administration
  (617) 951-6013

Additional Information:

http://www.bryant-engrs.com/projects/citysqr.html
http://www.tiac.net/users/kat/CAT/CITY_SQUARE_PARK_GROUNDBR.html
http://www.justrentals.com/relocating/charlestown.html
http://www.tufts.edu/as/stu-org/observer/1999/december2/town/3.htm
http://www.massturnpike.com/news/news_story.cfm?ID=142
http://boston.citysearch.com/feature/12021/13.html

I-35 Extension: Lake Place and Leif Erickson Park

Duluth, Minnesota

Description:

The I-35 Extension project used decking to bring about a variety of waterfront linkages and community amenities that reconnected downtown Duluth to Lake Superior. It also preserved the city's historic district, integrated the 2.3-mile freeway segment into the rest of the city, improved pedestrian access to the Lake Superior waterfront, and ultimately spawned the revitalization of downtown Duluth.

In 1992, the city completed the construction of four cut and cover tunnels, which added 13 city blocks to Duluth's downtown. The effort saved historic buildings, added the 2-1/2 acre Lake Place Park, restored the Rose Garden at Leif Erickson Park, and created new urban green spaces such as Lakewalk.

The public input process was a key component of the project from the beginning. When the Interstate 35 Extension through downtown Duluth was proposed 30 years ago, local residents feared that it would result in a detrimental separation between the city and its waterfront. As a result, the community organized and through a long public process, ultimately influenced the redesign of the highway. The project is now met with immense local pride.

Lake Place Park and the rose garden at Leif Erickson Park are good examples of green spaces set aside for public use to enhance the connection between the city and its lakeshore. The design also provided a catalyst for restructuring the Duluth-area economy from an industrial to a tourism base. The Leif Erikson Tunnel, which opened in October 1992, has been honored by the Federal Highway Administration and others for its use of cut and cover tunnels, architectural design treatments, and extensive landscaping to integrate the freeway into the surrounding urban environment and create a pleasing driving experience.

A 580 ft. long ceramic tile Image Wall mural on the outside highway wall faces lake level use areas. Consistent with community waterfront themes, it depicts historic marine images and provides additional highlight for lakefront trail visitors. Lake Place continues to accomplish its goals with new adjacent improvements, development, and attractions. More than a dozen adjacent downtown blocks have been revitalized as direct result of this multiple-use highway improvement.

Deck Details:

- Four cut and cover tunnels; total length of all four tunnels is about ¾ mile

Key Results/Lessons Learned:

- Community leadership is extremely important. In this case, the community organized against the initial design of I-35 and ultimately turned a major transportation investment into city renaissance. Millions have been invested in the old warehouse Brewery District since completion of the project. Duluth is now a tourist destination, attracting thousands from the Twin City area during the summer months.
- Freeway and park deck design reconnected downtown with the lakefront, providing access to Lake Superior
- Air quality was ultimately improved, since the tunnels allowed for through traffic through the downtown, reducing the amount of start/stop traffic congestion

Project Completion Status:

- Leif Erickson Tunnel (last of four) completed 1992

Project Costs:

- Costs: $220 million for decks and greenspace
  Example costs:
  - $45 million - rail relocation
  - $3.8 million - Leif Erickson Park, including park restoration, bike/ped path and landscaping
  - $23 million - Leif Erickson Park tunnel (1,480' long)
  - $10 million - Lake Place Park (3 acres)

Funding Sources:

- 90% - Federal funds, primarily from federal and state motor fuel tax (user fees). $74 million came from interstate substitution (I-Sub) funds
- 10% - State funds

Contacts:

- John Bray, District Public Affairs Director
  Minnesota Dept of Transportation
  (218) 723-4802

Additional Information:

http://www.landscapedirect.com/articles/kw/kw1.html
http://www.duluthnews.com/docs/mill/freeway.htm

Interstate 80 Platform

Reno, Nevada

Description:

The freeway deck was built in 1973 concurrent with construction of Interstate 80 through Reno's northern central business district. Since completion, the platform has been unused except for a brief period when it was used for parking. The deck is approximately 76,773 square feet (1.7 acres), including a 66,652 square foot concrete and steel platform and 10,121 square feet of land on either side of the platform that contains the necessary abutments, supports, and access for the platform.

The air rights were initially sold to a private party who built the pad in 1972, with the intention of constructing a platform that would provide the foundation (super-structure) for a multi-story building. Subsequent to the platform's construction, the development plans for the super-structure were terminated and the platform was foreclosed upon. A single-ply membrane roofing was applied to the surface of the concrete deck.

Ownership subsequently went through a number of bankruptcies over the next couple of decades. In 2000, a new owner bought interest in the deck from the previous lessee for $440K and has proposed a 14,976 square foot single-story commercial building to be leased to Walgreen's Drugs. Construction is currently in progress. Because the deck had been left to deteriorate for so many years, substantial repairs had to be made in order to begin construction of the building. The current estimated cost to rehabilitate the pad structure is $1,021,688. While difficult to assess, the initial lease rate of $31K per year has remained through to 2065, when the lease expires. Whereas previously it had been assessed every 5 years.

Deck Details:

- 66,652 square foot concrete and steel platform and 10,121 square feet of land on either side of the platform containing the necessary abutments, supports, and access for the platform

Key Results/Lessons Learned:

- If they knew now what they didn't now then, they may not have agreed to build the deck. It hasn't received much income, nor has it's potential been realized until now (nearly 30 years later).
- Air rights leases can be difficult to assess for fair market value. Good idea to talk with people who have negotiated the process before.

Project Completion Status:

- Deck foundation built in 1972; actual utilization of deck anticipated in 2001

Project Costs:

- Cost of deck – not available; deck rehabilitation of deck $1,021,688
- Current annual airspace lease is $31K

Funding Sources:

- Not available

Contacts:

- George W. Sloss, MAI, Chief Review Appraiser
  Nevada Department of Transportation
  (775) 888-7219

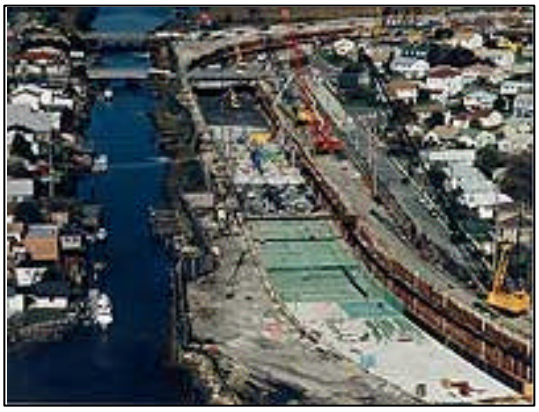
- Paul Saucedo
  Nevada Department of Transportation
  (775) 888-7390

Additional Information:

- Not available

Atlantic City / Brigantine Connector

Atlantic City, New Jersey



Description:

Currently under construction, the 2.2-mile-long Atlantic City/Brigantine Connector will increase the capacity of the transportation network for anticipated casino development in the Marina District and improve ingress and egress for the Atlantic City Convention Center. The project includes a 2,200-foot long cut and cover tunnel including a boat section at either end with pedestrian bridges and a landscaped park on top.

Plans for a connection between the Atlantic City Expressway and the island community of Brigantine have been discussed since the expressway opened in the mid-1960's. Previously, only one link provided access between Brigantine and mainland New Jersey. With the legalization of casino gambling in the late 1970's, heavy traffic has clogged the Brigantine Bridge. A new connection to the Atlantic City Expressway will allow motorists to avoid the congestion in Atlantic City.

The tunnel parallels a canal where the excavation ranged between 10 and 35 feet deep and extended into loose silty sands, 30 feet below the water table. The work included the design of the sheeting, high capacity tiebacks, and a jet grout wale and strut system to support the sheeting at subgrade. Design of the excavation support includes a 45-foot deep pump station.

The project has received the New York Construction News' Best of 2000 Award as the Heavy Construction Project of the Year.

Deck Details:
- 2,200-foot long cut and cover tunnel with park on top

Key Results/Lessons Learned:
- Not available

Project Completion Status:
- Construction began November 1998
- Completion of connector anticipated in Fall 2001

Project Costs:
- $330 Million for entire project (cost of deck alone not available), including $10 Million for park

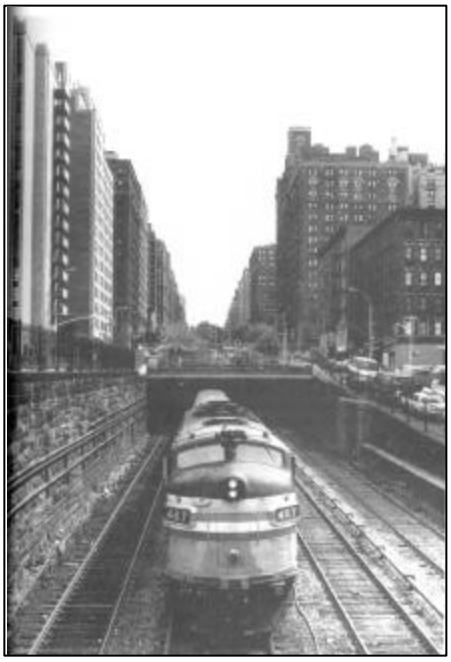
Funding Sources:
- 2/3 State of New Jersey
- 1/3 Private Funds

Contacts:
- Randy Merrill
  Parsons Brinckerhoff
  Atlantic City, New Jersey
  (609) 348-6600

Additional Information:
http://www.mrce.com/pages/projects/00-3.shtml
http://www.fwdodge.com/dcp/NYCN/NYBestProjects/Bestof2000/2000AtlanticCityBC.html
http://www.shorecast.com/html/Features/ScFeatures/AcRedevelp.html

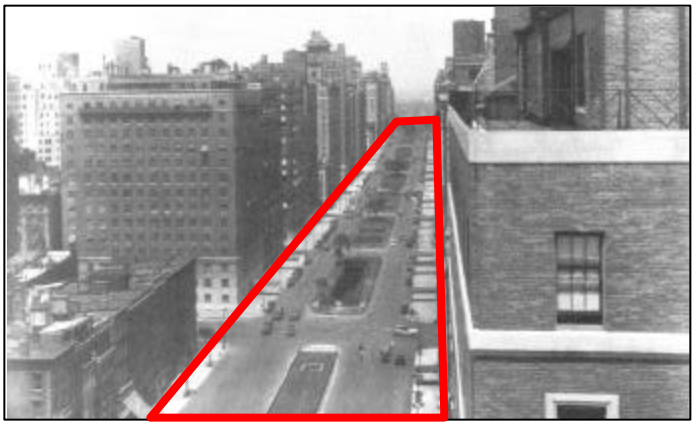
Park Avenue

New York, New York



Description:

Built above the rail yards in the 1930s, this deck changed a grimy 4th Avenue into a posh boulevard, which is now lined with housing, retail, and office space. Moreover, the entire New York Subway system was basically a cut and cover project, and the immeasurable benefits speak for itself.



Deck Details:

- Deck above rail yards

Key Results/Lessons Learned:

- Not available

Project Completion Status:

- Completed 1930s

Project Costs:

- Not available

Funding Sources:

- Not available

Contacts:

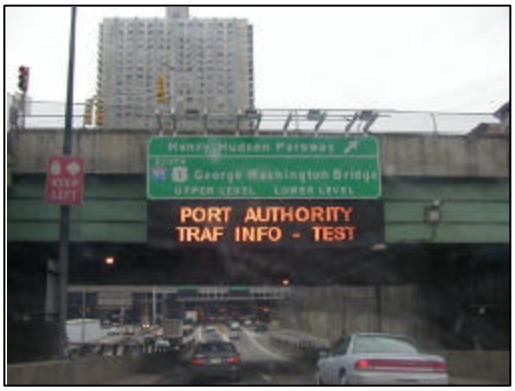
- Not available

Additional Information:

- Not available

Trans-Manhattan Expressway & George Washington Bridge

New York, New York



Description:

The Trans-Manhattan Expressway, which passes through the Washington Heights section of upper Manhattan, connects the Cross Bronx Expressway with the George Washington Bridge. It was the first expressway to be built across Manhattan.

Originally planned in 1955 as an open-cut design, the Trans-Manhattan Expressway is one of the few examples in New York City, and one of the earliest in the United States, where air rights over major highways are used. Upon completion of the expressway in 1962, the Port Authority Bridge Plaza bus terminal (which serves North Jersey communities via the George Washington Bridge) and apartment buildings opened above the expressway.

Originally constructed as a two-lane bypass, the expressway now carries more than 250,000 vehicles per day on its 12 lanes of roadway. The original 178th Street and 179th Street tunnels were designed in traditional Moses-style, utilizing stone-faced arch portals and "Whitestone" lightposts. Viaducts with single circular supports that connected the tunnels with the Washington (Heights) Bridge are still in use today.

Deck Details:

- Cut and cover expressway, with apartments and bus terminal built on top

Key Results/Lessons Learned:

- Cut and cover construction can easily accommodate multi-story buildings over the tunnel, with the potential for leveraging the costs of freeway construction

Project Completion Status:

- Expressway completed 1962

Project Costs:

- Not available

Funding Sources:

- Not available

Contacts:

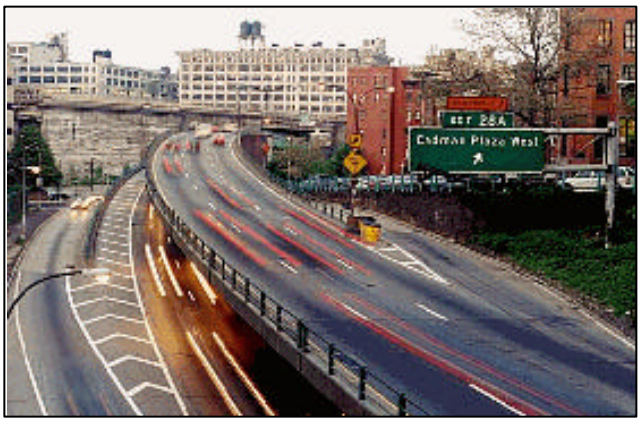
- Not available

Additional Information:

http://www.duke.edu/%7emjt7/gwb.html
http://www.nycroads.com/roads/trans-manhattan/

I-278: Brooklyn-Queens Expressway Promenade

New York, New York



Description:

The Brooklyn-Queens Expressway (BQE) is located parallel to the waterfront of the East River, immediately south of the Brooklyn Bridge. It was built in 1947-48, and was later designated as the I-278.

The initial plan was proposed as a 6-lane, open cut freeway directly bisecting Brooklyn Heights. But the plan was not popular with the public. Instead, the local community developed their own Citizen Alternative Plan, which included a 6-lane, 2 to 3 deck cantilevered structure that hugs the edge of the ridge along the edge of the Brooklyn Heights neighborhood, with a park deck built on top. The community's plan was forced upon Robert Moses, who accepted the community alternative design upon the condition that the park on the promenade deck that was proposed by the neighborhood groups for private gardens, would be open to the public.

Dramatically cantilevered over the BQE, the eight-block-long promenade parallels the East River and has an unimpeded view of the skyscrapers of Manhattan. At night, when the skyline is ablaze with light, the view is truly spectacular.

Between 2001 and 2004, studies will be undertaken for rehabilitation alternatives on the cantilevered section of the BQE through Brooklyn Heights. $11.6 million has been allocated for this work.

Deck Details:

- 8-block-long cantilevered deck with public promenade

Key Results/Lessons Learned:

- Through public pressure, communities can impact the design or redesign of freeways, and ultimately improve their quality of life through the public funds invested for improved transportation infrastructure

Project Completion Status:

- Completed in 1948

Project Costs:

- Not available for construction of cantilevered deck and promenade
- $11.6 million allocated to study rehabilitation alternatives for the deck

Funding Sources:

- Not available

Contacts:

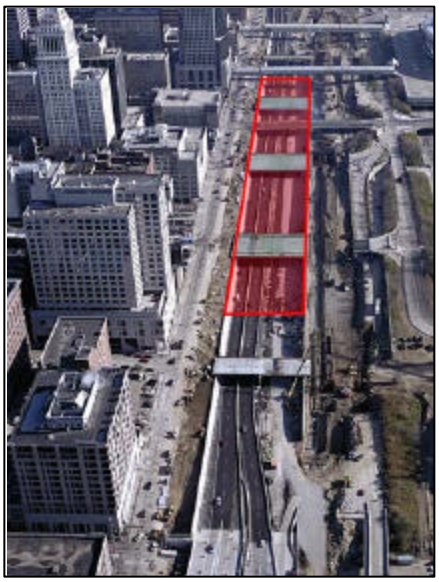
- Not available

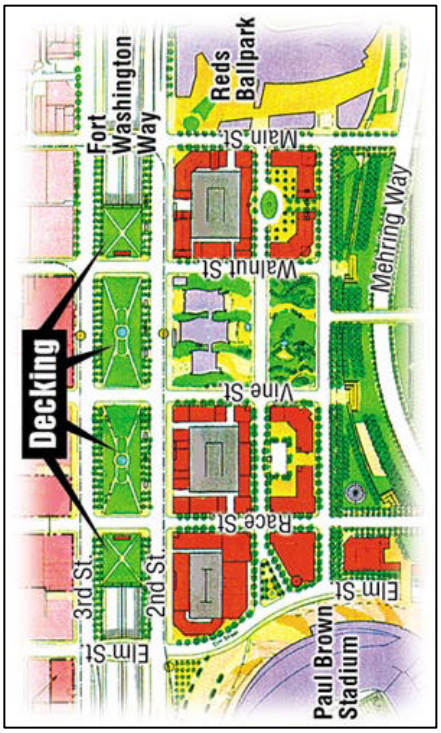
Additional Information:

http://www.nycroads.com/roads/brooklyn-queens/

I-71: Fort Washington Way

Cincinnati, Ohio





Description:

Built between 1959 and 1963, Fort Washington Way (FWW) was originally constructed as a downtown distributor, linking the Central Business District (CBD) via I-71 to the Brent Spence Bridge (I-75) Ohio River crossing. By the 1990s, the urban expressway had become functionally obsolete carrying almost twice the original traffic volume it was initially designed for, resulting in heavy congestion, traffic safety hazards, and physical deterioration. It also created a major barrier from the downtown to the riverfront.

Reconstruction of the FWW began in 1998. Some of the project's key goals were to: improve traffic flow, safety, and access on I-71; accommodate future construction of mass transit; reclaim roadway for future riverfront development; improve CBD access to the riverfront; and improve connections to new cultural facilities such as the new Paul Brown Stadium through better use of existing bridges.

The objective was to narrow the expressway from two 400' wide lanes in either direction to four 180' wide lanes each way. City and community groups realized that to maximize the economic potential of the Riverfront Redevelopment (including two new stadiums), connecting the CBD to the banks was critical to its success. Timing of the I-71 reconstruction played a key role in making the deck construction possible. The Riverfront Advisors spearheaded the effort, as their vision for the "Banks" would not be fulfilled without better connections and access to the riverfront. Foundation was laid for two half and two full decks across FWW, spanning 400 feet wide and 185 feet long.

The City now has plans to build two mini decks and two full decks, over the newly reconstructed FWW as part of an effort to increase pedestrian connectivity from the CBD to the Riverfront. Three rows of pilings spanning 5 city blocks were installed in February – August 2000, while major reconstruction of the expressway was still underway. The City is now gathering ideas from the public about what should be built on top of the decks (i.e., pedestrian plazas, parks, open space). Air rights will only become an issue if and when private development is considered. The decks will be built in-between five newly (re)constructed overpass bridges, with 25-foot gaps separating each structure for air intake. An exhaust system will be required to mitigate emissions from inside the decks.

