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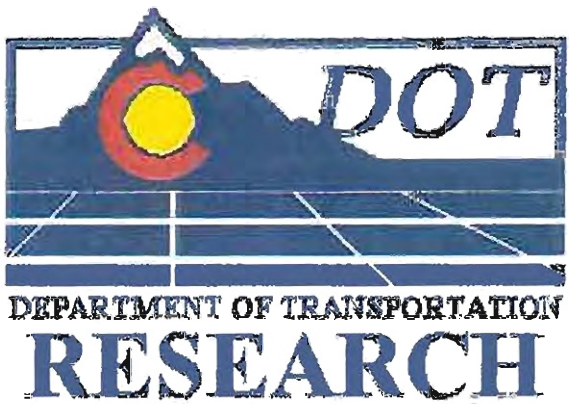
Long-Range Cost Estimation Research Project

Info Tech, Inc.



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16. Abstract

The purpose of this project was to research long-range (parametric) cost estimation at the Colorado Department of Transportation, utilizing AASHTO's Trns.port Cost Estimation and Decision Support software. Info Tech, Inc. analysis reviewed CDOT's current long-range estimation practices and identified revisions which would be needed to satisfactorily meet CDOT's future cost estimating requirements, i.e. in order to develop consistent and reliable cost estimates when little is known about a project. Both item and contract classifications utilized by CDOT in BAMS/DSS were revised to reflect more logical functional groupings. The new contract work type and item classification were used directly to develop an Interim Solution for Long-Range Cost Estimation that uses historical bid-based default prices. Info Tech analysts also researched Internet sources to identify the availability of major item cost data at the regional and national level, including data for multi-modal project types. Overall, given the absence of historical data available, it was not possible to evaluate outside data compatibility with CDOT data. The corollary to this research project is for CDOT to move forward with implementation of AASHTO's Trns.port Cost Estimation System (CES). The new CES is currently in the warranty phase, which will be completed by September 30, 2000.

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by

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Prepared for
Colorado Department of Transportation
Research Branch

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Executive Summary

The purpose of this project was to research long-range (parametric) cost estimation at the Colorado Department of Transportation, with a particular focus on utilizing AASHTO's Trns•port Cost Estimation and Decision Support software. Info Tech, Inc. analysts reviewed CDOT's current practices in order to fully understand the issues surrounding CDOT's long-range estimation procedures and identified revisions to those practices which would be needed to satisfactorily meet CDOT's future cost estimating requirements, i.e. in order to achieve the objective of developing consistent and reliable cost estimates when little is known about a project. Systematic use of historical data available from CDOT's BAMS/DSS database, combined with engineering knowledge, can be used to improve cost estimation. Also, BAMS/DSS provides the capability to conduct ad hoc analysis of historical project data and to analyze as-built cost variances.

A key factor in developing better cost estimates is the quality of the historical and other project-related data available. The CDOT transportation planning data set provides much data that describes the various features of the transportation system. However, relating this data to historical projects is a difficult task, complicated by the differing categorization systems currently in use. In order to perform effective historical price analysis, "proper" classification of projects and items is essential.

Both the item and contract classifications utilized by CDOT in BAMS/DSS were revised to reflect more logical functional groupings. The new contract work type and item classifications were then used directly in the development of an Interim Solution for Long-Range Cost Estimation. The focus of this effort was on improving the default unit costs for various project types using the most appropriate historical data from BAMS/DSS. By mapping the new contract work types to the statewide planning types, we performed statistical modeling to determine historical bid-based default prices per planning type. Ultimately, by tracking the planning types and the new work types together, it is possible to predict prices. However, further research is needed to map all the planning types to appropriate work types.

The updated interim solution for long-range cost estimation using historical bid-based default prices was provided to CDOT in December 1998. The final version included a

worksheet for developing a project estimate and guidelines on how to use the historical bid-based default prices table. Samples of completed worksheets were also provided. For non-bid items, a default percentage of the construction costs was used, with 17% and 12% for PE and CE, respectively. These percentages were provided directly by CDOT. The need to update these values based on recent experience was noted at various meetings held during the project. If relevant historical data were made available, then statistical modeling could be performed to estimate the appropriate default percentages for individual work types.

An important point to note from this research is the need to identify the correct work type that applies to a proposed project. Frequently, a planned project can involve multiple jobs, each with a distinct work type. For effective cost estimation, the component projects need to be isolated and estimated individually to the extent possible based on the available information. These component estimates would then be aggregated to provide a total cost estimate.

Much of the project data available from CDOT's GIS system seemed to lack vital data elements. Potential parameters for long-range cost estimation include: quantity (lane miles), terrain, projected index for inflation, market, road/bridge type, and work type. Therefore, the project planning data for the 20-year plan and the STIP needs to capture as much of this information as possible. Also, better project descriptions and more dimensions (lengths and widths) are needed in the historical BAMS/DSS data in order to identify appropriate work types and calculate project-level quantities such as lane miles. Linkages to other CDOT data sources, e.g. the Integrated Roadway Information System (IRIS), are needed so that the planning project data can be captured and retained as a vital part of the BAMS/DSS historical database. As the volume of planning data linked to BAMS/DSS accumulates over time, the ability to predict long-range costs would improve simultaneously.

Info Tech analysts researched Internet sources for historical cost data to identify the availability of major item data at the regional and national level, including data for multi-modal project types. Project types of interest included light rail, high occupancy vehicle (HOV) lanes, bicycle/pedestrian facilities, etc. Despite the vast amount of transportation information on-line, there appears to be a general lack of detailed project cost data available. Certainly, at the national level, there exists no single database of historical bid or constructed data for public transportation projects. Typically, the capital expenditure data provided by State transportation departments and mass transit agencies to the Federal Highway Administration and the Federal Transit Administration, respectively, is reported at an aggregate level which is not conducive to project level analysis and/or comparison. However, reports such as the National Transit Database Annual Report are useful in that they identify agencies who have made recent capital expenditures and, therefore, are potential sources for more detailed project cost data.

Most State Highway Agencies post bidding information on their Internet website. However, on-line access to large amounts of historical bid data is not generally provided. Although State Highway Agencies have been collecting and storing data for years, their usefulness is at times problematic, primarily because of inconsistent classification and

categorization which limits access to data on similar projects and work types. Also, it is often difficult to separate data specific to a given work type. For example, it is difficult to identify the costs associated with only the HOV lane, as construction of HOV lanes is frequently part of a major freeway project. While detailed project cost data for HOV lanes was not identified, various on-line publications and reports provide information with regard to facilities that have been developed or are proposed.

Another source of project information includes recent major investment studies available at state and regional planning websites. In practice, the level of detail provided in these studies varies considerably and may be useful only for general comparison purposes. Many studies include references and contact information for the appropriate source of the cost data used in the analysis of alternatives. Recent studies conducted by the Denver Regional Council of Governments (DRCOG) and Denver RTD, for example, utilized a guidance manual that provides a range of system costs per mile for computation of capital cost estimates. In addition to light rail, RTD is also a potential source for cost data related to Park-n-Ride lots. Access to RTD's historical bid and award data would facilitate development of default unit prices for cost estimation of new projects.

For bicycle and pedestrian facilities, no sources of actual project cost data were identified. Frequently, construction of these facilities is included as part of road construction projects and specific costs are difficult to isolate. Generally, national-level inventories of bicycle/pedestrian facilities, similar to those maintained for roads and highways, have not been developed. The extent of bicyle/pedestrian information compiled by state and local (city, county, MPO) agencies varies considerably and the data are not typically organized in a way that can be easily shared with others. Some electronic reports are available that contain general cost guidelines. Overall, given the absence of historical data available, it was not possible to evaluate outside data compatibility with CDOT data.

AASHTO's Trns•port Cost Estimation System (CES) offers a potential tool for improved cost estimation. At the time of this project, CES was undergoing a major rewrite. The new CES is intended to be a cradle-to-grave application for transportation project cost estimation. The following CDOT requirements were noted as regards potential CES or related enhancements: parametric estimation of quantities; multi-modal parametric estimation; multiple contract classifications; and inflation factors by cost group.

The corollary to this research project is for CDOT to move forward with implementation of the new CES. However, this requires CDOT to complete the migration of their Trns•port PES/LAS and BAMS/DSS systems to the client/server environment first. Also, CES is currently in the warranty phase, which will be completed by September 30, 2000. At that stage, implementation of CES can proceed with installation of the software and user training. Additional implementation assistance, such as defining items to the parametric estimation cost groups, setting up cost sheets, fine-tuning the bid history procedures, and even CES system management can be provided by Info Tech. CDOT should assess its ability to provide adequate resources for CES versus outsourcing CES support, or some combination of both.

Contents

1. Introduction

In June 1998, Info Tech, Inc. and the Colorado Department of Transportation (CDOT) agreed that Info Tech would perform data analysis services for CDOT. This data analysis effort would focus on researching long-range cost estimation utilizing Trns•port Cost Estimation and Decision Support software.

CDOT currently lacks a consistent source for estimating project costs at the sketch planning level. This problem encompasses both the accessibility of historic data and a method to analyze the data. During the development of the last long-range statewide plan, a number of different methods were used to estimate project costs. This inconsistency was cited as an area of particular concern in a legislative audit report. Also, long-range estimates are typically below real costs.

Cost escalation of transportation infrastructure projects is not confined to Colorado. A recent General Accounting Office (GAO) report[1] indicated that "cost growth has occurred on many of the large-dollar highway projects that GAO examined. However, the amount of and reasons for increases beyond the initial cost estimates on large-dollar highway projects cannot be determined because data to track this information over the life of projects are not readily available from FHWA or state highway departments." GAO developed limited data showing that costs on 23 of 30 ongoing projects (in 15 states) that were each initially estimated to cost over $100 million had increased from their initial estimates. These increases ranged from two to 211 percent, with about half of the projects' costs increasing by more than 25 percent. Cost estimates on the remaining seven projects either decreased or, in one case, remained the same.

While many factors can cause costs to increase, GAO found several factors that worked together to increase costs beyond the initial estimates:

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[1] GAO (1997). *Transportation Infrastructure: Managing the Costs of Large-Dollar Highway Projects.* GAO/RCED-97-47. U.S. General Accounting Office, Washington, DC.

1. Initial estimates are preliminary and not designed to be reliable predictors of a project's total cost or financing needs.

2. Initial estimates are modified to reflect more detailed plans and specifications as a project is designed. For example, detailed soil investigations and environmental testing can reveal engineering or other problems that were not known earlier and that can substantially increase costs.

3. A project's costs are affected by, among other things, inflation and changes in scope to accommodate economic development that occurs over time as a project progresses through the environmental, design and property acquisition, and construction stages.

The purpose of this research project, therefore, was to assist CDOT attain two principal goals: to understand the issues surrounding CDOT's long-range estimating procedures; and to generate consistent and reliable long-range parametric cost estimates when little is known about a project.

This research project involved three major activities:

- Researching and designing parametric estimation processes,
- Researching historic data sources,
- Defining client/server Trns•port CES™ enhancements.

Two related activities were also identified:

- Implementing client/server Trns•port CES,
- Enhancing client/server Trns•port CES, if required.

However, the latter two additional activities were not included in this project. They should be performed at a later time following release of the new client/server Trns•port CES software. CES was released on January 31, 2000 and is currently undergoing further testing during the warranty period.

2. Scope of Work

The scope of work for this project included the following primary tasks performed by Info Tech analysts, with significant input and guidance provided by CDOT personnel:

- Conducting research and analysis in the area of long-range parametric estimation at the CDOT and in other states.
- Designing sound parametric estimating procedures based upon both mathematical principles and logical and realistic expectations of the estimators.
- Researching viable sources for historic data to support parametric estimation.
- Defining client/server Trns•port CES enhancements.

These tasks were further grouped into three major activities, with the first two tasks above included in Activity 1 and the second two tasks included in Activities 2 and 3, respectively. Also, for each of the three major activities, one or two additional tasks specific to that activity were defined. The complete work plan for the project is provided as an addendum to this report.

The following table lists each major activity and task included in the scope of work for this research project. Subsequent sections of this report outline the steps taken to accomplish these tasks and document the results obtained for each of the three major activities.

Table 2-1. Task List

Activity	Task	Short Description
1		**Research and Design Parametric Estimation Process**
	1	Describe Impact of Parametric Estimation on CDOT's Existing Processes: Analyze CDOT's current long-range estimating procedures and the requirements CDOT has for its future parametric estimation procedures. Design a parametric estimation procedure that meets CDOT's requirements, including a short-term interim process.
	2	Define Work Types
	3	Define Major Items Within Work Types
2		**Research Historic Data Sources**
	4	Research Possible Data Sources for Major Items
	5	Assure Outside Data Compatibility with CDOT Data
3		**Define Client/Server Trns•port CES Enhancements**
	6	Determine Appropriate Quantities for a Given Work Type
	7	Determine Additional Client/Server **Trns•port CES** Enhancements

3. Research and Design Parametric Estimation Process

3.1 Describe Impact of Parametric Estimation on CDOT's Existing Processes

The initial task under Activity 1 (Research and Design Parametric Estimation Process) was to conduct research and analysis in the area of long-range parametric estimation at CDOT and in other states. In particular, this required an analysis of CDOT's current practices in order to fully understand the issues surrounding CDOT's long-range estimation procedures and to identify revisions to those practices which would be needed to satisfactorily meet CDOT's future cost estimating requirements, i.e. in order to achieve the objective of developing consistent and reliable cost estimates when little is known about a project. As part of this activity, Info Tech analysts participated in a series of meetings and information gathering sessions at CDOT during which CDOT personnel provided guidance and baseline information on the current estimating procedures.

Prior to the initiation of this project, which began on June 26, 1998, Info Tech analysts visited with members of CDOT's Staff Design Branch on June 16th to discuss their involvement with cost estimation processes. This discussion focused more on short-range project cost estimation, i.e. less than 5 years, rather than longer term estimation. However, an understanding of the complete estimation cycle is critical to improving the long-range cost estimation process.

A preliminary meeting, which served in effect as a project kick-off meeting, was held at CDOT's Division of Transportation Development (DTD) on June 17th to gather background information on long-term estimation processes at CDOT, to discuss project requirements, and to review the proposed work plan for the project with the CDOT project manager. Following this meeting, CDOT provided Info Tech with a package of information which included a copy of *Colorado's 20 Year Transportation Plan*, a sample

project list from the Draft Statewide Transportation Improvement Plan (STIP), and also copies of several documents showing the use of various categorization methods to track CDOT projects through their life cycles.

Info Tech analysts attended several meetings at CDOT on August 18-20, 1998. CDOT personnel provided an overview of the organizational structure of CDOT and the statewide long-range planning process (a brief description of Colorado's transportation planning process is outlined below). Details of the planning data set currently used for long-range planning were also provided, including a sample of project data and a list of default unit prices used for cost estimating. The issue of project work types was also discussed, particularly at the Advisory Committee Meeting held on August 20th. Minutes of the Advisory Committee meeting are provided in **Appendix A**.

3.1.1 Transportation Planning Process

Colorado is divided into fifteen transportation planning regions which are very diverse in their planning requirements and capabilities. Based on transportation commonalities, each transportation planning region (TPR) is comprised of municipalities and counties within a geographically contiguous area of the state (Figure 3-1). Five of the fifteen TPRs involve metropolitan areas, while ten TPRs are rural in nature. Also, Colorado's two Indian tribes, the Southern Ute Tribe and the Ute Mountain Ute Tribe, are included in the Southwest TPR. As part of the Southwest TPR's planning process, tribal needs are incorporated and prioritized among the TPR's needs.

Regional transportation planning consists of identifying issues, compiling pertinent information, examining alternatives, and selecting a desired course of action based on regional values. In the case of the non-metropolitan TPRs, each TPR is typically guided by a Regional Planning Commission (RPC). The RPC acts as the formal policy body, directing the transportation planning activities within the region. Each RPC has the responsibility to identify, analyze and prioritize the transportation needs for all modes of transportation and develop a 20-year regional transportation plan (RTP).

The RTP establishes the project priorities based on the TRP's values (what does the TPR value about quality of life?), vision (what will the TPR look like in 20 years?), goals (what needs to be accomplished to attain that vision), and strategies (what specific actions are required?) and on the analysis of future demand and appropriate alternatives. The result is a Preferred Plan that identifies all projects that a region believes are necessary to adequately maintain mobility over the 20-year timeframe. The second phase, developing the Financially Constrained Plan, identifies only those projects that can reasonably be expected to receive funding from anticipated revenues over the next 20 years.

The financially constrained plan is based on the results of the CDOT regional prioritization process and other local/private revenues likely to be available. All of the TPR's within a particular CDOT region meet to jointly prioritize all the projects in their preferred plans, based on the 20-year estimated revenues expected to be available for transportation improvements for that CDOT region, and produce the CDOT Region's

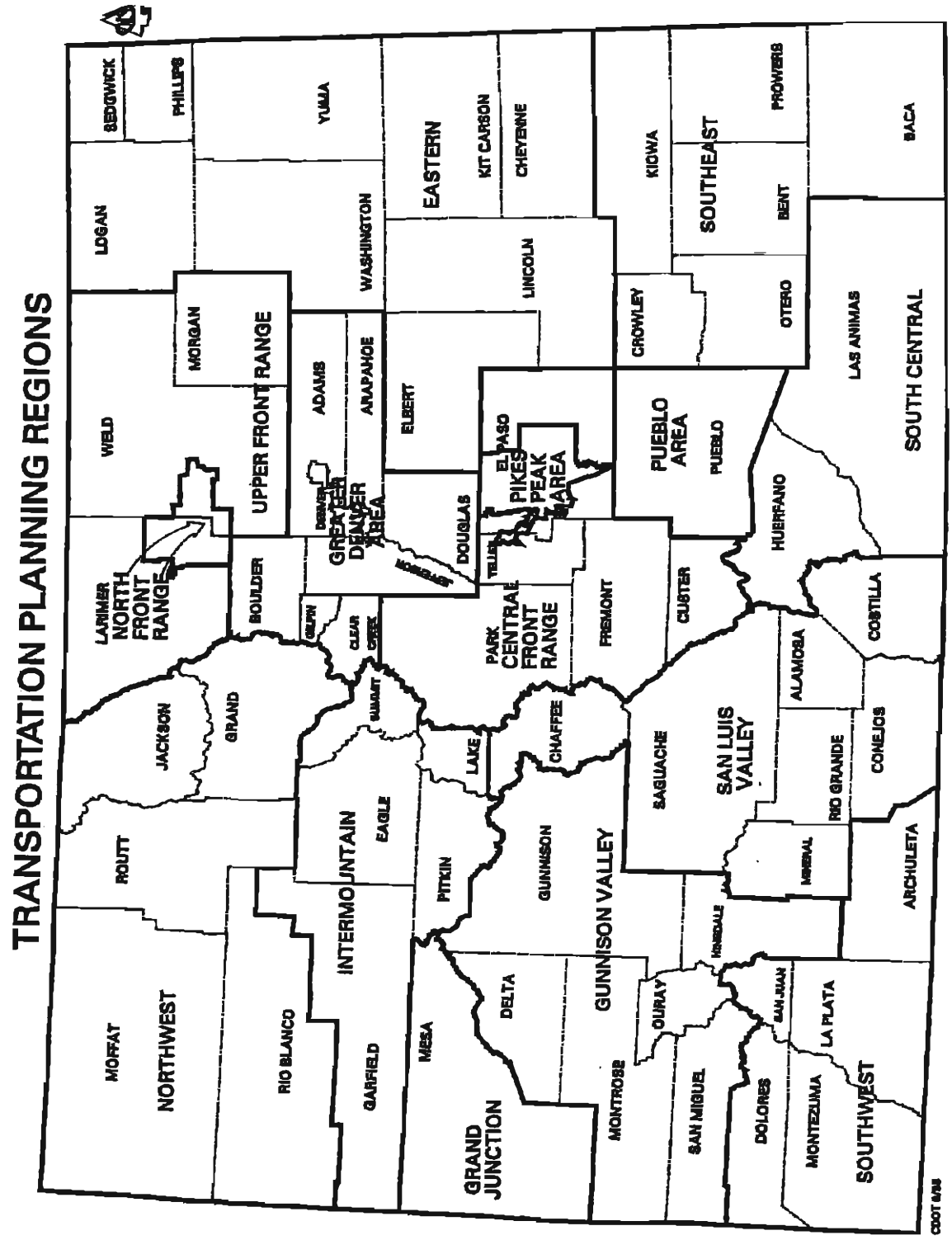


Figure 3-1. Colorado Transportation Planning Regions

Constrained Project List and the individual TPR Constrained Plans. Also, any additional projects that are expected to be completed using local or private funds may be included. RTPs are updated at least every six years and may be amended annually.

The basic steps in the regional planning process can be summarized as follows:

1. Establish values/vision/goals/strategies for the Transportation Planning Region.
2. Review inventory of existing transportation systems and facilities.
3. Consider socioeconomic and environmental profile for the region.
4. Conduct mobility demand analysis of existing/future person trip demand, passenger and freight.
5. Conduct alternatives analysis to identify solutions to meet future demand, including multi-modal options.
6. Develop a Preferred Plan (identify a set of preferred projects).
7. Prioritize projects according to need, impact, other appropriate criteria.
8. Develop a Financially Constrained Plan in conjunction with CDOT Region/other TPRs.

The process differs somewhat for the five TPRs that involve Metropolitan Planning Organizations (MPOs). The MPOs have specific federal requirements related to the development of long-range transportation plans and Transportation Improvement Programs (TIPs). In addition, Colorado has two transportation management areas (TMAs; 200,000+ population), the Denver metropolitan area and the Colorado Springs metropolitan area, both of which are designated as carbon monoxide nonattainment areas. The MPOs in both these TMAs have additional federal requirements and responsibilities regarding long-range planning, programming, project selection, etc.

Each MPO is required to produce a long-range transportation plan. To meet state requirements, the MPOs produce a "preferred" or needs-based plan as well as the financially constrained plan required under federal regulations (TIP). In the two TMAs, Denver and Colorado Springs, project selection involves a greater role for the MPOs, Denver Regional Council of Governments (DRCOG) and Pikes Peak Area Council of Governments (PPACG) respectively. Since both are air quality nonattainment areas, projects must be selected from the MPOs' financially constrained regional transportation plans that have an air quality conformity determination, and the TIPs must be fiscally constrained and have an air quality conformity determination.

Although not a TMA, the North Front Range TPR (Fort Collins/Greeley/Loveland metropolitan area) is an air quality nonattainment area. The North Front Range Transportation & Air Quality Planning Council MPO (NFRT&AQPC) also must develop a TIP which is fiscally constrained and has an air quality conformity determination. The MPO and the state select projects in cooperation.

The remaining two metropolitan TPRs, Pueblo and Grand Junction, are not TMAs and do not involve nonattainment areas. Consequently, both the Pueblo Area Council of Governments and the Grand Junction/Mesa County MPO consult with the state on project

selection. For all five metropolitan TPRs, the Governor approves the TIPs, which are then wholly incorporated in the Statewide Transportation Improvement Program (STIP).

The fifteen regional transportation plans are the cornerstone documents used in the development of Colorado's 20 Year Transportation Plan. The 20 Year Plan is a composite document examining Colorado's transportation system from an overall perspective and reflecting the projects contained in the fifteen RTPs. In addition to the needs identified in the regional plans, "statewide program needs" essential to maintaining and preserving the current transportation facilities and service are included, such as highway maintenance and operations, roadway surface treatment, existing transit system operating and capital replacement needs, safety, and bridge rehabilitation and replacement. The 20 Year Plan is updated every six years and may be amended annually on request from the RPCs.

Projects contained in the regional plans are eligible for inclusion in the statewide plan and, consequently, for state and federal funding through the Statewide Transportation Improvement Program (STIP), an identification of short-term project needs and priorities. The STIP is the project programming document for CDOT, containing projects from the statewide plan that are scheduled for implementation in the next six years. The first year comprises CDOT's budget, with the first three years of projects submitted for approval by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The STIP is updated every two years and can also be amended in intermediate years.

For the non-metropolitan or rural TPRs, CDOT provides information describing the existing transportation inventory in a Transportation Planning Data Set for each TPR. The data is combined into a standard format and integrated with geographic information system (GIS) mapping data. This information can be used to identify areas, corridors, or problems needing improvement over the 20-year period, as well as areas needing further detailed study or analysis.

The transportation planning data set contains the location and a description of transportation features, existing or planned projects, defined corridors, and other geographic and socioeconomic data. The data set contents are listed in **Appendix B**. The location and operating characteristics are provided as a beginning point, but it is expected that this data will be reviewed, verified, corrected and enhanced with information available within the TPR. Default unit prices are provided for cost estimation purposes. To estimate the cost of future needs, unit cost figures reflecting per-mile costs (adjusted for inflation) are included for construction, maintenance of system, and maintenance and operation activities. **Appendix C** contains three spreadsheets showing the statewide planning work types, default unit costs, and a sample of project data from the transportation planning data set.

3.1.2 Issues and Concerns

CDOT currently lacks a consistent source for estimating project costs at the sketch planning level. This problem encompasses both the accessibility of historic data and a method to analyze the data. During the development of the last long-range statewide plan, a number of different methods were used to estimate project costs. This inconsistency was cited as an area of particular concern in a legislative audit report. Generally, weaknesses that have been cited in the regional planning process include the availability of modal data, methodologies for data analysis, and the inconsistency of cost estimates. Long-range estimates are typically below real costs.

Although the TPRs and the CDOT regions communicate and work together to develop and prioritize projects, they need better tools to standardize their project management requirements. Project management in this context means entering project specifications into a system at first conception, updating with more definition over time until the project is finally designed with line items and quantities, and estimating costs at various stages during the process. Currently, cost estimates may be based only on the default figures provided in the statewide planning data set. Also, there is no mechanism defined to track final as-built cost back to the original conceptual estimates.

Documentation provided by CDOT showing the use of various categorization methods to track CDOT projects through their life cycles showed minimal overlap and there was no unifying classification system at the higher level. Also, the terminology was highly confusing. The categories are variously referred to as work types, project types and improvement types. The relationship or mapping between these various systems of project classification, therefore, was clearly an important issue to be addressed.

3.1.3 Solutions

CDOT needs a systematic solution to generate consistent and reliable long-range parametric cost estimates when little is known about a project. The default unit costs provided in the planning data set were based primarily on engineering experience. Systematic use of historical data available from CDOT's BAMS/DSS database, combined with engineering knowledge, can be used to improve cost estimation. Also, BAMS/DSS provides the capability to conduct ad hoc analysis of historical project data and to analyze as-built cost variances. These tools can provide additional input to the development of improved cost estimates.

AASHTO's Trns•port software module for cost estimation (the Cost Estimation System, CES) offers a potential tool to address the issues of cost estimation. At the time of this project, CES was undergoing a major rewrite. The new CES is intended to be a cradle-to-grave application for transportation project cost estimation. A project can be entered with very little information initially and a long-range or parametric estimate generated based on historical bid information drawn from BAMS/DSS. Where DSS history is not available, cost sheets can be utilized to develop estimates. As more detailed project

information becomes available, this data can be entered into CES and a revised cost estimate generated that reflects the latest information on the proposed project. At any stage, a snapshot of the project can be taken in CES to provide supporting documentation for each estimate revision over time. To a great extent, this research project is directed towards moving CDOT forward with the new CES once it becomes available for general release.

A key factor in developing better cost estimates is the quality of the historical and other project-related data available. The transportation planning data set provides much data that describes the various features of the transportation system. However, relating this data to historical projects is a difficult task, complicated by the differing categorization systems currently in use. Various audiences view a given project from different perspectives, resulting in multiple classifications for the same project. In order to do effective historical price analysis, "proper" classification of projects and items is essential.

Potential parameters for long-range cost estimation include: quantity (lane miles), terrain, projected index for inflation, market, road/bridge type, and work type. Therefore, the project planning data for the 20-year plan and the STIP needs to capture as much of this information as possible. For example, missing miles data needs to be filled in and the various projects should be classified by terrain type (i.e. rural, urban, mountain, plains). Additionally, better descriptions of the work to be performed on the job are required, and whether the jobs which extend for many miles would be split up, would contain structures jobs, etc.? Is the lane addition from 2 to 3 or 2 to 4 lanes; how many lane miles, etc.?

The Trns•port BAMS/DSS system provides for the classification of the line items utilized by CDOT in the design and bidding of construction contracts. Additionally, the system allows contracts to be classified based on work type. Both the item and contract classifications utilized by CDOT can be improved to allow for more logical functional groupings which will improve CDOT's ability to estimate both in the near term and in the long term.

Since item classification serves as a precursor to contract work type classification, Task 3 (Define Major Items within Work Types) is discussed below ahead of Task 2 (Define Work Types). The results of tasks 2 and 3 were used directly in the development of an Interim Solution for Long-Range Cost Estimation. The focus of this effort was on revising the default unit costs for various project types using the most appropriate historical data from BAMS/DSS.

3.2 Define Major Items Within Work Types

The Trns•port BAMS/DSS system provides for the classification of the line items in the **itemclss** field of the ITEMLIST table [ITEMLIST.itemclss]. **Appendix D** provides a list of the existing item classification codes that CDOT uses in BAMS/DSS.

The purpose of the field **itemclss** is to group items according to their function within the building or repairing of a road. The guiding principle here is to try to group items so that functions usually performed by a specialized contractor will be grouped together. For example, we have grouped all asphalt items together regardless of how they were originally classified. Items are grouped this way because a contractor with an asphalt plant will have to provide the product, and perhaps the related service (lay down) associated with that specification. Conversely, we have also created new classifications, e.g., **BASE**. Base work frequently resembles earthwork more closely than asphalt work. The idea is to utilize item classes that closely categorize discrete functions. Thus, at the contract classification stage, discussed below, these item functions within the contract can be easily identified and quantified. The items were categorized as outlined according to the above philosophy with the assistance of CDOT personnel.

The process of item classification has two overall goals: first, the grouping itself, which allows the identification of like contractors [a necessary task in the process of identifying markets, thus allowing more accurate estimation] and second, generation of the ability to identify and exclude non-like contractors and specialty functions and lump sum items which are non-controlling, in all but rare instances. To these ends, we have generated 35 item classifications. These item classifications are listed below in the rough sequential order in which they would typically be performed:

MOBL — Mobilization. This is a lump sum item that is paid early in the performance of the contract.

TRAF — Traffic Control. This includes items associated with the maintenance of traffic during the course of a road project.

OLS — Other Lump Sums. This category contains items that are paid as lump sum items. Frequently, these items seem to be associated with clearing and grubbing of the job site.

CLRG — Clearing. These items are non-lump sum items associated with the clearing and preparation of the job site.

RMVL — Removals. These items are frequently performed in connection with the preparation of rights of way and the clearing and preparation of a job site, and involve the removal of non-naturally occurring items (structures,

roadway, etc). Frequently, this function will require jobs akin to earthwork, and will often require truck hauling, and other heavy equipment.

ERTH	Earthwork items (excavation, borrow, grading, rolling, etc).
BASE	Base. Frequently involves truck hauling of materials (usually aggregate materials) from off-site as well as the placement, shaping and compaction thereof.
ASPH	Asphalt work items. These items are created by mixing aggregate and asphaltic cement in a mill at elevated temperatures.
ASLQ	Liquid asphalt items. These items may be used in conjunction with ASPH items or with SURF items (see below).
SURF	Surface treatment. The items associated with this grouping are primarily aggregate materials that are spread directly over various types of liquid asphalt items (ASLQ).
RCYL	Recycling. These items are associated with the recycling of asphalt pavement, a specialized process whereby old pavement is removed, treated, and reused.
AGGR	Miscellaneous aggregate items which are not otherwise accounted for in other item classifications.
CONR	Concrete used in the construction of roadway pavement.
DBLD	Non-itemized concrete roadway pavement provided in conjunction with Design/Build jobs.
DRNG	Drainage items including pipes, pre-cast culverts, etc.
STRC	Structures work items: Over Water and Over Passes. These items also include culverts which use poured in-place concrete.
RMVB	Removals of old bridge materials and structures.
TUNL	Tunnel construction items.
WTMN	Water Mains. This item classification involves the conduction and control of potable water. Frequently, the water is carried under pressure.

CGS	Curbs, Gutters and Sidewalks. This item classification usually involves on-site relatively low production poured concrete or placed asphalt.
PRPC	Concrete Pavement Repair.
OTHR	This is a miscellaneous grouping of items, usually performed by a prime contractor but which do not fit neatly into other item categories.
RIPR	Riprap is an erosion control item that is frequently comprised of aggregate material, but can be composed of a host of materials including crushed concrete.
REST	Rest Stop construction and repair items.
SLUR	Slurry Materials.
SPEC	Miscellaneous infrequently used items, usually performed by a specialty contractor.
GRDL	Guardrail. This item classification covers the installation of guardrail items. Frequently, a specialty contractor performs this function.
PVMK	Pavement Marking. Frequently, a specialty contractor performs this function.
PAIN	Painting of Structures. Frequently, a specialty contractor performs this function.
FENC	Fencing. A specialty contractor frequently installs fencing.
LSCP	Landscaping. A specialty contractor frequently performs this function.
LTNG	Lighting. This item classification covers the illumination of signs and roadway function. A specialty contractor frequently performs this function.
SGNL	Signalization. A lighting contractor frequently performs signalization functions, as well.

SIGN Signing. A specialty contractor frequently performs this function.

NBI Non-Bid Items.

The above item classifications were defined based on an analysis of the existing historical data in the BAMS/DSS database. Additional classifications can be defined in the future. For example, to accommodate multi-modal project data, the following item classifications could be added to the list:

BLDG Buildings (terminals and other facilities).

TRAK Rail track items.

Table 3-1 summarizes the proposed major item classifications in alphabetical order.

The effect of these item classifications is demonstrated by the output of the BAMS/DSS Item Rank Analysis Model (IRANK). The item rank analysis model identifies which construction items have the greatest dollar impact on the state's highway construction program in a specified time period. Items may be analyzed individually or classes of items can be used to perform summary level analysis. Using the proposed item classifications, the item rank analysis output shows that asphalt, structures, concrete, and earthwork were the top four item classes in term of dollars spent on CDOT contracts between January 1990 and August 1997 (Table 3-2). Together, these four item classes accounted for 60% of the total dollars. By comparison, using CDOT's existing item classifications, the top four item classes accounted for only 45.7% of the total contract dollars (Table 3-3).

Table 3-1. Proposed Item Classifications

Item Class		Description
1	AGGR	Miscellaneous Aggregate
2	ASLQ	Liquid Asphalt
3	ASPH	Asphalt
4	BASE	Base
5	BLDG	Buildings
6	CGS	Curbs, Gutters and Sidewalks
7	CLRG	Clearing
8	CONR	Concrete
9	DBLD	Design/Build Concrete
10	DRNG	Drainage
11	ERTH	Earthwork
12	FENC	Fencing
13	GDRL	Guardrail
14	LSCP	Landscaping
15	LTNG	Lighting
16	MOBL	Mobilization
17	OLS	Other Lump Sum
18	OTHR	Other
19	NBI	Non-bid Items
20	PAIN	Painting of Structures
21	PRPC	Concrete Pavement Repair
22	PVMK	Pavement Marking
23	RCYL	Recycling
24	REST	Rest Area Items
25	RIPR	Riprap
26	RMVB	Removal of Bridges/Structures
27	RMVL	Removals
28	SGNL	Signalization
29	SIGN	Signing
30	SLUR	Slurry Materials
31	SPEC	Specialty Items
32	STRC	Structures
33	SURF	Surface Treatment
34	TRAF	Traffic Control
35	TRAK	Rail Track Items
36	TUNL	Tunnels
37	WTMN	Water Mains

Table 3-2. Item Rank Analysis Using Proposed Item Classifications

AASHTO'S BAMS/DSS Statistical Analysis Models
Colorado Department of Transportation
Item Rank Analysis using Proposed Item Classifications

TOTAL DOLLARS SPENT ON ITEMS IN EACH ITEM CLASS

1097 CONTRACTS BETWEEN January 11, 1990 AND August 28, 1997

ITEM CLASS	DOLLARS	PERCENT
Asphalt	$435,750,719	21.9
Structures	$345,148,733	17.4
Concrete	$248,621,241	12.5
Earthwork	$162,870,720	8.2
Mobilization	$106,648,828	5.4
Traffic Control	$91,524,557	4.6
Other Lump Sums	$86,224,550	4.3
Drainage	$54,221,827	2.7
Guardrail	$52,027,997	2.6
Removals	$44,597,595	2.2
Pavement Marking	$35,433,507	1.8
Specialty Work	$30,337,659	1.5
Base	$29,739,049	1.5
Fencing	$26,320,225	1.3
Landscaping	$26,053,375	1.3
Lighting	$25,877,467	1.3
Curb, Gutters, and Sidewalks	$20,852,756	1.0
Signals	$19,953,574	1.0
Other	$19,625,129	1.0
Signing	$17,894,330	0.9
Recycling	$17,216,496	0.9
Miscellaneous Aggregate	$15,971,987	0.8
Liquid Asphalt	$13,088,250	0.7
Water Mains	$12,430,674	0.6
Removal of Bridges/Structures	$10,121,253	0.5
Riprap	$9,736,852	0.5
Design-Build Concrete	$9,437,148	0.5
Surface Treatment	$6,578,621	0.3
Rest Area	$4,909,998	0.2
Slurry Materials	$3,499,661	0.2
Tunnels	$2,875,879	0.1
Clearing	$727,501	0.0
Concrete Pavement Repair	$676,628	0.0
Non-bid Items	$112,492	0.0
	$1,987,107,279	100

Table 3-3. Item Rank Analysis Using Existing Item Classifications

AASHTO'S BAMS/DSS Statistical Analysis Models
Colorado Department of Transportation
Item Rank Analysis using Existing Item Classifications

TOTAL DOLLARS SPENT ON ITEMS IN EACH ITEM CLASS

1097 CONTRACTS BETWEEN January 11, 1990 AND August 28, 1997

ITEM CLASS	DOLLARS	PERCENT
Hot Bituminous Pavement	$383,965,078	19.3
Portland Cement Concrete Pavement	$222,649,348	11.2
Structural Concrete	$173,201,610	8.7
Excavation And Embankment	$129,961,274	6.5
Mobilization	$106,648,828	5.4
Not Convertible to Common Units	$89,131,233	4.5
Construction Traffic Control	$85,825,009	4.3
Steel	$69,580,746	3.5
Guard Rail	$63,831,702	3.2
Removal Of Structures And Obstructions	$62,739,672	3.2
Bituminous Materials	$56,769,268	2.9
Reinforcing Steel	$38,668,527	1.9
Culverts (All Types)	$35,611,766	1.8
Pavement Markings	$33,196,305	1.7
Cribbing	$28,077,011	1.4
Prestressed Concrete Structures	$27,234,230	1.4
Aggregate Base Course	$26,491,013	1.3
412 Related to Conc.Pav. but not Conc.	$26,154,446	1.3
Excavation And Backfill For Structures	$25,746,776	1.3
Traffic Control Devices	$16,094,552	0.8
Surveying & Testing	$15,505,214	0.8
Clearing And Grubbing	$15,146,760	0.8
Signal Items	$14,957,366	0.8
Electrical Conduit Items	$14,630,727	0.7
Topsoil	$14,536,661	0.7
Field Facilities	$11,291,946	0.6
Sewers, Manholes, Inlets, Meter Vaults	$11,180,710	0.6
Lighting Items	$10,854,730	0.5
Fences	$10,695,155	0.5
Water Lines	$10,690,062	0.5
Reset Structures	$9,775,436	0.5
Riprap	$9,647,685	0.5
Plant Mixed Seal Coat	$7,789,591	0.4
Temporary Roads & Structures	$7,721,440	0.4
Heating And Scarifying Treatment	$7,653,134	0.4
Rest Areas And Buildings	$6,965,397	0.4
Recycled Pavement	$6,754,816	0.3
Sidewalks	$6,633,647	0.3
Waterstops	$6,448,763	0.3
Planting	$6,076,356	0.3
Mulching	$5,354,884	0.3
Seal Coat	$5,336,881	0.3
Sign Panels	$5,249,977	0.3

Table 3-3. (continued)

AASHTO'S BAMS/DSS Statistical Analysis Models
Colorado Department of Transportation
Item Rank Analysis using Existing Item Classifications

TOTAL DOLLARS SPENT ON ITEMS IN EACH ITEM CLASS

1097 CONTRACTS BETWEEN January 11, 1990 AND August 28, 1997

ITEM CLASS	DOLLARS	PERCENT
Median Cover Material	$4,657,920	0.2
Sound Fence	$4,384,113	0.2
Seeding, Fertilizer And Sodding	$4,360,575	0.2
Geotextiles	$4,212,373	0.2
Cut Off Walls	$3,466,042	0.2
NON-CONVERTIBLE Concrete Items	$3,378,146	0.2
Sprinkler System	$3,316,143	0.2
Waterproofing Membrane	$3,145,749	0.2
Subgrade Stabilization	$2,948,196	0.1
Tunnel & Rock Items	$2,875,879	0.1
Bearing Device	$2,846,101	0.1
Joint & Crack Sealant	$2,584,086	0.1
Piling	$2,305,128	0.1
Erosion Control	$1,882,740	0.1
Pipe Railing	$1,862,429	0.1
Plant Mix Bituminous Base Course	$1,614,691	0.1
Underdrains	$1,535,467	0.1
Soil Retention	$1,491,398	0.1
Delineators	$1,436,854	0.1
Lighting (Misc.)	$1,415,518	0.1
Watering	$1,081,381	0.1
Reconditioning	$992,718	0.0
Br Girder and Deck Unit	$920,769	0.0
Timber	$778,460	0.0
Drain Pipe	$714,621	0.0
Steel Sheet Piling	$674,117	0.0
Water Control Devices	$464,677	0.0
Survey Monuments	$459,340	0.0
Bridge Painting	$398,370	0.0
Prime And Tack Coats, Rejuvenate Agent	$347,923	0.0
Process Asphalt	$312,690	0.0
Force Accounts	$262,492	0.0
Waterproofing	$243,564	0.0
Curb And Gutter	$228,426	0.0
Epoxy	$226,196	0.0
Transplanting	$208,607	0.0
Slope And Ditch Paving	$189,713	0.0
Cattle Guards	$169,204	0.0
Herbicide Treatment	$124,390	0.0
Trash Guards & Valve Boxes (Siphons 603)	$81,141	0.0
Dampproofing	$33,201	0.0
	$1,987,107,279	100

3.3 Define Work Types

The Trns•port BAMS/DSS system provides for the classification of contracts based on work type in the contract work type variable (**cnprpwrk**) of the DPROPOSL table [DPROPOSL.cnprpwrk]. **Appendix E** provides a list of the existing 22 work type codes that CDOT currently uses in BAMS/DSS.

The contract work type code allows for the identification and grouping of like contracts for the purpose of determining the markets where like contractors interact for various contracting functions – for example, asphalt, structures, and general contracting projects. Market determination is important and fundamental to pricing analysis and prediction. The object of contract classification is two-fold: (1) group contractors who perform like tasks together; and (2) exclude contractors who do not perform these tasks.

Based on the item reclassification performed and discussed above, and the existing CDOT work type codes, we created a matrix which displays the contract work type by contract and the winners as-bid dollar percentages by item class (**Appendix F**). It soon became apparent that many of the existing classifications would not facilitate vendor classification. Moreover, it was apparent that with rare exceptions the existing "work type" classifications did not focus on the actual functions and dollar allocations in the contract. For example, a contract might be classified as bridge replacement, but the controlling dollars in the contract were in the earthwork items – not the structures items; jobs classified as resurfacing might be controlled by the asphalt dollars in the contract. Safety jobs were variously controlled by asphalt dollars, guardrail dollars, pavement marking dollars, structures dollars, etc. The classification "Miscellaneous" did not provide any particular clues as to the functionality required to perform a "Miscellaneous" type contract.

Having organized the line items into 35 classifications (Table 3-1), we then analyzed each contract in the BAMS/DSS database based on how the winning vendor bid the job in terms of the percentage of dollars in each item category. Generally speaking, in contracts where 35% of the dollars as bid and won were for asphalt items, the contract was classified as an "asphalt" contract. If the substantial work in the contract involved the hauling and shaping of earthwork items, then an "earthwork" classification was in order. If drainage items predominated, then a "drainage" classification was appropriate. If the controlling work was in structures items, then it was classified accordingly, and so on.

Many contracts did not fall neatly into any particular category. For example, the dollars might be evenly split between drainage, earthwork, concrete paving, and asphalt. On the other hand, they might be relatively evenly divided between asphalt and earthwork or earthwork and drainage, such that each item classification involved so many of the contract dollars that neither function controlled the job. For example, a contractor who had both earth-moving capacity and asphalt plants might arrange for a subcontract from a structures contractor to bid the job, or a firm which had structures and earth-moving

capacity could get an asphalt subcontract to compete for the job. Similarly, the job might involve heavy asphalt and earthwork. An asphalt vendor could get an earthwork subcontract, and vice versa, so that they could compete against the firm which had both capacities. Contracts fitting such a general description were classified as "general construction" contracts (GEN). Table 3-4 provides a list of the proposed contract work type codes.

Table 3-4. Proposed Work Type Classifications

Item Class		Description
1	ASPH	Asphalt
2	BASE	Base
3	CGS	Curbs, Gutters and Sidewalks
4	CLRG	Clearing
5	CONR	Concrete
6	DBLD	Design/Build Concrete
7	DRNG	Drainage
8	ERTH	Earthwork
9	FENC	Fencing
10	GDRL	Guardrail
11	GEN	General Construction
12	LSCP	Landscaping
13	LTNG	Lighting
14	OLS	Other Lump Sum
15	OTHR	Other
16	PRPC	Concrete Pavement Repair
17	PVMK	Pavement Marking
18	RCYL	Recycling
19	REST	Rest Area
20	RIPR	Riprap
21	RMVL	Removals
22	SGNL	Signalization
23	SIGN	Signing
24	SPEC	Specialty Work
25	STRC	Structures
26	SURF	Surface Treatment
27	TRAF	Traffic Control
28	TUNL	Tunnels
29	WTMN	Water Mains

The above work type classifications were defined based on an analysis of the existing historical data in the BAMS/DSS database. Additional contract work type classifications can be defined in the future, for example to accommodate multi-modal project data, such as: PARK - Park and Ride; PATH - Bike/Pedestrian Paths; LRAL - Light Rail.

The following tables illustrate our findings and reclassification method. Table 3-5 displays the percent weighted average dollar allocations by CDOT work type according to the new item classification categories, and the number of contracts in each of these work type classifications. Table 3-6 displays the same analysis, but according to the proposed new work type classifications. As can be seen, the new classifications are more focused in terms of functionality, as manifested by the tighter concentrations of percentages in each classification grouping. Asphalt, for example, features prominently in several of the existing work types. With the new work type classifications, the allocation of the dollars is more focused, with 61% of the dollars for ASPH contracts now appearing in the ASPH item classification. Similarly, the dollars in the earthwork (ERTH) contracts are now concentrated for the most part in the earthwork items. By comparison, general construction (GEN) jobs are flat, with several item classes showing similar percentages. Output from the BAMS/DSS Item Rank Analysis Model (IRANK) also shows the effect of the revised item and work type classifications. **Appendix G** contains the IRANK model output based on the new item classifications for the newly classified asphalt, concrete, and general construction contracts, respectively.

Table 3-7 shows the contract breakdown of the CDOT work type classifications relative to the new work type classifications. For example, the set of 114 contracts previously classified as **Resurfacing** contains 94 newly classified ASPH contracts, 9 newly classified CONR contracts, 6 newly classified GEN contracts, 3 newly classified STRC contracts, and 2 newly classified SURF contracts. **Restoration/Rehab** has contracts in several new work classes, i.e. CONR (7 contracts), GEN (6), ASPH (4), OTHR (3), SURF (3), DRNG (1), and ERTH (1). Similarly, **Safety** has contracts spread over a number of new work types, with ASPH (25), GDRL (24), PVMK (23), GEN (20), and SGNL (19) most prominent. Given this job mix, you would be unlikely to find a contractor that specializes only in "safety jobs". **Reconstruction** is also a very mixed bag, with a dozen new classifications represented. The **Miscellaneous** category includes all sorts of jobs in terms of functionality, with 22 new classifications represented. **New Construction** included two lump sum jobs, which are very tough to analyze.

Table 3-8 provides the reciprocal analysis, showing the contract breakdown of the new work types relative to the CDOT work type classifications. For example, under the new classification ASPH (which is determined based on the predominance of items requiring the supply and placement of hot mix asphalt), as we might expect, the top three old work types represented are the surface treatment and resurfacing categories. However, the rest of the old work types in the set of new ASPH-classified contracts is quite diverse (SAFETY, MISCELLANEOUS, WIDENING, RECONSTRUCTION, BRIDGE REPLACEMENT, etc).

Table 3-5. Percent Weighted Average Dollars by Item Classification per CDOT Work Type

No. of Contracts	WORK TYPE	DESCRIPTION	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
114	001	RESURFACING	0%	1%	43%	2%	1%	0%	20%	0%	1%	4%	6%	1%	1%	0%	3%	0%	0%
27	002	BRIDGE RESTORE/REHAB	1%	0%	6%	0%	0%	0%	5%	0%	1%	4%	7%	5%	1%	0%	0%	0%	1%
131	003	BRIDGE REPLACEMENT	1%	0%	10%	1%	1%	0%	3%	0%	2%	9%	5%	5%	1%	0%	0%	0%	1%
25	004	RESTORATION/REHAB	1%	2%	19%	4%	2%	0%	24%	0%	5%	7%	8%	3%	3%	0%	2%	0%	1%
137	005	SAFETY	0%	0%	14%	1%	3%	0%	4%	0%	2%	6%	6%	2%	1%	0%	0%	0%	0%
0	006	HAZARDOUS LOCATIONS																	
2	007	RAIL/HIGHWAY SEPARATION	2%	0%	9%	2%	1%	0%	0%	0%	11%	13%	2%	6%	1%	0%	0%	0%	0%
30	008	TRANS SYS MGMT (TSM)	1%	0%	14%	1%	3%	0%	4%	0%	8%	9%	5%	4%	2%	0%	0%	0%	0%
26	009	TRAFFIC SIGNALS	0%	0%	4%	1%	3%	0%	0%	0%	1%	3%	5%	3%	1%	0%	0%	0%	0%
44	010	MINOR WIDENING	1%	1%	30%	7%	1%	0%	5%	0%	4%	18%	6%	5%	1%	0%	0%	0%	0%
32	011	MAJOR WIDENING	1%	0%	8%	1%	2%	0%	16%	0%	5%	11%	5%	3%	1%	0%	0%	0%	1%
97	012	RECONSTRUCTION	1%	0%	8%	2%	1%	0%	22%	2%	3%	10%	6%	8%	1%	0%	0%	1%	0%
45	013	NEW CONSTRUCTION	2%	0%	6%	1%	1%	0%	11%	0%	5%	13%	4%	4%	1%	0%	0%	0%	1%
10	014	REST AREA	1%	0%	7%	0%	5%	0%	6%	0%	3%	8%	7%	21%	0%	0%	0%	18%	0%
3	015	NOISE WALLS	2%	0%	1%	0%	0%	0%	0%	0%	1%	8%	5%	2%	2%	0%	0%	0%	0%
3	016	LANDSCAPING	2%	0%	3%	2%	6%	0%	0%	0%	7%	13%	5%	5%	1%	0%	0%	0%	0%
132	017	MISCELLANEOUS	1%	0%	8%	1%	1%	0%	6%	0%	5%	7%	6%	4%	2%	0%	0%	0%	1%
31	018	ENHANCEMENT	2%	0%	3%	1%	16%	0%	1%	0%	2%	6%	7%	3%	1%	0%	0%	4%	0%
2	019	PLANNING	7%	0%	0%	1%	14%	2%	0%	0%	16%	13%	5%	1%	0%	0%	0%	0%	2%
166	020	MAJOR SURFACE TREATMENT	0%	2%	63%	2%	1%	0%	1%	0%	1%	2%	5%	1%	1%	0%	4%	0%	0%
159	021	MINOR SURFACE TREATMENT	0%	3%	59%	1%	0%	0%	4%	0%	1%	2%	5%	0%	1%	0%	1%	0%	0%
14	022	ROUTINE MAINTENANCE	0%	1%	43%	0%	0%	0%	4%	0%	0%	1%	7%	0%	15%	8%	0%	0%	0%

There were no contracts classified as work type 006 - Hazardous Locations.
Shaded items account for more than 20% of the weighted average dollars.

Table 3-5. Percent Weighted Average Dollars by Item Classification per CDOT Work Type

WORK TYPE	DESCRIPTION	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	Total Spec. Items	Specialty Items								
											FENC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC
001	RESURFACING	0%	3%	0%	3%	0%	5%	0%	0%	7%	0%	2%	0%	1%	0%	2%	1%	1%	0%
002	BRIDGE RESTORE/REHAB	5%	3%	0%	**37%**	0%	11%	1%	0%	12%	2%	4%	2%	0%	0%	1%	0%	1%	2%
003	BRIDGE REPLACEMENT	2%	1%	1%	**40%**	0%	7%	0%	1%	7%	1%	2%	1%	1%	0%	0%	1%	0%	1%
004	RESTORATION/REHAB	0%	3%	0%	3%	1%	5%	0%	0%	7%	1%	1%	1%	1%	0%	1%	1%	1%	0%
005	SAFETY	1%	4%	0%	11%	0%	9%	0%	0%	**38%**	0%	10%	1%	4%	0%	11%	7%	3%	0%
006	HAZARDOUS LOCATIONS																		
007	RAIL/HIGHWAY SEPARATION	0%	1%	0%	**35%**	0%	5%	0%	6%	5%	1%	0%	0%	1%	0%	0%	1%	0%	0%
008	TRANS SYS MGMT (TSM)	0%	3%	0%	18%	0%	7%	0%	1%	18%	1%	1%	1%	4%	0%	1%	7%	1%	4%
009	TRAFFIC SIGNALS	0%	2%	0%	1%	0%	10%	0%	0%	**66%**	1%	1%	1%	14%	0%	7%	**43%**	1%	0%
010	MINOR WIDENING	0%	2%	0%	4%	0%	7%	0%	0%	9%	1%	3%	1%	1%	0%	1%	0%	0%	1%
011	MAJOR WIDENING	0%	2%	0%	**21%**	0%	5%	0%	1%	15%	5%	2%	2%	2%	0%	1%	1%	1%	2%
012	RECONSTRUCTION	0%	2%	0%	**16%**	0%	7%	0%	1%	10%	1%	2%	2%	1%	0%	1%	0%	1%	2%
013	NEW CONSTRUCTION	0%	1%	0%	**31%**	0%	3%	0%	1%	15%	4%	2%	2%	2%	0%	0%	0%	2%	3%
014	REST AREA	0%	0%	0%	2%	0%	2%	0%	1%	18%	1%	0%	10%	4%	0%	1%	0%	2%	0%
015	NOISE WALLS	0%	0%	0%	17%	0%	10%	0%	0%	**51%**	**38%**	3%	1%	0%	0%	0%	0%	1%	8%
016	LANDSCAPING	0%	1%	0%	1%	0%	7%	3%	8%	**37%**	1%	0%	**27%**	1%	0%	0%	0%	0%	8%
017	MISCELLANEOUS	0%	2%	0%	16%	1%	13%	1%	2%	**21%**	2%	2%	4%	1%	0%	8%	1%	2%	1%
018	ENHANCEMENT	0%	2%	0%	**21%**	0%	6%	1%	1%	**23%**	1%	0%	9%	5%	0%	2%	0%	1%	4%
019	PLANNING	0%	2%	0%	12%	0%	3%	0%	2%	19%	4%	0%	14%	0%	0%	0%	0%	0%	0%
020	MAJOR SURFACE TREATMENT	0%	4%	0%	1%	1%	5%	0%	0%	8%	0%	4%	0%	0%	0%	2%	0%	0%	1%
021	MINOR SURFACE TREATMENT	0%	5%	0%	1%	3%	5%	0%	0%	9%	0%	4%	0%	0%	0%	3%	1%	0%	1%
022	ROUTINE MAINTENANCE	0%	2%	0%	0%	0%	11%	1%	0%	8%	0%	1%	0%	0%	0%	6%	0%	0%	1%

There were no contracts classified as work type 006 - Hazardous Locations.

Shaded items account for more than 20% of the weighted average dollars.

Table 3-6. Percent Weighted Average Dollars by Item Classification per New Work Type

No. of Contracts	WORK TYPE	DESCRIPTION	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
516	ASPH	Asphalt	0%	1%	**81%**	2%	1%	0%	0%	0%	1%	3%	5%	1%	1%	0%	3%	0%	0%
1	BASE	Base	0%	0%	0%	**59%**	0%	0%	0%	0%	5%	16%	7%	6%	0%	0%	0%	0%	0%
7	CGS	Curbs, Gutters and Sidewalks	1%	0%	3%	3%	**50%**	0%	1%	0%	2%	4%	5%	4%	1%	0%	0%	0%	0%
0	CLRG	Clearing																	
56	CONR	Concrete	0%	0%	4%	1%	1%	0%	**53%**	0%	3%	8%	6%	2%	1%	0%	0%	0%	0%
1	DBLD	Design/Build Concrete	0%	0%	1%	0%	0%	0%	4%	**67%**	2%	1%	9%	2%	0%	0%	0%	0%	0%
10	DRNG	Drainage	2%	0%	6%	1%	1%	0%	0%	0%	**46%**	8%	4%	4%	2%	0%	0%	0%	0%
30	ERTH	Earthwork	1%	0%	8%	4%	2%	0%	2%	0%	3%	**40%**	8%	6%	1%	0%	0%	3%	1%
9	FENC	Fencing	0%	0%	0%	0%	0%	1%	0%	0%	0%	6%	6%	1%	0%	0%	0%	0%	0%
24	GDRL	Guardrail	0%	0%	8%	1%	0%	0%	1%	0%	1%	3%	6%	1%	1%	0%	0%	0%	0%
188	GEN	General Construction	1%	0%	**13%**	3%	3%	0%	**11%**	0%	6%	**14%**	6%	4%	1%	0%	0%	0%	1%
11	LSCP	Landscaping	1%	0%	4%	0%	1%	0%	0%	0%	3%	7%	6%	8%	1%	0%	0%	0%	0%
6	LTNG	Lighting	0%	0%	1%	0%	8%	0%	0%	0%	0%	2%	4%	**10%**	0%	0%	0%	0%	0%
10	OLS	Other Lump Sum	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	**95%**	0%	0%	0%	0%	0%
15	OTHR	Other	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	8%	0%	**74%**	0%	0%	0%	0%
3	PRPC	Concrete Pavement Repair	0%	0%	0%	0%	0%	0%	22%	0%	0%	0%	7%	0%	1%	**55%**	0%	0%	0%
44	PVMK	Pavement Marking	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%
2	RCYL	Recycling	0%	9%	4%	0%	0%	0%	0%	0%	0%	0%	7%	1%	0%	0%	**80%**	0%	0%
9	REST	Rest Area	1%	0%	9%	1%	6%	0%	0%	0%	2%	11%	7%	4%	1%	0%	0%	**32%**	0%
1	RIPR	Riprap	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	6%	0%	0%	0%	0%	0%	**55%**
1	RMVL	Removals	0%	16%	7%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%
53	SGNL	Signalization	0%	0%	3%	0%	3%	0%	0%	0%	1%	1%	6%	3%	1%	0%	0%	0%	0%
11	SIGN	Signing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%
11	SPEC	Specialty Work	3%	0%	3%	1%	4%	0%	1%	0%	4%	5%	11%	2%	1%	0%	0%	0%	0%
186	STRC	Structures	1%	0%	5%	1%	1%	0%	5%	0%	3%	7%	5%	4%	1%	0%	0%	0%	1%
30	SURF	Surface Treatment	0%	34%	2%	0%	0%	0%	0%	0%	0%	0%	7%	0%	1%	0%	0%	0%	0%
8	TRAF	Traffic Control	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	2%	0%	0%	0%	0%
2	TUNL	Tunnels	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	11%	0%	1%	1%	0%	0%	0%
2	WTMN	Water Mains	0%	0%	1%	0%	0%	0%	0%	0%	8%	1%	2%	1%	1%	0%	0%	0%	0%
3	?	Unclassified																	

There were no contracts classified as work type CLRG - Clearing and three contracts remained unclassified.
For General Construction, shaded items account for more than 10% of the weighted average GEN dollars.
For all other work types, shaded items account for more than 20% of the weighted average dollars.

