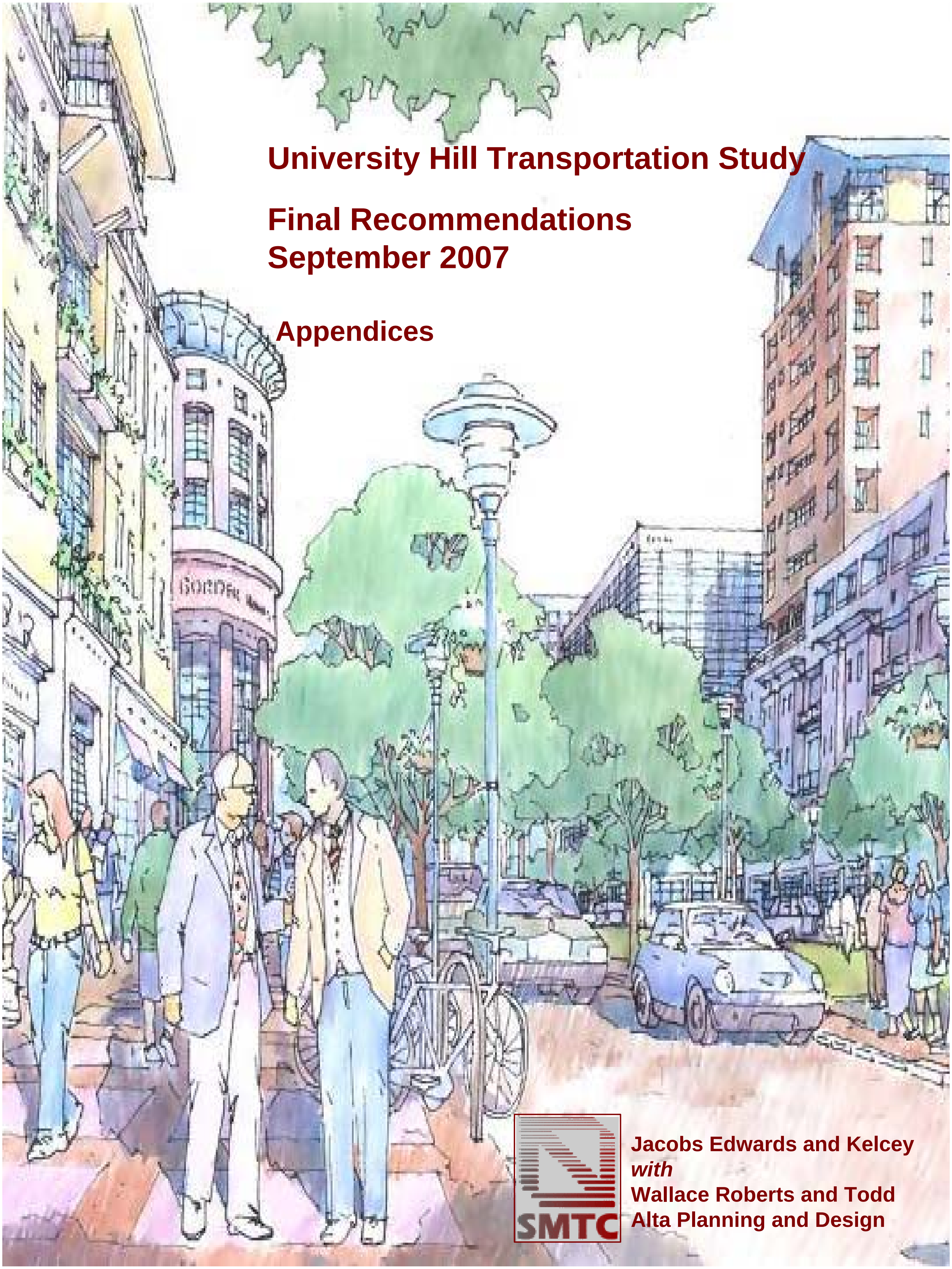

University Hill Transportation Study

Final Recommendations
September 2007

Appendices

Jacobs Edwards and Kelcey
with
Wallace Roberts and Todd
Alta Planning and Design

SMTC

Contents

APPENDIX A

UNIVERSITY HILL CORPORATION LAND USE CONCEPT ENDORSEMENT LETTER

RECEIVED MAR 1 4 2007

University Hill Corporation

Paul J. Kronenberg, MD, Chair
Irwin L. Davis, President
David A. Mankiewicz, Executive Vice President

March 13, 2007

Ms. Mary Rowlands
Executive Director
Syracuse Metropolitan Transportation Council
126 North Salina Street
Syracuse, NY 13202

Dear Mary:

The University Hill Corporation board met on February 15, and Chairman Paul Kronenberg reviewed with them the Land Use Element of the University Hill Transportation Study. Based on the comments of the board and the Executive Committee, the University Hill Corporation is providing this formal response to the concept:

1. The University Hill Corporation endorses the principles of the land use plan. These include:

    - The creation of vibrant streets.
    - Enhancement of the walkability of the area.
    - Emphasis on multi-modal transportation.
    - Mitigation of the impact of parking structures, particularly by "wrapping" them with other residential or commercial uses.
    - Coordination of future development projects.
    - Encouraging a greater diversity of land uses at the core of the Hill.
    - Construction in greater densities at the core of University Hill.

2. University Hill Corporation will have its development committee study and make recommendations to the board regarding the implementation of this plan. Based on this review, the University Hill Corporation will make recommendations for specific changes in the plan.

    - It must be noted that the City of Syracuse controls the zoning and land use regulations for these sites. As such, it is important that the City of Syracuse embrace these principles and undertake the necessary land use control changes to allow them to be implemented.

736 Irving Avenue, Syracuse, NY 13210
Tel: 315-475-7244 • Fax: 315-471-4503 • Email: mail@university-hill.com • Web: www.university-hill.com

- University Hill Corporation members do not control all of the land under study. We cannot guarantee that other landowners will comply with the plan, and need SMTC to be an active advocate with these entities to encourage their participation.

3. University Hill Corporation members need to review the proposals in their draft plan for specific sites on University Hill and may make recommendations to modify these uses, or relocate them.

4. SMTC and its consultants also need to be aware that the University Hill Corporation is supportive of the Connective Corridor project led by Syracuse University and the City of Syracuse. We expect that these two plans will be developed to mutually support each other as we believe the Connective Corridor is important to the future of University Hill, downtown and the city.

5. The University Hill Corporation looks forward to the specifics of the transportation plan, as a reduction on the dependency on the automobile is conditioned on an assumption that the consultant team will propose, and the appropriate parties implement, an alternative mode. We will need SMTC to be an advocate and funding conduit for these options.

6. There is currently $380 million worth of construction underway on University Hill, and there are several more projects that are advancing toward construction. It is the position of the University Hill Corporation that these projects should continue to move forward, and that this plan should not impede these projects.

7. Any plan for the University Hill area should take into consideration the shared value of sustainability, which includes energy conservation, minimization of carbon footprint, sustainable materials utilization, and optimization of indoor environmental quality for human health and performance.

8. The University Hill Corporation will pursue the creation of a mechanism to coordinate the development of University Hill.

Please call me at 475-7244 if you have any questions or comments.

Sincerely,

David A. Mankiewicz
Executive Vice President

APPENDIX B

STREETCAR SUMMARY TECHNICAL MEMORANDUM

University Hill Transportation Study

Appendix B - Technical Memorandum
Streetcars Summary
August 2007

Syracuse Metropolitan Transportation Council

Jacobs Edwards and Kelcey
with
Wallace Roberts and Todd
Alta Planning and Design

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INTRODUCTION

The objective of the University Hill Transportation Study (the Study) is to keep institutions and business within the University Hill area viable while reducing growth in auto use and parking. The Study and its consultant team have highlighted the potential for University Hill to become a bicycle- and pedestrian-friendly area, served by an attractive and efficient transit system. Bicycle and pedestrian amenities, accompanied by transit, increases accessibility, enhances the flexibility of the overall transportation system, acts as a catalyst for new economic activity, and provides a more sustainable way to travel. The consultant team has identified a streetcar system as an appealing transit option that could be seamlessly integrated into the roadway while preserving auto capacity and reducing auto-dependence in the University Hill area.

A streetcar system is a particularly effective tool to connect and shape neighborhoods: Streetcars "connect" neighborhoods by linking up activities, destinations, and the regional transit network. They "shape" neighborhoods by stimulating redevelopment, supporting active uses, promoting public-private investments, and creating places where people want to be.[1] This Technical Memorandum includes a description of a streetcar system, funding sources, and case studies of successful streetcar systems across the nation.

IMPROVED MOBILITY & ACCESSIBILITY

Streetcar systems operate on electric rails embedded in street surfaces and often travel in lanes shared with other vehicles. Streetcars normally operate over short distance (under 5 miles) with short station spacing (every few blocks) and emphasize mobility and accessibility rather than speed. Because they travel at moderate speeds and don't require exclusive right-of-ways, streetcars can operate safely in high-pedestrian areas where roadway capacity and parking are scarce. This form of rail transportation offers passengers smooth, quiet rides, comfortable interiors, and relatively easy boarding at operating costs

Figure 1. Portland Streetcar

[1] Taylor, D. (2006). Place Making and People Moving. In G. Ohland & S. Poticha, *Street Smart Streetcars and Cities in the Twenty-first Century* (23 – 27). Oakland: Reconnecting America.

equivalent to, or less than, those of a bus. The high quality of service provided by streetcars attracts a wide range of riders.

In urban neighborhoods and university campuses, especially, where land-use and planning promote pedestrian activity, streetcars serve as "pedestrian accelerators", extending the distance of short trips that can be made on foot. As a result, transit users and pedestrians can travel more easily to a greater selection of destinations. Drivers are able to park their car once, and use the streetcar to access other locations without having to drive and find a new parking space for their car. In this way, people are encouraged to enjoy the variety of dining, shopping, entertainment, or cultural opportunities available in their extended neighborhood.

Streetcars can also provide convenient connections to regional rail services, and are effective at encouraging commuters and other drivers to park their vehicles at outlying stations and ride transit to their destination. This can result in the need for fewer downtown parking spaces, and downtown streets that are less congested with private vehicles.

When streetcar service was initiated in New Orleans in 2004, the RTA expected that some people would abandon their cars and hop on the streetcar to get to work. The increase in ridership that followed implementation of streetcar service surpassed the agency's expectations for the new service. In May, June and July, of 2004 the streetcar and the two express buses that serve Canal Street had about 260,000 more riders than the buses had during the same time in 2003.[2]

The level of visibility and transparency typical of streetcar systems is an important catalyst for improved accessibility. Unlike bus or subway routes, streetcar tracks are clearly identifiable and within plain sight so that even infrequent visitors to neighborhoods served by streetcars can become familiar with the streetcar's route without consulting route maps or schedules. Unlike other rail systems, short stop spacings and the ability to view the outside environment allows riders to feel confident that they are traveling in their desired direction and that they will be able to alight within close proximity to their desired destination. For these reasons, streetcars can attract riders who may normally be intimidated by mass transit, such as tourists and occasional visitors.

In recent years, North American cities that have installed streetcar systems to replace existing bus service have by and large witnessed sustained growth in transit ridership, evidencing the greater attractiveness of the streetcar mode. On average, ridership on new streetcar lines jumped 15–50 percent above what the replaced bus routes had

[2] Melton, K. (2004, August 16). Reopened Streetcar line brings Boost in Ridership, More Choose it for Canal Transit. *The Times Picayune*.

attracted previously.[3] The cities of Toronto, Ontario and Tacoma, Washington are examples of cities that have experienced impressive growth.

Figure 2. Replica Vintage Streetcar

Toronto Transit Commission in Toronto, Ontario has expanded its streetcar network from 10 lines to 14 lines in the past 10 years. The new streetcar lines operate on streets that were previously served by local bus routes. Although the streetcars did not offer any significant increase in service level or travel time, ridership increased by 15–25 percent on each line after the streetcars were introduced. [4]

Of the North American cities to replace buses with streetcars, the most significant ridership growth has occurred in Tacoma, Washington. The Tacoma Link, a 1.6-mile streetcar line operated by Sound Transit, began service in 2003. The Link replaced an express bus service that connected a commuter rail station with many of Tacoma's downtown attractions. Annual ridership on the free express bus service was approximately 141,000. The free streetcar line, operating on the same schedule as the bus service, served a ridership demand of 730,000 in its first year of operation, an increase of over 500 percent. [4]

Streetcars are the ultimate urban circulator and succeed in making transit an enticing and convenient choice for short trips, while providing a seamless connection for longer trips–expanding the reach of regional rail systems into neighborhoods. Streetcars also extend the distance of short trips, allowing people a more diverse range of destination options and neighborhoods a larger sphere of attraction. By supporting the circulation of

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[3] Parsons Brinckerhoff (2004, June 30). Seattle Streetcar Network and Feasibility Analysis. Prepared for Seattle Department of Transportation, Seattle.

[4] Lamm C. & Levine S. (2007, February 5). University Hill Transportation and Land Use Study – Alternatives Analysis. Prepared for University Hill, Syracuse.

people with dissimilar lifestyles within relatively dense areas, streetcars can help to create neighborhoods that are complex, lively, and diverse.