Deck Details:

- Two full and 2 mini decks, when completed

Key Results/Lessons Learned:

- The idea of decking the freeway had been kicked around for years prior to the reconstruction of FWW. While initially left out of the final design due to lack of funding, the concept was resurrected during the construction phase, since much of the costs could be absorbed by the construction and traffic mitigation measures already underway. Building in tandem with the FWW Reconstruction project saved major costs, such as traffic control, etc.
- Having a project champion was key to getting the pilings installed for the deck foundation. The Riverfront Advisors worked with the City to raise $10 million to lay the foundation for the decks.
- Ventilation costs may be avoided depending on the design. In this case two half decks and two full decks are proposed to be built in between the five existing bridges, with 25 foot gaps between the landscaped buffer of the bridges and the edge of the decks to allow for air intake.

Project Completion Status:

- Construction of pilings (foundation) 1999. Completion of decks estimated in 2005 when development south of the expressway is complete.

Project Costs:

- $10 million for deck foundation (pilings only). Costs associated with the reconstruction of FWW are not included. An estimated $39 - 46 million is required to complete the decks (total tunnel length of about 1,200ft) and another $12 million for landscaping. An estimated $14 million was saved by driving the piles before reconstruction of FWW was complete.

Funding Sources:

- 60% ($6M) - City of Cincinnati, general fund
- 20% ($2M) - Hamilton County
- 20% ($2M) - Private (Cincinnati Business Committee), including $250K from the Bangles

Contacts:

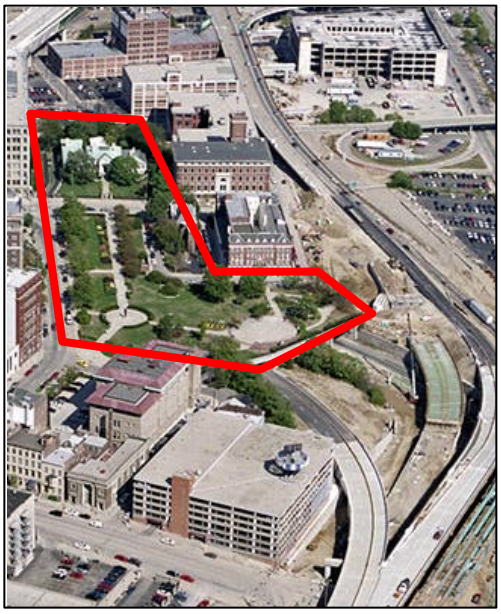
- Jeff Wallace, Construction Services Division
  Parsons Brinckerhoff – Ohio
  513-639-2100
- Mark McPhillips
  Ohio Dept of Transportation
  514-352-5270

Additional Information:

http://www.fww2000.com/
http://www.riverfrontplanning.org
http://www.rcc.org/news-parkplaza-20010123.html
http://web.utk.edu/~snake1/tunnels
http://www.cinci-parks.org/parks/pdf/lytle_park.pdf

I-71: Lytle Park

Cincinnati, Ohio



Description:

The 2.31-acre Lytle Park sits on top of a cut-and-cover tunnel, which was built in 1970 to link I-71 with FWW. Features of the park include a statue of Abraham Lincoln and a monument dedicated to the U.S. Marine Corp.

The tunnel is approximately 1,100 feet long. Its ventilation system is limited to a single set of ceiling intakes in the middle of the tunnel. Exhaust is removed with fans made of simple grates in the sidewalks above.

Deck Details:

- 2.31 acre park on top of a cut and cover tunnel

Key Results/Lessons Learned:

- Innovative freeway design solutions can minimize the negative impacts of construction and provide valuable and long lasting civic amenities

Project Completion Status:

- Completed in 1970

Project Costs:

- Not available

Funding Sources:

- Primarily (90%) private funds

Contacts:

- Dave Prather, City Parks Dept.
  City of Cincinnati
  513-421-4085

Additional Information:

http://www.cinci-parks.org/parks/text/lytle.html
http://www.rcc.org/cplanning/guidelines/lytleprk.htm
http://web.utk.edu/~snake1/tunnels/lytle.html
http://www.downtowncincinnati.com/pedestrian.html
http://www.cincinnati-transit.net/lytle.htm

Commerce Square

Philadelphia, Pennsylvania

Description:

Though not technically a decking project, the central courtyard at Commerce Square creates a unique gathering place in Center City Philadelphia, on top of an underground parking garage. An arched entrance leads pedestrians through an open facade and into the landscaped courtyard between twin towers. Setbacks on the towers allow sunlight to come into the courtyard in all seasons, and honey locust trees form a pattern of light over cafe seating adjacent to the buildings. In the center of the courtyard, two large planters with shrubs and flowering plants surround a fountain. At night, a dramatic column of light rises from the center of the fountain, while indirect lighting illuminates the planting, the walkways and the office towers.

Extensive planning was required to create a continuous tree planter of soil averaging more than six feet in depth above the garage. Appropriate irrigation, underdrainage, and support structures were developed to accommodate not only the planters and fountain, but also the granite paving, which were carefully designed not to inhibit tree growth. Innovative construction details were developed to provide optimum growing conditions for the plant material and close coordination between the landscape architects, architects, engineers, and other consultants was required.

Deck Details:

- Park deck and plaza built on top of a parking garage

Key Results/Lessons Learned:

- Restoring the connection between and throughout neighborhoods can be achieved through good, conscientious, and innovative design ideas that maximize bike and pedestrian connectivity.

Project Completion Status:

- 1992

Project Costs/Funding:

- Not available

Contacts:

- Not available

Additional Information:

- Not available

I-66 Extension: Gateway Park

Rosslyn, Virginia

Description:

The 9.6-mile extension of I-66 from the I-495 Capital Beltway to the Theodore Roosevelt Bridge (Potomac River) includes a 900-foot cut-and-cover tunnel that was built beneath a new 3.7-acre park in the city of Rosslyn, Virginia.

The Virginia Highway Department's original 1956 plan for this freeway called for an at-grade highway with an ivy-covered chain link fence to separate the neighborhoods from the Interstate. One location of the proposed plan was wide enough to accommodate 14 lanes for interchanges and highway ramps.

Opponents of the proposed 8-lane highway succeeded in having the project redesigned into a Multi-modal Transportation Corridor consisting of a 4-lane highway with 6 miles of rapid rail transit line in the median. More than half of the corridor was built below grade, in order to minimize community impacts. Bicycle and pedestrian trails follow most of the highway's right-of-way, and thousands of feet of sound barriers were constructed to alleviate noise impacts to the community.

This project demonstrates the power of public involvement. The Virginia Highway Department wanted an 8-lane expressway, while residents along the proposed route did not want a highway at all. The result was a compromise and one of the most innovative highways in American History.

Deck Details:

- 900-foot cut and cover tunnel with a park deck on top

Key Results/Lessons Learned:

- Through public pressure, communities can impact the design or redesign of freeways, and ultimately improve their quality of life through the public funds invested for improved transportation infrastructure. In this case, the city of Rosslyn got nearly 4 more acres of park space added to the system.

Project Completion Status:

- Completed 1982

Project Costs/Funding Sources:

- $280 million for entire project ($28.6 million/mile) – funds for park deck only not available

Contacts:

- Not available

Additional Information:

http://www.richmond.infi.net/~kozelsm/Int66_MetroViennaRte.html
http://www.angelfire.com/va2/Route66/Background.html

I-90 Completion Project

Mercer Island, Washington

Description:

The Interstate 90 Completion Project includes two landscaped lids on either end of a 7-mile stretch of freeway from Seattle to Mercer Island. The lids cover about 20 percent of the project's length and account for 28 acres of park land that help reunite the neighborhoods that had been torn apart by freeway construction decades ago.

Both park decks are distinctly linear and are organized around pedestrian/bike trails. The park created on top of the Seattle deck has a ventilation smokestack that looks like a modernist Mayan-like sculpture. Access to the park is easy - residents can enter at many places. An elementary school now exists on a large, adjacent deck, and when standing at grade, the freeway is nearly invisible. The Seattle deck reunited a neighborhood that began to be revitalized as WashDOT resold condemned houses and renovated some into affordable housing.

The Mercer Island deck features a 12-mile bike path lined by grass fields, which connects several sports fields and play meadows. A concrete wall that rises as high as 40 feet at the freeway's edge provides a noise barrier to the freeway traffic, yet some consider it a compromise to the island's rural character. The ventilation tunnel stacks are architecturally integrated into the design of the park, and the retaining walls are sculpted and painted neutral beige. The lid includes 13 9-foot-diameter exhaust fans and 3,800 lights.

The decking design is not only one of form, but of functionality. As a major interstate highway, I-90 had to allow a wide variety of trucking activity, including HAZMAT. Therefore, the I-90 Mercer Island Tunnels were designed and constructed with a state of the art ventilation and fire suppression system. Mobilized citizen concern made it politically impossible for highway planning authorities to shorten or delete the park-covered cut and cover tunnel sections or replace them with uncovered, up-encased highway.

Deck Details:

- Two landscaped decks with approximately 28 acre of park on top

Key Results/Lessons Learned:

- Not available

Project Completion Status:

- 1971-1985

Project Costs:

- $1.6 billion for entire project (about $225 million per mile)
- $300 million for parks ($300/sqft)

Funding Sources:

- 90% - Federal funds
- 10% - Other

Contacts:

- Pete Mayer, Director
  Mercer Island City Parks Dept.
  206-236-3545

Additional Information:

http://arts.endow.God/pub/Design95/pda/inter.htm
http://www.donnaonat.com/mercerisland.htm
http://www.wilsa.org/driving.htm

I-5: Freeway Park

Seattle, Washington

Description:

Built on one of the freeway overpasses of Interstate 5 between 6th and 9th Avenues, Freeway Park is a 5-acre oasis in the center of downtown Seattle. Its waterfalls and fountains mute the roar of the eight-lane freeway below and its landscaping provides a green respite and pedestrian connection between neighborhoods that were cut off from each other when I-5 was built in the 1960s.

Plans to deck the below-grade portion of I-5 that separated First Hill from downtown Seattle were first discussed by citizens and city, county, and state officials as early as 1966, when the freeway was completed. Air and noise pollution along the freeway had caused adjacent property values to plummet and new development ceased. Concerned citizens considered covering I-5 with a bridge to restore vitality to Seattle's downtown.

Freeway Park grew out of overlapping objectives - the city's need for a municipal parking garage and a developer's interest to construct a 21-story building. The completed complex includes two bridges covering more than 400 feet of freeway, a 630-car public parking garage, the park itself, and the 21-story Park Place building. Construction of the project began in February of 1974 and was completed in 1976. It was the first of its kind in which a mutual interest among diverse parties brought together a sizeable investment of capital. The project was a cooperative effort between the City of Seattle, the Federal Highway Commission, the State Highway Department, and public-spirited citizenry. The joint partnership produced benefits for all parties at minimal costs. Blighted land along the corridor and airspace above the freeway later became available for future park development, including the Pigott Memorial Corridor (1984) and the Washington State Convention and Trade Center (1992).

Deck Details:

- 5-acre park deck covering I-5

Key Results/Lessons Learned:

- Park provides a passive space for residents, shoppers, downtown office workers, and visitors to enjoy while adding value to the Park Place building, which ultimately increases property tax revenues.
- The municipal parking garage benefits from its link with the park as well as to the re-establishment of pedestrian access between First Hill and downtown.

Project Completion Status:

- Completed 1976

Project Costs:

- $23 million

Funding Sources (total public investment = $13.8 million):

- 25% ($5.5 million for decks) - Federal Highway Administration and State Funds (Washington DOT)
- 18% ($4.2 million for municipal parking garage) – City of Seattle (Councilmanic Bonds and Bond Interest)
- 18% ($4.1 million for parks) – King County-Approved Forward Thrust Park Bonds ($2.8 million), CBDG funds ($340K), municipal and interstate highway funds ($240K), Metro ($19K), HUD Open Space ($209K), Interagency Outdoor Recreation ($424K), and American Legion ($35K)
- 39% ($9 million for Park Place building) – Private developers

Contacts:

- City of Seattle Parks & Recreation Dept.
  206-684-4075

Additional Information:

http://www.dkassociates.com/plan/3.html
http://www.greatbuildings.com/buildings/Freeway_Park.html
http://www.seattletimes.com/news/lifestyles/html98/altmark_19990425.html
http://members.cruzio.com/~cmssc/main.htm
http://www.dallasnews.com/entertainment/267380_riverfront_21a.html

I-5: Washington State Convention and Trade Center

Seattle, Washington

Description:

In the 1960's, Seattle was severed by a twelve lane depressed freeway with on/off ramps and overpasses built through its center. Important urban transportation corridors - Seventh and Eighth Avenues, and University and Union Streets -- were severed by the construction of Interstate-5, disrupting the city's pedestrian links between the residential community and downtown. The Washington State Convention and Trade Center project is one of three lids that span across I-5, serving to reconnect the neighborhoods on either side of the freeway.

The tunnel under the convention center has variable lighting controlled by photocells, which adjusts to match the surrounding conditions. The cells control circuits that activate more lights on brighter days to reduce the contrast for drivers when entering the tunnel. Studies were done to determine the proper levels of illumination required during certain times of day, and minimum lengths for the transition zones. Washington's tunnel-lighting policy of using transitional zones at tunnel entrances, and less than full light farther inside, provides adequate illumination levels and is safe.

Plans to expand the Convention Center are currently underway, including the doubling of its exhibition space to 207,000 square feet by building across Pike Street. A connecting ninety-foot wide glass exhibition bridge will be a unique feature that frames views to Elliot Bay and the historic Pike-Pine neighborhood. Two loading docks, escalator banks, and pre-function areas will allow the space to serve two independent 100,000 sqft trade shows.

To fund the expansion and activate the new district, the project includes development partners that are constructing the 450 room Elliott Hotel, a public parking garage with 990 spaces and the 18 story One Convention Place office tower. The new 120,000 SF Museum of History and Industry will join the district's celebrated performing arts theaters: Paramount, ACT and 5th Avenue.

Deck Details:

- Using variable lighting controls in the tunnel will save thousands of dollars as opposed to having them lit at full intensity.

Key Results/Lessons Learned:

- Using variable lighting controls in the tunnel will save thousands of dollars as opposed to having them lit at full intensity.
- The 665-space Freeway Park Parking Garage is operated by the Convention Center, which provides much needed parking during events as well as a source of revenue for the City.
- Expansion of the Convention Center will add to the City's 24-hour a day urban activity, and the block-long glass canopy on Pike Street will create a new district with artworks, outdoor seating, cafes, restaurants and entertainment.

Project Completion Status:

- Freeway lid and original facility completed 1992; expansion of Convention Center scheduled for Summer 2001

Project Costs:

- $191 million for original deck

Funding Sources:

- Not available

Contacts:

- Washington State Convention and Trade Center
  206-694-5000

Additional Information:

http://www.wsctc.com/
http://seattlep-i.nwsource.com/local/get312.shtml

The Portals

Washington D.C.

Description:

The Portals is a mixed-use development project built over a rail line in Washington D.C., just blocks from the Capital. The goal of the project was to extend Maryland Avenue and build an urban park and central plaza on top of the deck. While it was designed to help spawn development in the surrounding area, it was not (at least primarily) part of a greater neighborhood strategy plan.

The deck covers several blocks of railway and is approximately 160 feet wide (width of the avenue's right of way). It is open on both sides, allowing for ventilation of the rail line below, and is constructed to absorb the vibration and noise of the trains. When on top of the deck, both are unnoticeable.

The deck was built to support significant soil depths in certain areas. Landscaping included 4 to 7 foot trees, shrubs under 3 feet, and 18-inch vegetation in lawn areas.

Planning for the Portals began in 1988, and construction of the public improvement portions was completed by 1990. The project was funded almost entirely by the developer, Republic Properties, although land was provided by the City at a reduced cost. Planning for this project did not include a community involvement process.

Deck Details:

- 160 feet wide

Key Results / Lessons Learned:

- The most significant problems encountered during the project involved running into utilities during construction and safety issues for the contractors working over the rail line. Rail maintenance and air rights over the line were also a challenge.

Project Completion Status:

- Completed in 1990

Project Costs:

- $20 million for the public space improvements
- $1 billion for construction of adjacent buildings

Funding Sources:

- 100% private funding from developer

Contacts:

- Not available

Additional Information:

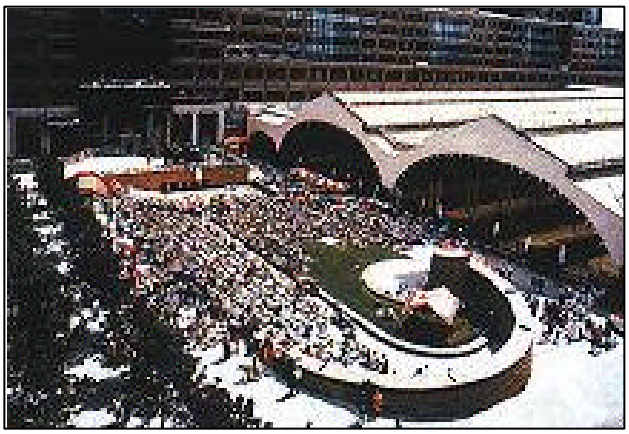
- Not available

OTHER SAMPLE DECKING PROJECTS

The following project descriptions represent examples of decking projects outside of the United States where communities have found ways to connect or reconnect neighborhoods that would otherwise be split apart by a freeway, water body, rail line, etc. Examples date back as early as 1639, when the Pont Au Change was built across the Seine to connect the Right Bank to the Ile de la Cite in France.

Bishopsgate

London, England



Description:

The Bishopsgate project is a prominent commercial/urban development in London's financial district. Located adjacent to the Liverpool Street Rail Station above rail yards and adjacent to the Broadgate development, the Bishopsgate creates a series of interconnected yet distinct exterior public spaces related to the buildings and reflecting the rich historic context of the site.

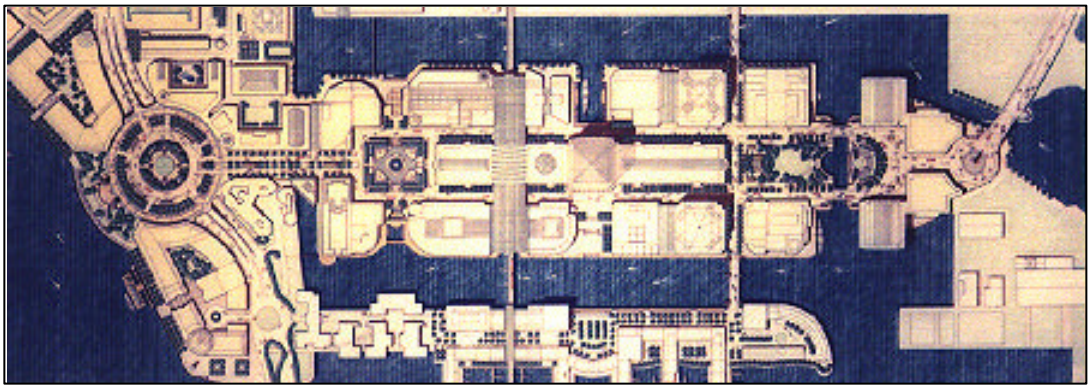
Significant elements of the project included a large, richly planted public square, a fountain, kiosks, artwork, and a handsome stone amphitheater for events and performances. The Bishopsgate roadway is a major regional bus stop and was transformed into a large public room, furnished with stone benches and shelters for commuters, obelisks, railings, and new pavements.