Table 3-6. Percent Weighted Average Dollars by Item Classification per New Work Type

WORK TYPE	DESCRIPTION	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	Total Spec. Items	Specialty Items								
											FENC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC
ASPH	Asphalt	0%	4%	0%	2%	0%	5%	0%	0%	9%	0%	4%	0%	0%	0%	2%	1%	1%	1%
BASE	Base	0%	0%	0%	0%	0%	0%	0%	0%	7%	2%	0%	2%	0%	0%	0%	0%	0%	3%
CGS	Curbs, Gutters and Sidewalks	0%	2%	0%	2%	0%	7%	0%	1%	14%	3%	0%	5%	5%	0%	0%	0%	0%	1%
CLRG	Clearing																		
CONR	Concrete	0%	2%	0%	7%	0%	5%	0%	1%	6%	1%	1%	1%	1%	0%	1%	1%	1%	0%
DBLD	Design/Build Concrete	1%	1%	0%	7%	0%	8%	0%	0%	6%	1%	2%	1%	1%	0%	1%	0%	1%	0%
DRNG	Drainage	0%	2%	0%	4%	0%	9%	4%	2%	3%	0%	0%	0%	0%	0%	1%	0%	0%	0%
ERTH	Earthwork	0%	1%	1%	8%	0%	4%	0%	1%	9%	1%	1%	4%	1%	0%	0%	0%	0%	2%
FENC	Fencing	0%	1%	0%	13%	0%	1%	2%	0%	67%	66%	0%	1%	0%	0%	0%	0%	0%	0%
GDRL	Guardrail	0%	3%	0%	1%	0%	14%	0%	0%	59%	0%	55%	0%	1%	0%	0%	0%	2%	0%
GEN	General Construction	0%	2%	0%	11%	0%	6%	0%	1%	15%	2%	3%	2%	2%	0%	1%	1%	1%	3%
LSCP	Landscaping	0%	1%	0%	1%	0%	5%	0%	10%	51%	1%	0%	48%	1%	0%	0%	0%	0%	1%
LTNG	Lighting	0%	0%	0%	2%	0%	13%	1%	1%	58%	0%	0%	3%	51%	0%	0%	3%	0%	0%
OLS	Other Lump Sum	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
OTHR	Other	0%	0%	0%	1%	0%	10%	0%	0%	6%	0%	0%	1%	0%	0%	5%	0%	0%	0%
PRPC	Concrete Pavement Repair	0%	0%	0%	0%	0%	10%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%	0%	0%
PVMK	Pavement Marking	0%	0%	0%	1%	0%	3%	0%	0%	92%	0%	0%	0%	0%	0%	92%	0%	0%	0%
RCYL	Recycling	0%	0%	0%	0%	8%	6%	0%	0%	4%	0%	0%	0%	0%	0%	4%	0%	0%	0%
REST	Rest Area	0%	0%	0%	4%	0%	1%	0%	2%	19%	1%	0%	12%	4%	0%	0%	0%	2%	0%
RIPR	Riprap	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	2%	0%	0%	0%	0%	0%	4%
RMVL	Removals	0%	31%	0%	0%	19%	16%	0%	0%	4%	0%	0%	0%	0%	0%	4%	0%	0%	0%
SGNL	Signalization	0%	2%	0%	0%	0%	12%	0%	0%	69%	0%	0%	0%	15%	0%	1%	51%	1%	0%
SIGN	Signing	0%	3%	0%	0%	0%	16%	0%	0%	70%	0%	0%	0%	1%	0%	3%	0%	67%	0%
SPEC	Specialty Work	0%	3%	0%	5%	0%	15%	0%	0%	43%	0%	6%	7%	4%	0%	1%	7%	0%	18%
STRC	Structures	1%	1%	1%	48%	0%	5%	0%	1%	11%	1%	2%	1%	2%	0%	0%	0%	1%	3%
SURF	Surface Treatment	0%	1%	0%	0%	39%	6%	0%	0%	8%	0%	0%	0%	0%	0%	7%	0%	0%	0%
TRAF	Traffic Control	0%	0%	0%	0%	0%	86%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%	1%	0%
TUNL	Tunnels	0%	0%	0%	1%	0%	26%	31%	0%	17%	0%	0%	0%	0%	0%	1%	0%	0%	17%
WTMN	Water Mains	0%	4%	0%	1%	0%	7%	0%	89%	8%	0%	0%	6%	0%	0%	0%	0%	0%	0%
?	Unclassified																		

There were no contracts classified as work type CLRG - Clearing and three contracts remained unclassified.
For General Construction, shaded items account for more than 10% of the weighted average GEN dollars.
For all other work types, shaded items account for more than 20% of the weighted average dollars.

Table 3-7. CDOT Work Types Mapped to New Work Types

CDOT Work Type	CDOT Work Type Description	New Work Type	Number of Contracts	Percentage of Contracts
001	RESURFACING	ASPH	94	7.52%
	RESURFACING	CONR	9	0.72%
	RESURFACING	GEN	6	0.48%
	RESURFACING	STRC	3	0.24%
	RESURFACING	SURF	2	0.16%
001	RESURFACING		114	9.12%
002	BRIDGE REHAB	STRC	22	1.76%
	BRIDGE REHAB	GEN	3	0.24%
	BRIDGE REHAB	LSCP	1	0.08%
	BRIDGE REHAB	SPEC	1	0.08%
002	BRIDGE REHAB		27	2.16%
003	BRIDGE REPLACE	STRC	84	6.72%
	BRIDGE REPLACE	GEN	35	2.80%
	BRIDGE REPLACE	ASPH	7	0.56%
	BRIDGE REPLACE	ERTH	3	0.24%
	BRIDGE REPLACE	DRNG	1	0.08%
	BRIDGE REPLACE	OLS	1	0.08%
003	BRIDGE REPLACE		131	10.48%
004	RESTORATION / REHAB	CONR	7	0.56%
	RESTORATION / REHAB	GEN	6	0.48%
	RESTORATION / REHAB	ASPH	4	0.32%
	RESTORATION / REHAB	OTHR	3	0.24%
	RESTORATION / REHAB	SURF	3	0.24%
	RESTORATION / REHAB	DRNG	1	0.08%
	RESTORATION / REHAB	ERTH	1	0.08%
004	RESTORATION / REHAB		25	2.00%
005	SAFETY	ASPH	25	2.00%
	SAFETY	GDRL	24	1.92%
	SAFETY	PVMK	23	1.84%
	SAFETY	GEN	20	1.60%
	SAFETY	SGNL	19	1.52%
	SAFETY	STRC	7	0.56%
	SAFETY	SIGN	5	0.40%
	SAFETY	SPEC	4	0.32%
	SAFETY	ERTH	3	0.24%
	SAFETY	LTNG	3	0.24%
	SAFETY	?	1	0.08%
	SAFETY	CGS	1	0.08%
	SAFETY	CONR	1	0.08%
	SAFETY	DRNG	1	0.08%
005	SAFETY		137	10.96%
006	HAZARDOUS LOCATIONS		0	0.00%
007	RAIL/HIGHWAY SEPARATION	STRC	2	0.16%
008	TRANS SYST MGT	GEN	13	1.04%
	TRANS SYST MGT	SGNL	10	0.80%
	TRANS SYST MGT	ASPH	4	0.32%
	TRANS SYST MGT	STRC	2	0.16%
	TRANS SYST MGT	OTHR	1	0.08%
008	TRANS SYST MGT		30	2.40%
009	TRAFFIC SIGNALS	SGNL	21	1.68%
	TRAFFIC SIGNALS	GEN	2	0.16%
	TRAFFIC SIGNALS	PVMK	2	0.16%
	TRAFFIC SIGNALS	ASPH	1	0.08%
009	TRAFFIC SIGNALS		26	2.08%

Table 3-7. CDOT Work Types Mapped to New Work Types

CDOT Work Type	CDOT Work Type Description	New Work Type	Number of Contracts	Percentage of Contracts
010	MINOR WIDENING	GEN	22	1.76%
	MINOR WIDENING	ASPH	17	1.36%
	MINOR WIDENING	ERTH	3	0.24%
	MINOR WIDENING	CONR	1	0.08%
	MINOR WIDENING	LTNG	1	0.08%
010	MINOR WIDENING		44	3.52%
011	MAJOR WIDENING	GEN	13	1.04%
	MAJOR WIDENING	CONR	7	0.56%
	MAJOR WIDENING	ASPH	6	0.48%
	MAJOR WIDENING	STRC	6	0.48%
011	MAJOR WIDENING		32	2.56%
012	RECONSTRUCTION	GEN	26	2.08%
	RECONSTRUCTION	CONR	22	1.76%
	RECONSTRUCTION	ASPH	15	1.20%
	RECONSTRUCTION	STRC	14	1.12%
	RECONSTRUCTION	ERTH	7	0.56%
	RECONSTRUCTION	TRAF	5	0.40%
	RECONSTRUCTION	LSCP	2	0.16%
	RECONSTRUCTION	?	1	0.08%
	RECONSTRUCTION	DBLD	1	0.08%
	RECONSTRUCTION	FENC	1	0.08%
	RECONSTRUCTION	OLS	1	0.08%
	RECONSTRUCTION	REST	1	0.08%
	RECONSTRUCTION	SIGN	1	0.08%
012	RECONSTRUCTION		97	7.76%
013	NEW CONSTRUCTION	STRC	16	1.28%
	NEW CONSTRUCTION	GEN	14	1.12%
	NEW CONSTRUCTION	ASPH	4	0.32%
	NEW CONSTRUCTION	ERTH	3	0.24%
	NEW CONSTRUCTION	CONR	2	0.16%
	NEW CONSTRUCTION	OLS	2	0.16%
	NEW CONSTRUCTION	BASE	1	0.08%
	NEW CONSTRUCTION	DRNG	1	0.08%
	NEW CONSTRUCTION	FENC	1	0.08%
	NEW CONSTRUCTION	LSCP	1	0.08%
013	NEW CONSTRUCTION		45	3.60%
014	REST AREA	OLS	3	0.24%
	REST AREA	REST	3	0.24%
	REST AREA	GEN	2	0.16%
	REST AREA	STRC	2	0.16%
014	REST AREA		10	0.80%
015	NOISE WALLS	FENC	1	0.08%
	NOISE WALLS	SPEC	1	0.08%
	NOISE WALLS	STRC	1	0.08%
015	NOISE WALLS		3	0.24%
016	LANDSCAPING	?	1	0.08%
	LANDSCAPING	GEN	1	0.08%
	LANDSCAPING	LSCP	1	0.08%
016	LANDSCAPING		3	0.24%

Table 3-7. CDOT Work Types Mapped to New Work Types

CDOT Work Type	CDOT Work Type Description	New Work Type	Number of Contracts	Percentage of Contracts
017	MISCELLANEOUS	ASPH	22	1.76%
	MISCELLANEOUS	PVMK	18	1.44%
	MISCELLANEOUS	STRC	15	1.20%
	MISCELLANEOUS	GEN	13	1.04%
	MISCELLANEOUS	ERTH	10	0.80%
	MISCELLANEOUS	DRNG	6	0.48%
	MISCELLANEOUS	FENC	6	0.48%
	MISCELLANEOUS	LSCP	5	0.40%
017	MISCELLANEOUS	SIGN	5	0.40%
	MISCELLANEOUS	SURF	5	0.40%
	MISCELLANEOUS	CONR	4	0.32%
	MISCELLANEOUS	OLS	3	0.24%
	MISCELLANEOUS	SGNL	3	0.24%
	MISCELLANEOUS	SPEC	3	0.24%
	MISCELLANEOUS	TRAF	3	0.24%
	MISCELLANEOUS	OTHR	2	0.16%
	MISCELLANEOUS	PRPC	2	0.16%
	MISCELLANEOUS	REST	2	0.16%
	MISCELLANEOUS	WTMN	2	0.16%
	MISCELLANEOUS	RIPR	1	0.08%
	MISCELLANEOUS	RMVL	1	0.08%
	MISCELLANEOUS	TUNL	1	0.08%
017	MISCELLANEOUS		132	10.56%
018	ENHANCEMENT	STRC	11	0.88%
	ENHANCEMENT	CGS	6	0.48%
	ENHANCEMENT	GEN	4	0.32%
	ENHANCEMENT	REST	3	0.24%
	ENHANCEMENT	LTNG	2	0.16%
	ENHANCEMENT	SPEC	2	0.16%
	ENHANCEMENT	LSCP	1	0.08%
	ENHANCEMENT	OTHR	1	0.08%
	ENHANCEMENT	PVMK	1	0.08%
018	ENHANCEMENT		31	2.48%
019	PLANNING	GEN	2	0.16%
020	MAJOR SURFACE TREATMENT	ASPH	173	13.84%
	MAJOR SURFACE TREATMENT	GEN	5	0.40%
	MAJOR SURFACE TREATMENT	SURF	5	0.40%
	MAJOR SURFACE TREATMENT	RCYL	2	0.16%
	MAJOR SURFACE TREATMENT	CONR	1	0.08%
020	MAJOR SURFACE TREATMENT		186	14.88%
021	MINOR SURFACE TREATMENT	ASPH	139	11.12%
	MINOR SURFACE TREATMENT	SURF	15	1.20%
	MINOR SURFACE TREATMENT	CONR	2	0.16%
	MINOR SURFACE TREATMENT	GEN	1	0.08%
	MINOR SURFACE TREATMENT	OTHR	1	0.08%
	MINOR SURFACE TREATMENT	STRC	1	0.08%
021	MINOR SURFACE TREATMENT		159	12.72%
022	ROUTINE MAINTENANCE	OTHR	7	0.56%
	ROUTINE MAINTENANCE	ASPH	5	0.40%
	ROUTINE MAINTENANCE	PRPC	1	0.08%
	ROUTINE MAINTENANCE	TUNL	1	0.08%
022	ROUTINE MAINTENANCE		14	1.12%
Total			1250	100.00%

Table 3-8. New Work Types Mapped to CDOT Work Types

New Work Type	CDOT Work Type	Work Type Description	Number Of Contracts	Percentage of Contracts
ASPH	020	MAJOR SURFACE TREATMENT	173	13.84%
	021	MINOR SURFACE TREATMENT	139	11.12%
	001	RESURFACING	94	7.52%
	005	SAFETY	25	2.00%
	017	MISCELLANEOUS	22	1.76%
	010	MINOR WIDENING	17	1.36%
	012	RECONSTRUCTION	15	1.20%
	003	BRIDGE REPLACEMENT	7	0.56%
	011	MAJOR WIDENING	6	0.48%
	022	ROUTINE MAINTENANCE	5	0.40%
	004	RESTORATION/REHAB	4	0.32%
	008	TRANS SYST MGT	4	0.32%
	013	NEW CONSTRUCTION	4	0.32%
	009	TRAFFIC SIGNALS	1	0.08%
ASPH		Asphalt	516	41.28%
BASE	013	NEW CONSTRUCTION	1	0.08%
CGS	018	ENHANCEMENT	6	0.48%
	005	SAFETY	1	0.08%
CGS		Curbs, Gutters and Sidewalks	7	0.56%
CONR	012	RECONSTRUCTION	22	1.76%
	001	RESURFACING	9	0.72%
	004	RESTORATION/REHAB	7	0.56%
	011	MAJOR WIDENING	7	0.56%
	017	MISCELLANEOUS	4	0.32%
	013	NEW CONSTRUCTION	2	0.16%
	021	MINOR SURFACE TREATMENT	2	0.16%
	005	SAFETY	1	0.08%
	010	MINOR WIDENING	1	0.08%
	020	MAJOR SURFACE TREATMENT	1	0.08%
CONR		Concrete	56	4.48%
DBLD	012	RECONSTRUCTION	1	0.08%
DRNG	017	MISCELLANEOUS	6	0.48%
	003	BRIDGE REPLACEMENT	1	0.08%
	004	RESTORATION/REHAB	1	0.08%
	005	SAFETY	1	0.08%
	013	NEW CONSTRUCTION	1	0.08%
DRNG		Drainage	10	0.80%
ERTH	017	MISCELLANEOUS	10	0.80%
	012	RECONSTRUCTION	7	0.56%
	003	BRIDGE REPLACEMENT	3	0.24%
	005	SAFETY	3	0.24%
	010	MINOR WIDENING	3	0.24%
	013	NEW CONSTRUCTION	3	0.24%
	004	RESTORATION/REHAB	1	0.08%
ERTH		Earthwork	30	2.40%
FENC	017	MISCELLANEOUS	6	0.48%
	012	RECONSTRUCTION	1	0.08%
	013	NEW CONSTRUCTION	1	0.08%
	015	NOISE WALLS	1	0.08%
FENC		Fencing	9	0.72%
GDRL	005	SAFETY	24	1.92%

Table 3-8. New Work Types Mapped to CDOT Work Types

New Work Type	CDOT Work Type	Work Type Description	Number Of Contracts	Percentage of Contracts
GEN	003	BRIDGE REPLACEMENT	35	2.80%
	012	RECONSTRUCTION	26	2.08%
	010	MINOR WIDENING	22	1.76%
	005	SAFETY	20	1.60%
	013	NEW CONSTRUCTION	14	1.12%
	008	TRANS SYST MGT	13	1.04%
	011	MAJOR WIDENING	13	1.04%
	017	MISCELLANEOUS	13	1.04%
	001	RESURFACING	6	0.48%
	004	RESTORATION/REHAB	6	0.48%
	020	MAJOR SURFACE TREATMENT	5	0.40%
	018	ENHANCEMENT	4	0.32%
	002	BRIDGE RESTORE/REHAB	3	0.24%
	009	TRAFFIC SIGNALS	2	0.16%
	014	REST AREA	2	0.16%
	019	PLANNING	2	0.16%
	016	LANDSCAPING	1	0.08%
	021	MINOR SURFACE TREATMENT	1	0.08%
GEN		General Construction	188	15.04%
LSCP	017	MISCELLANEOUS	5	0.40%
	012	RECONSTRUCTION	2	0.16%
	002	BRIDGE RESTORE/REHAB	1	0.08%
	013	NEW CONSTRUCTION	1	0.08%
	016	LANDSCAPING	1	0.08%
	018	ENHANCEMENT	1	0.08%
LSCP		Landscaping	11	0.88%
LTNG	005	SAFETY	3	0.24%
	018	ENHANCEMENT	2	0.16%
	010	MINOR WIDENING	1	0.08%
LTNG		Lighting	6	0.48%
OLS	014	REST AREA	3	0.24%
	017	MISCELLANEOUS	3	0.24%
	013	NEW CONSTRUCTION	2	0.16%
	003	BRIDGE REPLACEMENT	1	0.08%
	012	RECONSTRUCTION	1	0.08%
OLS		Other Lump Sum	10	0.80%
OTHR	022	ROUTINE MAINTENANCE	7	0.56%
	004	RESTORATION/REHAB	3	0.24%
	017	MISCELLANEOUS	2	0.16%
	008	TRANS SYST MGT	1	0.08%
	018	ENHANCEMENT	1	0.08%
	021	MINOR SURFACE TREATMENT	1	0.08%
OTHR		Other	15	1.20%
PRPC	017	MISCELLANEOUS	2	0.16%
	022	ROUTINE MAINTENANCE	1	0.08%
PRPC		Concrete Pavement Repair	3	0.24%
PVMK	005	SAFETY	23	1.84%
	017	MISCELLANEOUS	18	1.44%
	009	TRAFFIC SIGNALS	2	0.16%
	018	ENHANCEMENT	1	0.08%
PVMK		Pavement Marking	44	3.52%
RCYL	020	MAJOR SURFACE TREATMENT	2	0.16%
REST	014	REST AREA	3	0.24%
	018	ENHANCEMENT	3	0.24%
	017	MISCELLANEOUS	2	0.16%
	012	RECONSTRUCTION	1	0.08%
REST		Rest Area	9	0.72%

Table 3-8. New Work Types Mapped to CDOT Work Types

New Work Type	CDOT Work Type	Work Type Description	Number Of Contracts	Percentage of Contracts
RIPR	017	MISCELLANEOUS	1	0.08%
RMVL	017	MISCELLANEOUS	1	0.08%
SGNL	009	TRAFFIC SIGNALS	21	1.68%
	005	SAFETY	19	1.52%
	008	TRANS SYST MGT	10	0.80%
	017	MISCELLANEOUS	3	0.24%
SGNL		Signalization	53	4.24%
SIGN	005	SAFETY	5	0.40%
	017	MISCELLANEOUS	5	0.40%
	012	RECONSTRUCTION	1	0.08%
SIGN		Signing	11	0.88%
SPEC	005	SAFETY	4	0.32%
	017	MISCELLANEOUS	3	0.24%
	018	ENHANCEMENT	2	0.16%
	002	BRIDGE RESTORE/REHAB	1	0.08%
	015	NOISE WALLS	1	0.08%
SPEC		Specialty Work	11	0.88%
STRC	003	BRIDGE REPLACEMENT	84	6.72%
	002	BRIDGE RESTORE/REHAB	22	1.76%
	013	NEW CONSTRUCTION	16	1.28%
	017	MISCELLANEOUS	15	1.20%
	012	RECONSTRUCTION	14	1.12%
	018	ENHANCEMENT	11	0.88%
	005	SAFETY	7	0.56%
	011	MAJOR WIDENING	6	0.48%
	001	RESURFACING	3	0.24%
	007	RAIL/HIGHWAY SEPARATION	2	0.16%
	008	TRANS SYST MGT	2	0.16%
	014	REST AREA	2	0.16%
	015	NOISE WALLS	1	0.08%
	021	MINOR SURFACE TREATMENT	1	0.08%
STRC		Structures	186	14.88%
SURF	021	MINOR SURFACE TREATMENT	15	1.20%
	020	MAJOR SURFACE TREATMENT	5	0.40%
	017	MISCELLANEOUS	5	0.40%
	004	RESTORATION/REHAB	3	0.24%
	001	RESURFACING	2	0.16%
SURF		Surface Treatment	30	2.40%
TRAF	012	RECONSTRUCTION	5	0.40%
	017	MISCELLANEOUS	3	0.24%
TRAF		Traffic Control	8	0.64%
TUNL	017	MISCELLANEOUS	1	0.08%
	022	ROUTINE MAINTENANCE	1	0.08%
TUNL		Tunnels	2	0.16%
WTMN	017	MISCELLANEOUS	2	0.16%
?	005	SAFETY	1	0.08%
	012	RECONSTRUCTION	1	0.08%
	016	LANDSCAPING	1	0.08%
?		Unclassified	3	0.24%
Total			1250	100.00%

3.4 Interim Solution for Long-Range Cost Estimation

The new contract work type and item classifications were used directly in the development of an Interim Solution for Long-Range Cost Estimation. The focus of this effort was on improving the default unit costs for various project types using the most appropriate historical data from BAMS/DSS.

The general technique used to determine pricing defaults was based on the CDOT work types used in BAMS/DSS, but we used the new work types to modify the group of contracts and focus on the particular planning requirement at hand. Tables 3-7 and 3-8 provided the mapping between the CDOT work types and the new work types, and various documentation provided by CDOT was used to determine a basic mapping between the CDOT work types and the statewide planning work types. To some extent, the statewide planning work types were acceptable. On the other hand, there were obvious problems. For example, Rest Area jobs would need to be pulled out of the list of jobs used to calculate average prices for Capacity. Similarly, for other categories, it was necessary to eliminate jobs from the universe of jobs used to estimate a particular work type. In some instances, we could use our new work type since it was exactly the same as the planning work type.

Table 3-9 provided a formulaic methodology for determining the interim pricing defaults. The table data shows the current planning classifications and the current default values (per mile). We then indicate old "work type" classified contracts and/or (as indicated) proposed "new work type" classified contracts (e.g. GDRL) that should be aggregated to create the database of historical contracts to be used in determining the default pricing for a given planning type. Next, we identify the "new work type" contracts which should be deleted from the set of aggregated contract work types to tailor the group of contracts to best determine the default price for the planning type requested.

For example, to determine the historical pricing for planning category 102 (Geometric lane/shoulder width) jobs we first want to aggregate all the old work types which might contain appropriate contracts to be used for purposes of analysis. Contracts classified under the old work types "SAFETY", "RESTORATION/REHABILITATION", "MINOR WIDENING", and "RECONSTRUCTION" might all be relevant to our analysis. However, we know based on our new contract classification work and based on reference to the work type mapping tables that some of the contracts contained in the aggregated set of old work types are inappropriate for our consideration. Thus, we will remove these inappropriate contracts from the data set. In this example we would remove any contracts classified under the new work types as GDRL, PVMK, SGNL, SIGN, LTNG, CGS, SURF, LSCP, DBLD, FENC, OLS, and REST.

Table 3-9. Contract Classification for determination of Default Prices

Work Type	Terrain Class	Default Unit Cost	Units	Planning Type Description	Aggregated Current BAMS/DSS Contract Work Types	Add New Work Type	New Contract Classifications Removed											
101	M	3,000,000	Mile	Capacity:	Maj. Widening; Reconstruction		REST											
101	P	2,000,000	Mile	Capacity:	Maj. Widening; Reconstruction		REST											
101	R	2,500,000	Mile	Capacity:	Maj. Widening; Reconstruction		REST											
101	U	4,500,000	Mile	Capacity:	Maj. Widening; Reconstruction		REST											
102	M	750,000	Mile	Geometric:	Safety; Restor/Rehab; Min. Widening; Reconstruction		GDRL	PVMK	SGNL	SIGN	LTNG	CGS	SURF	LSCP	DBLD	FENC	OLS	REST
102	P	425,000	Mile	Geometric:	Safety; Restor/Rehab; Min. Widening; Reconstruction		GDRL	PVMK	SGNL	SIGN	LTNG	CGS	SURF	LSCP	DBLD	FENC	OLS	REST
102	R	500,000	Mile	Geometric:	Safety; Restor/Rehab; Min. Widening; Reconstruction		GDRL	PVMK	SGNL	SIGN	LTNG	CGS	SURF	LSCP	DBLD	FENC	OLS	REST
102	U	1,000,000	Mile	Geometric:	Safety; Restor/Rehab; Min. Widening; Reconstruction		GDRL	PVMK	SGNL	SIGN	LTNG	CGS	SURF	LSCP	DBLD	FENC	OLS	REST
103	M	3,000,000	Mile	Reconstruction:	Reconstruction													
103	P	1,500,000	Mile	Reconstruction:	Reconstruction													
103	R	2,000,000	Mile	Reconstruction:	Reconstruction													
103	U	3,300,000	Mile	Reconstruction:	Reconstruction													
106	M	850,000	Mile	Passing Lane:	Maj. Widening; Min. Widening; Reconstruction		LTNG	STRC	REST	DBLD	OLS	FENC	SIGN	ERTH	LSCP			
106	P	500,000	Mile	Passing Lane:	Maj. Widening; Min. Widening; Reconstruction		LTNG	STRC	REST	DBLD	OLS	FENC	SIGN	ERTH	LSCP			
106	R	550,000	Mile	Passing Lane:	Maj. Widening; Min. Widening; Reconstruction		LTNG	STRC	REST	DBLD	OLS	FENC	SIGN	ERTH	LSCP			
106	U	1,200,000	Mile	Passing Lane:	Maj. Widening; Min. Widening; Reconstruction		LTNG	STRC	REST	DBLD	OLS	FENC	SIGN	ERTH	LSCP			
107	A	10,000,000	Each	New Interchange	New Construction; Reconstruction		BASE	DRNG	FENC	LSCP	DBLD	OLS	REST	SIGN				
108	A	2,000,000	Each	Improve Interchange	Reconstruction		BASE	DRNG	FENC	LSCP	DBLD	OLS	REST	SIGN				
109	A	750,000	Each	Truck escape	Safety (Look for 0 length jobs)													
110	A	3,000,000	Each	New Rest Area	Rest Area													
112	A	2,000,000	Each	Grade Separation	Rail/Hwy Separation; Reconstruction		LSCP	DBLD	FENC	REST	SIGN	CONR						
113	A	100,000	Each	Corridor Study														
114	A	450,000	Each	Intersection Improvement	Safety (Look for 0 length jobs); Min. Widening		GDRL	STRC										
115	A	200,000	Mile	Guardrail		GDRL												
116	A	360,000	Mile	Noise Barrier	Noise Walls													
117	A	1,300,000	Mile	Drainage/erosion Control	Landscaping;	DRNG	PRCP	STRC	FENC	SIGN	SURF	CONR	OLS	SGNL	RMVL	TUNL		
					Miscellaneous (Use Non-Bridge STRC jobs)													
118	M	2,700,000	Mile	New HOV/Bus Lane	Maj. Widening; Min. Widening													
118	P	2,000,000	Mile	New HOV/Bus Lane	Maj. Widening; Min. Widening													
118	R	2,200,000	Mile	New HOV/Bus Lane	Maj. Widening; Min. Widening													
118	U	4,500,000	Mile	New HOV/Bus Lane	Maj. Widening; Min. Widening													
119	M	3,000,000	Mile	New Roadway:	New Construction													
119	P	2,000,000	Mile	New Roadway:	New Construction													
119	R	2,200,000	Mile	New Roadway:	New Construction													
119	U	4,800,000	Mile	New Roadway:	New Construction													
201	A	100,000	Mile	Pedestrian Path:	Enhancement													
202	A	150,000	Mile	Bicycle Path	Enhancement													
508	A	50,000	Each	Rail Crossing Upgrade	Rail/Hwy Separation; Safety (Look for 0 length jobs);		LSCP	DBLD	FENC	REST	SIGN	CONR						
					Min. Widening													

The next step in the process involved fine tuning the residual contracts in each default price category by comparing the advertised description of the work in the contract, contained in the PROPDESC table of the Trns•port PES database, with the proposed classification. (A copy of the project description data was received from CDOT in October 1998 – a sample of data from PROPDESC is provided in **Appendix H**). Descriptions at odds with the proposed inclusion of the contract for estimation of new unit cost defaults, resulted in exclusion of the contract.

The residuals of this culling process were aggregated within planning category, and where available, each terrain related subcategory, and used to determine the average cost per mile based on actual historical performance. Table 3-10 shows the historical bid-based default prices, which were determined based on the total dollars for the final list of contracts included in each work type category and also applying an inflation factor based on the producer price index. Note that these default prices are based on bid items only with non-bid items, such as preliminary engineering (PE), construction engineering (CE), and right of way (ROW), not included. These items were included in the original defaults.

The above methodology for developing an interim solution was presented at a meeting of the project Advisory Committee held at CDOT in October 1998. The minutes of this meeting are provided in **Appendix B**. Based upon the feedback received from the Advisory Committee, further efforts were made to refine the default prices for the interim solution. In particular, interchange and guardrail jobs were reviewed. Data for interchange jobs was reanalyzed in terms of "typical" and "complex" sub-classifications. Typical interchange projects include improvements to or construction of "diamond" and "at-grade" interchanges, while complex interchange projects include improvements to or construction of cloverleaf interchanges and interchanges at the junction of two interstate highways, and the like. The updated interim solution for long-range cost estimation using historical bid-based default prices was provided to CDOT in December 1998. The final version included a worksheet for developing a project estimate and guidelines on how to use the historical bid-based default prices table. Samples of completed worksheets were also provided. For non-bid items, a default percentage of the construction costs is used, with 17% and 12% for PE and CE, respectively. These percentages were provided directly by CDOT. A copy of the interim solution package is included in **Appendix I.**

An important point to note from this research is the need to identify the correct work type that applies to a proposed project. Frequently, a planned project can involve multiple jobs, each with a distinct work type. For effective cost estimation, the component projects need to be isolated and estimated individually to the extent possible based on the available information. These component estimates would then be aggregated to provide a total cost estimate.

We have attempted to relate the various work type classifications in order to facilitate cost estimation based on the historical project data. Table 3-11 displays an example of the relationships between the statewide planning types, the current CDOT contract work

types, and the new work types developed based on our analysis of the historical data. Ultimately, by tracking both the planning types and our work types together, we can predict better prices. However, further work is needed to relate the statewide planning types more closely to the work types. For example, a job at an intersection could be a capacity job or a safety job. Likewise, a capacity project could involve adding a lane, adding a passing lane for a short distance, etc. We need enough detail to be able to look at appropriate portions or stretches of road on a particular job.

Much of the project data available from CDOT's GIS system seemed to lack vital data elements. Also, better project descriptions and more dimensions (lengths and widths) are needed in the historical BAMS/DSS data in order to identify appropriate work types and calculate project-level quantities such as lane miles. Appropriate linkages to other CDOT data sources, e.g. the Integrated Roadway Information System (IRIS), are needed so that the planning project data can be captured and retained as a vital part of the BAMS/DSS historical database. As the volume of planning data available/linked to BAMS/DSS accumulates over time, the ability to predict long-range costs would improve simultaneously.

Table 3-10. Historical Bid-Based Default Prices

Planning Type	Description	Number of Contracts	Total Miles	Total Dollars	Terrain* Type	Unit	Unit Price	Adjusted# Unit Price	Original Default
101	Capacity	39	106	278,200,762	A	Mile	2,612,283	2,877,663	
	Capacity	7	17	59,682,114	M	Mile	3,500,364	3,882,117	3,000,000
	Capacity	8	37	56,997,384	P	Mile	1,537,673	1,719,894	2,000,000
	Capacity	4	19	40,608,705	R	Mile	2,107,058	2,307,060	2,500,000
	Capacity	19	31	118,070,229	U	Mile	3,838,070	4,189,821	4,500,000
102	Geometrics	81	288	238,637,285	A	Mile	828,262	909,122	
	Geometrics	33	112	108,729,270	M	Mile	969,990	1,063,065	750,000
	Geometrics	6	61	16,589,054	P	Mile	273,260	297,006	425,000
	Geometrics	24	91	58,627,561	R	Mile	641,751	703,298	500,000
	Geometrics	17	22	51,849,071	U	Mile	2,399,398	2,651,271	1,000,000
103	Reconstruction	70	159	320,397,563	A	Mile	2,011,816	2,191,305	
	Reconstruction	11	39	53,171,553	M	Mile	1,360,053	1,484,889	3,000,000
	Reconstruction	6	15	40,243,054	P	Mile	2,734,052	2,944,914	1,500,000
	Reconstruction	15	48	51,335,039	R	Mile	1,065,856	1,167,077	2,000,000
	Reconstruction	37	55	172,805,588	U	Mile	3,146,021	3,425,820	3,300,000
106	Passing Lanes	38	122	113,024,769	A	Mile	926,761	986,020	
	Passing Lanes	13	30	24,236,606	M	Mile	801,691	857,573	850,000
	Passing Lanes	3	5	3,649,360	P	Mile	729,872	795,644	500,000
	Passing Lanes	11	46	34,003,779	R	Mile	745,070	793,047	550,000
	Passing Lanes	11	41	51,135,024	U	Mile	1,244,567	1,318,052	1,200,000
107	New Interchange	26	52	213,933,184	A	Each	7,923,451	8,741,144	10,000,000
108	Improve Interchange	13	9	47,230,827	A	Each	3,373,631	3,656,694	2,000,000
109	Truck Escape	11	156	10,750,599	A	Each	895,883	981,718	750,000
110	Rest Area	14	19	28,514,313	A	Each	2,036,737	2,253,157	3,000,000
112	Grade Separations	10	26	39,653,630	A	Each	3,965,363	4,293,102	2,000,000
114	Improve Intersection	105	886	85,582,244	A	Each	785,158	862,614	450,000
115	Guardrail	25	258	9,443,365	A	Mile	36,563	39,817	200,000
	Guardrail	20	175	6,687,023	M	Mile	38,156	41,967	
	Guardrail	2	50	941,684	P	Mile	18,853	21,293	
	Guardrail	2	33	1,763,023	R	Mile	54,242	55,597	
	Guardrail	1	1	51,636	U	Mile	90,908	102,323	
116	Noise Barrier	3	2	3,348,016	A	Mile	2,079,513	2,216,041	360,000
	Noise Barrier	2	0	965,087	M	Mile	2,044,676	2,246,007	
	Noise Barrier	1	1	2,382,929	U	Mile	2,093,963	2,203,613	
117	Drainage	12	17	9,471,014	A	Mile	572,772	611,012	1,300,000
	Drainage	5	14	5,431,560	M	Mile	375,054	402,367	
	Drainage	2	0	516,252	P	Mile	1,704,929	1,777,992	
	Drainage	2	0	264,440	R	Mile	1,605,583	1,721,481	
	Drainage	3	2	3,258,761	U	Mile	2,054,943	2,178,254	
118	HOV or Bus Lanes	8	20	58,773,745	A	Mile	2,880,826	3,085,835	
	HOV or Bus Lanes	3	8	24,077,221	M	Mile	2,951,978	3,205,538	2,700,000
	HOV or Bus Lanes	1	3	3,413,322	R	Mile	1,281,421	1,348,523	2,200,000
	HOV or Bus Lanes	4	10	31,283,202	U	Mile	3,264,891	3,466,909	4,500,000
119	New Construction	43	97	284,263,649	A	Mile	2,926,980	3,231,183	
	New Construction	8	25	53,177,924	M	Mile	2,133,509	2,384,486	3,000,000
	New Construction	2	10	9,146,328	P	Mile	927,704	941,956	2,000,000
	New Construction	6	17	38,452,103	R	Mile	2,237,409	2,459,811	2,200,000
	New Construction	27	45	183,487,295	U	Mile	4,064,109	4,492,152	4,800,000
201	Pedestrian	9	9	1,714,810	A	Mile	183,520	197,032	100,000
	Pedestrian	1	2	254,424	M	Mile	129,149	135,912	
	Pedestrian	2	2	511,074	R	Mile	253,007	282,926	
	Pedestrian	6	5	949,312	U	Mile	177,309	187,115	
201a	Pedestrian w/Structu	6	1	1,638,320	A	Mile	3,032,824	3,255,166	
	Pedestrian w/Structu	1	0	229,095	P	Mile	2,411,522	2,628,833	
	Pedestrian w/Structu	5	0	1,409,226	U	Mile	3,165,403	3,388,818	
202	Bike Path	11	12	2,271,762	A	Mile	190,322	203,027	150,000
	Bike Path	1	2	254,424	M	Mile	129,149	135,912	
	Bike Path	2	2	511,074	R	Mile	253,007	282,926	
	Bike Path	8	8	1,506,264	U	Mile	189,553	199,355	
202a	Bike Path w/Structur	6	1	1,638,320	A	Mile	3,032,824	3,255,166	
	Bike Path w/Structur	1	0	229,095	P	Mile	2,411,522	2,628,833	
	Bike Path w/Structur	5	0	1,409,226	U	Mile	3,165,403	3,388,818	
508	Upgrade Crossings	1	2	438,900	A	Each	219,450	220,457	50,000

* Terrain: A = All, M = mountain, P = Plains, R = Rolling, U = Urban.

Adjusted to 1997 dollars.

Table 3-11. Work Type Mapping (examples)

Statewide Planning Type	CDOT BAMS/DSS Work Type	Proposed Work Types
101 - Capacity	Major Widening - 11 Reconstruction - 12	ASPH, CONC, ERTH, GEN, STRC
102 - Geometrics	Restoration/Rehabilitation - 4 Safety - 5 Minor Widening - 10 Reconstruction - 12	ASPH, CONC, ERTH, GEN, OTHR, STRC, SURF
103 -Reconstruction	Reconstruction - 12	ASPH, CONC, ERTH, GEN, STRC
106 -Passing Lanes	Minor Widening - 10 Major Widening - 11 Reconstruction - 12	ASPH, CONC, ERTH, GEN, STRC, TRAF
107 - New Interchange	Reconstruction - 12 New Construction - 13	ASPH, CONC, ERTH, GEN, STRC, TRAF
108 - Improve Interchange	Reconstruction - 12	ASPH, CONC, ERTH, GEN, STRC, TRAF
109 - Truck Escape	Safety - 5	ASPH, BASE, GDRL, ERTH
110 - Rest Area	Rest Area - 14	ERTH, GEN, OLS, REST, STRC
112 - Grade Separation	Rail/Hwy Separation - 7 Reconstruction - 12	ASPH, ERTH, GEN, STRC
114 - Improve Intersection	Safety - 5 Minor Widening - 10	ASPH, CONC, GEN, LTNG, SIGN, SGNL
115 - Guardrail	Safety - 5	GDRL
116 - Noise Barrier	Noise Walls - 15	FENC, SPEC, STRC
117 - Drainage/Erosion Control	Landscaping - 16 Miscellaneous - 17	DRNG, ERTH, GEN, LSCP, STRC
118 - New HOV or Bus Lanes	Minor Widening - 10 Major Widening - 11	ASPH, CONC, ERTH, GEN, STRC
119 - New Construction	New Construction - 13	ASPH, CONC, ERTH, GEN, STRC
201 - Pedestrian Facilities	Enhancement - 8	PATH, STRC
202 - Bike Facilities	Enhancement - 8	PATH, STRC

4. Research Historic Data Sources

4.1 Research Possible Data Sources for Major Items

The primary task defined under Activity 2 (Research Historic Data Sources) was to identify potential sources for historical cost data, external to CDOT. Issues related to CDOT data were addressed under Activity 1 in conjunction with defining project work types and major items, and developing an interim solution for long-range cost estimation. Research under Activity 2 focused on the availability of major item data at the regional and national level, including data for multi-modal project types. Project types of interest, which had been mentioned in the various meetings with CDOT personnel, included: light rail, high occupancy vehicle (HOV) lanes, bicycle/pedestrian facilities, etc.

Info Tech analysts conducted an on-line data search, focusing primarily on transportation-related sites hosted on the worldwide web. Sites visited included federal, state and local transportation agency sites, as well as numerous public and private sites for organizations involved in transportation planning, research, construction and policy analysis/development. Despite the vast amount of transportation information on-line, there appears to be a general lack of detailed project cost data available. Certainly, at the national level, there exists no single database of historical bid or constructed data for public transportation projects. Typically, the capital expenditure data provided by State transportation departments and mass transit agencies to the Federal Highway Administration and the Federal Transit Administration, respectively, is reported at an aggregate level which is not conducive to project level analysis/comparison.

Although data for transit infrastructure construction costs (e.g., new rail lines, HOV lanes, and busways) are reported to the Federal Transit Administration National Transit Database, data are not reported by complete project — only by year by mode, which could cover several projects being constructed simultaneously. Also, most projects are constructed over a period of several years, and only broad category data (vehicles, facilities, and other) are reported. Details on mileage, number of stations, size of parking

lots, and other variables are not reported. Dozens of variables impact the cost of a project. A few of those variables include:

1) land acquisition,
2) land clearance and demolition,
3) relocation of existing businesses and residences,
4) availability of "free" or low-cost right-of-way such as abandoned railroads,
5) utility relocation,
6) number, size, and length of stations,
7) number of tracks or lanes,
8) length of trackage or roadway,
9) number and size of maintenance yards and facilities,
10) proportion in deep tunnel, shallow tunnel, on the surface, and elevated,
11) number and size of parking lots or garages,
12) number and size of bridges,
13) station and right of way enhancements such as landscaping, works of art, information kiosks, benches, telephones, concession booths, fountains, etc.,
14) type and number of fare vending and collection machines,
15) inflation over the several-year time period needed for most projects,
16) the going labor costs for and number of construction workers,
17) type and number of propulsion, signal, communication, and other operating systems,
18) when the project was constructed,
19) the number of vehicles required,
20) interest and other financing charges.

For these reasons, it is not possible to develop accurate comparative construction cost data on a per-mile or any other basis since the detailed data on the above (and other) variables are not reported to allow identification of comparable projects. However, reports such as the National Transit Database Annual Report are useful in that they identify agencies who have made recent capital expenditures and, therefore, are potential sources for more detailed project cost data. **Appendix J** provides a summary of capital expenditure data abstracted from the 1997 National Transit Database Annual Report. For example, of the fifteen bus transit agencies with the largest number of vehicles operated in service, ten had more facilities and other capital investments in 1997 than Denver-RTD. Similarly, of the 21 light-rail transit agencies, ten also had more facilities and other capital investments in 1997 than Denver-RTD. Numerous other publications and reports are available on-line that provide general information on light rail projects. For example, a project report table is published periodically as part of *LRT News*. Table 4-1 shows the status of current light rail transit projects as of November 1999. Some reports can also be found on-line that provide actual cost information for transit projects. Examples include:

Characteristics of Urban Transportation Systems – Revised Edition, by Cambridge Systematics, Inc. for FTA, September 1992.

The Transit Capital Cost Index Study, by BoozAllen & Hamilton, Inc. and DRI/McGraw-Hill for FTA, January 1995.

Project and Construction Management Guidelines – 1996 Update, by EC&G Dynatrend Inc. for FTA, June 1996.

Table 4-1. LRT Project Progress Report Table (As of November 1999)

Focus City[a]	Planning or Conceptual Design	In Final Design	Under Construction	In Operation
Baltimore	E	-	U	S
Boston	-	U	-	S
Buffalo	E	-	-	I
Calgary	E	-	-	S
Cleveland	E	-	-	S
Dallas	E	E	E	S
Denver	S	-	E	I
Edmonton	E	-	-	S
Fort Worth	-	-	-	I[b]
Jersey City	S	E	I	-
Kansas City	I	-	-	-
Louisville	I	-	-	-
Los Angeles	S	E	-	S
Memphis	E	-	-	I[c]
Miami	I	-	-	-
Milwaukee	I	-	-	-
Minneapolis	I	-	-	-
New Orleans	E	E	-	S
New York	I	-	-	-
Newark	E	-	E	I
Orlando	I	-	-	-
Philadelphia	E/U	-	-	S
Phoenix	I	-	-	-
Pittsburgh	E/U	U	-	S
Portland	S	E	E	I
Sacramento	E	U	U	S
St. Louis	E	-	-	I
Salt Lake City	S	-	I	-
San Diego	E	E	E	S
San Francisco	E	E	E	S
San Jose	E	E	E	S
Seattle	S	-	-	I[c]
Tacoma[d]	I	-	-	-
Toronto	E	-	-	S
Total	34	11	11	23

Legend:
E = expansion of existing facilities (extension, new route, added trackage, etc.)
I = initial or basic one-corridor line
S = system (more than one corridor)
U = upgrading of existing facilities (same basic route)

[a] The corridor or system may extend well beyond the boundaries of the named city into or beyond adjacent corridors.

[b] Available for public use, but no fares charged.

[c] The vintage trolley lines in these cities, which were built and intended as a tourist attraction, have evolved to serve daily passengers. For that reason, they have been included in this table.

[d] Eventually, this line will be connected with and absorbed into a regional system focused on Seattle.

Source: *LRT News*, Vol. 14, No.2, December 1999.

Most State Highway Agencies post bidding information on their Internet website. Typically, this will include letting information and results of recent lettings, including bid totals and, in some cases, unit prices. However, on-line access to large amounts of historical bid data is not generally provided. Although State Highway Agencies have been collecting and storing data for years, their usefulness is at times problematic, primarily because of inconsistent classification and categorization which limits access to data on similar projects and work types. Also, it is often difficult to separate data specific to a given work type. HOV lanes are a typical example.

In many cases, it is difficult to identify the costs associated with only the HOV lane, as construction of the HOV lane(s) is often part of a major freeway project. While actual implementation costs depend on the type of facility and the site, when compared to other fixed-guideway transit alternatives or the addition of multiple general purpose lanes, the HOV priority treatments often represent the low end of the cost scale. This is especially true when the HOV treatment is developed within the existing freeway rights-of-way. While detailed project cost data could not be located, various on-line publications and reports provide information with regard to facilities that have been developed or are proposed. **Appendix K** provides an inventory of existing and proposed HOV projects in North America, as of January 1998 (available from the FHWA Operations website at http://www.ops.fhwa.dot.gov/Travel/).

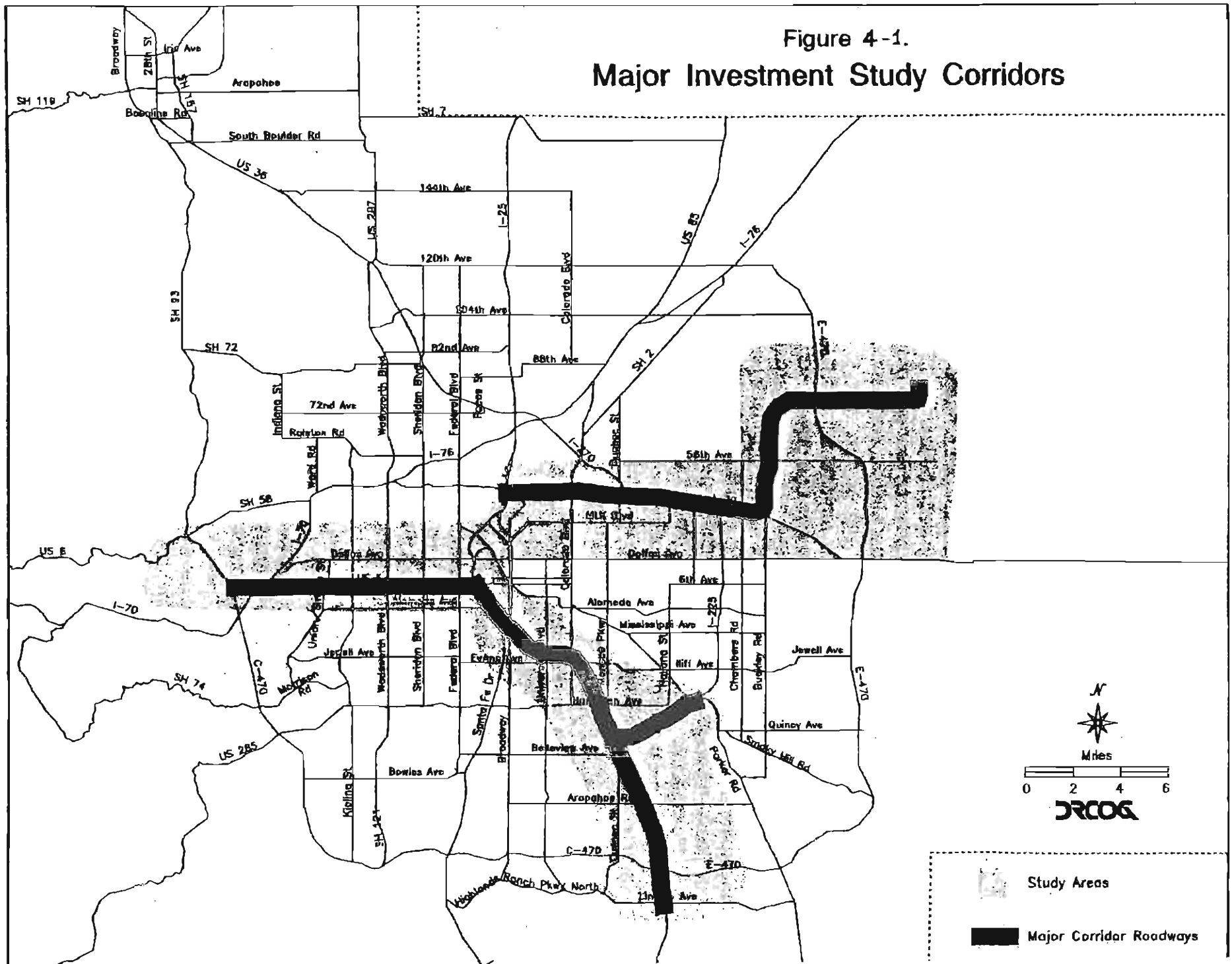
Another source of project information includes recent major investment studies available at state and regional planning websites. The purpose of a major investment study (MIS) is to examine the transportation needs of a subarea or corridor, and to develop and analyze multimodal solutions to meet these needs. An MIS provides a means to carefully consider a full range of mobility alternatives. In practice, the level of detail provided in these studies varies considerably and may be useful only for general comparison purposes. Many studies include references and contact information for the appropriate source of the cost data used in the analysis of alternatives.

In 1994, the Denver region's major planning agencies – the Denver Regional Council of Governments (DRCOG), the Regional Transportation District (RTD), and the Colorado Department of Transportation (CDOT) – agreed to initiate three major investment studies in three critical corridors in the Denver metropolitan area, which had been specifically identified in the adopted *Year 2015 Interim Regional Transportation Plan* (see Figure 4-1):

- The East Corridor (along I-70 from Downtown to Denver International Airport);
- The West Corridor (along US 6/West Colfax from Downtown to Golden); and
- The Southeast Corridor (along I-25 from Downtown to Lincoln Avenue, including I-225 to Parker Road).

These studies were conducted simultaneously over a two-year period from 1995 to 1997.

Figure 4-1.
Major Investment Study Corridors



The management responsibilities of the three studies were shared among the agencies, with extensive collaboration to ensure a consistent approach and level of analysis for each corridor. To assist in that process, the three agencies and the three consultant teams conducting the studies (prime consultants – BRW, Inc., Carter & Burgess, Inc., and Kimley-Horn and Associates) jointly developed a guidance manual that established common criteria, methodologies and procedures for conducting the technical analysis of the transportation alternatives developed in the three corridors. The first draft of this manual was compiled in April 1995 and was revised many times during the course of the studies. The final version[1] reflects the criteria, methodologies and procedures as they were actually applied and utilized in the three major investment studies.

The *Guidance Manual* provides a range of system costs per mile for computation of capital cost estimates, as shown in Table 4-2. This table was used in the conceptual level evaluation phase of the various transportation alternatives. For detailed level evaluation of alternatives, the *Guidance Manual* provides a table of unit costs for the major component construction elements (see Table 4-3). In general, these components begin with the site preparation elements, such as railroad track relocations, pavement/structure removals, guardrail/barrier removals, and any earthwork that may be required. Then definable construction elements are added, such as pavement, curb and gutter, structures, retaining walls, culverts, trackwork, crossing appurtenances, stations, maintenance facilities, etc. The unit costs presented in Table 4-3 for these elements were developed from CDOT, RTD and other historical data from relevant projects locally and nationally. All costs are presented in 1995 dollars.

Another set of construction elements is also identified in Table 4-3. These items include drainage, utility relocation, noise/environmental mitigation, signing/striping, construction traffic control, and urban design treatments. Rather than being quantified, these items are included as a percentage of the previous construction items, with ranges noted for some items. Contingency and other add-on factors are then applied. These percentages were developed from comparison of previous project estimates and actual accepted bids where possible. If applicable, vehicle costs can then be added to the construction cost items.

The general methodology utilized for detailed level capital costing (using Table 4-3) was as follows:

- compute the quantities required of the major component construction elements.
- apply unit costs to these quantities.
- add costs for non-detailed construction items.
- add contingency factors to account for uncertainty of the estimates at this level.
- add costs for engineering design, construction management, and insurance/legal.
- add costs for vehicle acquisition (if applicable).

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[1] Denver Regional Council of Governments, *East, West, and Southeast Corridor Major Investment Studies Guidance Manual for Technical Analysis*, June 1997.

Table 4-2.
Per Mile System Costs for Conceptual Level Analysis
June 1997

	Typical Capital Cost Range Per Mile (millions)	
Technology	**Lower Range**	**Upper Range**
Light Rail Transit (LRT)		
At-Grade	$20	$30
Grade Separated	$40	$55
Elevated	$70	$100
Commuter Rail		
Utilize Existing Track At-Grade	$5	$7
New Track At-Grade	$7	$9
Heavy Rail		
At-Grade	$20	$30
Elevated	$70	$100
Subway	$200	$250
Monorail	$70	$100
Automated Guideway Transit	$50	$70
Personal Rapid Transit	$50	$70
Vintage Streetcar	$15	$20
Electric Trolley Bus	$8	$12
Add Bus/HOV Lanes (40 ft envelope)		
At-Grade	$4	$8
Grade Separated	$12	$20
Elevated Structure	$18	$28
Widen Freeway (1 lane per direction)		
At-Grade	$3	$6
Grade Separated	$12	$20
Elevated Structure	$18	$28
Widen Arterial (1 lane per direction)		
At-Grade	$2	$4
Grade Separated	$5	$10
Elevated Structure	$8	$15

Source: Denver Regional Council of Governments, *East, West, and Southeast Corridor Major Investment Studies Guidance Manual for Technical Analysis*, June 1997.