PLACE MAKING & ENHANCED DEVELOPMENT

Because streetcars promote active environments, they also promote streetlife, thereby creating the kinds of neighborhoods where people like to see and be seen. Urban designers and planners now understand that people like to spend time in places where there are other people moving about, rather than in places that serve largely as storage areas for either goods or cars. Neighborhood features such as transparency that allows people to see into buildings, welcoming streetscapes, and a mix of public and private spaces enhance the pedestrian environment and the public realm. The streetcar can promote and enhance all of these urban attributes.[5]

The physical presence of streetcars adds character to neighborhoods they serve. Whether vintage or modern, streetcars can be designed to be an attractive representation of the neighborhood, one that is in constant motion and, if supported by appropriate land uses, full of people and vitality. They serve as an image maker for a particular neighborhood, helping to define it, and enhancing its identity and appeal by providing an added amenity.

Apart from the increased activity and appeal that streetcars can bring to neighborhoods, streetcars can indirectly promote place making by denoting a long-term commitment to a neighborhood. The decision to design, plan, construct, and operate a permanent, fixed rail transit system can catalyze change by encouraging planners, residents, and other shareholders to actively support their vision for the future of the neighborhood. The commitment to a large scale investment can energize political will and consensus as

Figure 3. Streetcar Neighborhood

[5] Taylor, D. (2006). Place Making and People Moving. In G. Ohland & S. Poticha, *Street Smart Streetcars and Cities in the Twenty-first Century* (23 – 27). Oakland: Reconnecting America.

shareholders and planners work out a plan for generating the most benefit from a nontrivial expenditure.

High-quality transportation systems can also stimulate more quantifiable forms of investment into neighborhoods. By increasing the accessibility and appeal of neighborhoods and by supporting the mobility of active groups of people, streetcars encourage retail, housing and service oriented development. This development will naturally cater to pedestrians and people who enjoy diverse and active environments, so that streetlife is further enhanced and neighborhoods are more vibrant. By supporting a symbiotic relationship between investors and consumers, streetcars can be tools for changing land-use and promoting economic development and job generation.

Moreover, the permanence of a rail based investment reduces the risk associated with private or public investment. Not only can investors depend on the existence of a high-quality transit system to provide good access to their shops, restaurants and employment centers or from housing developments; but they may also recognize a local commitment to creating neighborhoods that are inviting and attractive to their customers and, in general, places where people want to be. For these reasons, cities champion streetcar projects more often than transit agencies do[6], and private entities have proven willing to take on some of the costs of streetcar systems.

The documented evidence of economic development spurred by implementation of streetcar service is compelling. One of the most highly touted examples of streetcar success is from Portland, Oregon where over $2 billion in new development has occurred within a two-block radius of the streetcar system since it opened in 2001. In fact, about 55 percent of all new development in Portland's downtown during the past decade has occurred within one block of the system.[7]

Portland’s Pearl District is a model of the benefits that can be achieved through collaborative land use and streetcar planning. Before it was redeveloped, the Pearl District was a struggling industrial area next to downtown that contained mostly abandoned warehouses. After the streetcar helped trigger redevelopment, the district is now known for residential lofts that have restaurants, pubs and shops on the ground level.[3]

Other areas began witnessing an increased rate of development in anticipation of streetcar service. As a Tampa report states, “Just the announcement that the [heritage trolley] project was going to be implemented has resulted in heightened development activity all along the corridor. An estimated $800 million in new development is either

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[6] Taylor, D. (2006). Place Making and People Moving. In G. Ohland & S. Poticha, *Street Smart Streetcars and Cities in the Twenty-first Century* (23 – 27). Oakland: Reconnecting America.
[7] Osborne, K. (2007, June 20). Streetcar named Development. *City Beat*.

currently under way or will be under way before completion of construction of the line. This includes approximately 1,600 units of upscale high-density residential development never contemplated at the time that the project was in the development phase."[8]

From these and other real world examples it is reasonable to conclude that when streetcars and land-use planning support each other, vibrant neighborhoods result. Streetcar systems allow greater numbers of people convenient access to neighborhoods, establishing streetscapes that are more full of life and that developers are excited to invest in. Streetcars also symbolize a long-term commitment to creating neighborhoods where people want to be. Because investors can assume that neighborhoods served by streetcars and pedestrian-friendly land use will be active well into the future, developing or redeveloping theses neighborhoods is associated with little risk. Therefore, streetcars can help to re-energize neighborhoods making them places where people like to gather and spend time.

SUSTAINABLE TRANSPORTATION

Streetcar systems not only help to create thriving communities, but they can also abate the challenges associated with bustling neighborhoods such as congestion, the need for parking, and negative environmental impacts.

Transportation is one human activity that has a considerable impact on the environment. The development of infrastructure for a personal motor vehicle based transportation system requires vast amounts of land, intrudes into natural habitats and permanently alters the landscape. More significant from an environmental perspective is the consumption of large quantities of fossil fuels by the vehicles operating on the system. This consumption exhausts fuel resources and releases pollutants into the atmosphere.[9] By creating dense and attractive neighborhoods where residents do not have to rely on automobiles for transportation, and by providing appealing transit alternatives for travel to downtown neighborhoods or campuses, the roadway capacity required for motor vehicles and the energy consumed for transportation can be significantly reduced. Because the amount of CO_2 emissions per passenger-kilometer is more than five times less for passenger rail trips than for single-occupant cars[9], replacing car trips with transit trips would greatly reduce harmful emissions and result in the improved health of residents.

Reducing the number of car trips also represents a decrease in real cost to taxpayers. Alleviating the need for additional road capacity can minimize the expenditure required for new infrastructure. There is also a reduction in healthcare costs related to injuries

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[8] American Public Transportation Association. *Benefits of Heritage Trolley Lines*. Retrieved from http://www.heritagetrolley.org/planBenefits.htm.
[9] Institute of Transportation Engineers (2004). *Promoting Sustainable Transportation Through Site Design*. Washington, DC: ITE.

sustained in motor vehicle collisions and respiratory illness caused by pollution. Less traffic congestion reduces delays to passenger travel and the shipment of goods, which reduces time costs and the burden on the economy and individual travelers. [9] A decrease in the amount of parking spaces required could increase the amount of tax revenues generated since parking lots generate a fraction of the revenues of a commercial property ($3 a year per square foot vs. $50 for office space).[10]

In Portland, Oregon, the success of projects in the River District demonstrated a market demand for a new type of higher-density community–one that supported living with or without a car. Due in part to the high-quality transit service provided by streetcars, River District developers are able to construct mixed-use projects with parking ratios lower than found elsewhere in the city. With a full understanding of the role that streetcars can play in affecting the urban environment and market confidence in urban living, developers have begun construction on larger, higher risk projects in the South Waterfront, an area also served by streetcars.[11]

FUNDING

There is a wide range of federal, state and local funding sources that can be mobilized for planning, building and operating streetcar projects. However, there is a considerable amount of competition for these limited funds. Funding for the planning, design and construction of a streetcar system in Syracuse, NY should be considered through the SMTC's Transportation Improvement Program (TIP) process as an obvious starting point. Many of the federal sources discussed below would be administered through the TIP. Additional non-TIP sources are also described.

Federal Sources

Two important federal funding sources for transit projects are the "New Starts" and "Small Starts" programs. The Federal Transit Administration's (FTA) discretionary New Starts program is the federal government's primary financial resource for supporting locally planned, implemented, and operated transit guideway capital investments. The *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) authorized $6.6 billion in New Starts funding through fiscal year 2009. $600 million of this funding is set aside for "Small Starts–" that is, major transit capital

[10] Kozlowski, J. (2005, April 15). Doing the math of Public Transit. Retrieved from http://governing.com/notebest.htm.
[11] Office of Transportation and Portland Streetcar, Inc. (2006, January). *Portland Streetcar Development Oriented Transit*. Retrieved from http://www.portlandstreetcar.org/pdf/development.pdf.

projects costing less than $250 million, and requiring less than $75 million in Small Starts resources. [12]

While the level of New Starts funding has never been higher, neither has the competition for New Starts funds. As directed by SAFETEA-LU, the FTA evaluates, rates and recommends New Starts applications based on a number of criteria selected to justify federal involvement. SAFETEA-LU further directs New Starts projects to follow a comprehensive planning and project development process intended to assist local agencies and decision-makers in evaluating alternative strategies for addressing transportation problems, and select the most appropriate improvement to advance into implementation. Planning and project development for New Starts projects is a continuum of analytical activities carried out as part of metropolitan systems planning and *National Environmental Policy Act of 1969* (NEPA) review processes. [12]

FTA published a Final Rule on Major Capital Investment Projects in 2000 which outlines these New Starts requirements. FTA has also issued guidance in Advancing Major Transit Investments Through Planning and Project Development which provides additional detail on the project development and evaluation processes for fixed guideway transit projects seeking New Starts funding.[12]

A simpler review process was established for Small Starts projects since these projects cost less and are less complex. For example, projects will be rated against a shorter time frame, based on the benefits projected for the year a project opens as opposed to the 20-year evaluation period used in the New Starts process. In general, Small Starts grants are justified based on local land-use policies, local development goals, and forecast positive impact on local development. Both New and Small Starts programs require that an acceptable degree of locally funded financial commitment be met in order to receive federal funding.[13]

Listed below are other federal funding programs[13] that can be applied to the planning, design, evaluation or construction activities of local streetcar transportation projects.

- *Congestion Mitigation and Air Quality Improvement Program (CMAQ)*: funds projects that reduce emissions each year in accordance with a formula based on population and the severity of the air-quality problem. Each state is guaranteed half of one percent of CMAQ's annual funding regardless of the problem's severity. The MPO is responsible for developing and prioritizing projects and including projects in the Transportation Improvement Program. Funding is

[12] Federal Transit Administration (2007). *Introduction to New Starts*. Retrieved from http://www.fta.dot.gov/planning/newstarts/planning_environment_2608.html.
[13] Boothe, J. (2006). Federal Funding Opportunities. In G. Ohland & S. Poticha, *Street Smart Streetcars and Cities in the Twenty-first Century* (37-39). Oakland: Reconnecting America.

available to government agencies, non profit agencies and public-private partnerships and can be applied to planning activities.

- *Transportation and Community System Preservation Program (TCSP)*: funds comprehensive initiatives, including planning activities, which address the relationship between transportation systems and communities and identify private-sector-based initiatives.

- *Federal Grants for Urbanized Areas*: funds technical transportation-related studies, construction of maintenance and passenger facilities, capital investments, preventative maintenance and some ADA complementary paratransit service. For areas with populations over 200,000, funding is apportioned through a formula based on revenue vehicle miles, passenger miles, population and density. Populations of less than 200,000 may be eligible for capital and operating funding. The federal share is not to exceed 80% of the net project cost.

- *Surface Transportation Program (STP)*: funds projects on any federal-aid highway, bridge projects on public roads, and transit capital projects including parking facilities, landscaping, historic preservation, and environmental mitigation to name a few. Funds are distributed to states based on lane-miles of federal-aid highways, vehicle miles traveled on federal-aid highways, and estimated contributions to the Highway Account of the Highway Trust fund. Funds are then distributed to projects at the MPO level.

- *Community Development Block Grant (CDBG)*: the largest federal source for funding neighborhood revitalization, housing rehabilitation and economic development activities. These formula-based grants are administered to states by the Department of Housing and Urban Development for projects which meet one of its three “National Objectives,” those being:
  - principally benefit low- and moderate-income residents,
  - aid in eliminating pr preventing slums and blight,
  - meet particularly urgent community-development needs because existing conditions pose a serious and immediate threat to the health, safety or welfare of residents.

<u>Local Sources</u>

There are many reasons to avoid going after federal funding for a streetcar project, an important one being that project development can be greatly accelerated without the degree of planning and analysis required by most federal programs. Perhaps equally important is the sense of local ownership that happens when the project is built solely as a local partnership. Local funding means the project can be built in a way that is more responsive to local needs, sensitive to local design issues, and less disruptive to local businesses during construction.[14]

The wide range of local funding sources available include state transit development programs, legislative earmarks, state infrastructure bank loans, general obligation bonds, local transit or sales taxes (on gas, hotels, restaurants, rental cars, businesses, etc.), and transit operating revenues (fares, parking, advertising).

A frequently used urban-development tool is tax-increment financing. This "boot-straps" method finances urban-renewal or redevelopment through debt, expecting future increases in property values and tax revenues from the developing district to cover the costs of project financing. Rail transit projects are extremely compatible with this form of financing since they increase property values and the speed and intensity of development.

Cities can also create Business Improvement Districts (BID) that generate real-estate-related revenues. Property owners in BIDs contribute to projects that promote and market the area or otherwise enhance security, maintenance, beautification and transportation. These districts are normally established by local jurisdictions or county resolution and are predicated on the approval of the majority of affected property owners. Property owners should be assessed in proportion to the benefits received, normally through a formula based on property values, square footage, or linear footage.

Similar to BIDs are Transportation Management Associations that provide transportation benefits to businesses, and Special Assessment Districts. Unlike BIDs, Special Assessment Districts can be formed without the approval of affected property owners.