Additional Information:

- Not available

Canary Wharf – London Dockyards

London, England



Description:

This mixed use development project revitalized 71 acres at the site of the West India Maritime Shipping Facilities docks. Over 10,000,000 square feet of office space designed specifically for the expansion of the financial services sector were set within a strongly articulated public realm. A sequence of public spaces were developed that were integral with the project architecture and infrastructure. Urban squares, courtyards, boulevards, and esplanades are located over occupied space, which required the development of innovative construction and planting technologies for the creation of "established" landscapes with semi-mature plant materials. Growth support systems were designed to promote longevity of the trees in a stressful environment caused by limited root space, restricted water and drainage, high winds, and prolonged shade created by adjacent buildings.

Additional Information:

- Not available

Pont Au Change

Paris, France

Description:

In 1639, the Pont Au Change was built across the Seine from the Right Bank to the Ile de la Cite to replace the Grand Pont. It featured houses that had shops at ground level opening onto a central street with balconies on the river facades, kitchens above the shops, three upper floors and an attic on the fourth. An edict of 1786 ordered the houses to be demolished.

Additional Information:

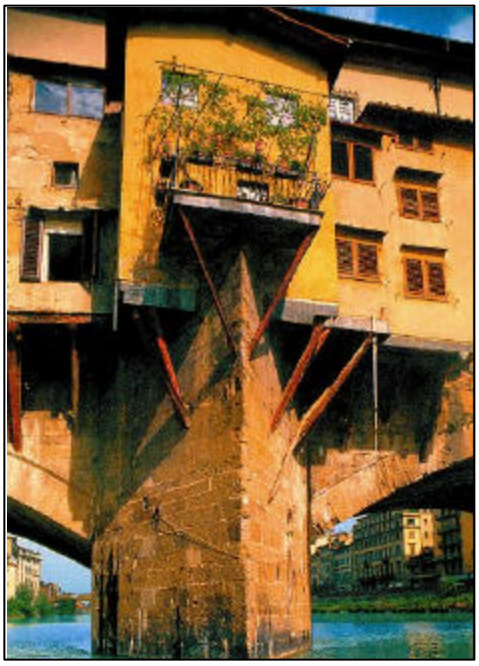
- Not available

Ponte Vecchio

Florence, Italy

Description:

Built on the River Arno in Florence, Italy, the Ponte Vecchio is one of the oldest examples of a connection between two neighborhoods. The bridge has supported churches, homes, vegetable markets, and shops for more than four centuries.



Additional Information:

http://library.thinkquest.org/2838/flnc2000.htm

Amadora Central Station

Amadora, Portugal

Description:

This project proposes the restructuring of the central train station in Amadora, Portugal, by capping over a section of the railroad, whereby augmenting the commercial and service industries facilities of the city. The central idea of the project is to create three large urban spaces, which are highly integrated within the city itself.

The city of Amadora lacks a defined urban center because of the barrier created by the railroad line itself, which divides the city into two parts. The design proposes the construction of a platform above the rail line, which would provide pedestrian access through a system of ramps and escalators. On the cap would be a series of landscaped and paved public spaces for important public functions.

The plan includes a shopping center that includes an arcade of shops, and a multi-level parking facility that is easily accessed from the bordering streets. A hanging garden becomes an integral part of the entire urban system.

Additional Information:

- Not available

Moll De La Fusta

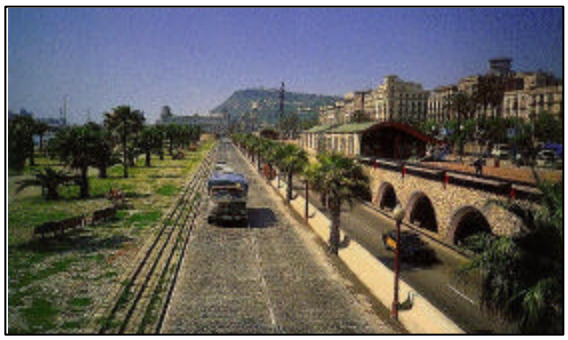
Barcelona, Spain

Description:

The Moll De La Fusta is located at the edge of Barcelona's historic city where it meets the sea. The Moll is a one-kilometer long garden platform used for recreation, festivals, and celebrations. The purpose of the project was to combine open space and transportation. The project reconfigures traffic patterns, converts obsolete wharf operations to open space, and provides the city with views to the sea.

The scope of the project involved the partial depression of one of the central quays stretching from Montijuic to the Barceloneta. This allowed for large traffic volumes to pass through the corridor, which is one of the densest urban seafronts on the Mediterranean. The decked platform (about 140 meters in length) is organized in three distinct units, which are visually and functionally interrelated:

1. The Salon de Colon is a 35-meter wide waiting and crossing zone that connects to city buildings.
2. The balcony above the harbor is a 25-meter wide place for rest and observation zone. The balconies were planned high enough to provide views of the water above traffic on the coastal street. Open, sunny rest areas along the balconies are dotted with cafes and music stands. From the balcony, three pedestrian bridges cross the avenue leading to the Moll. An underground parking garage is located below the balcony.
3. The Moll platform is a 65-meter wide platform used for festivals and celebrations, which also provide direct access to the water and ships. Heavy transport traffic uses the below grade freeway, leaving only light vehicles and public transportation on the surface street.



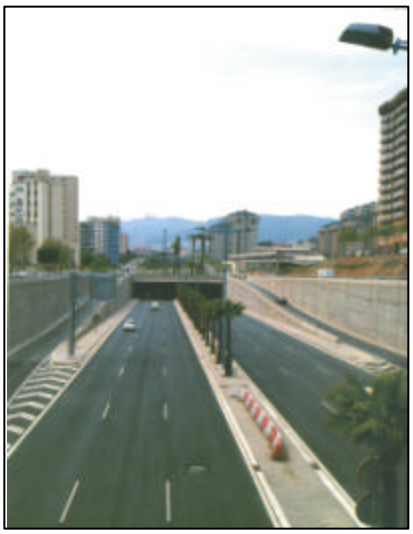
The project started in 1981 and was completed in 1987. Between 1987 and 1992, other spin-off street and open space connections were developed at both ends of the project. It was largely built exactly as designed and has been considered a huge success. The project cost about $900 million pesetas to build ($6 million in 1998 U.S. dollars), and those costs were shared among the local and regional authorities. Uses on the cap include open spaces, ramblas, cafes, promenades, and music stands, and other shelters.

Additional Information:

http://library.thinkquest.org/2838/flnc2000.htm

Ronda De Dalt

Barcelona, Spain



Description:

The Ronda De Dalt in Barcelona is an approximately 31 kilometer ring road that connects neighborhoods along its route with structural coverings that provide parks, play spaces, parking and pedestrian linkages over the depressed freeway. Built in response to the, at that time, forthcoming 1992 Summer Olympics, the Ronda De Dalt embodied the latest Spanish engineering, architecture and urban design. It is similar in width, depth and context to I-405.

Additional Information:

- Not available

N6 Motorway

Berne, Switzerland

Description:

The City of Berne, Switzerland, used the decking concept to comply with a 1987 noise abatement regulation. The deck covers 250 meters of the N6 Motorway in Berne. Funds for building a park on the deck were approved in 1991.

Additional Information:

- Not available

Anhangabau Valley Park

Sao Paolo, Brazil

Description:

Completed in 1991, this project was designed to mitigate traffic problems ease conflicts between cars and pedestrians, and restore the original character of the area. The project involved the construction of a 490-meter underground tunnel for traffic, so that the area above could be better for pedestrians in the area. The station descends down a steep hillside, with the entrance in a small park. The actual subway line is underneath a highway tunnel.

Additional Information:

- Not available

LIST OF PROPOSED FREEWAY DECKING PROJECTS IN THE UNITED STATES

The following list of freeway decking projects have been proposed but are not yet built, either because the projects are still being hotly debated (i.e., Pasadena I-710 Extension) or are still in the design phase (i.e., Vail, Colorado). Yet, even projects that have not yet been built can provide us with "lessons to learn from" in that their proposals for freeway decking may offer creative solutions to tough pedestrian connectivity issues. For further information about these projects, see web links below (when available).

SR-178 Extension from M Street to SR-99
Bakersfield, California

- This proposal includes a decking structure and is being promoted to provide a freeway facility in an environmentally sensitive manner in an existing built up area.

Liberty Project
La Canada Flintridge, California

- This proposal would provide approximately 65 acres of park and recreational land in the heart of the City, above the freeway.
- http://www.golct.com/LIBERT.HTM

I-710 Extension
Pasadena, California

- The latest version of this controversial project includes a number of covered decks, featuring areas where the existing historic houses will be moved and replaced on top the decks.

Freeway Decking Project
Glenwood Springs, Colorado

- This project is already in design stage and includes a park deck over the freeway.

Freeway Decking Project
Vail, Colorado

- This decking project has been designed and funded, but not yet built.
- http://www.clr.utoronto.ca/ARCHIVES/HMAIL/larchl94/0158.html

I-95: Haven Harbor Access Feasibility Study
New Haven, Connecticut

- This project proposed a 350-foot and a 500-foot deck to improve pedestrian access to waterfront.
- www.state.ct.us/dot/bureau/pp/docs/envir/nhh/nhhesview.htm

Uptown Transit Study
Cincinnati, Ohio

- This study included the option of light rail transit and a deck above the roadway. Contact:
- http://www.cincylightrail.org/process.html

Gowanus I-278 Expressway Tunnel
Brooklyn, New York

- This project proposes a tunnel replacement for the existing, primarily elevated Gowanus Expressway.
- http://brooklyn.miningco.com/library/weekly/aa042699.htm?terms=New+York+roads&COB=home

Miller Highway Project
Manhattan, New York

- This project proposal features a park-covered highway, with a sloping (6% grade) promenade on top of a highway, adjacent to a tunnel portal.
- www.pb4d.com/projects/highways/miller/maerials/maerials.htm

Mt. Hood Parkway
Gresham, Oregon

- The Oregon Department of Transportation evaluated alternatives to cap portions of the Mt. Hood Parkway in response to concerns about the parkway's noise, visual, economic, and environmental impacts. The proposed construction of six lids would cost approximately $290 million, with an additional $10 million in maintenance fees.

I-405 Capping Project
Portland, Oregon

- The "Bridge the Divide and Cap I-405 Vision Study" details concepts of how to recapture some of the 38 blocks bulldozed in 1965 for the construction of the open cut 6 lane I-405 freeway. The project would reclaim 26 downtown blocks in what is currently vacant air space over the I-405 freeway.
- http://www.aslaoregon.org/centennl/405.html
- http://www.asla.org/centennial/OR_I405C.htm
- http://www.oregonlive.com/todaysnews/9807/st070309.html
- http://www.ci.portland.or.us/mayor/press/I405rpt.htm
- http://local.portland.citysearch.com/story/990405katz.html

Freeway Decking Project
Medina, Washington

- Decking project proposed; no information available.

I-395 Third Street Tunnel (originally named the I-95 Center Leg)
Washington, D.C

- Decking project proposed; no information available.

APPENDIX A.2

INTERNET LINKS TO HIGHWAY AND CAP RELATED INFORMATION

Federal Highway Authority
http://www.fhwa.dot.gov/

Title 23 US Code - Highways
http://www.access.gpo.gov/uscode/title23/title23.html

Code of Federal Regulations
http://www.access.gpo.gov/nara/cfr/

Transportation Equity Act for the 21st Century
http://www.fhwa.dot.gov/tea21/index.htm

Right-of-Way Program Administration
http://www.fhwa.dot.gov////realestate/lpaguide/app3.htm

FHWA Real Estate Services – Property Management – Joint Development Study
http://www.fhwa.dot.gov/////realestate/jntdev.htm

Illinois Compiled Statutes Roads and Bridges Illinois Highway Code.
http://www.legis.state.il.us/legislation/ilcs/ch605/ch605act5articles/ch605act5artstoc.htm

L'Enfant Promenade Urban Planning Study
http://www.efl.fhwa.dot.gov/////planning/nepa/Handout_1B.doc

Covering the Canyon – Capping I-35 in Dallas
http://www.dallasnews.com/specialreports/2002/canyon.html

Lake Place Park, Duluth MN.
http://www.computerpro.com/~amuramur/lakeplac.html

http://www.computerpro.com/~amuramur/lakeplac2.html

CONTEXT SENSITIVE DESIGN CASE STUDY – Danville-Riverside Bridge and Bridge Approach, Montour and Northumberland Counties, Pennsylvania
http://128.163.155.75/csd/Danville-River.%20text.htm

Papago Tunnel Response for the I-10 Papago Freeway Tunnel, located in Central Phoenix,
http://www.ci.phoenix.az.us/FIRE/20515a.html

Liberty Project in Glendale, CA.
http://www.golct.com/LIBERT.HTM

City of Sacramento I-5 Decking Project Study
http://www.cityofsacramento.org/econdev/msc/I5%20Decking%20Docs.html

I-71 Fort Washington Way, Cincinnati,OH
http://www.cincinnati-transit.net/fww-tunnel.html

http://www.fww2000.com

http://www.riverfrontplanning.org

Midtown Center Project over I-15 in San Diego,CA.
http://www.midtowncenter.org/MidTown.htm

International Workshop on Tunnel Ventilation – Facilitator's Report
http://www.rta.nsw.gov.au/environment/downloads/airquroadttunne_dl1.html

UIC Oak Park Project
http://oakparkinfo.lib.uic.edu,

APPENDIX A.3

CAPPING PROJECT	CONTACTS
I-35 Extension: Lake Place & Leif Erickson Park - Duluth, MN	1. Kent Worley, landscape architect, Duluth MN., amuramur@cpinternet.com 2. Regarding more information from MnDOT, the public relations person, now Special Assistant to the District Engineer at MnDot is **John Bray** at (218) 723- 4802 john.bray@dot.state.mn.us, web site www.dot.state.mn.us. This gentleman was **highly recommended** . 3. Gus Blumer gblumer@sehinc.com ,Graduate Landscape Architect/Urban Designer,SEH – Minneapolis, (612) 758-6838 4. Mark Salzman msalzman@sehinc.com, Landscape Architect/Urban Designer, SEH – Minneapolis, (612) 758-6828 5. A key person in its early history was former Duluth City Planning Director, Richard [Dick] Loraas. Between Dick and Minnesota Department of Transportation administrators coupled with Federal Department of Transportation's planning program called "Multiple Use and Joint Corridor Programs", the project became eligible for this targeted funding which fit the problems and opportunities perfectly.
I-93: Central Artery/Tunnel, Copley Place & Prudential Center: BIG DIG - Boston, MA	1. Fred Yalouris, Director of Surface Restoraion for Project (617) 951-6400 2. John Romano - CA/T (617) 951-6531 3. Allan Hodges - Parsons Brinckerhoff (617) 960-4890
I-71: Fort Washington Way & Lytle Park - Cincinnati, OH	1. Jeff Wallace - Parsons Brinckerhoff-Ohio. (513) 639-2100 2. Mark MCPhillips ODOT (513) 352-5270 3. Dave Prather, City Parks Dept. (513) 421-4085 4. Riverfront Advisors (Private Investment Group)
I-5 Freeway Downtown Reconnection - Sacramento, CA	1. Michelle Nelson - Sr.Economic Development Project Manager, Metro Place, Lot A, Dash Trolley, I-5 Decking Research Study (916) 264-7064 mnelson@cityofsacramento.org 2. Tom Cooper - Parsons Brinckerhoff Quade & Douglas 3. Steve Brown - Fehr & Peers Assoc. Transportation Consultants (925) 284-3200 4. Frank Taber - Taber Consultants (Geotech. & Environmental Consultants)
I-10 Papago Freeway Margaret T. Hance Park - Phoenix, AZ	1. Bill Hayden, AzDOT Community Relations (602) 712-7524 2. Mark Lamm, City of Phoenix Parks and Rec. Dept. (602) 262-4541 3. Architect - HNTB Architects 4. Construction Management - Greiner, Inc. 5. Contractor - Ralph L. Wadsworth Construction Company 6. Design Team: Walt Kinsler (602) 534-2160 / Behrouz Fathali (602) 262-4597 / Bill Peifer (480) 312-7869
I-90 Completion Project - Mercer Island, WA	1. Survey Contact: Rich Conrad, the Mercer Island City Manager (206) 236-3570 2. Washington State Department of Transportation procured architects, engineers, etc… 3. Design of green space above lid- Jonejan, Gerrard and McNeil, 204-111th Avenue N.E., Bellevue, WA 98004, (425) 454-5723 4. Highly recommended Mediator: Jerry Cormack from the Mediation Institute, Seattle, WA. 5. Pete Mayer, Dir. Of Mercer Island City Parks Dept. (206)236-3545
Gowanus I-278 Expressway Tunnel - Brooklyn, NY	1. Regional Planning Association (RPA) assisted with a special committee of experts
City Square Park, Boston, MA.	1. Fred Yalouris - Dir. Of Surface Restoration (617) 951-6400 2. David Kruh - MA. Highway Admin. (617) 951-6013
Lighthouse Tunnel / Customs House Plaza - Monterey, CA.	1. Tom Reeves - City Engineer (831) 646-3920 2. Cathy Smith - Public Works Dept. (831) 646-3920
I-91/I-84 Interchange: Riverfront Plaza & Founders Bridge - Hartford, CT	1. Marc Nicol - Dir. Of Parks Planning & Dev. City of Hartford (860) 713-3131 2. Jim Connery - CtDOT (860) 594-2666
I-95 Haven Habor Access Feasibility Study - New Haven, CT	1. Parsons Brinckerhoff Quade & Douglas, (860) 659-0444, Mr. Anthony Moretti, Project Engineer 2. Parsons Brinkerhoff / Kate Giordano –Public Involvement (860) 659-0444 x 23
I-80 Platform- Reno, NV	1. Paul Saucedo -NvDOT (775) 888-7390 2. George Sloss - NvDOT (775) 888-7219
Brigantine Connector - Atlantic City, NJ	1. Randy Merrill - Parsons Brinckerhoff, NJ. (609) 348-6600
I-64/I40 St. Louis, MO.	1. Lesley Hoffarth, Project Mgr. - MoDOT (314) 340-4100 2. Design consultant HNTB, St. Louis, Mo. 3. Traffic Counts by Engineering Design Surce, Inc. (EDSI), St. Louis, Mo.