Table 4-3.
Capital Costs – Detailed Level Analysis
June 1997

Item	Unit	Unit Cost	Comments
1.0 Removals			
Track Removal	Trk. Ft.	$25	Mainline, by RR Forces
Paved Surfaces	S.Y.	$3	Includes curb, gutter, sidewalk
Signal Equipment	Each	$5,000	
Miscellaneous	L.S.	-	Est. cost of any other removals
2.0 Earthwork	C.Y.	$5	Includes fill & excavation
3.0 Reconstruction/Construction			
Pavement	S.Y.	$30	
Curb, Gutter, Sidewalk (8 ft)	L.F.	$27	One side of roadway
Off-street Trail (Concrete)	S.Y.	$18	
4.0 Bridges/Structures			
Mainline Highway	S.F.	$65	
Arterial	S.F.	$60	
Ramp Flyover/Bus-HOV Ramp	S.F.	$70	
Drainage Bridge	S.F.	$60	
Pedestrian Bridge	S.F.	$80	
Bridge, Light Rehab	L.F.	$500	
Bridge, Medium Rehab	L.F.	$800	
Bridge, Heavy Rehab	L.F.	$1,000	
Double Track Cut & Cover Tunnel		$6,000	Less than 1,250 L.F.
Double Track Cut & Cover Tunnel		$6,500	Greater than 1,250 L.F.
Single Track Elevated Structure		$3,500	Guideway Elevated
Double Track Elevated Structure		$6,500	Guideway Elevated
Rlway Brdg-Single Ball-Steel		$3,000	Guideway At-Grade
Rlway Brdg-Dbl Ballasted-Conc or Steel		$5,000	Guideway At-Grade
Concrete Barrier Type 4		$23	
5.0 Retaining Walls			
0 to 10 ft.	L.F.	$300	
10 to 20 ft.	L.F.	$750	
Over 20 ft.	L.F.	$1,000	
Mech. Stabilized Earth Wall	S.F.	$11	
6.0 Box Culvert			
CBC (8 ft. x 4 ft.)	L.F.	$275	
CBC (8 ft. x 6 ft.)	L.F.	$350	
CBC (10 ft. x 4 ft.)	L.F.	$370	
CBC (10 ft. x 6 ft.)	L.F.	$410	
CBC (12 ft. x 8 ft.)	L.F.	$580	
7.0 Trackwork			
Re-lay mainline track	Trk. Ft.	$200	Mainline, by RR Forces
Yard Trck, 115# Rail/OTM/New Ties	Trk. Ft.	$80	
Frt. Trck, New 133# Rail/OTM/New Ties	Trk. Ft.	$125	
Industrial (Yard) track Rel./Rehab.	Trk. Ft.	$60	Not by RR forces
Ballast, Crushed Rock (@2200 CY/mile)	C.Y.	$30	

Table 4-3 (continued).
Capital Costs – Detailed Level Analysis
June 1997

Item	Unit	Unit Cost	Comments
Single Ballasted Track	L.F.	$100	
Double Ballasted Track	L.F.	$200	
Single Embedded Track	L.F.	$170	
Double Embedded Track	L.F.	$340	
8.0 Turnout			
Turnout, #10-115# Rail Ties	Each	$50,000	
Turnout, #10/14-133# Rail Ties	Each	$60,000	
Turnout, #20-133# Rail Ties	Each	$100,000	
Turnout, #10-Rehabilitation	Each	$25,000	
Turnout, #20-Rehabilitation	Each	$40,000	
9.0 Signals			
Communications (Rail)	Rte. Mile	$1,000,000	Fiber optic comm & train control
Signal System (ABS, Rail)	Rte. Mile	$200,000	
Traffic Signals (Vehicular)	Each	$80,000	
10.0 System Wide Elements			
Traction Electrification System	L.F.	$300	
11.0 At-Grade Crossing (New)			
Grade crossing (excl. track cost)	Each	$150,000	Includes gates, lights, signs, pads, etc.
12.0 Enforcement Areas	S.Y.	$35	Bus/HOV only for additional pavement. Includes signing.
13.0 Stations-Connections			
Line Station-Light Rail	Each	$300,000	
Line Station-Commuter Rail	Each	$500,000	
Line Station-ETB	Each	$150,000	
Terminal Station-Light Rail	Each	$500,000	
Terminal Station-Commuter Rail	Each	$1,000,000	
Terminal Station-ETB	Each	$350,000	
"Station" – Bus/HOV	Each	$100,000	
Bus Bay	Each	$40,000	
Parking, surface	Per Spc.	$3,000	
Parking, structured	Per Spc.	$10,000	
Transit Amenities	Each	$25,000	Upgrades at stops
14.0 Maintenance Facility			
Base Cost	L.S.	$5,000,000	Base cost; also add per vehicle cost
15.0 Lighting			
Highway	Mile	$54,000	
Arterial	Mile	$100,000	
16.0 TDM/ITS Strategies			
TDM	*	*	Not Applicable
ITS	Mile	$500,000	Includes comm, det, r.m., vms
SUBTOTAL (A)			

Table 4-3 (continued).
Capital Costs – Detailed Level Analysis
June 1997

Item	Unit	Unit Cost	Comments
17.0 Drainage	5% of (A)		
18.0 Utility Relocation	4% of (A)		
19.0 Noise/Environmental Abatement/ Mitigation			Use only one of these
Residential	3% of (A)		
Commercial	2% of (A)		
Industrial	1% of (A)		
20.0 Signing and Striping			Use only one of these
Interstate	5% of (A)		
State Highway	4% of (A)		
Arterial	2% of (A)		
Rail Corridor	1% of (A)		
21.0 Construction Traffic Control			Use only one of these
Interstate	5% of (A)		
State Highway	5% of (A)		
Arterial	7.5% of (A)		
Rail Corridor	3% of (A)		
22.0 Urban Design/Landscaping			Use only one of these
Residential	4% of (A)		
Commercial	2% of (A)		
Industrial	1% of (A)		
TOTAL COST OF CONSTRUCTION BID ITEMS (CBI)			
23.0 Mobilization	3% of (CBI)		
24.0 Contingencies & Other Costs			
Contingencies	25% of (CBI)		
Engineering (Design)	12% of (CBI)		
Construction Management	10% of (CBI)		
Insurance and Legal	2% of (CBI)		
Total	**49% of (CBI)**		
TOTAL COST OF CONSTRUCTION			

Table 4-3 (continued).
Capital Costs – Detailed Level Analysis
June 1997

Item	Unit	Unit Cost	Comments
25.0 Vehicles			
Commuter Rail Locomotives			
Diesel Electric	Each	$3,000,000	
Rehabilitated Diesel Electric	Each	$2,000,000	
Commuter Rail Trailer/Cab Cars			
Cab Cars	Each	$1,600,000	
Trailer Cars	Each	$1,200,000	
Trailer/Cab Cars (Rehabilitated)	Each	$550,000	
DMU Cars			
VT610	Each	$2,225,000	
RegioSprinter	Each	$2,100,000	
Light Rail Vehicles	Each	$2,100,000	
Bus Vehicles			
30 foot	Each	$70,000	
40 foot	Each	$250,000	
60 foot	Each	$325,000	
Electric Trolley Bus Vehicles			
40 foot	Each	$500,000	
60 foot Articulated	Each	$650,000	

Source: Denver Regional Council of Governments, *East, West, and Southeast Corridor Major Investment Studies Guidance Manual for Technical Analysis*, June 1997.

The *Guidance Manual* also provides estimated per square foot costs (low to high ranges) for acquiring various classifications of land in each of the three corridors, which were prepared by CDOT and RTD land acquisition specialists (see Table 4-4). Estimates for relocation costs, to be added to the cost of any property acquisition, are also included. These right-of-way cost estimates are corridor and, to a lesser extent, time specific. Their applicability to cost estimation of future projects, particularly in other corridors, may be limited. Generally, the cost of recent CDOT, RTD, and other agency right-of-way purchases should be referenced to develop the most appropriate (local and temporal) unit cost ranges.

The locally preferred alternative for each of three study corridors is:

East Corridor - Commuter Rail between DIA and Denver Union Terminal;
West Corridor - Light Rail between the Denver CBD and US6/US40;
Southeast Corridor - Light Rail between I-25 & Broadway and Lincoln Ave, and on I-225 between I-25 and Parker Rd.

The Light Rail Transit Alternative for the Southeast Corridor was refined during the subsequent National Environmental Policy Act process to provide better operations and more stations. The highway elements identified as part of this alternative were also increased in scope to reduce travel time and take advantage of efficiencies created when the highway is rebuilt at the same time LRT is added. The selected alternative includes 19 miles of double-tracked LRT, with 13 stations and a light rail maintenance facility, as well as improvements to I-25 and I-225 totaling 16.5 miles involving additional lanes, replacement of existing acceleration/deceleration lanes and provision of new acceleration/deceleration lanes to fill in current gaps, and widened paved shoulders throughout, where feasible; interchange reconstruction at eight interchanges; bridge replacement of numerous bridges; and drainage upgrades to address the deteriorating and undersized drainage system.

Clearly, the Southeast Corridor Multimodal Project may provide significant amounts of project-level data that can contribute to future analysis for cost estimation purposes. Note, however, that CDOT/RTD are in the process of soliciting a design-build contract for the Southeast Corridor project. Whereas a traditional project is fully designed by the state or its contractors and the design plans are then provided to prospective contractors who prepare proposals for building the project, a design-build project is both designed and built by the same contractor. This may impact the ability to acquire detailed cost/estimate data at the item level, particularly given the range of component work types involved in the overall project.

According to FTA's *Annual Report on New Starts – Proposed Allocation of Funds for Fiscal Year 2001*, the latest capital cost estimate for the fixed-guideway element of the Southeast Corridor project is $882.5 million in escalated dollars, including right-of-way acquisition, final design, construction, and acquisition of rolling stock, with opening day anticipated for 2007. The capital cost estimate for the LRT project has increased 84 percent since its major investment study, with project cost escalation primarily a result of further engineering and the addition of four stations to the proposed system.

Table 4-4.
Right-of-Way Costs for Each Corridor
(Per Square Foot)
June 1997

Corridor Item	Unit	Low Range Unit Cost	High Range Unit Cost
East Corridor			
Vacant	Land SF	$3	$4
Residential	Land SF	$7	$8
Commercial	Land SF	$21	$28
Industrial	Land SF	$11	$12
West Corridor			
Vacant	Land SF	$3	$9
Residential	Land SF	$14	$17
Commercial	Land SF	$10	$17
Industrial	Land SF	$14	$17
Southeast Corridor			
Vacant	Land SF	$4	$12
Residential	Land SF	$14	$17
Commercial	Land SF	$22	$23
Industrial	Land SF	$10	$11
TOTAL COST OF RIGHT OF WAY			
Relocation Costs			
Residential Per Family-Owner Occupied	Each	$22,500	$22,500
Rental	Each	$6,000	$6,000
Commercial			
Small Business (< 25 k.s.f.)	Each	$20,000	$50,000
Medium Business	Each	$150,000	$250,000
Large Business (> 75 k.s.f.)	Each	$300,000	$600,000
GRAND TOTAL: RIGHT OF WAY PLUS RELOCATION COSTS			

Source: Denver Regional Council of Governments, *East, West, and Southeast Corridor Major Investment Studies Guidance Manual for Technical Analysis*, June 1997.

RTD also has two other light rail projects under construction at this time.[1] Three corridors (out of a planned eight-corridor rapid transit system) are already operating – the Central Corridor light rail line (5.3 miles long), the heart of the system; the Downtown Express bus/HOV lanes on north I-25; and, the bus-only lanes on U.S. 36 that were converted to bus/HOV in 1996. The Central Corridor light rail project, which was completed in October 1994, potentially offers a local source for historical bid and award data that could be utilized for cost estimation of future light rail projects.

The Downtown Express includes 6.6 miles of barrier-separated, reversible lanes in the middle of I-25 that are reserved for buses and high occupancy vehicles (two or more occupants). It includes an emergency lane and a traffic management system with overhead electronic signs, access control gates, and video monitoring of traffic/road conditions. The project included road improvements to I-25; a new 20th Street, with full on- and off-ramps to I-25 and noise barriers to protect neighborhoods; multiple bridges rebuilt; and a pedestrian/bicycle path built along 20th Street. Express and regional buses can be caught at 12 Park-n-Ride lots and two transit centers. Historical cost data for each of these project components should be available from the CDOT Trns•port database and from RTD.

The Southwest Corridor (approx. 8.7 miles) is currently under construction. RTD's Southwest Corridor project consists of a comprehensive package of transit improvements including Park-n-Rides, bus transfer facilities and light rail transit. LRT service to and from the southwest metro area is the primary focus of the improvements. The Southwest Corridor light rail line is a double-track system running from the existing I-25 and Broadway Station to Mineral and South Santa Fe. The overall Southwest Corridor LRT project was 65% complete through the end of January 1999. Opening day is currently scheduled for July, 2000.

The Southwest Corridor LRT civil construction was split up into four sections which are referred to as "line segments." These segments typically include a combination of project types, e.g. construction of bridges and culverts, railroad and light rail trackbed grading, and construction of retaining walls, as well as LRT station platforms, underground and drainage components. The overall project also necessitates relocation of existing railroad lines, laying of light rail tracks, construction of five stations and four Park-n-Rides, construction of the electrified overhead contact system and train signals/communications, and expansion of the existing light rail operations facilities.

Environmental and engineering activities to design the Central Platte Valley Light Rail Spur are also currently underway. This 1.8-mile spur will connect the existing light rail line from approximately West Colfax and 7th Street to the Denver Union Terminal. New stations and several at-grade crossings will also be included. Bid and award data for the

[1] RTD (1999). Rapid Transit page, Regional Transportation District web site, http://www.rtd-denver.com/RapidTransit/

various components of the Southwest Corridor and Central Platte Valley LRT projects should be available from a combination of RTD and CDOT sources.

RTD is also currently in the process of conducting a major investment study in each of four major transportation corridors: I-70 from Denver to Golden; US 36 between Denver and Boulder; I-225 from Parker Road to I-70; and North Metro in the area between I-25 and I-76, from Denver to the Weld County Line. A guidance manual establishes common criteria, methodologies, and procedures for conducting the technical analysis in the four corridors.[1] The *Guidance Manual* provides a range of system costs per mile, as shown in Table 4-5, for computation of capital cost estimates. This table includes a range of typical, total project costs per mile by technology and case. The table was developed using relevant projects from around the country for rail technologies and Colorado-specific projects for highway-related technologies. It covers all project costs for rail technologies including typical right-of-way acquisition, engineering, vehicles, storage and maintenance facilities, etc., as noted in the footnotes of the table. Highway-related technologies cover the same items as rail, except for vehicles and storage/maintenance facilities. Suggested application of this table is to find the most relevant single case (or a composite case) for the technology of a transportation alternative and to select or estimate a single cost per mile within the range shown on the table. The capital cost estimate of the basic alternative is then computed based on its total length.

Given the significant level of previous and current project activity, RTD clearly represents a major source of relevant transit-related cost data. In addition to light rail, RTD is also a potential source for cost data related to Park-n-Ride lots. A total of 92 Park-n-Ride lots are included in the 2020 Regional Transportation Plan, including 59 existing sites operated by RTD and 33 proposed new Park-n-Ride sites. Also, twenty of the existing Park-n-Ride sites are planned for expansion. Access to RTD's historical bid and award data for previously constructed Park-n-Ride lots would facilitate development of default unit prices for cost estimation of new lots.

For bicycle and pedestrian facilities, no sources of actual project cost data were identified. Frequently, construction of these facilities is included as part of road construction projects and specific costs are difficult to isolate. Generally, national-level inventories of bicycle/pedestrian facilities, similar to those maintained for roads and highways, have not been developed. The extent of bicyle/pedestrian information compiled by state and local (city, county, MPO) agencies varies considerably and the data are not typically organized in a way that can be easily shared with others. Some electronic reports are available that contain general cost guidelines. For example, the *Oregon Bicycle and Pedestrian Plan*[2] provided the following cost information.

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[1] RTD (1998). *I-70, US 36, I-225 and North I-25 Major Investment Studies Guidance Manual for Technical Analysis - Final Working Draft*, August 1998. Regional Transportation District, Denver, CO.

[2] Oregon Bicycle and Pedestrian Program (1995). *Oregon Bicycle and Pedestrian Plan* (Second Edition). Oregon Department of Transportation, http://www.odot.state.or.us/techserv/bikewalk/obpplan.htm

Table 4-5.
Per Mile System Costs for Conceptual Level Analysis
August 1998

Technology	Typical Capital Cost Range Per Mile (millions)	
	Lower Range	Upper Range
Light Rail Transit (LRT)		
At-Grade (generally)	$20	$30
Moderate Grade Separation	$30	$45
Fully Elevated	$70	$100
Commuter Rail (existing RR ROW) (2)		
Utilize Existing Track At-Grade	$5	$7
New Track At-Grade	$7	$10
Heavy Rail Rapid Transit (2)		
At-Grade	$50	$80
Elevated	$100	$150
Subway	$200	$250
Monorail	$70	$100
Automated Guideway Transit (AGT)	$70	$100
Personal Rapid Transit (1)	$25	$35
Vintage Streetcar	$15	$20
Electric Trolley Bus	$8	$12
Guided Bus (5)	See note 5.	See note 5.
Add Bus/HOV Lanes (Two way) (3) (6)		
Barrier Separated	$9	$17
Continuous Access	$6	$12
Widen Freeway (1 lane/direction) (4) (6)		
At-Grade (6)	$3	$6
Grade Separated	$12	$20
Elevated Structure	$18	$28
Widen Arterial (1 lane/direction) (4) (6)		
At-Grade (6)	$2	$4
Grade Separated	$5	$10
Elevated Structure	$8	$15

Notes:

1 - Personal Rapid Transit (PRT) may be considered for collection/distribution only, not line haul. PRT cost range assumes future successful completion of demonstration projects and commercial production quantities for vehicles, guideway, and systems.
2 - Rail costs include guideway, yards, systems, stations, vehicles, typical ROW, project administration, and special conditions.
3 - Bus/HOV costs include same items as for rail except vehicles and storage/maintenance facilities. Flyovers or T-ramps to provide direct access to Bus/HOV lanes are $2.9 million to $3.5 million each.
4 - Roadway widening costs include same items as for Bus/HOV.
5 - Guided Bus - Research not yet complete. For prescreening, add 20% to grade separated and elevated bus/HOV cases to account for guidance feature costs in guideway. Items included are same as for bus/HOV.
6 - A variance to design standards may be considered to reduce the cost or impact of highway-related alternatives.

Source: Regional Transportation District, *Guidance Manual for Technical Analysis - Final Working Draft*, August 1998.

Bicycle/Pedestrian Costs for Rural Highways (in Oregon):

The cost of providing paved shoulders as part of highways improvements is incorporated into the overall cost of a project, since shoulders are provided primarily for motor vehicle safety and to reduce long-term maintenance costs. The cost of adding paved shoulders to an existing roadway ranges widely:

- Adding paved shoulders can cost as little as $50,000/mile (both sides) if there are already graded, stable shoulders in place, if there are no additional needs such as culvert extensions or ditch regrading, and if the project is built in conjunction with a preservation overlay (paving materials costs are lower when large quantities are purchased).

- Adding paved shoulders can cost over $300,000/mile (both sides) if the shoulders need grading, if a ditch must be relocated, if there are geological or environmental constraints, and if right-of-way must be purchased.

Bicycle/Pedestrian Costs for Urban Highways (in Oregon):

The cost of bicycle and pedestrian facilities is accounted for in urban modernization projects. Examples include sidewalks, pedestrian signals, and the extra width required for bike lanes when these are over and beyond the standard shoulder width for the roadway. The cost range is wider than with rural projects: right-of-way costs vary throughout the state, and adding curbs and sidewalks usually requires drainage system improvements, or installation of a drainage system where there is none. Generally, sidewalks are more expensive to provide than bike lanes. Bike lane striping can cost as little as $2,000 per mile, but reconstructing a roadway requiring right-of-way and drainage improvements can cost as much as $2 million per mile.

A recent Bureau of Transportation Statistics report[1] summarizes the present state of bicycle/pedestrian data. The availability of costing data for various facility types was mentioned as an outstanding need by some respondents to the outreach effort conducted for this report. **Appendix L** contains a reprint of the Facilities section of this report, which documents the potential sources of data on bicycle and pedestrian facilities.

[1] Bureau of Transportation Statistics (2000). *Bicycle and Pedestrian Data: Sources, Needs, & Gaps.* BTS-00-02. U.S. Department of Transportation, Washington, DC. http://www.bts.gov/programs/transtu/bikeped/report.pdf

4.2 Assure Outside Data Compatibility with CDOT Data

Given the absence of historical data available, Task 5 (Assure Outside Data Compatibility with CDOT Data) became essentially redundant. The new CES will include the capability to import heavy construction data from R.S. Means. The interface with R.S. Means data is scheduled to be included with the CES warranty release at the end of September 2000. Also, labor, equipment, and materials can be loaded via comma-separated-value (CSV) format files, which can be generated by many applications such as spreadsheets.

5. Define CES Enhancements

5.1 Determine Appropriate Quantities for a Given Work Type

The new Trns•port CES produces estimates for cost groups (major items) but does not support parametric estimation of quantities at this time. However, this is a potential future enhancement.

Efforts to model quantities for a given contract work type (ASPH), based on CDOT's historical BAMS/DSS data, yielded fairly good results for asphalt quantities based on lane miles, as shown below in Figure 5-1. A field for "lane miles" has now been added to the Trns•port database to support future parametric estimation of cost group quantities.

Further research is needed to develop default profiles for other cost groups. Not all cost groups, such as bridge items, will lend themselves to quantity modeling. However, the very major items such as asphalt, concrete, and earthwork, may be appropriate candidates for parametric quantity estimates for the most common contract work types.

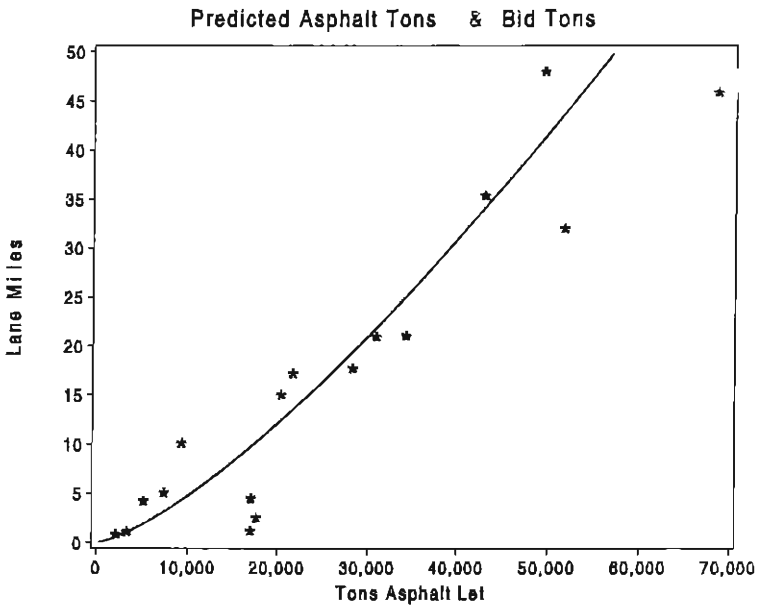

Figure 5-1. Quantity Estimation for Asphalt based on Lane Miles.

5.2 Determine Additional CES Enhancements

The following CDOT requirements were noted in regard to additional CES or related enhancements:

1. Parametric estimation of quantities (discussed above).
2. Multi-modal parametric estimation.
3. Multiple contract classifications.
4. Inflation factors by cost group.

The development of multi-modal parametric estimation would require pilot testing a single multi-modal work type, in the first instance. This would require building a data history and/or finding data sources for appropriate item-level project data. For example, the LRT projects being run by RTD have been suggested as a source of data for light rail. If historical project data can be made available for a multi-modal work type, this will allow generation of bid-based default prices for estimation purposes.

The ability to store sufficient contract classifications for a given contract in order satisfy the various reporting needs of different departments could be addressed by adding a new table to the BAMS/DSS database. Data elements in the table could include contract ID, classification type, classification code, classification percentage, and DOT department. This structure would allow a single contract to have an unlimited number of classifications. There are three options for adding this table to Trns•port.

1. A table can be placed in the BAMS/DSS database directory for CDOT only, along with some procedures and/or interfaces for populating the table. This table would be CDOT-specific and maintained outside of the normal BAMS/DSS database in the current release. Alternatively, the new BAMS/DSS Version 6, scheduled for a July 2000 release for SAS and Oracle databases, will allow addition and maintenance of state-specific tables within the database environment. However, at this point, it is too early to test this functionality. BAMS/DSS 6 will not be available for DB2 and Sybase databases until a later release, which has not been scheduled at the time of this report.

2. CDOT could fund the addition of this table to the Trns•port system and work with the Trns•port Task Force to get it adopted into the generic system. Sometimes, multiple states will pool their funds to support the implementation of a state-sponsored enhancement.

3. Another option is to place this enhancement for future consideration on the Trns•port enhancements ballot. Although this may be the lowest cost option and will ensure a completely integrated solution, a two to three year

timeframe is typically required for enhancements through the balloting process.

The new CES includes an inflation factor at the job level. However, prices for different categories of items often tend to vary at different rates. Thus, the need for individual inflation factors by major item groups requires an enhancement to CES.

Also, as previously noted, complete contract descriptions need to be retained in BAMS/DSS. This data is currently entered in the PROPDESC table in Trns•port PES/LAS. However, the current BAMS/DSS database has no table to receive this information. An interim table could be added to the BAMS/DSS database directory and a procedure, probably an ad hoc program, developed to copy the contract description data from PES/LAS into this interim table. The options for adding this table to Trns•port are similar to those described above for the contract classifications table.

The new BAMS/DSS 6 will include all Trns•port PES/LAS and SiteManager data. Therefore, the PES/LAS PROPDESC table data, specifically complete contract descriptions, will be passed to BAMS/DSS in release 6.x, currently scheduled for July 2000 for SAS and Oracle databases. DB2 and Sybase platforms are being scheduled for a future release.

The effort for all Trns•port enhancements described in this section falls within Trns•port's large scope category, which is six to twelve month's effort. More detailed estimates can be determined when a state or group of states decides to fund an enhancement and wants to schedule the work.

6. Conclusions

Info Tech presented the overall results of this research project at the final meeting of the Advisory Committee in December 1999. Minutes of the meeting are provided in **Appendix B** and a copy of the slide presentation is provided in **Appendix M.**

Info Tech reclassified the items and contracts in the historical BAMS/DSS database, based primarily on functionality. By mapping the new contract work types to the statewide planning types, Info Tech performed statistical modeling to determine historical bid-based default prices per planning type. Ultimately, by tracking the planning types and the new work types together, it is possible to predict prices. However, further research is needed to map all planning types to appropriate work types. For example, at the final Advisory Committee meeting, an existing crosswalk table in CDOT's data warehouse that relates all the project types was mentioned. This could be expanded to include relationships to the new contract work types. Also, a contract review or postmortem procedure could be applied to verify a completed contract's work classifications based upon the actual items used in the job and the contract description text. This would facilitate generation of appropriate historical bid-based prices for use in cost estimation.

For non-bid items (PE, CE, ROW, force accounts), typically a default percentage of the construction costs is used for estimation, e.g. 17% for PE and 12% for CE. The need to update these values based on recent experience was mentioned a number of times at various meetings during the project. Since this data was not available in BAMS/DSS, CDOT was to conduct an internal study to review the percentages for PE, CE and ROW. At the meeting of the Advisory Committee in December 1999, it was mentioned that CDOT did have data for the past ten years for non-bid project costs. If this historic data were made available, then some statistical modeling could be performed to estimate the appropriate default percentages for individual work types.

Much of the project data available from CDOT's GIS system seemed to lack vital data elements. Potential parameters for long-range cost estimation include: quantity (lane miles), terrain, projected index for inflation, market, road/bridge type, and work type. Therefore, the project planning data for the 20-year plan and the STIP needs to capture as

much of this information as possible. For example, missing miles data needs to be filled in and the various projects should be classified by terrain type (i.e. rural, urban, mountain, plains). Additionally, better descriptions of the work to be performed on the job are required, and whether jobs which extend for many miles would be split up or involve structures jobs, etc.

Better project descriptions and more dimensions (lengths and widths) are also needed in the historical BAMS/DSS data in order to identify appropriate work types and calculate project-level quantities such as lane miles. Additionally, appropriate linkages to other CDOT data sources, e.g. the Integrated Roadway Information System (IRIS), are needed so that relevant planning project data can be accessed. As the volume of planning data available/linked to BAMS/DSS accumulates over time, the ability to predict long-range costs would improve simultaneously.

The corollary to this research project is for CDOT to move forward with implementation of the new CES. However, this requires CDOT to complete the migration of their Trns•port PES/LAS and BAMS/DSS systems to the client/server environment first. Also, CES is currently in the warranty phase, which will be completed by September 30, 2000. At that stage, implementation of CES can proceed with installation of the software and user training.

Additional implementation assistance, such as defining items to the parametric estimation cost groups, setting up cost sheets, fine-tuning the bid history procedures, and even CES system management can be provided by Info Tech. CDOT should assess its ability to provide adequate resources for CES versus outsourcing CES support, or some combination of both. If desired, further details on Estimation Support Services can be requested from Info Tech.

Appendix A

Minutes of the Advisory Committee Meetings

FIRST MEETING OF THE ADVISORY COMMITTEE

FOR THE

COLORADO DEPARTMENT OF TRANSPORTATION

LONG-RANGE COST ESTIMATION RESEARCH PROJECT

August 20, 1998

MINUTES

The meeting was held at the Division of Transportation Development (DTD), Colorado Department of Transportation. Liz Van Lauwe called the meeting to order at 10:00am by inviting each participant to introduce themselves. The attendees included:

CDOT:

Joni Allen	Information Systems,
Marilyn Beem	Statewide Planning,
Scott Burger	Staff Design, Cost Estimating,
Cecilia Joy	DTD, Mobility Section,
Ron Marschel	Region 1, Resident Engineer,
Greg Mugele	Region 6, Planning,
Larry Rein	Office of Financial Management and Budget, and
Liz Van Lauwe	DTD, Planning/Project Manager.

Info Tech:

Kathy Yellé,
Roy Johnstone.

The other member of the Advisory Committee (Dino Sarganis, CDOT, Staff Design) was absent due to vacation.

There followed some opening remarks by Liz Van Lauwe regarding the role of the Committee. She explained that the purpose of the Committee is to provide advice and input with regard to the research being conducted by Info Tech, Inc. on long-range cost estimation. Input from each committee member is welcomed and will be actively solicited. It is hoped that the Committee will meet about three times during the project period. From time to time, material may be distributed to each member for their review and comments. Also, Info Tech may call members directly if they have specific questions relevant to a given member's area of expertise.

Liz then continued with a description of the purpose of the project. Cost estimating is relevant at many points in the spectrum of CDOT activities. The overall goal, therefore, is to seek a broad solution that many people can use effectively. It is hoped that the diverse representation reflected in the makeup of the committee will contribute towards that goal. The project originated as a research project from a study by a committee looking at multi-modal changes in the transportation environment. The primary purpose is to produce consistent, reliable, and supportable cost estimates, starting at the long-range planning stage. We are looking to establish a process that can be reliably used from start to finish. We are hoping to develop tools that can be used and are consistent with methods and procedures being used by several CDOT offices. In this regard, the issue of the various work types currently in use was mentioned.

Kathy Yellé pointed out that this project is timely because Trns•port CES (AASHTO's Cost Estimation System software module) is currently in the process of being rewritten by Info Tech. CES is the only Trns•port module that does parametric/long-range estimation. CDOT has licensed the old CES version, but software problems have prevented successful use. The new CES design was overseen by a Joint Application Development committee, although CDOT was not specifically represented. However, to the extent possible, it is anticipated that this project will allow CDOT's perspectives on parametric estimation to be reflected in the final CES product. What we are driving towards is to move CDOT forward with the new CES at the end of this project. Overall, CDOT has a very good estimating record among DOT's at the final project estimate level, but needs to improve in the earlier estimating stages. The new CES is intended to be a "cradle-to-grave" application for cost estimation. A project can be entered with very little information initially and a long-range estimate created based on historical information. The new CES for the Sybase database environment (which CDOT uses) will not be available until the end of 1999.

At this point, Joni Allen asked how CES would handle design-build projects. Kathy Yellé gave some general information on Design Build. Scott Burger stated that CDOT would be better equipped to handle design build as a result of this estimation project. Already, CDOT has required contractors to provide at least a breakdown of the major items in design-build projects. (I70 East is an example of a design-build project in Colorado).

Joni also asked how projects at the long-range planning stage would be entered into the Trns•port Proposal and Estimates System (PES). Kathy replied that probably CDOT would not need to enter the conceptual projects into PES. However, they can be passed to PES from CES, if desired, to produce certain reports from PES, etc.

Kathy Yellé then presented an overview of the activities described in the Project Workplan (copies of which had been distributed at the start of the meeting). Under the first activity, Research & Design Parametric Estimation Process, Info Tech will be writing a report describing the current long-range estimation processes at CDOT and recommending possible changes in procedures, *e.g.* using more historical data to formulate estimates, etc. Researching historic data sources (Activity 2) will provide an

opportunity for more robust data to be fed to the long-range planning process. Activity 3 provides an opportunity to define enhancements that should be added to CES. Activities 4 and 5, Implement and Enhance Client/Server Trns•port CES, are included in the Workplan for information purposes only. They will not be part of this project as it is currently contracted.

A more detailed discussion of the individual tasks for each of the major activities followed. Cecilia Joy asked about the interim method of simple cost estimating mentioned in the Workplan under Task 1. Kathy Yellé replied that there is so little data available for conceptual projects that such an interim solution may not be possible. Essential data elements are not provided to the CDOT Geographic Information System (GIS). Cecilia thought that some of the specific data (*e.g.* length, width, depth) could be found in the Integrated Roadway Information System (IRIS) database. She posed the question: Are there some other data elements that folks should be using to help produce better cost estimates? Also, are there any other improvements to be recommended in this interim solution? Info Tech will likely focus more on revising the default costs (from GIS) for various project types using the historical data from Trns•port BAMS/DSS. They will load the project data into a spreadsheet and work with the bid history data to develop better cost estimates. As Kathy Yellé suggested, "let's do a better job on the default costs as a first step".

Ron Marschel commented that the work types were very important. This led into a major discussion of work types and project categorization for various purposes. Kathy indicated that part of this interim solution will focus on defining the work types appropriately (Task 2). She went on to discuss the various categorizations used for projects. In order to do a good job of historic price analysis, you must have good classification of items and projects. There is a lot of overlap in this area. Info Tech is developing a methodology to classify the work types. They will make recommendations for changing and/or revising work types and item classifications to facilitate better cost estimating. Info Tech will also map the current CDOT work types to the new proposed work types.

Ron described the difficulty of selecting a work type for a given project - do you pick it based on funding or work category, for example. A shoulder-paving project could be considered modal (in the context of bike paths), safety (improving bicycle/pedestrian safety), or minor widening. Per Kathy, a major question will be "How wedded are people to the current set of 70 plus work types used in the Planning Data Set?". The work types are relevant to estimation and collusion detection, and numerous other reporting purposes. They also relate closely to the item classifications. Cecilia asked whether Info Tech would provide a definition with the proposed list of work types, and how will these changes be integrated into current practices at CDOT? Per Liz Van Lauwe, one purpose of this committee is to provide input on this kind of question.

Cecilia asked if Info Tech needed people's buy-in on these changes before proceeding? Kathy replied that this was not absolutely necessary, since Info Tech could apply changes to its own copy of CDOT's BAMS/DSS database. According to Cecilia, a common

thread here is "How do you view the project?" - there are multiple audiences who see it differently. Kathy suggested that a task for the committee is to identify current assignments or uses for work funding and other categories.

Marilyn Beem stated that, with any project, it gets an identifier code that perhaps can be used to reflect the correct category. Scott Burger cited the example of buying an automobile - people buy a particular model for different reasons, but the cost is the same regardless. Ron Marschel highlighted the need to identify the originator of the project. Per Cecilia, we need to keep track of these categorizations throughout the process so that project information can be reported correctly.

Ron identified the need for some mechanism (*e.g.* data switches) to reflect other factors such as market conditions, limited products, remoteness and duration of the work - all of which can affect prices. These probably need to be noted as potential requirements in CES. Liz Van Lauwe noted that duration of work may also be related to funding. Kathy Yellé mentioned that "scheduling" was actually removed from the old CES. One of the primary problems with the old CES was that it tried to do too many things rather than focusing on cost estimation. The CES Joint Application Development Committee decided to redesign the new CES to be a road construction conceptual-to-final cost estimation tool.[1]

Ron outlined a specific project on the whiteboard that was affected by all these factors, causing his estimate to be way off -under by about 40% on a multi-million dollar project. This led to an engaging discussion of project types and work types, with all present participating. For example: Who requested the project - what type of project was it considered to be at the outset? (Ron). In the example cited, the project was initiated by the local entity as a safety project, but CDOT regards it more as minor widening or reconstruction. A given project may satisfy multiple purposes - we need to be able to carry more than one work type (Cecilia). Marilyn Beem noted that some categories in the State Plan are lumped together into a lump sum (*e.g.* resurfacing, bridge) rather than entered as individual projects.

Due to time constraints, this discussion was ended to allow time for a brief mention of the other tasks. Task 3, Define Major Items Within Work Types, was already discussed with the project work types. The tasks for Activity 2 involve researching other data sources, *e.g.* other states and federal sources. Marilyn asked about the status of cleaning up CDOT's historical data. Scott Burger responded that a summer intern had been employed reviewing the project plans and updating the database with relevant information (*e.g.* project length, width, depth, etc.). This information helps to improve parametric estimation.

Since this meeting, Info Tech was awarded a contract to develop a scheduling system that will be integrated with Trns•port. It is possible that AASHTO will adopt this system and offer it as part of Trns•port in the future.

As time was running out, several closing remarks were made to wrap up. Kathy Yellé commented by way of recommendation that, in Info Tech's experience, the States that are most successful in this type of effort are those that do not try to do it all themselves - this is very complex software that is used by a lot of different people. With regard to expected outcomes, any recommendations made will need input and support from the members of the committee if the project is to be successful. Cecilia Joy encouraged all present to look for opportunities for promoting buy-in since the purpose here is to provide a tool that will help the Regions with their planning. Cecilia and Liz Van Lauwe emphasized the need to think "cradle-to-grave". Liz asked committee members to identify specific reports that utilize cost estimates and to e-mail her with details.

Finally, scheduling for the next Advisory Committee meeting was discussed. Info Tech will be on-site again October 13-15. Wednesday, October 14, was agreed as the best day for a meeting. Cecilia suggested a longer time for the next meeting in order to cover work types and the proposed interim solution.

The meeting adjourned at 11:55am, although informal discussion continued amongst several participants for another 10-15 minutes or so.

(Minutes compiled by Roy Johnstone, Info Tech, Inc.)

SECOND MEETING OF THE ADVISORY COMMITTEE

FOR THE

COLORADO DEPARTMENT OF TRANSPORTATION

LONG-RANGE COST ESTIMATION RESEARCH PROJECT

October 14, 1998

MINUTES

The meeting was held at the Mt. Evans Conference Room, Division of Transportation Development (DTD), Colorado Department of Transportation. Liz Van Lauwe called the meeting to order at 9:00am by welcoming everybody present. The attendees included:

CDOT:

Al Allen*	Information Systems,
Marilyn Beem	Statewide Planning,
Scott Burger	Staff Design, Cost Estimating,
Cecilia Joy	DTD, Mobility Section,
Ron Marschel	Region 1, Resident Engineer,
John Mascarenas*	Information Systems,
Greg Mugele	Region 6, Planning,
Larry Rein	Office of Financial Management and Budget,
Dino Sarganis	Staff Design, Cost Estimating,
Liz Van Lauwe	DTD, Planning/Project Manager.

Info Tech:

Kathy Yellé,
Ragan Gilbert,
Wick Heath,
Roy Johnstone,
Janese Nix.

*Not a member of the Advisory Committee.
John Mascarenas stood in for Joni Allen (CDOT-IS) who was unable to attend.

Following some brief opening remarks by Liz Van Lauwe regarding the role of the Committee, each participant introduced themselves.

The first item on the agenda was to review the Minutes of the previous meeting, which was held on August 20th. Since each committee member had already received a copy of the Minutes, Liz suggested that any corrections be forwarded to her and that, given the amount of material to be covered, we move quickly to the major items on the agenda. Marilyn Beem noted that, on page 4 of the Minutes, "reinforcing" should be changed to "resurfacing". With regard to the mention of scheduling systems in the Minutes, Kathy Yellé commented that Info Tech was currently developing a system for Indiana which will probably be adopted by AASHTO as part of the Trns•port suite of software. At this point, Liz asked Kathy to spend a few minutes describing the background and system modules in Trns•port for the benefit of those present who were unfamiliar with Trns•port. Kathy obliged with a brief outline mentioning the major Trns•port systems, including the Cost Estimation System (CES).

Liz continued with a recap on how this project originated, i.e. from the need to develop a consistent method to track projects through their entire life cycle. Cost estimating is relevant at many points in the spectrum of CDOT activities. The primary purpose is to produce consistent, reliable, and supportable cost estimates, starting at the long-range planning stage. We are looking to establish a process that can be reliably used from start to finish. The overall goal, therefore, is to seek a broad solution that many people can use effectively. We are hoping to develop tools that can be used and are consistent with methods and procedures being used by several CDOT offices.

Liz talked about the issue of project classifications, i.e. the different purposes and reasons that projects are tracked and mapped for planning, financing, etc. She then handed over to Wick Heath of Info Tech. A handout on Item and Contract Classifications and the Interim Solution for Default Long-Range Planning Dollar Values, prepared by Info Tech, had been provided to each participant at the start of the meeting.

Wick began by explaining that part of the overall goal is to determine how to get better estimates. We have a detailed history of costs at the line-item level available from DSS. We want to be able to make better predictions based on these costs.

Info Tech has done significant work for CDOT and other states in the area of competition analysis. Many of the techniques used here are also relevant to cost estimating. For example, identifying markets (e.g. asphalt) is one component. Markets are fundamental to determination of competition and price. Each job, or type of job, will attract a different set of contractors. Markets impact price, e.g. asphalt markets showed variances of $5.00 per ton in a recent study for CDOT. This may be due to variances in material costs, etc.

To determine a market, we have to group the items according to their functionality, i.e. what is required to perform these work items. Wick displayed a sample of items on the projection screen (Item Exhibit in the handout) and discussed several items, emphasizing how different items require different contracting capabilities and, thus, will tend to attract a different group of vendors. There are also other non-bid items (e.g. force accounts) that factor into the contract price.

Having classified the items from the CDOT Trns•port DSS historic data, we can then classify the contracts. Wick displayed a spreadsheet showing the "percent weighted average dollars by item classification per work type" (Comparisons.xls in the handout) and discussed several examples to explain why a given contract classification was appropriate, i.e. a single item class is controlling the job. However, not all contracts are so easily classified. General construction jobs, for example, may have equal portions in different major item classes - no big spike in a particular category such as asphalt, structures, etc. Info Tech classified all the jobs in the database, which spanned the period from January 1990 to October 1997. This allowed us to determine the major markets. For example, based on *circa* 500 contracts, we determined that there were six distinct asphalt markets in Colorado.

Wick posed the question "How do these revised contract classifications compare with the existing classifications?". Currently, there are 22 work type codes in CDOT's DSS system. If you take the weighted average item allocation per contract classification, you can see that asphalt, for example, features prominently in several of the existing work types. With the new work type classifications, the allocation of the dollars is more focused. For example, the dollars in the ERTH contracts are concentrated for the most part in the ERTH work items. By comparison, general construction (GEN) jobs are flat, with several item classes showing similar percentages.

Next, Wick displayed a spreadsheet showing the "old work types mapped to new work types" (OldNewEx.xls in the handout). This shows the contract breakdown of the old work types relative to the new work types. For example, **Restoration/Rehab** has contracts in several new work classes, i.e. CONR (7 contracts), GEN (6), ASPH (4), OTHR (3), SURF (3), DRNG (1), and ERTH (1). Similarly, **Safety** has contracts spread over a number of new work types, with ASPH (25), GDRL (24), PVMK (23), GEN (20), and SGNL (19) most prominent. Wick commented that "It seems clear, therefore, that you are unlikely to find a contractor that specializes in Safety". **Reconstruction** is also a very mixed bag, with 13 or 14 new classifications represented. The **Miscellaneous** category is full of all sorts of jobs in terms of functionality. **New Construction** included two lump sum jobs, which are very tough to analyze or estimate.

Wick continued to say that some earlier work has been done, although not completed, to map the current DSS contract classifications to the GIS planning work types. To some extent, the GIS work types are acceptable. On the other hand, there are obvious problems. For example, Rest Area jobs would need to be pulled out of the list of jobs used to calculate average prices for Capacity. Similarly, for other categories, it was necessary to eliminate jobs from the universe of jobs used to estimate a particular work type. In some instances, we used our new work type since it was exactly the same as the GIS work type. This was the basic approach used to determine default pricing from historical data. At this point, Wick displayed a worksheet showing the contract types used and the contract types removed from consideration for determining the default price for a given GIS work type (DefaultPriceWorksheet.xls in the handout).

The final component in Info Tech's methodology was to review detailed project descriptions to eliminate any contracts that should clearly not be included in a given category for the purposes of determining default pricing. Wick then displayed a spreadsheet showing the historical bid-based default prices, which were based on the total dollars for the list of contracts to be included in each work type category and also applying an inflation factor based on the producer price index (NewDefaultPrices in the handout).

Kathy Yellé then spoke. She said that "One of Info Tech's tasks was to come up with a mechanism to estimate. Having looked at the data, we found that we were missing vital data elements. Wick has described what we were able to accomplish. Some of these prices may be good, but others may not be so appropriate. We have the old default prices which were based on expertise, these new ones based on historical analysis, and also Scott Burger's which are based on some elements of both expertise and historical analysis (The latter refers to a current analysis prepared by Scott for "Ballpark costs for 8 common highway elements"). We are looking to improve on these individual prices based on a combination of these analyses."

At this point, Liz invited questions. Cecilia Joy asked about the application of these new work types permanently in some system. Wick explained that what we would need is to further fine tune the GIS type descriptions in order to relate them more closely to the work types. Ron Marschel also asked about the reclassification. He suggested that, in rural Colorado, most of the work types used are probably wrong anyway. He pointed out the importance of having no overlap in the work types. Kathy Yellé responded with some further comments about the work types. By going through this reclassification exercise, Info Tech effectively worked around the possibility of erroneous work type assignments.

Cecilia commented about the interchange data - only terrain type All (A) is covered. Ron suggested that "switches" to escalate the prices would be useful to account for the uniqueness of a job. Factors such as market conditions, limited products, remoteness, and duration of the work can all affect prices. A job at an intersection could be a capacity job or a safety job, for example. Janese Nix commented that only four of the 26 interchange jobs used in the analysis were non-urban.

Larry Rein asked about right-of-way (ROW) issues in the prices. (This will be talked about later in the meeting). Greg Mugele asked about the streamlining of the GIS work types and if that had been done, or whether Info Tech would be doing that. Kathy replied that Info Tech was looking at that, but Liz also emphasized that the uniqueness of individual situations makes this a particularly difficult task.

Scott Burger asked if Info Tech was adding a second layer below the GIS work types. Wick responded in the affirmative, explaining that, ultimately, by tracking both the GIS work type and our work types together, we can predict prices. Kathy added that Info Tech would include these recommendations in our report.

Cecilia commented again that, for new interchanges, CDOT needs a further refinement because of the critical nature of this work category - likewise for interchange improvement. Ron suggested that some philosophical changes at CDOT have an impact here, e.g. it is not cost-effective to redo an interchange in asphalt - you need to use concrete; also, different mixes are now being used - this has increased prices by $10.00 (per ton?) on average. Wick commented that some of these interchange jobs may involve much more than an interchange, e.g. road work, etc. Marilyn commented that three MPO's have already done their estimates, with their interchanges varying from 9 to 57 million dollars. She suggested that, perhaps, by breaking out this data we might be able to apply it here. Scott Burger commented that, for the exercise he is doing, the price variation is so great that a range of $2 to $200 million seems appropriate. Cecilia maintained that such a wide range is not good enough. We need to get closer to the real-life price on these types of jobs, especially since they were a particular concern in the legislative audit.

Wick asked about the existence of multiple contracts per interchange. Several people responded that this was indeed the case. The "mouse-trap" was cited as a good example. Greg suggested that typically two to four contracts is common. Wick emphasized that Info Tech was not aggregating these instances of multiple contracts for one interchange in the data presented today.

Liz asked "Is there a way to include some of these MPO data for price calculations?". Larry suggested that classifications could be based on vehicle miles travelled (VMT), or some such measure. "How many lanes are involved?" could also be used to refine interchanges.

Cecilia commented on the level of technical support that would be required to gather a greater level of project detail out in the Districts. Wick gave an example of a capacity project - it could be adding a lane, adding a passing lane for a short distance, etc. We need enough detail to look at appropriate portions or stretches of road on a particular job. Ultimately, we can then build a profile of a typical job for a given work type. Dino Sarganis commented that "Estimation is not an exact science - we have to use engineering judgement".

John Mascarenas asked "What happens if you over-estimate?". Ron and Greg answered that you could lose the job entirely. In such a case, funding may tend to go to other less costly jobs.

At this point, the meeting adjourned for a 10-15 minute break.

The meeting restarted with Liz recapping briefly on what Info Tech had tried to do in its analysis. We have also been talking somewhat about interacting with the GIS data, etc. Feedback on the individual categories and new default prices is next, by going down through the Historical Bid-Based Default Prices table. Wick commented that any issues raised here will assist Info Tech in refining the price analysis.

Marilyn commented that the original defaults included ROW and engineering costs (that was how they instructed the designers who came up with these prices), but the adjusted price that Info Tech has calculated is not using these factors. Kathy responded that this was an issue that Info Tech wanted to bring to the table for discussion today. Ron mentioned that costs are typically higher if outside consultants are used. Cecilia commented that "We don't really know at this early stage, so an overall percentage is more appropriate. Larry stated that this approach has already been used for these non-bid items and he cited figures of 11% and 9% for CE and PE, respectively. Wick asked if these numbers were constant from year to year. What about inflation?

Ron stated that, for bridges, PE can be as high as 50%. Larry agreed that this level of refinement was missing. Cecilia wondered whether an overall average of 11%, say, was as good as more detailed job type by job type percentages when looking at the total budget. Ron commented that the size of the job was a major factor in these costs. Scott also agreed that a table of PE percentages by job type would be best. Kathy asked where the PE costs were kept. Larry has provided some past data. He also pointed out that PE costs could cover more than one project.

Cecilia recommended doing an analysis of projects to establish PE percentages, or whether one overall percentage would be sufficient. She asked if Info Tech would do this? Wick replied that Info Tech does not have access to this particular data, so it would need to be an inhouse project by CDOT. Cecilia suggested that perhaps one of her staff, together with Scott and Larry, could attempt to review PE costs. Marilyn asked "How is PE accounted for in the resurfacing and bridge programs?". Maintenance and Operation (M&O) is another category that is a major program. Marilyn is concerned whether these estimates include preliminary engineering costs. There was some discussion as to where exactly the PE costs are tracked at CDOT. Cecilia was keen to do something on this issue. Kathy suggested that Info Tech could research the database and get back to Liz with their findings.

Utilities was also mentioned, although Cecilia said that this was typically too low (around 1%) to be a major concern, whereas PE and ROW are more appropriate for inclusion. Liz summarized the discussion by saying that it would be nice to have individual percentages by work type but, failing that, an overall percentage should be used. CDOT is to follow up internally on the issue of percentages for CE, PE and ROW.

Scott asked "How is ROW paid for?". Ron replied that, if a major corridor is involved, a separate ROW project might be set up. Otherwise, this would be a cost in the project. Ron noted that, for a resurfacing project, the rule is "there should be no ROW cost". However, this is frequently not true and it probably indicates a problem of some kind.

The meeting then continued with a line-by-line discussion of the job types and prices in the Historical Bid-Based Default Prices table. Ron suggested that Geometrics should be eliminated. More discussion of work types followed. Cecilia asked how Info Tech was going to track this. Again, Kathy suggested that we could track this best with a new data table. Wick added that, under each GIS type, we could have work types with a

percentage allocation of the job to each. Ron was pleased with this approach since it matched with his own perception of the problem. He recommended a "decision tree" approach. Wick warned against getting too refined, since the number of observations goes down accordingly. Scott remarked on how the old CES would return no estimate if you selected too many parameters. Wick added that "everything becomes a trade-off". To do econometric analysis, you want more data for meaningful estimation!

Ron remarked that, for example, in a resurfacing project, you look at traffic volume and accident numbers - you may have to go with concrete, i.e. more than six inches. At this depth level, a resurfacing job automatically becomes a reconstruction job. Liz commented that we can't cover every possibility, much as we'd like to. Ron explained that resurfacing is scoped out two to three years ahead. Roy asked how the program estimate for resurfacing was produced. Marilyn explained that this comes from a resurfacing pool - traffic factors, etc. are used to determine/predict the requirements. However, Marilyn stated that she was not overly concerned at this time with better resurfacing estimates.

Larry suggested that the work types/contract classifications are not necessarily sacrosanct. "What we need is a system that is uniform but still meets our reporting requirements". Kathy replied that Info Tech could make recommendations in this regard. At this point, Cecilia resorted to the whiteboard and drew a schematic. She sees a greater need to relate back to a higher level, e.g. safety, mobility, system preservation. There was some discussion of this and Scott also added other reporting categories to the schematic. Cecilia clarified that "What CDOT needs is an overall tool to handle the requirements - the cost portion is Info Tech's slice". Ron remarked that, for all resurfacing projects, they have to write up a safety letter (Procedural Directive 581) which might help to analyze the safety program.

As time was running over, Liz began her closing remarks. She encouraged feedback on the default prices, especially via e-mail to her. Roy emphasized the need for early responses to allow Info Tech to factor them into the defaults promptly. Marilyn provided her marked-up copy of the new default prices immediately. The Guardrail data in particular seemed to her to merit further review and analysis.

Liz discussed the plan for linking into the new CES and Kathy updated the Committee re the CES delivery status. What we are driving towards is to move CDOT forward with the new CES at the end of this project. The new CES is intended to be a "cradle-to-grave" application for cost estimation. The current development schedule anticipates a mid-1999 delivery date. However, the new CES for the Sybase database environment (which CDOT uses) will not be available until the end of 1999. We will continue with our scheduled workplan and then put the final part of the project on hold until the new CES is available for testing with CDOT data.

Cecilia wanted to know how Info Tech planned to wrap up the interim solution. Kathy responded that Info Tech would incorporate the feedback received at this meeting, to the extent possible based on the available data, and send a final package for the interim

solution in mid-November. Cecilia remarked that one reason this research project got supported was the hope that it would contribute to the upcoming planning review process. She feels it is very critical that CDOT meet that commitment. Cecilia asked that a description be provided for the expected deliverable and was anxious for a meeting to be scheduled to review it. She does not feel that CDOT has enough information from Info Tech's presentation today to serve as a valid interim solution, e.g. a form/etc. for estimators to fill out. Her impression is that some of the procedural recommendations would also need to be included. Kathy said that she would forward a sample outline for the final interim solution to Liz as soon as possible.

There was some discussion about the need for a review meeting after delivery of the interim solution. Due to scheduling conflicts for several people, no decision on a meeting was reached at this time. However, since Info Tech representatives will be at CDOT in early December in relation to another project, the need for a meeting on the interim solution could be revisited once CDOT has reviewed the final interim solution package.

At this point, the Advisory Committe Meeting was adjourned, with the time at approximately 12:30pm.

(Minutes compiled by Roy Johnstone, Info Tech, Inc.)

FINAL MEETING OF THE ADVISORY COMMITTEE

FOR THE

COLORADO DEPARTMENT OF TRANSPORTATION

LONG-RANGE COST ESTIMATION RESEARCH PROJECT

December 3, 1999

MINUTES

The third and final meeting of the Advisory Committee was held at the Mt. Evans Conference Room, Division of Transportation Development (DTD), Colorado Department of Transportation. Richard Griffin (DTD) called the meeting to order shortly after 8:00am by welcoming everybody present. The attendees included:

CDOT:

Joni Allen	Information Systems Center
Nancy Brumley	DTD, Statewide Planning
Marilyn Beem	DTD, Statewide Planning
Paul Engstrom	Region 1
Richard Griffin	DTD, Research
Timothy Harris	Project Development
John Mascarenas	Information Systems Center
Shelley Ostrem	Information Systems Center
Larry Rein	Office of Financial Management and Budget
Dino Sarganis	Staff Design, Cost Estimating
Shawn You	Staff Design, Cost Estimating
Mohamed Zaina	Staff Design, Cost Estimating

Info Tech:

Kathy Yellé
Roy Johnstone

Richard Griffin began with a brief description of the project. This is a research project on long-range cost estimation. The primary purpose is to assist CDOT in developing a method to produce consistent, reliable and supportable cost estimates, starting at the long-range planning stage, i.e. when very little is known about a project. Each of the attendees then introduced themselves. Richard then called on Kathy Yellé to present the Wrap-Up Presentation for the project.

Kathy began with some background remarks. Since the last Advisory Committee Meeting was held back in October 1998, Kathy explained that there had been a delay in the project due to the revised development schedule for the Trns•port Cost Estimation System (CES). What we are driving towards is to move CDOT forward with the new CES at the end of this project. The new CES is intended to be a "cradle-to-grave" application for cost estimation. However, with CES being tied to other projects, there was a ripple effect from various delays. As a result, the final part of this project was put on hold until the new CES became available for testing with CDOT data. Although CES is almost complete, we are not ready to give a full CES demonstration today. Instead, Info Tech will schedule a CES demonstration for early next year, probably sometime after March 1st.

Kathy then proceeded with her slide presentation, beginning with a Project Overview outlining the various project tasks and following with a Discussion of Research Results for each task. She mentioned that an interim cost-estimating solution (Interim Solution for Default Long-Range Planning Dollar Values) was provided by Info Tech last year. However, it may not have been used very much in practice. Marilyn Beem indicated that the Interim Solution had been circulated to the engineers in the Regions, so they did have it available to them. Dino Sarganis asked if Info Tech was going to report with actual data on what CDOT is currently doing. Kathy replied in the affirmative and proceeded to display a slide showing the results of Task 1, which summarized the basic steps in CDOT's planning process.

Shelley Ostrem mentioned a new "electronic linkage" process that is being implemented for the STIP and enquired where CES would fit into the overall process at CDOT. Kathy explained that CES is only intended to be an estimation system. Shelley indicated that she could make a copy of the functional requirements for this new STIP planning system available.

Marilyn mentioned another project dealing with investment categories (5 categories, e.g. System Quality) and wondered if there was any impact on what Info Tech was doing. This led to further discussion on project categorization issues. The question of work types was addressed specifically under Task 2 of the project. Roy Johnstone distributed a cross-reference table showing examples of statewide planning types mapped to CDOT BAMS/DSS work types and to new proposed work types for estimation purposes. Kathy mentioned the possible need to track project classifications for multiple purposes using a new database table. This could be an enhancement to the Trns•port systems.

Shelley asked about the inclusion of non-bid costs and indicated that she had data available for the past ten years on these project costs. This issue was discussed at length at the previous Advisory Committee meeting, with overall percentages suggested for items such as CE, PE and ROW.

At this point, Dino asked if everyone understood the terminology being used in relation to Trns•port, e.g. PES, LAS, etc. By way of explanation, Kathy took a few minutes to describe briefly the background and individual system modules available in Trns•port,

and displayed a slide showing the major Trns•port systems (all of which are used at CDOT).

The discussion of work types then continued. Shelley mentioned an existing crosswalk table that relates all the project types and asked if that would need to be expanded to include Info Tech's proposed work types. Kathy replied that this would be appropriate.

Larry Rein asked how you would know that the work type would be ASPH, for example, when doing long-term planning. Kathy responded that you would have a general idea based on the description of the proposed project and that the work type could be changed or refined over time, as more information became available for the project.

Shelley raised the question of data consistency between different systems and passing of data between them. Larry asked if changes in CES estimates would be automatically transmitted to other planning systems. Kathy replied that they could be, but this may not be the preferred approach. Marilyn noted that, in the recent round of planning revisions, they found several cases where the same "old" estimate was simply put back in for a project and they are now seeking to get these updated.

Kathy continued with a discussion of major item classifications (Task 3) and showed some slides of item class rankings for CDOT contracts. There was a lot of interest in and discussion of the item rankings. The item rank data showed, for example, that the top four classes (ASPH, STRC, CONC, ERTH) accounted for 60% of the contract dollars for all contracts in the period studied (January 1990 to August 1997). The item class ranking could be used in CES to profile a contract for estimation purposes.

At this point, the meeting adjourned for a 10-15 minute break.

After the break, Kathy continued with the results for Task 4, Research Historic Data Sources. Info Tech conducted research on the Internet to locate national, State and other data sources. While there is a lot of data available from FHWA and FTA, it is not at the project level. State data on the Internet is typically limited to recent bid data. Regional Planning sites provided several reports, such as major investment studies, but no historical project data.