An interesting example of a Special Assessment District is the one formed for the planned South Lake Union Streetcar in Seattle, Washington. Property owners in the district offered to contribute to a streetcar system they believe will be an effective spur to development in the area. Assessments will be based on how much property is owned and how close it is to the streetcar line with the city to receive a total of $25 million toward the $51 million project. A study of streetcar benefits to nearby property owners forecasts the increase in the value of properties near the line will be $70 million to $80 million.[15]

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[14] Taylor, D. (2006). Local Funding Sources. In G. Ohland & S. Poticha, *Street Smart Streetcars and Cities in the Twenty-first Century* (37-39). Oakland: Reconnecting America.
[15] Young, B. (2005, May 10). New Report Cites Streetcar Benefits. *Seattle Times*.

CASE STUDIES

Examples of successful streetcar planning and implementation can be found throughout the United States and Canada. Although the case studies presented here offer a range of streetcar applications from single lines to complex networks, each has gained experience with streetcar planning, financing, or operations that would be relevant to a Syracuse application (as identified throughout the body of this work).

Canal Street Line, New Orleans, Louisiana

New Orleans' Canal Street Line was first built in 1861 and then restored in 2004 after 40 years of bus service on the route. The decision to reinstitute streetcar service on Canal Street was motivated mainly by the success of the Riverfront Line, another streetcar route operated by the New Orleans Regional Transit Authority (RTA). The Canal Street main line covers five and a half miles of historic New Orleans, serving the area between the French Market, the Mississippi River, and City Park Avenue. A one-mile Carrollton spur links Canal Street to the City Park entrance.[16]

The vehicles for the Canal Street line are streetcars built by the RTA themselves and are replicas of the 1924 units historically operated on the line. For the new units, the RTA wanted to preserve the roofline and vintage look of the original cars, make them ADA compliant, and include air-conditioning. Unlike the tourist Riverfront route, the Canal Street route is mainly a commuter line, and it would have been infeasible to replace air-conditioned buses with vintage vehicles that were not air-conditioned. Stations consist of ground-level concrete side platforms, some with bus shed-like structures.[17]

Toronto Streetcar System, Toronto, Ontario

The Toronto streetcar system comprises eleven streetcar routes operated by the Toronto Transit Commission (TTC), the municipal public transit operator. Totaling 190 miles in length, the network is generally concentrated downtown and in proximity to the city's waterfront. Much of the TTC's streetcar network dates back to the 19th century. Most of Toronto's streetcar routes operate in the classic style on street trackage shared with car traffic, and stop on demand at frequent stops like buses. However, some routes operate (totally or partially) within their own rights-of-way. There are also underground

[16] American Public Transport Authority (2004, April 26). Streetcars *return to New Orleans' Canal Street for the First Time in 40 Years*. Retrieved from http://www.apta.com/passenger_transport/thisweek/040426_1.cfm
[17] Sattler C. *New Orleans, Louisiana*. Retrieved from http://world.nycsubway.org/us/neworleans/

connections between streetcars and the subway, and streetcars pass by the entrances of other downtown stations to provide convenient connections.

Toronto's streetcars differ from heritage streetcars run for tourism or nostalgic purposes; they provide most of the downtown core's surface transit service with modern vehicles, and four of the TTC's five most heavily traveled surface routes are streetcar routes.[18]

Tacoma Link, Tacoma, Washington

Tacoma Link is a 1.6-mile modern electric streetcar line designed to connect major activity and transit centers in downtown Tacoma and provide a key interconnection with other major regional transit services provided by Sound Transit (ST), the region's major public transport agency. The streetcars now provide free, high-quality transit service on a five-stop line from South Ninth and Commerce streets in downtown Tacoma to the Tacoma Dome.

With a pricetag of approximately $80.4 million when it was opened in 2003, the Tacoma Link was completed under budget and ahead of schedule. However, the total cost doesn't just cover the streetcar network–it also includes an array of urban enhancements, including new sidewalks, benches, trees, and bike racks that add to Tacoma's livability.[19]

The bulk of funding for the streetcar is from local taxes, including a 0.4 percent sales tax and a 0.3 percent vehicle license tax.[20]

Initial ridership has exceeded expectations, averaging 2,400 riders/day by late 2003. The pre-opening forecast had been for 2,000 riders daily by 2006. Planning is underway for extensions to the system using either modern or heritage equipment.[21]

Portland Streetcar, Portland, Oregon

The Portland Streetcar was opened in July of 2001, becoming the first modern streetcar system in North America. It is part of a unique public-private strategy to link investment in high-quality transit with major redevelopment. The three mile system, which operates through the campus of Portland State University, was built to circulate people between

[18] *Toronto Streetcar System*. Wikipedia. Retrieved from http://en.wikipedia.org/wiki/Toronto_streetcar_system

[19] Corvin, A. (2003, August). Tacoma Streetcar brings Modern Electric Rail Transit to Puget Sound. *Light Rail Progress*.

[20] Corvin, A. (2003, August 23). Tacoma Line Makes its Debut. *Tacoma News Tribune*.

[21] American Public Transportation Association. *Tacoma, WA*. Retrieved from http://www.heritagetrolley.org/planTacoma.htm

sections of Portland's close-in central neighborhoods and increase development along the "linear neighborhood," as the streetcar line has been called.

The original 2.4 miles of the system cost $54.6 million to build in 2001 with a $15.8 million, 0.6 mile extension added in 2005.[22] Streetcar operations and construction have been funded entirely through local sources including fares, an annual contribution from TriMet (the local transit authority), a special taxation zone along the route, car and station sponsorship, and parking meter revenues. The special taxation district was created by business owners along the route who volunteered and petitioned to be taxed.[23]

When the streetcar initially opened in 2001, the projected ridership target was 3,500 weekday rides. Not only was that target immediately exceeded, ridership by the fall of 2005 grew to over 9,000 rides each weekday. Saturday ridership has demonstrated the greatest percentage growth from 3,200 to 6,650 in the past four years.[24]

TECO Line, Tampa, Florida

Tampa's TECO Line Streetcar, which began operation in October 2002, is a 2.3 mile long heritage streetcar operation that uses modern replica streetcars. The line connects the southern edge of downtown Tampa with the cruise-ship terminal area and the Ybor City historic and entertainment district. The entire line is on reserved right of way, mostly alongside city streets, so that streetcars do not have to compete with automobile traffic except at street crossings.

The initial line primarily serves tourists and is justified as an economic catalyst for the area, which it fulfills successfully. In its first two years of operation, it trolled past vacant and empty industrial lots. Now the area is exploding with new condo and loft residences and helping to cement the corridor as a solid urban thruway for the city. The system is also light-rail compatible and is expected to work with the longer-range vision to enhance county and regional connectivity via rail.[25]

Hillsborough Area Regional Transit (HARTline) operates the streetcar system as part of a partnership with the city of Tampa and local businesses. Part of the money for operating the system comes from an endowment funded by payments for naming rights

[22] Light Rail Now (2005). *Portland Light Rail Streetcar: Key Facts*. Retrieved from http://www.lightrailnow.org/facts/fa_por-stc-data-01.htm.
[23] Adam, B. *Portland Streetcar*. Retrieved from http://world.nycsubway.org/us/portland/streetcar.html.
[24] Office of Transportation and Portland Streetcar, Inc. (2006, January). *Portland Streetcar Development Oriented Transit*. Retrieved from http://www.portlandstreetcar.org/pdf/development.pdf.
[25] Tampa Rail. *The Tampa Streetcar*. Retrieved from http://www.battleblog.com/user/tamparail/streetcar.asp.

for the entire system and individual stations, cars, etc. The Tampa Electric Company (TECO) bought the right to name the entire system, for example.[26]

Planning is underway for Phase 2, which will extend the line into the heart of downtown Tampa.

South Lake Union Streetcar, Seattle, Washington

Construction is currently underway on the planned 1.3 route-mile streetcar system that will connect South Lake Union (the new waterfront park), the Denny Triangle (an emerging downtown neighborhood) and Westlake (the downtown retail core). Connections to light rail, regional buses and monorail at Westlake will be made available. The system will feature modern streetcar vehicles that carry up to 140 passengers, are air-conditioned, and accessible to all. Stops are located every 2-3 blocks, so that there are a total of 11 stops on the line. A "Streetcar Arrival Time" system will be installed at stops along the route to inform riders when the next Streetcar will arrive. [27]

Mayor Nickels developed the South Lake Union Action Plan in an effort to support the creation of thousands of new jobs, capture revenue for all of Seattle, and build a great new urban neighborhood. The streetcar was developed as a tool to support the plan for the South Lake Union neighborhood by providing good transit service for the Denny Triangle and South Lake Union areas and supporting efforts to transform the area into a livable, vibrant urban neighborhood where people choose to live, work and socialize. [24] Since 2005, about 920 housing units have been built within a few blocks of the line, while 1,550 homes and 1.7 million square feet of office space are under construction. This rate of development is faster than what was expected for this stage of the project.[28]

[26] Bell, J. (2003). *Tampa, FL TECO Line Streetcar*. Retrieved from http://web.presby.edu/~jtbell/transit/Tampa/
[27] Seattle Department of Transportation. *The South Lake Union Streetcar*. Retrieved from http://www.seattle.gov/transportation/stcar_slu.htm
[28] Lindblom, M. (2007, May 21). South Lake Union streetcar making tracks. *The Seattle Times*.

APPENDIX C

AIR QUALITY ANALYSIS

MEMORANDUM

DATE: July 23, 2007

TO: Scott Levine

FROM: Nagaraju Kashayi

SUBJECT: University Hill Transportation and Land Use Study
CO, NO_X, and VOC emissions for the University Hill study area (year 2027)

This memorandum outlines the procedure adopted to calculate CO, NO_X, and VOC emissions for the University Hill area, for the year 2027.

The SMTC travel demand model for the year 2027 was used, with refinements for three different transportation network improvement scenarios:

- No Improvement
- Alternative #3-A
- Alternative #4
- Alternative #5

The University Hill study area is bounded by I-81 on the west, I-690 on the north, Thornden Park on the east, and Syracuse University on the south. For each of the alternatives above, the total Vehicle Miles Traveled (VMT), total Vehicle Hours Traveled (VHT), and average speed for each of the functional classes and in the model were calculated.

The following formulae were used:

Vehicle Miles Traveled (VMT) = (Volume on each link) * (Length of link)

Vehicle Hours Traveled (VHT) = (Volume on each link) * (Travel time on the link)

$$\text{Average speed} = \frac{TotalVehicleMilesTravelled}{TotalVehicleHoursTravelled}$$

SMTC provided MOBILE6 emission factors for Onondaga County for the year 2027. The CO, NO_X, and VOC emission rates (in gram/mile) were provided for different functional classes based upon average vehicle speed. The emission rates were calculated for the "calculated average speeds," using linear interpolation.

299 Madison Avenue
P.O. Box 1936
Morristown, New Jersey 07962-1936

Voice 973.267.0555
Fax 973.267.3555
www.ekcorp.com

The total pollutant emissions (in grams) were found by multiplying the interpolated emission factors (in gram/mile), with the total vehicle miles traveled (VMT) (in miles). This was then converted to kilograms per mile.

The summary of the outputs are:

Scenario	**CO (kilogram/day)**	**NOx (kilogram/day)**	**VOC (kilogram/day)**
No Improvement	3,057	63	68
Alternative #3-A	3,022	62	67
Alternative #4	3,009	63	67
Alternative #5	2,334	46	58

The pollutant emissions for the alternative 3-A and 4 show either marginal emissions reductions or no effects, *vis-a-vis* the "No Improvement" scenario within the University Hill study area. Alternative #5, however, shows significant reductions in emissions within the study area. This is due to the significantly lower amount of vehicle travel (in the study area) with the removal of the I-81 facility.

Please call with any questions at 973.267.8830 x.1157. Thank you.