APPENDIX B.1

I-290 Eisenhower Expressway in Oak Park
Existing Condition Photos

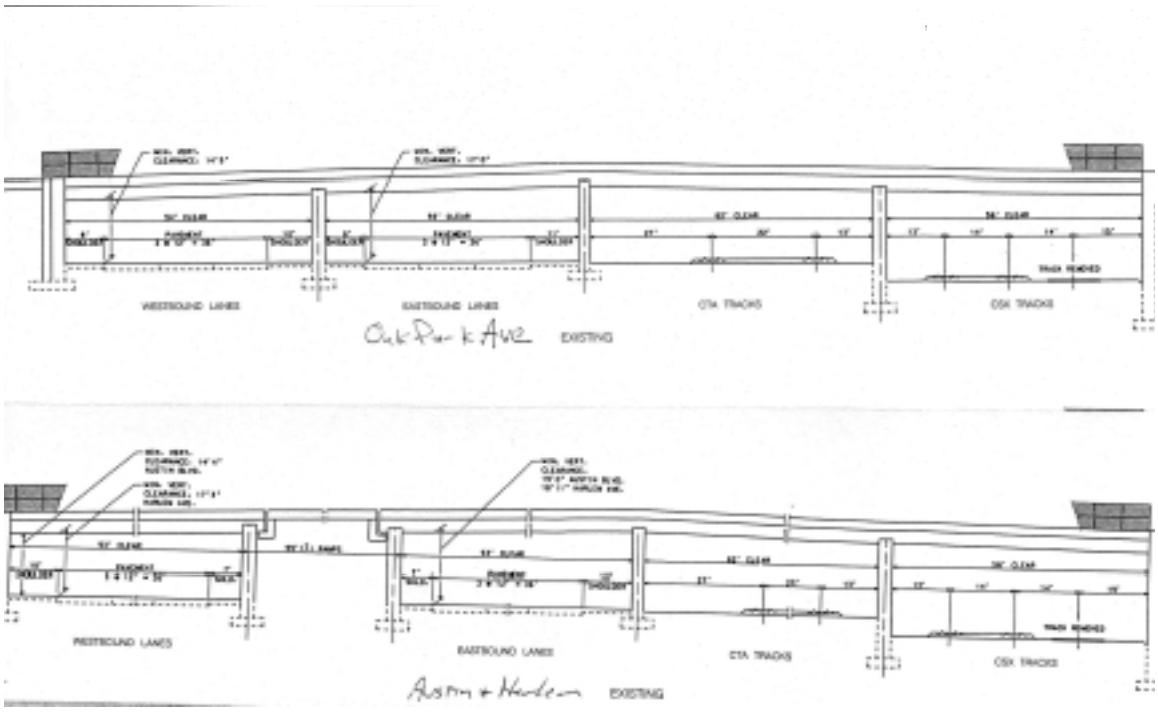


Fig 1: Cross section drawing illustrating typical bridge measurements

Fig 2: From Lombard Ave. Bridge (east view)

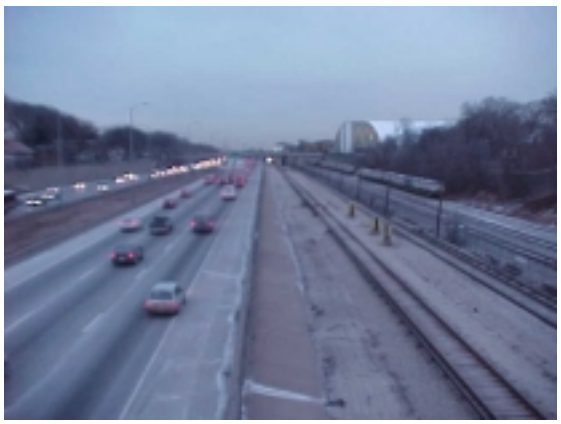


Fig 3: From Ridgeland Ave. Bridge (east view)

Fig 4: From East Ave. Bridge (east view)

Fig 5: From Oak Park Ave. Bridge (west view)

Fig 6: Multi-Family Residential at Oak Park Ave. (south view)

Fig 7: Multi-Family Residential at Oak Park Ave. (north view)

Fig 7: CSX and CTA rail lines at Oak Park Ave. (west view)

Fig 8: Business District at Oak Park Ave. (north view)

Fig 9: Conservatory and CTA station at East Ave. (south view)

Fig 10: Rehm Pool and Park at East Ave. (south view)

Fig 11: Harlem Ave. ramp from Circle Ave. (east view)

Fig 12: from Circle Ave. (west view)

APPENDIX B.2

Additional Photos of Other Cap Projects

Fig. 1: Gateway Park over I-66, Rosslyn, VA.

Fig. 2: Freeway Park over I-5, Seattle, WA.

Fig. 3: MidTown Center Project over I-15 , San Diego, CA.

Fig. 4: MidTown Center Project over I-15 , San Diego, CA.

Fig. 5: Park Avenue pre-cap, New York City, NY.

Fig. 6: Park Avenue post-cap, New York City, NY.

Fig. 7: Aerial Photo showing cap area for Concept 3, Trans-Lake Project, Seattle, WA.

Fig. 8: Aerial Photo showing cap area for Concept 2, Trans-Lake Project, Seattle, WA.

Fig. 9: Rosthstein Park over I-696, Oak Park, MI.

Fig.10: Rosthstein Park over I-696, Oak Park, MI.

Fig. 11: Victoria Park over I-696, Oak Park, MI.

Fig. 12: Victoria Park over I-696, Oak Park, MI.

Fig. 13: Washington State Convention and Trade Center over I-5, Seattle, WA.

Fig. 14: Japanese Garden in Margaret T. Hance Park over I-10, Phoenix, AZ.

Fig. 15: First Hill Lid over I-90,
Mercer Island, Washington.

APPENDIX C

portions of the U.S.D.O.T. / FHWA Highway Related Statutes Title 23 from
CHAPTER 1 – Federal-Aid Highways
CHAPTER 2 - Other Highways (Bicycle / Pedestrian Paths)
CHAPTER 4 – Highway Safety

TITLE 23--HIGHWAYS

CHAPTER 1--FEDERAL-AID HIGHWAYS

SUBCHAPTER I--GENERAL PROVISIONS

Sec. 111. Agreements relating to use of and access to rights-of- way--Interstate System

(a) In General.--All agreements between the Secretary and the State transportation department for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such project, without the prior approval of the Secretary. Such agreements shall also contain a clause providing that the State will not permit automotive service stations or other commercial establishments for serving motor vehicle users to be constructed or located on the rights-of-way of the Interstate System. **Such agreements may, however, authorize a State or political subdivision thereof to use or permit the use of the airspace above and below the established grade line of the highway pavement for such purposes as will not impair the full use and safety of the highway, as will not require or permit vehicular access to such space directly from such established grade line of the highway, or otherwise interfere in any way with the free flow of traffic on the Interstate System**. Nothing in this section, or in any agreement entered into under this section, shall require the discontinuance, obstruction, or removal of any establishment for serving motor vehicle users on any highway which has been, or is hereafter, designated as a highway or route on the Interstate System (1) if such establishment (A) was in existence before January 1, 1960, (B) is owned by a State, and (C) is operated through concessionaries or otherwise, and (2) if all access to, and exits from, such establishment conform to the standards established for such a highway under this title.

Amendments

1998--Subsecs. (a), (b). Pub. L. 105-178 substituted ``State transportation department'' for ``State highway department''.

1995--Subsec. (c). Pub. L. 104-59 added subsec. (c).

1987--Pub. L. 100-17 designated existing provision as subsec. (a), inserted heading for subsec. (a), and added subsec. (b).

1978--Pub. L. 95-599 inserted provision listing situations which would not require the discontinuance, obstruction, or removal of any establishment for serving motor vehicle users.

1961--Pub. L. 87-61 substituted ``to use or permit the use of the airspace above and below the established grade line of the highway pavement for such purposes as will not impair the full use and safety of the highway, as will not require or permit vehicular access to such space directly from such established grade line of the highway, or otherwise interfere'' for ``to use the airspace above and below the established grade line of the highway pavement for the parking of motor vehicles provided such use does not interfere''.

Revision of Agreements Relating to Utilization of Space on Rights-of-Way

Section 104(b) of Pub. L. 87-61 authorized Secretary of Commerce [now Transportation], on application, to revise any agreement made prior to June 29, 1961, to extent that such agreement relates to utilization of space on rights-of-way on National System of Interstate and Defense Highways [now Dwight D. Eisenhower System of Interstate and Defense Highways] to conform to section 111 of this title as amended by subsection (a).

TITLE 23--HIGHWAYS

CHAPTER 1--FEDERAL-AID HIGHWAYS

SUBCHAPTER I--GENERAL PROVISIONS

Sec. 129. Toll roads, bridges, tunnels, and ferries

(7) Loans.--

(A) In general.--A State may loan to a public or private entity constructing or proposing to construct under this section a toll facility or non-toll facility with a dedicated revenue source an amount equal to all or part of the Federal share of the cost of the project if the project has a revenue source specifically dedicated to it. Dedicated revenue sources for non-toll facilities include excise taxes, sales taxes, motor vehicle use fees, tax on real property, tax increment financing, and such other dedicated revenue sources as the Secretary determines appropriate.

(B) Compliance with federal laws.--As a condition of receiving a loan under this paragraph, the public or private entity that receives the loan shall ensure that the project will be carried out in accordance with this title and any other applicable Federal law, including any applicable provision of a Federal environmental law.

(C) Subordination of debt.--The amount of any loan received for a project under this paragraph may be subordinated to any other debt financing for the project.

(D) Obligation of funds loaned.--Funds loaned under this paragraph may only be obligated for projects under this paragraph.

(E) Repayment.--The repayment of a loan made under this paragraph shall commence not later than 5 years after date on which the facility that is the subject of the loan is open to traffic.

(F) Term of loan.--The term of a loan made under this paragraph shall not exceed 30 years from the date on which the loan funds are obligated.

(G) Interest.--A loan made under this paragraph shall bear interest at or below market interest rates, as determined by the State, to make the project that is the subject of the loan feasible.

(H) Reuse of funds.--Amounts repaid to a State from a loan

made under this paragraph may be obligated--

(i) for any purpose for which the loan funds were available under this title; and

(ii) for the purchase of insurance or for use as a capital reserve for other forms of credit enhancement for project debt in order to improve credit market access or to lower interest rates for projects eligible for assistance under this title.

(I) Guidelines.--The Secretary shall establish procedures and guidelines for making loans under this paragraph.

Amendments

Subsec. (a)(7). Pub. L. 104-59, Sec. 313(b), amended par. (7) generally. Prior to amendment, par. (7) read as follows:

``(7) Loans.--A State may loan all or part of the Federal share of a toll project under this section to a public or private agency constructing a toll facility. Such loan may be made only after all Federal environmental requirements have been complied with and permits obtained. The amount loaned shall be subordinated to other debt financing for the facility except for loans made by the State or any other public agency to the agency constructing the facility. Funds loaned pursuant to this section may be obligated for projects eligible under this section. The repayment of any such loan shall commence not more than 5 years after the facility has opened to traffic. Any such loan shall bear interest at the average rate the State's pooled investment fund earned in the 52 weeks preceding the start of repayment. The term of any such loan shall not exceed 30 years from the time the loan was obligated. Amounts repaid to a State from any loan made under this section may be obligated for any purpose for which the loaned funds were available. The Secretary shall establish procedures and guidelines for making such loans."

TITLE 23--HIGHWAYS

CHAPTER 1--FEDERAL-AID HIGHWAYS

SUBCHAPTER I--GENERAL PROVISIONS

Sec. 137. Fringe and corridor parking facilities

(a) The Secretary may approve as a project on the Federal-aid urban system the acquisition of land adjacent to the right-of-way outside a central business district, as defined by the Secretary, and the construction of publicly owned parking facilities thereon or within such right-of-way, including the use of the air space above and below the established grade line of the highway pavement, to serve an urban area of fifty thousand population or more. Such parking facility shall be located and designed in conjunction with existing or planned public transportation facilities. In the event fees are charged for the use of any such facility, the rate thereof shall not be in excess of that required for maintenance and operation (including compensation to any person for operating such facility).

(b) The Secretary shall not approve any project under this section until--

(1) he has determined that the State, or the political subdivision thereof, where such project is to be located, or any agency or instrumentality of such State or political subdivision, has the authority and capability of constructing, maintaining, and operating the facility;

(2) he has entered into an agreement governing the financing, maintenance, and operation of the parking facility with such State, political subdivision, agency, or instrumentality, including necessary requirements to insure that adequate public transportation services will be available to persons using such facility; and

(3) he has approved design standards for constructing such facility developed in cooperation with the State transportation department.

(c) The term ``parking facilities'' for purposes of this section shall include access roads, buildings, structures, equipment, improvements, and interests in lands.

(d) Nothing in this section, or in any rule or regulation issued under this section, or in any agreement required by this section, shall prohibit (1) any State, political subdivision, or agency or instrumentality thereof, from contracting with any person to operate any

parking facility constructed under this section, or (2) any such person from so operating such facility.

(e) The Secretary shall not approve any project under this section unless he determines that it is based on a continuing comprehensive transportation planning process carried on in accordance with section 134 of this title.

(f)(1) The Secretary may approve for Federal financial assistance from funds apportioned under section 104(b)(4), projects for designating existing facilities, or for acquisition of rights of way or construction of new facilities, for use as preferential parking for carpools, provided that such facilities (A) are located outside of a central business district and within an interstate highway corridor, and (B) have as their primary purpose the reduction of vehicular traffic on the interstate highway.

(2) Nothing in this subsection, or in any rule or regulation issued under this subsection, or in any agreement required by this subsection, shall prohibit (A) any State, political subdivision, or agency or instrumentality thereof, from contracting with any person to operate any parking facility designated or constructed under this subsection, or (B) any such person from so operating such facility. Any fees charged for the use of any such facility in connection with the purpose of this subsection shall not be in excess of the amount required for operation and maintenance, including compensation to any person for operating the facility.

(3) For the purposes of this subsection, the terms ``facilities'' and ``parking facilities'' are synonymous and shall have the same meaning given ``parking facilities'' in subsection (c) of this section.

(Added Pub. L. 89-574, Sec. 8(c)(1), Sept. 13, 1966, 80 Stat. 768; amended Pub. L. 91-605, title I, Sec. 134(a), Dec. 31, 1970, 84 Stat. 1733; Pub. L. 97-424, title I, Sec. 118, Jan. 6, 1983, 96 Stat. 2110; Pub. L. 105-178, title I, Secs. 1103(l)(3)(B), 1212(a)(2)(A)(i), June 9, 1998, 112 Stat. 126, 193.)

Amendments

1998--Subsec. (b)(3). Pub. L. 105-178, Sec. 1212(a)(2)(A)(i), substituted ``State transportation department'' for ``State highway department''.

Subsec. (f)(1). Pub. L. 105-178, Sec. 1103(l)(3)(B), substituted ``section 104(b)(4)'' for ``section 104(b)(5)(B) of this title''.

1983--Subsec. (f). Pub. L. 97-424 added subsec. (f).

1970--Pub. L. 91-605 substituted ``Fringe and corridor parking facilities'' for ``Limitation on authorization of appropriations for certain purposes'' in section catchline.

Subsec. (a). Pub. L. 91-605 substituted provisions permitting the Secretary to approve construction of publicly owned parking facilities under the Federal-aid urban system for provisions limiting authorization of appropriations under section 131, 136, and 319(b) of this title, or any highway safety bill enacted after May 1, 1966 by preventing these sections and provisions from being construed as authority for any

appropriations not specifically authorized in these sections and provisions.

Subsec. (b). Pub. L. 91-605 substituted provisions preventing project approval by the Secretary unless the State or political subdivision thereof where the project is located can construct, maintain, and operate the facility, unless the Secretary has entered into an agreement with the State or political subdivision governing the financing, maintenance, and operation of the facility, and unless the Secretary has approved design standards for construction of the facility for provisions limiting authorization of appropriations under sections 131, 136, and 319(b) of this title, or any highway safety bill enacted after May 1, 1966 by preventing appropriations to carry out these sections and provisions unless they are specific as to the amount authorized and as to the fiscal year.

Subsec. (c). Pub. L. 91-605 substituted provisions defining ``parking facilities'' for provisions limiting authorization of appropriations under sections 131, 136, and 319(b) of this title, or any highway safety bill enacted after May 1, 1966 by preventing the highway trust fund from being a source of appropriation for these sections and provisions in an amount exceeding the tax imposed by section 4061(a)(2) of Title 26, if such tax was imposed at a rate of 1% plus additional amounts appropriated from the general fund to the highway trust fund for such purposes except that the total of all appropriations made from such fund to carry out these sections and provisions shall never exceed the total of all appropriations made to such fund based on the imposition of such tax plus additional amounts appropriated from the general fund to the highway trust fund for such purposes.

Subsecs. (d), (e). Pub. L. 91-605 added subsecs. (d) and (e).

TITLE 23--HIGHWAYS

CHAPTER 1--FEDERAL-AID HIGHWAYS

SUBCHAPTER I--GENERAL PROVISIONS

Sec. 142. Public transportation

(a)(1) To encourage the development, improvement, and use of public mass transportation systems operating motor vehicles (other than on rail) on Federal-aid highways for the transportation of passengers (hereafter in this section referred to as ``buses''), so as to increase the traffic capacity of the Federal-aid systems for the movement of persons, **the Secretary may approve as a project on any Federal-aid system the construction of exclusive or preferential high occupancy vehicle lanes, highway traffic control devices, bus passenger loading areas and facilities (including shelters), and fringe and transportation corridor parking facilities to serve high occupancy vehicle and public mass transportation passengers, and sums apportioned under section 104(b) of this title shall be available to finance the cost of projects** under this paragraph. If fees are charged for the use of any parking facility constructed under this section, the rate thereof shall not be in excess of that required for maintenance and operation of the facility and the cost of providing shuttle service to and from the facility (including compensation to any person for operating the facility and for providing such shuttle service).

(2) **In addition to the projects under paragraph (1), the Secretary may approve as a project on the the \1\ surface transportation program for payment from sums apportioned under section 104(b)(3) for carrying out any capital transit project eligible for assistance under chapter 53 of title 49, capital improvement to provide access and coordination between intercity and rural bus service, and construction of facilities to provide connections between highway transportation and other modes of transportation.**

(f) **Availability of Rights-of-Way.--In any case where sufficient land or air space exits \2\ within the publicly acquired rights-of-way of any highway, constructed in whole or in part with Federal-aid highway funds, to accommodate needed passenger, commuter, or high speed rail, magnetic levitation systems, and highway and nonhighway public mass transit facilities, the Secretary shall authorize a State to make such lands, air space, and rights-of-way available with or without charge to a publicly or privately owned authority or company or any other person for such purposes if such accommodation will not adversely affect automotive safety.**

Amendments

Pub. L. 102-240, Sec. 1027(d), amended subsec. (g) generally. Prior to amendment, subsec. (g) read as follows: ``In any case where sufficient land exists within the publicly

acquired rights-of-way of any Federal-aid highway to accommodate needed rail or non-highway public mass transit facilities and where this can be accomplished without impairing automotive safety or future highway improvements, the Administrator may authorize a State to make such lands and rights-of-way available without charge to a publicly owned mass transit authority for such purposes wherever he may deem that the public interest will be served thereby."

1976--Subsec. (a)(1). Pub. L. 94-280, Sec. 127(a), inserted provision that if fees are charged for the use of any parking facility constructed under this section, the rate thereof shall not be in excess of that required for maintenance and operation of the facility (including compensation to any person for operating the facility).

TITLE 23--HIGHWAYS

CHAPTER 1--FEDERAL-AID HIGHWAYS

SUBCHAPTER I--GENERAL PROVISIONS

Sec. 149. Congestion mitigation and air quality improvement program

(a) Establishment.--The Secretary shall establish and implement a congestion mitigation and air quality improvement program in accordance with this section.