Sharing of BAMS/DSS data between States is complicated by differences in work types and item classifications. Recently, Info Tech has worked with a number of States to classify their items and contracts, so some State data is getting to be more similar. Also, if State data are classified by major item/cost groups, this would facilitate more direct comparison.

Task 5, Assure Outside Data Compatibility, became essentially redundant, given the absence of historical data available. CES will support importing of heavy construction cost data from R.S. Means.

Next, Kathy discussed quantity calculations and Info Tech's efforts to model quantities for a given work type (Task 6). We had pretty good results modeling asphalt quantities based on lane miles. A field for "Lane Miles" has now been added to the Trns•port database.

Larry asked about inflation factors? Shelley pointed out a need for individual inflation factors by major item groups, since prices of different item classes tend to vary at different rates. This was noted as a potential enhancement for CES.

With regard to Additional CES Enhancements (Task 7), the following CDOT requirements were also noted:

1. Parametric estimation of quantities
   (the new CES uses cost groups but does not support quantities).

2. Multi-modal parametric estimation
   (pilot test a single multi-modal type; this requires building a data history and/or finding a data source).

3. Sufficient contract classifications for varying purposes
   (this requires a new database table).

Kathy asked about the availability of multi-modal data for loading into BAMS/DSS. The Southeast Corridor project (being run by RTD) should be a good source of data for light rail, but probably not for some time yet. Roy suggested that given the nature of rail projects they may be more comparable nationwide (as opposed to other work types), so getting historical data from other States for light rail might be feasible.

The question of a networked versus a standalone workstation was also discussed. A standalone CES system did not appear to be a major requirement for CDOT, since network connectivity is generally available where CES would be used.

This concluded the discussion of the project results. Kathy's final slides then summarized the outstanding issues (complete the Final Project Report; schedule a CES demonstration) and where CDOT goes from here (migrate to Client/Server Trns•port; implement CES). She indicated that implementation of CES should wait until the Client/Server versions of PES/LAS and BAMS/DSS are installed at CDOT first.

Tim Harris expressed a concern that if we have a "handy/automated system", it will tend to be abused in that users will be inclined to assume that the system is always right. They may not take time to spec out projects sufficiently, but just blindly accept the defaults suggested by the system. Marilyn commented that, because the Transportation Planning Commission is now requiring so many reports/etc., this practice would be likely to be detected fairly quickly.

At this point, the Advisory Committee Meeting concluded, with the time at approximately 11:00am.

Following the meeting, some of the attendees stayed on for further discussion and to see a short slide presentation from Info Tech on the functionality of Trns•port CES.

(Minutes compiled by Roy Johnstone, Info Tech, Inc.)

Appendix B

CDOT Transportation Planning Data Set

Part 1: GIS Map Coverages

Airports	
Boundaries:	CDOT Commission CDOT Maintenance CDOT Regions Census Tracts Colorado Legislative County Indian Reservations MPO Municipal National Forests, monuments, parks Non-attainment air quality zones Transportation Planning Regions Urban limits US Congressional
Corridors:	Bicycle ITS NHS Scenic Byways SSC WTTN
Highways	
Projects:	Budgeted Statewide Other
Public Roads:	Arterials and collectors Local roads Other
Railroads	
Transit:	Facilities Routes
Water Features:	Lakes Rivers

Part 2: Database Files

Airport Data:	Airport name, Hours of operation, Lighting availability, Major city served, Max. runway length, Navigational system, Number of runways, Passengers per year, Runway length, Takeoffs/landings per day, season or year, Type of service (Commercial, General Aviation, Reliever, other).
Demographic characteristics (available by county and TPR):	Age, Income, Employment, Number of housing units, Population (current and projected), Vehicle Miles Traveled (VMT).
Highway data:	Lane width, Median type, Median width, Number of through lanes, Pavement condition, Posted speed limits, Segment length, Shoulder width, Shoulder type, Surface type.
Other public road data:	Functional classification, Lane width, Owner, Number of lanes, Road name, Segment length, Surface type.
Project locations:	Description, Estimated cost.
Railroads: Mainlines Only	Abandonment status, Amtrak routes, Class code, Owner, Passengers per year, Trackage rights, Trains per day.
Traffic:	Average Annual Daily Traffic (AADT), Average daily truck percentage, Design hour volume, Directional distribution, Prior year(s) AADT, Projected AADT in 20 years, Vehicle classifications (# of single unit and combination trucks), Volume to capacity ratio (current and projected).
Transit:	SERVICE PROVIDER – Operator name, Annual budget, Annual capacity, Number of service vehicles, Passengers per year, Type of service. ROUTES – Hours of service, location.

Appendix C

Planning Work Types / Default Unit Costs / Project Data

Colorado Statewide Planning Work Types

Work Type	Statewide Planning Work Type Description	Category	Function
101	Capacity / Add Lanes	Highway	Mobility
102	Geometrics Safety	Highway	Safety
103	Reconstruction [State Highway]	Highway	System Quality
104	Surface Treatment	Highway	System Quality
105	Bridge [On System Program]	Highway	System Quality
105	Bridge [Off System Repair, Reconstr, Rehab Program]	Highway	System Quality
106	Passing Lanes	Highway	Mobility
107	New Interchange	Highway	Mobility
108	Improve Interchange	Highway	Mobility
109	Truck Ramp or Net	Highway	Mobility
109	Truck Ramp or Net	Highway	Safety
110	Rest Area / Info Center [State Program]	Highway	System Quality
111	Traffic Operations	Highway	Mobility
112	Grade Separations	Highway	Safety
113	Corridor Study	Highway	
114	Improve Intersection	Highway	Safety
115	Safety / Guardrail	Highway	
116	Noise Barrier	Highway	System Quality
117	Drainage / Erosion Control	Highway	System Quality
118	HOV or Bus Lanes	Highway	Mobility
119	New Construction	Highway	Mobility
120	State M&O	Highway	System Quality
121	Regional / Local M&O	Highway	System Quality
122	Regional / Local Surface Treatment	Highway	System Quality
123	Non-Eligible Bridge Repair, Reconstruction, Rehabilitation	Highway	System Quality
124	Regional / Local Reconstruction	Highway	System Quality
125	Regional / Local Rest Areas	Highway	System Quality
126	Regional / Local Noise Barriers	Highway	System Quality
127	Safe Driver Behavior Programs	Highway	Safety
128	New Traffic Signals	Highway	Safety
129	Accel / Decel Lanes	Highway	Safety
201	Pedestrian Facility [Sidewalks / Trail Heads]	Enhancements	Mobility
202	Bike Facilities / Programs	Enhancements	Mobility
203	Acquire [Scenic] Easement for Historical / [Scenic Sites]	Enhancements	System Quality
204	Scenic [historic] Highway [Programs]	Enhancements	System Quality
205	Transportation Buildings [Rehab & Op of Historic]	Enhancements	System Quality
206	Landscaping [& Other Scenic Beautification]	Enhancements	System Quality
207	Preserve [of abandoned] Rail ROW [for Trail Use]	Enhancements	Mobility
208	Control [and Removal of Outdoor] Advertising	Enhancements	System Quality
209	Archeological [Planning and] Research	Enhancements	System Quality
210	Mitigate [Water] Pollution [due to Highway Runoff]	Enhancements	System Quality
211	Trailheads	Enhancements	Mobility
212	Corridor Study	Enhancements	
213	Bike Master Plan	Enhancements	
214	Historic Preservation	Enhancements	System Quality
301	Operating Funds	Transit	Mobility
302	Bus Purchase	Transit	
303	New Maintenance Facility	Transit	System Quality
304	Rehab Maintenance Facility	Transit	System Quality
305	Bus Stops / Bus Shelters (New Construction)	Transit	Mobility
305	Amenities [Bus Shelters / Bus Stops]	Transit	System Quality
306	New Service	Transit	Mobility
307	Transit Development Program	Transit	
308	Transit Planning	Transit	
309	Exixting Transit Service Capital Needs	Transit	Mobility
310	Exixting Transit Service Operating Needs	Transit	Mobility
311	New Transit Service Capital Needs	Transit	Mobility

Colorado Statewide Planning Work Types

Work Type	Statewide Planning Work Type Description	Category	Function
312	Light Rail Capital for New / Expanded Service	Transit	Mobility
313	Light Rail Operating for New / Expanded Service	Transit	Mobility
314	Security Equipment and Staff	Transit Safety Programs	Safety
401	Navigation Equipment	Aviation	Safety
402	Runways / Taxiways [New / Expanded]	Aviation	Mobility
403	Fire / Rescue Equipment	Aviation	Safety
404	Hangers [Fencing (New, Replacement, Rehab)]	Aviation	System Quality
405	Snow Removal Equipment	Aviation	
406	Lighting	Aviation	Safety
407	Terminals	Aviation	
408	Commuter Aviation Services [Operating Needs]	Aviation	Mobility
409	General Aviation Services [Operating Needs]	Aviation	Mobility
410	Airport Master Plan	Aviation	
411	Maintenance Facilities, Equipment (new / Replace / Rehab)	Aviation	System Quality
412	Resurfacing of Runways, Taxiways, Aprons	Aviation	System Quality
413	Reconstruction of Runways, Taxiways, Aprons	Aviation	System Quality
414	On-Site Road Maintenance Resurfacing / Reconstruction, Relocation	Aviation	System Quality
415	Noise Mitigation	Aviation	System Quality
416	Existing Commercial Air Service Capital Needs	Aviation	Mobility
417	Expanded Commercial Air Service Capital Needs	Aviation	Mobility
418	Expanded Commercial Air Service Operating Needs	Aviation	Mobility
419	Existing General Aviation Capital Needs	Aviation	Mobility
420	Expanded General Aviation Capital Needs	Aviation	Mobility
421	Expanded General Aviation Operating Needs	Aviation	Mobility
422	Safety Related Improvements to Runways, Taxiways, Aprons	Aviation	Safety
423	Obstruction Removal	Aviation	Safety
501	Rail Line Construction	Rail	Mobility
502	Rail Sidings	Rail	Mobility
503	Rail Stations	Rail	
504	Rail Vehicles	Rail	
505	Rail M&O	Rail	
506	Rail ROW Acquisition	Rail	Mobility
507	Rail Studies	Rail	
508	Upgrade Crosslings	Rail	Safety
509	Light Density Track Replacement or Rehabilitation	Rail	System Quality
510	New Commuter Rail Capital Needs	Rail	Mobility
511	New Commuter Rail Operating Needs	Rail	Mobility
512	Existing Passenger Rail Capital Needs	Rail	Mobility
513	Existing Passenger Rail Operating Needs	Rail	Mobility
514	Expanded Passenger Rail Capital Needs	Rail	Mobility
515	Expanded Passenger Rail Operating Needs	Rail	Mobility
516	Existing Freight Rail Capital Needs	Rail	Mobility
517	Existing Freight Rail Operating Needs	Rail	Mobility
518	Expanded Freight Rail Capital Needs	Rail	Mobility
519	Expanded Freight Rail Operating Needs	Rail	Mobility
520	Rail / Highway Grade Separations	Rail	Safety
601	Transfer Stations [New Construction / Replacement]	Intermodal	Mobility
602	Park-n-Rides [New Construction]	Intermodal	Mobility
603	Transit Stations [New Construction / Replacement]	Intermodal	Mobility
604	Airport Terminals	Intermodal	Mobility
605	Kiosks / Info Centers	Intermodal	
606	Intermodal Studies	Intermodal	
607	Transit Terminal (Reconstruction, Rehab, Repair)	Intermodal	System Quality
608	Rail Terminal (Reconstruction, Rehab, Repair)	Intermodal	System Quality
609	Airport Terminal (Reconstruction, Rehab, Repair)	Intermodal	System Quality
610	Air Cargo Facility (Reconstruction, Rehab, Repair)	Intermodal	System Quality

Colorado Statewide Planning Work Types

Work Type	Statewide Planning Work Type Description	Category	Function
611	Rail/Truck Transfer Facility (Reconstruction, Rehab, Repair)	Intermodal	System Quality
612	Park-n-Rides (Reconstruction, Rehab, Repair)	Intermodal	System Quality
613	Kiosks / Info Centers (Reconstruction, Rehab, Repair)	Intermodal	System Quality
614	(New Construction / Replacement)	Intermodal	Mobility
615	Air Cargo Facilities	Intermodal	Mobility
701	IVHS	ITS / Telecommunications	Mobility
702	Traffic Ops Center	ITS / Telecommunications	Mobility
703	Telecommunications	ITS / Telecommunications	Mobility
704	Automate Ports of Entry	ITS / Telecommunications	Mobility
705	ITS Facilities, Equipment (Maint, Rehab, Recon, Replacement)	ITS / Telecommunications	System Quality
706	TSM Facilities, Equipment (Maint, Rehab, Recon, Replacement)	ITS / Telecommunications	System Quality
707	Public Transportation Management	ITS / Telecommunications	Mobility
708	Electronic Payment	ITS / Telecommunications	Mobility
709	Emergency Management	ITS / Telecommunications	Safety
710	Advanced Vehicle Safety Systems	ITS / Telecommunications	Safety
800	Mobility Related Plans and Studies	Plans and Studies	Mobility
801	System Quality Related Studies	Plans and Studies	System Quality
802	Driver-Related Safety Plans and Studies	Plans and Studies	Safety
803	Roadway Related Safety Plans and Studies	Plans and Studies	Safety
901	Carpool / Vanpool Programs	Travel Demand Management	Mobility
902	Travel Demand Management	Travel Demand Management	
903	TMOs and TMAs	Travel Demand Management	Mobility
904	Telecommuting Facilities	Travel Demand Management	Mobility
999	Placeholder Costs for Undetermined improvements, including MIS/CIS	Undetermined Mobility Solution	Mobility
1000	Access Control	Transportation System	Mobility

CDOT Default Unit Costs

Statewide Planning Work Type Description	Work Type	Terrain Class	Default Unit Cost	Units	Description	Extra Description
Capacity / Add Lanes	101	M	3,000,000	Mile	Capacity:	2 Lane Miles
Capacity / Add Lanes	101	P	2,000,000	Mile	Capacity:	2 Lane Miles
Capacity / Add Lanes	101	R	2,500,000	Mile	Capacity:	2 Lane Miles
Capacity / Add Lanes	101	U	4,500,000	Mile	Capacity:	2 Lane Miles
Geometrics Safety	102	M	750,000	Mile	Geometric:	Safety (lane...
Geometrics Safety	102	P	425,000	Mile	Geometric:	Safety (lane...
Geometrics Safety	102	R	500,000	Mile	Geometric:	Safety (lane...
Geometrics Safety	102	U	1,000,000	Mile	Geometric:	Safety (lane...
Reconstruction [State Highway]	103	M	3,000,000	Mile	Reconstruction:	2 Lane
Reconstruction [State Highway]	103	P	1,500,000	Mile	Reconstruction:	2 Lane
Reconstruction [State Highway]	103	R	2,000,000	Mile	Reconstruction:	2 Lane
Reconstruction [State Highway]	103	U	3,300,000	Mile	Reconstruction:	2 Lane
Passing Lanes	106	M	850,000	Mile	Passing Lane:	Lane Mile
Passing Lanes	106	P	500,000	Mile	Passing Lane:	Lane Mile
Passing Lanes	106	R	550,000	Mile	Passing Lane:	Lane Mile
Passing Lanes	106	U	1,200,000	Mile	Passing Lane:	Lane Mile
New Interchange	107	A	10,000,000	Each	New Interchange	
Improve Interchange	108	A	2,000,000	Each	Improve Interchange	
Truck Ramp or Net	109	A	750,000	Each	Truck escape	
Rest Area / Info Center [State Program]	110	A	3,000,000	Each	New Rest Area	
Grade Separations	112	A	2,000,000	Each	Grade Separation	
Corridor Study	113	A	100,000	Each	Corridor Study	
Improve Intersection	114	A	450,000	Each	Intersection Improvement	
Safety / Guardrail	115	A	200,000	Mile	Guardrail	
Noise Barrier	116	A	360,000	Mile	Noise Barrier	
Drainage / Erosion Control	117	A	1,300,000	Mile	Drainage / erosion Control	
HOV or Bus Lanes	118	M	2,700,000	Mile	New HOV/Bus Lane	
HOV or Bus Lanes	118	P	2,000,000	Mile	New HOV/Bus Lane	
HOV or Bus Lanes	118	R	2,200,000	Mile	New HOV/Bus Lane	
HOV or Bus Lanes	118	U	4,500,000	Mile	New HOV/Bus Lane	
New Construction	119	M	3,000,000	Mile	New Roadway:	2 Lane ...
New Construction	119	P	2,000,000	Mile	New Roadway:	2 Lane ...
New Construction	119	R	2,200,000	Mile	New Roadway:	2 Lane ...
New Construction	119	U	4,800,000	Mile	New Roadway:	2 Lane ...
Pedestrian Facility [Sidewalks / Trail Heads]	201	A	100,000	Mile	Pedestrian Path:	(Lane...
Bike Facilities / Programs	202	A	150,000	Mile	Bicycle Path	Lane Mile
Acquire [Scenic] Easement for Historical / [Scenic Sites]	203	A	640,000	Mile	Acquire Easement	
Rail Line Construction	501	A	1,000,000	Mile	Rail Line Construction	
Rail Sidings	502	A	800,000	Mile	Rail Sidings	
Rail Stations	503	A	250,000	Each	Rail Stations	
Upgrade Crossiings	508	A	50,000	Each	Rail Crossing Upgrade	

Colorado Planning Projects -- Sample

ProjectId	Route	Refpt	Endrefpt	Length	Tpr	County	City	Region	Commis_dis
PP237	025A	151.66	160.763	9.103	Pikes Peak Area	El Paso		2	9
PP236	025A	135.262	151.66	16.398	Pikes Peak Area	El Paso	Colorado Springs	2	9
DR3520					Denver Area	Denver		6	
PB212	025A	100.681	101.389	0.708	Pueblo Area	Pueblo	Pueblo	2	10
PB219	025A	100	100	0	Pueblo Area	Pueblo	Pueblo	2	10
DR2804		223.049	223.049		Denver Area	Adams		6	
DR2806	025A	200.093	200.093	0	Denver Area	Denver		6	
DR2805	025A	212.769	212.769	0	Denver Area	Denver		6	
PB3831					Pueblo Area	Pueblo		2	10
UF439	025A	229.107	243	13.893	Upper Front Range	Weld		4	5
UF2771	025A	281.338	298.879	17.541	Upper Front Range	Larimer		4	5
DR1391	025A	226	226	0	Denver Area	Adams		6	
DR4044	025A	217.006	217.006	0	Denver Area	Adams		6	
UF440	025A	240.214	240.214	0	Upper Front Range	Weld		4	5
NF4064					North Front Range			4	
DR2570	070A	251.318	253.528	2.21	Denver Area	Jefferson		1	
DR4054	070A	269.005	269.005	0	Denver Area	Jefferson		6	
IM2516	070A	258.7	327.4	68.7	Intermountain	Summit		1	7
ST1402									
PB3340	050B	335	351		Pueblo Area	Pueblo		2	10
EA2630	070A	332.02	340.35	8.33	Eastern	Elbert		1	3
EA1025	070A	418	438.5	20.5	Eastern	Kit Carson	Burlington	1	11
EA1024	070A	340.354	394.564	54.21	Eastern	Lincoln	Limon	1	11
DR4052	070A	274.607	274.607	0	Denver Area	Denver		6	
DR4051	070A	282.563	282.563	0	Denver Area	Denver		6	
DR4226	070A	280	280	0	Denver Area	Denver		6	
EA2776	076A	115	127	12	Eastern	Logan	Sterling	4	11
UF2775	076A	38.93	43.76	4.83	Upper Front Range	Weld	Keenesburg	4	5
UF442	076A	75.28	75.28	0	Upper Front Range	Morgan		4	5
NW2150	040A	202.343	211.876	9.533	Northwest	Grand	Granby	3	6
NW2736	040A	126	128.5	2.5	Northwest	Routt		3	6
DR2577					Denver Area	Gilpin		1	
NW2742	040A	155.5	157.2	1.7	Northwest	Jackson		3	6
NW3487					Northwest	Routt		3	6
DR2578	040A	232.458	242	9.542	Denver Area	Gilpin		1	
EA1026	040H	398	412	14	Eastern	Lincoln	Hugo	1	11
GJ2737	050A	36.4	70.5	34.1	Grand Junction Area	Mesa	Delta	3	7
GV2753	050A	94	189.275	95.275	Gunnison Valley	Montrose	Montrose	3	7
CF328	050A	285.633	285.663	0.03	Central Front Range	Fremont		2	9
PB3829					Pueblo Area	Pueblo		2	10

Colorado Planning Projects -- Sample

ProjectId	Facilityna	Projecttyp	Projectcod	Descriptio	Priority
PP237		Capacity/Add Lanes	101	I-25 - Briargate to SH 105	2
PP236		Capacity/Add Lanes	101	I-25 - S. Academy Blvd. to Briargate	1
DR3520		Capacity/Add Lanes	101	I-25/I-70 - 38th to 58th/Washington to Brighton	2
PB212		Reconstruction	103	I-25 - US 50 and SH 47 Interchange Phase I	1
PB219		New Interchange	107	I-25 US 50 and SH 47 Interchanges Phase III	2
DR2804		Improve Interchange	108	I-25 - SH 128 (120th Ave)	2
DR2806		Improve Interchange	108	I-25 - I-225	2
DR2805		Improve Interchange	108	I-25 - Fox/23rd St	2
PB3831		Safety/guardrail	115	I-25 and US 50A/SH 47 Interchange	1
UF439		Capacity/Add Lanes	101	I-25 - SH 7 to SH 66	2
UF2771		Reconstruction	103	I-25 - Owl Canyon to Wyoming State Line	2
DR1391		New Interchange	107	I-25 - 144th Ave (New Interchange)	2
DR4044		Improve Interchange	108	I-25 - US 36 (Interchange Improvements)	2
UF440		Improve Interchange	108	I-25 - SH 119 Interchange	1
NF4064		Corridor Study	113	I-25 Interchange Study	2
DR2570		Reconstruction	103	I-70 - SH 74 (El Rancho) to SH 40 (Genesee) (Reconstru)	2
DR4054		Improve Interchange	108	I-70 - SH 121 (Wadsworth)	2
IM2516		Improve Intersection	114	I-70 - Signage	1
ST1402		Safety/guardrail	115	Region-Wide Safety and TSM Pool - Region 1	3
PB3340		Capacity/Add Lanes	101	Boone to Fowler	1
EA2630		Reconstruction	103	I-70 - SH 86 to Elbert/Lincoln County Line	2
EA1025		Reconstruction	103	I-70 - Flagler to Kansas State Line	2
EA1024		Reconstruction	103	I-70 - Kiowa Creek to Flagler	1
DR4052		Improve Interchange	108	I-70 - Washington St (Interchange Improvements)	2
DR4051		Improve Interchange	108	I-70 - I-225 (Interchange Improvements)	2
DR4226		Safety/guardrail	115	I-70/Stapleton Runway Tunnel Removal & I-70 @ Havana	2
EA2776		Geometrics Safety	102	I-76 - Atwood to East of Sterling	2
UF2775		Geometrics Safety	102	I-76 - Keenesburg East	2
UF442		Improve Interchange	108	I-76 - Bijou Interchange	1
NW2150		Geometrics Safety	102	US 40 - Hot Sulphur Springs to Granby	1
NW2736		Geometrics Safety	102	US 40 - West of Steamboat Springs	1
DR2577		Reconstruction	103	US 40 - East side of Berthoud Pass	2
NW2742		Reconstruction	103	US 40 - West of Muddy Pass	1
NW3487		Safety/guardrail	115	US 40 - RR Xing West of CR 70	1
DR2578		Drainage/Erosion Con	117	US 40 - Berthoud Pass to Winter Park	2
EA1026		Reconstruction	103	US 40 - Hugo East	2
GJ2737		Capacity/Add Lanes	101	US 50 - SE of Grand Junction to Delta	1
GV2753		Reconstruction	103	US 50 - Montrose to Sargents (Critical Shoulders)	1
CF328		Improve Intersection	114	US 50 - SH 67 Intersection	2
PB3829		Safety/guardrail	115	US 50A - I-25 to Baltimore	1

Colorado Planning Projects -- Sample

Projectid	Projectcat	Conformity	Corridor	Plancost	Stipcost	Amendtype	Amendyr	Amenddesc	Xcoord	Ycoord
PP237	Roadway	C	Denver - NM	30000	0				0	0
PP236	Roadway	C	Denver - NM	124000	21437				0	0
DR3520	Roadway	C	Denver - NM	69349	69349				0	0
PB212	Roadway	RP	Denver - NM	12630	12630				0	0
PB219	Roadway	RP	Denver - NM	20000	0				0	0
DR2804	Roadway	C	Denver - NM	7500	0				0	0
DR2806	Roadway	C	Denver - NM	43000	0				0	0
DR2805	Roadway	C	Denver - NM	16800	16800				0	0
PB3831	Roadway	RP	Denver - NM	600	600				0	0
UF439	Roadway	RP	Denver - WY	35152	2769	P	1996	35% Correction/ 999 to 101	0	0
UF2771	Roadway	RP	Denver - WY	16000	200		0		0	0
DR1391	Roadway	C	Denver - WY	7500	0				0	0
DR4044	Roadway	C	Denver - WY	30474	30474				0	0
UF440	Roadway	RP	Denver - WY	19000	13400				0	0
NF4064	Roadway	C	Denver - WY	1400	0				0	0
DR2570	Roadway	C	Denver - UT Central	74	74				0	0
DR4054	Roadway	C	Denver - UT Central	7500	0				0	0
IM2516	Roadway	RP	Denver - UT Central	500	500				0	0
ST1402					7978					
PB3340					60000					
EA2630	Roadway	RP	Denver - KN	12300	0				0	0
EA1025	Roadway	RP	Denver - KN	31500	0				0	0
EA1024	Roadway	RP	Denver - KN	84000	82574				0	0
DR4052	Roadway	C	Denver - KN	7500	0				0	0
DR4051	Roadway	C	Denver - KN	24490	24490				0	0
DR4226	Roadway	C	Denver - KN	5900	5900				0	0
EA2776	Roadway	RP	Denver - NE	13000	0				0	0
UF2775	Roadway	RP	Denver - NE	5225	0				0	0
UF442	Roadway	RP	Denver - NE	7634	7634				0	0
NW2150	Roadway	RP	Denver - UT (NW)	13400	13400				0	0
NW2736	Roadway	RP	Denver - UT (NW)	2768	2768				0	0
DR2577	Roadway	RP	Denver - UT (NW)	33000	0				0	0
NW2742	Roadway	RP	Denver - UT (NW)	2500	450				0	0
NW3487	Roadway	S	Denver - UT (NW)	120	120				0	0
DR2578	Roadway	RP	Denver - UT (NW)	874	0				0	0
EA1026	Roadway	RP	Denver - OK - TX	28500	0				0	0
GJ2737	Roadway	RP	Grand Jnctn - Pueblo - KS	64000	3068	P	1996	999 to 101	0	0
GV2753	Roadway	RP	Grand Jnctn - Pueblo - KS	20000	820				0	0
CF328	Roadway	RP	Grand Jnctn - Pueblo - KS	330	0				0	0
PB3829	Roadway	RP	Grand Jnctn - Pueblo - KS	800	800				0	0

Appendix D

CDOT Item Classification Codes Used in BAMS/DSS

ITEM CLASSIFICATION CODE TABLE - ITEMCLS

FORMAT NAME: $ITEMCLS LENGTH: 40 NUMBER OF VALUES: 90
MIN LENGTH: 1 MAX LENGTH: 40 DEFAULT LENGTH 40 FUZZ: 0

START	END	LABEL (VER. 6.12 04NOV97:13:37:38)
*	*	Call Jim @ 2865
000	000	Administrative- PE,CE,ROW,IC,SFM,CMO
201	201	Clearing And Grubbing
202	202	Removal Of Structures And Obstructions
203	203	Excavation And Embankment
204	204	Haul
206	206	Excavation And Backfill For Structures
207	207	Topsoil
208	208	Erosion Control
209	209	Watering
210	210	Reset Structures
211	211	Tunnel & Rock Items
212	212	Seeding, Fertilizer And Sodding
213	213	Mulching
214	214	Planting
215	215	Transplanting
216	216	Soil Retention
217	217	Herbicide Treatment
301	301	Plant Mix Bituminous Base Course
303	303	Emulsified Asphalt Treated Bse
304	304	Aggregate Base Course
306	306	Reconditioning
307	307	Subgrade Stabilization
310	310	Process Asphalt
403	403	Hot Bituminous Pavement
405	405	Heating And Scarifying Treatment
406	406	Recycled Pavement
407	407	Prime And Tack Coats, Rejuvenate Agent
408	408	Joint & Crack Sealant
409	409	Seal Coat
410	410	Plant Mixed Seal Coat
411	411	Bituminous Materials
412	412	Portland Cement Concrete Pavement
412R	412R	412 Related to Conc.Pav. but not Conc.
420	420	Geotextiles

ITEM CLASSIFICATION CODE TABLE - ITEMCLS

FORMAT NAME: $ITEMCLS LENGTH: 40 NUMBER OF VALUES: 90
MIN LENGTH: 1 MAX LENGTH: 40 DEFAULT LENGTH 40 FUZZ: 0

START	END	LABEL (CONT'D)
501	501	Steel Sheet Piling
502	502	Piling
504	504	Cribbing
506	506	Riprap
507	507	Slope And Ditch Paving
508	508	Timber
509	509	Steel
509P	509P	Bridge Painting
512	512	Bearing Device
513	513	Drain Pipe
514	514	Pipe Railing
515	515	Waterproofing Membrane
516	516	Dampproofing
517	517	Waterproofing
518	518	Waterstops
519	519	Epoxy
521	521	Cut Off Walls
601	601	Structural Concrete
601N	601N	NON-CONVERTIBLE Concrete Items
602	602	Reinforcing Steel
603	603	Culverts (All Types)
604	604	Sewers, Manholes, Inlets, Meter Vaults
605	605	Underdrains
606	606	Guard Rail
607	607	Fences
607S	607S	Sound Fence
608	608	Sidewalks
609	609	Curb And Gutter
610	610	Median Cover Material
611	611	Cattle Guards
612	612	Delineators
613	613	Lighting (Misc.)
613C	613C	Electrical Conduit Items
613L	613L	Lighting Items

ITEM CLASSIFICATION CODE TABLE - ITEMCLS

FORMAT NAME: $ITEMCLS LENGTH: 40 NUMBER OF VALUES: 90
MIN LENGTH: 1 MAX LENGTH: 40 DEFAULT LENGTH 40 FUZZ: 0

START	END	LABEL (CONT'D)
614	614	Traffic Control Devices
614P	614P	Sign Panels
614S	614S	Signal Items
615	615	Water Control Devices
616	616	Trash Guards & Valve Boxes (Siphons 603)
618	618	Prestressed Concrete Structures
619	619	Water Lines
620	620	Field Facilities
621	621	Temporary Roads & Structures
622	622	Rest Areas And Buildings
623	623	Sprinkler System
625	625	Surveying & Testing
626	626	Mobilization
627	627	Pavement Markings
628	628	Br Girder and Deck Unit
629	629	Survey Monuments
630	630	Construction Traffic Control
631	631	Miscellaneous Tunnel Related Items
700	700	Force Accounts
NC	NC	Not Convertible to Common Units
OTHER	**OTHER**	CODE NOT FOUND

Appendix E

CDOT Contract Work Type Codes Used in BAMS/DSS

CONTRACT TYPE OF WORK CODE TABLE - WRKTYP

FORMAT NAME: $WRKTYP LENGTH: 37 NUMBER OF VALUES: 24
MIN LENGTH: 1 MAX LENGTH: 40 DEFAULT LENGTH 37 FUZZ: 0

START	END	LABEL (VER. 6.12 05MAY99:10:23:39)
*	*	This field will be input by DSS Unit.
001	001	RESURFACING
002	002	BRIDGE RESTORE/REHAB
003	003	BRIDGE REPLACEMENT
004	004	RESTORATION/REHAB
005	005	SAFETY
006	006	HAZARDOUS LOCATIONS
007	007	RAIL/HIGHWAY SEPARATION
008	008	TRANS SYS MGMT (TSM)
009	009	TRAFFIC SIGNALS
010	010	MINOR WIDENING
011	011	MAJOR WIDENING
012	012	RECONSTRUCTION
013	013	NEW CONSTRUCTION
014	014	REST AREA
015	015	NOISE WALLS
016	016	LANDSCAPING
017	017	MISCELLANEOUS
018	018	ENHANCEMENT
019	019	PLANNING
020	020	MAJOR SURFACE TREATMENT
021	021	MINOR SURFACE TREATMENT
022	022	ROUTINE MAINTENANCE
OTHER	**OTHER**	CODE NOT FOUND

Appendix F

As-bid Item Dollar Percentages by Item Class

CDOT Contracts (1/1990-8/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9001B:C88232	ASPH	021	$2,772,737.16		0.78%	64.99%	1.42%		0.07%			0.14%	0.77%	2.42%	0.14%	0.34%				
9001C:C85225	STRC	002	$842,809.75	1.23%	0.03%	3.79%	1.18%	1.03%	0.47%	0.11%		2.55%	4.21%	1.78%	2.17%	0.69%				6.00%
9001D:C88084	STRC	003	$525,027.22	1.90%	0.15%	7.93%						4.24%	5.52%	5.85%	11.01%	1.26%				1.99%
9001D:C88110	STRC	017	$108,469.25	18.75%			7.68%						8.78%	3.23%		2.74%				1.03%
9001D:C90413	ASPH	021	$585,419.70		2.34%	84.15%								1.92%		0.25%				
9002A:C88193-CO	ASPH	017	$153,366.97		0.43%	29.54%	0.76%	7.08%				3.20%	5.56%	2.31%	1.54%	0.07%				
9002A:C89012-CO	DRNG	013	$286,614.30	4.34%		0.50%	2.27%					71.87%	8.88%	4.42%		0.62%				0.49%
9002A:C90007R	TRAF	012	$2,507,350.00											7.98%		0.18%				
9002A:C90016	PVMK	017	$201,063.00											0.50%	2.49%					
9002A:C90810	ASPH	020	$937,177.50		0.00%	100.00%														
9002B:C88146	STRC	003	$379,835.15	1.81%	0.20%	9.55%	4.44%						8.49%	7.57%	3.25%	2.42%				3.13%
9002C:C87012	CONR	001	$6,710,619.90	0.15%	0.06%	9.50%	0.75%		0.04%	56.81%		0.53%	6.84%	9.95%	1.45%	0.33%				
9002C:C88019	STRC	005	$3,015,973.43	0.10%	0.31%	11.26%		0.24%	0.03%	0.01%		2.74%	1.05%	3.81%	1.57%	0.46%				0.00%
9002C:C89828R	SURF	020	$597,499.80		47.44%		1.17%							5.02%		0.23%				
9002C:C90010	STRC	012	$4,275,029.04	0.89%	0.08%	5.93%	1.30%			13.12%		3.71%	16.49%	1.75%	0.73%	0.48%				
9002C:C90084-CO	TRAF	012	$792,150.00				0.16%							8.21%		2.88%				
9002D:C89098	CONR	021	$9,440,932.86	0.32%	0.78%	3.08%	0.15%			60.00%		0.32%	7.09%	9.53%	2.44%	0.19%				
9002D:C89099	CONR	017	$1,323,198.80		0.03%	5.44%	5.00%	1.13%	0.16%	32.95%		1.22%	11.21%	2.65%	4.55%	0.81%				0.12%
9003A:C88111	STRC	003	$881,366.25	2.64%	0.31%	8.34%		0.06%				0.24%	11.31%	4.54%	2.33%	1.14%				14.27%
9003A:C90007S	TRAF	012	$2,368,300.00											14.79%						
9003A:C90088-CO	STRC	003	$2,026,097.39	3.51%	0.05%	7.34%	1.97%	0.10%				0.35%	14.23%	10.86%	6.81%	1.93%				1.70%
9003A:C90115S	SIGN	012	$369,750.00											20.53%		2.31%				
9003A:C90630	ASPH	017	$901,210.17		1.55%	78.67%	0.88%					0.17%	3.07%	2.22%	0.33%					
9003B:C88031	FNC	017	$231,506.00									3.64%	17.48%	11.51%	4.05%					0.48%
9003B:C89061	ASPH	017	$179,271.00		0.48%	41.00%	0.39%	8.03%				1.78%	4.61%	1.48%	3.63%	0.11%				
9003B:C89866	GEN	017	$51,636.00			3.63%		20.87%	15.49%	1.45%		12.20%		6.78%	2.90%					
9003C:C88168-CO	SGNL	005	$228,444.17			5.59%		8.36%		1.06%		3.40%	1.46%	3.17%	2.71%					
9003C:C89161-CO	ASPH	001	$3,367,218.70	0.10%	0.79%	39.26%	0.09%	0.22%	0.02%	5.90%		3.60%	0.98%	5.49%	0.68%	0.92%				
9003C:C90083	STRC	002	$879,446.00			1.99%						2.78%		5.72%	4.58%	1.79%				
9003D:C89150	SGNL	005	$48,607.00											4.70%	2.38%					
9003D:C90092-CO	PVMK	017	$148,971.00											1.75%	3.49%					
9003D:C90619	ASPH	021	$1,106,792.05		0.83%	57.30%							0.91%	5.24%		0.31%		22.12%		
9003D:C90620	ASPH	020	$1,418,203.51		0.69%	72.50%							3.78%	2.40%		0.11%				
9003D:C90648	ASPH	021	$436,475.84		0.80%	41.35%		5.01%				3.10%		2.75%						
9003E:C85231	STRC	003	$851,301.72		0.21%	2.13%	1.45%	0.83%				0.49%	2.72%	7.52%	2.29%	0.68%				5.60%
9003E:C88005	STRC	012	$23,693,720.67	1.22%	0.16%	2.42%	0.39%	0.31%		0.03%		0.43%	6.16%	5.23%	1.97%	0.04%				1.90%
9003E:C88212	ASPH	012	$922,220.60		2.34%	39.37%	7.23%					3.64%	13.10%	8.67%	2.49%	1.30%				
9003E:C90415	ASPH	021	$357,997.85		0.59%	68.16%						2.58%		2.79%						
9004A:C89063	ERTH	013	$1,808,116.05				0.10%		0.27%			3.25%	63.37%	4.15%	16.58%	0.56%				3.48%
9004A:C89158	SGNL	017	$78,749.20			7.39%		0.52%				0.60%		3.51%	5.08%					
9004A:C89420	STRC	003	$367,199.26		0.09%	12.09%	5.72%					0.35%	24.31%	1.09%	3.89%	0.90%				
9004A:C90075	GDRL	005	$160,000.00											1.45%		0.13%				
9004B:C88029	STRC	017	$4,087,299.38	5.15%	0.01%	2.27%		0.88%	0.20%	0.38%		0.62%	8.95%	4.23%	1.63%	0.62%				
9004B:C89046-CO	ASPH	021	$1,947,453.32		1.76%	86.00%	4.07%					0.18%	0.32%	1.13%		0.39%				
9004C:C89436	ASPH	003	$365,823.97	1.06%	0.91%	40.41%	4.96%					7.33%	13.18%	6.29%		0.69%				
9004C:C90617	ASPH	020	$232,860.05		1.98%	72.25%						1.17%	5.33%	2.58%		0.21%				
9004C:C90621	ASPH	012	$2,549,647.70	0.17%	1.72%	85.81%	6.52%					2.23%	8.47%	5.49%	1.53%	0.55%				
9004D:C90038	STRC	011	$7,493,000.40	1.73%	0.02%	2.67%	0.75%	0.64%		7.73%		7.19%	3.49%	9.34%	1.80%	0.99%				
9004D:C90080	SIGN	005	$466,022.00											4.27%						
9004D:C90640	ASPH	020	$1,237,765.05		1.59%	71.47%	3.16%						0.57%	9.45%	0.16%	0.37%				
9005A:C89488	CONR	012	$3,233,302.93		0.01%	4.44%	2.05%	1.80%		67.85%		0.42%	10.38%	7.17%	1.24%					