UH27NI	Functional Class	Daily VMT	Daily VHT	Average Speed	CO (kg/Day)	Nox (kg/Day)	VOC (kg/Day)
	High Capacity Ramp	21,509	770	29.72	224.29	4.73	5.19
	Interstate/Freeway	200,190	5,312	37.68	2,114.95	44.04	44.97
	Local	21,251	1,024	20.74	238.95	4.40	5.86
	Major Collector	2,196	118	18.54	25.14	0.47	0.67
	Minor Arterial	22,184	1,093	20.30	247.13	4.85	6.17
	Principal Arterial	18,572	919	20.21	207.01	4.07	5.18
					3057.47	62.57	68.03

UC27A3-A	Functional Class	Daily VMT	Daily VHT	Average Speed	CO (kg/Day)	Nox (kg/Day)	VOC (kg/Day)
	High Capacity Ramp	22,458	830	27.05	235.86	4.94	5.65
	Interstate/Freeway	193,647	5,116	37.85	2,047.58	42.60	43.44
	Local	20,239	965	20.96	227.29	4.17	5.55
	Major Collector	2,087	109	19.08	23.77	0.45	0.62
	Minor Arterial	22,987	1,089	21.11	254.86	4.96	6.28
	Principal Arterial	21,328	908	23.48	233.12	4.40	5.53
					3022.48	61.51	67.07

UH27A4	Functional Class	Daily VMT	Daily VHT	Average Speed	CO (kg/Day)	Nox (kg/Day)	VOC (kg/Day)
	High Capacity Ramp	22,201	790	28.09	232.52	4.88	5.50
	Interstate/Freeway	193,523	5,101	37.94	2,047.23	43.71	43.37
	Local	20,507	992	20.67	230.67	4.25	5.66
	Major Collector	2,246	118	19.01	25.60	0.48	0.66
	Minor Arterial	22,575	1,112	20.29	251.49	4.94	6.28
	Principal Arterial	19,875	993	20.02	221.78	4.37	5.56
					3009.29	62.64	67.04

UH27A5	Functional Class	Daily VMT	Daily VHT	Average Speed	CO (kg/Day)	Nox (kg/Day)	VOC (kg/Day)
	High Capacity Ramp	11,347	343	33.06	118.24	2.50	2.65
	Interstate/Freeway	104,832	2,640	39.69	985.60	18.93	23.13
	Local	22,851	1,250	18.27	262.26	4.96	7.03

Major Collector	1,830	100	18.30	21.00	0.40	0.56
Minor Arterial	24,969	1,389	17.97	284.53	5.70	7.90
Principal Arterial	59,127	3,003	19.68	662.05	13.08	16.90

APPENDIX D

COST ESTIMATIONS

Classification Number 1 - NEW CONSTRUCTION - English

Route	Almond St. Narrowing	Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified, **See (J)**	C.Y.	900	40	36000
Removal of Conc. Base & Conc. Surface Courses, **See (K)**	S.Y.	0		0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10	0
Borrow Excavation Zone 3, **See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			36000

Suggested procedure for calculating earthwork:

A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 inc depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent pric information.
K) 11.2 to 12.5, based on the quantity, location and type of project.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Meter
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0

PAVEMENT TOTAL = 0

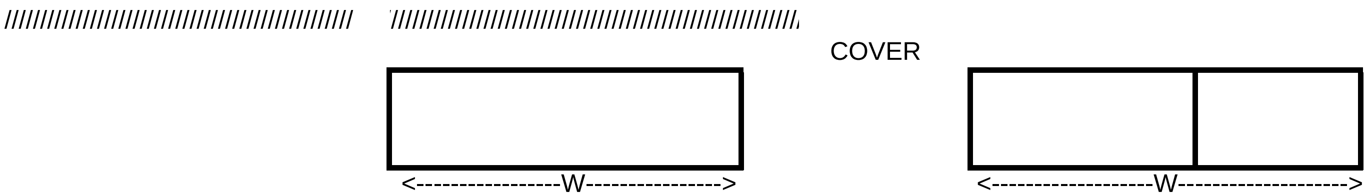
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type 1 W< 20 Feet

Type 2 W> 20 feet

Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet)

H = Clear Height 14 To 23 feet (4)

L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq. Foot
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stu	174.75

		40 to 60 Degrees	No Piles	145.00
			Piles at Stub Abut.	168.25
			Piles at Piers & Stu	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)
H = Clear Height 14 feet (4)
L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq. Foot
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.50
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	226.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.50
			On Piles	310.00
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.50
			On Piles	396.75
		40 to 60 Degrees	No Piles	318.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
	40 to 60 Degrees	No Piles	166.50
Minimum Length 100 feet		Piles at Semi-Stub Abut.	194.75
		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a squa foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can b used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		
		BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains

Rural	0	364356	0
	project length (miles)	x cost per mile	= Amount
Urban	0	544280	0
	project length (miles)	x cost per mile	= Amount

The above are the total costs of basins, manholes, longitudinal and transverse pipes, underdrains, headwalls, protecting curbs, aprons, etc. for a divided highway with a depressed median. The costs are assumed to apply to 4, 6 or 8 lane sections since there will be no appreciable difference in the number of basins or the sizes or lengths of pipes.

Frontage Road & Ramp Drainage

1272	55	69960
length of ramp or frontage rd. in feet	x cost per foot	= Amount

DRAINAGE TOTAL = 69960

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	20	1008	20160
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46	0	0

Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		20160

LANDSCAPE

	Quantity	x Unit Prices	= Amount
Topsoil and Seeding (Mainline) Length of Project in miles	0.24	112,815	27075.6
Planting (Mainline) Length of Project in miles	0.24	64,500	15480
Topsoil, Seeding, Planting (Finger Ramp) Number of Finger Ramps	0	12,500	0
Topsoil, Seeding, Planting (Loop Ramp) Number of Loop Ramps	0	20,000	0
Topsoil, Seeding (Access Road) Length of Access Road in Feet	0	7.9	0
LANDSCAPE TOTAL	=		42555.6

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0.24	44,260	10622.4
Materials Field Laboratory	0.24	28,970	6952.8
Erosion Control during Construction	0.24	64,375	15450
GENERAL ITEMS TOTAL	=		33025.2

SUMMARY

Route	Almond St. Narrowing	Section/Contract #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	36000
Pavement	0
Context Sensitive Design	0
Culverts	0
Bridges	0
Drainage	69960
Incidental Items	20160
Landscape	42555.6

Class 1 - New Construction

Noise Abatement		0
General Items		33025.2
Upgrade Two(2) Traffic Signals	2 @ $50000 each	100000
Four(4) New Textured X-Walks	4 @ $3000 each	12000
PROJECT SUBTOTAL		313700.8

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	9411.024	
Maintenance of Traffic		1.5% of Proj. Subtotal	4706	
Training		1% of Proj. Subtotal	3137.008	
Mobilization			28233.072	
	Project Cost < 5.0 (Mil.)	9% of Proj. Subtotal		28233
	Project Cost 5.0 & above	10% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0
	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	15000	
	Less than 1.0	15,000		15000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0
	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	7000	
	Less than 1.0	7,000		7000
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		0
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	220,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	381187	

Classification Number 2 - RECONSTRUCTION, WIDENING & DUALIZATION - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified,**See (J)**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15	0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10	0
Borrow Excavation Zone 3,**See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:

A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 in depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

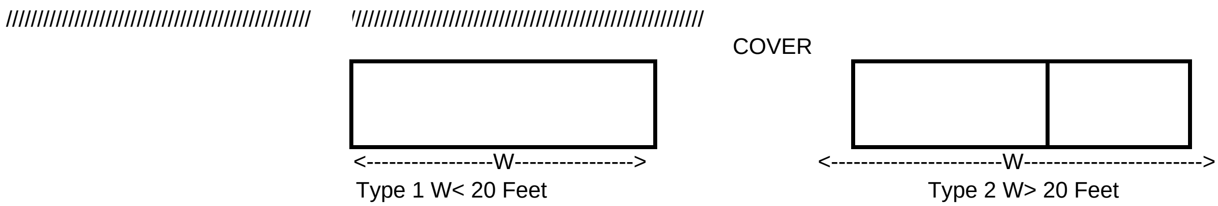
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable to above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 3 spans and 2 side spans (Max. Span 100 feet)
H = Clear Height 14 To 23 feet (4)
L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Foot
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stu	174.75
		40 to 60 Degrees	No Piles	145
			Piles at Stub Abut.	168.25
			Piles at Piers & Stu	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)

H = Clear Height 14 feet (4)
L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Foot
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.5
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	226.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.5
			On Piles	310
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.5
			On Piles	396.75
		40 to 60 Degrees	No Piles	318.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
	40 to 60 Degrees	No Piles	166.50
Minimum Length		Piles at Semi-Stub Abut.	194.75
100 feet		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a square foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can be used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0

			0
			0
			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		

BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains)

Rural	0	364356	0
	project length (miles)	x cost per mile	= Amount
Urban	0	544280	0
	project length (miles)	x cost per mile	= Amount

The above are the total costs of basins, manholes, longitudinal and transverse pipes, underdrains, headwalls, protecting curbs, aprons, etc. for a divided highway with a depressed median. The costs are assumed to apply to 4, 6 or 8 lane sections since there will be no appreciable difference in the number of basins or the sizes or lengths of pipes.

Frontage Road & Ramp Drainage

0	55	0
length of ramp or frontage rd. in feet	x cost per foot	= Amount

DRAINAGE TOTAL	=	0

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

	Quantity	x Unit Prices	= Amount
Topsoil and Seeding (Mainline) Length of Project in miles	0	112,815	0
Planting (Mainline) Length of Project in miles	0	64,500	0
Topsoil, Seeding, Planting (Finger Ramp) Number of Finger Ramps	0	12,500	0
Topsoil, Seeding, Planting (Loop Ramp) Number of Loop Ramps	0	20,000	0
Topsoil, Seeding (Access Road)			

Length of Access Road in Feet	0	7.9	0
LANDSCAPE TOTAL	=		0

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
Erosion Control during Construction	0	64,375	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Context Sensitive Design	0
Culverts	0
Bridges	0
Drainage	0
Incidental Items	0
Landscape	0
Noise Abatement	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	9% of Proj. Subtotal		0
	Project Cost 5.0 & above	10% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0

	20.0 to 30.0	30,000		0
	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	15000	
	Less than 1.0	15,000		15000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0
	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	7000	
	Less than 1.0	7,000		7000
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		0
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	220,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	22000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
22000	1.030	1.00	22660		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-10	3%	1	0.030
10-20	2.50%	2	0.000
Over 20	2%	3	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		31.10%	7047
1.0 to 5.0		20.30%	0.00
5.0 to 10.0		16.20%	0.00
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$7,047.26	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY A = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

22660	0.09		2039
Construction Cost for Initial Estimate	for Urban use 0.12, Rural 0.055 or + Estimate Use % or utilities detailed estimate	=	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	22660
Construction Engineering (CE)	7047
Contingencies	6000
Utilities Relocations	2039
Total Construction Cost	37747
Right of Way Cost	0

Classification Number 3 - WIDENING & RESURFACING - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified, **See (J)**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15.00	0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10.00	0
Borrow Excavation Zone 3, **See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 inch depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

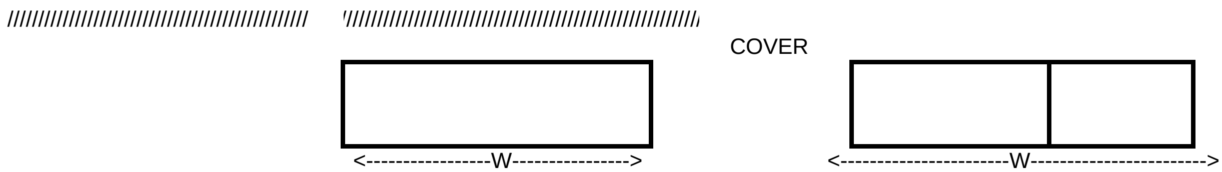
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type 1 W< 20 Feet

Type 2 W> 20 Feet

Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable to above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet)

H = Clear Height 14 To 23 feet (4)

L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Meter
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stul	174.75
		40 to 60 Degrees	No Piles	145.00
			Piles at Stub Abut.	168.25
			Piles at Piers & Stul	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)

H = Clear Height 14 feet (4)

L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Meter
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.50
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	223.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.50
			On Piles	310.00
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.50
			On Piles	396.75
		40 to 60 Degrees	No Piles	219.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
Minimum Length 100 feet	40 to 60 Degrees	No Piles	166.50
		Piles at Semi-Stub Abut.	194.75
		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a square foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can be used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0
			0
			0

			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		
		BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains)

PER DIRECTION OF WIDENING	0	55	0
	feet	x cost per foot	= Amount
	DRAINAGE TOTAL	=	0

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

The linear foot measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot. If a dualized roadway is widened into the median for each direction of traffic and both outside edges, the cost = 16.50 per foot. When more than one-half of the profile changes by 1 foot, the above costs will increase by 25%.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
Erosion Control during Construction	0	64,375	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Context Sensitive Design	0
Culverts	0
Bridges	0
Drainage	0
Incidental Items	0
Landscape	0
Noise Abatement	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	8% of Proj. Subtotal		0
	Project Cost 5.0 & above	8% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0
	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	10000	
	Less than 1.0	10,000		10000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 & above	50,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	16000	

CONTINGENCIES & ESCALATION		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
16000	1.030	1.00	16480		

Project Total Contingencies (1+C) | 1 + [0.01 (Y+1) (Y-2)] | Construction Estimate for PD

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-10	3%	1	0.030
Over 10	2.5%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		27.00%	4450
1.0 to 5.0		14.90%	0
5.0 to 10.0		13.50%	0
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$4,449.60	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY A = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

Construction Cost for Initial Estimate	for Urban use 1.12, Rural 0.055 or + Estimate — Use % or utilities detailed estimate	= Utility Relocation Cost for Initial Estimate
16480	0.09	1483

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	16480
Construction Engineering (CE)	4450
Contingencies	6000
Utilities Relocations	1483
Total Construction Cost	28413
Right of Way Cost	0

Classification Number 4 - RESURFACING - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified **See (A) for Unit Price**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15.00	0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) See Construction Cost Estimate Work Sheet (Section 3.1) for the method to utilize the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

DRAINAGE (includes inlets and cross drains)

Item	Quanity	Cost	= Amount
Reset Casting (Unit)		425	0
Inlet (Unit) *		2865	0
Pipe (L.F.) *		104	0
	DRAINAGE TOTAL	=	0

* Any drainage problems to be corrected should be estimated and included.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

The measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Drainage	0
Incidental Items	0
Landscape	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		2% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	8% of Proj. Subtotal		0
	Project Cost 5.0 & above	8% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	

	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 & above	8,000		0
Clearing Site	Project Cost (Mil.)	$	10000	
	Less than 1.0	10,000		10000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 & above	50,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	16000	

CONTINGENCIES & ESCALATION

		Y			
				2.00	1.00
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00			
16000	1.030	1.00	16480		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-20	3%	1	0.030
Over 20	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		20.30%	3345
1.0 to 5.0		14.90%	0
5.0 to 10.0		10.80%	0
10.0 & above		9.50%	0

CONSTRUCTION ENGINEERING AMOUNT $3,345.44

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENC = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

16480	0.025	412
Construction Cost for Initial Estimate	Use 2.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	16480
Construction Engineering (CE)	3345
Contingencies	6000
Utilities Relocations	412
Total Construction Cost	26237

Right of Way Cost	0

Classification No. 5 - BRIDGE REPAIR - English

Route		Section/Contract #	
PM		UPC No.	