(b) **Eligible Projects.--Except as provided in subsection (c), a State may obligate funds apportioned to it under section 104(b)(2) for the congestion mitigation and air quality improvement program only for a transportation project or program if the project or program is for an area in the State that is or was designated as a nonattainment area for ozone, carbon monoxide, or particulate matter** under section 107(d) of the Clean Air Act (42 U.S.C. 7407(d)) and classified pursuant to section 181(a), 186(a), 188(a), or 188(b) of the Clean Air Act (42 U.S.C. 7511(a), 7512(a), 7513(a), or 7513(b)) or is or was designated as a nonattainment area under such section 107(d) after December 31, 1997, and--

(1)(A) if the Secretary, after consultation with the Administrator of the Environmental Protection Agency, determines, on the basis of information published by the Environmental Protection Agency pursuant to section 108(f)(1)(A) of the Clean Air Act (other than clause (xvi) of such section), that the project or program is likely to contribute to--

(i) the attainment of a national ambient air quality standard; or

(ii) the maintenance of a national ambient air quality standard in a maintenance area; or

(B) in any case in which such information is not available, if the Secretary, after such consultation, determines that the project or program is part of a program, method, or strategy described in such section;

(2) if the project or program is included in a State implementation plan that has been approved pursuant to the Clean Air Act and the project will have air quality benefits;

(3) the Secretary, after consultation with the Administrator of the Environmental Protection Agency, determines that the project or program is likely to contribute to the attainment of a national ambient air quality standard, whether through reductions in vehicle miles traveled, fuel consumption, or through other factors;

(4) to establish or operate a traffic monitoring, management, and control facility or program if the Secretary, after consultation with the Administrator of the Environmental Protection Agency, determines that the facility or program is likely to contribute to the attainment of a national ambient air quality standard; or

(5) if the program or project improves traffic flow, including projects to improve signalization, construct high occupancy vehicle lanes, improve intersections, and implement intelligent transportation system strategies and such other projects that are eligible for assistance under this section on the day before the date of enactment of this paragraph.

No funds may be provided under this section for a project which will result in the construction of new capacity available to single occupant vehicles unless the project consists of a high occupancy vehicle facility available to single occupant vehicles only at other than peak travel times. In areas of a State which are nonattainment for ozone or carbon monoxide, or both, and for PM-10 resulting from transportation activities, the State may obligate such funds for any project or program under paragraph (1) or (2) without regard to any limitation of the Department of Transportation relating to the type of ambient air quality standard such project or program addresses.

(c) States Receiving Minimum Apportionment.--

(1) States without a nonattainment area.--If a State does not have, and never has had, a nonattainment area designated under the Clean Air Act (42 U.S.C. 7401 et seq.), the State may use funds apportioned to the State under section 104(b)(2) for any project eligible under the surface transportation program under section 133.

(2) States with a nonattainment area.--If a State has a nonattainment area or maintenance area and receives funds under section 104(b)(2)(D) above the amount of funds that the State would have received based on its nonattainment and maintenance area population under subparagraphs (B) and (C) of section 104(b)(2), the State may use that portion of the funds not based on its nonattainment and maintenance area population under subparagraphs (B) and (C) of section 104(b)(2) for any project in the State eligible under section 133.

(e) Partnerships With Nongovernmental Entities.--

(1) In general.--Notwithstanding any other provision of this title and in accordance with this subsection, a metropolitan planning organization, State transportation department, or other project sponsor may enter into an agreement with any public, private, or nonprofit entity to cooperatively implement any project carried out under this section.

(2) Forms of participation by entities.--Participation by an entity under paragraph (1) may consist of--

(A) ownership or operation of any land, facility, vehicle, or other physical asset associated with the project;

(B) cost sharing of any project expense;

(C) carrying out of administration, construction management, project management, project operation, or any other management or operational duty associated with the project; and

(D) any other form of participation approved by the Secretary.

TITLE 23--HIGHWAYS

CHAPTER 1--FEDERAL-AID HIGHWAYS

SUBCHAPTER I--GENERAL PROVISIONS

Sec. 156. Proceeds from the sale or lease of real property

(a) Minimum Charge.--Subject to section 142(f), a State shall charge, at a minimum, fair market value for the sale, use, lease, or lease renewal (other than for utility use and occupancy or for a transportation project eligible for assistance under this title) of real property acquired with Federal assistance made available from the Highway Trust Fund (other than the Mass Transit Account).

(b) Exceptions.--The Secretary may grant an exception to the requirement of subsection (a) for a social, environmental, or economic purpose.

(c) Use of Federal Share of Income.--The Federal share of net income from the revenues obtained by a State under subsection (a) shall be used by the State for projects eligible under this title.

Amendments

1998--Pub. L. 105-178 amended section catchline and text generally. Prior to amendment, text read as follows: ``Subject to section 142(f), States shall charge, as a minimum, fair market value, with exceptions granted at the discretion of the Secretary for social, environmental, and economic mitigation purposes, for the sale, use, lease, or lease renewals (other than for utility use and occupancy or for transportation projects eligible for assistance under this title) of right-of-way airspace acquired as a result of a project funded in whole or in part with Federal assistance made available from the Highway Trust Fund (other than the Mass Transit Account). This section applies to new airspace usage proposals, renewals of prior agreements, arrangements, or leases entered into by the State after the date of the enactment of the Federal-Aid Highway Act of 1987. The Federal share of net income from the revenues obtained by the State for sales, uses, or leases (including lease renewals) under this section shall be used by the State for projects eligible under this title.''

TITLE 23--HIGHWAYS

CHAPTER 2--OTHER HIGHWAYS

Sec. 217. Bicycle transportation and pedestrian walkways

(a) Use of STP and Congestion Mitigation Program Funds.--Subject to project approval by the Secretary, a State may obligate funds apportioned to it under sections 104(b)(2) and 104(b)(3) of this title for construction of pedestrian walkways and bicycle transportation facilities and for carrying out nonconstruction projects related to safe bicycle use.

(b) Use of National Highway System Funds.--Subject to project approval by the Secretary, a State may obligate funds apportioned to it under section 104(b)(1) of this title for construction of pedestrian walkways and bicycle transportation facilities on land adjacent to any highway on the National Highway System.

(c) Use of Federal Lands Highway Funds.--Funds authorized for forest highways, forest development roads and trails, public lands development roads and trails, park roads, parkways, Indian reservation roads, and public lands highways shall be available, at the discretion of the department charged with the administration of such funds, for the construction of pedestrian walkways and bicycle transportation facilities in conjunction with such trails, roads, highways, and parkways.

(d) State Bicycle and Pedestrian Coordinators.--Each State receiving an apportionment under sections 104(b)(2) and 104(b)(3) of this title shall use such amount of the apportionment as may be necessary to fund in the State department of transportation a position of bicycle and pedestrian coordinator for promoting and facilitating the increased use of nonmotorized modes of transportation, including developing facilities for the use of pedestrians and bicyclists and public education, promotional, and safety programs for using such facilities.

(e) Bridges.--In any case where a highway bridge deck being replaced or rehabilitated with Federal financial participation is located on a highway on which bicycles are permitted to operate at each end of such bridge, and the Secretary determines that the safe accommodation of bicycles can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations.

TITLE 23--HIGHWAYS

CHAPTER 4--HIGHWAY SAFETY

Sec. 407. Innovative project grants

(a) **-** In addition to other grants authorized by this chapter, the Secretary may make grants in any fiscal year to those States, political subdivisions thereof, and nonprofit organizations which develop innovative approaches to highway safety problems in accordance with criteria to be established by the Secretary in cooperation with the States, political subdivisions thereof, and such nonprofit organizations as the Secretary deems appropriate.

APPENDIX D .1

Excerpts from

DEPARTMENT OF TRANSPORTATION [4910-22-P]
Federal Highway Administration
23 CFR Parts, 710, 712, and 713
[FHWA Docket No. FHWA-98-4315]
RIN 2125-AE44
Right-of-Way Program Administration

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule.

SUMMARY: This document amends the right-of-way regulations for federally assisted transportation programs administered under title 23, United States Code. The FHWA clarifies and reduces Federal regulatory requirements and places primary responsibility for a number of approval actions at the State level. Conforming revisions are made to several regulatory parts to remove outdated, redundant, and unnecessary content. Also, the regulations are arranged to follow the same sequence as the development and implementation of a Federal-aid project to assist the public and State transportation departments (STDs) in locating regulations applicable to a specific point of interest.

DATES: The final rule is effective January 20, 2000.

FOR FURTHER INFORMATION CONTACT: Mr. James E. Ware, (202) 366-2019, Office of Real Estate Services, HEPR-20, or Mr. Reid Alsop, Office of the Chief Counsel, HCC-31, (202) 366-1371. Office hours are from 7:45 a.m. to 4:15 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:
Electronic Access

Internet users may access all comments received by the U.S. DOT Dockets, Room PL-401, by using the universal resource locator (URL): **http://dms.dot.gov.** It is available 24 hours each day, 365 days each year. Please follow the instructions online for more information and help.

An electronic copy of this document may be downloaded by using a computer modem, and suitable communications software from the Government Printing Office's Electronic Bulletin Board Service at (202) 512-1661. Internet users may reach the Office of the Federal Register's home page at: **http://www.nara.gov/fedreg** and the Government Printing Office's webpage at: **http://www.access.gpo.gov/nara.**

PART 710 - RIGHT-OF-WAY AND REAL ESTATE

§ 710.405 Air rights on the Interstate.

(a) The FHWA policies relating to management of airspace on the Interstate for non-highway purposes are included in this section. Although this section deals specifically with approval actions on the Interstate, any use of airspace contemplated by a STD must assure that such occupancy, use, or reservation is in the public interest and does not impair the highway or interfere with the free and safe flow of traffic as provided in 23 CFR 1.23.

(1) This subpart applies to Interstate facilities which received title 23 of the United States Code assistance in any way.

(2) This subpart does not apply to the following:

(i) Non-Interstate highways.

(ii) Railroads and public utilities which cross or otherwise occupy Federal-aid highway right-of-way.

(iii) Relocations of railroads or utilities for which reimbursement is claimed under 23 CFR part 140, subparts E and H.

(iv) Bikeways and pedestrian walkways as covered in 23 CFR part 652.

(b) A STD may grant rights for temporary or permanent occupancy or use of Interstate system airspace if the STD has acquired sufficient legal right, title, and interest in the right-of-way of a federally assisted highway to permit the use of certain airspace for nonhighway purposes; and where such airspace is not required presently or in the foreseeable future for the safe and proper operation and maintenance of the highway facility. The STD must obtain prior FHWA approval, except for paragraph (c) of this section.

(c) An STD may make lands and rights-of-way available without charge to a publicly owned mass transit authority for public transit purposes whenever the public interest will be served, and where this can be accomplished without impairing automotive safety or future highway improvements

(d) An individual, company, organization, or public agency desiring to use airspace shall submit a written request to the STD. If the STD recommends approval, it shall forward an application together with its recommendation and any necessary supplemental information including the proposed airspace agreement to the FHWA. The submission shall affirmatively provide for adherence to all policy requirements contained in this subpart and conform to the provisions in the FHWA's Airspace Guidelines at: **http://www.fhwa.dot.gov/realestate/index.htm**.

§ 710.407 Leasing.

(a) Leasing of real property acquired with title 23 of the United States Code, funds shall be covered by an agreement between the STD and lessee which contains provisions to insure the safety and integrity of the federally funded facility. It shall also include provisions governing lease revocation, removal of improvements at no cost to the FHWA, adequate insurance to hold the State and the FHWA harmless, nondiscrimination, access by the STD and the FHWA for inspection, maintenance, and reconstruction of the facility.

(b) Where a proposed use requires changes in the existing transportation facility, such changes shall be provided without cost to Federal funds unless otherwise specifically agreed to by the STD and the FHWA.

(c) Proposed uses of real property shall conform to the current design standards and safety criteria of the Federal Highway Administration for the functional classification of the highway facility in which the property is located.

§ 710.513 Environmental mitigation.

(a) The acquisition and maintenance of land for wetlands mitigation, wetlands banking, natural habitat, or other appropriate environmental mitigation is an eligible cost under the Federal-aid program. FHWA participation in wetland mitigation sites and other mitigation banks is governed by 23 CFR part 777.

(b) Environmental acquisitions or displacements by both public agencies and private parties are covered by the Uniform Act when they are the result of a program or project undertaken by a Federal agency or one that receives Federal financial assistance. This includes real property acquired for a wetland bank, or other environmentally related purpose, if it is to be used to mitigate impacts created by a Federal aid highway project.

[Code of Federal Regulations]
[Title **23**, Volume 1]
[Revised as of April 1, 2002]
From the U.S. Government Printing Office via GPO Access
[**CITE**: **23CFR1**.**23**]

TITLE **23**--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 1--GENERAL--Table of Contents

Sec. 1.23 Rights-of-way.

(a) Interest to be acquired. The State shall acquire rights-of-way of such nature and extent as are adequate for the construction, operation and maintenance of a project.

(b) Use for highway purposes. Except as provided under paragraph (c) of this section, all real property, including air space, within the right-of-way boundaries of a project shall be devoted exclusively to public highway purposes. No project shall be accepted as complete until this requirement has been satisfied. The State highway department shall be responsible for preserving such right-of-way free of all public and private installations, facilities or encroachments, except (1) those approved under paragraph (c) of this section; (2) those which the Administrator approves as constituting a part of a highway or as necessary for its operation, use or maintenance for public highway purposes and (3) informational sites established and maintained in accordance with Sec. 1.35 of the regulations in this part.

(c) Other use or occupancy. Subject to 23 **U.S.C. 111, the temporary or permanent occupancy or use of right-of-way, including air space, for nonhighway purposes and the reservation of subsurface mineral rights within the boundaries of the rights-of-way of Federal-aid highways, may be approved by the Administrator, if he determines that such occupancy, use or reservation is in the public interest and will not impair the highway or interfere with the free and safe flow of traffic thereon.**

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TITLE 23--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 710--RIGHT-OF-WAY AND REAL ESTATE--Table of Contents

Subpart D--Real Property Management

Sec. 710.**405 Air rights on the Interstate.**

(a) The FHWA policies relating to management of airspace on the Interstate for non-highway purposes are included in this section. Although this section deals specifically with approval actions on the Interstate, any use of airspace contemplated by a STD must assure that such occupancy, use, or reservation is in the public interest and does not impair the highway or interfere with the free and safe flow of traffic as provided in 23 CFR 1.23.

(1) This subpart applies to Interstate facilities which received title 23 of the United States Code assistance in any way.

(2) This subpart does not apply to the following:

(i) Non-Interstate highways.

(ii) Railroads and public utilities which cross or otherwise occupy Federal-aid highway right-of-way.

(iii) Relocations of railroads or utilities for which reimbursement is claimed under 23 CFR part 140, subparts E and H.

(iv) Bikeways and pedestrian walkways as covered in 23 CFR part 652.

(b) A STD may grant rights for temporary or permanent occupancy or use of Interstate system airspace if the STD has acquired sufficient legal right, title, and interest in the right-of-way of a federally assisted highway to permit the use of certain airspace for non-highway purposes; and where such airspace is not required presently or in the foreseeable future for the safe and proper operation and maintenance of the highway facility. The STD must obtain prior FHWA approval, except for paragraph (c) of this section.

(c) An STD may make lands and rights-of-way available without charge to a publicly owned mass transit authority for public transit purposes whenever the public interest will be served, and where this can be accomplished without impairing automotive safety or future highway improvements

(d) An individual, company, organization, or public agency desiring to use airspace shall submit a written request to the STD. If the STD recommends approval, it shall forward an application together with its recommendation and any necessary supplemental information including the proposed airspace agreement to the FHWA. The submission shall affirmatively provide for adherence to all policy requirements contained in this subpart and conform to the provisions in the FHWA's Airspace Guidelines at:

http://www.fhwa.dot.gov/realestate/index.htm.

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TITLE 23--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 710--RIGHT-OF-WAY AND REAL ESTATE--Table of Contents

Subpart D--Real Property Management

Sec. 710.**407** Leasing.

(a) Leasing of real property acquired with title 23 of the United States Code, funds shall be covered by an agreement between the STD and lessee which contains provisions to insure the safety and integrity of the federally funded facility. It shall also include provisions governing lease revocation, removal of improvements at no cost to the FHWA, adequate insurance to hold the State and the FHWA harmless, nondiscrimination, access by the STD and the FHWA for inspection, maintenance, and reconstruction of the facility.

(b) Where a proposed use requires changes in the existing transportation facility, such changes shall be provided without cost to Federal funds unless otherwise specifically agreed to by the STD and the FHWA.

(c) Proposed uses of real property shall conform to the current design standards and safety criteria of the Federal Highway Administration for the functional classification of the highway facility in which the property is located.

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TITLE 23--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 710--RIGHT-OF-WAY AND REAL ESTATE--Table of Contents

Subpart E--Property Acquisition Alternatives

Sec. 710.**513** Environmental mitigation.

(a) The acquisition and maintenance of land for wetlands mitigation, wetlands banking, natural habitat, or other appropriate environmental mitigation is an eligible cost under the Federal-aid program. FHWA participation in wetland mitigation sites and other mitigation banks is governed by 23 CFR part 777.

(b) **Environmental acquisitions or displacements by both public agencies and private parties are covered by the Uniform Act when they are the result of a program or project undertaken by a Federal agency or one that receives Federal financial assistance. This includes real property acquired for** a wetland bank, or other **environmentally related purpose, if it is to be used to mitigate impacts created by a Federal-aid highway project**.

APPENDIX D .2

Excerpts from

DEPARTMENT OF TRANSPORTATION [4910-22-P]
Federal Highway Administration
23 CFR Part 772

NOISE ABATEMENT

[Code of Federal Regulations]
[Title 23, Volume 1]
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TITLE 23--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 772--PROCEDURES FOR ABATEMENT OF HIGHWAY TRAFFIC NOISE AND CONSTRUCTION NOISE--Table of Contents

Sec. 772.**5** Definitions.

(a) Design year. The future year used to estimate the probable traffic volume for which a highway is designed. A time, 10 to 20 years, from the start of construction is usually used.

(b) Existing noise levels. The noise, resulting from the natural and mechanical sources and human activity, considered to be usually present in a particular area.

(c) L<INF>10</INF>. The sound level that is exceeded 10 percent of the time (the 90th percentile) for the period under consideration.

(d) L<INF>10</INF>(h). The hourly value of L<INF>10</INF>.

(e) Leq--the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period.

(f) Leq(h). The hourly value of Leq.

(g) Traffic noise impacts. Impacts which occur when the predicted traffic noise levels approach or exceed the noise abatement criteria (Table 1), or when the predicted traffic noise levels substantially exceed the existing noise levels.

(h) Type I projects. A proposed Federal or Federal-aid highway project for the construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizonal or vertical alignment or increases the number of through-traffic lanes.

(i) Type II projects. A proposed Federal or Federal-aid highway project for noise abatement on an existing highway.

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TITLE 23--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 772--PROCEDURES FOR ABATEMENT OF HIGHWAY TRAFFIC NOISE AND CONSTRUCTION NOISE--Table of Contents

Sec. 772.**11** Noise abatement.

(a) In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit.

(b) In those situations where there are no exterior activities to be affected by the traffic noise, or where the exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities, the interior criterion

[[Page 394]]

shall be used as the basis of determining noise impacts.

(c) If a noise impact is identified, the abatement measures listed in Sec. 772.13(c) of this chapter must be considered.

(d) When noise abatement measures are being considered, every reasonable effort shall be made to obtain substantial noise reductions.

(e) Before adoption of a final environmental impact statement or finding of no significant impact, the highway agency shall identify:

(1) Noise abatement measures which are reasonable and feasible and which are likely to be incorporated in the project, and

(2) Noise impacts for which no apparent solution is available.

(f) The views of the impacted residents will be a major consideration in reaching a decision on the reasonableness of abatement measures to be provided.