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9001B:C88232	ASPH	021	0.37%	3.78%		9.42%		2.49%				6.55%	0.03%			2.64%		3.62%		12.84%
9001C:C85225	STRC	002	0.31%	0.08%		68.88%		1.70%		0.22%	1.18%	0.63%	1.70%							3.51%
9001D:C88084	STRC	003	7.50%	0.68%		40.31%		5.44%			0.35%	2.36%	0.70%	0.68%		0.77%		0.20%	0.15%	5.20%
9001D:C88110	STRC	017	4.61%	0.18%		45.17%		0.94%			0.47%	5.53%	0.92%							6.92%
9001D:C90413	ASPH	021		1.13%				3.19%						0.07%		3.49%	2.96%	0.50%		7.02%
9002A:C88183-CO	ASPH	017		4.24%				16.02%		0.21%				6.49%			20.95%		1.58%	28.02%
9002A:C89012-CO	DRNG	013				3.00%		2.94%		0.62%									0.04%	0.04%
9002A:C90007R	TRAF	012		0.04%				89.67%								1.75%		0.18%		1.93%
9002A:C90018	PVMK	017		0.50%												96.52%				96.52%
9002A:C90810	ASPH	020																		0.00%
9002B:C88146	STRC	003	3.15%	0.12%		45.40%		3.48%			0.65%	2.01%	2.14%	0.46%		0.09%		0.04%	3.80%	9.19%
9002C:C87012	CONR	001	0.18%	1.62%		2.99%		5.77%			0.10%	0.70%	0.64%			0.99%		0.81%		3.04%
9002C:C88019	STRC	005	3.54%	1.83%		42.85%		7.68%		0.49%	0.23%	5.38%	1.49%	3.32%		0.19%		11.10%	0.32%	22.03%
9002C:C89828R	SURF	020					37.49%	7.29%								1.35%				1.35%
9002C:C90010	STRC	012	1.08%	1.55%		29.48%		6.04%			0.29%	9.82%	0.22%	2.48%		1.62%	0.07%	3.00%	0.08%	17.34%
9002C:C90084-CO	TRAF	012		0.63%				76.43%			1.01%					6.52%		4.17%		11.70%
9002D:C89098	CONR	021		0.61%		7.59%	0.59%	3.73%			0.01%	0.94%	0.29%	0.81%		0.65%		0.86%	0.03%	3.59%
9002D:C89099	CONR	017		2.23%		0.02%		12.98%				1.71%	2.81%	7.13%		1.26%	2.13%	4.41%	0.04%	19.49%
9003A:C88111	STRC	003	5.11%	0.37%		45.19%		0.67%			0.70%	0.84%	0.93%					0.01%		2.48%
9003A:C90007S	TRAF	012						85.21%												0.00%
9003A:C90088-CO	STRC	003	2.96%	1.08%		37.65%		3.73%			2.05%	1.45%	1.86%			0.06%		0.16%	0.14%	5.72%
9003A:C90115S	SIGN	012		0.26%				81.03%								14.34%		1.54%		15.88%
9003A:C90630	ASPH	017		2.18%				3.36%			0.13%		0.23%			6.53%	0.64%	0.17%		7.60%
9003B:C88031	FNC	017		0.42%				4.84%			54.37%	2.11%	0.72%						0.38%	57.59%
9003B:C89091	ASPH	017		2.17%				11.92%		0.54%	0.58%		0.27%	1.88%		2.27%	16.89%	1.98%		23.67%
9003B:C89866	GEN	017		2.06%		5.64%		11.21%		5.04%	2.94%		9.39%					0.29%		12.62%
9003C:C88168-CO	SGNL	005		4.96%				12.12%		1.67%				9.36%			46.14%			55.50%
9003C:C89161-CO	ASPH	001	1.40%	4.82%		5.46%	0.78%	6.78%			0.61%	18.61%	0.04%	0.32%		2.45%	0.13%	0.57%		22.73%
9003C:C90083	STRC	002		6.98%		21.92%		34.24%		0.40%		16.44%				1.17%		1.28%	0.71%	19.60%
9003D:C89150	SGNL	005						18.44%						25.85%		2.27%	47.54%	0.84%		76.50%
9003D:C90092-CO	PVMK	017														94.76%				94.76%
9003D:C90619	ASPH	021		0.38%				3.02%				4.60%	0.38%			4.91%				9.89%
9003D:C90620	ASPH	020		0.81%				2.16%			0.48%	2.08%	1.26%			2.64%			11.12%	17.56%
9003D:C90648	ASPH	021		23.89%				8.16%		1.15%						12.35%	1.44%			13.79%
9003E:C85231	STRC	003	2.11%	0.01%		68.89%		3.56%		0.04%	0.17%	0.90%				0.10%		0.02%	0.27%	1.46%
9003E:C88005	STRC	012		0.31%		74.78%		0.59%	1.16%		0.06%	0.79%	0.10%	1.77%		0.07%		0.05%	0.04%	2.88%
9003E:C88212	ASPH	012	1.08%	0.54%		5.92%		6.63%			0.16%	4.46%	0.78%			1.19%		0.11%	0.98%	7.68%
9003E:C90415	ASPH	021		19.17%				7.02%		0.17%						7.87%	1.88%			9.55%
9004A:C89063	ERTH	013		0.28%				0.05%			2.73%		4.63%	0.03%				0.13%	0.36%	7.88%
9004A:C89158	SGNL	017						13.96%						8.93%			60.02%			68.95%
9004A:C89420	STRC	003	4.36%	0.36%		42.02%		2.83%			1.27%		0.51%			0.20%			0.01%	1.98%
9004A:C90075	GDRL	005		6.30%				13.09%				79.05%								79.05%
9004B:C88029	STRC	017		1.54%		63.28%		4.18%		0.99%	0.55%	2.55%	9.11%	1.79%		0.37%	0.50%	1.87%	0.13%	16.87%
9004B:C89046-CO	ASPH	021		0.49%				2.90%				0.45%				2.24%		0.08%		2.77%
9004C:C89436	ASPH	003	3.69%	0.84%		3.73%		11.40%			2.50%		0.92%			0.17%		0.12%	1.78%	5.49%
9004C:C90617	ASPH	020		0.54%				6.07%				5.93%				1.17%		0.77%		7.87%
9004C:C90621	ASPH	012		0.52%		0.14%		3.71%		0.01%	0.71%	0.45%	0.39%			0.94%		0.53%	0.12%	3.14%
9004D:C90038	STRC	011	0.80%	2.09%		43.96%		1.89%		0.44%	5.38%	2.74%	3.02%	1.21%		0.26%	0.01%	1.64%		14.26%
9004D:C90060	SIGN	005		6.47%				4.68%										84.57%		84.57%
9004D:C90640	ASPH	020		1.52%				2.79%								6.03%				8.03%
9005A:C89488	CONR	012		0.65%				9.71%		0.21%				0.46%		1.06%	2.31%	0.24%		4.07%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9005A:C90005	REST	012	$3,333,333.33	1.15%	0.51%	8.44%	2.32%	8.45%	0.44%			1.97%	12.14%	5.92%	3.37%	1.05%			27.72%	0.66%
9005A:C90429-CO	GEN	010	$2,347,000.00	1.14%	0.21%	17.85%	0.70%	8.89%	0.12%	0.07%		8.38%	18.95%	0.40%	3.42%	1.97%				0.01%
9005A:C90447-CO	CONR	012	$2,842,329.38		0.38%	28.30%	7.90%	0.60%		40.08%		0.50%		5.99%	1.00%	0.21%				
9005A:C90653	ASPH	021	$278,267.95		0.78%	46.52%						1.46%		5.75%						
9005B:C87073	STRC	003	$1,905,134.00	4.69%	0.27%	10.24%	1.37%	0.04%				0.85%	12.48%	9.66%	1.73%	1.89%				0.65%
9005B:C90083R	SPEC	002	$819,067.20			3.14%						2.97%		19.92%	3.09%	1.51%				
9005B:C90667	ASPH	021	$59,915.75		0.93%	37.17%		1.67%		22.43%			0.50%	11.85%		2.34%				
9005C:C90436	ASPH	021	$1,530,671.21		7.70%	65.98%		1.01%					4.18%	1.89%		0.36%		10.58%		
9005C:C90829	ASPH	020	$412,600.00			99.78%						0.21%								
9005D:C88080	ASPH	010	$672,658.80		0.71%	47.57%		0.64%				3.99%	14.25%	4.46%	0.12%	0.56%				0.04%
9005D:C89054	GEN	017	$928,124.61	0.22%	0.08%	12.43%		0.95%				3.38%	9.58%	2.27%	5.28%	0.83%				
9005D:C90440	ASPH	020	$1,687,570.15		0.02%	75.46%		0.03%					2.83%	9.43%		0.26%				
9005D:C90722	ASPH	021	$907,261.15		1.10%	83.12%						0.06%		2.76%						
9005D:C90817	ASPH	017	$75,155.50		2.71%	52.14%			0.77%				10.23%	3.04%		1.58%				
9005E:C89165	ASPH	001	$898,312.83		1.84%	83.91%							2.57%	3.35%	0.06%	0.71%				
9005E:C90402	ASPH	020	$1,735,396.40		0.80%	88.10%							3.44%	5.99%		0.29%				
9006A:C87436-CO	CONR	012	$4,428,644.75	0.14%	0.03%	4.42%	7.11%	1.57%	0.28%	45.53%		5.60%	10.15%	5.19%	1.13%	0.39%				1.10%
9006A:C89489	ASPH	020	$1,221,090.65		0.70%	78.39%	2.44%	2.44%						1.52%		0.49%		7.91%		
9006A:C90721	ASPH	021	$1,419,207.80		1.99%	75.32%	0.23%	0.35%				0.05%		0.99%		1.88%				
9006A:C91809	ASPH	020	$192,205.31			100.00%														
9006B:C89090	GEN	021	$1,303,793.10	0.58%	0.30%	21.71%	2.78%	11.02%		5.08%		12.61%	11.11%	3.53%	3.16%	0.33%				0.09%
9006B:C90011-CO	STRC	013	$6,570,013.35	0.99%	0.02%	2.56%	0.74%	0.00%		6.19%		2.82%	12.89%	6.19%	0.55%	0.63%				0.11%
9006B:C90055-CO	GEN	003	$733,312.02	1.38%	0.71%	19.84%	2.41%					1.08%	13.44%	6.57%	3.54%	1.50%				
9006B:C90134-CO	ASPH	005	$1,799,701.25		0.59%	30.37%		0.85%				1.38%		5.17%		0.33%				
9006B:C90404	ASPH	021	$3,840,632.33		0.53%	85.84%	0.40%						4.59%	2.33%		0.91%				
9006B:C90414-CO	ASPH	020	$1,875,194.58		8.06%	65.46%	0.96%							9.23%		0.40%		13.31%		
9006B:C90435-CO	ASPH	020	$1,289,491.60		3.38%	86.49%								6.20%		0.25%				
9006B:C90838	ASPH	020	$693,019.95		2.18%	79.07%	3.77%		0.04%				1.76%	3.61%		0.43%				
9006C:C85231R	STRC	003	$975,652.71		0.19%	1.86%	1.33%	0.79%				0.45%	2.34%	6.43%	1.97%	0.71%				2.44%
9006C:C89108	ASPH	021	$530,466.62		0.38%	32.91%	1.85%	0.86%				1.86%	3.25%	1.89%	0.76%	1.91%				1.26%
9006C:C90051	STRC	003	$714,009.08	1.92%	0.83%	16.84%							7.90%	2.87%	5.61%	1.43%				2.72%
9006C:C90860	ASPH	021	$286,076.21		1.20%	44.60%								1.57%		1.70%				
9006C:C90727-CO	SGNL	009	$128,750.55											5.17%	3.83%					
9006D:C88081	STRC	003	$277,777.70	1.58%	0.36%	13.94%							16.47%	9.15%	4.43%	1.46%				
9006D:C90441	ASPH	001	$2,361,705.35		0.67%	67.50%		0.07%					3.82%	1.69%	0.09%	0.18%		6.29%		
9006D:C90629	ASPH	021	$694,949.70		3.12%	86.93%						0.01%		0.36%		0.30%				
9006D:C90723	ASPH	021	$221,641.37		1.22%	39.83%						0.08%		2.48%		4.00%				
9006D:C90725	ASPH	021	$250,762.20		0.69%	52.28%						1.34%		3.79%		1.63%				
9006D:C90726	ASPH	021	$751,580.70		1.66%	87.01%	1.60%	0.22%				0.40%		3.73%		1.32%				
9006D:C90821	ASPH	020	$188,495.50		1.84%	82.76%						0.16%		4.83%		1.11%				
9006D:C90839	ASPH	020	$765,459.38			100.00%														
9006D:C91803	ASPH	020	$156,544.80			92.86%										1.95%				
9006D:C91804	ASPH	020	$179,880.00			90.50%										2.60%				
9006D:C91805	ASPH	020	$398,834.45			96.16%										0.54%				
9006D:C91807	ASPH	020	$166,410.84			100.00%														
9007A:C85178	STRC	003	$239,557.00	1.17%	0.25%	3.91%	1.99%					0.21%	5.29%	11.08%	8.56%	1.85%				3.93%
9007A:C86147	GEN	020	$310,593.78		0.48%	34.83%	15.96%	10.39%				10.94%	11.21%	1.61%	1.18%					
9007A:C86216	STRC	009	$309,393.25	1.16%	0.59%	5.72%	1.65%						1.19%	9.05%	0.32%	1.71%				2.59%
9007A:C89697	ASPH	017	$142,000.00		12.78%	27.99%		5.62%				8.04%	11.61%	12.11%						0.45%
9007A:C90418	GEN	003	$383,235.20	0.89%	0.26%	35.11%		0.21%					15.04%	8.35%	0.85%	0.91%				
9007A:C90724	ASPH	021	$698,831.87		0.92%	48.89%						11.29%		3.68%		0.77%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9005A:C90005	REST	012	0.32%	0.39%		9.48%				3.84%	0.88%	1.10%	10.21%	2.77%		0.13%		0.74%		16.83%
9005A:C90429-CO	GEN	010		1.89%		19.79%		8.80%		0.87%	2.09%	4.90%	3.07%	2.03%		0.47%		0.18%	0.02%	12.76%
9005A:C90447-CO	CONR	012		9.14%		1.86%		3.97%		0.32%						1.07%	0.31%		0.16%	1.54%
9005A:C90653	ASPH	021		22.24%				9.45%		0.49%				1.78%		9.75%	1.78%			13.32%
9005B:C87073	STRC	003	5.77%	0.47%		42.26%		3.95%			2.11%	1.18%	0.40%			0.09%		0.04%	0.07%	3.89%
9005B:C90083R	SPEC	002		5.17%		18.46%		23.01%		0.32%		19.69%				1.30%		1.07%	0.37%	22.43%
9005B:C90667	ASPH	021		2.69%								16.89%				3.21%		0.32%		20.22%
9005C:C90436	ASPH	021		0.51%				1.90%				3.86%	0.50%			1.26%		0.26%		5.88%
9005C:C90829	ASPH	020																		0.00%
9005D:C88060	ASPH	010	0.35%	1.42%		2.42%		5.53%			6.73%	8.07%	0.65%	0.80%		0.98%	0.10%	0.61%		17.94%
9005D:C89054	GEN	017		2.04%		17.33%		7.54%			0.05%	14.08%	0.70%	5.50%		0.67%		17.11%		38.11%
9005D:C90440	ASPH	020		1.36%				2.26%			0.71%	1.14%	0.75%			1.48%		0.44%	3.82%	8.34%
9005D:C90722	ASPH	021		12.83%				8.86%				1.30%	0.11%			5.93%	1.00%	0.09%	2.86%	11.29%
9005D:C90817	ASPH	017		0.55%				19.51%					1.03%			2.64%		5.90%		9.47%
9005E:C89165	ASPH	001		0.33%				3.54%								3.68%				3.68%
9005E:C90402	ASPH	020		0.09%				1.43%				0.62%	0.43%			0.45%		0.17%		1.87%
9006A:C87438-CO	CONR	012	0.21%	0.88%		6.16%		2.50%			0.65%	0.19%	0.20%	0.91%		1.49%	3.21%	0.72%	0.22%	7.59%
9006A:C89489	ASPH	020						3.24%				3.38%				1.49%				4.87%
9006A:C90721	ASPH	021		2.34%				6.25%				3.70%				8.36%	0.28%		0.27%	10.61%
9006A:C91809	ASPH	020																		0.00%
9006B:C89090	GEN	021		4.04%		9.34%		4.57%		0.37%	0.98%		0.38%	0.17%		2.33%	1.28%	0.84%	3.45%	9.43%
9006B:C90011-CO	STRC	013	1.05%	0.78%		54.27%		2.63%			0.82%	1.74%	0.12%	3.33%		0.44%		1.04%	0.07%	7.56%
9006B:C90055-CO	GEN	003	1.64%	0.81%		33.88%		6.85%		0.03%		1.99%	0.60%	1.55%		0.43%		0.46%	1.39%	8.44%
9006B:C90134-CO	ASPH	005		14.91%				7.94%		0.38%				8.58%		3.29%	26.08%		0.03%	37.98%
9006B:C90404	ASPH	021	0.14%	0.36%		0.78%		1.35%				0.41%	0.87%			1.49%		0.19%		2.86%
9006B:C90414-CO	ASPH	020						2.17%								0.41%				0.41%
9006B:C90435-CO	ASPH	020						2.99%								0.69%				0.69%
9006B:C90838	ASPH	020		0.17%				4.80%								3.96%		0.21%		4.17%
9006C:C85231R	STRC	003	1.74%	0.02%		77.17%		1.27%		0.01%	0.12%	0.83%				0.05%		0.02%	0.26%	1.28%
9006C:C89108	ASPH	021	1.63%	4.19%		6.26%		8.19%		0.17%	0.07%	22.43%	0.11%	0.22%		6.03%	1.83%	0.04%	1.88%	32.82%
9006C:C90051	STRC	003	3.57%	0.70%		49.18%		4.96%			0.56%	1.12%	0.39%			0.24%		0.05%	0.21%	2.57%
9006C:C90660	ASPH	021		22.00%	1.67%			12.18%				0.63%				11.65%	2.80%			15.08%
9006C:C90727-CO	SGNL	009						14.78%						18.57%		0.52%	58.59%	0.43%		76.11%
9006D:C88081	STRC	003	7.56%	0.17%		31.64%		5.12%			0.42%	2.63%	5.02%			1.01%		0.04%		9.12%
9006D:C90441	ASPH	001		1.53%		0.13%		2.05%				6.27%	0.66%	0.18%		1.80%		7.05%		15.97%
9006D:C90629	ASPH	021						3.22%		0.24%						5.60%		0.22%		5.82%
9006D:C90723	ASPH	021		25.13%				13.16%		0.03%						12.69%	1.39%			14.08%
9006D:C90725	ASPH	021		21.68%				9.40%		0.56%						7.59%	1.04%			8.63%
9006D:C90726	ASPH	021		7.23%				8.14%				2.88%				6.03%	0.59%			8.50%
9006D:C90821	ASPH	020						10.93%		0.25%		18.12%								18.12%
9006D:C90839	ASPH	020																		0.00%
9006D:C91803	ASPH	020						5.39%												0.00%
9006D:C91804	ASPH	020						8.90%												0.00%
9006D:C91805	ASPH	020						3.31%												0.00%
9006D:C91807	ASPH	020																		0.00%
9007A:C85178	STRC	003	4.59%			42.94%		5.93%			1.24%	2.87%	3.91%			0.21%		0.09%		8.32%
9007A:C88147	GEN	020		5.14%				8.23%												0.00%
9007A:C86216	STRC	003	7.92%	0.11%		59.86%		1.82%			1.41%	3.12%	0.49%					0.03%	1.46%	8.51%
9007A:C89697	ASPH	017		1.88%			3.22%	6.76%			0.18%		4.44%	0.30%		2.22%		2.49%	0.03%	9.64%
9007A:C90418	GEN	003	2.22%	0.93%		27.42%		4.81%			0.11%	1.76%	0.68%			0.56%		0.08%		3.19%
9007A:C90724	ASPH	021		13.19%				11.06%								9.99%	1.91%	0.32%		12.22%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RPR
9007A:C90822	ASPH	020	$299,341.50		3.67%	61.61%							0.25%	9.37%		0.88%				
9007A:C91815	ASPH	020	$335,733.00		1.09%	97.10%														
9007A:C91816	ASPH	020	$294,502.00		1.20%	96.63%														
9007A:C91817	ASPH	020	$243,750.00		0.97%	97.48%														
9007B:C89497	GEN	003	$907,982.15	0.58%	0.39%	25.98%						4.12%	23.15%	3.32%	3.08%	0.59%				
9007B:C90875	ASPH	017	$76,407.90		0.58%	29.69%		15.21%		14.93%		5.69%		3.93%	0.39%					
9007C:C89816	PVMK	017	$255,673.70											3.91%						
9007C:C90003-CO	STRC	012	$10,820,062.50	1.30%	0.36%	4.79%	1.73%	1.29%	0.26%	0.08%		2.36%	13.57%	8.13%	3.47%	0.38%			0.06%	1.22%
9007C:C90659-CO	ASPH	020	$644,608.24		1.76%	86.03%	2.51%						0.93%	1.88%		0.36%				
9007C:C91808	ASPH	020	$289,550.80			100.00%														
9007C:C91810-CO	ASPH	020	$469,467.40			82.78%				7.22%										
9007D:C90071	ASPH	005	$102,854.00	2.83%	0.15%	22.74%		9.04%					3.30%	14.16%		17.81%				
9007D:C90411-CO	ASPH	020	$1,394,620.80		1.68%	67.34%	0.03%					1.06%	7.14%	5.88%		0.44%				
9007D:C90674	CONR	017	$218,522.00			6.94%		0.91%		60.74%			0.82%	5.49%	1.33%					
9007D:C90833	ASPH	021	$575,983.00		1.03%	46.79%						1.13%	1.40%	0.29%		9.47%				
9008A:C89113	SGNL	017	$77,206.55		0.68%	22.61%							0.87%	5.41%	3.47%					
9008A:C89118	GEN	005	$121,449.00			22.91%	1.85%	7.97%		8.94%		13.73%		12.35%	4.12%	1.31%				
9008B:C86848-CO	GEN	017	$458,952.80		0.15%	18.69%		6.75%		0.49%		1.65%	4.64%	12.04%	1.31%	9.92%				
9008B:C87057	ASPH	010	$1,587,279.91		0.66%	47.52%	1.32%	0.09%				5.70%	14.76%	2.84%	0.82%	0.88%				3.54%
9008B:C90106	STRC	011	$13,684,241.16	0.92%	0.02%	1.35%	0.66%	0.03%		7.83%		1.36%	4.76%	3.62%	1.72%	0.72%				0.00%
9008B:C90164	STRC	013	$3,025,053.98	0.59%	0.01%	1.11%						1.48%	3.08%	3.64%	2.40%	0.60%				
9008B:C90167-CO	SIGN	017	$233,651.00			0.47%							0.90%	7.28%						
9008B:C90833R	ASPH	021	$598,450.00		0.99%	46.22%						1.09%	1.35%	3.84%		0.28%				
9008B:C91813	ASPH	020	$484,232.60		1.09%	81.53%								11.01%		0.76%				
9008B:C91814	ASPH	020	$172,979.34		1.42%	73.81%								16.24%		1.45%				
9008C:C89400	ASPH	013	$1,118,025.51		1.40%	67.25%	4.95%					0.16%	3.23%	8.31%		0.67%				0.06%
9008C:C89816R	PVMK	017	$267,277.60											1.12%						
9008C:C90453	ASPH	017	$242,321.60		0.26%	31.70%		6.11%				3.46%	4.35%	3.43%	2.64%	0.56%				
9008C:C91317	ASPH	020	$336,860.75		3.92%	59.79%								10.03%		0.74%		3.47%		
9008D:C86034	STRC	002	$748,255.00	0.29%			0.80%	0.53%		4.12%			2.40%	10.02%	11.68%	0.80%				3.93%
9008D:C90116-CO	PVMK	005	$92,918.94											3.23%						
9008D:C91808R	ASPH	020	$310,494.80			100.00%														
9008D:C91810R-C	ASPH	020	$431,868.00			100.00%														
9008E:C90008-CO	ERTH	013	$5,626,974.54	0.50%	0.02%	2.83%	0.11%	0.14%				3.30%	56.04%	3.54%	2.15%	0.99%				0.05%
9008E:C90685	ASPH	017	$272,330.00			96.07%							2.39%	0.73%		0.59%				
9008E:C90822R	ASPH	020	$242,610.30		2.38%	84.94%	4.55%						0.31%	2.23%		0.41%				
9009A:C89132	STRC	012	$2,812,541.00	1.96%									3.82%	9.80%	0.71%	1.10%				2.01%
9009A:C90099	ASPH	001	$1,208,243.60		1.62%	89.84%						2.88%	7.96%	6.35%	0.42%	0.62%				
9009B:C88194	GEN	011	$1,698,122.00	1.30%	0.20%	27.86%	0.01%	5.82%	0.79%			20.76%	12.77%	3.54%	3.24%	0.84%				0.08%
9009B:C90132-CO	ASPH	010	$1,531,805.10		0.46%	54.30%	10.87%					5.14%	14.08%	4.24%	0.98%	0.50%				0.13%
9009B:C91080	ASPH	001	$415,094.05		7.14%	35.31%								9.84%						
9009B:C91800	ASPH	021	$331,582.70		1.47%	56.77%								0.24%		1.38%				
9009C:C86848R	ASPH	017	$411,849.10		0.29%	23.49%		6.51%		0.32%		1.63%	7.31%	8.71%	0.85%	6.63%				
9009C:C88079-CO	STRC	003	$985,372.50	2.43%	0.22%	17.74%	1.38%			6.47%		0.97%	14.14%	3.66%	2.64%	1.46%				
9009C:C89041	GEN	003	$1,426,750.10	0.85%	0.78%	31.12%	6.58%					14.42%	14.14%	7.92%	2.10%	0.43%				3.59%
9009C:C89140R	ASPH	005	$27,980.00		0.30%	30.13%		11.98%						21.91%						
9009C:C90059-CO	STRC	003	$3,754,983.82	1.12%	0.27%	9.45%		0.44%		0.12%		0.78%	4.75%	2.49%	1.43%	1.02%				0.07%
9010A:C86034R	STRC	002	$759,999.46	0.29%			0.78%	0.84%		4.17%			2.38%	10.78%	11.65%	0.79%				3.92%
9010A:C90108	TRAF	017	$2,539,383.00											16.74%		2.54%				
9010A:C90851S-C	STRC	003	$352,390.10	4.75%		0.41%		0.10%				1.69%	2.01%	5.86%	13.34%	1.14%				
9010A:C90689	STRC	002	$154,280.50			0.79%								14.78%		3.92%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9007A:C90822	ASPH	020						4.21%												0.00%
9007A:C91815	ASPH	020														1.81%				1.81%
9007A:C91816	ASPH	020														2.16%				2.16%
9007A:C91817	ASPH	020														1.55%				1.55%
9007B:C89497	GEN	003	7.39%	3.44%		17.77%		5.27%			1.30%	2.36%	0.75%			0.47%		0.04%		4.92%
9007B:C90875	ASPH	017		5.40%		7.58%		5.60%						4.86%		1.60%	2.62%	1.86%		11.04%
9007C:C89816	PVMK	017		0.86%				11.73%								83.48%				83.49%
9007C:C90003-CO	STRC	012	0.18%	0.79%		40.62%		8.87%	0.03%	0.58%	0.66%	1.74%	0.99%			0.12%		0.14%	6.27%	9.92%
9007C:C90659-CO	ASPH	020						3.04%								3.48%				3.48%
9007C:C91808	ASPH	020																		0.00%
9007C:C91810-CO	ASPH	020																		0.00%
9007D:C90071	ASPH	005		8.88%				17.05%		0.44%								3.81%		3.81%
9007D:C90411-CO	ASPH	020	0.43%	1.86%		4.81%		5.39%			0.09%	1.26%	0.62%			1.46%		0.29%	0.02%	3.94%
9007D:C90674	CONR	017		12.75%				0.18%				2.27%		5.49%		1.60%	1.37%	0.09%		10.82%
9007D:C90833	ASPH	021		6.22%				9.13%				27.41%				1.04%		2.08%		30.53%
9008A:C89113	SGNL	017		3.91%				11.71%						2.59%		2.90%	39.54%	6.91%		51.94%
9008A:C89118	GEN	005		15.80%				11.96%			0.49%							0.56%		1.05%
9008B:C86848-CO	GEN	017		4.30%				10.73%		0.09%	2.43%		0.77%	12.69%		1.21%	10.80%	1.24%		29.24%
9008B:C87057	ASPH	010		0.31%		12.62%		4.84%				0.50%	1.53%			0.77%		0.52%	0.96%	4.28%
9008B:C90105	STRC	011	1.10%	1.17%		85.34%		2.22%		0.08%	0.86%	1.78%	0.04%	1.17%		0.53%		2.84%	0.06%	7.09%
9008B:C90154	STRC	013		0.81%		75.59%		3.68%			0.87%	3.66%	0.05%	1.81%		0.16%		0.63%	0.03%	7.21%
9008B:C90167-CO	SIGN	017		1.39%		2.36%		18.33%				2.76%				2.70%		63.81%		69.27%
9008B:C90833R	ASPH	021		7.83%				6.03%				30.99%				1.28%		0.09%		32.36%
9008B:C91813	ASPH	020						4.42%								1.20%				1.20%
9008B:C91814	ASPH	020						4.47%								2.61%				2.61%
9008C:C89400	ASPH	013	0.56%	0.02%		4.26%		2.80%			4.07%	0.71%	0.65%			0.50%		0.39%	0.01%	6.33%
9008C:C89816R	PVMK	017		1.23%				17.96%								78.68%				78.68%
9008C:C90453	ASPH	017		0.50%				11.38%				6.60%		4.08%		0.58%	9.87%	2.78%	11.71%	35.82%
9008C:C91317	ASPH	020		15.39%				6.21%								0.45%				0.45%
9008D:C86034	STRC	002		1.51%		46.27%		11.78%			0.40%	1.52%	0.16%			3.29%		0.08%	0.41%	5.86%
9008D:C90118-CO	PVMK	005						5.83%								89.94%				89.94%
9008D:C91808R	ASPH	020																		0.00%
9008D:C91810R-C	ASPH	020																		0.00%
9008E:C90006-CO	ERTH	013		0.70%	9.61%	10.78%		1.86%		2.30%	1.67%	0.11%	0.28%	0.15%		0.11%		0.16%	2.58%	5.07%
9008E:C90885	ASPH	017						0.22%												0.00%
9008E:C90822R	ASPH	020						5.19%												0.00%
9009A:C89132	STRC	012	1.07%			79.16%		0.08%			0.23%		0.04%						0.20%	0.47%
9009A:C90099	ASPH	001	0.08%	2.80%		1.02%		3.19%				1.40%				1.93%				3.33%
9009B:C88194	GEN	011		4.78%		0.47%		5.42%		0.99%	7.41%		0.43%	0.52%		0.38%	2.43%		0.24%	11.41%
9009B:C90132-CO	ASPH	010		0.43%				4.42%			2.51%		0.91%			0.66%		0.18%	0.18%	4.44%
9009B:C91080	ASPH	001		39.32%				5.62%								2.98%				2.98%
9009B:C91800	ASPH	021		14.49%		4.84%		9.31%								11.49%				11.49%
9009C:C86848R	ASPH	017		6.81%				8.69%		0.34%	2.20%		0.18%	5.42%		1.19%	15.73%	0.90%		25.62%
9009C:C88079-CO	STRC	003	2.54%	0.71%		31.33%		4.37%		0.08%	0.36%	0.89%	1.18%	1.21%		1.73%	3.47%	0.86%		9.70%
9009C:C89041	GEN	003	2.10%	1.05%		2.24%		7.36%			0.44%	1.71%	0.52%			0.16%		0.05%	0.44%	3.32%
9009C:C89140R	ASPH	005		8.08%				24.40%								3.20%				3.20%
9009C:C90059-CO	STRC	003	2.66%	1.70%		55.22%		11.60%				5.84%	0.05%	0.36%		0.45%	0.07%	0.10%	0.05%	6.71%
9010A:C86034R	STRC	002		1.54%		48.08%		11.35%			0.31%	1.61%	0.12%			3.13%		0.07%	0.36%	5.50%
9010A:C90108	TRAF	017		0.04%				78.02%			0.20%						0.79%	1.66%		2.67%
9010A:C90651S-C	STRC	003		6.03%		57.55%		6.53%					0.27%	0.25%		0.09%				0.61%
9010A:C90889	STRC	002	28.68%	0.93%		23.95%		26.94%												0.00%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9010B:C90097	LSCP	017	$394,392.00					6.98%				0.46%	3.20%	5.15%	3.97%	0.90%			1.22%	
9010B:C90101	ASPH	020	$532,401.30		1.21%	61.43%	2.04%					0.42%	3.61%	6.39%	0.66%	0.34%				
9010B:C90852	GEN	013	$2,442,969.11	0.74%	0.23%	30.30%	0.14%	0.39%				2.81%	36.60%	1.76%	1.79%	0.48%				7.02%
9010C:C87182	STRC	003	$509,080.98	0.22%		2.82%	4.53%		0.21%			7.54%	13.16%	6.50%	0.98%	0.71%				7.69%
9010C:C88105-CO	ASPH	003	$1,479,085.75	1.20%	0.14%	44.93%							12.93%	4.34%	1.09%	0.45%				
9010C:C90107	STRC	013	$9,252,525.00	2.17%	0.04%	1.96%	0.67%			4.64%		1.56%	8.41%	3.87%	1.82%	1.26%				
9010D:C88075	STRC	003	$1,584,140.43	1.24%	0.32%	22.41%							12.97%	3.67%	0.69%	1.50%				0.04%
9010D:C90157	ASPH	012	$1,631,811.88		2.26%	62.33%	12.81%	0.03%				0.29%	3.41%	5.00%	0.82%	0.46%				0.11%
9011A:C89439	STRC	003	$537,402.10	0.19%	0.18%	17.05%	0.50%	0.85%				3.63%	8.18%	2.79%	3.36%	1.26%				0.18%
9011B:C88092	ASPH	011	$271,719.30		0.21%	30.00%		9.28%		1.34%		3.84%	8.97%	1.84%	1.47%	2.08%				
9011B:C90170	CONR	012	$3,701,867.19	0.05%	0.05%	3.81%	0.64%	0.55%		53.17%		4.47%	7.56%	8.90%	2.47%	0.38%				0.10%
9011B:C90637	SIGN	017	$88,989.75											3.22%						
9011C:C90033	SURF	017	$114,620.00		11.52%	6.54%								17.45%						
9011C:C90842	ASPH	017	$158,952.30		0.62%	31.20%		11.01%					4.09%	11.86%	0.03%	1.55%				
9011C:C91103	GEN	003	$149,774.97		0.27%	13.33%						23.61%	25.80%	9.35%	5.44%	4.11%				
9011C:C91822	DRNG	017	$71,599.50	0.36%								70.26%	2.87%	1.40%		0.10%				4.24%
9011D:C88101	GEN	013	$3,793,242.32	5.78%	0.29%	0.32%		0.15%		0.07%		6.20%	27.01%	4.80%	1.71%	0.32%				0.92%
9011D:C90108R	TRAF	017	$1,724,275.00											14.03%		2.26%				
9011D:C91436	SPEC	017	$158,383.00		0.06%	6.13%								13.95%						
9012A:C88048	GEN	017	$880,544.45		0.12%	22.06%						0.31%	6.84%	5.68%	3.18%	0.91%				
9012B:C91437	STRC	002	$49,714.50											16.09%						
9101A:C87878	STRC	017	$472,193.00	2.75%		2.68%	0.85%					0.78%	11.28%	5.29%	39.33%					
9101A:C90442-CO	GEN	017	$453,726.00	1.66%		0.13%		18.83%				2.23%	18.99%	7.32%	2.78%	0.69%				1.73%
9101B:C90113-CO	SGNL	005	$125,303.00		0.24%	26.44%	1.20%	5.40%				1.44%		7.55%	1.94%					
9101B:C91016	PVMK	017	$305,500.00											1.64%	4.91%					
9101C:C88100	ASPH	017	$197,935.86	28.21%	1.18%	38.20%						7.78%	9.84%	3.74%	2.81%	0.86%				
9101C:C90172	ASPH	004	$449,842.63		1.14%	49.24%						12.22%	15.28%	0.87%	1.70%	0.30%				1.54%
9101D:C90082	ASPH	005	$2,233,852.50		0.77%	63.51%	5.36%	0.09%				0.49%	1.19%	3.76%	0.02%	0.52%				0.08%
9101D:C90174	GEN	012	$561,015.31	0.40%	0.38%	19.99%		2.12%		14.49%		3.62%	7.01%	5.35%	2.64%	0.58%				0.06%
9101D:C91011-CO	STRC	012	$21,665,733.12	0.61%	0.24%	6.04%	3.75%	1.04%	0.06%	0.01%		0.76%	5.10%	7.71%	9.35%	0.19%				0.03%
9101D:C91109	STRC	005	$39,481.22											1.27%						
9102A:C91439	DRNG	017	$423,436.15	2.06%	0.16%	7.65%	3.86%		0.08%			32.90%	14.71%	3.78%		0.66%				
9102B:C89159	GEN	013	$3,132,800.45		0.28%	18.36%		0.09%		10.14%		7.78%	14.47%	1.26%	3.25%	0.29%				0.01%
9102C:C89168	CONR	001	$10,839,880.08			6.70%	0.48%	0.03%		62.79%		0.63%	13.34%	4.75%	0.99%	0.29%				
9102C:C91031	PVMK	017	$336,531.00											0.89%	5.35%					
9102D:C89078	ASPH	003	$325,815.26		0.87%	36.14%		0.69%				4.97%	13.14%	9.48%	4.60%	1.47%				1.36%
9102D:C90033R	RMVL	017	$98,320.00		16.11%	7.12%								7.12%						
9102D:C90146	ASPH	012	$470,001.99		0.78%	31.29%	0.09%	11.74%		0.81%		6.46%	8.74%	4.91%	2.12%	9.81%				0.04%
9103A:C89078	GEN	003	$364,960.00		0.44%	35.53%						0.38%	24.33%	1.67%	2.47%	1.21%				0.88%
9103A:C91007	STRC	013	$9,109,876.85	0.67%	0.02%	2.68%	0.16%	1.01%		0.02%		1.00%	10.05%	1.10%	3.64%	0.98%				3.67%
9103B:C89059	ERTH	012	$2,686,057.90	2.41%	0.12%	8.97%		0.33%				7.62%	61.59%	3.72%	2.23%	0.45%				0.06%
9103B:C91125	SIGN	017	$380,762.10											3.84%						
9103C:C90121-CO	SGNL	009	$102,917.00					5.18%						2.00%	2.72%					
9103C:C91111	ASPH	001	$4,383,195.85		0.45%	64.23%	0.51%						3.07%	5.85%		1.19%				
9104A:C89139-CO	ASPH	005	$317,425.68		0.22%	31.45%		7.81%	0.22%	1.10%		0.39%	11.57%	3.15%	1.04%					
9104A:C90041	PVMK	017	$149,820.00											0.67%	3.34%					
9104A:C90095	SGNL	009	$111,702.00											3.13%						
9104A:C90401	ASPH	020	$2,389,844.78		1.41%	75.75%	3.72%					0.16%	4.52%	3.46%		0.34%				0.03%
9104B:C89020	STRC	002	$2,414,852.32	0.85%	0.02%	3.23%				14.37%		0.32%	7.41%	4.43%	1.39%	0.49%				2.98%
9104B:C89079	STRC	003	$1,546,308.16	0.47%	0.22%	9.89%	5.46%	2.13%				0.25%	3.00%	1.88%	4.94%	2.15%				2.14%
9104B:C91062	ASPH	021	$754,207.00		1.15%	86.65%							1.06%	3.18%		0.36%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9010B:C90097	LSCP	017		0.82%		7.84%		7.58%		7.84%	0.32%		52.48%						1.21%	54.01%
9010B:C90101	ASPH	020		2.39%				9.64%				9.10%	0.21%			2.24%		0.32%		11.87%
9010B:C90652	GEN	013	0.98%	1.35%		3.31%		4.36%		0.74%	0.77%	0.22%	0.56%	0.74%		1.17%	2.06%	0.73%	0.75%	7.00%
9010C:C87182	STRC	003	0.54%	0.36%		42.16%		4.15%			3.70%	2.23%	0.83%			0.62%		0.28%	0.68%	8.45%
9010C:C88105-CO	ASPH	003	3.63%	0.24%		21.91%		6.32%			0.09%	0.71%	0.37%	0.08%		1.38%		0.14%	0.05%	2.62%
9010C:C90107	STRC	013	2.92%	2.18%		62.37%		1.38%		0.36%	0.58%	1.54%	0.10%	1.00%		0.25%		0.75%	0.08%	4.30%
9010D:C88075	STRC	003	2.53%	2.23%		42.43%		8.53%		0.05%	0.93%		0.21%			0.25%		0.02%		1.39%
9010D:C90157	ASPH	012		0.86%		1.84%		2.28%				8.07%	0.78%			0.23%		0.31%		7.40%
9011A:C89439	STRC	003	3.72%	1.72%		35.80%		8.07%			0.59%	9.89%	0.42%			1.24%		0.13%	0.23%	12.50%
9011B:C88092	ASPH	011		3.84%		1.03%		13.95%		0.58%	1.38%		0.97%	1.98%		3.55%	12.09%	1.54%		21.48%
9011B:C90170	CONR	012	0.12%	4.88%		2.06%		4.71%		0.00%	2.16%		1.41%	1.22%		0.67%		0.43%	0.19%	8.08%
9011B:C90857	SIGN	017		2.58%				10.20%										84.00%		84.00%
9011C:C90033	SURF	017		26.49%			26.49%	8.38%								3.14%				3.14%
9011C:C90842	ASPH	017		12.14%				7.16%					1.49%	4.48%		5.77%	3.96%	4.60%	0.04%	20.34%
9011C:C91103	GEN	009		1.68%		10.35%		1.92%			2.50%		1.44%			0.21%				4.16%
9011C:C91822	DRNG	017		0.45%		1.18%		6.05%				9.32%	2.95%						0.81%	13.08%
9011D:C88101	GEN	013		0.44%		38.99%		0.59%		8.73%	1.30%		1.99%					0.35%	0.04%	3.68%
9011D:C90108R	TRAF	017		0.06%				79.78%			0.32%						0.70%	2.85%		3.87%
9011D:C91436	SPEC	017		4.21%		0.42%		8.43%				24.03%		11.44%		1.44%	28.78%	1.11%		66.80%
9012A:C88048	GEN	017	3.41%	0.73%		34.94%		12.26%				1.13%	0.25%			4.82%		1.36%		7.56%
9012B:C91437	STRC	002	11.80%			29.53%		42.58%												0.00%
9101A:C87878	STRC	017		0.08%		32.97%		1.00%			1.03%	0.06%	1.96%	0.10%				0.04%		3.19%
9101A:C90442-CO	GEN	017		0.17%		33.60%		4.17%			0.20%	4.18%	1.70%			0.59%		0.50%	0.43%	7.60%
9101B:C90113-CO	SGNL	005		2.26%				13.49%		1.44%				4.17%		0.96%	33.14%	0.34%		38.61%
9101B:C91018	PVMK	017														93.45%				93.45%
9101C:C88100	ASPH	017		0.27%		0.59%		7.46%		0.09%	0.33%		0.29%			0.35%		0.02%	0.18%	1.15%
9101C:C90172	ASPH	004		1.32%				2.99%			6.65%		1.14%			0.93%	0.62%	1.50%	2.55%	13.38%
9101D:C90082	ASPH	005	0.37%	3.73%		4.38%		3.55%	0.13%			5.20%	0.10%			3.47%	0.51%	2.78%	0.01%	12.08%
9101D:C90174	GEN	012		2.99%		2.72%		2.84%			0.35%	17.22%	0.29%	10.29%		0.66%	0.36%	5.74%		34.81%
9101D:C91011-CO	STRC	012	0.05%	1.67%		34.90%		18.11%	0.18%	0.39%	0.06%	3.65%	2.30%	0.22%		0.73%	0.01%	0.14%	0.70%	7.81%
9101D:C91109	STRC	005				99.73%														0.00%
9102A:C91439	DRNG	017	0.23%	2.87%		21.97%		6.87%			0.56%					1.49%		0.15%		2.20%
9102B:C89159	GEN	013		1.62%		6.18%		2.68%		5.85%	1.81%	13.33%	1.18%	7.18%		0.48%		2.62%	2.17%	28.78%
9102C:C89168	CONR	001		1.38%		3.06%		2.21%			0.07%	0.49%	0.78%	0.57%		0.81%		0.63%		3.35%
9102C:C91031	PVMK	017		0.30%												93.46%				93.46%
9102D:C89078	ASPH	003	4.91%	3.06%		4.60%		9.31%			1.86%	2.11%	0.76%			0.54%		0.14%		5.40%
9102D:C90033R	RMVL	017		30.88%			18.80%	16.31%								3.66%				3.66%
9102D:C90146	ASPH	012		1.85%		0.49%		5.47%		4.49%			9.42%			0.56%		0.91%	0.02%	10.91%
9103A:C89078	GEN	003	1.60%	2.28%		17.57%		6.47%			0.88%	2.67%	0.80%			0.36%		0.23%	0.20%	5.16%
9103A:C91007	STRC	013	0.27%	0.52%	3.75%	86.49%		0.28%		0.21%	0.29%	0.22%	0.86%	1.79%		0.13%	0.04%	0.07%	0.11%	3.51%
9103B:C89059	ERTH	012	0.07%	0.55%		2.99%		3.71%			0.67%	2.50%	1.30%			0.13%		0.12%	0.25%	4.97%
9103B:C91125	SIGN	017		1.39%				2.49%						3.18%				89.00%		92.18%
9103C:C90121-CO	SGNL	009		0.90%				31.60%						11.50%		4.12%	38.10%	3.90%		57.62%
9103C:C91111	ASPH	001	0.09%	0.34%		0.64%		1.38%				0.40%	0.68%			1.01%		0.15%		2.24%
9104A:C89139-CO	ASPH	005		3.41%				9.05%						4.19%		4.53%	20.89%	0.98%		30.59%
9104A:C90041	PVMK	017														96.00%				96.00%
9104A:C90085	SGNL	009		3.45%				7.69%						15.33%		5.28%	64.48%	0.70%		85.79%
9104A:C90401	ASPH	020	0.16%	0.72%		1.54%		1.85%			3.38%	1.25%	0.46%			0.54%		0.07%	0.84%	8.34%
9104B:C89020	STRC	002	10.40%	1.09%		43.12%		6.38%			0.07%	0.85%	0.17%			1.61%		0.42%	0.42%	9.54%
9104B:C89079	STRC	003	4.75%	0.87%		50.08%		6.09%			0.52%	3.55%	0.15%	1.29%		0.11%		0.10%	0.16%	6.88%
9104B:C91082	ASPH	021	0.22%	0.16%		1.61%		1.91%				0.90%				2.80%				3.70%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9104B:C91117	STRC	013	$1,988,011.82	4.58%			0.76%					10.29%	18.64%	3.07%	5.92%	0.72%				0.14%
9104B:C91441	ASPH	021	$556,992.25		1.16%	81.54%	4.77%						0.31%	7.29%		0.99%				
9104C:C90730	SGNL	017	$59,596.00			1.21%		2.77%						2.52%	6.71%					
9104C:C91328	DRNG	017	$82,575.46	9.65%			0.82%					53.68%	31.41%	3.50%	2.42%	0.11%				
9104C:C91446	ASPH	021	$778,371.90			100.00%														
9104C:C91450	ASPH	021	$1,974,585.90		0.85%	65.52%								1.82%		0.15%				
9104D:C91438	ASPH	020	$646,266.83		1.60%	69.52%		0.12%				0.65%	0.95%	1.16%		1.26%				
9105A:C90045	ERTH	012	$1,539,577.75		0.80%	22.99%	20.34%					2.05%	30.60%	6.76%	1.62%	0.58%				
9105A:C90074	ASPH	005	$172,303.70		0.95%	38.18%	3.24%	3.08%				12.55%	1.51%	19.15%		0.73%				
9105A:C91118	ASPH	001	$899,611.83		0.95%	41.07%	3.35%	7.15%		0.68%		3.45%	5.80%	9.12%	0.89%	2.04%				
9105B:C88152	REST	014	$387,059.00	14.01%		2.34%						0.51%	11.35%	8.17%	32.50%	1.20%			22.27%	
9105B:C91404	ASPH	020	$1,984,928.75		0.57%	88.58%	1.61%						0.08%	4.23%		0.45%				
9105B:C91452	ASPH	021	$747,268.80		0.59%	81.61%		0.43%				0.13%	1.33%	0.94%	0.20%	0.16%				
9105C:C87878R	STRC	017	$319,710.10	3.70%		1.24%	7.69%					2.60%	10.60%	8.76%	10.38%					
9105C:C91320	ASPH	020	$1,136,458.80		0.80%	76.06%	7.32%						0.37%	4.68%		0.97%				
9105C:C91322-CO	ASPH	020	$1,244,392.75		0.55%	74.42%	5.43%						0.36%	12.05%		0.32%				
9105C:C91449	ASPH	001	$1,311,362.60		0.55%	47.05%		0.43%		3.80%		1.46%	0.65%	6.88%		1.72%				
9105C:C91451	ASPH	021	$1,137,793.01		1.87%	80.54%		0.68%				0.63%		1.32%						
9105C:C91453	ASPH	021	$796,295.47		0.67%	59.78%		0.47%	0.13%			0.01%		5.02%						
9105C:C91455	ASPH	021	$1,743,242.82		0.61%	55.58%		0.53%		0.07%		0.71%		3.65%	0.10%	3.29%				
9105D:C90160	ASPH	011	$1,229,813.21	0.16%	0.46%	34.33%		8.21%				4.76%	5.92%	10.16%	3.37%	7.20%				0.10%
9105D:C90645	ASPH	020	$1,786,227.50		11.33%	62.06%	0.98%							3.25%		0.36%		17.93%		
9105D:C91038	STRC	012	$8,797,403.87	0.75%	0.13%	10.74%	1.22%	0.11%		14.29%		2.34%	5.96%	6.05%	2.67%	0.91%				1.88%
9105D:C91823	ASPH	020	$603,908.60		1.59%	64.59%								2.73%						
9105E:C90138	SGNL	005	$204,541.10		0.19%	17.15%		9.22%		0.68%		1.83%	2.71%	5.87%	1.22%	2.82%				
9105E:C90151	ASPH	020	$77,812.70		0.45%	34.29%	20.86%	21.76%		0.96%		0.22%	7.56%	6.43%	1.93%					
9105E:C91070	STRC	003	$421,857.95	2.06%	0.16%	5.73%		0.15%	0.58%			5.73%	16.57%	4.27%	1.49%	4.23%				0.81%
9105E:C91136	LSCP	012	$257,870.39											19.39%						
9105E:C91321-CO	ASPH	020	$1,522,126.93		1.14%	79.89%	4.26%					0.11%	0.21%	6.18%		0.37%				
9105E:C91701-CO	ASPH	010	$305,805.40	0.74%	0.59%	51.47%	3.55%					3.64%	18.71%	6.64%	1.84%	2.13%				0.82%
9105E:C92800	ASPH	020	$247,842.12			100.00%														
9106A:C88117-CO	SGNL	005	$195,140.38			6.86%		8.87%				1.64%		2.38%	0.21%					
9106A:C90074R	ASPH	005	$157,552.00		0.84%	32.45%	4.96%	5.59%				19.38%	1.90%	7.62%		1.65%				
9106A:C91082	ASPH	012	$915,018.55	0.54%	0.45%	28.00%		12.22%	0.08%	1.07%		5.90%	12.71%	2.65%	3.03%	6.09%				0.07%
9106A:C91447	ASPH	020	$3,088,773.73		1.31%	69.94%	5.79%	1.06%		10.64%		0.37%	0.19%	2.10%	0.45%	0.17%				
9106A:C91824	ASPH	020	$134,602.00			89.24%										1.45%				
9106A:C91826	ASPH	020	$395,883.00			92.43%										0.68%				
9106B:C88070	ASPH	012	$3,916,401.31	2.54%	1.71%	35.19%	6.90%	0.12%				6.88%	18.76%	6.74%	1.05%	0.40%		2.18%		0.25%
9106B:C91145	ASPH	020	$2,539,136.41		13.40%	58.62%	4.14%					0.17%	0.26%	3.47%		0.22%		15.15%		
9106B:C91848	ASPH	020	$247,742.35		0.42%	96.90%														
9106B:C91849	ASPH	020	$427,636.30		0.36%	96.98%														
9106B:C91865	ASPH	020	$112,844.30			100.00%														
9106B:C92801	ASPH	020	$239,117.34			100.00%														
9106B:C92802	ASPH	020	$255,733.60			100.00%														
9106C:C90052	STRC	001	$812,875.40	0.67%	0.92%	15.97%							11.63%	3.81%	1.48%	1.35%				3.67%
9106C:C90133	ASPH	005	$45,304.00		0.37%	47.32%		10.04%						2.76%						
9106C:C90433	CONR	010	$8,205,044.20		0.01%	3.24%	0.09%		0.56%	49.69%		0.49%	24.17%	4.83%	3.56%	0.35%				
9106C:C90437	GDRL	005	$499,956.75										6.83%	1.46%	1.43%					
9106C:C91088	ASPH	020	$259,587.50			77.38%						0.36%	18.18%	0.39%						
9106C:C91097	GDRL	005	$212,119.50			6.17%						4.10%	6.63%	9.43%	0.94%	2.83%				0.38%
9106C:C91319	ASPH	021	$298,715.00		0.61%	63.15%						0.23%		2.51%		1.09%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9104B:C91117	STRC	013	0.23%	0.17%		50.40%		0.62%		0.34%	2.00%		1.79%	0.92%				0.03%		4.14%
9104B:C91441	ASPH	021		0.91%				2.54%								0.47%				0.47%
9104C:C80730	SGNL	017		4.15%				14.85%						14.24%		3.52%	49.92%		0.11%	67.79%
9104C:C91328	DRNG	017		0.19%				2.89%			1.23%									1.23%
9104C:C91446	ASPH	021																		0.00%
9104C:C91450	ASPH	021		18.76%				5.85%		0.17%						4.71%	2.17%			6.88%
9104D:C91438	ASPH	020		6.45%		0.95%		7.72%		0.02%		0.71%	0.28%	0.71%		6.45%	0.80%	1.64%		9.60%
9105A:C90045	ERTH	012		2.30%		0.06%		4.47%				6.09%	0.45%			0.24%		0.50%		7.28%
9105A:C90074	ASPH	005		0.44%				12.60%						1.18%		5.80%		0.61%		7.69%
9106A:C91118	ASPH	001		2.38%				9.66%				2.38%	0.03%	1.64%		0.29%	8.90%	0.36%	0.04%	13.64%
9105B:C86152	REST	014				0.30%		2.28%		2.94%	1.02%		1.09%							2.11%
9105B:C91404	ASPH	020		0.62%				3.03%				1.61%				0.62%		0.31%		2.54%
9105B:C91452	ASPH	021	0.24%	13.47%				4.31%		0.09%		4.45%				10.51%	1.17%	0.47%		16.60%
9105C:C87878R	STRC	017				39.75%		0.31%		10.71%	2.35%		2.01%							4.36%
9105C:C91320	ASPH	020		0.04%				3.15%				4.78%				0.73%		0.76%	0.35%	6.61%
9105C:C91322-CO	ASPH	020		0.74%				4.37%				0.66%				1.09%				1.75%
9105C:C91449	ASPH	001		13.12%				6.17%		0.93%				2.07%		10.80%	4.54%	0.05%		17.26%
9105C:C91451	ASPH	021		16.66%				8.58%		0.12%				0.35%		8.74%	1.51%	0.02%		10.62%
9105C:C91453	ASPH	021		15.85%				8.56%		0.20%	0.61%					7.60%	1.12%			9.33%
9105C:C91455	ASPH	021		17.32%				7.39%		0.14%		1.21%				6.66%	1.07%	0.01%	1.65%	10.60%
9105D:C90160	ASPH	011		5.16%		0.42%		5.02%		1.93%	0.16%		0.69%	2.23%		2.21%	7.02%	0.47%	0.02%	12.80%
9105D:C90645	ASPH	020		0.28%				2.77%								1.04%				1.04%
9105D:C91038	STRC	012	0.66%	3.29%		35.31%		2.02%		0.33%	0.21%	4.65%	0.18%	1.16%		0.39%	0.06%	1.36%	3.31%	11.32%
9105D:C91823	ASPH	020		7.91%				8.11%								11.07%	1.89%		2.10%	15.06%
9105E:C90138	SGNL	005		8.81%				12.54%		0.08%			1.98%	2.87%		3.41%	28.80%	2.04%		37.08%
9105E:C90151	ASPH	020		3.19%				2.20%		0.36%										0.00%
9105E:C91070	STRC	003	3.77%	1.49%		34.34%		11.02%		1.19%	0.55%	1.46%	1.19%			0.37%		0.48%	3.22%	7.27%
9105E:C91136	LSCP	012											60.61%							60.61%
9105E:C91321-CO	ASPH	020		1.90%				3.99%		0.13%		0.78%				0.93%				1.72%
9105E:C91701-CO	ASPH	010		1.73%		2.64%		5.97%					1.12%			0.38%		0.33%		1.83%
9105E:C92800	ASPH	020																		0.00%
9106A:C89117-CO	SGNL	005		4.94%				13.37%						13.28%			48.86%			61.94%
9106A:C90074R	ASPH	005		1.45%				13.31%						2.09%		7.20%		1.56%		10.85%
9106A:C91092	ASPH	012		6.13%		0.91%		8.19%		1.03%			0.59%	1.97%		2.60%	1.91%	1.39%	2.46%	10.92%
9106A:C91447	ASPH	020		3.24%		0.08%		2.70%		0.08%						1.76%	0.13%			1.88%
9106A:C91824	ASPH	020						9.31%												0.00%
9106A:C91828	ASPH	020						5.58%								1.30%				1.30%
9106B:C88070	ASPH	012	0.04%	0.70%		4.91%		5.41%		2.20%	1.75%	0.90%	0.68%	0.01%		0.27%		0.06%	0.54%	4.21%
9106B:C91145	ASPH	020						3.26%								1.32%				1.32%
9106B:C91848	ASPH	020														3.28%				3.28%
9106B:C91849	ASPH	020														2.65%				2.65%
9106B:C91855	ASPH	020																		0.00%
9106B:C92801	ASPH	020																		0.00%
9106B:C92802	ASPH	020																		0.00%
9106C:C90052	STRC	001	1.11%	0.84%		50.80%		3.84%			1.51%	1.27%	0.63%			0.22%		0.05%	0.22%	3.90%
9106C:C90133	ASPH	005		19.76%				18.81%								0.87%		0.08%		0.93%
9106C:C90433	CONR	010		2.16%		0.28%		3.08%			0.22%	0.30%	0.49%	0.78%		4.85%		0.69%	0.21%	7.48%
9106C:C90437	GDRL	005		7.82%				8.50%				63.03%	0.24%	9.75%			0.41%	0.74%		74.17%
9106C:C91088	ASPH	020						3.59%		0.11%										0.00%
9106C:C91097	GDRL	005		0.75%				12.16%				56.28%	0.28%					0.05%		56.61%
9106C:C91319	ASPH	021		18.44%				9.08%		2.41%									1.47%	1.47%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9106C:C91709	ASPH	004	$239,151.40			74.47%							6.72%	5.23%		0.63%			3.35%	0.35%
9106C:C91842	ASPH	020	$595,082.78			88.86%												7.42%		
9106C:C91843	ASPH	020	$593,088.45			90.10%						0.28%						6.55%		
9106C:C91844	ASPH	020	$387,634.50			100.00%														
9106C:C91845	ASPH	020	$297,200.00			100.00%														
9106C:C91848	ASPH	020	$275,616.00			79.57%												20.43%		
9107A:C87052	GEN	012	$6,165,540.00	9.86%	0.42%	33.10%	10.38%					4.88%	22.85%	3.57%	2.27%	0.57%				0.04%
9107A:C91824R	ASPH	020	$128,524.60			88.73%										1.52%				
9107B:C91099	SGNL	005	$153,814.29											1.30%						
9107B:C91323	CONR	017	$408,105.15		0.31%	14.03%		0.12%		36.10%			19.45%	8.33%	1.47%	1.54%	2.31%			
9107C:C89111	GEN	003	$701,951.12	3.73%	0.24%	20.98%	3.14%					0.89%	14.56%	6.94%	7.05%	1.68%				0.40%
9107C:C89119	GEN	005	$197,656.00	0.13%	0.31%	22.37%		14.68%		0.78%		2.40%	6.09%	11.86%	2.02%	2.78%				
9107C:C91113	ASPH	001	$2,627,707.22			56.55%						1.09%	8.78%	3.04%	0.23%	0.40%				
9107C:C91115	ASPH	020	$81,757.00		0.87%	71.01%						0.98%	0.37%	1.83%		1.04%				
9107D:C91108	GEN	005	$104,824.06					11.89%	0.52%	21.34%		7.19%	7.57%	2.91%	13.71%					
9107D:C91701R-C	ASPH	010	$253,858.90	0.35%	0.57%	57.51%	1.47%					1.71%	5.70%	15.76%	3.55%					
9107D:C91839	ASPH	020	$522,264.00			100.00%														
9107D:C91840	ASPH	020	$464,815.24			100.00%														
9108A:C89060	ERTH	012	$1,147,907.00	0.05%	0.05%	5.70%	0.91%					0.81%	77.19%	6.53%		1.13%				
9108A:C90058	STRC	003	$456,115.05		1.01%	16.64%	1.39%					0.27%	6.55%	6.58%	3.51%	1.01%				
9108A:C91138	GEN	012	$8,886,790.45	1.11%	0.15%	13.55%	3.09%	0.86%	0.06%	23.02%		8.84%	7.48%	9.15%	3.44%	0.81%				0.02%
9108A:C91403	ASPH	001	$1,126,608.74		1.55%	72.16%								2.67%		0.16%				
9108A:C91414	ASPH	020	$991,683.64		10.45%	62.13%	3.22%							5.24%		0.81%		13.31%		
9108B:C90452-CO	ASPH	012	$3,426,138.50	0.04%	1.09%	43.06%	8.79%					9.43%	15.63%	4.85%	5.84%	0.61%				0.10%
9108B:C91115R	ASPH	020	$71,912.86		0.01%	65.45%						0.40%	0.67%	6.12%		4.34%				
9108B:C91308	ASPH	001	$649,655.55		0.84%	48.41%		0.05%				1.59%		15.39%	1.54%	0.69%				
9108B:C91408-CO	ASPH	012	$4,934,726.40	0.16%	0.89%	42.75%	10.49%					5.48%	10.37%	8.34%	5.27%	0.43%				0.19%
9108B:C91647	PVMK	017	$239,469.45											1.25%						
9108C:C89048	ERTH	012	$3,793,831.50	2.96%	0.66%	25.26%	8.03%					5.04%	34.77%	3.95%	6.33%	0.38%				0.34%
9108C:C91015	GEN	013	$7,174,300.20	1.56%	0.11%	8.78%	1.63%	0.08%		12.84%		9.09%	20.85%	2.57%	7.30%	1.55%				0.72%
9108C:C91325	ASPH	001	$2,977,117.94	0.05%	7.70%	53.09%		0.05%				0.31%	3.10%	2.72%	0.15%	0.22%		10.15%		
9108C:C91445	ASPH	021	$357,814.85		0.96%	62.09%		1.36%				0.17%		5.17%	0.26%					
9108C:C92306	ASPH	017	$552,182.63	0.65%	1.25%	39.95%	12.48%					4.97%	11.79%	10.87%	5.16%	0.63%				0.07%
9108C:C92806	ASPH	020	$160,840.00			93.29%										0.99%				
9108D:C89074	GEN	003	$882,958.83		2.13%	27.86%							13.69%	4.98%	1.76%	2.82%				
9108D:C90177	GEN	008	$127,995.50		0.61%	18.27%		25.02%	0.23%	4.62%		18.25%		5.47%	2.34%					
9108D:C90454	ASPH	011	$2,116,382.75	0.13%	0.36%	32.92%	0.48%					1.05%	9.46%	9.31%	2.64%	0.98%				
9108E:C90147	GEN	012	$531,963.30		0.81%	15.03%	13.76%	19.19%	0.56%	2.72%		20.76%	9.54%	4.32%	1.88%	1.45%				
9108E:C90422	STRC	003	$1,249,034.85	0.58%	0.18%	15.99%		0.08%	0.69%			0.44%	14.77%	3.20%	4.16%	1.49%				3.95%
9108E:C91014-CO	GEN	013	$7,544,787.80	0.66%	0.34%	18.27%	2.02%	0.83%				7.86%	23.01%	3.05%	5.70%	0.51%				0.30%
9108E:C91173	ASPH	017	$211,641.00		0.90%	63.34%	12.00%						0.94%	8.03%		0.28%				
9109A:C88172	GEN	003	$970,260.60	1.98%	0.59%	13.31%	0.14%					11.59%	17.13%	6.60%	7.37%	1.47%				2.62%
9109A:C91097S	GDRL	005	$155,260.00			13.75%						5.18%	10.10%	9.40%	3.26%	2.19%				1.03%
9109A:C91126	SPEC	017	$80,247.00			3.10%		5.85%				9.02%	3.59%	18.69%	0.63%					
9109B:C88048R	STRC	017	$933,000.00		0.13%	16.84%						0.28%	7.15%	7.11%	2.24%	1.00%				
9109B:C90063-CO	ASPH	009	$409,405.98	0.30%		25.89%	3.24%	15.73%		0.88%		0.79%	4.15%	3.18%	3.36%					
9109B:C91120	ASPH	021	$122,672.20		0.86%	67.38%						1.71%		22.79%		1.38%				
9109B:C91841	SURF	021	$230,008.75		25.71%									8.52%						
9109B:C92309	ASPH	020	$851,395.00		2.23%	81.75%								8.69%		0.18%				
9109C:C90422R	STRC	003	$1,220,967.00	0.79%	0.14%	9.99%		0.08%	1.06%			0.27%	15.97%	3.28%	4.91%	9.69%				3.09%
9109C:C91105	GDRL	005	$22,239.00																	