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
INCIDENTAL ITEMS TOTAL	=		0

BRIDGES

Cost to be provided by the Bureau of Structural Engineering TOTAL =

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages

Pavement	0
Incidental Items	0
Bridges	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		1% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization	Project Cost (Mil.)	% of Proj. Subtotal	0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	5.00%		0
	5.0 & above	5.00%		0
Clearing Site	Project Cost (Mil.)	$	2000	
	Less than 1.0	2,000		2000
	1.0 & above	3,000		0
Construction Layout	Project Cost(Mil.)	$	4000	
	Less than 1.0	4,000		4000
	1.0 & above	6,000		0
		PROJECT TOTAL	6000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
6000	1.030	1.00	6180		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-20	3%	1	0.030
Over 20	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		14.90%	921
1.0 to 5.0		12.20%	0
5.0 to 10.0		10.80%	0
10.0 & above		9.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$920.82	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0

15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENC = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

6180	0.085	525
Construction Cost for Initial Estimate	Use 8.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	6180
Construction Engineering (CE)	921
Contingencies	6000
Utilities Relocations	525
Total Construction Cost	13626
Right of Way Cost	0

Classification Number 6 - INTERSECTION IMPROVEMENT - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified, C.Y. **See (A) for Unit Price**	0		0
Removal of Conc. Base & Conc. Surface Courses, S.Y.	0	15	0
Borrow Excavation, Zone 3, C.Y. **See (A) for Unit Price**	0		0
EARTHWORK TOTAL			0

Suggested procedure for calculating earthwork:
A) See Construction Cost Estimate Work Sheet (Section 3.1) for the method to utilize the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

DRAINAGE (includes inlets and cross drains)

Item	Quanity	Cost	= Amount
Reset Casting (Unit)		425	0
Inlet (Unit) *		2865	0
Pipe (L.F.) *		104	0
	DRAINAGE TOTAL	=	0

* Any drainage problems to be corrected should be estimated and included.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Lighting Assembly/Unit (Includes wire, junction box, etc.) *	9,500	0	0
Meter Cabinet/Unit (Lighting one per cross road)	11,000	0	0
Complete Traffic Signal Installation/Unit at Typical Intersection	165,000	0	0
INCIDENTAL ITEMS TOTAL	=		0

* For estimating purposes space lights 200 feet apart.

LANDSCAPE

The measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Drainage	0
Incidental Items	0
Landscape	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	5.00%		0
	5.0 & above	5.00%		0
Clearing Site	Project Cost (Mil.)	$	15000	
	Less than 1.0	15,000		15000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0

	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	7000	
	Less than 1.0	7,000		7000
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		0
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	270,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	22000	

CONTINGENCIES & ESCALATION

Y

2.00 1.00

Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%

0.00

22000	1.030	1.00	22660
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-5	3%	1	0.030
Over 5	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		36.50%	8271
1.0 to 5.0		35.10%	0
5.0 to 10.0		12.20%	0
10.0 & above		10.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$8,270.90	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY / = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

22660	0.015	340
Construction Cost for Initial Estimate	Use 1.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate "No Utilities" in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate "No ROW" the box

SUMMARY

Construction Estimate for Initial	22660
Construction Engineering (CE)	8271
Contingencies	6000
Utilities Relocations	340
Total Construction Cost	37271
Right of Way Cost	0

Classification Number 7 - SAFETY & TRAFFIC CONTROL - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK & LANDSCAPE

	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified, C.F	0	26.75	0
Removal of Conc. Base & Conc. Surface Courses, S.Y.	0	15	0
Borrow Excavation, Zone 3, C.F.	0	15.25	0
	0		0
	0		0
EARTHWORK TOTAL			0

Roadway Excavation Unclassified and Borrow Excavation Zone 3 should be calculated on a job-to-job basis depending on need. The prices include Topsoil and Seeding required.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
QuadGuard (per unit)	27500	0	0
Sign Bridge	308000	0	0
Cantilever Sign Structure	60500	0	0
Lighting Assembly/Unit (Includes wire, junction box, etc.) *	9,500	0	0

Meter Cabinet/Unit (Lighting one per cross road)	11,000	0	0
Complete Traffic Signal Installation/Unit at Typical Intersection	165,000	0	0
INCIDENTAL ITEMS TOTAL	=		0

* For estimating purposes space lights 200 feet apart.

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork & Landscape	0
Pavement	0
Incidental Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	8.00%		0
	5.0 & above	8.00%		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 & above	8,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	6000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
6000	1.030	1.00	6180		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-5	3%	1	0.030
Over 5	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		21.60%	1335
1.0 to 5.0		12.20%	0
5.0 to 10.0		12.20%	0
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$1,334.88	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY A = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

6180	0.01	62
Construction Cost for Initial Estimate	Use 1% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	6180
Construction Engineering (CE)	1335
Contingencies	6000
Utilities Relocations	62
Total Construction Cost	13577
Right of Way Cost	0

Classification Number 1 - NEW CONSTRUCTION - English

Route	Adams/Harrison Two Way	Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified, **See (J)**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses, **See (K)**	S.Y.	0		0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10	0
Borrow Excavation Zone 3, **See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 in depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent pric information.
K) 11.2 to 12.5, based on the quantity, location and type of project.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Meter
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156

Computation Table for Pavement. Cost

Type	Cost	x Quantity	~~x Pavement *W.F.~~	= Amount
Milling - Adams	3.5	27699	1	96946.5
Milling - Harrison	3.5	28508	1	99778
2" BCSC - Adams	65	3185	1	207025
2" BCSC - Harrison	65	3278	1	213070
2" BRT Lane	65	1871	1	121615
4" BRT Lane	75	3741	1	280575
6" DGABC	12.5	16267	1	203337.5
12" Subbase	51	5417	1	276267
				0

Class 1 - New Construction

PAVEMENT TOTAL = 1498614

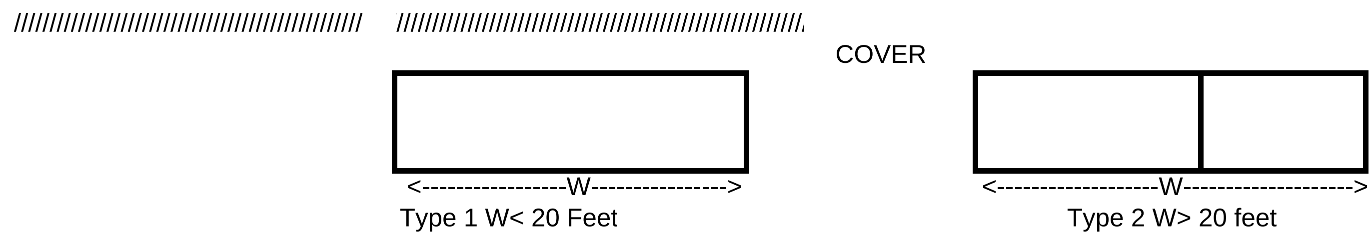
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 3 spans and 2 side spans (Max. Span 100 feet)
H = Clear Height 14 To 23 feet (4)
L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq. Foot
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stu	174.75

		40 to 60 Degrees	No Piles	145.00
			Piles at Stub Abut.	168.25
			Piles at Piers & Stu	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)
H = Clear Height 14 feet (4)
L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq. Foot
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.50
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	226.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.50
			On Piles	310.00
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.50
			On Piles	396.75
		40 to 60 Degrees	No Piles	318.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
Minimum Length 100 feet	40 to 60 Degrees	No Piles	166.50
		Piles at Semi-Stub Abut.	194.75
		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparab to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a squa foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can b used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustment (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		

BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains

Rural	0	364356	0
	project length (miles)	x cost per mile	= Amount

Urban	0	544280	0
	project length (miles)	x cost per mile	= Amount

The above are the total costs of basins, manholes, longitudinal and transverse pipes, underdrains, headwalls, protecting curbs, aprons, etc. for a divided highway with a depressed median. The costs are assumed to apply to 4, 6 or 8 lane sections since there will be no appreciable difference in the number of basins or the sizes or lengths of pipes.

Frontage Road & Ramp Drainage

12280	55	675400
length of ramp or frontage rd. in feet	x cost per foot	= Amount

DRAINAGE TOTAL	=	675400

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46	0	0

Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

	Quantity	x Unit Prices	= Amount
Topsoil and Seeding (Mainline) Length of Project in miles	0	112,815	0
Planting (Mainline) Length of Project in miles	0	64,500	0
Topsoil, Seeding, Planting (Finger Ramp) Number of Finger Ramps	0	12,500	0
Topsoil, Seeding, Planting (Loop Ramp) Number of Loop Ramps	0	20,000	0
Topsoil, Seeding (Access Road) Length of Access Road in Feet	0	7.9	0
LANDSCAPE TOTAL	=		0

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	3.5	44,260	154910
Materials Field Laboratory	3.5	28,970	101395
Erosion Control during Construction	3.5	64,375	225312.5
GENERAL ITEMS TOTAL	=		481618

SUMMARY

Route	Adams/Harrison Two Way	Section/Contract #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	1498614
Context Sensitive Desigr	0
Culverts	0
Bridges	0
Drainage	675400
Incidental Items	0
Landscape	0

Class 1 - New Construction

Noise Abatement			0
General Items			481618
Bus Shelters	2 @ $15000 each + 6 @ $10000 each		90000
Signal Preemption	11 @ $25000		275000
PROJECT SUBTOTAL			3020631.5

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	90619	
Maintenance of Traffic		1.5% of Proj. Subtotal	45309	
Training		1% of Proj. Subtotal	30206	
Mobilization			271857	
	Project Cost < 5.0 (Mil.)	9% of Proj. Subtotal		271857
	Project Cost 5.0 & above	10% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	6000	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		6000
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0
	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	45000	
	Less than 1.0	15,000		0
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		45000
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0
	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	42000	
	Less than 1.0	7,000		0
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		42000
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	220,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	3551623	

Classification Number 2 - RECONSTRUCTION, WIDENING & DUALIZATION - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified,**See (J)**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15	0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10	0
Borrow Excavation Zone 3,**See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 inch depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

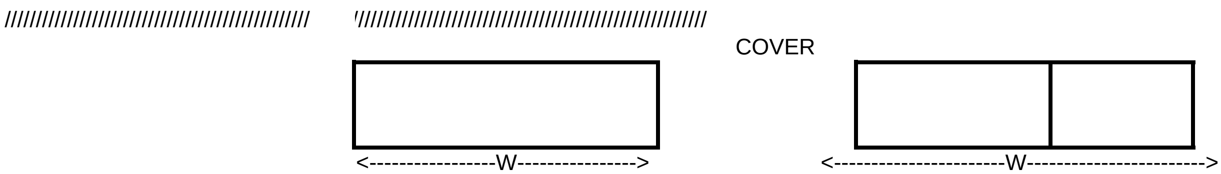
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type 1 W< 20 Feet

Type 2 W> 20 Feet

Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable to above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet)

H = Clear Height 14 To 23 feet (4)

L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Foot
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stu	174.75
		40 to 60 Degrees	No Piles	145
			Piles at Stub Abut.	168.25
			Piles at Piers & Stu	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)

H = Clear Height 14 feet (4)

L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Foot
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.5
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	226.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.5
			On Piles	310
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.5
			On Piles	396.75
		40 to 60 Degrees	No Piles	318.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
	40 to 60 Degrees	No Piles	166.50
Minimum Length 100 feet		Piles at Semi-Stub Abut.	194.75
		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a square foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can be used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0
			0

			0
			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		

BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains)

Rural	0	364356	0
	project length (miles)	x cost per mile	= Amount
Urban	0	544280	0
	project length (miles)	x cost per mile	= Amount

The above are the total costs of basins, manholes, longitudinal and transverse pipes, underdrains, headwalls, protecting curbs, aprons, etc. for a divided highway with a depressed median. The costs are assumed to apply to 4, 6 or 8 lane sectio since there will be no appreciable difference in the number of basins or the sizes or lengths of pipes.