(g) The plans and specifications will not be approved by FHWA unless those noise abatement measures which are reasonable and feasible are incorporated into the plans and specifications to reduce or eliminate the noise impact on existing activities, developed lands, or undeveloped lands for which development is planned, designed, and programmed.

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[Title 23, Volume 1]
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TITLE 23--HIGHWAYS

CHAPTER I--FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

PART 772--PROCEDURES FOR ABATEMENT OF HIGHWAY TRAFFIC NOISE AND CONSTRUCTION NOISE--Table of Contents

Sec. 772.**13** Federal participation.

(a) Federal funds may be used for noise abatement measures where:

(1) A traffic noise impact has been identified,

(2) The noise abatement measures will reduce the traffic noise impact, and

(3) The overall noise abatement benefits are determined to outweigh the overall adverse social, economic, and environmental effects and the costs of the noise abatement measures.

(b) For Type II projects, noise abatement measures will only be approved for projects that were approved before November 28, 1995, or are proposed along lands where land development or substantial construction predated the existence of any highway. The granting of a building permit, filing of a plat plan, or a similar action must have occurred prior to right-of-way acquisition or construction approval for the original highway. Noise abatement measures will not be approved at locations where such measures were previously determined not to be reasonable and feasible for a Type I project.

(c) The noise abatement measures listed below may be incorporated in Type I and Type II projects to reduce traffic noise impacts. The costs of such measures may be included in Federal-aid participating project costs with the Federal share being the same as that for the system on which the project is located, except that Interstate construction funds may only participate in Type I projects.

(1) Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive land designations).

(2) Alteration of horizontal and vertical alignments.

(3) Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers.

(4) Construction of noise barriers (including landscaping for esthetic purposes) whether within or outside the highway right-of-way. Interstate construction funds may not participate in landscaping.

(5) Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. This measure may be included in Type I projects only.

(6) Noise insulation of public use or nonprofit institutional structures.

(d) There may be situations where (1) severe traffic noise impacts exist or are expected, and (2) the abatement measures listed above are physically infeasible or economically unreasonable. In these instances,
noise abatement measures other than those listed in Sec. 772.**13**(c) of his chapter may be proposed for Types I and II projects by the highway agency and approved by the Regional Federal Highway Administrator on a
case-by-case basis when the conditions of Sec. 772.**13**(a) of this chapter have been met.

APPENDIX E

FHWA Real Estate Services – Property Management – Joint Development Study

The report, hereafter referred to as the Study, was prepared in 1996. The purpose of the Study was to explore and explain transportation uses of joint development. The Study is comprised of a glossary, literature review, and joint development case studies. The case studies include:

- Boston Central Artery Project
- Allied Junction Multi-Modal Station Development, N.J.
- Washington State and Seattle Air-Rights and Public/Private Financing
- San Diego Light Rail, Air Rights and Privatized Financing
- Pensacola Highway I-110 Project

The Study defines Joint Development as an effort by a public agency and a private developer to undertake a construction project. Joint Developments are usually a voluntary joining of governmental entities with private for-profit organizations to undertake mutually beneficial development in connection with public infrastructure. A Joint Development agreement generally contains formal legally binding language between a public entity and a private individual. Projects may also be initiated through a co-development. A co-development is an informal working arrangement in which the public agency and the private developer work together to complete their individual projects in a mutually beneficial way. The co-developers usually attempt to site and coordinate their projects based on a non-binding legal agreement.

Each case study within the Study is targeted on one of the following joint development activities:

- Telecommunications utility accommodations
- Jointly developed projects

The analysis of the case studies concentrates on several key issues related to joint development:

- Agency objectives - project options
- Public agency development policy and organizational capacity
- Acquisition of Property
- Sale and Lease of Property
- Market Demand
- Financing
- Zoning

Successful joint development requires planning, supportive zoning and a single point of contact for the project. The Study identified four conditions necessary for successful joint development:

- Healthy real estate market
- An agency with an entrepreneurial outlook
- Coordination of zoning/rezoning with local agencies
- Realization that benefits of joint development transcend the generation of revenue.

The Study identified several factors which may inhibit joint development:

- Laws and regulations which prohibit or hinder agency cooperation/involvement
- Agencies' lack of experience with joint development projects
- Lack of incentives for developer to enter into joint development agreement
- Agencies' goals may not be compatible with developer's profit maximization goals
- Uncertainty about length of occupancy - most agencies agreements include a clause requiring tenants to vacate on 30 days notice

Lessons learned from the case studies are:

- The public must be kept informed.
- The pace of the project development/approval process may need to be streamlined to maintain project viability.
- The telecommunications field is moving very quickly because of market demands. State and federal policies may have to be adapted in order to take advantage of this opportunity to lease DOT lands.
- Joint development/multiple use needs support from local agencies and policy approval at both the state DOT and federal levels.
- Agencies should have realistic expectations, demonstrate strong public commitment, and demonstrate the benefits to the public sector.

Some innovative ideas drawn from the Study:

- Wetlands banking - The Allied Junction project in New Jersey utilized Wetlands Banking to address remediation requirements.
- Philadelphia formed a corporation for the management of its Interstate 95 airspace. The corporation is financially self sufficient and must have approval from several community groups before any new lease can be executed.
- San Francisco has the nations' only Transit Impact Fee. The fee is levied against developers who are building within specified areas. It is used to fund transit improvement projects.
- In several instances the Study identified a trend in which the Environmental Impact Statement functions as a planning tool.
- In some of the case studies, joint development served as an engine for economic revitalization and redevelopment.

Research Program: Lannie Graham lannie.graham@fhwa.dot.gov or 202-366-2039
Publications: LindaD. Williams@fhwa.dot.gov 202.366.0134

APPENDIX F

Excerpts from
Illinois Compiled Statutes - Roads & Bridges / Illinois Highway Code: 605 ILCS 5

(605 ILCS 5/4-201.18)
Sec. 4-201.18.

To acquire land adjacent to the right-of-way on a federal aid system outside the central business district in an urban area of 50,000 population or more as provided by the Federal Aid Road Act and to construct and operate a publicly owned parking facility thereon or within the right-of-way, including the use of air space above and below the established grade line of the highway pavement. Such parking facility shall be (1) based on a continuing comprehensive transportation planning process as defined in the Federal Aid Road Act, and (2) located and designed in conjunction with existing or planned public transportation facilities.

Fees charged for the use of such facility shall not be in excess of that amount required for maintenance and operation, including Compensation to any person for operating such facility, and shall be used for such purposes before any other funds may be used for maintenance and operation.

Any federal aid project constructed under this Section may be constructed by agreement and jointly at the expense of the federal government and the State of Illinois or jointly at the expense of the federal government, the State of Illinois, a municipality or municipalities or a county or counties, in accordance with the provisions of the Federal Aid Road Act.

For the purposes of this Section, the term "parking facilities" shall include access roads, buildings, structures, equipment, improvements, and interests in the lands.
(Source: P. A. 77-1410.)

http://www.legis.state.il.us/legislation/ilcs/ch605/ch605act5articles/ch605act5artstoc.htm

A recommendation regarding lidding concepts will be prepared following the All Committee Workshop on May 23, 2001. At this point, it is anticipated the Executive Committee will be in a position to validate or modify the recommendations, allowing further, more detailed work to be conducted in the EIS phase of the project.

2.4 NOISE RELATED DESIGN ISSUES AND ANALYSIS METHODS

This section provides general information related to noise, highway design measures, and noise mitigation measures. For detailed information, the Trans-Lake Washington Team has produced a detailed report, *Noise Mitigation and Design Options*, April 2001. The report carefully details the noise analysis and mitigation process that will be used for the Trans-Lake Project.

The reduction of project related noise levels during the detailed design phase could be accomplished with noise reducing design measures. Noise reducing design measures include such items as traffic management and highway orientation. Traffic management measures include modifying speed limits, restricting or prohibiting truck traffic, or closing roadways or access ramps during times when noise could have an adverse effect.

Highway orientation design measures include altering the roadway alignment and depressing roadway cut sections. Alteration of roadway alignment could decrease noise effects by moving the noise source farther from the affected receivers. Because of the limited right-of-way in the project corridor, and the fact that noise impacts are expected to occur along both sides of the project roadway, this method is not seen as a feasible noise-reducing design option. In addition, realigning the Trans-Lake Washington Project would lower noise levels for residences on one side of the roadway, but would increase noise levels for residences on the other.

Other design options that could be used to reduce noise levels, such as adding noise walls depressing the corridor, or placing a lid over the roadway, are currently being considered in several sections of the project. This report will examine the benefits, and drawbacks, to providing lidded highway sections in select locations throughout the project corridor.

Once a highway design is completed, a detailed noise analysis is performed. The analysis uses the detailed design drawings, including any design measures, to determine traffic related noise impacts. For those locations where noise impacts are identified, noise mitigation is considered.

General information on highway design and noise mitigation measures that may be used on the Trans-Lake Project are given in the following sections. Information that is more detailed is available in the *Noise Mitigation and Design Options*, April 2001.

2.4.1 Depressed Highways

Depressed corridors are simply roadways placed below the elevation of the noise-sensitive receiver locations. This method can be very effective in reducing noise levels at structures located within a few hundred feet of the project corridor. The depressed corridor is often bordered by a retaining wall or berm. Depending on the type of vehicle traffic and the level of

corridor depression, a significant amount of noise can be blocked from reaching the noise-sensitive receiver locations.

2.4.2 Lidded Highways

Lidded highways are essentially depressed roadways that are covered to provide community connection. The lids effectively prevent sound from reaching noise-sensitive receiver locations adjacent to the lidded area. However, for receivers located near the end-points of the lidded roadway, noise levels can often be higher than would be produced with out the lid. The increased noise levels near end-points is caused by reflected noise resulting from the lid. For these locations, additional noise mitigation such as noise walls may be necessary near the portals.

If openings in the lids are used to ventilate the corridor, it should be noted that noise could also escape from these openings. Therefore, placing openings in locations as far as possible from noise-sensitive receivers can help to prevent additional noise impacts. For example, placing the opening near major arterial roads with access to the corridor is preferred because noise levels in this area are already elevated due to the traffic on the arterial road.

One primary concern with lidded corridors is proper ventilation of vehicle exhaust once lids become a certain size, (about 350 feet) ventilation is required. Lidded project corridors are essentially tunnels. Ventilation of the exhaust fumes is an important part of the design. Ventilation can be provided by leaving gaps or openings in the corridor lids to allow exhaust fumes to escape.

Ventilation fans can also be used to evacuate vehicle exhaust. It should be noted that the fans themselves make noise, and incorrect placement of the fans could result in noise impacts. It is possible to mitigate fan noise with noise-reducing louvers and silencers.

2.4.3 Noise Mitigation Measures

Mitigation measures normally evaluated for highway projects include noise walls and berms. Other mitigation measures such as property acquisition and sound insulation are evaluated on a case-by-case basis, and are normally reserved for projects involving high capacity transit, or when the proposed project generates extremely high noise levels.

Any specific mitigation measures that are recommended as part of the project must be considered feasible and reasonable by WSDOT and/or Sound Transit policies. Details on the feasibility and reasonableness of mitigation measures, along with design options and mitigation measures that may be applicable to the Trans-Lake Washington Project are given in the following sections.

2.5 DESIGN ASSUMPTIONS

- Lid sections that cover the freeway and are more than 350-feet in length will require mechanical ventilation and fire suppression systems.

- Lid widths are assumed to cover 8-lanes of highway traffic, and HCT lines. Interchange ramps will not be covered by lids.

- Roadway profile changes to accommodate lidded areas in Concepts 2 and 3 will not reduce the roadway design speed from what presently exists. For Concept 2, the roadway profile will be lowered up to 20 feet.

5.3 SUMMARY OF POTENTIAL NOISE IMPACTS OF EACH CONCEPT

Table 5-1 summarizes the potential noise impacts of each of the concept examined. Information in the table includes:

1. Noise Impacts without Lids or Noise Mitigation: This concept, though not explored in the text, assumes the project is constructed with no lids or noise mitigation.

2. Noise Impacts with Mitigation and without Lids: This concept assumes construction of the project with normal noise mitigation measures and no additional lids.

3. Noise Impacts with Lids, and without the Noise Mitigation: This concept assumes only the application of the lids with no additional noise mitigation, and provides a rating of the lids overall effectiveness at noise reduction

4. Noise Impacts with Lids and Noise Mitigation: This concept assumes the lids and the noise mitigation.

At this time, none of the options can guarantee that all residential areas in the project corridor will have noise levels below the WSDOT 66 dBA traffic noise impact criteria. It may be that during the analysis, it is possible to eliminate all projected noise impacts, however, residual noise from main arterial roads and SR 520 access ramps may not allow for all receivers in the corridor to have noise levels under the criteria levels. During the environmental noise impact analysis, every effort will be made to reduce noise levels and eliminate impacts throughout the project corridor; however, all design concepts do have some potential for residual noise impacts.

Table 5-1. Noise Impact Comparison Summary

See definitions above for details on the options presented in this table	1. Noise Impacts w/o Mitigation	2. Noise Impacts w/mitigation & w/o lids	3. Noise Impacts w/Lids & w/o Supplemental Mitigation	4. Noise Impacts w/Lids & Supplemental Mitigation
Eastlake/Portage Bay/Roanoke/North Capitol Hill Neighborhoods				
Concept 1			○	◐
Concept 2			○	◐
Concept 3	○	◐	◐	◐
Montlake Neighborhoods				
Concept 1			○	◐
Concept 2			○	◐
Concept 3	○	◐	◐	◐
Lake Washington to West of I-405				
Concept 1a				
Concept 1b			○	◐
Concept 2a			○	◐
Concept 2b			◐	◐
Concept 3	○	◐	◐	◐
East of I-405 to SR 202				
Concept 1			***N/A***	***N/A***
Concept 2			***N/A***	***N/A***
Concept 3	○	◐	◐	◐

○ = High Level of Noise Impacts (equal to, or worse than current conditions, significant impacts)

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5.4 RECOMMENDATIONS

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Narrative from Kent Worley's website http://www.cpinternet.com/~amuramur/ regarding caps in Duluth, Mn.

Lake Place
Downtown Lake Superior Lakefront, Duluth, Minnesota

The proximity of a proposed freeway to Lake Superior represented one of the most critical challenges of the entire Interstate 35 corridor within the City of Duluth. The freeway's alignment between downtown and lakefront areas demanded unique design solutions to protect environmental resources, link major downtown land use areas and improve pedestrian access to the long neglected lakefront.

A three-acre, ten million dollar park structure over the freeway was the Landscape Architect's design concept to eliminate negative impacts identified during a long public involvement process. The urban area impacts included the following:

1 The freeway and placement of protective walls along the lakeshore would have created visual, as well as, physical barriers between commercial/residential areas and Lake Superior.

2 Freeway alignment would have eliminated any significant potential for lakefront open space in the vicinity.

3 Severe weather conditions off Lake Superior would cause hazardous roadway icing.

4 Proximity of the highway to downtown and the lakefront would have created severely negative impacts of noise, lighting, air quality and accessibility.

5 Long-range community goals to unify and strengthen the core downtown would have been forfeited.

Because citizens of Duluth and State/Federal Departments of Transportation recognized these potential impacts, lead role opportunity was well defined for the Project Landscape Architect. The design team included MnDOT administration and staff, the City of Duluth and several consultant civil, structural, mechanical and electrical engineers. The Landscape Architect's role was Urban Design Lead, and included Conceptual through Final Design Services for architectural and site components of Lake Place.

Defining the needs, and programming the extent and levels of improvement for the facility were the initial Landscape Architect's challenge. This early conceptual work and extensive project justification became basis to obtain Federal, State and City funding commitments involving a wide-range of design opportunities…all focusing on design solutions to *integrate* the highway and city in linking the public with Lake Superior.

Lake Place incorporates two major elements. First, a wall was constructed between the roadway and the lake. A covering deck was then built over the highway to provide

protection from Lake Superior over-spray and wind-driven debris. Second, and most important, the deck of the protective structure was planned as a multiple-use outdoor area in conjunction with the development of lakefront trail systems. These multiple-use concepts for *Lake Place* and the Urban Highway Corridor have created harmonious transportation, recreation, open space, and quality environment far-exceeding visions of client-city-citizen expectations. It also resulted in community reinvestment and renewal of once marginal lakefront property. This unique oasis for travelers and residents not only protects, but becomes a *Gateway* for the most valuable natural resource of the region ... *"Lake Superior."*

Design concepts insure that the freeway will not visually or physically separate the lakeshore from the City. The two block long *Lake Place* park structure forms one of four highway tunnels within the corridor. Although a "tunnel" in name, Lake Place was envisioned as a pedestrian "bridge" *connecting people and places*; acceptance has been enthusiastic as citizens could finally see, and physically reach their Lake.

A 580 ft. long ceramic tile *Image Wall* mural on the outside highway wall faces lake level use areas. Consistent with community waterfront themes, this depicts historic marine images and provides additional highlight for lakefront trail visitors. *Lake Place* is continuing to accomplish one of its goals with new adjacent improvements, development and attractions; easily a dozen adjacent downtown blocks will see eventual renewal as direct result of this multiple-use highway improvement.

A comprehensive MnDOT/FHWA program, the Urban Interstate 35 resulted in several individual multiple-use improvements with *Lake Place* as the focus. These were designed as a system, and share continuity of design philosophy, design vocabulary of materials, colors, textures, native vegetation, site lighting and subtle messages of environmental awareness. Public acceptance is best illustrated by observing response through public use and enjoyment of these rediscovered resources; a recent comment to the Landscape Architect was, "…with these improvements, there is a NEW SPIRIT in Duluth !"

The Downtown Duluth Interstate issues with their 20-year environmental stalemate illustrates the crucial importance for Landscape Architects to state their case and initiate leadership to attain *"something better."* Lake Place, and other highway corridor multiple-use improvements are living examples that a larger context of human and community opportunities exist, and need to be identified through established inventory, analysis and solution procedures.

The Duluth Freeway Story
...or what can happen when people work together...
This, in no way intends to be comprehensive in terms of sequence, detail and the people, firms, agencies, citizenry, successes and failures which became a part of this history. Instead, it is a very brief outline highlighting this one participant's look back at one magnificent experience and outcome. One very significant difference exists between public perception of how all this happened, and the facts. For this reason, it seems important to record the perception and the reality. Endlessly, people exclaim, "What was the objection, argument, and delay to this facility all about anyway; this is just what this city and region needed." What they either forgot, or are not

aware of is that the highway extension as planned and nearly constructed would have caused eight moving lanes of traffic and barrier fencing between downtown and Lake Superior. No physical connection would have existed. No shoreline trails would have been feasible. No lakefront commercial renewal would have followed. Traffic movement would have been the sole achievement, and with it.....negative sounds, negative sights, negative economic impact, and "opportunities-lost" would have been its legacy.

The battle needed to have been waged; challenges had to occur, and opportunities which existed had to be explored, imagined, communicated, developed, and justified. Perhaps one key person in its early history was Duluth City Planning Director, Richard [Dick] Loraas. Between Dick and Minnesota Department of Transportation administrators coupled with Federal Department of Transportation's planning program called "Multiple Use and Joint Corridor Programs", the project became eligible for this targeted funding which fit the problems and opportunities perfectly.