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9106C:C91709	ASPH	004						0.88%					1.42%			2.76%		4.39%		8.57%
9106C:C91842	ASPH	020		4.53%												1.19%				1.19%
9106C:C91843	ASPH	020		2.89%						0.17%										0.00%
9106C:C91844	ASPH	020																		0.00%
9106C:C91845	ASPH	020																		0.00%
9106C:C91846	ASPH	020																		0.00%
9107A:C87052	GEN	012		1.93%		1.17%		3.71%		0.18%	1.06%	0.97%	1.58%			0.56%	0.02%	0.11%	0.89%	4.99%
9107A:C91824R	ASPH	020						9.75%												0.00%
9107B:C91099	SGNL	005		1.95%				18.91%						26.56%			52.88%			78.44%
9107B:C91323	CONR	017		2.57%		0.11%		9.87%				0.46%	0.47%			2.09%		0.93%	0.03%	3.98%
9107C:C89111	GEN	003	0.94%	1.59%		27.85%		5.42%			1.49%	1.15%	0.68%			0.35%		0.38%	0.76%	4.79%
9107C:C89119	GEN	005		9.41%				11.55%		0.08%			0.46%	4.43%		2.58%	6.41%	1.67%		15.55%
9107C:C91113	ASPH	001	0.77%	1.77%		13.68%		3.97%			0.04%	7.58%	0.32%			1.76%				9.70%
9107C:C91115	ASPH	020						6.21%		0.24%									17.44%	17.44%
9107D:C91106	GEN	005		10.22%		8.45%		13.97%						0.88%					3.37%	4.25%
9107D:C91701R-C	ASPH	010		0.45%		3.22%		7.81%					0.64%			0.57%		0.70%		1.91%
9107D:C91839	ASPH	020																		0.00%
9107D:C91840	ASPH	020																		0.00%
9108A:C89060	ERTH	012		0.36%		0.14%		5.36%			0.21%	0.37%	0.27%			0.18%		0.72%		1.75%
9108A:C90056	STRC	003	3.51%	1.19%		42.15%		8.75%			0.79%	3.01%	0.49%			0.44%			2.71%	7.44%
9108A:C91138	GEN	012		1.79%		9.11%		2.76%		0.07%	0.36%	5.45%	0.09%	1.36%		0.62%	0.25%	0.75%	5.85%	14.65%
9108A:C91403	ASPH	001		15.64%				2.87%								4.85%				4.85%
9108A:C91414	ASPH	020		0.08%				3.54%								1.21%				1.21%
9108B:C90452-CO	ASPH	012	0.06%	1.57%		0.76%		3.88%		0.02%	1.44%	1.20%	0.51%			0.36%	0.04%	0.31%	0.41%	4.27%
9108B:C91115R	ASPH	020						8.08%		0.05%									14.87%	14.87%
9108B:C91308	ASPH	001		16.04%				9.10%		0.82%						3.56%	1.87%			5.43%
9108B:C91406-CO	ASPH	012	0.51%	1.42%		4.15%		3.82%		0.01%	3.00%	3.21%	0.57%			0.38%		0.34%	0.22%	7.73%
9108B:C91847	PVMK	017		1.25%				8.35%								89.14%				89.14%
9108C:C89048	ERTH	012		0.45%		2.72%		5.14%				0.94%	1.78%			0.28%		0.32%	0.64%	3.96%
9108C:C91015	GEN	013		1.58%		13.42%		1.90%		0.35%	0.51%	7.78%	1.65%	1.38%		0.64%	0.06%	3.63%	0.21%	15.86%
9108C:C91325	ASPH	001		0.54%				3.14%				5.34%	0.28%	1.32%		1.72%		0.05%	0.06%	8.77%
9108C:C91445	ASPH	021		9.29%				11.82%		0.22%						4.16%	4.47%			8.63%
9108C:C92306	ASPH	017		0.45%		0.79%		4.80%		2.94%	0.14%		1.67%			0.60%		0.91%	0.09%	3.31%
9108C:C92806	ASPH	020						5.72%												0.00%
9108D:C89074	GEN	003	1.46%	1.00%		31.97%		10.56%			1.21%		0.14%			0.31%		0.12%		1.78%
9108D:C90177	GEN	008		12.99%				7.26%								4.27%	2.66%			6.93%
9108D:C90454	ASPH	011		7.11%		3.11%		7.29%			21.16%	3.22%	0.23%	0.27%		2.84%		3.28%	0.19%	31.17%
9108E:C90147	GEN	012		2.84%				5.11%		0.23%	0.15%					0.62%		0.56%	0.56%	1.88%
9108E:C90422	STRC	003	2.40%	1.08%		37.27%		8.86%			0.65%	1.07%	0.40%	0.33%		0.83%		0.32%	3.47%	6.87%
9108E:C91014-CO	GEN	013		0.20%		29.65%		2.50%		1.33%	0.73%	3.43%	0.12%	2.10%		0.54%		2.21%	0.62%	9.75%
9108E:C91173	ASPH	017						13.49%								1.02%				1.02%
9109A:C88172	GEN	003	0.62%	0.68%		23.08%		10.55%			0.73%	1.16%	0.18%			0.20%		0.01%	0.03%	2.31%
9109A:C91097S	GDRL	005		0.89%				18.34%				35.25%	0.48%					0.13%		35.84%
9109A:C91126	SPEC	017		4.53%				12.95%						14.21%		0.66%	25.30%	1.58%		41.74%
9109B:C88046R	STRC	017	6.04%	0.94%		35.28%		16.36%				1.10%	0.22%			5.05%		0.28%		6.65%
9109B:C90063-CO	ASPH	009		4.76%				6.52%		0.21%			1.83%	4.82%		4.52%	16.37%	1.00%	2.34%	30.88%
9109B:C91120	ASPH	021						5.03%		0.85%										0.00%
9109B:C91841	SURF	021					58.63%	5.07%								4.07%				4.07%
9109B:C92309	ASPH	020						4.29%								2.85%				2.85%
9109C:C90422R	STRC	009	4.77%	1.45%		35.60%		8.19%			0.63%	0.97%	0.52%	0.49%		0.52%		0.21%	0.43%	0.77%
9109C:C91105	GDRL	005										100.00%								100.00%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9109C:C92315	ASPH	001	$863,178.38		2.92%	69.64%								6.67%						
9109D:C92700	ASPH	001	$196,991.36		0.71%	58.35%	28.26%						6.33%	3.33%		1.17%				
9109D:C92805	ASPH	021	$751,594.90		1.28%	66.58%								3.33%						
9110A:C91308R	ASPH	001	$875,657.75		0.80%	58.12%		0.07%				1.53%		7.40%	1.48%	0.67%				
9110B:C90054	ASPH	003	$193,008.75		0.55%	40.05%							15.06%	6.22%	2.33%	1.24%				
9110B:C92060	TRAF	012	$2,491,825.00			0.44%								0.80%		2.49%				
9110C:C91039	STRC	017	$11,160,610.13	1.26%	0.01%	1.51%	2.74%	0.14%		21.61%		2.77%	4.58%	3.68%	1.48%	0.48%				0.00%
9110C:C91040	STRC	012	$3,106,761.62	0.49%	0.10%	16.00%		0.24%	0.02%			1.98%	2.87%	6.53%	1.00%	0.50%				0.02%
9110D:C89435	STRC	017	$312,229.70	3.06%	0.10%	6.32%		0.31%				1.68%	15.86%	8.65%	4.52%	2.39%				
9110D:C91079	STRC	003	$293,900.00		0.04%	3.03%	10.57%	0.37%				0.10%	9.87%	8.90%	2.74%	1.83%				4.32%
9110D:C91089	STRC	013	$253,222.17	0.23%			1.71%	29.19%				2.07%	8.91%	6.89%		0.10%				1.07%
9110D:C91100	SGNL	005	$471,208.10										1.59%	5.87%		0.07%				
9110D:C91300	ERTH	012	$7,144,818.55	2.38%	0.01%	1.91%	0.63%	0.08%		11.11%		1.49%	38.96%	9.10%	6.28%	0.61%				0.07%
9110D:C92323	STRC	002	$230,830.85		0.09%	7.89%								17.33%	3.61%					
9110E:C88068	GEN	010	$1,286,143.30	0.22%	0.62%	29.84%	0.98%	0.08%	0.30%			3.74%	32.80%	4.12%	5.69%	0.98%				0.96%
9110E:C90014	STRC	013	$16,433,106.46	2.01%	0.04%	6.01%		0.06%		13.49%		7.69%	7.85%	6.75%	1.92%	0.37%				
9111A:C88172R	GEN	003	$995,492.22	2.21%	0.48%	14.44%	0.14%					10.55%	17.48%	2.16%	11.01%	1.10%				0.92%
9111A:C90416	STRC	003	$825,002.00	2.04%	0.02%	1.49%		1.06%		5.86%		0.44%	5.51%	3.76%	5.09%	0.90%				0.36%
9111A:C92003	FNC	012	$982,374.00										16.40%	9.16%						
9111B:C91072	GEN	003	$419,224.00	2.66%	0.19%	5.01%	6.61%					1.22%	20.52%	6.33%	2.10%	2.38%				
9111C:C91013	LSCP	012	$205,133.50										2.08%	9.75%						7.78%
9111C:C91135	ASPH	001	$383,698.66		0.45%	43.65%						0.89%	44.80%	3.91%	3.48%	0.52%				
9111C:C91170	STRC	003	$1,625,889.35	0.26%	0.01%	2.45%		0.14%	0.03%	23.23%		0.25%	12.84%	8.32%	1.10%	0.58%				3.46%
9112A:C92814	OTHR	017	$577,385.00											5.30%		77.07%				
9112B:C88097	SGNL	009	$869,120.00											4.17%		0.03%				
9112B:C91102	ASPH	010	$4,371,757.10	0.90%	1.38%	38.43%	7.76%					3.77%	18.27%	9.61%	4.83%	0.59%				
9112B:C91827	ASPH	020	$314,336.75		0.77%	76.22%	2.98%						0.24%	9.86%		0.30%				
9112C:C90409	GEN	013	$1,133,787.50	0.64%	0.08%	5.96%		4.71%		2.40%		20.48%	9.62%	8.82%	3.75%	1.06%				0.13%
9112C:C90444	CONR	012	$2,502,108.30		0.27%	16.73%	0.58%	0.62%		40.65%		2.52%	10.83%	5.44%	1.46%	1.45%				
9112C:C91098	GDRL	005	$253,469.90		0.35%	18.76%						1.67%		3.63%	0.99%	1.74%				
9201A:C89809	GEN	017	$207,090.40	2.02%	2.12%	28.94%	1.88%	7.48%		0.83%		23.57%	4.63%	4.83%		2.46%				
9201A:C91086	STRC	003	$294,409.09	0.95%	0.12%	2.61%	6.68%	0.66%					10.48%	3.97%	1.53%	0.99%				8.09%
9201B:C84207	STRC	003	$1,185,492.90	1.74%	0.01%	1.50%		2.03%		7.73%		0.95%	5.66%	5.08%	17.29%	4.21%				2.05%
9201B:C89155	GEN	001	$209,866.75	0.49%	0.29%	23.65%	4.98%	9.81%				15.25%	17.91%	9.01%	3.00%					0.77%
9201C:C91112	ASPH	010	$1,811,465.60		1.23%	41.40%	13.71%					4.54%	11.98%	9.93%	5.09%	1.43%				
9201C:C92063	ASPH	001	$1,331,347.64		0.86%	73.21%						0.68%	2.94%	3.98%		0.45%		6.98%		
9202A:C89094-AL	ASPH	010	$2,888,604.10	0.07%	0.38%	46.07%	10.41%					1.14%	20.82%	4.72%	1.18%	0.37%				
9202A:C90028	CONR	001	$11,895,416.74			5.71%				61.35%		1.17%	9.59%	8.20%	1.33%	0.32%				
9202A:C90034	GEN	005	$441,728.00		0.20%	13.98%							12.99%	10.41%	0.29%	0.07%				
9202A:C92013	PVMK	017	$489,798.00											0.81%	3.47%					
9202A:C92433	ASPH	021	$456,537.25		0.58%	50.03%		1.31%		0.39%		4.17%	1.58%	4.82%	0.77%	0.66%				
9202B:C89021	STRC	002	$3,204,435.25	0.70%		0.22%			0.26%	11.08%		0.04%	4.42%	4.81%	1.15%	0.30%				0.40%
9202C:C91077-CO	STRC	003	$8,903,209.84	2.73%	0.35%	15.73%		1.68%		0.05%		1.20%	9.27%	2.13%	5.64%	0.48%				1.72%
9202C:C92017	ASPH	001	$1,419,217.35		0.67%	72.64%	4.90%					0.25%	0.62%	8.53%		0.63%				
9202C:C92425	ASPH	001	$2,031,572.40		1.18%	65.40%						0.12%		4.43%	7.76%	0.49%				
9203A:C91708	STRC	013	$18,437,410.30	4.34%	0.01%	1.16%	2.40%	0.09%		19.56%		2.94%	11.42%	1.05%	3.29%	0.36%				0.06%
9203A:C92429	ASPH	001	$344,790.85		0.60%	48.09%		0.34%				0.47%		3.69%		0.06%				
9203A:C92432	ASPH	021	$329,522.35		0.82%	41.81%		2.90%				1.41%		1.52%		0.35%				
9203B:C88102	STRC	013	$13,138,633.63	3.48%	0.04%	4.84%	0.11%	2.39%	0.01%	11.65%		4.52%	9.20%	2.64%	2.15%	0.14%				0.13%
9203B:C91434	GEN	020	$266,378.30		0.69%	14.44%	2.50%					24.86%	26.25%	3.00%	5.81%	2.82%				
9203B:C91864	SURF	020	$421,666.99		43.27%									6.52%		0.76%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9109C:C92315	ASPH	001		17.16%				2.27%								1.34%				1.34%
9109D:C92700	ASPH	001								0.95%				0.17%		0.73%				0.90%
9109D:C92805	ASPH	021		7.28%				6.55%								14.69%	0.30%			14.99%
9110A:C91308R	ASPH	001		14.69%				8.90%		0.89%						3.64%	1.81%			5.45%
9110B:C90054	ASPH	003	2.07%	1.50%		18.61%		10.83%			0.70%		0.37%			0.38%		0.07%		1.53%
9110B:C92060	TRAF	012						94.54%			0.08%						0.08%	1.67%		1.73%
9110C:C91039	STRC	017	0.11%	1.86%		30.56%		1.25%		2.14%	2.41%	6.24%	11.84%	1.96%		0.35%		0.82%	0.20%	23.82%
9110C:C91040	STRC	012	1.29%	0.81%		57.44%		0.57%			1.20%	1.15%	0.46%	4.17%		0.68%	1.73%	0.35%	0.40%	10.14%
9110D:C89435	STRC	017	4.00%	0.70%		35.59%		12.38%			0.58%	2.46%	0.38%			0.69%		0.35%		4.45%
9110D:C91079	STRC	003	2.81%	0.31%		46.65%		1.85%			2.58%	2.79%	0.53%			0.07%		0.01%	0.44%	6.42%
9110D:C91089	STRC	013	1.78%	1.11%		41.17%		1.61%		0.02%	0.04%		0.66%					0.10%	3.45%	4.25%
9110D:C91100	SGNL	005		1.21%				19.94%						11.28%			60.03%			71.31%
9110D:C91300	ERTH	012	0.07%	0.82%		18.91%		2.49%	1.28%	0.29%	0.46%	1.00%	0.74%	0.51%		0.21%		0.46%	0.14%	3.52%
9110D:C92323	STRC	002	18.77%	4.47%		15.92%		28.66%				1.99%				1.06%				3.05%
9110E:C88086	GEN	010		1.69%	2.72%	0.23%		6.45%			2.91%		2.24%	0.04%		1.22%		1.19%	0.95%	6.55%
9110E:C90014	STRC	013	0.87%	1.69%		29.87%		0.80%		0.82%	3.06%	2.04%	0.09%	1.66%		0.11%	0.04%	0.87%	12.27%	20.14%
9111A:C86172R	GEN	009	0.52%	0.82%		24.59%		11.31%			1.00%	0.87%	0.14%			0.20%		0.01%	0.04%	2.26%
9111A:C90416	STRC	003		1.35%		51.91%		18.90%				1.22%	0.21%	0.31%		0.13%		0.04%		1.91%
9111A:C92003	FNC	012							22.08%		48.09%			4.26%						52.35%
9111B:C91072	GEN	003	1.79%	0.71%		29.22%		18.08%				1.51%	0.25%			0.37%		0.03%		2.16%
9111C:C91013	LSCP	012								4.13%			76.26%							76.26%
9111C:C91135	ASPH	001						1.67%								0.20%		0.23%		0.43%
9111C:C91170	STRC	003	1.75%	2.56%		37.52%		2.79%			0.81%	0.41%	1.03%			0.17%		0.04%	0.25%	2.71%
9112A:C92814	OTHR	017						6.67%								10.76%				10.76%
9112B:C86097	SGNL	009		1.33%				10.93%			0.03%			25.84%			57.68%			83.55%
9112B:C91102	ASPH	010		0.66%		0.27%		4.46%			3.56%	3.93%	0.85%			0.21%		0.31%	0.19%	9.05%
9112B:C91827	ASPH	020		1.30%				5.01%				2.72%				0.59%				3.31%
9112C:C90409	GEN	013		1.07%		0.97%		4.25%		1.59%	27.40%	1.06%	1.38%	4.12%		0.12%		0.23%	0.15%	34.46%
9112C:C90444	CONR	012	1.36%	0.78%		7.68%		4.29%		0.01%	0.11%		0.36%	0.75%		1.22%	1.72%	1.05%	0.04%	5.25%
9112C:C91098	GDRL	005		3.22%				10.77%				39.52%				0.47%	11.84%	6.95%		58.88%
9201A:C88609	GEN	017		2.30%		8.50%		9.34%			0.10%		0.38%			0.61%				1.10%
9201A:C91088	STRC	003	2.21%	0.20%		56.46%		0.86%			1.17%	2.22%	0.27%					0.04%	0.47%	4.17%
9201B:C84207	STRC	003		1.70%		36.31%		1.22%		9.78%	0.08%		1.83%	0.27%		0.46%		0.14%		2.78%
9201B:C89155	GEN	001		3.21%		1.37%		7.12%			1.89%					1.11%			0.14%	3.14%
9201C:C91112	ASPH	010		2.72%		1.36%		5.10%				0.43%	0.19%			0.44%		0.46%		1.52%
9201C:C92063	ASPH	001		0.61%				3.51%				5.05%	0.31%			1.25%		0.15%		6.76%
9202A:C89094-AL	ASPH	010	0.16%	0.88%		6.49%		4.33%		0.04%	1.47%		0.40%			0.66%		0.23%	0.19%	2.85%
9202A:C90028	CONR	001	0.19%	1.13%		4.62%		3.17%			0.01%	0.48%	0.83%	0.64%		0.77%		0.48%	0.04%	3.23%
9202A:C90034	GEN	005	1.30%	10.38%		25.75%		11.66%				12.32%	0.50%					0.17%		12.99%
9202A:C92013	PVMK	017														95.92%				95.92%
9202A:C92433	ASPH	021		13.69%				7.89%		0.55%		0.88%				11.68%	0.62%	0.09%		13.57%
9202B:C89021	STRC	002	1.87%	1.16%		60.61%		10.73%			0.11%	0.50%	0.17%	0.23%		1.00%		0.16%	0.07%	2.24%
9202C:C91077-CO	STRC	003	2.43%	2.13%		31.92%		8.66%		0.94%	0.68%	2.37%	4.29%	2.66%		0.60%	0.68%	1.36%	0.10%	12.74%
9202C:C92017	ASPH	001		6.00%				3.80%								1.95%				1.95%
9202C:C92425	ASPH	001		12.25%								1.95%				3.47%	2.65%	0.30%		8.37%
9203A:C91708	STRC	013		0.63%		43.47%		2.76%		0.68%	0.49%	2.27%	0.20%	1.73%		0.15%	0.07%	0.83%	0.06%	5.80%
9203A:C92429	ASPH	001		17.67%				12.68%		0.21%		1.32%		2.51%		9.29%	2.96%			16.08%
9203A:C92432	ASPH	021		18.55%				8.84%		0.16%				0.98%		16.95%	5.71%			23.64%
9203B:C88102	STRC	013		0.58%		37.20%		1.87%		2.85%	0.15%	2.56%	0.86%	2.41%		0.45%	0.58%	1.86%	7.42%	16.39%
9203B:C91434	GEN	020	2.44%	0.69%		4.28%		9.81%			1.94%		0.37%			0.32%				2.63%
9203B:C91864	SURF	020					38.49%	5.92%								5.04%				5.04%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9203B:C92428	SURF	021	$276,300.60			15.33%		2.43%				1.12%		2.53%	0.90%					
9203C:C87125	STRC	003	$284,661.58	8.65%	0.16%	10.85%	8.96%		0.04%				16.63%	6.32%		0.83%				4.10%
9203C:C88016	GEN	002	$1,539,999.00	1.14%		0.35%		0.06%		28.85%		0.17%	8.93%	1.45%	2.59%	1.06%				1.78%
9203C:C91463	ASPH	020	$517,071.00		0.56%	80.03%	5.32%						0.15%	8.70%		0.18%				
9203D:C92426	ASPH	021	$545,827.59		0.26%	43.10%		1.07%				0.18%		3.65%	0.92%	2.22%				
9203D:C92427	ASPH	001	$2,087,400.45		0.70%	71.79%		0.44%		0.48%		0.36%		2.18%	0.15%	0.27%				
9203D:C92813	SURF	020	$298,472.33		39.46%		2.17%							7.35%		0.77%				
9204A:C91464	GEN	013	$551,142.56			7.99%				19.98%		6.67%	5.90%	17.03%		9.72%				3.01%
9204B:C92336	CONR	021	$379,185.00			7.49%	1.35%			57.88%		2.74%		5.01%		0.16%				
9204C:C92331	ASPH	020	$3,174,880.25		1.01%	83.73%	5.98%							4.28%		0.35%				
9204C:C92339	ASPH	020	$720,532.60			100.00%														
9204C:C92345	ASPH	020	$3,240,299.55		9.99%	60.61%	5.30%					0.05%	0.28%	5.09%		0.28%		12.96%		
9204C:C92447	ASPH	020	$734,679.03		15.49%	52.05%	4.39%							1.57%	0.41%	1.09%		19.19%		
9204D:C92055	STRC	002	$1,327,320.91	0.53%	0.10%	6.93%		0.28%	0.12%	5.05%		0.47%	5.43%	5.37%	7.46%	0.62%				
9204D:C92340	ASPH	020	$774,116.70		1.23%	76.29%							0.96%	6.46%		0.52%		8.86%		
9205A:C88178	GEN	005	$1,117,635.47	0.84%	0.67%	21.06%		8.58%	0.63%	1.82%		13.84%	7.16%	5.62%	1.85%	0.75%				
9205A:C90065	ASPH	001	$2,867,198.32	0.47%	0.93%	42.67%	6.24%					4.47%	22.53%	8.13%	3.31%	0.55%				0.12%
9205A:C91087	GEN	003	$129,036.12		0.44%	17.02%	2.23%						12.39%	5.27%	6.30%	2.16%				0.79%
9205A:C92347	ASPH	005	$438,966.00	0.95%	0.66%	23.34%		4.76%	0.23%			1.01%	3.28%	7.97%	2.62%	1.25%				
9205B:C92083	GDRL	005	$198,719.50											5.03%		0.13%				
9205B:C92337	ASPH	020	$441,445.95		12.88%	59.62%												26.10%		
9205B:C92434	ASPH	021	$2,095,696.10		0.53%	56.31%	5.04%	2.34%					1.56%	1.81%	1.84%	1.09%				
9205C:C89815	ASPH	010	$246,840.00		0.22%	37.47%	0.30%			0.95%		6.21%	4.30%	9.93%	5.47%					
9205C:C90006-CO	GEN	012	$5,231,697.20	0.55%	0.06%	2.16%	1.67%	5.01%	0.24%	0.07%		1.51%	20.75%	6.88%	3.61%	8.40%			14.01%	0.25%
9205C:C91306	CONR	005	$4,911,808.80	0.94%		1.69%	0.07%	2.71%	0.12%	52.03%		3.80%	8.34%	7.33%	1.99%	5.18%				
9205C:C92004X	ERTH	012	$3,187,254.46	0.42%	0.10%	4.37%	1.93%	5.31%	1.71%			1.37%	30.18%	6.27%	7.31%	0.81%			18.33%	0.66%
9205C:C92015	GDRL	005	$419,820.00		0.38%	11.29%	3.97%	1.25%					6.49%	9.53%	1.49%	1.79%				
9205C:C92342	ASPH	020	$1,894,199.06		0.49%	73.26%	3.05%					0.07%	0.44%	7.60%		0.24%				
9205C:C92456	ASPH	017	$63,253.70		1.76%	35.30%							9.72%	44.27%						
9205C:C92458	ASPH	021	$1,123,455.16		0.40%	73.90%						0.21%	0.69%	2.67%	0.01%	0.27%		5.43%		
9205D:C89003	ASPH	001	$7,078,321.09		0.71%	51.15%		0.76%				1.00%	4.98%	4.94%	0.95%	1.01%				0.11%
9205D:C91061	GEN	003	$411,854.80		0.24%	27.08%						0.24%	19.85%	6.31%	1.46%	0.97%				
9205D:C92457	ASPH	001	$1,774,342.80		0.78%	45.62%								1.37%		0.20%		40.15%		
9205D:C92460	RCYL	020	$1,124,352.45		14.10%	2.79%								8.00%	0.36%	0.18%		50.17%		
9206A:C88148	STRC	003	$893,000.00	0.83%	0.04%	2.99%	1.79%					0.41%	4.30%	5.80%	1.43%	1.49%				1.47%
9206A:C92925	ASPH	020	$331,356.96			100.00%														
9206A:C92926	ASPH	020	$314,638.20			96.63%						0.06%								
9206A:C92927	ASPH	020	$249,466.20			100.00%														
9206A:C92930	GDRL	005	$122,430.00										0.61%	2.63%						
9206B:C91043	GEN	011	$5,505,250.50	0.24%	0.03%	4.56%	0.15%	1.68%		14.89%		28.89%	4.69%	5.41%	6.21%	3.34%				0.48%
9206B:C91150	ASPH	001	$589,898.70		0.93%	75.72%	0.16%					1.83%		2.14%		0.76%				
9206B:C92826	STRC	002	$137,902.95											7.27%						
9206C:C91045	GEN	012	$5,745,910.70	0.04%	1.46%	28.66%	9.21%					9.01%	24.47%	8.53%	4.79%					0.04%
9206C:C91401	ASPH	020	$937,527.88		0.70%	79.59%							1.15%	2.66%		0.64%				
9206C:C92015R	GDRL	005	$424,320.00		0.38%	11.17%	3.92%	1.24%					8.42%	9.43%	1.41%	1.77%				
9206C:C92333	PRPC	017	$196,955.00											12.69%			58.21%			
9206C:C92464	ASPH	020	$1,419,054.60		0.82%	75.65%							1.40%	15.36%		0.28%				
9206C:C92928	ASPH	020	$265,232.20			91.17%						2.38%								
9206C:C92929	ASPH	017	$403,504.40			100.00%														
9206D:C88014	GEN	012	$7,966,817.75	1.33%	0.52%	12.57%	1.06%	1.16%		0.71%		1.32%	13.15%	8.35%	6.77%	0.58%				0.26%
9206D:C90142	SGNL	005	$132,285.00					4.88%		0.20%		0.76%		8.56%						