Frontage Road & Ramp Drainage

0	55	0
length of ramp or frontage rd. in feet	x cost per foot	= Amount

DRAINAGE TOTAL	=	0

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

	Quantity	x Unit Prices	= Amount
Topsoil and Seeding (Mainline) Length of Project in miles	0	112,815	0
Planting (Mainline) Length of Project in miles	0	64,500	0
Topsoil, Seeding, Planting (Finger Ramp) Number of Finger Ramps	0	12,500	0
Topsoil, Seeding, Planting (Loop Ramp) Number of Loop Ramps	0	20,000	0
Topsoil, Seeding (Access Road) Length of Access Road in Feet	0	7.9	0

LANDSCAPE TOTAL	=		0

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
Erosion Control during Construction	0	64,375	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Context Sensitive Design	0
Culverts	0
Bridges	0
Drainage	0
Incidental Items	0
Landscape	0
Noise Abatement	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	9% of Proj. Subtotal		0
	Project Cost 5.0 & above	10% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0

	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	15000	
	Less than 1.0	15,000		15000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0
	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	7000	
	Less than 1.0	7,000		7000
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		0
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	220,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	22000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
22000	1.030	1.00	22660		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-10	3%	1	0.030
10-20	2.50%	2	0.000
Over 20	2%	3	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		31.10%	7047
1.0 to 5.0		20.30%	0.00
5.0 to 10.0		16.20%	0.00
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$7,047.26	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY AI = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

22660	0.09	2039
Construction Cost for Initial Estimate	for Urban use 0.12, Rural 0.055 or + Estimate Use % or utilities detailed estimate	= Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	22660
Construction Engineering (CE)	7047
Contingencies	6000
Utilities Relocations	2039
Total Construction Cost	37747
Right of Way Cost	0

Classification Number 3 - WIDENING & RESURFACING - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified, **See (J)**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15.00	0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10.00	0
Borrow Excavation Zone 3, **See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:

A) Determine Typical section (number of lanes, median widths, side slopes, etc.).

B) Get latest topography map available.

C) Plot proposed alignment on topo map.

D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.

E) Calculate Areas for the typical section in 1 foot increments of cut or fill.

F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.

G) Calculate any other significant earthwork (ramps, cross-roads, etc.).

H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 inch depth for all flexible pavement and 4 inch depth for stripping.

I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.

J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

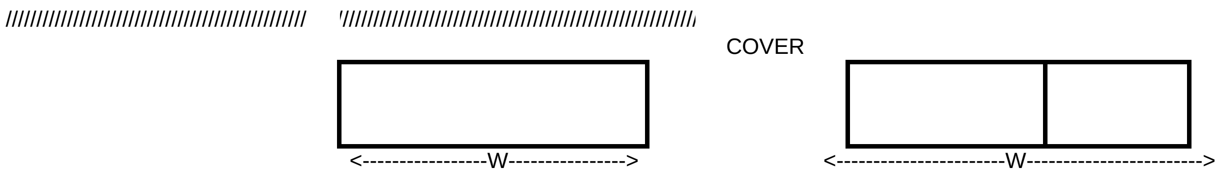
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type 1 W< 20 Feet

Type 2 W> 20 Feet

Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable to above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet)

H = Clear Height 14 To 23 feet (4)

L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Meter
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stul	174.75
		40 to 60 Degrees	No Piles	145.00
			Piles at Stub Abut.	168.25
			Piles at Piers & Stul	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)

H = Clear Height 14 feet (4)

L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Meter
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.50
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	223.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.50
			On Piles	310.00
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.50
			On Piles	396.75
		40 to 60 Degrees	No Piles	219.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
Minimum Length 100 feet	40 to 60 Degrees	No Piles	166.50
		Piles at Semi-Stub Abut.	194.75
		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a square foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can be used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0
			0
			0

			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		
		BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains)

PER DIRECTION OF WIDENING	0	55	0
	feet	x cost per foot	= Amount
	DRAINAGE TOTAL	=	0

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

The linear foot measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot. If a dualized roadway is widened into the median for each direction of traffic and both outside edges, the cost = 16.50 per foot. When more than one-half of the profile changes by 1 foot, the above costs will increase by 25%.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
Erosion Control during Construction	0	64,375	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Context Sensitive Design	0
Culverts	0
Bridges	0
Drainage	0
Incidental Items	0
Landscape	0
Noise Abatement	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	8% of Proj. Subtotal		0
	Project Cost 5.0 & above	8% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0
	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	10000	
	Less than 1.0	10,000		10000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 & above	50,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	16000	

CONTINGENCIES & ESCALATION		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
16000	1.030	1.00	16480		

Class 3 - Widening and Resurfacing

	Project Total Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD	

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-10	3%	1	0.030
Over 10	2.5%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		27.00%	4450
1.0 to 5.0		14.90%	0
5.0 to 10.0		13.50%	0
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$4,449.60	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY A = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

16480	0.09	1483
Construction Cost for Initial Estimate	for Urban use 1.12, Rural 0.055 or + Estimate Use % or utilities detailed estimate	= Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	16480
Construction Engineering (CE)	4450
Contingencies	6000
Utilities Relocations	1483
Total Construction Cost	28413

Right of Way Cost	0

Classification Number 4 - RESURFACING - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified **See (A) for Unit Price**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15.00	0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) See Construction Cost Estimate Work Sheet (Section 3.1) for the method to utilize the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

DRAINAGE (includes inlets and cross drains)

Item	Quanity	Cost	= Amount
Reset Casting (Unit)		425	0
Inlet (Unit) *		2865	0
Pipe (L.F.) *		104	0
	DRAINAGE TOTAL	=	0

* Any drainage problems to be corrected should be estimated and included.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

The measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Drainage	0
Incidental Items	0
Landscape	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		2% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	8% of Proj. Subtotal		0
	Project Cost 5.0 & above	8% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	

	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 & above	8,000		0
Clearing Site	Project Cost (Mil.)	$	10000	
	Less than 1.0	10,000		10000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 & above	50,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	16000	

CONTINGENCIES & ESCALATION

Y

2.00 1.00

Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%

0.00

16000	1.030	1.00	16480
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-20	3%	1	0.030
Over 20	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		20.30%	3345
1.0 to 5.0		14.90%	0
5.0 to 10.0		10.80%	0
10.0 & above		9.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$3,345.44	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENC = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

16480	0.025	412
Construction Cost for Initial Estimate	Use 2.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	16480
Construction Engineering (CE)	3345
Contingencies	6000
Utilities Relocations	412
Total Construction Cost	26237

Right of Way Cost	0

Classification No. 5 - BRIDGE REPAIR - English

Route		Section/Contract #	
PM		UPC No.	

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
INCIDENTAL ITEMS TOTAL	=		0

BRIDGES

Cost to be provided by the Bureau of Structural Engineering TOTAL =

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages

Pavement	0
Incidental Items	0
Bridges	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		1% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization	Project Cost (Mil.)	% of Proj. Subtotal	0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	5.00%		0
	5.0 & above	5.00%		0
Clearing Site	Project Cost (Mil.)	$	2000	
	Less than 1.0	2,000		2000
	1.0 & above	3,000		0
Construction Layout	Project Cost(Mil.)	$	4000	
	Less than 1.0	4,000		4000
	1.0 & above	6,000		0
		PROJECT TOTAL	6000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
6000	1.030	1.00	6180		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-20	3%	1	0.030
Over 20	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		14.90%	921
1.0 to 5.0		12.20%	0
5.0 to 10.0		10.80%	0
10.0 & above		9.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$920.82	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0

15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENC = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

6180	0.085	525
Construction Cost for Initial Estimate	Use 8.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	6180
Construction Engineering (CE)	921
Contingencies	6000
Utilities Relocations	525
Total Construction Cost	13626
Right of Way Cost	0

Classification Number 6 - INTERSECTION IMPROVEMENT - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified, C.Y. **See (A) for Unit Price**	0		0
Removal of Conc. Base & Conc. Surface Courses, S.Y.	0	15	0
Borrow Excavation, Zone 3, C.Y. **See (A) for Unit Price**	0		0
EARTHWORK TOTAL			0

Suggested procedure for calculating earthwork:
A) See Construction Cost Estimate Work Sheet (Section 3.1) for the method to utilize the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

DRAINAGE (includes inlets and cross drains)

Item	Quanity	Cost	= Amount
Reset Casting (Unit)		425	0
Inlet (Unit) *		2865	0
Pipe (L.F.) *		104	0
	DRAINAGE TOTAL	=	0

* Any drainage problems to be corrected should be estimated and included.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Lighting Assembly/Unit (Includes wire, junction box, etc.) *	9,500	0	0
Meter Cabinet/Unit (Lighting one per cross road)	11,000	0	0
Complete Traffic Signal Installation/Unit at Typical Intersection	165,000	0	0
INCIDENTAL ITEMS TOTAL	=		0

* For estimating purposes space lights 200 feet apart.

LANDSCAPE

The measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Drainage	0
Incidental Items	0
Landscape	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	5.00%		0
	5.0 & above	5.00%		0
Clearing Site	Project Cost (Mil.)	$	15000	
	Less than 1.0	15,000		15000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0

	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	7000	
	Less than 1.0	7,000		7000
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		0
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	270,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	22000	

CONTINGENCIES & ESCALATION

		Y			
				2.00	1.00
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00			
22000	1.030	1.00	22660		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-5	3%	1	0.030
Over 5	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		36.50%	8271
1.0 to 5.0		35.10%	0
5.0 to 10.0		12.20%	0
10.0 & above		10.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$8,270.90	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY A = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

22660	0.015	340
Construction Cost for Initial Estimate	Use 1.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	22660
Construction Engineering (CE)	8271
Contingencies	6000
Utilities Relocations	340
Total Construction Cost	37271
Right of Way Cost	0

Classification Number 7 - SAFETY & TRAFFIC CONTROL - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK & LANDSCAPE

	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified, C.F	0	26.75	0
Removal of Conc. Base & Conc. Surface Courses, S.Y.	0	15	0
Borrow Excavation, Zone 3, C.F.	0	15.25	0
	0		0
	0		0
EARTHWORK TOTAL			0

Roadway Excavation Unclassified and Borrow Excavation Zone 3 should be calculated on a job-to-job basis depending on need. The prices include Topsoil and Seeding required.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
QuadGuard (per unit)	27500	0	0
Sign Bridge	308000	0	0
Cantilever Sign Structure	60500	0	0
Lighting Assembly/Unit (Includes wire, junction box, etc.) *	9,500	0	0

Meter Cabinet/Unit (Lighting one per cross road)	11,000	0	0
Complete Traffic Signal Installation/Unit at Typical Intersection	165,000	0	0
INCIDENTAL ITEMS TOTAL	=		0

* For estimating purposes space lights 200 feet apart.

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork & Landscape	0
Pavement	0
Incidental Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	8.00%		0
	5.0 & above	8.00%		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 & above	8,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	6000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
6000	1.030	1.00	6180		
	Project Total Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-5	3%	1	0.030
Over 5	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		21.60%	1335
1.0 to 5.0		12.20%	0
5.0 to 10.0		12.20%	0
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$1,334.88	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY A = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

6180	0.01	62
Construction Cost for Initial Estimate	Use 1% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	6180
Construction Engineering (CE)	1335
Contingencies	6000
Utilities Relocations	62
Total Construction Cost	13577
Right of Way Cost	0

Classification Number 1 - NEW CONSTRUCTION - English

Route	Two Roundabouts	Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified, **See (J)**	C.Y.	18265	15	273975
Removal of Conc. Base & Conc. Surface Courses, **See (K)**	S.Y.	0		0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10	0
Borrow Excavation Zone 3, **See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			273975

Suggested procedure for calculating earthwork:
A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 inch depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent price information.
K) 11.2 to 12.5, based on the quantity, location and type of project.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Meter
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156

Computation Table for Pavement. Cost

Type	Cost	x Length	~~x Pavement *W.F.~~	= Amount
2" BCSC	65	1854	1	120510
4" BSBC	75	3707	1	278025
6" DGABC	12.5	16115	1	201437.5
12" Subbase	51	5366	1	273666
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	873639

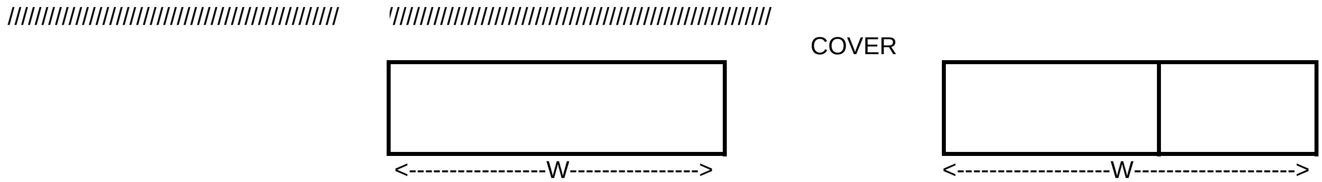
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type 1 W< 20 Feet

Type 2 W> 20 feet

Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable to above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet)

H = Clear Height 14 To 23 feet (4)

L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq. Foot
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stu	174.75
		40 to 60 Degrees	No Piles	145.00
			Piles at Stub Abut.	168.25
			Piles at Piers & Stu	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)

H = Clear Height 14 feet (4)

L = under 400 feet

Class 1 - New Construction

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq. Foot
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.50
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	226.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.50
			On Piles	310.00
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.50
			On Piles	396.75
		40 to 60 Degrees	No Piles	318.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 2 spans (Max. Span 125 feet)

H = Clear Height 14 feet (4)

L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
	40 to 60 Degrees	No Piles	166.50
Minimum Length 100 feet		Piles at Semi-Stub Abut.	194.75
		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a square foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can be used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0
			0

Class 1 - New Construction

			0
			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		
		BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains)

Rural	0	364356	0
	project length (miles)	x cost per mile	= Amount
Urban	0.525	544280	285747
	project length (miles)	x cost per mile	= Amount

The above are the total costs of basins, manholes, longitudinal and transverse pipes, underdrains, headwalls, protecting curbs, aprons, etc. for a divided highway with a depressed median. The costs are assumed to apply to 4, 6 or 8 lane sections since there will be no appreciable difference in the number of basins or the sizes or lengths of pipes.