After the I-35 Multiple Use and Joint Corridor Development Study was completed in 1976, this theme of Integration of the Highway with Environment, became the focus for this 250 million dollar public works project. Some will remember the name, CIHE, which identified Citizens for Integration of Highway and Environment. Few realized in the beginning that this is exactly what could and would occur to cause resolution of differences and conflicts. This was primarily achieved by pushing the roadway down and bringing the pedestrian up and over the freeway as often as possible along this three mile section of freeway. Sounds were mitigated---safety was solved---connection possibilities were apparent---views were created---roadways were made winter-safe---conflicts of vehicular and roadway lighting were solved---and a sense of human scale was created within the corridor which resulted in an integration of uses, needs, activities and priorities.

Perhaps a future chapter may deal with details of the various sequenced projects all accomplished between 1988 and 1994. Was it successful multiple use; you be the judge.....The Projects provided: separated and safe transportation, efficient loading of existing parking ramps, relief to existing downtown street systems, downtown and public facility ingress and egress efficiencies, increased corridor parking opportunities, 3 acre Lake Place connection to Lake Superior, Brewery Plaza extended bridge, Jay Cooke Plaza extended bridge, Downtown Duluth Lakewalk, new and enlarged Leif Erikson Park, East Lakewalk extending to 26th Ave. East, space for Northland Vietnam Veterans Memorial, City storm water system improvements, Newfound Beach, underwater fish habitat improvements, the Corner-of-the-Lake with Endion Station Convention and Visitors Bureau, ten pedestrian connections to the lakefront and even more.

As this community progresses, several Downtown lakefront blocks will continue to achieve renewal and new life in responding to the multiple-use initiatives which define one landmark urban freeway undertaking.

APPENDIX I

Oak Park Cap the Ike Study
Illinois Tomorrow Grant Agreement
DRAFT Scope of Services
Village of Oak Park, Illinois

This agreement provides funding to accomplish the following transportation-related tasks:

Introduction to Project

The Village of Oak Park, a fully developed older suburb of more than 52,000 people bordering the City of Chicago, will undertake a planning study that will update and expand upon a 1987 air rights study that considered the feasibility of capping portions of the I-290 expressway that runs through Oak Park. Within the vision for this one project, lies the potential not only to reduce traffic congestion by enhancing many different transportation modes, but also to create public open space and potential areas for private development, to encourage rather than discourage reinvestment in Oak Park property adjacent to the Eisenhower, and to improve the quality of life for Oak Park residents.

As evidenced by the 1987 report on this topic, it has long been the desire of the Village to re-establish and re-connect the community through some sort of cap that would bridge the current divide that the Eisenhower creates through Oak Park. Yet without a major highway infrastructure project-taking place, there has been no mechanism to undertake the cap project. Constructing a cap at the same time as other major work on the highway is expected to reduce the expense of undertaking a cap construction project separately. The immediate impetus for this update of the concepts and plans for an Oak Park cap project was prompted by the new I-290 HOV proposal and the concerns of the Village and its residents with respect to adverse economic, social and environmental impacts likely to result from the proposed expansion or reconstruction of I-290 through Oak Park.

As noted, IDOT has begun a Phase I study of a major reconstruction of the Eisenhower Expressway as it nears 50 years since the original construction. The Phase I study includes an examination of the potential expansion of I-290 as it goes through Oak Park to include high-occupancy vehicles (HOV) lanes, as proposed in the 2020 Regional Transportation Plan for the Chicago metropolitan area. Thus, the timing is right to perform this planning project in order for the detailed engineering to be considered in the analyses of the Eisenhower reconstruction and HOV proposal.

In general, the Village of Oak Park Cap the Ike Study project would update cost and feasibility assumptions from the prior study and conduct a planning process involving the community to develop alternatives, concepts and recommendations that meet the current needs of the Village. The project is intended to study the feasibility and effectiveness of a cap over all or part of the portions of I-290 that run through Oak Park as a means of mitigating existing and expected adverse impacts of the current highway

and the proposed reconstruction and possible HOV project, as a means enhancing intermodal transportation options, and as a means of improving community livability through enhanced open spaces and recreational options, as well as to explore the potential for creating new areas available for private development.

The planning activity would necessarily be a cooperative inter-jurisdictional project. This planning activity will seek to partner with IDOT, transit agencies, and other taxing bodies, business associations, local community based interests, and residents. Public involvement and participation will be an integral part of the planning process.

By promoting alternative transportation at the grade level of the cap, this proposal supports congestion relief in and beyond the borders of Oak Park. In addition, reinvestment in private properties, particularly in the commercial and residential areas adjacent to the cap, would be spurred by such a visionary effort to reconnect the community on either side of the Eisenhower. This project also would preserve open space as well as create new opportunities for parks, recreation, biking, walking and access to enhanced intermodal transit stations at grade level. As such it would promote the quality of life of Oak Park residents -- including those who live in rental and more affordable multi-family dwelling units near the Eisenhower -- and mitigate the existing and expected future impacts of noise and air quality from the current, reconstructed and potentially expanded expressway.

Along the highway corridor are many affordable apartment and condo buildings, single-family residences including a newly listed national historic district, parks, a plant conservatory, a fire station, and a branch library as well as several churches and schools and hospitals in close proximity. Also along the route are two neighborhood business districts that would benefit from parking opportunities and reconnection to customers on the opposite side of the expressway. In the case of the Oak Park Avenue/Eisenhower Business District, which was divided by the original highway, its two commercial segments on either side of the Expressway could be reconnected. Similarly, the patron base for the Harrison Business District was affected by the separation and lack of street access to and from commercial stores caused by the construction of the highway. It was also affected by the significant loss of residences in this area due to displacement by the highway.

This project would support the ongoing work in developing the Oak Park community pursuant to the Village's comprehensive plan, and fully develop our advantages such as location and already existing public transportation and utility infrastructure to offer enhanced quality of life, community cohesion and improved transportation choices. Specifically, two community-planning studies related in some way to this project are underway and will be coordinated with this planning project. First, the Park District of Oak Park has undertaken a review of its infrastructure needs, which documents a shortage of park space in the Village. As the Village owns some of the park facilities and the Village provides significant funds to provide recreational services, the Village and the Park District are now launching a comprehensive planning effort to examine the future of park facilities and recreational services in the Village. Second, the Village of Oak Park has just begun a comprehensive planning process to ascertain the needs and future vision for the Oak Park/Eisenhower business district and the Harrison business district with the assistance of the University of Illinois – Chicago. These two business districts were selected, in part, because of the need to plan for and how a reconstructed I-290

may impact and affect these districts. The product of these studies will be a character plan for these two areas that will guide future development projects.

The proposed study would be intended specifically to evaluate effective ways to integrate land use planning, development decisions and infrastructure investments in the affected areas of Oak Park, where the Eisenhower Expressway cuts through the Village. Goals for the proposed study would include:

- Create a plan for innovative development and enhancement of open space and recreational areas in the affected portion of Oak Park;
- Develop a transit-oriented/mixed use development plan to increase transportation options, improve walkability, increase bike facilities and enhance access to transit in the affected portion of the Village;
- Study innovative ways to mitigate the existing and potential adverse impacts of the proposed highway reconstruction and potential expansion, within the context of a multi-community highway corridor development plan;
- Identify funding sources and financing plan as well as quantify and address air rights issues
- Study ways to create an effective redevelopment and revitalization plan for the portions of the Village adversely affected by I-290 and the proposed expansion with a multiple use development plan for the cap surface.

Technical Work Program

1. DOCUMENT REVIEW -- As noted above, this report would update and expand upon the Oak Park Air Rights study prepared by IDOT in 1987. This report will be reviewed in depth and more in-depth background information sought from IDOT or other involved parties as necessary. Other documents to be reviewed include: 1990 Village of Oak Park Comprehensive Plan; the CATS 2020 Regional Transportation Plan; the 2002 Park District Infrastructure Report; IDOT's 1998 I-290 HOV Feasibility Report; Business Plans for the Harrison and Oak Park / Eisenhower Districts; the 2003 Oak Park Cap the IKE Working Group Report, and information about the Phase I I-290 Study including IDOT materials and plans (as available) as well as Village correspondence and Eisenhower Advisory Committee Impact report of December 2002.

2. PLANNING PROCESS –
   - The consultant will conduct a planning process significantly involving the public to obtain the Oak Park community's priorities for the options available and desirable to cap the Eisenhower through a planning study of the entire area of the expressway's route through Oak Park. Hold community meetings to explain the study at the outset and throughout the process as necessary to update and obtain input including to review and select alternatives. The consultant will develop a process involving the public as well as interested and affected parties to develop concepts and all programming requirements

that are both technically feasible and desirable to the community. At the end, the study would outline the consensus for recommended options for further more detailed engineering approaches, for potential inclusion into the Eisenhower Expressway Phase I engineering process.

- This proposed study would directly impact transportation agencies serving the Village including IDOT, CTA and PACE. Their input and active participation will be sought throughout this process. Other transit agencies including CATS, RTA and Metra will be invited to participate. Other local agencies to be invited include the Harrison Business District, the Oak Park / Eisenhower Business District, the Oak Park Library, the Park District of Oak Park, District 97 schools, community and environmental organizations interested in transportation issues and open space, and residents. In the development of the proposed plan, the Village will seek to establish an ad hoc committee of representatives from each of the above groups and work with the Village to identify any other key stakeholders within Oak Park or regionally. By including Oak Park community representatives as well as transportation agency representatives on the committee, both the technical requirements and the priorities of the community will be represented. Through the creation of this "joint" committee, facilitation of as much of a consensus as possible about the final recommendations for program requirements and the scope of a potential cap project will occur. The committee will hold periodic public meetings at which it is expected that the consultant will present updates and issues for discussion by the committee and the public. It is expected that the consultant will work with representatives of the affected agencies in other meetings as necessary to review technical issues, and that the consultant will present the product or summaries of those interactions to the committee and the public in order to facilitate a productive discussion and resolution of issues relating to capping the Eisenhower.
- Coordination with other on-going planning related efforts will need to occur. These include but are not limited to: 1) Coordination with the Oak Park / Eisenhower & Harrison Business District's Business Development Planning process, 2) IDOT's I-290 Phase I planning, and 3) comprehensive planning efforts for parks and recreational facilities within Oak Park.

3. TECHNICAL RESEARCH, COORDINATION AND EVALUATION –
   - Update the technical and planning assumptions from the prior 1987 study to reflect current IDOT planning and design efforts. Investigate issues called out in that previous report requiring additional review. In addition, relate the 1987 study to Phase One IDOT HOV plans that call for rebuilding or creating new retaining walls through Oak Park, including reconstructing all seven Oak Park overpasses/ramps and CTA stations on the Blue Line. The new study also would examine the desirability and feasibility of capping the Eisenhower with a focus on these locations, given that much of the existing infrastructure would have to be rebuilt to accommodate proposed reconstruction plans.
   - Document any incremental costs necessary to accommodate such a cap as part of IDOT reconstruction or expansion plans, and developing up-to-date cost estimates of options deemed desirable. These cost estimates in this

study will be expanded to include a broad range of capping options, and not limited to the three locations in the 1987 report.

- Develop an implementation plan including addressing funding issues and commitments from key parties
- Study the feasibility of incorporating on the cap in Oak Park grade level pedestrian linkages, bike paths, commuter parking, enhanced bus connections and transfer points, open space and public recreational areas, rebuilt public transit stations, and the need for any other public facilities.
- Study the feasibility of transforming existing CTA stations, many of which are served by several bus routes, into intermodal uses that would promote alternatives to vehicle trips on the highway.
- Study the health, safety and environmental benefits and impacts of a cap, including the potential for improving air quality and noise for the areas in Oak Park that are adjacent to I-290.
- Develop principles on which to base recommendations for placement of a cap or partial caps for the entire IKE corridor through Oak Park. Such factors would include but are not limited to community priorities, technical feasibility and sound land use practices. Apply those principles to develop recommended plan.
- Technical methods for ensuring a cap is environmentally sound and incorporates emergency response issues also would be examined in detail.
- Assess the commercial development possibilities adjacent to and potentially on top of the cap project in terms of market potential, legal ramifications, and technical feasibility.
- The feasibility of filtering the air of any required ventilation system will be examined. The most advanced technology and innovations in ventilation and air filtering systems will be reviewed for potential inclusion into this project.

Deliverables

This project would produce a detailed report on the feasibility of capping all or portions of I-290 as reconstructed through the Village of Oak Park as described above, and detail the recommended capping alternative(s) that result from the planning process undertaken as a result of the grant. The alternative(s) would be described in sufficient detail to provide information about all integral elements necessary for completing more detailed engineering and environmental studies and intergovernmental agreements needed to build the project, including: all necessary structural and equipment requirements, the proposed extent and length of the cap(s), the features of the grade level portion of the cap(s), planning and construction cost estimates, funding concepts, sources, and commitments secured, analysis of ongoing operations and maintenance costs, an overall projected timeline that will include the timeline for the development of this study, for further design and engineering planning periods for cap options, and for a construction period for cap options. The report would include conceptual drawings from a plan view, front view and cross sectional views as necessary to illustrate the concepts reviewed and recommendations made. Concept drawings will include the recommended solutions include the layout and structure of a cap(s) noting physical structures and amenities contemplated such as rebuilt transit stations and bike paths. Deliverables also include but are not limited to: meetings, workshops, meeting invitations, agendas,

minutes, and materials, technical and progress reports, maps, data, correspondence. A draft and final version of the report is expected.

Projected Funding

Federal Transportation Planning Funds	$200,000	80%
State of Illinois Match	$ 25,000	10%
Village of Oak Park Match	$ 25,000	10%
TOTAL	$250,000	100%

DATED: 26 JULY 2000

APPENDIX J
SELECTED
EXCERPTS

Facilitator's Report

International Workshop on Tunnel Ventilation

7 to 9 June 2000 - Sydney, Australia

Prepared by:

Arnold Dix
Partner
MADDOCK LONIE & CHISHOLM

International Workshop on Tunnel Ventilation

7 to 9 June 2000 - Sydney, Australia

EXECUTIVE SUMMARY

The Workshop provided a forum for a detailed discussion of international and local trends and factors with respect to tunnel ventilation design.

An examination of alternative technologies occurred and an assessment of a number of air quality treatment systems was undertaken.

The Workshop focussed on the example of the M5 East project while also discussing the Cross City and Lane Cove tunnel projects generally and the underlying philosophes of tunnel ventilation design in Sydney, Melbourne, Western Europe, Asia and America.

Discussions focussed on international and local experience with tunnel ventilation technologies, the relationship between air quality and health, local and international trends in air pollution management, air pollution initiatives, the costs and effectiveness of technologies, and the importance of the relationship between communities and government.

FINDINGS

- Emissions from motor vehicles can cause adverse health effects.

- In all urban areas, including Sydney – people suffer adverse health effects as a result of breathing polluted air.

- Technologies exist which can alter the composition of polluted air from tunnels.

- A holistic approach to addressing polluted air is required when assessing tunnel air cleaning technologies. Prudent use of financial resources demands that the use of technology to alter the composition of tunnel air has to be compared with other methods of improving air quality.

- Information on the effectiveness of electrostatic precipitators at changing the air quality around tunnels, their cost and operational performance should be obtained from countries such as Norway, Japan and South Korea which use them.

- The suite of air quality objectives for tunnel emissions in New South Wales are comparatively strict compared with many other countries.

- The M5 East design is expected to meet all Sydney's comparatively strict environmental performance requirements, however in engineering terms, location is not optimal due to the remote stack location in a shallow valley.

- Analysis of the ventilation systems designed for the M5 East tunnel indicates that Sydney's comparatively strict standards are expected to be met outside tunnel portals and in areas surrounding the stack.

- The M5 East ventilation design is an example of a system, which has been designed by considering, factors in addition to engineering.

- Conditions of approval substantially control the designs of Sydney tunnels.

- Holistic tunnel design includes consideration of more than engineering issues.

- The energy consumption of a ventilation system is a relevant factor in tunnel system design.

- Immediate consideration should be given to the most effective ways of improving air quality in areas identified as receiving the least benefit from the operation of the M5 East tunnel ventilation system.

- The benefits of cleaning tunnel air with various technologies – as they emerge – must be compared with the benefits of other measures to improve air quality.

- If measures to improve air quality are not implemented rapidly the opportunity afforded by the tunnel environment to manage motor vehicle emissions will become increasingly attractive.

I have not recommended air cleaning technologies be employed in the M5 East project. Nor have I recommended that works stop on the construction of the ventilation system. I have not made such recommendations on the basis that:

a) Such a conclusion was not reached at the workshop; nor could it be reasonably reached on the basis of material presented at the workshop;

b) My recommendations for further data collection, policy review, and air quality improvement measures will be responded to promptly;

c) The M5 East system has been designed in a way that can accommodate both particulate and gas cleaning technologies should it be determined they are necessary and effective in the future.

Given the acknowledged adverse health effects of motor vehicle emissions it is appropriate that tangible programs for air quality improvement are introduced as a priority.

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Facilitator's Report

International Workshop on Tunnel Ventilation
7 to 9 June 2000 - Sydney, Australia

INTRODUCTION

1.1 Tunnels & Pollution

The construction of vehicle tunnels has focussed both government and community attention on the potential adverse health effects of polluted air.

I have not recommended air cleaning technologies be employed in the M5 East project. Nor have I recommended that works stop on the construction of the ventilation system. I have not made such recommendations on the basis that:

a) My recommendations will be addressed promptly;

b) The M5 East system has been designed in a way it can accommodate both particulate and gas cleaning technologies.

The tunnel environment provides an opportunity which can, and in at least some instances, has, been used to install technology to either extract or modify some of the pollutants emitted from motor cars.

However as noted by Giselle Mawer of the M5 East RAPS:

> *"we need to look at cost effectiveness in the holistic way. It is effective for the short term as well as the long term, is it effective in terms of the total cost not just the financial cost from the RTA budget, what about the health costs, what about the*

aesthetic costs, what about the amenity costs, the environment cost, the equity cost, and the cost for generations to come?"

It is for these reasons that factors such as effectiveness, the magnitude of any health risks posed, the comparative cost of achieving the environmental improvement must be carefully considered between different strategies to improve air quality.

In Western Europe programs designed to address motor vehicle emissions have resulted in such significant air quality improvements that in some instances it is not expected stacks will be needed on some tunnel projects in the future.

There was insufficient material presented at the workshop to decide on the practical effectiveness of electrostatic precipitators or other technologies such as gas cleaning.

Such information should be readily available – and should form the basis of any discussions made about their use. This material should be requested on at least on agency level.

1.2 The Nature of this Report

This report is an overview of themes, discussion, debate and conclusions which arose from the international workshop into tunnel ventilation held in Sydney from 7 to 9 June 2000.

I have revisited my draft report following both written and oral communications from participants at the Workshop. Material forwarded to me in response to my draft report is included on the resource CD.

This report should be read in the context of reference material contained on the International Workshop and Tunnel Ventilation Workshop CD. The transcript and overheads that were presented during the course of the 3 days of the proceedings are contained on that CD.

This report places more emphasis upon non-scientific and non-engineering matters, which were raised, at the workshop than my draft report.

The initial transcript was of such a poor quality that it required correction. The uncorrected transcripts together with the corrected version are contained on the CD. There remain errors in the transcript. These should be corrected in a co-operative arrangement between the RTA and RAPS whom have indicated they have a copy of the proceedings on a separate tape.

As the corrected version of the proceedings was not available while compiling this report, no detailed references to the quotations extracted have been included.

This report does not attempt to detail every matter canvassed, argument raised or conclusion reached at the workshop.

To obtain a detailed appreciation of all matters, argument and recommendations of the workshop the transcript, briefing material and overheads should be examined in their entirety.