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9203B:C92428	SURF	021		8.16%			50.67%	9.63%		0.32%				1.13%		7.41%	0.29%	0.03%		8.86%
9203C:C87125	STRC	003	1.93%	1.47%		31.85%		2.96%			1.93%	2.20%	1.12%							5.25%
9203C:C88016	GEN	002	3.90%	3.62%		35.80%		9.57%			0.11%	1.16%	0.24%			0.93%		0.22%	0.07%	2.73%
9203C:C91463	ASPH	020						4.59%								0.48%				0.48%
9203D:C92426	ASPH	021	0.21%	7.82%		7.79%		12.23%		0.21%		12.78%				4.35%		0.15%	2.86%	20.15%
9203D:C92427	ASPH	001		10.81%				5.89%		0.12%				0.57%		4.75%	1.50%			6.82%
9209D:C92818	SURF	020					37.93%	4.44%								7.87%				7.87%
9204A:C91464	GEN	013		8.48%		0.45%		19.26%					0.56%			0.79%			0.19%	1.64%
9204B:C92336	CONR	021		9.43%		0.53%		10.02%						0.64%		3.72%	1.03%			5.39%
9204C:C92331	ASPH	020						3.00%								1.64%				1.64%
9204C:C92339	ASPH	020																		0.00%
9204C:C92345	ASPH	020		1.33%				2.82%				0.20%				0.74%		0.36%		1.30%
9204C:C92447	ASPH	020		0.06%				4.43%								1.33%				1.33%
9204D:C92055	STRC	002	7.53%	3.80%		30.14%		9.92%			1.16%	12.13%	0.58%	0.52%		0.99%		0.58%	0.09%	16.05%
9204D:C92340	ASPH	020		0.16%				2.13%				1.07%	0.43%			1.89%				3.38%
9205A:C88178	GEN	005		7.27%				8.13%		0.32%	0.23%		0.44%	13.63%		4.59%	1.51%	0.49%	0.16%	21.25%
9205A:C90085	ASPH	001	0.10%	0.91%		0.97%		3.86%				3.01%	0.53%			0.46%		0.30%	0.24%	4.54%
9205A:C91087	GEN	003	1.86%	0.20%		34.69%		2.86%			2.46%	9.44%	0.55%			0.21%		0.44%	0.68%	13.78%
9205A:C92347	ASPH	005		8.75%		0.07%		13.23%		0.18%		0.40%	0.81%	4.86%		7.15%	16.85%	1.38%	0.06%	31.71%
9205B:C92083	GDRL	005		0.08%				9.67%				82.81%						2.27%		85.08%
9205B:C92337	ASPH	020		0.79%														0.62%		0.62%
9205B:C92434	ASPH	021		2.11%		3.33%		8.35%			0.67%	12.19%				2.95%		0.11%		15.92%
9205C:C89815	ASPH	010		2.50%				8.69%		0.20%	2.31%	0.89%	0.18%	2.52%		3.30%	13.60%	0.85%		23.75%
9205C:C90006-CO	GEN	012		0.14%		4.54%				1.26%	0.75%		16.28%	2.49%		0.00%		8.36%		28.88%
9205C:C91306	CONR	005		2.23%		2.27%		3.18%		2.54%	0.32%	0.35%	0.27%	3.43%		0.47%		0.77%		5.81%
9205C:C92004X	ERTH	012		0.08%		3.37%				2.84%	0.61%		11.39%	2.10%		0.13%		0.26%	0.81%	15.12%
9205C:C92015	GDRL	005		0.96%				17.13%				43.50%		0.95%		0.76%		0.57%		45.78%
9205C:C92342	ASPH	020		0.73%				9.87%				9.67%				0.58%				10.25%
9205C:C92458	ASPH	017						6.69%					0.95%			1.33%				2.28%
9205C:C92458	ASPH	021		1.95%		3.98%		3.58%		0.02%		0.68%				4.24%	1.91%	0.07%		6.88%
9205D:C89003	ASPH	001	0.68%	2.34%		7.43%		6.16%			0.17%	3.92%	0.55%	1.21%		1.75%	1.74%	6.83%	1.65%	17.82%
9205D:C91061	GEN	003	1.46%	1.75%		27.49%		7.96%			2.02%	2.36%	0.22%			0.57%		0.03%		5.20%
9205D:C92457	ASPH	001		0.88%				9.35%								7.65%				7.65%
9205D:C92460	RCYL	020					13.59%	6.06%								4.47%		0.29%		4.76%
9206A:C88148	STRC	003	1.25%	0.16%		72.36%		2.05%			1.12%	0.64%	1.46%	0.28%				0.02%	0.11%	3.63%
9206A:C92925	ASPH	020																		0.00%
9206A:C92926	ASPH	020		3.24%						0.06%										0.00%
9206A:C92927	ASPH	020																		0.00%
9206A:C92930	GDRL	005						12.36%				84.40%								84.40%
9206B:C91043	GEN	011		2.12%		15.23%		4.37%		0.17%	0.37%	1.84%	0.09%	2.06%	0.76%	0.58%	1.58%	0.42%	0.04%	7.52%
9206B:C91150	ASPH	001		9.31%				5.55%		2.14%		0.47%								0.47%
9206B:C92828	STRC	002	50.31%			16.11%		1.23%											25.08%	25.08%
9206C:C91045	GEN	012		0.48%		1.61%		6.59%			1.18%	3.17%	0.86%	0.17%		0.58%		0.56%	0.57%	7.09%
9206C:C91401	ASPH	020		7.80%				2.46%			2.33%	2.22%	0.37%			0.71%		0.36%		5.99%
9206C:C92015R	GDRL	005		0.95%				18.01%				43.04%		0.94%		0.75%		0.56%		45.29%
9206C:C92393	PRPC	017						25.95%								3.15%				3.15%
9206C:C92464	ASPH	020		0.50%				1.82%				2.88%	0.52%			0.75%		0.43%		4.38%
9206C:C92928	ASPH	020		5.31%						1.16%										0.00%
9206C:C92929	ASPH	017																		0.00%
9206D:C88014	GEN	012	0.32%	0.82%		24.16%		5.91%			0.56%	4.85%	1.43%	3.18%	0.63%	0.41%	0.70%	2.61%	6.65%	21.02%
9206D:C90142	SGNL	005		3.75%				17.64%						14.02%		2.09%	48.10%			64.21%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9208D:C90426	STRC	003	$737,341.22	0.88%	0.10%	7.79%		0.06%				0.74%	1.08%	2.46%	8.56%	1.55%				0.25%
9208D:C91058	GEN	010	$1,295,253.50	1.55%	0.56%	25.97%						0.92%	24.71%	3.86%	3.09%	0.73%				
9206D:C91073	GEN	003	$372,309.46		0.40%	9.46%	6.98%					0.91%	16.13%	4.03%	9.18%	0.99%				3.39%
9206D:C82304	ERTH	010	$1,285,747.70		0.18%	11.87%	0.61%					0.68%	41.11%	5.60%	5.30%	0.55%				
9206D:C92343-CO	ASPH	001	$1,470,143.88		0.60%	75.89%	11.83%						0.27%	4.80%		0.62%				
9206D:C93087	ASPH	021	$2,482,845.07		8.18%	46.60%	0.75%	0.40%				0.08%		1.79%		0.81%				0.02%
9206E:C92347R	ASPH	003	$485,146.85	0.77%	0.23%	22.58%		3.80%	0.11%			1.17%	1.50%	13.97%	4.51%	0.75%				
9207A:C91110	OLS	017	$134,947.18											1.48%	98.52%					
9207A:C92320	GEN	017	$47,008.00									13.94%	16.51%	21.27%						10.01%
9207A:C92462	ASPH	020	$1,918,544.50		7.00%	63.45%							1.00%	7.19%		0.17%				
9207A:C93056	ASPH	020	$348,996.20		0.99%	53.35%	1.94%					0.08%		12.77%	0.72%	3.23%				
9207A:C93091	ASPH	020	$293,778.94		2.53%	76.47%	2.45%							5.04%	0.85%	1.28%				
9207B:C91028	ASPH	013	$2,399,738.55		0.48%	17.61%	0.08%	0.29%	0.21%			1.31%	3.91%	5.08%	4.68%	0.26%				0.67%
9207B:C91150R	ASPH	001	$437,591.00		1.14%	78.78%	0.38%					0.58%		3.31%		0.63%				
9207B:C92341	ASPH	021	$1,856,113.00		0.44%	53.62%	1.44%	0.63%		11.66%		0.47%	0.87%	8.08%	0.54%	1.05%				
9207C:C90420	GEN	003	$660,615.40		1.32%	17.81%	3.45%					0.97%	12.98%	7.73%	3.18%	1.85%				
9207C:C91085	STRC	003	$547,035.12	4.94%	0.54%	8.71%	1.39%						11.87%	10.05%	0.86%	2.21%				0.22%
9207C:C92460R	RCYL	020	$575,356.50			6.19%								5.92%	0.74%	0.52%		77.34%		
9207C:C93036	ASPH	020	$360,054.50		0.84%	79.22%								11.11%						
9207C:C93037	ASPH	020	$286,112.60		0.64%	82.57%								11.16%		1.75%				
9207D:C90030	GEN	005	$202,719.60		0.21%	19.76%		4.62%				1.64%	10.58%	11.59%	2.86%					
9207D:C92304R	LTNG	010	$359,375.18											4.17%	16.17%	0.07%				
9207D:C92465	ASPH	020	$473,814.85		0.26%	62.08%						1.70%		13.72%		5.49%				
9207E:C92343R-C	ASPH	001	$1,319,169.63		0.67%	75.87%	10.42%						0.30%	5.89%		0.91%				
9207E:C92902	ASPH	001	$125,484.30		1.71%	44.14%								10.35%		1.28%				
9208A:C92828R	STRC	002	$99,381.76											11.88%						
9208B:C91144	GEN	010	$224,937.50		0.50%	13.07%	6.28%	18.57%		0.27%		7.21%	13.36%	4.45%	4.89%	2.67%				
9208B:C92937	PVMK	005	$260,241.40											0.98%						
9208B:C93103	STRC	002	$36,617.00											15.37%	17.89%					
9208C:C93040	ASPH	017	$242,329.88			100.00%														
9208C:C93141	ERTH	017	$168,684.10	1.35%			4.67%					7.10%	33.88%	7.20%	3.00%	1.20%				9.54%
9208D:C92105	STRC	017	$333,333.33	0.64%				0.72%				0.30%	3.16%	7.46%	2.10%					
9208D:C93041	ASPH	020	$255,048.75			100.00%														
9208D:C93045	ASPH	021	$465,761.88			100.00%														
9208D:C93046	ASPH	020	$129,260.80			100.00%														
9209A:C93121	ASPH	017	$257,074.48			100.00%														
9209B:C86130	STRC	003	$4,633,333.33	0.48%	0.07%	4.05%		1.72%	0.06%	9.51%		3.00%	5.25%	5.78%	8.43%	1.14%				1.21%
9209B:C90116-CO	SGNL	005	$385,306.80			1.16%		2.30%						3.31%	2.89%					
9209B:C91028R	ASPH	013	$2,016,871.95		0.27%	19.80%	0.09%	0.21%	0.15%			1.48%	4.25%	5.19%	1.57%	0.24%				0.01%
9209C:C86268	GEN	004	$1,929,422.60		0.05%	24.24%	8.61%	7.76%				11.77%	10.37%	4.06%	0.86%	6.82%				0.20%
9209C:C90060	STRC	003	$1,522,068.29	0.84%	0.07%	7.52%		0.20%				0.67%	3.55%	4.84%	2.99%	1.02%				5.08%
9209C:C90103	STRC	003	$464,582.15		0.21%	7.67%							3.06%	11.84%	12.16%	0.97%				2.37%
9209C:C90112	GDRL	005	$70,750.48											7.42%		0.25%				
9209C:C91174	OTHR	008	$79,023.56					0.71%					15.94%	5.06%		70.19%				
9209D:C91088	GEN	003	$478,642.25		0.07%	18.99%						0.57%	27.53%	6.89%	5.01%	1.00%				0.61%
9209D:C92436	CONR	012	$18,913,456.56	0.01%	0.61%	0.31%				75.31%		0.21%	2.97%	5.76%	0.88%	0.17%				0.04%
9209D:C93128	ASPH	017	$461,698.35		0.44%	22.33%	0.71%	12.14%		0.20%		5.04%	3.32%	8.72%	3.06%					0.13%
9210A:C91119	STRC	003	$3,099,130.02		0.04%	6.03%	0.11%	2.22%		15.41%		1.49%	6.22%	6.27%	1.49%	4.85%				
9210A:C91423	GEN	003	$276,062.55	3.01%	0.53%	19.10%							23.94%	5.98%	2.35%	1.38%				
9210A:C92014-CO	ASPH	001	$1,881,450.05		0.58%	58.70%	4.67%	0.37%				0.19%	1.25%	9.04%	0.48%	0.80%				
9210A:C93137	TRAF	012	$2,802,305.00											8.56%		2.21%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification								Specialty Items									Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9206D:C90426	STRC	003	3.53%	0.61%		58.34%		6.69%			1.45%	2.61%	2.31%	2.16%		0.82%		0.11%	0.06%	9.52%
9206D:C91056	GEN	010	0.15%	0.67%		19.68%		14.66%			1.00%		1.47%			0.85%		0.12%		3.44%
9206D:C91073	GEN	003	0.94%	0.29%		27.01%		10.61%			0.90%	2.54%	1.84%			0.32%		0.02%	2.02%	7.64%
9206D:C92304	ERTH	010		0.66%		1.50%		12.97%	0.69%			1.68%	0.77%	14.61%		0.19%		0.44%		18.09%
9206D:C92343-CO	ASPH	001		1.36%				3.41%								0.93%				0.93%
9206D:C93087	ASPH	021	0.22%	0.60%		1.27%	12.08%	6.25%				13.00%				1.79%		0.50%	8.64%	21.93%
9206E:C92347R	ASPH	005		6.73%		0.04%		9.65%		0.26%		0.37%	0.86%	5.28%		6.75%	19.06%	1.57%	0.03%	33.92%
9207A:C91110	OLS	017																		0.00%
9207A:C92320	GEN	017		0.43%				14.89%			2.83%		18.95%						1.17%	22.95%
9207A:C92462	ASPH	020		0.10%			10.53%	2.16%				0.40%	0.34%			2.63%		0.24%	4.79%	8.40%
9207A:C93056	ASPH	020		8.94%				12.13%		1.27%						3.60%				3.60%
9207A:C93091	ASPH	020						8.10%								3.29%				3.29%
9207B:C91028	ASPH	013		1.14%		9.29%		2.65%		1.84%	6.30%	6.34%	8.09%	3.54%		1.35%		24.79%	0.08%	60.49%
9207B:C91150R	ASPH	001		3.39%				9.21%		0.56%		1.01%								1.01%
9207B:C92341	ASPH	021		9.61%				3.94%		0.48%	0.15%			0.27%		2.04%	4.71%		0.11%	7.28%
9207C:C90420	GEN	003	3.48%	0.73%		25.48%		14.81%			0.91%	0.68%	0.60%			2.40%		0.48%	1.44%	6.41%
9207C:C91085	STRC	003	3.66%	0.66%		43.80%		8.62%			0.50%	1.07%	0.41%			0.15%		0.03%		2.16%
9207C:C92460R	RCYL	020						5.30%								3.35%		0.64%		3.99%
9207C:C93036	ASPH	020						5.83%								3.00%				3.00%
9207C:C93037	ASPH	020						2.74%								1.13%				1.13%
9207D:C90030	GEN	005		6.88%		2.22%		13.92%				4.38%	0.08%	2.57%		2.53%	1.29%	14.95%		25.74%
9207D:C92304R	LTNG	010				6.25%		26.68%	3.05%					44.41%						44.41%
9207D:C92465	ASPH	020		6.18%				4.40%				3.28%				2.90%				6.18%
9207E:C92343R-C	ASPH	001		1.31%				3.53%								1.00%				1.00%
9207E:C92902	ASPH	001		11.06%				8.69%								0.60%	23.89%	0.48%		24.77%
9208A:C92828R	STRC	002	27.42%			26.47%		1.71%											32.52%	32.52%
9208B:C91144	GEN	010		2.33%				8.71%		0.25%			2.02%	7.56%		0.54%	7.32%			17.44%
9208B:C92937	PVMK	005		0.27%				8.65%								90.12%				90.12%
9208B:C93103	STRC	002				42.08%		24.66%												0.00%
9208C:C93040	ASPH	017																		0.00%
9208C:C93141	ERTH	017		0.79%		9.11%		7.94%			2.40%		12.41%							14.81%
9208D:C92105	STRC	017		0.05%		69.66%		5.56%			8.98%			1.24%				0.14%		10.36%
9208D:C93041	ASPH	020																		0.00%
9208D:C93045	ASPH	021																		0.00%
9208D:C93046	ASPH	020																		0.00%
9209A:C93121	ASPH	017																		0.00%
9209B:C85130	STRC	003	2.08%	1.95%		21.39%		8.08%		1.15%	0.23%	4.57%	0.20%	0.79%	0.28%	0.31%		0.85%	17.42%	24.65%
9209B:C90116-CO	SGNL	005		3.17%				10.75%						19.28%			56.03%	1.10%		76.41%
9209B:C91028R	ASPH	013		2.04%		8.19%		3.65%			8.47%	5.99%	0.07%	5.93%		1.91%		30.51%	0.09%	52.97%
9209C:C86268	GEN	004		2.09%		5.05%		7.01%		0.95%	1.00%	0.40%	0.71%	0.48%		0.19%	8.74%	0.83%		10.15%
9209C:C90060	STRC	003	2.43%	0.76%		55.98%		8.46%			0.31%	1.28%	0.17%	2.59%		0.65%		0.26%	0.32%	5.58%
9209C:C90103	STRC	003	1.87%	0.39%		41.98%		7.74%			2.43%	4.09%	1.69%			1.19%		0.17%	0.17%	9.74%
9209C:C90112	GDRL	005						20.79%				71.54%								71.54%
9209C:C91174	OTHR	008		0.26%				7.82%												0.00%
9209D:C91068	GEN	003	4.18%	3.27%		19.64%		7.05%			2.07%	1.64%	0.65%			0.43%		0.05%	0.53%	5.37%
9209D:C92498	CONR	012	0.40%	1.95%		2.68%	0.32%	4.66%			0.66%	0.78%	0.34%			1.83%		0.13%	0.00%	3.74%
9209D:C93128	ASPH	017		8.50%				10.92%		0.34%			0.06%	2.68%		6.04%	13.53%	1.45%	0.39%	24.15%
9210A:C91119	STRC	003	2.28%	2.66%		39.12%		7.98%			0.56%	1.87%	0.15%	0.17%		0.37%		0.51%		3.63%
9210A:C91423	GEN	003	2.17%	0.96%		17.56%		18.42%			2.44%		0.79%			1.14%		0.24%		4.61%
9210A:C92014-CO	ASPH	001	0.15%	3.83%		1.21%		6.01%				10.14%		0.05%		1.74%		0.54%	0.27%	12.74%
9210A:C93137	TRAF	012						87.67%			0.11%						0.43%	1.02%		1.56%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9210B:C89015	CONR	012	$15,359,222.11	0.87%		3.83%	0.94%	0.10%		37.83%		5.16%	10.44%	3.26%	2.05%	0.85%				0.15%
9210B:C90061	STRC	007	$3,765,432.10	1.27%	0.11%	9.47%		1.96%		0.38%		11.16%	11.46%	1.27%	7.06%	1.00%				
9210B:C90445	ERTH	010	$380,581.50		0.37%	23.47%	1.33%					1.70%	42.41%	8.93%	5.91%	1.16%				
9210B:C91110R	OLS	017	$103,700.00											4.34%	95.66%					
9210B:C92079	ASPH	005	$254,025.05			39.67%		12.13%		9.45%		3.49%	4.30%	2.17%	2.17%	8.35%				
9210B:C92099	ERTH	017	$112,871.28										70.37%	14.36%						
9210C:C91053	ASPH	010	$2,070,959.01		0.46%	55.55%	1.82%					0.70%	5.31%	8.21%	0.57%	0.52%				0.66%
9211A:C92024	STRC	012	$7,592,205.60	2.12%	0.06%	9.28%	0.64%	2.22%		12.00%		9.13%	7.39%	3.49%	3.97%	2.28%				0.01%
9211A:C92066	STRC	021	$330,892.80	3.15%	0.11%	6.19%	1.46%	2.84%	0.09%	1.49%		1.06%	4.12%	7.25%	4.53%	2.15%				
9211B:C86130R	STRC	003	$4,805,199.97	0.49%	0.07%	3.91%		1.92%	0.07%	10.57%		2.75%	4.95%	4.20%	2.99%	0.89%				0.52%
9211B:C90158	STRC	003	$250,085.70		0.15%	7.33%			1.04%				6.95%	12.23%	19.05%	3.31%				
9211B:C91078-AL	STRC	003	$12,760,440.11	0.98%	0.01%	0.56%	0.20%	0.39%		0.58%		6.91%	2.65%	6.76%	1.53%	0.30%			0.13%	0.61%
9211B:C93070	GEN	011	$1,092,109.50		0.27%	23.08%		14.73%	0.05%	4.28%		11.92%	0.98%	7.55%	1.51%	2.49%				
9211C:C90654	LSCP	002	$577,205.60		0.08%	4.56%								7.38%	8.14%	0.33%				
9211C:C91106	STRC	003	$873,706.15	0.95%	0.06%	7.07%	0.27%					2.53%	12.50%	5.24%	3.43%	1.39%				3.54%
9211C:C92086	GDRL	005	$121,791.13				3.28%							7.64%		0.08%				
9212A:C89015R	CONR	012	$15,772,800.75	1.09%		3.21%	1.39%	0.11%		40.41%		4.67%	8.58%	3.66%	1.98%	0.78%				0.11%
9212A:C92102	LSCP	018	$77,591.00						11.86%											
9212B:C92100	GEN	017	$1,989,470.00	3.91%	0.09%	7.96%		14.29%				18.98%	12.30%	9.55%	3.57%	0.30%				6.25%
9212B:C92311	STRC	008	$11,373,000.00	0.98%	0.09%	6.83%	0.02%	0.01%		2.91%		4.45%	15.11%	1.09%	2.40%	0.81%				0.03%
9212B:C93144	PVMK	005	$524,619.00											0.19%	0.57%					
9212C:C91426	STRC	003	$1,040,908.85	1.37%	0.88%	11.51%	3.97%					0.56%	12.74%	7.83%	2.53%	2.24%				1.00%
9212C:C92092-CO	SGNL	005	$1,058,564.50										0.57%	4.67%		0.10%				
9212C:C92705	GEN	013	$7,748,932.02	0.34%	0.08%	4.66%	0.70%	0.99%	0.02%	23.41%		5.53%	13.99%	0.82%	3.21%	0.55%				
9301A:C91128	CONR	011	$8,476,573.13	0.33%	0.17%	2.77%	0.26%	0.04%	0.56%	54.20%		3.54%	8.84%	3.97%	1.14%	0.56%				0.18%
9301A:C91134	ASPH	001	$147,550.00		0.75%	74.16%							1.36%	9.49%		2.37%				
9301A:C92021	STRC	011	$6,880,329.08	0.89%	0.02%	1.92%	3.19%		0.01%	13.11%		0.88%	6.90%	3.03%	2.22%	0.42%				
9301A:C93133	ASPH	020	$938,339.90	0.19%	0.53%	66.89%	6.14%					0.39%	0.43%	10.44%		0.36%				
9301B:C92913	STRC	012	$18,191,366.35	0.53%	0.06%	3.98%	2.66%	0.08%		14.44%		1.95%	9.32%	2.26%	2.45%	0.58%			0.02%	0.06%
9301B:C93053	ERTH	017	$122,056.50									3.36%	61.57%	0.82%	1.64%					1.47%
9301C:C91069	STRC	001	$338,376.48	0.52%	0.41%	11.85%							10.40%	6.54%	1.94%	1.31%				
9301C:C91164	STRC	012	$4,225,675.13	0.45%	0.48%	14.52%	7.09%		0.16%			1.97%	11.46%	5.54%	7.29%	0.28%				0.34%
9302A:C89080	GEN	003	$2,498,530.00	0.16%	0.34%	12.37%	5.00%	0.09%				1.66%	21.28%	4.80%	1.66%	0.80%				4.92%
9302A:C92329	ERTH	017	$459,189.50									0.69%	56.39%	6.53%	1.74%	0.82%				19.85%
9302B:C92074	SGNL	009	$239,154.56			4.62%	6.01%	4.75%					1.02%	5.02%		5.16%				
9302B:C93078	ASPH	010	$124,515.25		0.22%	37.78%						10.16%	6.45%	8.02%	2.69%					
9302C:C91424	GEN	003	$420,849.35		0.91%	27.43%	7.00%					0.85%	11.11%	6.42%	2.02%	2.73%				0.86%
9302C:C93080	STRC	013	$748,019.15	3.29%				0.07%	0.15%			4.53%	12.37%	1.24%	1.60%	1.22%				4.48%
9302C:C93136	PVMK	005	$319,370.50											0.94%	0.94%					
9302C:C93148	GEN	010	$293,477.15		0.43%	21.30%	0.22%	12.26%		3.86%		2.86%	1.39%	4.94%	6.95%	8.54%				
9302C:C93154	GEN	013	$376,086.30	1.89%	0.14%	15.54%	0.40%	5.66%		2.89%		2.89%	7.51%	4.36%	10.08%					
9302D:C91090	CGS	005	$123,240.62	1.99%		5.80%	6.24%	33.51%				2.15%	6.67%	12.44%	1.65%	0.17%				1.33%
9303A:C89116	ASPH	005	$567,786.60	0.10%	0.24%	30.38%		15.74%		1.70%		2.90%	2.68%	9.16%	2.64%	1.83%				0.14%
9303B:C89120	GEN	005	$298,524.20		0.24%	11.79%		8.24%		1.78%		9.14%	5.51%	10.05%	7.54%	1.84%				
9303B:C93287	STRC	015	$317,672.90	0.02%		1.18%						3.10%	0.44%	11.33%	1.51%	6.38%				0.00%
9303C:C91035	CONR	001	$12,493,526.61	0.53%		3.80%	1.32%	0.04%		48.52%		0.36%	5.17%	3.89%	3.14%	0.12%	0.09%			0.42%
9304A:C93276	ASPH	020	$5,604,648.55		0.72%	62.24%		0.26%		0.10%		0.85%	3.20%	7.14%	2.37%	0.80%				0.05%
9304B:C91129	GEN	010	$3,612,258.25	2.03%	0.61%	33.26%	20.17%					2.44%	19.23%	7.74%	2.44%	0.47%				0.17%
9304C:C90159	CONR	011	$2,181,811.39	0.33%	0.24%	6.67%	0.26%	5.29%		24.69%		7.30%	3.54%	5.50%	8.38%	3.75%				
9304C:C92012	LSCP	013	$2,913,655.72	0.57%	0.17%	6.69%	0.07%					3.05%	12.55%	4.20%	10.36%	1.96%				0.36%
9304C:C93051	CONR	012	$243,148.00		0.07%	3.97%	6.82%	7.14%	0.04%	47.86%		0.63%	3.72%	8.23%		4.24%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9210B:C89015	CONR	012		0.80%		20.35%		4.29%		0.93%	0.93%	1.09%	1.65%	1.84%		0.28%		1.89%	0.36%	8.04%
9210B:C90061	STRC	007		1.30%		34.98%		5.56%		9.52%	1.06%		0.06%	1.10%		0.32%	0.39%	0.43%	0.13%	3.48%
9210B:C90445	ERTH	010		2.41%				6.68%					1.99%			0.87%		0.76%		3.62%
9210B:C91110R	OLS	017																		0.00%
9210B:C92079	ASPH	005						11.08%			1.41%					4.14%		1.46%		7.01%
9210B:C92099	ERTH	017		0.69%				1.80%			1.47%		11.31%							12.78%
9210C:C91053	ASPH	010	1.38%	0.28%		14.90%		7.19%			0.21%		1.62%			0.73%		0.02%	0.07%	2.65%
9211A:C92024	STRC	012		2.83%		23.25%		1.27%		1.68%	0.62%	2.75%	4.29%	4.26%		0.43%	1.89%	1.52%	6.70%	24.46%
9211A:C92066	STRC	021		7.83%		46.22%		8.87%		0.06%			0.79%			0.95%		0.35%	0.60%	2.59%
9211B:C88130R	STRC	003	2.67%	2.34%		24.41%		7.54%		0.80%	0.25%	7.86%	0.25%	0.80%	0.50%	0.30%		0.86%	18.06%	28.90%
9211B:C90158	STRC	003		1.17%		24.01%		11.95%				3.37%	1.31%	6.71%		0.32%		0.13%	0.99%	12.83%
9211B:C91078-AL	STRC	003		0.16%		73.59%		0.52%	0.15%	0.07%	0.24%	0.48%	0.31%	2.10%		0.01%	0.10%	0.02%	0.63%	3.89%
9211B:C93070	GEN	011		8.53%		6.91%		10.98%			0.23%		0.34%			3.90%	3.27%			7.74%
9211C:C90654	LSCP	002		1.29%		2.42%		5.47%				4.60%	65.67%			0.08%				70.35%
9211C:C91106	STRC	003	1.82%	1.37%		40.12%		9.37%		0.07%	0.84%	7.40%	0.66%	0.23%		0.56%		0.04%	0.54%	10.27%
9211C:C92086	GDRL	005		0.53%				21.81%				66.17%						0.10%		66.27%
9212A:C89015R	CONR	012		1.06%		19.54%		4.23%		1.24%	0.88%	1.07%	1.54%	1.69%		0.27%		1.82%	0.55%	7.92%
9212A:C92102	LSCP	018											88.14%							88.14%
9212B:C92100	GEN	017		1.19%		1.65%		3.44%			0.08%	1.19%	14.16%			0.11%		0.11%	0.87%	16.52%
9212B:C92311	STRC	008	1.46%	1.05%		39.27%		1.82%		0.11%	0.61%	3.07%	0.37%	3.70%		0.28%	0.01%	2.48%	11.08%	21.58%
9212B:C93144	PVMK	005														99.24%				99.24%
9212C:C91426	STRC	009	3.36%	2.93%		35.76%		12.02%			0.74%		0.16%			0.16%		0.01%	0.29%	1.30%
9212C:C92092-CO	SGNL	005		1.69%				7.18%			0.09%			16.50%			66.55%	0.66%		66.80%
9212C:C92705	GEN	013		0.64%		27.88%		2.96%		0.44%	2.03%	2.82%	2.10%	3.60%		0.27%	0.36%	2.46%	0.15%	13.79%
9301A:C91126	CONR	011	0.15%	1.67%		7.84%		3.51%			1.16%	0.69%	2.28%	1.45%		0.40%	2.50%	0.67%	1.14%	10.29%
9301A:C91134	ASPH	001		0.41%				5.60%				2.63%				3.25%				5.88%
9301A:C92021	STRC	011	0.73%	1.07%		48.93%		7.12%			6.89%	1.39%	0.17%	0.22%		0.12%		0.11%	0.57%	9.47%
9301A:C93133	ASPH	020		0.88%				5.90%				8.05%				1.58%			0.10%	8.73%
9301B:C92913	STRC	012	0.23%	0.72%		45.51%		3.65%		0.14%	0.57%	1.51%	0.31%	3.02%		0.16%	0.07%	1.05%	4.67%	11.36%
9301B:C93053	ERTH	017								21.79%	0.41%		8.93%							9.34%
9301C:C91089	STRC	001	0.89%	0.26%		49.28%		12.87%			0.91%	2.05%	0.35%			0.33%		0.10%		3.74%
9301C:C91164	STRC	012		1.21%		29.64%		4.96%			0.34%	6.37%	0.55%	0.45%		3.43%	1.44%	0.31%	2.34%	15.23%
9302A:C89080	GEN	003	0.80%	0.39%		20.36%		19.04%			0.45%	2.02%	2.18%	0.14%		0.13%		0.27%	1.14%	8.33%
9302A:C92329	ERTH	017		0.15%		0.79%					0.94%		11.84%						0.26%	13.04%
9302B:C92074	SGNL	009		3.05%				13.45%				1.02%		5.87%			49.62%	0.43%		56.94%
9302B:C93078	ASPH	010		2.40%		0.29%		9.38%		5.20%	5.04%	2.49%	0.18%			6.18%	2.89%	2.60%		19.39%
9302C:C91424	GEN	003	1.19%	1.85%		20.34%		10.47%			0.52%	5.28%	0.62%			0.28%		0.13%		5.83%
9302C:C93080	STRC	013		0.16%		31.32%		4.56%			32.71%		1.75%	0.32%					0.24%	35.02%
9302C:C93136	PVMK	005		0.31%												97.81%				97.81%
9302C:C93148	GEN	010		9.89%				10.29%		0.46%			0.07%	9.11%		3.63%	2.35%	1.65%		16.61%
9302C:C93154	GEN	013	0.64%	3.68%		23.70%		6.85%		0.08%	2.58%		0.08%	6.41%		0.54%	3.49%	0.51%		13.59%
9302D:C91080	CG5	005		0.77%		15.03%		2.27%			0.04%		1.05%					0.80%	8.09%	9.98%
9303A:C88116	ASPH	005		8.66%				6.37%		0.13%			0.28%	2.61%		2.61%	10.30%	1.19%	0.32%	17.31%
9303B:C89120	GEN	005		6.97%				6.91%		2.01%			0.29%	6.30%		3.22%	17.08%	0.99%	0.10%	27.98%
9303B:C93287	STRC	015		0.93%		25.79%		13.47%			25.97%	9.11%	0.65%					0.06%	0.07%	35.86%
9303C:C91035	CONR	001	0.82%	2.00%		20.84%		4.10%			0.32%	1.00%	0.95%	0.23%		0.68%	0.05%	1.49%	0.10%	4.82%
9304A:C93276	ASPH	020	0.11%	3.54%		1.14%		4.56%		0.30%	0.02%	1.94%	1.29%	0.90%		3.20%	2.88%	0.28%	2.08%	12.59%
9304B:C91129	GEN	010		0.19%		0.54%		5.83%				0.65%	2.83%			0.30%		0.22%	0.78%	4.78%
9304C:C90159	CONR	011		2.04%				8.09%		4.45%	6.63%		7.00%	2.69%		0.43%	3.24%	0.42%	0.84%	21.45%
9304C:C92012	LSCP	013		1.52%				4.37%		6.87%	2.58%	0.27%	42.96%	0.94%		0.12%		0.22%	0.19%	47.28%
9304C:C93051	CONR	012		9.48%				3.47%		0.08%				0.74%		0.39%	1.33%	2.03%		4.49%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9304C:C83094	GEN	020	$937,707.00		0.25%	15.89%		8.75%		28.84%		1.28%	0.13%	7.90%	0.21%	1.49%				
9304C:C93228	WTMN	017	$279,374.00			6.77%		0.43%					4.12%	4.30%	1.61%					
9304D:C82098	ERTH	017	$782,570.55		0.48%	30.08%	2.32%					0.44%	43.08%	6.31%	3.15%	0.76%				
9304D:C93272	OLS	017	$102,698.30	0.43%									0.23%	1.85%	78.89%					1.84%
9304D:C93301	ASPH	020	$1,035,275.48	7.67%	0.61%	70.61%						1.68%	2.78%	2.18%	0.43%	0.46%				
9304E:C92988	PVMK	017	$611,338.50											0.62%						
9304E:C83092	ASPH	020	$3,777,824.40	0.15%	0.70%	32.13%		1.02%				5.29%	2.71%	5.56%	2.19%	1.09%				
9304E:C93097	ASPH	021	$1,463,152.00	0.03%	1.50%	47.69%	0.04%	2.24%				1.53%	2.38%	5.47%	2.05%	1.30%				
9305A:C10022R	ERTH	017	$379,164.80									1.43%	59.30%	9.23%	3.16%	0.79%				10.82%
9305A:C10028	SURF	004	$956,371.80		37.75%									26.04%	0.21%	0.42%				
9305A:C84076	CONR	011	$5,491,568.50	1.10%	0.04%	4.87%	5.69%	2.17%		33.24%		4.80%	11.21%	7.28%	3.01%	0.86%				0.68%
9305A:C89080R	GEN	003	$2,606,864.10	0.68%	0.39%	13.66%	6.51%	0.11%				1.94%	15.25%	8.06%	3.76%	1.14%				6.16%
9305A:C91426R	STRC	003	$935,049.44	1.15%	0.96%	17.20%	4.43%					0.73%	13.91%	8.02%	1.82%	1.90%				0.94%
9305A:C92046	STRC	003	$737,904.81	5.45%	0.15%	10.37%						7.38%	12.63%	6.99%	1.59%	0.73%				0.82%
9305A:C93202	SGNL	009	$516,950.00		0.10%	5.30%	1.18%	7.20%				2.63%	3.64%	4.64%	4.87%	0.19%				
9305A:C93902	ASPH	001	$1,290,058.16		0.65%	78.74%	0.04%					0.12%	7.11%	5.12%		0.38%				
9305B:C10157	PRPC	022	$942,230.85				0.27%			27.01%				5.18%		0.99%	52.11%			
9305C:C92074R	SGNL	009	$260,782.36			4.71%	2.01%	2.52%					0.62%	8.55%		3.31%				
9305C:C93025	ASPH	020	$1,410,919.52		0.79%	55.44%	1.00%					0.39%		5.67%	0.08%	0.41%				
9305D:C90058	STRC	003	$930,979.85	3.37%								0.27%	13.61%	6.07%	0.74%	2.24%				2.50%
9305D:C92963	ASPH	022	$861,577.50		0.50%	48.83%						0.41%	0.19%	9.86%	1.74%					
9305D:C93268	ASPH	020	$677,220.58		0.80%	78.92%	6.88%	1.03%					0.24%	6.50%		0.66%				
9306A:C10027	ASPH	021	$743,621.83		0.46%	84.71%								11.57%						
9306A:C10028	ASPH	020	$171,781.47		3.10%	52.72%	11.38%					0.99%	4.60%	4.45%		2.39%				
9306A:C92302	ASPH	020	$804,487.06			73.24%						3.26%	0.63%	10.57%	0.95%	0.53%				
9306A:C93202R	SGNL	009	$507,730.60		0.08%	5.88%	1.31%	7.94%				2.83%	4.05%	8.47%	4.41%	0.10%				
9306A:C93268	SURF	021	$1,040,878.25		50.39%									2.84%		0.22%				
9306B:C92801	SGNL	009	$247,081.25		0.13%	5.29%		3.06%						0.00%	3.36%					
9306B:C93092R	ASPH	020	$3,333,326.00	0.04%	0.35%	34.92%		0.86%				4.74%	1.65%	6.14%	0.60%	1.97%				
9306B:C93094-CO	GEN	020	$1,488,656.70		0.30%	21.18%		14.40%		7.48%		1.41%	0.22%	18.58%	0.34%	1.25%				
9306C:C83028	ERTH	003	$195,203.54		0.63%	7.20%	3.58%					6.06%	32.52%	6.06%	1.73%					
9306C:C93138	GEN	001	$200,000.00		0.50%	15.91%	1.14%		1.50%			12.73%	5.72%	17.21%	1.75%	2.50%				0.11%
9306C:C93215	ASPH	020	$1,950,878.88	0.01%	0.61%	44.62%	4.42%					0.08%	9.57%	18.95%	0.41%	0.56%		14.48%		
9306C:C93300	PVMK	005	$178,675.70											11.19%						
9306C:C93343	ASPH	021	$588,739.60			82.74%								1.19%						
9306C:C93344	ASPH	021	$863,426.60			83.60%								13.43%						
9306C:C93345	ASPH	021	$701,654.00			82.81%								14.82%						
9306C:C93346	ASPH	021	$519,198.00			78.22%								18.88%						
9306D:C10067	SURF	017	$383,733.95			2.93%								10.42%		11.73%				
9306D:C10068	SURF	017	$321,200.75			6.02%								9.34%		4.67%				
9306D:C91159	STRC	003	$415,424.26	4.70%	0.39%	4.38%	10.87%	0.37%	0.22%			0.48%	13.28%	7.39%	1.93%	0.98%				2.02%
9306D:C92110	GEN	009	$409,703.00			8.71%		4.21%				1.65%	11.65%	13.18%	1.26%	1.22%				0.15%
9306D:C93072	SGNL	008	$95,402.28			2.40%	1.34%	7.21%						6.29%	4.61%					
9306D:C93342	ASPH	021	$786,387.00			92.12%						0.53%		2.67%						
9307A:C10086	SURF	021	$259,945.20		41.51%	3.08%								7.48%		0.62%				
9307A:C88177	SGNL	005	$705,426.50		0.01%	9.82%		7.76%		0.85%		5.87%	1.63%	7.48%	4.86%	2.51%				
9307A:C91121	ASPH	001	$211,090.50		0.79%	84.01%	0.71%							9.47%						
9307A:C92302R	ASPH	020	$668,247.50			74.13%						5.78%	0.81%	8.35%	1.05%	0.68%				
9307A:C92410	ASPH	020	$5,893,317.22		0.48%	50.10%		0.51%				2.48%	9.29%	4.92%	0.34%	0.29%		12.25%		0.07%
9307A:C93096	ASPH	020	$1,139,854.03		0.65%	61.36%						0.38%	0.70%	2.76%		1.80%				
9307B:C10075	ASPH	021	$1,037,069.70		0.31%	72.25%	6.25%							17.84%		0.48%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9304C:C93094	GEN	020		14.24%		5.33%		6.16%		1.76%						4.00%	0.40%		3.38%	7.79%
9304C:C93228	WTMN	017		0.74%				18.93%		35.65%	0.78%		26.68%							27.46%
9304D:C92098	ERTH	017		3.00%				4.39%			0.64%	3.57%	0.48%			0.99%		0.40%	0.01%	5.99%
9304D:C93272	OLS	017				8.92%		1.66%			0.78%		0.39%						4.91%	6.08%
9304D:C93301	ASPH	020	0.19%	0.58%		0.55%		3.29%					0.79%			2.72%		0.32%	4.93%	8.76%
9304E:C92988	PVMK	017						0.01%								99.17%				99.17%
9304E:C93092	ASPH	020	0.10%	10.75%		0.72%		5.34%			0.07%	28.10%	0.02%	0.30%		2.21%	0.36%	1.02%	0.14%	32.22%
9304E:C93097	ASPH	021		13.65%				6.34%		0.18%			0.08%	1.94%		5.77%	7.65%	0.10%	0.10%	15.64%
9305A:C10022R	ERTH	017		0.18%		1.36%					1.26%		12.02%						0.42%	13.72%
9305A:C10029	SURF	004					21.41%	9.92%								4.25%				4.25%
9305A:C84078	CONR	011	0.09%	1.34%		10.03%		6.24%		0.01%	1.07%	0.55%	0.49%	2.29%		0.75%	1.59%	0.65%	0.02%	7.33%
9306A:C89080R	GEN	003	1.73%	0.49%		19.73%		16.07%			0.40%	1.76%	1.81%	0.12%		0.05%		0.32%	0.86%	5.34%
9305A:C91426R	STRC	003	2.46%	1.55%		28.22%		13.83%			1.19%		0.43%			0.16%		0.01%	0.08%	1.89%
9305A:C92046	STRC	003	1.76%	3.03%		33.34%		14.82%			0.41%		0.33%			0.30%				1.04%
9305A:C93202	SGNL	009		1.44%				8.17%					0.35%	14.49%		4.28%	39.58%	1.95%		60.65%
9305A:C93302	ASPH	001	0.10%	0.14%		1.64%		2.12%				1.83%	0.84%			0.74%		0.43%		3.84%
9305B:C10157	PRPC	022		0.21%		0.18%		7.41%								6.64%				8.84%
9305C:C92074R	SGNL	009		2.58%				18.01%				0.93%		5.83%			50.53%	0.39%		57.68%
9305C:C93025	ASPH	020		7.74%	0.29%	4.03%		9.15%				7.40%				2.81%		0.72%	4.08%	15.01%
9305D:C90058	STRC	003		0.11%		61.83%		7.25%			0.33%		0.98%	0.09%					0.70%	2.10%
9305D:C92983	ASPH	022		14.85%				11.69%		0.35%						10.03%	1.30%		2.27%	13.60%
9305D:C93266	ASPH	020		1.83%				3.35%								1.78%				1.78%
9306A:C10027	ASPH	021						3.13%								0.13%				0.13%
9306A:C10028	ASPH	020		0.15%				12.89%								4.95%			2.22%	7.17%
9306A:C92302	ASPH	020		2.63%		0.33%		4.61%				1.35%				1.22%		0.78%		3.35%
9306A:C93202R	SGNL	009		1.71%				8.71%					0.45%	11.82%		4.27%	35.75%	2.13%		54.42%
9306A:C93288	SURF	021					36.71%	4.70%								5.20%				5.20%
9306B:C92901	SGNL	009		4.27%				5.83%						16.83%		1.97%	59.25%			78.05%
9306B:C93092R	ASPH	020	0.18%	9.40%		0.95%		15.37%			0.07%	18.59%	0.02%	0.24%		2.01%	0.45%	1.36%	0.08%	22.82%
9306B:C93094-CO	GEN	020		18.05%		2.99%		8.84%		0.36%				0.77%		5.27%	2.10%		1.47%	9.61%
9306C:C93026	ERTH	003	16.72%	0.33%		1.20%		18.52%			1.44%		2.07%						1.92%	5.43%
9306C:C93138	GEN	001		2.35%		10.70%		15.00%				5.06%	2.84%			1.05%		2.63%	1.20%	12.78%
9306C:C93215	ASPH	020	0.02%	0.04%				4.27%					1.01%			0.86%		0.17%	0.01%	2.05%
9306C:C93300	PVMK	005						13.82%								74.98%				74.98%
9306C:C93343	ASPH	021						2.98%								3.10%				3.10%
9306C:C93344	ASPH	021						1.47%								1.30%				1.30%
9306C:C93345	ASPH	021						1.31%								1.06%				1.06%
9306C:C93346	ASPH	021						1.69%								1.21%				1.21%
9306D:C10067	SURF	017					70.65%	1.64%								2.73%				2.73%
9306D:C10068	SURF	017					75.49%	1.84%								2.64%				2.64%
9306D:C91159	STRC	003	1.69%	0.33%		38.00%		5.79%			2.92%	3.36%	0.66%						0.33%	7.27%
9306D:C92110	GEN	009	0.82%	2.35%		10.35%		8.15%			4.10%	3.38%	4.12%	5.52%		1.76%	16.19%	0.56%	0.67%	36.30%
9306D:C93072	SGNL	008		3.68%				28.34%						10.80%			35.24%			46.14%
9306D:C93342	ASPH	021						2.32%		0.03%						2.32%				2.32%
9307A:C10086	SURF	021					31.57%	8.52%								7.24%				7.24%
9307A:C88177	SGNL	005		3.39%				10.16%		1.28%	0.07%			10.82%		4.13%	34.57%	0.68%	2.02%	52.29%
9307A:C91121	ASPH	001						5.02%												0.00%
9307A:C92302R	ASPH	020		2.53%		0.45%		4.67%				1.37%				0.83%		1.38%		3.58%
9307A:C92410	ASPH	020	0.35%	1.59%		3.30%		4.29%				7.73%	0.58%			1.02%		0.40%		9.73%
9307A:C93096	ASPH	020		12.63%				4.31%		0.11%			0.09%	1.95%		4.95%	5.73%		2.58%	15.30%
9307B:C10075	ASPH	021						1.77%								1.11%				1.11%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9307C:C10089	ASPH	020	$527,855.90		1.15%	74.40%	2.36%						0.68%	9.85%		1.80%				
9307C:C10094	ASPH	021	$612,389.60		1.67%	76.24%	5.47%						0.31%	5.14%		0.29%				
9307C:C10141	SURF	020	$580,662.27		39.01%									10.99%	0.90%	0.47%				
9307C:C92344	ASPH	020	$1,512,534.28			91.76%	2.48%					0.06%	0.26%	6.15%		0.40%				
9307C:C93028R	ERTH	003	$190,189.14		0.65%	6.63%	3.69%					5.89%	33.38%	8.22%	1.78%					
9307C:C93216	CONR	001	$2,956,313.00	1.16%		1.47%	0.24%	1.16%		37.51%		1.10%	5.43%	10.15%	3.08%	2.16%				
9307D:C10023	ASPH	021	$2,284,054.22	0.16%	0.13%	58.82%	1.18%	4.44%				1.40%	0.64%	3.40%	0.53%	1.43%				0.07%
9307D:C10067R	SURF	017	$296,966.15			3.41%								10.10%		6.59%				
9307D:C91048	CONR	004	$3,331,552.65	0.38%	0.02%	10.06%		4.45%	0.08%	38.47%		14.71%	4.82%	6.85%	2.61%	1.56%				0.31%
9307D:C92047-CO	STRC	003	$920,370.25		0.08%	5.57%	1.13%					0.80%	8.80%	6.52%	8.09%	1.11%				3.85%
9307D:C93006	ASPH	020	$1,132,751.00			72.85%	3.55%						0.49%	14.12%		0.53%				
9307D:C93072R	SGNL	008	$97,157.28			2.36%	1.31%	7.08%						6.18%	4.53%					
9307D:C93132	SGNL	009	$142,731.43											16.44%						
9307D:C93227	STRC	013	$1,897,490.00	5.42%	0.03%	2.91%		2.61%	0.06%			4.88%	9.72%	4.22%	1.63%	2.36%				0.01%
9307E:C10073	SURF	021	$448,213.10		51.87%									8.92%		0.10%				
9307E:C10074	ASPH	021	$680,508.00			80.82%	4.28%						0.10%	9.55%		0.56%				
9307E:C93134	ASPH	020	$1,354,799.02			85.25%	2.82%						0.27%	8.07%		0.44%				
9307E:C93344R	ASPH	021	$826,593.00			91.86%								3.39%		0.85%				
9307F:C10086	ASPH	021	$249,532.00		1.49%	80.96%						0.24%		8.42%						
9307F:C10136	STRC	005	$2,865,980.50		0.02%	1.16%							1.38%	10.47%	0.35%	0.31%				1.07%
9307F:C92110R	GEN	009	$405,299.23			11.23%		4.00%				1.33%	12.64%	4.29%	2.10%	0.57%				0.08%
9307F:C92465	ASPH	012	$1,320,315.69		0.42%	39.67%	0.61%	0.05%				4.21%	19.64%	2.80%	5.23%	0.52%		2.98%		1.41%
9307F:C93339	ASPH	005	$299,407.30		0.23%	32.99%						0.19%	8.18%	10.02%	3.34%	4.76%				
9308A:C10033-CO	ASPH	020	$1,974,516.80			80.65%	3.29%						0.38%	7.60%		0.57%				
9308A:C10083	OTHR	022	$73,100.00											13.68%		61.70%				
9308A:C10114	ASPH	021	$1,931,563.20			94.29%														
9308A:C10219	ERTH	004	$431,084.20	3.45%		5.42%	1.89%					2.48%	29.76%	10.44%	26.44%	1.32%				0.09%
9308A:C88177R	SGNL	005	$870,452.00		0.01%	3.58%		7.06%		0.78%		3.53%	0.60%	13.08%	3.06%	2.60%				
9308A:C92023	GEN	012	$18,750,918.16	0.49%	0.11%	8.78%		1.62%		22.34%		7.22%	6.49%	8.53%	3.10%	0.55%			0.57%	0.01%
9308A:C92038	GEN	008	$1,302,898.90		0.46%	37.02%	0.21%					3.28%	29.30%	1.92%	2.76%	0.69%				0.55%
9308B:C10038	SGNL	008	$129,866.70					16.27%						12.44%		0.19%				
9308B:C10112	ASPH	020	$475,958.00			100.00%														
9308B:C10113	ASPH	020	$379,399.98			100.00%														
9308B:C10123	OLS	013	$1,659,900.00		0.04%	1.92%						3.96%	5.70%	4.22%	72.08%	1.01%				9.06%
9308B:C10147	FNC	017	$282,644.60											6.02%						
9308B:C10179	PVMK	005	$319,785.33											1.41%						
9308B:C91048R	CONR	004	$3,006,849.75	0.35%	0.02%	2.50%	2.50%	4.99%	0.05%	41.60%		14.99%	4.90%	7.32%	3.08%	2.13%				0.48%
9308B:C92090	GEN	005	$654,042.00		0.23%	10.53%		15.90%		3.63%		6.16%	2.31%	20.64%		2.99%				
9308C:C10023R	ASPH	021	$1,978,639.52	0.19%	0.12%	50.83%	1.32%	6.01%				2.98%	1.28%	2.02%	0.49%	1.58%				0.12%
9308C:C10084	ASPH	021	$815,591.50			72.89%	5.09%					0.29%	0.25%	14.71%						
9308C:C10136R	STRC	005	$2,088,604.88		0.03%	1.98%							1.00%	4.30%	0.44%	0.16%				0.84%
9308C:C89130	GEN	012	$1,426,445.88		0.10%	8.72%		2.68%		23.59%		12.24%	5.88%	15.42%	3.05%	1.82%				0.05%
9308C:C92087	GEN	005	$269,912.80		0.21%	6.29%	7.59%	13.70%		5.61%		6.32%	8.05%	9.52%	3.19%	0.91%				
9308C:C93143	GEN	014	$326,694.50		0.76%	29.88%						1.38%	23.31%	9.18%	8.26%	1.84%				
9308C:C93249	ASPH	020	$3,725,444.47		0.63%	84.96%		2.15%				1.83%	3.04%	9.31%	0.07%	0.43%				
9308D:C10132	ASPH	021	$1,319,478.80		1.38%	72.37%							0.16%	5.68%	0.05%	1.33%				
9308D:C90131	CONR	012	$14,610,085.11	0.10%	0.11%	2.41%		0.15%	0.10%	55.86%		0.76%	12.02%	9.58%	1.05%	0.29%			0.02%	0.15%
9308D:C92005	ERTH	012	$6,374,002.50	0.60%	0.05%	1.29%	1.08%	6.22%	0.60%			1.42%	26.43%	3.65%	10.17%	0.78%			12.14%	0.04%
9308D:C93171	STRC	018	$278,218.20			5.32%	1.43%	14.59%					0.60%	10.32%	4.89%	8.97%				
9308D:C93215R	ASPH	020	$1,718,654.04	0.03%	0.84%	47.05%	8.98%					0.11%	12.99%	4.75%	1.14%	0.94%		16.76%		
9309A:C10083R	OTHR	022	$56,680.00											7.94%		63.34%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9307C:C10089	ASPH	020		0.91%				5.05%				2.10%				1.71%				3.81%
9307C:C10094	ASPH	021		1.77%				4.14%				2.18%				2.79%				4.97%
9307C:C10141	SURF	020					30.21%	6.62%								11.79%				11.79%
9307C:C92344	ASPH	020		4.82%				3.02%								0.61%		0.33%		0.94%
9307C:C93028R	ERTH	003	17.18%	0.33%		1.24%		17.86%			1.05%		2.13%							5.15%
9307C:C93218	CONR	001		1.11%		0.58%		10.31%		0.14%	0.31%			9.76%		0.57%	13.56%	0.01%	0.21%	24.42%
9307D:C10023	ASPH	021		3.19%				4.34%				7.57%	0.30%	0.30%		2.33%		3.00%	6.75%	20.25%
9307D:C10067R	SURF	017					73.10%	1.21%								3.59%				3.59%
9307D:C91048	CONR	004	0.60%	7.24%		0.09%		2.96%		0.09%	0.15%		0.03%	0.36%		0.42%	1.22%	0.40%	0.14%	2.72%
9307D:C92047-CO	STRC	003	3.04%	0.93%		46.95%		10.83%			0.05%	2.19%	0.03%	0.05%		0.19%			0.37%	2.88%
9307D:C93008	ASPH	020		1.65%				5.18%								1.60%				1.60%
9307D:C93072R	SGNL	008		3.61%				29.63%						10.70%			34.80%			45.30%
9307D:C93132	SGNL	009						8.06%						17.32%			55.89%	0.28%		73.50%
9307D:C93227	STRC	013		1.99%		36.84%		3.13%			11.10%	0.56%	0.25%	0.31%		0.17%		0.03%	11.68%	24.10%
9307E:C10073	SURF	021					28.65%	3.79%								6.87%				6.87%
9307E:C10074	ASPH	021						3.17%								1.41%				1.41%
9307E:C93134	ASPH	020		0.61%				5.18%				14.47%				1.85%		0.04%		16.36%
9307E:C93344R	ASPH	021						2.29%								1.59%				1.59%
9307F:C10085	ASPH	021						5.98%		0.04%						2.86%				2.86%
9307F:C10136	STRC	005		0.21%		80.08%		2.42%	1.02%	0.17%	0.01%	0.71%	0.40%			0.02%			0.20%	1.34%
9307F:C92110R	GEN	009	0.33%	3.13%		8.86%		9.59%			5.88%	3.71%	3.13%	8.24%		2.11%	17.39%	0.75%	0.83%	41.84%
9307F:C92466	ASPH	012	0.21%	1.53%		1.15%		5.04%		0.52%	2.05%	6.03%	1.54%			1.52%		1.45%	1.23%	13.82%
9307F:C93339	ASPH	005		3.46%				10.27%					1.00%	4.32%		5.01%	14.95%	1.13%	0.17%	26.58%
9308A:C10033-CO	ASPH	020		3.03%				5.19%								0.93%		0.36%		1.29%
9308A:C10083	OTHR	022						24.62%												0.00%
9308A:C10114	ASPH	021		5.71%																0.00%
9308A:C10219	ERTH	004				3.31%		10.58%				0.93%	2.65%						1.23%	4.81%
9308A:C88177R	SGNL	005		5.39%				10.49%		1.04%	0.04%			7.17%		3.36%	35.87%	0.57%	1.79%	48.80%
9308A:C92023	GEN	012		3.29%		4.42%		1.69%	0.87%	2.30%	0.38%	7.78%	3.62%	4.79%		0.89%	1.69%	2.60%	6.85%	27.60%
9308A:C92038	GEN	008		0.67%				4.24%			1.97%		3.71%	4.07%		1.45%	5.23%	2.38%	0.09%	18.90%
9308B:C10038	SGNL	008		0.95%				12.84%						12.10%		4.15%	37.52%	3.56%		57.33%
9308B:C10112	ASPH	020																		0.00%
9308B:C10113	ASPH	020																		0.00%
9308B:C10123	OLS	013		0.63%		0.24%		5.66%				0.39%	0.52%			0.35%			0.22%	1.48%
9308B:C10147	FNC	017		5.25%				0.66%			88.07%									88.07%
9308B:C10179	PVMK	005						8.91%								89.68%				89.68%
9308B:C91048R	CONR	004	0.30%	6.22%		0.10%		4.36%		0.14%	0.20%		0.04%	1.03%		0.82%	1.40%	0.42%	0.28%	3.98%
9308B:C92090	GEN	005		8.50%				10.34%		0.15%	0.34%			3.06%		4.00%	10.02%	1.08%	0.11%	18.61%
9308C:C10023R	ASPH	021		6.04%				4.98%				7.73%	0.26%	0.55%		2.87%		3.50%	7.16%	22.06%
9308C:C10084	ASPH	021		2.87%				3.69%												0.00%
9308C:C10136R	STRC	005		0.48%		84.41%		2.69%	1.78%	0.09%	0.02%	0.78%	0.71%			0.02%			0.30%	1.83%
9308C:C89130	GEN	012		1.87%		0.06%		18.46%			0.28%		0.27%	2.06%		1.31%	0.87%	1.25%		6.04%
9308C:C92087	GEN	005		6.29%				12.70%		1.54%	0.09%		0.72%	5.19%			11.71%		0.43%	18.14%
9308C:C93143	GEN	014		2.02%				8.66%				4.90%	6.89%			0.23%		2.57%		14.69%
9308C:C93249	ASPH	020		3.87%				3.64%				8.09%	0.46%			1.14%		0.36%	0.03%	10.08%
9308D:C10132	ASPH	021		12.44%				2.13%								3.51%	0.95%			4.46%
9308D:C90131	CONR	012	0.55%	1.15%		6.46%		4.40%		0.07%	0.55%	0.87%	1.33%	0.35%		1.84%		0.22%	0.01%	4.77%
9308D:C92005	ERTH	012	0.77%	0.63%		8.70%		4.33%		1.75%	0.46%	0.08%	10.71%	2.27%		0.03%		0.09%	5.70%	18.34%
9308D:C93171	STRC	018	2.80%	2.83%		25.10%		9.28%			11.91%			1.45%		0.42%		0.20%		13.98%
9308D:C93215R	ASPH	020	0.12%	0.14%				4.82%					0.89%			0.39%		0.24%	0.01%	1.53%
9309A:C10083R	OTHR	022						28.72%												0.00%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9309A:C10109	ASPH	010	$137,773.00		0.94%	47.68%	1.03%	24.72%		0.42%			7.50%	2.54%		0.36%				0.29%
9309A:C10131-CO	ASPH	021	$748,822.30			81.22%														
9309A:C10207	ASPH	017	$936,978.40		0.79%	84.65%	0.40%					0.06%	1.20%	8.39%		0.28%				
9309A:C92981	SGNL	008	$301,407.40			0.50%		2.40%				3.32%		16.59%	0.33%	9.63%				
9309A:C93353	ASPH	017	$342,455.00		0.77%	67.77%							1.21%	23.36%		0.88%				
9309B:C10204	ASPH	020	$2,174,819.57		0.36%	54.47%							7.05%	6.44%		0.37%		21.34%		
9309B:C10229	SURF	020	$104,087.57		84.12%								5.53%	11.53%						
9309C:C92095	GEN	005	$109,421.44		0.48%	13.07%		19.16%		2.22%		7.96%	2.44%	12.09%	4.01%	3.21%				
9309D:C10130	ASPH	021	$454,552.00			96.86%														
9309D:C91022	CONR	012	$13,411,517.40		0.01%	0.74%			0.01%	76.66%		0.90%	5.62%	4.08%	1.18%	0.16%				
9309E:C10218	ASPH	020	$486,571.00			72.51%	3.61%						0.31%	8.53%		1.29%				
9309E:C92087A	GEN	005	$271,260.00		0.21%	6.26%	7.49%	8.53%		5.49%		6.29%	8.01%	6.41%	4.02%	0.90%				
9310A:C10220-CO	ASPH	020	$855,927.50	2.17%		44.52%	0.80%					0.63%	11.27%	4.01%	16.01%	0.95%				0.01%
9310A:C91091	GEN	013	$2,937,965.33	0.78%	0.18%	24.43%		5.40%		0.28%		15.75%	10.21%	4.08%	2.06%	1.07%				0.98%
9310B:C10123R	OLS	013	$1,547,784.00		0.03%	1.93%						3.66%	2.26%	8.69%	69.97%	1.87%				2.49%
9310B:C91303	CONR	013	$5,193,758.96	1.84%	0.08%	5.07%		1.96%	0.04%	25.31%		2.23%	10.61%	8.00%	1.86%	0.42%				4.82%
9310B:C93073-CO	GEN	012	$190,905.85	1.60%	0.36%	21.02%		19.29%		2.34%		11.36%	1.38%	5.74%	2.43%	0.34%				0.12%
9311A:C93094R-C	ASPH	020	$1,299,346.45		0.60%	24.55%		10.45%		9.93%		2.62%	0.37%	5.77%	1.54%	1.75%				
9311B:C10183	TRAF	017	$2,852,281.58											8.38%		0.91%				
9311B:C93125	STRC	017	$546,269.06	1.85%								2.61%	2.14%	3.03%	1.85%	0.27%				1.37%
9311C:C10237	STRC	003	$964,858.81	1.00%	1.01%	9.60%	0.67%	0.18%				0.60%	14.39%	3.52%	10.21%	1.61%				0.51%
9311C:C91154	ASPH	012	$242,397.00		2.78%	29.85%		12.38%		7.70%		7.71%	6.31%	8.66%	10.31%	0.08%				
9311C:C92059	DRNG	004	$547,879.85			25.32%	1.41%	6.67%	0.15%	1.08%		40.84%	2.56%	3.65%	1.67%	0.82%				
9311D:C10934	ERTH	017	$187,398.00										49.52%	10.00%		0.24%				
9311D:C90139-CO	GEN	005	$658,758.50		0.20%	18.05%		7.67%		0.40%		9.99%	1.66%	3.57%	14.98%	5.50%				0.02%
9311D:C93309	PVMK	005	$59,780.99											8.20%						
9312A:C92018	ASPH	020	$1,648,190.30	0.03%	0.74%	62.38%	3.27%					0.56%	0.76%	8.67%	0.40%	0.29%				
9312B:C10072	ASPH	021	$1,478,660.85		0.79%	75.71%	3.63%					0.92%	0.06%	2.91%		2.04%				
9312C:C10182	OTHR	017	$98,193.00	2.64%		0.61%		0.73%						3.45%		81.62%				
9312C:C93140	GEN	010	$3,161,727.28		0.71%	33.43%	4.34%					7.10%	25.17%	5.79%	5.93%	0.56%				
9312C:C93201-CO	ASPH	021	$4,423,781.92		0.34%	43.37%		0.44%				0.29%	10.00%	4.47%	1.62%	0.67%				0.06%
9401A:C92030	GEN	012	$6,842,729.35	0.52%	0.69%	26.20%	5.56%	0.78%				3.47%	26.67%	7.42%	10.52%	0.08%				0.02%
9401A:C92087S	SPEC	005	$310,753.75		0.18%	6.31%	7.84%	7.45%		4.79%		6.37%	7.45%	8.89%	4.18%	0.97%				
9401A:C92954	PVMK	005	$750,901.60											0.67%						
9401B:C10053	ERTH	005	$1,242,103.35	0.17%	0.32%	23.49%						0.96%	48.85%	7.08%	1.37%	0.79%				
9401B:C10136	ASPH	021	$1,065,283.34		0.80%	68.02%		0.26%				0.78%	0.46%	3.41%		0.56%		14.52%		
9401B:C10145	OTHR	022	$246,247.21											10.74%		77.85%				
9401B:C10253	BASE	013	$253,654.20				58.73%					4.83%	15.90%	7.28%	5.91%					
9401B:C10350	STRC	002	$212,872.40		0.19%	4.51%							0.39%	9.70%	34.41%	1.56%				0.37%
9401B:C88147	STRC	003	$1,282,828.28	1.65%	0.05%	4.28%	1.78%					1.33%	5.68%	3.70%	8.21%	0.92%				6.28%
9401B:C89163	GEN	012	$1,130,448.17		0.19%	24.05%		15.23%	0.48%	4.28%		4.82%	11.45%	5.98%	0.05%	0.99%				
9401B:C91147	STRC	003	$174,617.10	3.05%	0.12%	14.11%	6.76%	0.99%				0.53%	7.36%	6.29%	0.48%	2.32%				2.40%
9401B:C93163	STRC	018	$128,513.80	0.63%									1.87%	10.49%	3.12%	0.48%				7.82%
9401B:C93351	STRC	018	$148,148.39	5.54%				13.19%				2.72%	7.36%	1.25%	3.56%	0.30%				4.60%
9401C:C10134	ASPH	021	$1,223,494.61		0.40%	38.91%							1.54%	13.16%		0.57%		11.40%		
9401C:C10153	ASPH	021	$648,689.50		0.58%	39.86%		2.58%				1.39%	0.35%	2.77%	0.31%					
9401C:C10357	ASPH	021	$879,988.60		0.85%	65.60%	1.72%					0.06%	0.22%	12.80%		0.43%				
9401C:C91154R	ASPH	012	$208,358.00		3.23%	34.73%		16.20%		8.96%		8.97%	7.34%	4.80%	7.20%					
9401C:C92963	ASPH	020	$841,811.15			82.96%	1.22%						0.33%	8.53%		0.08%				
9401C:C93160	STRC	018	$109,550.00											26.29%	26.18%	0.28%				
9401C:C93237	STRC	003	$27,141,270.26	1.11%	0.04%	1.10%	0.39%	1.92%		4.55%		1.73%	3.45%	3.08%	1.27%	0.66%			0.04%	0.26%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9309A:C10109	ASPH	010		5.05%				8.86%								0.61%				0.61%
9309A:C10131-CO	ASPH	021					38.78%													0.00%
9309A:C10207	ASPH	017		1.16%				1.81%					0.05%							0.05%
9309A:C92981	SGNL	008		1.03%				4.64%						11.17%		0.60%	48.34%	1.46%		61.57%
9309A:C93353	ASPH	017						3.12%					0.80%			1.57%		0.53%		2.90%
9309B:C10204	ASPH	020		0.04%				7.55%				0.37%	0.49%			1.29%		0.22%	0.02%	2.39%
9309B:C10229	SURF	020					18.82%													0.00%
9309C:C92095	GEN	005		10.58%				13.19%		3.56%				5.57%		2.21%		0.23%		8.01%
9309D:C10130	ASPH	021		4.12%																0.00%
9309D:C91022	CONR	012	1.06%	0.82%		3.18%		2.77%			0.40%	0.74%	0.57%			0.64%		0.07%		2.42%
9309E:C10218	ASPH	020						6.28%				5.14%				2.37%		0.03%		7.54%
9309E:C82087R	GEN	005		6.26%				15.51%		1.53%	0.09%		0.71%	6.69%			15.15%		0.42%	23.06%
9310A:C10220-CO	ASPH	020		0.14%		0.94%		5.94%			0.26%	7.00%	1.27%			2.04%		1.55%	0.49%	12.61%
9310A:C91091	GEN	013		3.20%		6.81%		5.34%		0.94%	0.40%		7.91%	1.21%		2.18%	5.61%	0.77%	0.55%	18.51%
9310B:C10123R	OLS	013		0.89%		0.21%		5.51%				0.43%	0.54%			0.37%			0.15%	1.49%
9310B:C91303	CONR	013		0.87%		9.63%		7.59%		9.64%	0.26%	0.17%	1.23%	4.45%		2.36%	1.20%	0.30%	0.05%	10.02%
9310B:C93073-CO	GEN	012		6.00%		0.13%		23.94%		0.19%	0.08%					3.68%				3.76%
9311A:C93084R-C	ASPH	020		15.26%		4.27%		9.77%		0.56%				1.37%		6.78%	2.82%		1.78%	12.55%
9311B:C10183	TRAF	017						90.35%			0.14%	1.89%					0.11%	0.22%		2.36%
9311B:C93125	STRC	017		0.12%		82.96%					0.34%		3.39%						0.07%	3.80%
9311C:C10237	STRC	003		2.76%		32.31%		13.37%			1.82%	3.69%	1.76%			0.16%		0.10%	1.03%	8.38%
9311C:C91154	ASPH	012		2.37%		0.13%		9.78%					1.16%					0.40%	0.37%	1.93%
9311C:C92059	DRNG	004		5.61%				6.84%		0.33%	0.39%		0.91%			1.50%		0.05%		2.85%
9311D:C10334	ERTH	017						15.12%	21.61%				1.33%						2.17%	3.50%
9311D:C90139-CO	GEN	005		4.69%		1.14%		8.80%		0.35%	4.75%		0.05%	4.21%		2.11%	15.96%	0.80%	1.11%	28.99%
9311D:C93309	PVMK	005						36.27%								53.53%				53.53%
9312A:C92018	ASPH	020		6.83%		0.02%		5.34%		0.10%		8.54%	0.75%	1.33%		1.83%		0.01%		12.46%
9312B:C10072	ASPH	021		4.26%				3.05%		0.03%		1.29%				4.34%	0.93%	0.05%		6.61%
9312C:C10182	OTHR	017		0.61%				10.14%					-							0.00%
9312C:C93140	GEN	010		0.79%		0.27%		3.98%			2.94%	6.61%	1.36%			0.48%		0.22%	0.33%	11.94%
9312C:C93201-CO	ASPH	021	0.03%	4.39%		0.78%		7.05%			0.37%	20.54%	1.00%	0.52%		1.81%	1.67%	0.46%	0.11%	26.48%
9401A:C92030	GEN	012		0.89%		3.91%		4.29%			0.67%	1.04%	2.83%	0.66%		0.39%	1.14%	0.54%	3.20%	10.67%
9401A:C92087S	SPEC	005		5.93%				18.25%		1.50%	0.08%		0.79%	6.68%			14.02%		0.51%	22.08%
9401A:C92954	PVMK	005		0.50%												98.83%				98.83%
9401B:C10053	ERTH	005		0.84%				7.62%			0.17%	2.57%	1.08%			0.82%		0.31%	5.53%	10.48%
9401B:C10135	ASPH	021		4.90%				3.11%					0.55%			2.11%		0.54%		3.20%
9401B:C10145	OTHR	022						11.42%												0.00%
9401B:C10253	BASE	013		0.08%				0.18%			1.61%		2.21%						3.25%	7.07%
9401B:C10350	STRC	002	3.10%	0.87%		27.55%		11.34%				5.77%				0.28%				6.03%
9401B:C88147	STRC	003	2.42%	0.22%		38.84%		4.36%		20.87%		0.65%	0.48%							1.13%
9401B:C89163	GEN	012		10.02%		0.83%		9.27%		0.23%	0.27%		6.82%	0.31%		1.43%	2.60%	0.62%		12.05%
9401B:C91147	STRC	003	2.57%	0.55%		32.83%		11.50%			3.20%	4.72%	0.23%							8.15%
9401B:C93169	STRC	018				72.01%					0.31%		2.65%						0.61%	3.57%
9401B:C93351	STRC	018		0.80%		48.98%					0.45%		4.39%	6.67%		0.15%				11.66%
9401C:C10134	ASPH	021		2.21%				10.48%				15.77%	0.50%			6.06%				21.33%
9401C:C10153	ASPH	021		19.53%				8.64%		1.54%				3.51%		11.01%	3.26%		4.68%	22.48%
9401C:C10357	ASPH	021		2.60%				4.46%		0.02%		9.76%				1.47%				11.23%
9401C:C91154R	ASPH	012		2.76%		0.16%		3.86%					1.34%					0.46%		1.80%
9401C:C92963	ASPH	020		1.04%				6.74%								0.58%		0.55%		1.11%
9401C:C93160	STRC	018				44.76%				-			3.49%							3.49%
9401C:C93237	STRC	003	1.29%	0.81%		65.97%		1.87%	0.06%	0.41%	0.20%	0.04%	0.81%	4.18%		0.38%	3.46%	0.42%	0.62%	10.11%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRQ	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9401D:C91162	CONR	012	$11,326,269.62	0.10%	0.20%	14.68%	0.97%	0.02%	0.01%	65.18%		0.55%	7.13%	4.34%	0.93%	0.29%				0.16%
9401D:C91163	ASPH	013	$1,571,987.43	0.05%	0.66%	21.46%		5.52%				0.22%	1.05%	3.07%	1.50%	5.18%				1.21%
9401D:C93341	GEN	020	$217,424.00		2.57%	31.73%	9.61%	11.74%		1.57%		0.69%	13.03%	9.20%	3.45%					
9402A:C10133	ASPH	021	$1,089,793.53		1.09%	83.11%							0.15%	2.50%		0.45%				
9402A:C10140	ASPH	021	$1,834,419.80		2.59%	82.48%	3.99%					0.31%	0.16%	1.95%	0.11%	0.20%				
9402A:C92090R	GEN	005	$541,868.20		0.28%	10.76%		17.96%		3.65%		5.05%	4.59%	2.77%		6.42%				
9402A:C92914	GEN	012	$4,020,202.02	0.19%	0.04%	5.42%	3.37%	0.13%	0.03%	30.50%		4.28%	7.55%	2.34%	3.01%	1.39%				0.03%
9402A:C93166	CGS	018	$242,491.00	1.80%		1.65%	1.08%	23.87%	0.16%	1.40%		2.47%		2.89%	1.65%	0.25%			1.24%	
9402B:C10196	CONR	011	$3,355,485.74			5.43%	0.08%			49.57%		3.86%	18.97%	3.28%	5.13%	0.55%				
9402B:C10230	GEN	010	$1,933,352.80		0.33%	27.45%	1.93%					5.37%	28.51%	5.69%	8.18%	0.83%				
9402B:C10231	ASPH	020	$219,779.01		1.29%	52.49%								3.84%						
9402C:C10111	GEN	010	$2,407,237.70	0.70%	0.35%	35.68%	9.26%		0.24%			4.27%	18.55%	7.81%	4.24%	0.87%				0.22%
9402C:C10144	OTHR	022	$193,862.50											1.56%		89.33%				
9402C:C10350R	STRC	002	$216,189.50		0.08%	3.70%							0.63%	8.79%	31.46%	1.34%				0.25%
9402C:C10352	OTHR	022	$376,372.40											10.83%		33.32%				
9402C:C10446-CO	ERTH	017	$466,727.20						2.08%			4.86%	68.85%	10.04%	0.80%	0.08%				0.81%
9402D:C10127	ASPH	021	$905,630.50			88.18%								10.82%	0.11%	0.35%				
9402D:C10165	PVMK	005	$146,580.00											1.36%	3.41%					
9402D:C93107	STRC	017	$3,157,930.00											6.55%	9.18%	0.14%				
9403A:C10078	GEN	011	$985,920.65	0.91%		21.02%	4.04%	12.82%	0.15%	1.25%		15.77%	4.78%	8.03%	1.66%	11.24%				0.19%
9403B:C10129-CO	ASPH	020	$1,619,960.55		0.26%	67.70%	2.46%						0.25%	5.66%		0.27%		16.78%		
9403B:C10149	ASPH	020	$966,666.66		0.56%	46.93%							0.47%	3.07%		2.22%				
9403B:C93098	ASPH	021	$926,498.70		0.32%	45.64%		5.11%		0.92%		0.22%	0.54%	8.09%	2.18%	0.55%				
9403C:C10125	ASPH	020	$2,446,478.76			32.79%		0.12%					2.60%	2.58%	12.69%	1.86%				
9403C:C10358	ASPH	021	$915,794.00			82.86%	4.45%						0.16%	4.91%		0.96%				
9403C:C10454	SGNL	009	$79,884.00											3.76%						
9403C:C92313-CO	GEN	002	$4,275,768.77	1.14%	0.37%	16.69%	0.93%	0.85%				2.81%	7.85%	6.01%	3.65%	1.07%				0.01%
9403D:C10108	SGNL	005	$220,440.10		0.21%	13.21%		8.23%	0.11%	3.75%		0.73%		7.03%	7.69%					
9403D:C10128	ASPH	020	$885,281.44		0.28%	61.95%	3.55%						0.34%	6.78%		1.21%		19.74%		
9403D:C10139	ASPH	021	$1,843,313.00		1.73%	78.24%	1.84%					0.12%		9.66%	0.26%	0.52%				
9403E:C91036	GEN	004	$7,219,503.86	0.93%		11.04%	1.49%	0.63%		28.15%		0.84%	13.67%	9.70%	3.13%	0.39%				0.01%
9403E:C92029-CO	GEN	012	$5,976,010.84	1.54%	0.20%	20.55%	1.03%	0.64%	0.05%	2.96%		3.91%	16.32%	6.34%	1.84%	0.28%		4.04%		1.85%
9403E:C92431	ASPH	020	$1,726,700.85		0.34%	29.16%	1.58%	0.73%				1.90%	5.01%	3.83%	2.22%	0.61%				0.12%
9404A:C10310	PVMK	009	$264,928.50																	
9404A:C91433	GEN	011	$8,397,990.88	0.34%	0.02%	6.76%	0.08%	4.69%		30.30%		9.30%	8.89%	4.17%	5.33%	1.26%				0.11%
9404A:C93044	CGS	018	$91,071.09				5.56%	51.24%	0.55%				3.83%	11.32%						
9404B:C10166	GDRL	005	$45,045.00											9.99%		0.46%				
9404B:C10507	ASPH	021	$1,877,812.75		2.32%	82.15%	4.08%						0.19%	3.73%	0.11%	0.40%				
9404B:C89146	ASPH	005	$482,258.75		0.83%	22.68%		6.57%		0.67%		4.07%	3.47%	2.70%	13.08%	6.63%				
9404B:C93316	ASPH	008	$158,509.50			22.48%		12.08%		1.02%		7.12%	0.25%	11.91%	3.76%	7.86%				
9404C:C10108R	SGNL	005	$221,078.70		0.21%	13.17%		8.20%	0.11%	3.74%		0.72%		6.11%	7.61%	0.06%				
9404C:C10128	ASPH	020	$2,578,120.80			72.40%	4.86%	0.32%				0.07%	0.17%	6.79%	1.22%	1.18%				
9404C:C10508-CO	ASPH	020	$2,821,185.90	0.01%	0.63%	69.41%	3.74%	0.18%				0.65%	0.57%	3.05%		0.62%				0.05%
9404D:C93015	GEN	011	$11,900,180.04	0.89%	0.01%	2.17%	0.71%	0.30%		19.36%		2.16%	29.23%	3.14%	11.70%	0.65%				0.16%
9404D:C93165	STRC	018	$229,094.60	5.32%			0.33%	3.45%					6.30%	9.63%						0.42%
9405A:C10090	SURF	021	$399,998.98		42.90%		0.35%							8.35%		0.58%				
9405A:C10154	ASPH	021	$516,658.10		0.33%	58.86%						0.23%	0.77%	7.35%	0.58%	0.45%				
9405A:C10155	ASPH	021	$1,311,500.28	0.07%	0.57%	33.62%		1.34%				0.67%	0.35%	2.44%	1.51%	2.42%				
9405A:C10356	SURF	021	$639,281.35		50.47%									4.90%		0.34%				
9405B:C10078	ASPH	020	$1,594,006.80		1.49%	76.63%	5.82%					0.02%	0.46%	6.90%		0.45%				
9405B:C10359	ASPH	021	$796,248.95		1.09%	82.07%	0.25%						0.43%	3.27%		0.88%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAP	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9401D:C91162	CONR	012	0.37%	1.17%		6.83%		2.16%			0.59%	0.62%	0.74%	0.07%		0.73%		0.36%	2.10%	5.11%
9401D:C91163	ASPH	013		2.22%		17.48%		8.05%		0.53%	14.88%	3.01%	0.48%	6.82%		1.71%	2.17%	0.89%	2.08%	31.82%
9401D:C93341	GEN	020		3.03%		0.02%		8.46%		0.14%						0.14%			4.62%	4.76%
9402A:C10133	ASPH	021		6.00%				3.10%								3.59%				3.59%
9402A:C10140	ASPH	021		2.79%				3.40%		0.25%						1.78%				1.78%
9402A:C92090R	GEN	005		6.31%				13.83%		0.11%	0.23%		0.09%	4.54%		5.71%	14.17%	1.27%	0.15%	26.16%
9402A:C92914	GEN	012		1.83%		19.51%		8.84%		0.03%	0.54%	5.72%	0.80%	0.10%		0.60%		3.86%	0.18%	11.82%
9402A:C93166	CGS	018		4.76%				10.59%		3.72%	0.93%		19.18%	22.39%						42.50%
9402B:C10196	CONR	011	0.89%	1.53%		0.50%		4.73%			0.55%	0.18%	0.46%	0.55%		0.58%	0.82%	1.18%	0.06%	4.36%
9402B:C10230	GEN	010		1.33%		1.05%		8.87%			1.16%	6.09%	1.91%			1.63%		0.87%		11.46%
9402B:C10231	ASPH	020		19.18%				16.41%								7.99%				7.99%
9402C:C10111	GEN	010		1.11%		6.53%		6.84%			0.03%	0.79%	1.27%			0.23%		0.29%	0.71%	3.32%
9402C:C10144	OTHR	022						9.12%												0.00%
9402C:C10350R	STRC	002	6.01%	0.67%		26.89%		15.09%				4.83%				0.25%				5.08%
9402C:C10352	OTHR	022		1.62%				28.72%								25.52%				25.52%
9402C:C10446-CO	ERTH	017		0.40%		2.88%			0.65%		0.37%	2.52%	2.23%					0.07%	3.59%	8.78%
9402D:C10127	ASPH	021		0.52%																0.00%
9402D:C10165	PVMK	005		0.34%												94.88%				94.88%
9402D:C93107	STRC	017		6.42%		72.98%						1.58%					0.32%		0.82%	2.72%
9403A:C10078	GEN	011		4.82%		1.22%		3.88%		0.81%			0.54%	4.84%		0.65%		0.08%	1.28%	7.19%
9403B:C10129-CO	ASPH	020		1.88%				3.31%								0.78%		0.35%		1.13%
9403B:C10149	ASPH	020		15.36%				16.61%				9.71%				4.81%	0.31%	0.16%	0.79%	15.78%
9403B:C93098	ASPH	021		12.48%				9.95%		0.30%				0.34%		10.74%	1.84%	0.02%	0.76%	13.70%
9403C:C10125	ASPH	020	0.29%	22.58%		2.04%		10.94%				6.86%	0.07%			3.93%		0.67%	0.09%	11.52%
9403C:C10356	ASPH	021		0.84%				3.93%				1.89%								1.89%
9403C:C10454	SGNL	009						15.54%						12.78%		7.45%	56.30%	4.16%		80.71%
9403C:C92313-CO	GEN	002	1.22%	3.61%		12.90%		11.88%		0.04%	7.76%	6.05%	0.43%	2.39%		1.37%	1.41%	2.14%	7.64%	29.18%
9403D:C10108	SGNL	005		11.81%				12.80%						0.42%		3.17%	30.89%			34.48%
9403D:C10128	ASPH	020		0.08%				4.96%								0.88%		0.25%		1.14%
9403D:C10139	ASPH	021		1.87%				3.30%		0.02%						2.46%				2.46%
9403E:C91038	GEN	004	1.14%	1.42%		12.59%		6.80%			0.23%	1.42%	1.29%	1.66%		0.98%		2.28%	0.02%	7.88%
9403E:C92029-CO	GEN	012	0.14%	1.24%		14.06%		4.80%		6.21%	0.89%	1.52%	1.49%	4.65%		0.33%		1.68%	1.61%	12.18%
9403E:C92431	ASPH	020	0.66%	8.12%		8.67%		14.80%				19.08%	0.26%	0.07%		1.83%		1.45%	1.58%	24.27%
9404A:C10310	PVMK	009														100.00%				100.00%
9404A:C91433	GEN	011	0.24%	4.84%		2.24%		4.42%		2.67%	2.20%	3.46%	0.23%	5.34%		0.37%	1.46%	1.19%	0.18%	14.43%
9404A:C93044	CGS	018		5.00%							19.51%		2.98%							22.49%
9404B:C10166	GDRL	005						17.58%				71.99%								71.99%
9404B:C10507	ASPH	021		1.09%				3.98%								1.96%				1.96%
9404B:C89146	ASPH	005		4.78%				9.43%		0.45%			0.35%	6.39%		2.89%	13.54%	1.31%	0.15%	24.63%
9404B:C93316	ASPH	008		6.10%				19.05%		0.19%			0.54%			5.07%		0.59%		6.20%
9404C:C10108R	SGNL	005		11.89%				12.41%						0.42%		3.16%	32.18%			35.76%
9404C:C10126	ASPH	020		0.79%				3.21%				0.43%	0.04%	1.21%		2.60%	4.11%	0.60%		8.99%
9404C:C10508-CO	ASPH	020		4.71%		0.13%		4.68%				1.78%	1.71%	0.13%		3.14%	1.17%		3.84%	11.57%
9404D:C93015	GEN	011		0.53%		14.26%		5.52%	4.45%		0.38%	1.13%	1.18%	0.68%		0.25%	0.01%	0.46%	0.87%	4.75%
9404D:C93165	STRC	018		0.06%		54.22%		18.16%					2.12%							2.12%
9405A:C10090	SURF	021					35.42%	6.66%								5.75%				5.75%
9405A:C10154	ASPH	021		8.24%				7.24%		0.16%		0.61%		1.14%		4.09%	3.84%	0.37%	4.74%	14.79%
9405A:C10155	ASPH	021	0.36%	10.03%		10.16%		13.61%		0.93%	0.48%	7.09%	0.02%	0.96%		5.42%	3.19%	0.03%	4.73%	21.92%
9405A:C10356	SURF	021					31.17%	7.19%								5.94%				5.94%
9405B:C10076	ASPH	020		1.91%				3.40%				1.68%		0.04%		0.91%	0.28%			2.82%
9405B:C10359	ASPH	021		0.76%				4.11%				7.14%								7.14%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9405B:C92067	STRC	003	$4,278,470.27	0.83%		6.37%	0.86%					2.34%	21.06%	2.72%	7.42%	0.15%				3.86%
9405C:C10091	ASPH	021	$504,746.15		0.95%	76.74%	1.79%						0.19%	10.90%		0.74%				
9405C:C10126R	ASPH	020	$2,450,711.30			74.64%	3.03%	0.63%				0.10%	0.13%	8.16%	0.43%	1.13%				
9405C:C10139R	ASPH	021	$1,567,957.80		1.58%	71.05%	0.94%					0.57%		12.76%	0.26%	0.70%				
9405C:C10353	ASPH	021	$1,408,435.62		0.52%	42.40%						0.82%	3.69%	3.80%	0.33%					
9405C:C92051	STRC	003	$1,258,430.00	1.55%	0.13%	5.04%	1.74%	4.44%				0.80%	4.91%	3.91%	2.50%	4.25%				
9405D:C10234	CONR	012	$9,766,223.40	0.06%	0.03%	2.18%		0.03%		75.17%		0.29%	4.18%	4.40%	1.25%	0.32%				0.01%
9405D:C10361	SGNL	008	$413,251.00										1.60%	5.08%						
9405D:C90027	ASPH	020	$1,611,732.09		0.88%	81.14%						1.37%	1.30%	2.02%		0.34%				
9405D:C91457	STRC	003	$2,640,422.52	1.37%	0.15%	5.55%	0.16%	2.48%	0.44%			2.60%	5.37%	8.14%	4.32%	1.10%				2.54%
9405D:C92094	GEN	005	$357,410.00		0.08%	12.22%		10.38%				0.98%	8.38%	4.20%	1.82%	15.07%				
9406A:C10151	ASPH	020	$1,782,612.60	0.03%	0.75%	50.38%						1.53%	0.85%	1.23%		0.22%				0.01%
9406A:C10491	ASPH	021	$909,650.10			92.76%								2.02%		0.30%				
9406A:C10493	ASPH	021	$768,226.50			81.19%								15.62%						
9406A:C10511	ASPH	020	$1,478,746.00		0.92%	80.98%	3.82%						0.22%	4.73%		0.37%				
9406A:C10523	ASPH	021	$2,382,914.10			96.08%								2.93%	0.06%	0.25%				
9406A:C10658	GEN	008	$2,633,209.35	0.82%	0.10%	18.00%		7.01%	0.38%	2.07%		2.81%	4.71%	5.64%	11.39%	3.43%			0.50%	
9406B:C10091R	ASPH	021	$448,686.80		0.58%	78.37%	2.64%						0.22%	9.81%		0.13%				
9406B:C10492	ASPH	021	$552,127.30			90.77%								0.74%						
9406B:C10495	ASPH	021	$427,494.00			97.15%								2.81%		1.87%				
9406B:C10512-CO	ASPH	020	$1,478,745.00			77.48%	0.58%						0.35%	3.82%	0.22%	0.44%				
9406B:C92106	STRC	018	$742,153.60	3.69%		0.44%	0.68%	0.06%				0.27%	4.38%	6.76%	1.72%	0.76%				0.11%
9406C:C10086	ASPH	020	$838,093.75		0.85%	81.22%							0.70%	9.81%		1.10%				
9406C:C10494	ASPH	021	$827,142.10			77.71%								16.93%						
9406C:C10546	ASPH	021	$368,975.65			100.00%														
9406C:C10547	ASPH	021	$795,564.00			100.00%														
9406C:C93314	ASPH	020	$347,475.00		1.67%	49.55%		0.21%				1.05%	1.21%	6.60%	1.93%	4.58%				
9406C:C93337	GEN	010	$1,246,077.60	0.42%	0.30%	20.77%		11.20%	0.11%	1.90%		11.76%	4.61%	3.69%	2.00%	1.64%				
9406D:C10174	SURF	021	$420,378.31		38.62%									10.87%						
9406D:C10439	PVMK	005	$132,965.40											0.75%						
9406D:C93209	GEN	003	$245,092.50		0.92%	5.21%	4.72%					11.28%	17.80%	13.22%	4.37%	3.26%				
9406E:C10184	GDRL	005	$49,567.50											10.89%						
9406E:C10232	GDRL	005	$820,458.00	0.35%	0.41%	6.28%	2.27%			6.30%		5.22%	12.88%	7.19%	5.09%	2.80%				0.93%
9406E:C10460-CO	ASPH	021	$2,769,572.85		2.40%	65.39%	0.19%					0.33%	0.34%	4.15%		2.82%				
9406E:C10509	ASPH	021	$773,521.39		0.40%	47.57%		3.18%				0.19%	0.72%	4.40%		0.92%				
9406E:C10600	ASPH	021	$836,015.00			80.62%								5.98%		0.54%				
9406E:C10643	ASPH	020	$2,432,380.45		1.12%	83.72%						0.04%	3.31%	3.98%		0.49%		15.28%		
9406E:C10659	PVMK	009	$56,849.40											3.52%						
9406E:C88174-CO	GEN	012	$7,306,627.95	0.70%	0.06%	2.04%	7.11%	0.83%		36.47%		2.87%	21.89%	7.53%	2.88%	0.56%				0.08%
9407A:C10433	PVMK	005	$166,536.25											1.80%						
9407A:C10514-CO	ASPH	020	$1,659,359.60			79.12%								5.32%	0.13%	0.29%		14.30%		
9407B:C10057	ASPH	020	$1,589,002.00		0.88%	61.75%							5.19%	6.17%		0.44%		17.26%		
9407B:C10455	ASPH	020	$1,672,810.41		0.01%	69.07%						0.63%	6.56%	6.99%	0.24%	0.54%				
9407C:C10044R-C	SPEC	005	$859,709.00		0.10%	7.63%		10.37%		2.66%		7.89%		9.18%	2.08%	1.31%				
9407C:C10092	ASPH	021	$1,290,627.40		0.87%	75.50%	5.08%						1.28%	4.46%		0.74%				
9407C:C10706	ASPH	021	$1,733,714.60		0.42%	41.93%				2.00%		1.30%	0.32%	6.23%						
9408A:C10079	STRC	003	$689,985.04	7.51%	0.05%	6.95%		1.41%	0.09%	0.37%		5.30%	5.80%	3.89%	3.68%	0.64%			0.14%	1.19%
9408A:C10530	OTHR	022	$142,571.00											4.70%		77.77%				
9408A:C10671	ASPH	020	$3,164,851.38		0.34%	62.41%	1.84%							2.15%	0.16%	1.04%		29.11%		
9408B:C10188	GEN	014	$2,150,975.25	0.42%	0.02%	1.76%	0.23%	4.22%		27.61%		7.37%	5.92%	7.36%	4.97%	0.33%			19.87%	0.35%
9408B:C10329	LSCP	017	$343,658.00			1.80%		0.72%					0.73%	9.76%		1.02%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9405B:C92067	STRC	003	1.46%	0.17%		48.38%		0.85%		0.52%	0.47%	0.19%	1.11%	0.42%		0.26%	0.10%	0.34%	0.09%	2.98%
9405C:C10091	ASPH	021		1.61%				4.58%				0.58%				1.93%				2.51%
9405C:C10126R	ASPH	020		0.53%				3.41%				0.56%	0.04%	1.22%		1.52%	4.08%	0.52%		7.94%
9405C:C10139R	ASPH	021		5.50%				3.43%		0.16%						3.05%				3.05%
9405C:C10353	ASPH	021		14.11%				15.68%		0.23%			0.29%	0.82%		9.93%	6.59%	0.07%	0.72%	18.42%
9405C:C92051	STRC	003	6.63%	1.55%		50.50%		7.66%			1.65%	0.39%	0.25%	0.95%		0.59%	0.08%	0.50%		4.39%
9405D:C10234	CONR	012	0.04%	1.68%		2.42%		3.81%			0.70%	0.44%	0.80%			0.92%		0.16%	0.00%	3.02%
9405D:C10361	SGNL	008		0.17%				14.70%						24.80%			51.60%		2.03%	78.43%
9405D:C90027	ASPH	020		0.82%				4.79%				4.97%				2.29%		0.08%		7.34%
9405D:C91457	STRC	003	0.95%	1.55%		43.49%		9.91%		2.32%	0.36%	1.14%	1.08%	3.77%		0.55%		0.13%	0.55%	7.56%
9405D:C92094	GEN	005		10.83%				12.31%		0.06%			0.68%	7.77%		0.74%	13.97%	2.54%		25.90%
9406A:C10151	ASPH	020		11.55%		1.86%		6.52%				17.28%		1.68%		3.24%	0.57%		2.21%	24.98%
9406A:C10491	ASPH	021						3.24%								1.68%				1.68%
9406A:C10493	ASPH	021						2.11%								1.08%				1.08%
9406A:C10511	ASPH	020						3.53%				0.41%				5.05%				5.46%
9406A:C10523	ASPH	021		0.68%																0.00%
9406A:C10658	GEN	008		7.71%		18.87%		6.60%		1.76%	0.19%		3.23%	1.28%		1.05%	3.81%	0.90%	0.25%	10.11%
9406B:C10091R	ASPH	021		1.95%				4.27%				0.63%				1.42%				2.05%
9406B:C10492	ASPH	021						4.91%								3.58%				3.58%
9406B:C10495	ASPH	021						4.36%								3.81%				3.81%
9406B:C10512-CO	ASPH	020		8.31%				4.21%				1.51%				3.09%				4.60%
9406B:C92106	STRC	018	3.19%			56.82%		7.57%	7.23%		0.08%	0.97%	2.66%	0.31%				0.25%	0.02%	4.29%
9406C:C10095	ASPH	020		0.35%				3.89%				0.92%				1.17%				2.09%
9406C:C10494	ASPH	021						3.29%								2.07%				2.07%
9406C:C10546	ASPH	021																		0.00%
9406C:C10547	ASPH	021																		0.00%
9406C:C93314	ASPH	020		17.08%				6.98%		0.12%			6.85%			3.38%				9.03%
9406C:C93337	GEN	010		7.55%				10.94%		0.39%	2.15%		1.30%	7.78%		1.63%	9.34%	0.53%		22.71%
9406D:C10174	SURF	021					42.13%	4.53%								3.85%				3.85%
9406D:C10439	PVMK	005						1.50%								97.74%				97.74%
9406D:C93209	GEN	003	9.79%	0.13%		2.99%		21.64%			1.28%		1.64%			1.71%		0.03%		4.66%
9406E:C10164	GDRL	005		0.70%				20.46%				68.15%								68.15%
9406E:C10232	GDRL	005		0.30%		3.77%		8.57%				26.92%	1.27%			0.17%		6.43%	1.63%	36.82%
9406E:C10460-CO	ASPH	021		2.09%				3.73%				12.25%	0.26%			4.05%			2.00%	18.56%
9406E:C10509	ASPH	021		9.93%		18.79%		5.01%			0.79%	0.40%				2.65%		0.25%	4.77%	8.86%
9406E:C10600	ASPH	021						5.11%								7.75%				7.75%
9406E:C10643	ASPH	020		1.32%				4.56%				2.95%	0.26%			2.53%		0.51%		6.25%
9406E:C10659	PVMK	009		0.88%												95.60%				95.60%
9406E:C88174-CO	GEN	012	2.05%	1.80%		0.78%		7.38%		0.23%	1.18%	0.26%	1.23%	0.08%		0.89%	0.03%	1.25%	0.24%	5.16%
9407A:C10433	PVMK	005						1.60%								98.40%				98.40%
9407A:C10514-CO	ASPH	020																0.49%	0.35%	0.84%
9407B:C10057	ASPH	020		0.07%		0.70%		3.35%					0.50%			2.46%		1.24%		4.20%
9407B:C10455	ASPH	020		0.32%				3.27%					1.00%			1.10%		0.26%	10.00%	12.38%
9407C:C10044R-C	SPEC	005		4.96%		0.62%		12.32%		0.45%		0.41%		11.84%		4.62%	22.95%	0.82%		40.44%
9407C:C10092	ASPH	021		0.63%				4.34%				5.62%				1.48%				7.11%
9407C:C10706	ASPH	021		19.90%				8.39%		0.52%				1.87%		10.95%	4.25%		2.17%	19.04%
9408A:C10079	STRC	003	5.49%	3.94%		44.18%		0.71%		3.94%	0.16%		1.89%	2.53%				0.10%	0.03%	4.71%
9408A:C10530	OTHR	022						17.54%												0.00%
9408A:C10871	ASPH	020						2.00%								0.90%		0.27%		1.17%
9408B:C10188	GEN	014		0.16%		3.45%		1.25%		1.20%	1.93%		8.41%	5.10%		1.43%		2.66%		19.53%
9408B:C10328	LSCP	017		0.38%				9.37%		14.72%			60.97%	0.55%						61.52%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9408B:C93248	ASPH	020	$1,465,410.63		0.51%	57.17%						3.56%	10.59%	2.73%		0.55%				
9408C:C10514R-C	ASPH	020	$1,377,596.75			94.51%								4.50%	0.07%	0.33%				
9408C:C10707	STRC	002	$38,853.50											14.54%	12.74%	0.39%				
9408D:C10208	ASPH	020	$195,156.00		0.76%	37.88%		2.97%		2.77%		18.26%	4.85%	7.69%		0.28%				
9408D:C10437	GDRL	005	$117,500.00											2.91%						
9408D:C10528	OTHR	022	$274,540.00											9.51%		73.17%				
9409A:C10175	GEN	013	$6,306,123.60	2.17%	0.04%	6.62%	0.43%	4.35%		20.20%		1.86%	6.75%	1.28%	8.17%	0.48%				7.18%
9409A:C10656R	GEN	008	$2,411,301.85	0.65%	0.11%	19.99%		8.40%	0.12%	2.32%		4.22%	3.29%	6.30%	4.53%	1.65%			1.17%	
9409A:C93012	SPEC	015	$647,414.00	10.16%		1.69%		0.17%				0.35%	1.98%	6.85%	0.53%	0.45%				
9409B:C10482	GEN	005	$906,098.50			17.32%		1.43%				0.76%	28.07%	3.52%	0.77%					
9409B:C10571	ASPH	010	$182,402.54		0.59%	43.45%	2.53%	21.51%		0.21%			17.28%	2.45%		0.11%				
9409B:C92049-CO	ASPH	003	$2,827,593.58	0.47%	0.28%	32.40%			0.07%			1.03%	13.41%	4.24%	3.50%	1.03%		1.72%		3.47%
9409B:C93337R	GEN	010	$1,189,132.47	0.54%	0.25%	20.70%		11.88%	0.13%	1.85%		7.80%	3.69%	9.76%	2.66%	3.11%				
9409C:C10734	PVMK	017	$216,864.64											1.38%						
9409C:C93151	GEN	003	$2,382,793.45	1.41%	1.06%	12.90%	1.70%	0.02%				0.16%	30.73%	2.10%	0.93%	1.13%				2.39%
9409C:C93223	GEN	012	$11,394,383.83	2.91%	0.26%	5.58%	0.79%	3.39%		14.70%		7.14%	6.47%	3.35%	4.90%	2.29%				0.08%
9409D:C90025	REST	014	$2,937,271.44	0.02%	0.16%	10.33%	0.38%	6.28%		0.02%		1.67%	16.77%	7.03%	1.63%	0.29%			28.10%	0.07%
9409E:C10044S-C	SGNL	005	$637,562.00		0.09%	7.99%		8.76%		2.26%		7.62%		9.41%	6.36%	1.71%				
9410A:C10482R	?	005	$834,481.90			19.75%		1.54%				1.14%	22.81%	8.06%	1.56%					
9410A:C10697	SGNL	008	$222,350.00										0.67%	4.14%	11.83%					
9410A:C93277	ASPH	020	$2,782,930.90	0.13%	0.72%	48.78%	3.97%					0.89%	6.25%	9.05%	0.91%	0.41%		14.94%		0.36%
9410B:C10054	ASPH	005	$510,838.98	0.33%	0.85%	37.66%	0.07%	5.46%	0.80%	0.93%		5.09%	2.73%	5.45%		0.07%			0.15%	0.05%
9410B:C10208R	ASPH	020	$149,980.00		1.10%	38.47%		2.58%		2.88%		16.78%	5.40%	4.00%		0.20%				
9410B:C10524	ASPH	021	$787,457.00			84.62%	3.61%						0.46%	4.76%	0.46%	0.88%				
9410B:C10649-CO	ASPH	021	$2,073,884.00		0.12%	74.50%	4.44%						0.27%	2.56%	0.24%	0.58%		14.27%		
9410C:C10245	PVMK	005	$704,105.60											0.14%						
9410C:C93271	GEN	013	$16,695,861.49	0.73%	0.04%	3.83%	2.95%	0.83%		21.82%		4.27%	5.27%	3.11%	1.76%	0.99%				1.30%
9411A:C92034	CONR	011	$12,310,349.15	1.19%	0.04%	5.90%	2.01%	3.25%		23.85%		10.15%	8.15%	6.90%	4.15%	1.44%				0.67%
9411B:C10476	GEN	019	$147,088.00	0.14%			1.22%	26.28%				3.69%	21.64%	4.42%	3.99%					1.24%
9411C:C10044T-C	GEN	005	$556,814.00		0.13%	11.66%		12.66%		3.15%		9.22%		7.18%	3.41%	1.54%				
9411C:C10161	ASPH	012	$111,492.00		0.65%	44.98%	2.09%	1.15%				6.54%	12.65%	11.21%	5.38%	2.60%				
9411C:C10222	ASPH	020	$848,625.25		0.53%	70.43%	7.41%	2.13%				0.32%	3.32%	6.72%	1.77%	0.41%				
9411C:C10782	GEN	011	$10,718,414.12	2.69%	0.46%	13.68%	1.01%	1.44%				3.25%	18.77%	0.70%	2.86%	0.37%				1.26%
9411D:C10105	GEN	008	$2,561,352.70	0.24%	0.07%	9.90%		5.30%		12.62%		25.73%	3.06%	7.46%	7.81%	4.22%				0.20%
9412A:C10106	GEN	008	$543,943.15	1.74%	0.34%	16.31%		10.46%	0.01%			4.85%	5.73%	4.87%	2.76%	6.67%				
9412A:C10699	SGNL	008	$176,453.50										0.38%	3.52%	0.27%					
9412A:C93029	STRC	003	$1,784,937.65	4.10%	0.51%	12.62%	3.75%	0.66%		0.54%		1.42%	6.13%	2.72%	1.36%	0.15%			0.07%	1.37%
9412A:C93120	GEN	010	$3,084,361.00	1.93%	0.87%	28.92%	11.68%	0.25%				3.54%	14.54%	5.18%	3.96%	0.58%				1.55%
9412B:C92043	GEN	003	$1,579,579.79	1.47%	0.46%	15.28%				7.04%		0.47%	6.88%	5.28%	11.23%	1.13%				4.64%
9412C:C10409	STRC	018	$205,786.80			2.00%	2.88%	21.67%				0.89%	4.63%	9.77%	2.38%					
9412C:C10556	ASPH	010	$3,417,201.32	1.15%	0.52%	36.80%	7.29%	0.53%	0.11%			9.00%	17.82%	5.03%	4.06%	0.46%				0.03%
9412C:C10635	STRC	003	$841,910.40	8.44%		2.26%	0.03%	0.14%				2.17%	10.40%	7.48%	4.42%	1.26%				0.96%
9501A:C10435	ASPH	005	$296,038.13		0.54%	31.52%		8.24%				4.34%	1.82%	10.54%	2.70%	7.13%				
9501A:C10438	LTNG	005	$126,205.00										13.91%	1.03%	7.13%					
9501A:C10515	ASPH	020	$2,245,684.47			83.04%	4.62%						0.16%	6.23%	0.27%	0.33%				
9501A:C90025R	REST	014	$2,250,678.30	0.03%	0.22%	12.90%	0.75%	7.74%		0.02%		2.76%	6.40%	6.73%	3.04%	0.49%			27.98%	0.06%
9501A:C92982-CO	STRC	013	$2,362,981.72	1.62%	0.10%	5.79%		2.05%		10.83%		12.18%	8.03%	8.98%	3.33%	0.46%	0.07%			4.82%
9501B:C10178	GEN	011	$2,772,900.99	1.92%	0.16%	12.11%		2.79%				1.15%	19.30%	2.76%	1.26%	2.88%				4.92%
9501B:C10370	GEN	010	$2,073,196.25	0.18%	0.55%	29.79%	21.26%					1.29%	19.55%	4.62%	3.04%	0.96%				1.16%
9501B:C10403	STRC	003	$674,094.64	1.28%	0.14%	6.35%	0.34%	2.76%				3.45%	4.98%	3.93%	1.38%	0.78%				10.71%
9501B:C10674	ASPH	022	$346,118.06			43.68%								15.54%		0.69%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9408B:C93248	ASPH	020		1.27%				4.53%			4.23%	10.51%	0.93%			2.98%		0.47%		19.10%
9408C:C10514R-C	ASPH	020																0.56%	0.02%	0.58%
9408C:C10707	STRC	002	6.95%	7.22%		38.37%		13.10%				6.69%								6.69%
9408D:C10208	ASPH	020		13.13%				11.64%												0.00%
9408D:C10437	GDRL	005						14.15%				82.93%								82.93%
9408D:C10529	OTHR	022						17.32%												0.00%
9409A:C10175	GEN	013		0.57%		19.11%		3.50%	0.34%	7.15%	0.35%	0.33%	7.86%	2.27%		0.68%		0.30%		11.79%
9409A:C10658R	GEN	008		5.21%		19.32%		9.00%		2.15%	0.25%		3.51%	1.75%		1.02%	4.65%	0.26%	0.14%	11.58%
9409A:C93012	SPEC	015		0.75%				25.02%				8.86%	0.81%	0.40%		0.14%		0.04%	43.81%	51.96%
9409B:C10482	GEN	005	0.05%	3.30%				6.03%				36.32%	1.45%	0.26%				0.71%	0.01%	38.75%
9409B:C10571	ASPH	010		2.70%				7.96%								1.21%				1.21%
9409B:C92049-CO	ASPH	003	1.24%	2.21%		18.81%		7.47%		4.51%	0.47%	0.45%	0.60%	1.23%		0.84%		0.47%	0.05%	4.11%
9409B:C93337R	GEN	010		6.37%				11.31%		0.41%	2.58%		0.85%	7.07%		1.52%	7.20%	0.33%		19.55%
9409C:C10734	PVMK	017						4.16%								94.47%				94.47%
9409C:C93151	GEN	003	1.46%	0.98%		34.52%		3.68%			0.76%	2.23%	1.37%	0.02%		0.12%		0.03%	0.06%	4.59%
9409C:C93223	GEN	012		2.80%		17.90%		5.37%		1.57%	0.94%	3.84%	1.74%	4.96%		0.67%	1.05%	1.71%	5.62%	20.53%
9409D:C90025	REST	014		0.22%		0.39%		2.09%		1.55%	0.32%		14.04%	4.19%		0.49%		2.80%	0.15%	21.89%
9409E:C10044S-C	SGNL	005		4.87%		0.61%		11.63%		0.46%		0.42%		9.02%		3.59%	24.46%	0.75%		38.24%
9410A:C10482R	?	005	0.03%	2.81%				6.14%				33.50%	1.71%	0.25%				0.64%	0.05%	36.15%
9410A:C10897	SGNL	008		1.62%				11.81%						21.61%			48.32%			69.93%
9410A:C93277	ASPH	020		0.98%		0.08%		5.28%			0.12%	3.85%	1.09%			1.74%		0.31%	0.35%	7.26%
9410B:C10054	ASPH	005		4.31%		0.36%		16.68%		1.10%			2.08%	2.99%		4.58%	6.03%	0.73%	1.60%	17.89%
9410B:C10208R	ASPH	020		16.26%				12.33%												0.00%
9410B:C10524	ASPH	021						2.96%								2.27%				2.27%
9410B:C10649-CO	ASPH	021						2.31%								0.72%				0.72%
9410C:C10245	PVMK	005		0.14%												99.72%				99.72%
9410C:C93271	GEN	013	0.77%	3.36%		21.17%		6.02%		0.18%	4.67%	3.04%	1.04%	3.57%		0.61%	0.40%	1.81%	6.36%	21.50%
9411A:C92034	CONR	011	0.12%	1.82%		11.54%		4.10%		2.68%	0.70%	3.13%	0.21%	4.15%		0.46%	2.18%	1.28%	0.10%	12.21%
9411B:C10476	GEN	019		5.20%		0.98%		7.57%			8.19%		14.66%					0.68%		23.43%
9411C:C10044T-C	GEN	005		5.79%		0.78%		12.88%		0.54%		0.46%		5.95%		4.80%	18.83%	0.97%		31.03%
9411C:C10161	ASPH	012		5.10%				1.97%					5.68%							5.68%
9411C:C10222	ASPH	020		0.71%				3.69%								1.60%			0.87%	2.57%
9411C:C10792	GEN	011		0.45%		20.09%		6.13%	0.28%	0.02%	4.43%	2.44%	5.02%	1.23%		0.60%	2.00%	0.46%	10.14%	26.32%
9411D:C10105	GEN	008		7.40%		1.88%		6.13%		1.08%	0.21%		0.52%	1.11%		1.13%	3.01%	0.64%	0.51%	7.13%
9412A:C10106	GEN	008	1.10%	1.14%		21.82%		10.77%		0.06%	0.87%		0.24%	2.64%		1.71%	4.27%	1.41%	0.06%	11.20%
9412A:C10699	SGNL	008		0.82%				13.48%						9.02%			72.50%			81.52%
9412A:C93029	STRC	003	2.36%	1.57%		36.04%		9.63%		0.21%	0.12%	4.97%	1.08%			0.75%		0.25%	7.81%	14.76%
9412A:C93120	GEN	010	1.88%	1.06%		7.97%		5.68%			3.23%	3.18%	1.46%			0.33%		0.69%	1.53%	10.42%
9412B:C92043	GEN	003	1.44%	1.17%		24.31%		15.52%			0.88%	0.58%	1.93%	0.05%		0.11%		0.15%		3.86%
9412C:C10409	STRC	018		6.37%		33.02%		8.85%			2.78%	4.18%	0.08%					0.41%		7.43%
9412C:C10556	ASPH	010		1.19%		2.05%		9.30%			0.00%	2.79%	1.11%			0.40%		0.35%	0.00%	4.65%
9412C:C10635	STRC	003	9.98%	0.10%		26.15%		28.09%			0.34%	2.16%	0.60%			0.93%		0.01%	0.71%	4.75%
9501A:C10436	ASPH	005		4.51%				8.97%		0.17%			0.27%	2.58%		4.38%	14.75%	0.07%		22.03%
9501A:C10438	LTNG	005						17.74%						60.19%						60.19%
9501A:C10515	ASPH	020		0.25%				3.04%								1.39%		0.57%	0.10%	2.08%
9501A:C90025R	REST	014		0.22%		0.51%		2.53%		1.40%	0.26%		16.20%	5.66%		0.38%		3.44%	0.07%	26.21%
9501A:C92992-CO	STRC	013		0.15%		26.84%		1.54%		1.01%	0.41%	2.67%	2.60%	5.90%		0.33%	0.74%	1.26%	0.27%	14.18%
9501B:C10178	GEN	011	0.89%	2.34%		27.17%		6.17%		2.78%	0.81%	2.03%	2.50%	2.69%		1.98%		0.40%	1.89%	12.40%
9501B:C10370	GEN	010		0.62%		0.20%		7.43%			2.08%	4.01%	1.04%			0.16%		0.17%	1.62%	9.08%
9501B:C10403	STRC	003	2.97%	0.12%		54.95%		1.27%			0.12%		1.24%	1.08%		1.27%		0.07%	0.82%	4.60%
9501B:C10874	ASPH	022		0.51%				27.20%								12.36%				12.36%