Frontage Road & Ramp Drainage

	0	55	0
length of ramp or frontage rd. in feet		x cost per foot	= Amount
	DRAINAGE TOTAL	=	285747

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	20	9700	194000
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46	0	0
Sign Bridge	308,000	2	616000
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		810000

LANDSCAPE

	Quantity	x Unit Prices	= Amount
Topsoil and Seeding (Mainline) Length of Project in miles	0.525	112,815	59227.875
Planting (Mainline) Length of Project in miles	0.525	64,500	33862.5
Topsoil, Seeding, Planting (Finger Ramp) Number of Finger Ramps	0	12,500	0
Topsoil, Seeding, Planting (Loop Ramp) Number of Loop Ramps	0	20,000	0
Topsoil, Seeding (Access Road)			

Length of Access Road in Feet	0	7.9	0
LANDSCAPE TOTAL	=		93090

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0.525	44,260	23236.5
Materials Field Laboratory	0.525	28,970	15209.25
Erosion Control during Construction	0.525	64,375	33796.875
GENERAL ITEMS TOTAL	=		72243

SUMMARY

Route	Two Roundabouts	Section/Contract #	0
PM	0	UPC No.	0

Work Type		Totals from other pages
Earthwork		273975
Pavement		873639
Context Sensitive Design		0
Culverts		0
Bridges		0
Drainage		285747
Incidental Items		810000
Landscape		93090
Noise Abatement		0
General Items		72243
Remove Signals	2 @ $100,000	200000
Concrete Island	7664 SY @ $50/SY	383200
PROJECT SUBTOTAL		2991894

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	89757	
Maintenance of Traffic		1.5% of Proj. Subtotal	44878	
Training		1% of Proj. Subtotal	29919	
Mobilization			269270	
	Project Cost < 5.0 (Mil.)	9% of Proj. Subtotal		269270
	Project Cost 5.0 & above	10% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	6000	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		6000

	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0
	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	45000	
	Less than 1.0	15,000		0
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		45000
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0
	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	42000	
	Less than 1.0	7,000		0
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		42000
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	220,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	3518718	

Classification Number 2 - RECONSTRUCTION, WIDENING & DUALIZATION - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified,**See (J)**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15	0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10	0
Borrow Excavation Zone 3,**See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 inch depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

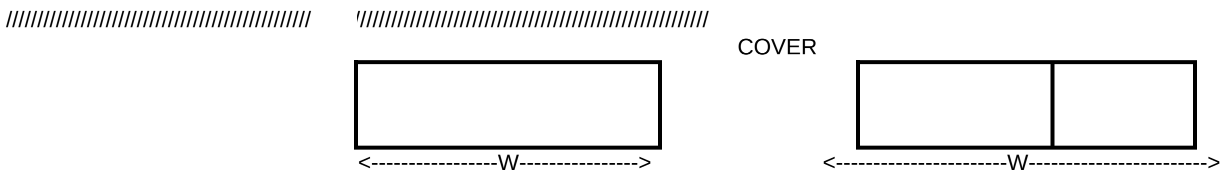
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type 1 W< 20 Feet

Type 2 W> 20 Feet

Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable to above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet)

H = Clear Height 14 To 23 feet (4)

L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Foot
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stu	174.75
		40 to 60 Degrees	No Piles	145
			Piles at Stub Abut.	168.25
			Piles at Piers & Stu	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)

H = Clear Height 14 feet (4)

L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Foot
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.5
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	226.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.5
			On Piles	310
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.5
			On Piles	396.75
		40 to 60 Degrees	No Piles	318.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
Minimum Length 100 feet	40 to 60 Degrees	No Piles	166.50
		Piles at Semi-Stub Abut.	194.75
		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a square foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can be used. Redu by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0
			0

			0
			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		
		BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains)

Rural	0	364356	0
	project length (miles)	x cost per mile	= Amount
Urban	0	544280	0
	project length (miles)	x cost per mile	= Amount

The above are the total costs of basins, manholes, longitudinal and transverse pipes, underdrains, headwalls, protecting curbs, aprons, etc. for a divided highway with a depressed median. The costs are assumed to apply to 4, 6 or 8 lane sectio since there will be no appreciable difference in the number of basins or the sizes or lengths of pipes.

Frontage Road & Ramp Drainage

0	55	0
length of ramp or frontage rd. in feet	x cost per foot	= Amount

DRAINAGE TOTAL = 0

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

	Quantity	x Unit Prices	= Amount
Topsoil and Seeding (Mainline) Length of Project in miles	0	112,815	0
Planting (Mainline) Length of Project in miles	0	64,500	0
Topsoil, Seeding, Planting (Finger Ramp) Number of Finger Ramps	0	12,500	0
Topsoil, Seeding, Planting (Loop Ramp) Number of Loop Ramps	0	20,000	0
Topsoil, Seeding (Access Road) Length of Access Road in Feet	0	7.9	0

LANDSCAPE TOTAL = 0

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
Erosion Control during Construction	0	64,375	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Context Sensitive Design	0
Culverts	0
Bridges	0
Drainage	0
Incidental Items	0
Landscape	0
Noise Abatement	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	9% of Proj. Subtotal		0
	Project Cost 5.0 & above	10% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0

	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	15000	
	Less than 1.0	15,000		15000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0
	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	7000	
	Less than 1.0	7,000		7000
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		0
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	220,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	22000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
22000	1.030	1.00	22660		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-10	3%	1	0.030
10-20	2.50%	2	0.000
Over 20	2%	3	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		31.10%	7047
1.0 to 5.0		20.30%	0.00
5.0 to 10.0		16.20%	0.00
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$7,047.26	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY AI = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

22660	0.09	2039
Construction Cost for Initial Estimate	for Urban use 0.12, Rural 0.055 or + Estimate Use % or utilities detailed estimate	= Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	22660
Construction Engineering (CE)	7047
Contingencies	6000
Utilities Relocations	2039
Total Construction Cost	37747
Right of Way Cost	0

Classification Number 3 - WIDENING & RESURFACING - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Stripping (4 - 6" Depth)	Acre	0	4,050	0
Roadway Exc. Unclassified, **See (J)**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15.00	0
Channel Excavation	C.Y.	0	12.25	0
Ditch Excavation	C.Y.	0	10.00	0
Borrow Excavation Zone 3, **See (J)**	C.Y.	0		0
		0		0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) Determine Typical section (number of lanes, median widths, side slopes, etc.).
B) Get latest topography map available.
C) Plot proposed alignment on topo map.
D) Develop profile using topo controls such as existing roads, streams, rivers and design manual.
E) Calculate Areas for the typical section in 1 foot increments of cut or fill.
F) At 10 to 60 foot intervals (depending on frequency of X-section changes) calculate the earthwork.
G) Calculate any other significant earthwork (ramps, cross-roads, etc.).
H) Make appropriate earthwork corrections for the pavement box and striping. Use 21 inch depth for rigid pavement, 26 inch depth for all flexible pavement and 4 inch depth for stripping.
I) Deduct any roadway excavation from borrow required to calculate Borrow Excavation Zone 3.
J) See Construction Cost Estimate Work Sheet (Section 3.1). This worksheet must be utilized for the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

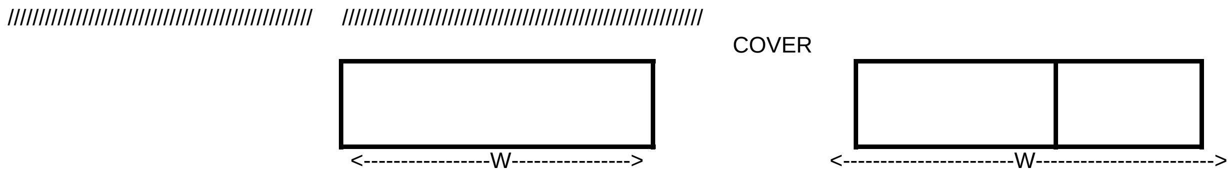
*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

CONTEXT SENSITIVE DESIGN

Attach additional sheet detailing items and costs of context sensitive design work =

CULVERTS



Type 1 W< 20 Feet

Type 2 W> 20 Feet

Type	Layout (3)	Skew (1)	Cover (2)	Cost Per Sq. Foot
Type 1	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	114.75
			10' to 20'	147.25
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00
Type 2	Area w x L exceeds 1000 Sq. Feet	0-60 degrees	0 to 10'	121.75
			10' to 20'	152.50
	Short Culverts Difficult Conditions under 1000 Square Feet	0-60 degrees	0 to 10'	203.50
			10' to 20'	235.00

For skews over 60 degrees it will be necessary to make a special analysis and establish a square meter price comparable to above.

Description	Area Computation	x Cost per Sq. Foot	= Amount
			0
			0
			0
			0
		Culvert Total =	0

BRIDGES

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet)

H = Clear Height 14 To 23 feet (4)

L = 100 to 400 feet & all viaducts over 400 feet (5)

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Meter
I	Width at Least 45 feet	0 to 40 Degrees	No Piles	134.75
			Piles at Stub Abut.	159.75
			Piles at Piers & Stul	174.75
		40 to 60 Degrees	No Piles	145.00
			Piles at Stub Abut.	168.25
			Piles at Piers & Stul	181.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual

1 to 3 spans and 2 side spans (Max. Span 100 feet) (3)

H = Clear Height 14 feet (4)

L = under 400 feet

Class	Layout	Skew (1)	Foundation (2)	Cost per Sq.Meter
II	L exceeds W Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	176.50
			On Piles	187.25
		40 to 60 Degrees	No Piles	219.75
			On Piles	273.25
III	W exceeds L Area L x W exceeds 4500 Sq. Feet	0 to 40 Degrees	No Piles	223.75
			On Piles	299.25
		40 to 60 Degrees	No Piles	241.50
			On Piles	310.00
IV	Width 30 - 45 feet Area W x L under 4500 Sq. Foot	0 to 40 Degrees	No Piles	295.50
			On Piles	396.75
		40 to 60 Degrees	No Piles	219.25
			On Piles	416.25

For the Bridge Sketch see the Construction Cost Estimation Preparation Manual
1 to 2 spans (Max. Span 125 feet)
H = Clear Height 14 feet (4)
L = 100 to 250 feet

Layout	Skew (1)	Foundation (2)	Cost/ Sq. Foot
Width at Least 40 feet	0 to 40 Degrees	No Piles	157.00
		Piles at Semi-Stub Abut.	182.00
		Piles at Piers & Semi-Stub Abut.	204.50
	40 to 60 Degrees	No Piles	166.50
Minimum Length		Piles at Semi-Stub Abut.	194.75
100 feet		Piles at Piers & Semi-Stub Abut.	217.50

Length	Width	Cost per SF	Bridge Total
			0

1. For skews over 60 degrees it will be necessary to make a special analysis and establish a square foot price comparable to above.

2. For very bad foundation conditions requiring unusual lengths or spacing of piles, it will be necessary to establish a square foot price.

3. For longer spans, adjust the cost per square foot to reflect increased cost of structural members.

4. For span bridges, it is expected the length of the side span will be increased in proportion to any increase in height. Because of the resultant increase in deck area, the square foot price will remain approximately the same in the range of heights shown. For extremely high structures (particularly for viaducts), square foot prices will have to be increased.

5. For structures over 400 foot long (viaducts), reduce the cost per square foot if repetitive span length and forming can be used. Reduce by $0.50 for lengths from 400 to 600 feet and by $1.00 for lengths over 600 feet. (Do not forget adjustments (3) and (4) above on viaducts).