Importantly an overview of community expectations of the Workshop were noted in a series of questions presented to the Workshop participants on Day 1 of the Workshop. They are reproduced in full:

"

1. What technology exists to treat the harmful pollutants (especially particulates and Nitrogen Dioxide) of vehicle emissions from tunnels?

2. Why and in what context have other countries used air cleaning and filtration technologies? To what extent have environmental issues played a part in these decisions? With what effect?

3. Would their use make stacks in urban areas redundant? What is the cost benefit analysis of comparative ventilation systems?

4. How would the available technology apply to Australian conditions? How would this technology apply specifically to the M5 East?

5. What are the implications of the latest research on the health effects of air pollution for current air quality goals? How appropriate are they for:
   a) Point source emissions?

b) Sustained levels of exposure?
c) Local as compared with regional impacts?
d) Sensitive sectors of the population?

6. How adequate are the current DUAP approval conditions for tunnel ventilation systems and monitoring processes in light of emerging standards and latest research on air pollution and its health effects? Are they actually applicable to a point source such as a stack?

7. What are the realistic predictions, time frames for implementation and impacts of improved air quality and health outcomes from proposed changes to the vehicle fleet and fuel standards?

8. What will happen as a result if this workshop? How will the findings from this workshop be recorded? How will recommendations be made? How will the public get access to this information? Who will write the draft report? Who will have input into it? What review/appeal mechanisms are available?

9. What are the implementation strategies and implementation timeframes?

10. How can the lessons learnt from the M5 East be applied to ensure more effective planning and consultation processes and better community acceptance of infrastructure projects?"

1.3 The Workshop

The RTA requested the facilitation of an international workshop to promote a detailed discussion of international experience local conditions and alternative technologies with a view to assessing the appropriateness of the treatment systems for road tunnels in New South Wales.

To achieve this tunnel ventilation experts from around the world and proponents of technology were brought together (for the first time) in a forum encouraging open discussion on tunnel air management strategies for Sydney.

- Suggestions of unfairness;
- That the proposals were bad for health;
- That there was a conspiracy and incompetence;
- That the RTA had adopted a "design and defend" mentality;
- That it caused devaluation of land;
- Was visually unacceptable;

to name just some issues.

It was within this context that the Workshop proceeded.

1.7 Material Provided Following the Workshop

Matsushita Electric Industrial Co, Ltd of Japan provided material on electrostatic precipitator use in Japan. A short discussion of that material, and revised recommendations arising from it appear in this report.

The comments on my draft report and the draft report are also contained also on the CD.

DISCUSSION OF WORKSHOP

2.1 Tunnel Ventilation Philosophy - General

All presenters agreed that each tunnel ventilation system must be considered on a tunnel-by-tunnel basis. On no other subject was such a unanimous view expressed.

Once accepted that each tunnel required individual examination, the technical problem - which remains unresolved - is how to balance competing factors in designing a tunnel ventilation system?

Dr Zumsteg, from Switzerland, proposed a simplified model for tunnel ventilation decision-making. At its most basic level, he observed:

> *"At the very least a balance had to be reached between the air quality sought to be achieved, the energy which was used to achieve it and the amount of money that has to be spent."*

On day 2, he noted:

> *"We have to apply certain limits to be able to dimension what we want to build so that if we don't know any limit for example for the air quality, we cannot say how much air we should put into this tunnel or take out of this tunnel. If we have no limit of money available then problem is not too big, we can afford everything, but usually there is quite a strict limit where the costs have to be and what the maximum cost can be…. "*

This basic model of decision-making was generally consistent with views expressed by a range of participants.

Throughout the Workshop there was a recurring theme that factors such as health, visual impact, process and equity should be considered as well as more fundamental engineering performance measures.

An insight into the task of dimensioning and general design of a tunnel ventilation system was provided by Charles MacDonald, formerly the General Manager, Engineering, on Melbourne's City Link project.

He explained that the form of the Australian ventilation system is driven by the current air quality requirement of minimal or no emissions at portals and applying comparatively strict environmental standards immediately outside the tunnel portals. On day 2, he said:

> *" … not having emissions at portals … applying the standards literally everywhere and not adjusting them in the circumstances of the portal …… gives us …… very tight constraints in which to work. …".*

The tunnel ventilation design engineers pointed out that there was a relationship between the strict environmental performance requirements of the M5 East tunnel ventilation system conditions of approval and the actual ventilation design.

Given this fact, the workshop explored the origin of the regulatory environment via extensive discussion, submission and debate.

A second non-technical and perhaps even more difficult issue arose: how are conflicting community expectations about ventilation design is accommodated?

There was a range of outcomes sought by the community, which were to varying extents non reconcilable. For example taller stacks for enhanced pollution dispersion as compared with no stacks and full portal emissions.

The importance of balancing a number of important considerations underlined much of the debate at the workshop.

Complex equity issues arose at the workshop in relation to the allocation of resources to improve the environment. It was beyond the scope of the workshop to consider a methodology for the assessment of the health implications of placing road infrastructure in tunnels in comparison with other public health initiatives to improve health.

Awareness of the relationship between exposure to air pollution and adverse health effects for people, in the context of a large city, raises complex equity issues on how limited resources should be allocated.

Another important implication of the dynamics of tunnel ventilation systems is their ability to respond to changes in pollution levels and/or environmental requirements with time. The demands may become more onerous – (such as in the Ten-nohzan Tunnel (Japan) in which precipitators have been retrospectively installed) or less demanding (such as in the Oslo Tunnel (Norway) where the precipitators were turned off.)

No detailed information was presented on the ability of competing tunnel ventilation designs to respond to decreased tunnel ventilation demands with time. The ability to retrospectively

fit technology simply is an example of a design that can respond to an increase in demands upon the system.

Currently portal emissions are effectively not permitted for the Melbourne City Link or Sydney's M5 East tunnels. Over the operational lifetime of a project it is conceivable that portal emissions may occur. Indeed, it is conceivable they may even be encouraged. In such circumstances, monitoring of air quality outside portals should be implemented, whether the current design anticipates portal emissions or not.

- **Serious consideration should be given to monitoring air quality outside portals, whether the ventilation design anticipates portal emissions or not.**

Air quality monitoring outside portals would allow informed management of the tunnel ventilation system with respect to outside tunnel air quality no matter what variations occur in the tunnels operational regime during its lifetime.

Of course it is conceivable that within our lifetime, improvements in vehicle emissions may render stacks redundant requiring them to be decommissioned.

Analysing the implications of variations in air quality - including regional, local, near surface road and local - were discussed, but there was insufficient information at the workshop to properly consider this matter.

Ultimately, there may be no correct way to balance competing issues, other than to observe that a process involving consultation and mutual respect between a community and its public servants is a critical factor in arriving at an acceptable solution. Like all relationships that between the community and government authorities is in a state of evolution.

2.2 Interdepartmental Regulatory Responsibility for Tunnels

The importance of meeting comparatively strict environmental goals immediately outside the M5 East tunnel was confirmed by Mark Hather of the Department of Urban Affairs and Planning (DUAP). He confirmed that the goals were part of , "*conditions of approval which need to be met*".

just a question of looking at the increase in the context of the exposure we encounter going about in our daily life. That is the only point I would make because otherwise we are looking at it in isolation."

Dr Corbett has conducted research in Sydney, as pointed out by Dr Kearney in his response to the Draft Report – (but in the context of criticising Dr Corbett's opinion):

"Dr Corbett has examined the actual association between pollution and hospital admissions in Sydney and identified – amongst other things – that an increase in PM_{10} of 50mg/m^3 is associated with a 4% increase in admissions for chronic pulmonary disease".

Accordingly Dr Corbett's observations about the significance to health of exposure to substances were made within the context of actual analysis of health outcomes. Dr Kearney's important observations appeared to be made from the perspective of a doctor identifying the causes of particular illnesses.

Dr Vicky Sheppeard, from the Department of Health, also commented in the context of a discussion in relation to the health effects of NO2 on the importance of the significance to health of the gas:

" … those kinds of levels would not have an appreciable health effect."

On the other hand, some other participants considered such an approach to the health analysis was unacceptable. This was summed up when a community representative said:

" … the fact is, we don't care how small the increase is. Sure if we had an unflued gas heater or someone smokes in our house that is our choice. But if you put this out onto our roads and into our backyard, that is not our choice. If we choose to pollute our own atmosphere where we live then you cannot do anything about it but we don't want you to pollute it for us. So we don't care whether it's observable or not observable, what we want is [you to] stop it. So lets forget all of this and sit down and say, do you think this stuff works? [The air cleaning technologies] What do you

think of the technology? And how do you think we can adapt it to improve our environment."

Conflicts over health risk methodology were a common cause for conflicts of opinion at the workshop. The issue of health risk assessment must be further examined.

- **Methodologies for calculating and communicating comparative health risk assessment information should be established to better enable the assessment of the implications of tunnel ventilation systems.**

3.3 Presentation of Health Risk Data

Information generated about the performance of a tunnel ventilation system should be presented in a way that is useful for lay people as well as health professionals for conducting comparative health risk analysis.

Both acute and chronic health predictions are appropriate when trying to determine the impact of tunnel ventilation systems.

- **The use of both worst-case emissions predictions as well as cumulative and long term predictions for health risk assessment should be considered.**

TUNNEL AIR MANAGEMENT OPTIONS

4.1 Dispersion

It was apparent from discussions that all tunnels in Australia and most of the world have, to date, relied upon dispersion techniques to achieve the prescribed environmental standards. The use of dispersion techniques to manage tunnel air emissions is used in all countries including Norway and Japan.

communities' response to it with a view to considering whether to implement a similar system.

7.3 Communication

The workshop also identified that engineers around the world fail to use units of measurements and express information in a consistent way that is useful for other professionals and the community. This workshop has highlighted the difficulties this can cause both health professionals and the community. This should be borne in mind in future communications.

7.4 Ventilation System Review

The performance of ventilation systems should be regularly reviewed in the context of:

- Changes in pollution reduction technology;
- Changes in emission characteristics;
- Changes in medical knowledge;
- Changes in community expectations.

A formal, transparent, multidisciplinary process that includes community input for the review of tunnel ventilation performance monitoring and philosophy for all urban road tunnels in Sydney should be implemented.

7.5 Modelling

Emphasis was placed on the role and relevance of modelling at the Workshop. This is because in very large projects it is the modelling which underlies the confidence that its ventilation system will perform at least as well as predicted.

To consider the equity issues associated with these matters in detail would have required the attendance of representatives of other communities including those from other possible stack locations and from communities living near the portals - and the assistance of professionals expert in analysing environmental equity issues.

Although this may have resulted in debate on these issues, it is unlikely it would have assisted in facilitating constructive debate on tunnel ventilation alternatives for Sydney.

This position was also vindicated during the workshop as it was made very clear by one community group that they did not want to impose the M5 East “stack solution” on other communities - they wanted to resolve the matter absolutely.

Resolution of these equity issues will at least in part require an acknowledgment that the location of the stack some distance from the tunnel will more greatly effect people near the new stack than it would have had it been constructed over or adjoining the tunnel air is the international practice.

SUMMARY & RECOMMENDATIONS

The design and design review of tunnel ventilation systems for long urban tunnels in Sydney has been undertaken by competent local and international experts.

The designs of these ventilation systems are primarily a response to the comparatively strict environmental performance requirements of projects in Sydney. It is these comparatively strict standards which have in substantial part resulted in the ventilation designs for Sydney's road tunnels.

The experts on tunnel ventilation design at the workshop generally agreed that the results of the design analysis meant there should be confidence the M5 East project would meet the comparatively strict environmental standards set. (It must be remembered that each expert was provided with comprehensive technical data for review well before the workshop.) However it also became clear that other issues are relevant in considering the appropriateness of a particular tunnel ventilation design.

The location of the M5 East stack in a broad valley, distant from the tunnel, in full view of homes was criticised by the international presenters. Given the tunnel is being built under hills which are the optimal place to locate ventilation stacks from a strictly engineering perspective, the current location could be expected to generate discontent. However the tunnel ventilation engineers maintained that while the location was not "optimal" it would still function appropriately.

It was determined at the workshop, following a site inspection and general discussion, that the tunnel ventilation design of the M5 East project has been configured so as to allow devices such as electrostatic precipitators and/or NO_2 gas conversion plants to be installed in the future.

The discontent from the local community appeared partly the result of a failure of the approvals process to adequately deal with community concerns about scientific, engineering and health issues but perhaps even more importantly, consultation, property values and the physical/visual intrusiveness of a ventilation stack into their environment were also relevant.

Given the limitations of the Workshop there was insufficient information presented to determine, on a holistic basis, the appropriateness of installing devices such as electrostatic precipitators and/or NO_2 gas conversion plants in the M5 East project or in other NSW tunnel projects.

Information and methodologies arising from the detailed recommendations of this report are intended to provide a sound basis upon which decisions about tunnel ventilation design and the use of technologies for altering the composition of tunnel air can be made in the near future.

It is recommended, in relation to the general design for urban tunnels in New South Wales that the relevant authorities:

- **Review the strict environmental performance requirements of tunnel ventilation systems in the context of other environmental outcomes that such requirements may cause.**

- **An analysis should be undertaken of the likely timing and effect of introduced fuel and emission standards on both motor vehicle emissions from tunnels and their effect on ambient air quality.**

- **Implement a formal, transparent, multidisciplinary process for the regular review of tunnel design philosophy, ventilation performance monitoring and operational philosophy for all long urban road tunnels in Sydney.**

It is recommended, in relation to health risk evaluation of tunnel ventilation systems:

- **Methodologies for calculating and communicating comparative health risk assessment information should be established to better enable the assessment of the health implications of tunnel ventilation systems.**

- **The use of both worst-case emissions predictions, as well as cumulative and long term predictions for health risk assessment should be considered.**

- **That an explanation of the health risk implications of the standards, be prepared and made available to the public.**

- **Air quality analysis, examining where present and future changes in air quality will occur and the nature of any changes should be conducted for tunnelling projects.**

- **A health risk analysis of any change in air quality predicted should be undertaken which examines the nature and extent of the likely health impacts of any change in air quality identified.**

It is recommended, in relation to cost benefit analysis of alternative tunnel ventilation designs that as a matter of urgency the following information should be sought overseas:

- **The relevant NSW department(s) formally request details of the rationale for installing the electrostatic precipitation systems for external air quality management**

in the Norwegian, Korean and Japanese tunnels from the appropriate government authorities.

- **The relevant NSW department(s) formally request data from Norway, Japan and South Korea on the effect on external air quality of operating electrostatic precipitators.**

- **It is recommended that the relevant NSW department(s) formally request data from Norway, Japan and South Korea on:**

    - **the effect on external air quality of operating electrostatic precipitators.**

    - **the quantity and composition of wastes electrostatic precipitators generate.**

    - **how wastes from electrostatic precipitators are disposed.**

    - **the reliability of serviceability of operating electrostatic precipitators.**

In relation to more general issues about the Sydney context of future tunnel ventilation performance the following should be undertaken:

- **Further examination of alternative technologies is required to determine their actual costs and benefits.**

- **It is recommended that further analysis of the benefits of NO_2 removal should be undertaken.**

- **An analysis of the likely timing and effect of changes in fuel and emission standards on both motor vehicle emissions from tunnels and their effect on ambient air quality be conducted.**

- **An examination is required of the effects of alternative measures – such as emission testing on motor vehicles – as was described from Switzerland – and**

the further regulation of other activities such as solid fuel heating will have on ambient air quality.

It is recommended, in relation to the measurement of the environmental performance of long urban road tunnels that:

- **Data on air quality proximate to tunnels be made available to the public rapidly (such as via the Internet) in a manner similar to that currently deployed by the Victorian EPA.**

It is recommended, in relation to modelling that:

- **An independent assessment of the differences predicted by the numerical modelling as compared with the physical modelling of the M5 East ventilation system be undertaken.**

- **The relevant NSW government agencies formally request their Victorian counterparts for data demonstrating any differences between actual and predicted changes in air quality as a result of the operation of the City Link ventilation system.**

- **Investigation of the feasibility of conducting full height gas dispersion test for tunnel projects, and if feasible, conducted prior to the operation of ventilation systems.**

It is recommended in relation to this report and the materials associated with it that:

- **they be made freely accessible to the public.**

In relation to the recommendations of this report:

- **that any responses to the recommendations be made available at the same location as the report.**

COMMUNITY CONSULTATION

I recommend that there be a review of community consultation practices, particularly with respect to the substance of such practices as compared with what is written in legal and practice documentation.

CONCLUSION

This report contains key recommendations for further investigations in relation to tunnel air management philosophies in Sydney.

This report is no substitute for studying the materials accompanying this report.

The complex and often highly technical and emotional issues associated with management of the risks associated with the use of internal combustion engine driven vehicles can be dealt with equitably and rationally.

Given the importance of the relationship between human health and the quality of air people breath, action must be taken to manage air quality.

A holistic approach to decisions in relation to tunnel air management ultimately demands tangible actions by communities and government. Action is warranted with respect to polluted air.

The suggestions for action in this report, will contribute to the equitable and rational process of complex decision-making with respect to tunnel ventilation options for Sydney.

Arnold Dix
Facilitator
26 July 2000

APPENDIX K

References / Acknowledgements

References:

The following documents were used in the research of information and development of this report. All documents are available to the general public.

1. Downtown to the Riverfront Reconnection Research Study prepared by Parsons Brinckerhoff Quade & Douglas.(I-5 Freeway in City of Sacramento) – dated July 26, 2001

2. Report on the Potential Impacts of the Proposed Eisenhower Expansion prepared by the Eisenhower Citizens Advisory Committee for the Village of Oak Park, IL. – dated December 2002

3. Preliminary Engineering Study – New Haven Harbor Access, New Haven CT. prepared by Parsons Brinckerhoff for Connecticut Dept. of Transportation – March 2002

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5. Memorandum Agreement for the City of Seattle, City of Mercer Island, City of Bellevue, King of County, Metro and Washington State Highway Commission – dated December 1976

6. Oak Park Air Rights Feasibility Study prepared by the Illinois Department of Transportation for the Village of Oak Park, IL. – dated September 1987

7. UIC Oak Park Project website http://oakparkinfo.lib.uic.edu, prepared by University of Illinois - Chicago, Dept. of Urban Planning for the Village of Oak Park, IL.

8. The Chicago Central Area Plan prepared by The City of Chicago Dept. of Planning & Development / Dept. of Transportation for the Mayor's Central Area Plan Steering Committee – dated July 2002

9. Proposed Capital Improvement Program prepared by the Parks Infrastructure Committee for the Village of Oak Park, IL. – dated November 2002

NOTE: Please see Appendix A.2 for a list of websites that were also used in the research and development of this report.

Acknowledgements:

Cap the Ike Working Group members include:

Charles Anderson, S.E. – structural engineer, architect, member of Chicago Committee for High Rise Buildings

Josephine Bellalta, RLA, ASLA – landscape architect / urban designer, member of Oak Park Design Commission, Friends of the Parks board member

(Chair) Fred Brandstrader, AIA – architect, construction management

Lou Garapolo, AIA – architect, member of the Oak Park Architectural League

Mark Johnson – civil engineer, former/chair of Oak Park Parking and Traffic Commission, member of the Eisenhower Citizens Advisory Committee

Marion E. Kessy, Phd., MASCE – civil and environmental engineer

Sandra Kuplian – attorney, member of South Oak Park Community Council, member of the Eisenhower Citizens Advisory Committee

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