6. For statically indeterminate structures, square foot prices will have to be established.

Structure Description	Calculated Sq. Foot of Bridge Deck	x Cost Per Square Foot	= Amount
			0
			0
			0
			0
			0
			0
			0

			0
			0
			0
			0
			0
		Sub Total	0
Clearing Site Bridge *0-3% of Sub Total			0
	%		
		BRIDGE TOTAL	0

*Pick appropriate percent based on the size, type and materials of existing structure

DRAINAGE (includes inlets and cross drains)

PER DIRECTION OF WIDENING	0	55	0
	feet	x cost per foot	= Amount
	DRAINAGE TOTAL	=	0

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

The linear foot measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot. If a dualized roadway is widened into the median for each direction of traffic and both outside edges, the cost = 16.50 per foot. When more than one-half of the profile changes by 1 foot, the above costs will increase by 25%.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

NOISE ABATEMENT

	Unit	Quantity	x Cost	= Amount
Noise Wall	L.F.	0	305	0
				0
				0
				0
NOISE ABATEMENT TOTAL	=			0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0

Materials Field Laboratory	0	28,970	0
Erosion Control during Construction	0	64,375	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Context Sensitive Design	0
Culverts	0
Bridges	0
Drainage	0
Incidental Items	0
Landscape	0
Noise Abatement	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	8% of Proj. Subtotal		0
	Project Cost 5.0 & above	8% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 to 10.0	8,000		0
	10.0 to 20.0	15,000		0
	20.0 to 30.0	30,000		0
	30.0 to 40.0	40,000		0
	40.0 & above	58,000		0
Clearing Site	Project Cost (Mil.)	$	10000	
	Less than 1.0	10,000		10000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 & above	50,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	16000	

CONTINGENCIES & ESCALATION **Y**

2.00 1.00

Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00	
16000	1.030	1.00	16480
	Project Total Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-10	3%	1	0.030
Over 10	2.5%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		27.00%	4450
1.0 to 5.0		14.90%	0
5.0 to 10.0		13.50%	0
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$4,449.60	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

16480	0.09	1483
Construction Cost for Initial Estimate	for Urban use 1.12, Rural 0.055 or + Estimate Use % or utilities detailed estimate	= Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	16480
Construction Engineering (CE)	4450
Contingencies	6000
Utilities Relocations	1483
Total Construction Cost	28413
Right of Way Cost	0

Classification Number 4 - RESURFACING - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Unit	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified **See (A) for Unit Price**	C.Y.	0		0
Removal of Conc. Base & Conc. Surface Courses	S.Y.	0	15.00	0
EARTHWORK TOTAL	=			0

Suggested procedure for calculating earthwork:
A) See Construction Cost Estimate Work Sheet (Section 3.1) for the method to utilize the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

DRAINAGE (includes inlets and cross drains)

Item	Quanity	Cost	= Amount
Reset Casting (Unit)		425	0
Inlet (Unit) *		2865	0
Pipe (L.F.) *		104	0
	DRAINAGE TOTAL	=	0

* Any drainage problems to be corrected should be estimated and included.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Sign Bridge	308,000	0	0
Cantilever Sign Structure	60,500	0	0
INCIDENTAL ITEMS TOTAL	=		0

LANDSCAPE

The measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

GENERAL ITEMS

Item	Project Length (miles)	x Cost/Mile	= Amount
Field Office	0	44,260	0
Materials Field Laboratory	0	28,970	0
GENERAL ITEMS TOTAL	=		0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Drainage	0
Incidental Items	0
Landscape	0
General Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		2% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Project Cost < 5.0 (Mil.)	8% of Proj. Subtotal		0
	Project Cost 5.0 & above	8% of Proj. Subtotal		0
Progress Schedule	Project Cost(Mil.)	$	0	

	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 & above	8,000		0
Clearing Site	Project Cost (Mil.)	$	10000	
	Less than 1.0	10,000		10000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 & above	50,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	16000	

CONTINGENCIES & ESCALATION

Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		Y 0.00		2.00	1.00
16000	1.030	1.00	16480		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-20	3%	1	0.030
Over 20	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		20.30%	3345
1.0 to 5.0		14.90%	0
5.0 to 10.0		10.80%	0
10.0 & above		9.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$3,345.44	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENC = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

16480	0.025	412
Construction Cost for Initial Estimate	Use 2.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	16480
Construction Engineering (CE)	3345
Contingencies	6000
Utilities Relocations	412
Total Construction Cost	26237

Right of Way Cost	0

Classification No. 5 - BRIDGE REPAIR - English

Route		Section/Contract #	
PM		UPC No.	

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
INCIDENTAL ITEMS TOTAL	=		0

BRIDGES

Cost to be provided by the Bureau of Structural Engineering TOTAL =

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages

Pavement	0
Incidental Items	0
Bridges	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		1% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization	Project Cost (Mil.)	% of Proj. Subtotal	0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	5.00%		0
	5.0 & above	5.00%		0
Clearing Site	Project Cost (Mil.)	$	2000	
	Less than 1.0	2,000		2000
	1.0 & above	3,000		0
Construction Layout	Project Cost(Mil.)	$	4000	
	Less than 1.0	4,000		4000
	1.0 & above	6,000		0
		PROJECT TOTAL	6000	

CONTINGENCIES & ESCALATION

		Y			
				2.00	1.00
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00			
6000	1.030	1.00	6180		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-20	3%	1	0.030
Over 20	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		14.90%	921
1.0 to 5.0		12.20%	0
5.0 to 10.0		10.80%	0
10.0 & above		9.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$920.82	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0

15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENC = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

6180	0.085	525
Construction Cost for Initial Estimate	Use 8.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	6180
Construction Engineering (CE)	921
Contingencies	6000
Utilities Relocations	525
Total Construction Cost	13626
Right of Way Cost	0

Classification Number 6 - INTERSECTION IMPROVEMENT - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK (must be calculated)

	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified, C.Y. **See (A) for Unit Price**	0		0
Removal of Conc. Base & Conc. Surface Courses, S.Y.	0	15	0
Borrow Excavation, Zone 3, C.Y. **See (A) for Unit Price**	0		0
EARTHWORK TOTAL			0

Suggested procedure for calculating earthwork:
A) See Construction Cost Estimate Work Sheet (Section 3.1) for the method to utilize the most recent price information.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

DRAINAGE (includes inlets and cross drains)

Item	Quanity	Cost	= Amount
Reset Casting (Unit)		425	0
Inlet (Unit) *		2865	0
Pipe (L.F.) *		104	0
	DRAINAGE TOTAL	=	0

* Any drainage problems to be corrected should be estimated and included.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
9" X 16" Conc. Vertical Curb	13.75	0	0
15" X 41" Conc. Barrier Curb	50.25	0	0
24" X 41" Conc. Barrier Curb	73.25	0	0
24" X Variable Conc. Barrier Curb	46.00	0	0
Lighting Assembly/Unit (Includes wire, junction box, etc.) *	9,500	0	0
Meter Cabinet/Unit (Lighting one per cross road)	11,000	0	0
Complete Traffic Signal Installation/Unit at Typical Intersection	165,000	0	0
INCIDENTAL ITEMS TOTAL	=		0

* For estimating purposes space lights 200 feet apart.

LANDSCAPE

The measurement is for each side of the roadway or ramp that requires landscaping. For example: If a road is widened on one side only the cost = 4.00 per foot. If the road is widened on both sides the cost = 8.00 per foot.

Pavement Edge Length in feet	Cost per pavement edge for Topsoil & Seeding	= Amount
0	4.00	0
LANDSCAPE TOTAL	=	0

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork	0
Pavement	0
Drainage	0
Incidental Items	0
Landscape	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	5.00%		0
	5.0 & above	5.00%		0
Clearing Site	Project Cost (Mil.)	$	15000	
	Less than 1.0	15,000		15000
	1.0 to 2.0	30,000		0
	2.0 to 5.0	45,000		0
	5.0 to 10.0	115,000		0
	10.0 to 20.0	220,000		0
	20.0 to 30.0	240,000		0

	30.0 to 40.0	250,000		0
	40.0 & above	490,000		0
Construction Layout	Project Cost(Mil.)	$	7000	
	Less than 1.0	7,000		7000
	1.0 to 2.0	20,000		0
	2.0 to 5.0	42,000		0
	5.0 to 10.0	87,000		0
	10.0 to 20.0	160,000		0
	20.0 to 30.0	270,000		0
	30.0 to 40.0	490,000		0
	40.0 & above	890,000		0
		PROJECT TOTAL	22000	

CONTINGENCIES & ESCALATION

Y

2.00 1.00

Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%

0.00

22000	1.030	1.00	22660
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-5	3%	1	0.030
Over 5	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		36.50%	8271
1.0 to 5.0		35.10%	0
5.0 to 10.0		12.20%	0
10.0 & above		10.50%	0
CONSTRUCTION ENGINEERING AMOUNT		$8,270.90	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY A = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

22660	0.015	340
Construction Cost for Initial Estimate	Use 1.5% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	22660
Construction Engineering (CE)	8271
Contingencies	6000
Utilities Relocations	340
Total Construction Cost	37271

Right of Way Cost	0

Classification Number 7 - SAFETY & TRAFFIC CONTROL - English

Route		Section/Contract #	
PM		UPC No.	

EARTHWORK & LANDSCAPE

	Quantity	x Unit Price	Amount
Roadway Exc. Unclassified, C.F	0	26.75	0
Removal of Conc. Base & Conc. Surface Courses, S.Y.	0	15	0
Borrow Excavation, Zone 3, C.F.	0	15.25	0
	0		0
	0		0
EARTHWORK TOTAL			0

Roadway Excavation Unclassified and Borrow Excavation Zone 3 should be calculated on a job-to-job basis depending on need. The prices include Topsoil and Seeding required.

PAVEMENT

12 FOOT WIDE LANE (from subgrade up)

Pav't. Type	Description of Pavement	Cost/Linear Foot
A	10 inch R.C. Pavement	156
B	2 inch HMA Surf. Crs. & 8 inch HMA Base	61
C	3 inch HMA Surf. Crs. & 4 inch HMA Base	46
D	2 inch HMA Surf. Crs. & 2 inch HMA Base	22
E	Bridge Approach & Transition Slabs	156
	(Resurfacing Portion only F & G)	
F	2 inch HMA Surface Course	8.25
G	3 inch HMA Surface Course	12
H	Milling 2 inch	3

Computation Table for Pavement. Cost

Type	Cost from table above	x Length	x Pavement *W.F.	= Amount
				0
				0
				0
				0
				0
				0
				0
				0
				0
PAVEMENT TOTAL			=	0

*Width Factors = Ratio of 12 foot wide lane to actual pavement width.

Example = actual pavement width = 25 foot = 25/12 = 2.08 W.F.

INCIDENTAL ITEMS

Item	Cost / L.F.	x Quantity	= Amount
Beam Guide Rail	16.75	0	0
Fence 6 Foot High	18.25	0	0
QuadGuard (per unit)	27500	0	0
Sign Bridge	308000	0	0
Cantilever Sign Structure	60500	0	0
Lighting Assembly/Unit (Includes wire, junction box, etc.) *	9,500	0	0

Meter Cabinet/Unit (Lighting one per cross road)	11,000	0	0
Complete Traffic Signal Installation/Unit at Typical Intersection	165,000	0	0
INCIDENTAL ITEMS TOTAL	=		0

* For estimating purposes space lights 200 feet apart.

SUMMARY

Route	0	Section/Proj. Id. #	0
PM	0	UPC No.	0

Work Type	Totals from other pages
Earthwork & Landscape	0
Pavement	0
Incidental Items	0
PROJECT SUBTOTAL	0

Other Items	Proj. Subtotal Range	Choice	Amount	
Lighting, Traffic Stripes, Signs and Delineators		3% of Proj. Subtotal	0	
Maintenance of Traffic		7% of Proj. Subtotal	0	
Training		1% of Proj. Subtotal	0	
Mobilization			0	
	Less than 1.0	8.00%		0
	1.0 to 5.0	8.00%		0
	5.0 & above	8.00%		0
Progress Schedule	Project Cost(Mil.)	$	0	
	Less than 2.0	0		0
	2.0 to 5.0	6,000		0
	5.0 & above	8,000		0
Construction Layout	Project Cost(Mil.)	$	6000	
	Less than 1.0	6,000		6000
	1.0 to 2.0	8,000		0
	2.0 to 5.0	26,500		0
	5.0 & above	31,000		0
		PROJECT TOTAL	6000	

CONTINGENCIES & ESCALATION

		Y			
Y = Number of Years until midpoint of construction duration plus number of years until construction start. If midpoint is less than 2 years from the date of this estimate, no escalation is required. Maximum value = 10%		0.00		2.00	1.00
6000	1.030	1.00	6180		
Project Total	Contingencies (1+C)	1 + [0.01 (Y+1) (Y-2)]	Construction Estimate for PD		

Project Cost(Mil.)	Contingencies (C) Percent	Average Construction Duration in Years	
0-5	3%	1	0.030
Over 5	2.0%	2	0.000

CONSTRUCTION ENGINEERING (CE)

Project Cost (Mil.)		% of Construction Cost	
Less than 1.0		21.60%	1335
1.0 to 5.0		12.20%	0
5.0 to 10.0		12.20%	0
10.0 & above		12.20%	0
CONSTRUCTION ENGINEERING AMOUNT		$1,334.88	

CONSTRUCTION CHANGE ORDER CONTINGENCIES

Total Federal Participating Items in Millions of $	Construction Change Order Contingency Amount	
$0 to 0.1	$6,000	6000
0.1 to 0.5	25,000	0
0.5 to 5.0	25,000 + 4% of amount in excess of $500,000	0
5.0 to 10.0	205,000 + 3% of amount in excess of $5,000,000	0
10.0 to 15.0	355,000 + 2% of amount in excess of $10,000,000	0
15.0 and above	455,000 + 1.5% of amount in excess of $15,000,000 - max $500,000	0
		0

For State Funded Projects, Contingencies for Change orders = 0

CHANGE ORDER CONTINGENCY / = 6000

UTILITIES RELOCATIONS BY COMPANIES/OWNERS

Construction Cost for Initial Estimate	Use 1% or utilities detailed estimate	Utility Relocation Cost for Initial Estimate
6180	0.01	62

If there are no utility relocations on the project indicate “No Utilities” in the box above.

RIGHT OF WAY COST

If there is no ROW cost on the project indicate “No ROW” the box

SUMMARY

Construction Estimate for Initial	6180
Construction Engineering (CE)	1335
Contingencies	6000
Utilities Relocations	62
Total Construction Cost	13577
Right of Way Cost	0