CDOT Contracts (1/1990-8/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9501C:C10390	GEN	010	$198,099.75	0.07%	0.07%	12.85%		6.58%		0.45%		2.90%	8.85%	17.16%	2.62%	7.05%				
9501C:C10400	GEN	018	$109,085.57			3.40%	5.94%	27.75%	3.30%	1.65%		6.18%	12.02%	3.67%	5.04%	0.28%				0.14%
9501C:C10401-CO	SPEC	018	$237,518.55	22.94%				1.77%	2.55%			1.82%	8.98%	13.96%		0.42%				0.45%
9501C:C10418-CO	STRC	003	$497,437.20		0.21%	11.89%		0.24%				0.57%	5.57%	6.03%		1.01%				0.04%
9501C:C10725	GEN	018	$208,841.00	0.34%		8.20%	10.67%	25.47%		0.09%		8.43%	7.51%	5.84%	3.00%	0.76%			0.16%	
9501C:C80026	ASPH	012	$1,230,883.25	0.29%	0.30%	30.54%		0.36%				1.42%	9.22%	7.88%	1.27%	0.19%				
9501C:C91020	STRC	002	$3,255,646.00	2.74%		0.45%		0.18%	0.05%	4.10%		0.08%	1.18%	5.30%	1.07%	3.11%				
9501D:C10105R	GEN	008	$2,323,103.55	0.58%	0.13%	11.52%		7.34%		12.85%		26.62%	3.55%	4.30%	5.90%	4.26%				0.29%
9501D:C10187	OLS	014	$687,403.00					0.74%				0.36%		6.54%	82.38%	0.85%			1.52%	
9502A:C85013	STRC	008	$1,071,201.70	3.85%	0.19%	4.18%	0.10%	0.21%				1.79%	5.07%	7.73%	2.15%	1.49%				2.40%
9502B:C10185	GEN	011	$8,965,406.58	0.77%		2.52%	0.74%	4.06%		20.48%		4.93%	16.36%	2.01%	1.82%	0.93%				1.18%
9502C:C10767	SPEC	018	$1,163,610.00	0.12%		0.86%		5.59%				4.76%	12.75%	6.53%	2.75%	0.30%				0.06%
9503A:C10227	STRC	003	$1,955,101.45	3.51%	0.40%	12.90%	2.36%	0.02%				0.68%	7.30%	5.36%	3.26%	1.77%				2.47%
9503A:C92915	GEN	012	$4,456,597.97	0.41%	0.10%	7.60%	1.39%	0.78%	0.03%	13.22%		16.19%	7.37%	9.65%	1.68%	1.32%				0.09%
9503A:C93089	GEN	012	$1,510,684.03	0.64%	0.53%	23.40%		6.77%	0.27%	22.42%		13.35%	3.71%	3.13%	2.58%	4.79%				0.10%
9503B:C10088	ASPH	021	$1,382,366.31			68.13%	0.24%			10.28%		0.83%	0.48%	3.81%	0.33%	0.85%				
9503B:C10378	ASPH	017	$243,117.00		0.15%	26.49%	3.55%			16.07%		0.28%	7.58%	9.87%	4.03%	0.99%				
9503C:C10678	ASPH	020	$1,491,989.48		0.82%	47.27%				0.50%		0.99%	11.31%	3.02%		0.69%				
9503C:C92019	CONR	012	$7,492,865.28	0.74%		2.22%			0.06%	50.23%		1.28%	8.58%	3.77%	3.79%	0.42%				
9503D:C10187R	OLS	014	$813,699.77					0.27%				0.16%		0.86%	87.36%	0.22%			1.77%	
9503D:C10636	GEN	002	$334,975.80			0.54%								9.85%	11.94%	0.30%				
9503D:C93109	GEN	010	$2,218,108.40	2.78%	0.80%	28.23%	9.09%	0.02%				2.84%	19.21%	5.95%	2.71%	0.80%				0.13%
9504A:C10553	ASPH	020	$1,141,775.40		0.53%	83.16%	3.32%					0.09%	0.56%	3.07%		0.86%				
9504B:C10146	STRC	013	$3,346,792.04	3.07%	0.10%	3.91%	0.99%	0.52%				5.38%	7.17%	5.65%	8.93%	1.03%				3.03%
9504B:C10225	ASPH	008	$1,473,058.10	0.55%	1.03%	42.10%	9.28%					2.57%	15.37%	8.96%	2.67%	1.06%				0.34%
9504B:C10580	GEN	008	$2,117,787.00	1.48%	0.11%	4.30%		1.68%		7.12%		2.12%	2.21%	11.30%	2.86%	0.59%				1.53%
9504B:C10984	ASPH	021	$1,329,085.93		0.82%	60.97%	3.08%						0.24%	5.41%	0.11%	0.83%		22.45%		
9504B:C93210	STRC	003	$1,118,034.50	6.19%	0.32%	11.46%	2.90%	0.18%				2.03%	13.73%	9.75%	4.02%	0.89%				1.47%
9504C:C10679	ASPH	020	$2,298,723.52		0.18%	39.90%	0.27%	0.17%				0.60%	1.76%	5.44%	0.39%	1.07%		5.77%		
9504C:C10897	LTNG	005	$59,527.00											4.20%						
9504D:C10687	ASPH	021	$1,385,420.50		0.35%	34.97%		1.62%		1.21%		11.89%		6.35%	0.54%	0.72%				
9504D:C10722	SPEC	005	$87,642.00		0.30%	13.01%								2.17%	2.85%					
9504D:C10870	GEN	005	$1,046,183.48		0.27%	14.72%		5.48%	0.02%			1.87%	9.35%	9.32%	9.48%	3.30%				0.05%
9505A:C10228	ASPH	020	$4,255,549.75	0.11%	0.73%	65.73%	3.60%					1.10%	9.71%	2.21%	0.15%	0.46%		9.96%		
9505A:C10555	ASPH	021	$1,062,601.15		0.66%	79.55%	6.48%						1.05%	2.35%		0.52%				
9505A:C10772	ASPH	020	$2,026,866.53		0.50%	57.23%	1.75%	0.07%				0.13%	0.35%	4.24%		0.59%		0.45%		
9505B:C10225R	ASPH	008	$1,456,134.80	0.55%	1.04%	42.30%	9.32%					2.58%	15.44%	9.00%	2.97%	1.06%				0.32%
9505B:C10596	SPEC	005	$38,474.00											17.24%	1.56%					
9505B:C10738	FNC	015	$2,382,929.36	0.01%		0.55%	0.39%	0.11%				0.33%	10.70%	4.20%	2.48%	1.51%				
9505B:C10773	ASPH	021	$1,883,585.98		0.25%	83.19%							1.07%	4.79%		0.85%				
9505B:C10779	PVMK	005	$125,276.00											0.80%	3.99%					
9505B:C10812	ASPH	021	$429,330.10		0.47%	39.56%		1.33%				1.16%		7.92%						
9505B:C10826	GDRL	005	$135,116.80										7.85%	6.66%						
9505B:C10833	PVMK	005	$169,302.00											5.91%						
9505B:C10957	ASPH	021	$1,439,178.75		0.74%	60.42%						0.33%	3.41%	6.95%		0.76%				
9505C:C10654	ASPH	021	$1,183,995.98		1.10%	80.75%								5.15%		0.38%				
9505C:C10867	ASPH	021	$870,055.60		1.15%	78.96%	3.34%						0.34%	4.86%		0.59%				
9505C:C10868	SURF	021	$354,056.66		52.92%									1.41%		0.08%				
9505C:C10943	ASPH	020	$2,914,373.43		1.03%	58.02%							1.10%	3.62%	0.07%	0.41%		14.72%		
9505C:C10983	ASPH	022	$1,699,073.40		1.07%	78.08%							1.90%	2.88%		1.80%				
9505C:C11004	SURF	021	$370,588.23		35.97%									8.80%	1.89%	0.08%				

CDOT Contracts (1/1990-8/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification												Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9501C:C10390	GEN	010		7.43%		0.61%		12.60%		1.13%	0.24%		3.21%	4.36%		2.02%	3.54%	0.48%	5.77%	19.62%
9501C:C10400	GEN	018		3.74%		19.23%		4.78%		0.08%	2.18%		1.64%					1.09%		4.81%
9501C:C10401-CO	SPEC	018		0.83%		3.79%		0.57%			0.43%	0.67%	2.89%						39.75%	43.84%
9501C:C10418-CO	STRC	003	1.71%	1.68%		65.00%		1.35%			0.95%	3.22%	0.64%							4.71%
9501C:C10725	GEN	018		0.80%		26.59%		0.48%			0.15%		0.15%	0.71%				0.68%		1.67%
9501C:C90026	ASPH	012	0.78%	2.80%		8.45%		3.13%				9.23%	2.26%	6.10%		1.89%		13.82%		33.40%
9501C:C91020	STRC	002	9.77%	0.98%		57.41%		9.78%			0.22%	1.91%	0.36%			1.06%		0.06%	0.19%	3.80%
9501D:C10105R	GEN	008		7.05%		1.32%		4.56%		0.93%	0.46%		1.19%	1.19%		1.34%	3.51%	0.54%	0.58%	8.81%
9501D:C10187	OLS	014								0.47%			2.36%	2.87%				0.03%	1.88%	7.15%
9502A:C86013	STRC	008		0.85%		44.37%		8.43%			0.09%	7.36%	0.50%	0.63%		0.14%		2.22%	6.16%	17.10%
9502B:C10185	GEN	011		0.34%		10.18%		1.80%		0.46%	15.40%	1.51%	1.32%	0.71%		0.65%	1.65%	0.45%	9.83%	31.42%
9502C:C10787	SPEC	018		0.91%		2.88%		10.08%			0.09%	1.93%	24.35%			0.36%		0.05%	25.84%	52.42%
9503A:C10227	STRC	003	5.16%	1.79%		21.34%		27.17%			0.77%	0.55%	2.82%			0.09%		0.02%	0.29%	4.54%
9503A:C92915	GEN	012		1.87%		11.04%		4.80%		0.22%	0.99%	0.49%	2.12%	0.85%		0.18%		0.87%	16.94%	22.24%
9503A:C93089	GEN	012		5.07%				4.85%		0.56%		0.58%	0.55%	3.97%				1.54%	0.22%	6.86%
9503B:C10088	ASPH	021		2.19%				4.59%		0.06%	0.14%	2.82%		1.05%		2.57%	1.84%			8.42%
9503B:C10378	ASPH	017		9.24%		2.19%		7.75%				0.39%	0.02%	3.44%		0.27%	3.04%	3.48%	1.16%	11.80%
9503C:C10878	ASPH	020		9.57%				11.44%				8.72%	0.24%	0.12%		4.42%	0.80%	0.09%		14.39%
9503C:C92019	CONR	012	1.09%	2.36%		12.16%		6.46%			0.15%	1.64%	0.93%	2.09%		0.62%		1.52%	0.01%	6.86%
9503D:C10187R	OLS	014								0.20%			2.74%	5.66%				0.06%	0.69%	9.15%
9503D:C10636	GEN	002		7.21%		14.07%		32.18%				22.05%				1.17%		0.68%		23.91%
9503D:C93109	GEN	010	0.90%	1.25%		13.92%		5.64%			0.93%	1.52%	2.19%	0.10%		0.39%		0.40%	0.23%	5.76%
9504A:C10553	ASPH	020		2.81%				4.01%				0.74%				1.06%				1.80%
9504B:C10148	STRC	013		0.09%		57.34%		0.45%		1.36%	0.30%	0.20%	0.66%	2.03%		0.07%		0.04%	0.05%	3.35%
9504B:C10225	ASPH	008		0.68%		0.98%		7.17%		1.02%	2.79%		1.44%	0.54%		0.45%	0.14%	0.33%	0.35%	6.04%
9504B:C10680	GEN	008	0.29%	4.43%		24.68%		18.87%		0.10%	0.39%	5.07%	0.59%	2.45%		0.91%	4.37%	2.28%	0.07%	16.13%
9504B:C10984	ASPH	021		0.23%				4.81%						0.08%		0.56%	0.23%	0.16%		1.03%
9504B:C93210	STRC	003	1.78%	0.37%		33.64%		5.76%			0.31%	3.49%	1.31%			0.27%		0.12%		5.50%
9504C:C10879	ASPH	020	0.10%	7.25%		0.90%		13.35%			0.47%	17.20%	0.01%	0.12%		2.99%	0.53%	1.48%	0.03%	22.83%
9504C:C10897	LTNG	005		1.41%				10.50%						46.15%		0.27%	35.87%	1.60%		83.89%
9504D:C10687	ASPH	021		22.00%				10.08%		1.06%				0.01%		6.00%	1.17%		2.01%	9.19%
9504D:C10722	SPEC	005		0.68%				27.18%						20.55%		5.80%	27.45%			53.80%
9504D:C10870	GEN	005	0.98%	3.37%		12.78%		14.67%				3.68%	0.49%	1.57%	3.39%	1.24%	3.23%	1.32%		14.92%
9505A:C10228	ASPH	020		0.30%				3.23%		0.01%	0.20%		1.05%			0.95%		0.15%	0.35%	2.70%
9505A:C10555	ASPH	021		1.76%				4.22%				1.49%				1.92%				3.41%
9505A:C10772	ASPH	020		8.48%				4.34%		9.77%		6.35%				1.89%	0.04%	0.05%	3.87%	12.10%
9505B:C10225R	ASPH	008		0.88%		0.93%		7.20%		1.02%	1.60%		1.49%	0.82%		0.45%	0.14%	0.34%	0.35%	5.39%
9505B:C10596	SPEC	005		0.39%				38.86%						17.00%			20.79%	4.16%		41.95%
9505B:C10738	FNC	015	0.06%	0.35%		21.02%		5.09%			50.11%	1.03%	0.83%	0.17%		0.12%		1.15%		53.21%
9505B:C10773	ASPH	021						3.51%				14.47%		0.34%		3.29%		0.05%	8.18%	26.34%
9505B:C10779	PVMK	005						5.03%								90.18%				90.18%
9505B:C10812	ASPH	021		19.81%		14.30%		5.86%			2.31%	2.72%				4.14%	0.21%	0.20%		9.58%
9505B:C10828	GDRL	005		0.26%				12.46%				72.75%								72.75%
9505B:C10833	PVMK	005						17.41%								78.68%				78.68%
9505B:C10957	ASPH	021		3.61%				7.06%		0.08%		13.92%	0.06%			2.66%				16.64%
9505C:C10654	ASPH	021		24.89%				3.73%				1.11%				2.37%	0.52%			4.00%
9505C:C10887	ASPH	021		0.33%				2.81%				5.28%				1.53%				6.81%
9505C:C10888	SURF	021					36.25%	4.69%								2.84%				2.84%
9505C:C10943	ASPH	020	0.92%	5.84%		1.28%		5.37%				3.81%				1.65%		0.56%	1.60%	7.62%
9505C:C10963	ASPH	022		0.39%				3.28%				5.17%				2.98%		0.07%	2.98%	10.60%
9505C:C11004	SURF	021					33.90%	7.10%								10.28%		2.19%		12.47%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9505D:C10329R	LSCP	017	$345,936.00			10.66%		0.76%					2.06%	3.58%		1.10%				
9505D:C10510	ASPH	020	$3,039,566.70			75.77%	2.33%	0.20%				0.13%	0.15%	3.30%	0.43%	0.63%				
9505D:C10682	ASPH	021	$791,513.55		0.99%	48.01%		1.41%				2.56%	0.57%	1.07%	0.51%	0.28%				
9505D:C10875	ASPH	005	$97,386.90		0.37%	36.43%		1.33%				2.85%	10.33%	8.93%	4.11%					
9505D:C10907	SGNL	009	$189,987.60										3.68%	3.16%						
9505D:C10941	ASPH	020	$936,341.13		0.64%	45.59%		1.43%				2.01%	1.64%	9.72%	0.32%	0.38%				
9505D:C91428	GEN	003	$576,434.42	2.65%	1.00%	9.89%	0.50%	6.16%				4.63%	3.84%	9.85%	6.59%	2.32%				0.24%
9505D:C92044	STRC	003	$1,122,323.10	0.81%	0.90%	8.96%						1.89%	11.15%	4.46%	1.43%	1.26%				
9505D:C93008	ASPH	021	$987,629.65			48.97%	0.80%	0.25%	0.10%	17.97%		1.16%	0.49%	7.75%	1.03%	0.52%				
9506A:C10946	ASPH	021	$947,988.00			81.55%							3.26%	8.44%		0.32%				
9506A:C93262	ASPH	020	$1,486,436.20			71.00%	3.86%						1.17%	6.05%	0.34%	0.86%				
9506B:C10554	ASPH	021	$1,334,734.00			77.37%								4.12%		0.43%				
9506B:C10651	ASPH	021	$1,467,166.90		0.81%	55.93%							1.05%	12.00%		0.55%		16.12%		
9506B:C10772R	ASPH	020	$1,946,137.50		0.54%	57.86%	1.89%	0.08%				0.54%	0.38%	3.59%		0.46%		0.47%		
9506B:C10937	ASPH	021	$370,550.56		20.68%	57.24%	0.20%							2.58%		1.00%				
9506C:C10652	ASPH	021	$1,551,621.86		0.84%	56.17%		0.29%				0.62%	1.48%	4.23%		0.71%		13.34%		
9506C:C10654R	ASPH	021	$1,245,285.60		1.76%	56.11%								7.71%		0.47%				
9506C:C10780	PVMK	005	$94,551.00			2.91%								7.93%		0.85%				
9506C:C10911	ASPH	021	$350,855.00		2.26%	84.27%								0.21%		0.71%				
9506C:C10945	ASPH	021	$1,122,234.18			81.13%						0.16%	5.70%	6.51%		0.36%				
9506C:C10958	ASPH	021	$2,417,742.80	0.21%		40.47%	0.16%					0.05%	4.73%	9.80%		0.50%		20.85%		
9506D:C10364	CONR	004	$78,206.00			14.56%				55.34%			0.56%	6.39%		0.13%				
9506D:C10861	ASPH	001	$1,772,637.00			81.00%	4.14%						0.27%	9.82%	0.28%	0.24%				
9506D:C10964	ASPH	020	$958,192.50		0.45%	69.25%				0.78%		1.19%	6.47%	7.74%		0.72%				
9506D:C11124	ASPH	001	$2,141,788.00	0.08%	0.60%	52.00%		0.35%		0.02%		0.19%	0.09%	3.34%	0.36%					
9506D:C93008R	ASPH	021	$982,093.00			52.83%	0.91%	0.24%	0.13%	14.75%		1.30%	0.56%	9.67%	0.81%	0.36%				
9506E:C10791-AL	ASPH	011	$3,855,763.15	0.78%	0.42%	45.13%		3.96%				2.51%	12.91%	7.34%	4.42%	0.86%			0.01%	0.01%
9506E:C10912	ASPH	021	$588,554.50		0.59%	78.80%	2.43%							5.69%	0.59%	1.02%				
9506E:C10942	ASPH	020	$3,457,309.15	0.18%	0.54%	52.65%		0.03%				1.29%	1.47%	4.60%	1.65%	0.42%		14.76%		0.16%
9506E:C10947	ASPH	001	$1,239,811.00			79.29%							3.47%	13.31%		0.24%				
9506E:C90161	CONR	012	$1,091,153.50		0.13%	8.51%	1.61%	16.14%		21.04%		0.66%	0.55%	5.96%	3.21%	0.78%				
9506E:C91416	GEN	001	$1,618,338.21	1.46%	0.78%	29.66%	5.56%					2.30%	13.52%	6.67%	6.05%	1.51%				0.04%
9507A:C10326	CONR	011	$4,719,639.82	0.02%		7.75%	7.88%	3.10%		46.38%		3.59%	6.52%	5.09%	3.33%	0.58%				1.00%
9507A:C10386	GEN	004	$57,717.00							14.77%		10.17%	5.20%	17.33%	3.12%	22.87%	2.18%			
9507A:C10583	ERTH	017	$497,655.00			0.88%	10.34%	8.71%				4.46%	20.39%	9.24%	26.62%					5.96%
9507A:C10653	ASPH	021	$1,027,587.21		0.76%	56.77%		0.28%				1.25%		7.51%		1.07%				
9507A:C10788	ASPH	020	$2,850,113.80		0.57%	38.38%		0.57%				1.15%	4.81%	5.09%	1.73%	0.86%		0.88%		0.01%
9507A:C10776	SIGN	005	$73,300.00											13.64%						
9507A:C10911R	ASPH	021	$348,895.00		2.27%	84.75%								5.88%		0.21%				
9507A:C10944	ASPH	021	$1,914,310.07			83.01%						0.14%	2.57%	4.02%		0.26%				
9507A:C10959	ASPH	021	$800,637.00		0.28%	71.34%							1.16%	1.37%	0.82%	0.25%				
9507A:C10961	ASPH	022	$822,251.60		1.07%	84.33%								4.98%						
9507A:C92317-CO	ASPH	008	$886,733.10			28.51%	6.74%	6.19%	0.60%	12.54%		3.45%	9.39%	7.73%	7.38%	0.97%				
9507B:C10162	STRC	003	$247,842.48	2.20%	0.12%	5.67%	7.42%	1.54%	0.52%			4.51%	9.98%	6.91%	3.83%	1.25%				1.80%
9507B:C10595	ASPH	021	$411,574.90			84.72%							0.51%	3.64%	0.92%	0.85%				
9507B:C10665	ASPH	021	$558,547.00			56.28%								9.85%	0.72%					
9507B:C10960	ASPH	001	$698,815.84			100.00%														
9507B:C10964R	ASPH	020	$914,494.00		0.93%	70.26%				1.04%		0.82%	2.98%	6.89%		1.51%				
9507B:C92993	CONR	012	$4,586,267.20			2.11%			0.03%	60.53%		1.72%	15.96%	4.01%	2.29%	1.18%				
9507B:C93305	SGNL	005	$108,205.00					4.16%						5.36%	2.13%					
9507C:C10744	GEN	008	$1,590,118.50	0.92%	0.09%	12.25%		6.87%	0.33%	1.10%		18.04%	6.14%	7.04%	5.09%	1.95%			0.42%	

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9505D:C10329R	LSCP	017		0.84%				12.70%		29.33%			38.94%							38.94%
9505D:C10510	ASPH	020		5.26%				4.88%				3.41%				3.38%		0.14%		6.93%
9505D:C10682	ASPH	021		14.46%		1.25%		15.42%		0.40%	0.38%	2.22%	0.09%	0.40%		4.77%	4.89%	0.14%	0.18%	13.07%
9505D:C10875	ASPH	005		2.52%		1.39%		18.56%					0.26%	2.42%		4.84%	4.22%	1.43%		13.17%
9505D:C10907	SGNL	009		0.08%				17.91%						13.00%		2.38%	56.30%	3.49%		75.17%
9505D:C10941	ASPH	020	0.59%	18.96%		0.16%		10.76%		1.34%			0.26%	0.47%		2.54%	3.00%	0.20%		6.47%
9505D:C91428	GEN	003	3.94%	3.39%		12.62%		28.67%		0.54%	1.48%	2.69%	2.46%	0.19%		0.78%		0.13%	0.30%	8.17%
9505D:C92044	STRC	003	1.43%	1.01%		22.63%		40.40%			1.38%	0.25%	1.55%			0.20%		0.29%	0.03%	3.70%
9505D:C93008	ASPH	021		3.70%		2.64%		7.55%						1.99%		2.52%	2.43%	0.14%		7.08%
9506A:C10946	ASPH	021		3.28%				1.74%								1.42%				1.42%
9506A:C93262	ASPH	020	0.14%	3.21%		0.94%		4.96%				3.39%				1.55%		2.50%		7.44%
9506B:C10554	ASPH	021		0.81%				2.57%		0.06%		12.51%				2.04%				14.55%
9506B:C10661	ASPH	021	0.07%	6.03%		0.73%		3.14%				1.76%	0.38%			1.44%		0.02%		3.57%
9506B:C10772R	ASPH	020		9.02%				4.82%		8.32%		6.03%				1.76%	0.08%	0.06%	4.13%	12.04%
9506B:C10937	ASPH	021					9.67%	5.44%								3.20%				3.20%
9506C:C10652	ASPH	021		4.08%				7.98%				4.67%	0.71%			4.17%	0.50%	0.21%		10.26%
9506C:C10654R	ASPH	021		25.61%				3.89%				1.28%				2.44%	0.72%			4.44%
9506C:C10780	PVMK	005						18.92%				27.33%				42.06%				69.39%
9506C:C10911	ASPH	021						12.54%												0.00%
9506C:C10945	ASPH	021		2.27%				2.34%								1.53%				1.53%
9506C:C10958	ASPH	021	0.15%	0.60%		1.14%		6.12%				11.86%	1.08%			1.39%		0.76%	0.12%	15.21%
9506D:C10384	CONR	004		9.67%			6.62%	5.15%								1.38%				1.38%
9506D:C10861	ASPH	001		0.60%				2.11%								1.27%		0.26%		1.53%
9506D:C10964	ASPH	020		0.53%				2.86%				6.98%				2.65%		0.16%		9.89%
9506D:C11124	ASPH	001		25.44%				6.24%		0.12%						5.22%	1.91%		4.05%	11.18%
9506D:C93008R	ASPH	021		3.59%		2.20%		6.55%						1.85%		2.22%	1.82%	0.19%		6.08%
9506E:C10791-AL	ASPH	011		2.88%		2.28%		5.45%			0.28%	1.55%	1.37%	1.72%		1.68%	3.10%	1.28%	0.04%	11.02%
9506E:C10912	ASPH	021		0.73%				6.18%				1.69%				2.27%				3.96%
9506E:C10942	ASPH	020	0.16%	2.98%	0.15%	7.01%		4.06%				4.76%	0.83%			2.17%	0.04%	0.09%		7.89%
9506E:C10947	ASPH	001		0.76%				1.61%								1.31%				1.31%
9506E:C90161	CONR	012		9.21%		0.16%		12.60%		1.58%				7.52%		1.62%	7.69%	0.61%	0.28%	17.87%
9506E:C91418	GEN	001	0.93%	2.37%		15.50%		9.87%			1.86%	0.44%	0.62%			0.23%		0.27%	0.39%	3.81%
9507A:C10326	CONR	011		0.97%		1.73%		4.26%		0.44%	0.84%	0.25%	0.43%	0.69%		0.94%	3.37%	0.93%	0.12%	7.37%
9507A:C10386	GEN	004		0.69%		13.60%		6.43%			3.64%									3.64%
9507A:C10583	ERTH	017				0.56%		2.61%			0.21%		5.08%						4.94%	10.21%
9507A:C10653	ASPH	021		14.56%				3.27%		1.28%		10.84%				1.98%	0.44%			13.26%
9507A:C10768	ASPH	020		3.87%				12.13%			0.01%	22.31%	2.23%			1.80%		0.53%	3.28%	29.96%
9507A:C10778	SIGN	005																86.36%		86.36%
9507A:C10911R	ASPH	021						6.89%												0.00%
9507A:C10944	ASPH	021		2.93%				4.68%					0.13%			2.25%				2.38%
9507A:C10959	ASPH	021	0.97%	2.15%		1.68%		5.38%				5.44%				0.66%		0.05%	8.63%	14.76%
9507A:C10961	ASPH	022						7.33%								2.29%				2.29%
9507A:C92317-CO	ASPH	008		3.48%				8.05%			0.34%		0.59%			1.94%		1.35%	0.75%	4.97%
9507B:C10152	STRC	003	3.07%			42.92%					2.71%	3.44%	2.01%						0.10%	8.26%
9507B:C10595	ASPH	021		1.66%														7.49%	0.18%	7.67%
9507B:C10865	ASPH	021		21.80%				5.00%								4.51%	1.67%	0.18%		6.36%
9507B:C10960	ASPH	001																		0.00%
9507B:C10964R	ASPH	020		0.99%				3.74%				7.56%				3.01%		0.26%		10.83%
9507B:C92993	CONR	012	0.11%	0.37%		1.27%		7.00%			0.76%		1.59%			0.86%		0.17%	0.05%	3.43%
9507B:C93305	SGNL	005		1.85%				19.86%						6.62%			60.03%			66.65%
9507C:C10744	GEN	008		6.67%		9.15%		7.33%		4.09%	0.22%		1.61%	2.49%		1.05%	7.86%	0.22%	0.19%	13.64%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9507C:C10857	ASPH	020	$1,487,567.30			71.95%	2.55%						0.77%	4.03%	0.44%	0.50%				
9507D:C10597	ASPH	021	$384,373.50			85.61%							0.49%	5.20%	1.00%	1.30%				
9507D:C10915	SGNL	005	$626,755.67					0.60%					0.19%	4.38%	3.38%	0.13%				
9508A:C10304	STRC	012	$2,910,344.70	1.96%	0.13%	10.81%		2.56%				2.75%	7.13%	2.75%	1.87%	1.20%				0.88%
9508A:C10788R	ASPH	020	$2,937,836.60		0.44%	46.45%		0.56%				1.09%	4.07%	7.62%	1.60%	0.84%				0.04%
9508A:C10776R	SIGN	005	$69,837.00											8.14%						
9508A:C10872	PVMK	017	$275,953.00											0.36%						
9508A:C10913	ASPH	010	$231,579.85		1.25%	84.70%	3.73%						4.49%	4.32%						
9508A:C10962	ASPH	021	$572,017.00		1.27%	83.04%								6.29%						
9508A:C93172	CGS	018	$57,345.76					100.00%						0.00%						
9508B:C10932	ASPH	020	$224,780.00			65.02%	13.31%					1.67%								
9508B:C11003	ASPH	011	$298,539.30		0.69%	48.93%						7.95%	15.29%	5.19%	5.96%	0.47%				
9508B:C90111	STRC	003	$3,409,099.62	2.48%		4.84%	0.31%	0.04%				0.81%	12.01%	9.97%	2.82%	1.56%				8.51%
9508B:C90448	STRC	011	$8,381,114.90	1.12%	0.16%	14.16%	2.48%	3.65%		0.65%		7.20%	4.25%	1.19%	5.93%	2.10%				1.58%
9508B:C92317R-C	GEN	008	$590,466.25			21.30%	7.20%	6.68%	0.88%	15.69%		4.12%	6.26%	9.15%	4.57%	1.07%				
9508C:C10306	ASPH	012	$1,222,221.92	0.66%	0.33%	32.17%		1.19%				1.02%	9.34%	8.84%	6.44%	2.05%				
9508C:C10823	GDRL	005	$135,580.69											25.08%						
9508C:C10856	ASPH	020	$3,207,256.55			83.22%	6.31%						0.12%	4.21%	0.16%	0.24%				
9508C:C10865R	ASPH	021	$523,456.00			58.38%								7.12%	0.76%					
9508C:C11080	SURF	004	$304,516.96		43.92%		0.29%							12.87%		1.41%				
9508D:C10809	STRC	018	$534,968.00			3.18%						0.49%		2.43%	0.19%	0.47%				
9508D:C90168	CONR	012	$14,873,048.40	0.07%	0.01%	1.19%		0.00%	0.01%	67.10%		0.93%	5.36%	3.97%	3.00%	0.19%				0.03%
9508E:C10384R	CONR	004	$67,669.00			12.44%				49.33%			1.18%	10.34%		5.78%				
9508E:C10386R	GEN	004	$46,220.00							21.48%			4.33%	25.96%		26.56%				
9509A:C11178	PVMK	017	$222,837.25											3.81%	16.83%					
9509B:C10878	DRNG	017	$2,923,139.01	1.03%	0.04%	3.98%		0.18%		0.69%		54.51%	9.50%	2.45%	6.15%	2.52%				0.32%
9509B:C11045	FNC	017	$74,081.00											10.80%						
9509C:C10466	TUNL	017	$418,370.00										14.18%	5.35%		0.98%				
9509C:C10932R	ASPH	020	$201,870.00			84.88%	13.27%					1.86%								
9508C:C11072	ASPH	017	$200,802.00			73.52%								13.99%		1.34%				
9510A:C10802	STRC	012	$9,778,185.09	2.65%	0.07%	8.43%	0.48%	0.26%	0.06%	8.26%		5.14%	5.71%	5.44%	9.30%	1.16%				0.09%
9510A:C11112	GEN	017	$219,304.00	4.47%		3.06%	1.94%					20.46%	11.19%	5.02%		1.80%				0.08%
9510A:C11140	ASPH	005	$3,598,991.65	0.01%	0.38%	32.82%	1.35%	0.17%				1.49%	7.61%	5.57%	0.78%	0.33%				0.04%
9510B:C10369	STRC	003	$428,199.37	1.34%	0.62%	3.88%	1.37%					0.68%	3.65%	5.72%	1.31%	9.77%				2.14%
9510B:C10713	GEN	018	$109,389.66	4.67%			1.59%		2.83%			18.88%	22.03%	7.31%	3.02%	0.16%				0.85%
9510B:C10714	GEN	019	$292,357.40	11.07%			1.44%	8.10%	3.25%			21.92%	8.81%	5.13%		0.10%				2.89%
9510B:C10930	OTHR	004	$146,539.38											2.73%		97.27%				
9510B:C10976	SIGN	005	$244,023.30											1.23%						
9510B:C11005	OLS	014	$155,604.88											1.05%	97.64%					
9510B:C92935	ASPH	005	$519,999.99			34.41%	7.09%			1.01%		7.07%	13.61%	6.61%	2.61%	1.27%				0.14%
9510C:C10901	SGNL	009	$303,266.00										1.07%	2.54%	3.63%					
9510C:C11115	STRC	005	$1,508,096.65			5.08%		1.11%					13.06%	3.65%						
9510C:C11173	LTNG	005	$322,804.00											4.08%	0.19%	1.71%				
9510C:C11178R	PVMK	018	$152,195.60											5.26%	16.43%					
9510D:C11112R	GEN	017	$192,840.00	5.08%			3.11%					23.65%	13.05%	6.48%		0.26%		2.50%		0.09%
9510D:C92098-CO	ASPH	005	$442,700.50	0.16%	0.74%	39.55%						8.41%	11.44%	9.04%	7.91%	1.92%				0.38%
9511A:C10385	GEN	012	$4,130,339.15	3.71%	0.37%	29.65%	16.75%					4.75%	16.24%	6.25%	2.42%	0.57%				0.11%
9511B:C10405	CGS	018	$254,423.75					97.45%						2.55%						
9511B:C10790	GEN	003	$685,505.72		1.09%	28.78%						0.19%	28.29%	5.84%	4.80%	1.87%				
9511B:C10908	REST	017	$119,950.00					0.88%						16.67%	3.25%				79.20%	
9511B:C10950	SGNL	008	$904,547.00										4.07%	2.10%	1.56%					

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9507C:C10857	ASPH	020	0.77%	2.31%		5.17%		4.83%				3.73%				2.04%		0.80%		6.57%
9507D:C10597	ASPH	021														4.72%		1.04%	0.64%	6.40%
9507D:C10915	SGNL	005		0.33%				15.84%			0.17%			10.64%			64.01%	0.35%		75.17%
9508A:C10304	STRC	012	1.03%	2.28%		42.58%		9.45%			1.49%	2.10%	0.37%	1.67%		0.93%	2.83%	3.01%	0.15%	12.55%
9508A:C10768R	ASPH	020		5.44%				9.09%			0.01%	15.42%	2.15%			1.72%		0.55%	3.10%	22.95%
9508A:C10776R	SIGN	005																91.86%		91.86%
9508A:C10872	PVMK	017						2.54%								97.10%				97.10%
9508A:C10913	ASPH	010														1.51%				1.51%
9508A:C10962	ASPH	021						6.42%								2.98%				2.98%
9508A:C93172	CGS	018																		0.00%
9508B:C10932	ASPH	020																		0.00%
9508B:C11003	ASPH	011		1.75%				4.89%				5.52%	0.72%			1.23%		1.22%		8.69%
9508B:C90111	STRC	003	1.01%	0.32%		47.52%		3.30%		2.22%	0.50%	0.68%	1.05%			0.04%		0.13%	0.07%	2.47%
9508B:C90448	STRC	011	1.01%	2.68%		22.92%		3.22%		1.88%	5.60%	0.73%	1.17%	1.48%		0.43%	1.64%	0.17%	12.71%	23.93%
9508B:C92317R-C	GEN	008		5.70%				11.55%			0.34%		0.33%			2.20%		1.99%	0.97%	5.83%
9508C:C10306	ASPH	012	2.05%	2.38%		15.11%		10.21%			1.55%	1.95%	0.72%	0.93%		1.09%	2.71%	1.12%	0.35%	10.42%
9508C:C10823	GDRL	005		3.43%								71.50%								71.50%
9508C:C10856	ASPH	020		0.41%				2.98%								1.85%		0.51%		2.36%
9508C:C10865R	ASPH	021		21.33%				5.63%								4.81%	1.78%	0.19%		8.78%
9508C:C11080	SURF	004					28.59%	7.52%								5.40%				5.40%
9508D:C10809	STRC	018	1.18%	7.86%	0.51%	67.09%		0.21%		1.72%				14.66%						14.66%
9508D:C90168	CONR	012	0.45%	1.80%		6.41%		6.65%			0.86%	0.86%	0.76%	0.27%		0.84%		0.23%	0.22%	4.04%
9508E:C10384R	CONR	004		13.48%				6.53%								0.93%				0.93%
9508E:C10386R	GEN	004				18.44%		3.26%												0.00%
9509A:C11178	PVMK	017														79.36%				79.36%
9509B:C10876	DRNG	017		0.82%		3.18%		3.87%	8.38%	2.28%	0.60%		0.40%	0.08%		0.10%			0.03%	1.21%
9509B:C11045	FNC	017		11.39%				0.27%			77.55%									77.55%
9509C:C10466	TUNL	017		0.59%				30.79%	26.13%							0.84%			21.14%	21.98%
9509C:C10932R	ASPH	020																		0.00%
9509C:C11072	ASPH	017						7.82%								3.32%				3.32%
9510A:C10802	STRC	012		2.87%	1.18%	25.82%		6.76%	0.08%	0.21%	0.78%	10.34%	0.58%	1.46%		0.32%	1.39%	1.84%	0.33%	17.04%
9510A:C11112	GEN	017		17.78%				32.93%					1.46%							1.46%
9510A:C11140	ASPH	005	19.17%	7.19%		0.80%		5.65%		0.59%	1.39%	3.86%	0.97%	4.48%		0.62%		4.80%		16.12%
9510B:C10369	STRC	003	4.02%	0.58%		50.08%		8.32%		0.23%	0.82%	1.51%	2.54%	0.66%		0.80%		0.18%		6.11%
9510B:C10713	GEN	018		1.64%				0.32%			9.48%		27.32%							36.80%
9510B:C10714	GEN	019				17.15%		0.16%		3.45%	2.36%		13.98%						0.18%	16.53%
9510B:C10930	OTHR	004																		0.00%
9510B:C10976	SIGN	005		3.26%				5.25%										90.27%		90.27%
9510B:C11005	OLS	014		0.15%				0.47%										0.69%		0.69%
9510B:C92935	ASPH	005		4.15%		0.74%		7.51%					1.33%	7.15%		4.29%		1.01%		13.78%
9510C:C10901	SGNL	009						10.68%						12.08%			69.58%	0.43%		82.09%
9510C:C11115	STRC	005	4.30%	3.02%		31.59%		7.66%				28.39%	1.37%	0.83%		0.17%				30.56%
9510C:C11178	LTNG	005						13.22%		0.26%				79.43%			1.11%			80.54%
9510C:C11178R	PVMK	018														78.32%				78.32%
9510D:C11112R	GEN	017		20.22%				25.54%												0.00%
9510D:C92096-CO	ASPH	005		4.54%				9.99%			2.16%		3.91%			0.84%		1.39%	0.24%	8.54%
9511A:C10395	GEN	012	0.44%	1.32%		4.36%		5.80%		0.03%	1.89%	2.71%	1.83%			0.31%		0.39%	0.29%	7.22%
9511B:C10405	CGS	018																		0.00%
9511B:C10790	GEN	003	0.88%	1.98%		14.77%		8.19%			1.26%		1.70%			0.38%		0.18%	0.03%	3.55%
9511D:C10908	REST	017																		0.00%
9511D:C10950	SGNL	008		0.26%				9.19%						17.98%			64.66%			82.82%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9511B:C10952	SGNL	008	$304,466.45										1.51%	2.99%	3.49%	0.20%				
9511C:C10217	DRNG	003	$193,679.72		0.48%	2.40%	1.95%					26.24%	9.25%	6.54%	7.90%	0.15%				0.17%
9511C:C10701R	GEN	005	$384,974.67	0.71%	0.72%	18.07%		7.04%				6.44%	1.42%	5.53%	4.22%	4.33%				0.17%
9511C:C10789	CGS	018	$296,090.00			6.14%	6.70%	25.57%		2.52%		4.08%	7.27%	6.31%	11.60%	1.32%				0.12%
9511C:C10892	STRC	018	$457,474.20	0.61%									0.46%	6.74%	2.23%	2.51%				
9511C:C11185	TUNL	022	$114,263.00											33.55%			4.12%			
9511C:C92904	STRC	003	$1,884,904.45	3.27%	0.07%	7.97%		0.16%				2.17%	13.20%	4.29%	0.86%	1.98%				
9511D:C10463	STRC	003	$7,718,384.82	0.32%	0.01%	0.29%			0.01%			0.06%	1.11%	9.98%	0.36%	0.54%				0.01%
9511D:C10931	OTHR	004	$249,753.50											6.43%		89.79%				
9511D:C10954	STRC	003	$254,091.24	5.08%	0.05%	4.08%	3.04%		0.13%			0.50%	1.84%	7.77%	18.62%	1.74%				5.84%
9512A:C11169	ASPH	011	$3,413,321.97	1.51%	0.44%	33.21%						3.67%	17.89%	8.79%	1.35%	0.72%				0.87%
9512A:C92917	GEN	011	$9,586,752.12	1.04%	0.01%	1.28%	1.33%	0.12%	0.01%	30.03%		4.18%	4.94%	4.83%	0.92%	0.82%				0.58%
9512B:C10588	PVMK	005	$716,673.15											0.42%						
9512C:C10908R	REST	017	$84,490.00					2.06%						9.07%	1.06%				87.81%	
9512C:C10950R	SGNL	008	$847,729.40										1.68%	2.01%	0.18%					
9512C:C92057	STRC	003	$1,281,735.46	3.68%	0.69%	5.89%	0.82%					0.37%	3.59%	1.82%	2.38%	1.32%				1.05%
9601A:C10487	STRC	018	$232,187.25	3.31%	0.02%	3.56%	1.27%	7.60%		0.21%		4.31%	9.35%	9.91%	3.23%	1.42%				0.23%
9601A:C10741	GEN	008	$211,110.00		0.63%	17.26%		7.84%		0.51%		17.29%	3.48%	10.96%	3.32%	1.52%				
9601A:C10934	GEN	011	$4,272,708.69	0.89%	0.62%	20.35%		0.37%				0.68%	30.44%	3.51%	1.31%	0.43%				1.11%
9601B:C10093	ASPH	020	$2,126,398.82			59.48%	1.18%	0.17%				0.40%	2.72%	5.93%	0.13%	0.49%				0.06%
9601B:C10391	GEN	011	$1,794,973.72	3.91%	0.07%	18.90%		9.41%	0.08%	10.22%		4.31%	7.22%	5.57%	4.32%	1.50%				0.01%
9601B:C11187	ERTH	013	$2,367,790.83	6.07%	0.20%	10.29%	18.57%		0.07%			6.00%	23.37%	3.31%	0.51%	0.24%				4.47%
9601B:C90098	CONR	011	$5,113,937.19	3.38%		0.35%	4.35%	0.11%		48.03%		7.76%	15.34%	3.91%	3.16%	0.22%	0.11%			0.47%
9601B:C92421	STRC	003	$1,799,333.00	1.64%		4.34%	0.32%	0.02%				1.81%	10.12%	10.80%	3.17%	1.60%				9.01%
9601C:C10436	ASPH	005	$733,546.15	0.18%	0.31%	33.81%		7.60%		0.23%		2.77%	2.10%	3.90%	3.78%	0.66%				
9601C:C10717	STRC	018	$312,913.10	4.45%			4.15%	24.71%				1.80%	6.04%	1.79%	0.61%					
9601C:C11117	SGNL	005	$271,045.00			3.29%								9.22%						
9602A:C10586	STRC	003	$295,567.70	2.73%	0.06%	7.20%		0.25%				0.17%	4.10%	5.06%	1.62%	0.10%				2.81%
9602A:C91052	ASPH	001	$533,867.21		0.78%	47.24%								1.97%	1.72%	0.68%		37.90%		
9602B:C10210	GEN	010	$1,805,004.55	0.06%	1.11%	34.49%	19.05%					0.66%	11.99%	6.40%	5.54%	1.41%				0.03%
9602B:C10858	ASPH	001	$2,185,780.14			43.28%	1.42%	0.03%		11.71%			0.97%	4.49%	0.35%	0.47%		15.51%		
9602C:C10918	CONR	004	$313,466.08	0.11%		9.63%	0.57%			37.70%		0.96%	7.42%	9.57%		1.28%				
9603A:C10216	GEN	003	$417,955.98	1.12%	0.59%	9.49%	7.62%					8.38%	21.79%	11.96%	4.43%	2.15%				
9603A:C10769	ASPH	001	$1,383,485.84	0.84%	1.24%	57.41%							4.16%	4.81%	1.11%	1.10%		15.48%		
9603A:C11073	ASPH	001	$853,189.00		0.78%	78.17%	1.50%					0.01%	0.23%	7.56%		0.85%				
9603A:C92303	GEN	011	$1,458,616.75			29.74%	6.41%	3.17%	1.44%	0.57%		12.17%	13.80%	6.17%	3.19%	1.47%				0.02%
9603B:C10483	GEN	005	$333,063.60			33.85%						4.06%	27.48%	9.89%	1.97%	2.04%				
9603B:C11061	ASPH	021	$280,907.60		18.56%	39.24%	0.27%							5.30%		0.79%				
9603B:C11318	ASPH	001	$1,185,455.30			93.26%								5.86%	0.14%	0.66%				
9603B:C11343	STRC	002	$163,411.55	0.54%		6.98%		2.22%					0.20%	7.96%	7.96%	3.32%				
9603C:C10996	ASPH	005	$3,538,892.30	0.41%	0.74%	26.86%	7.32%	1.78%				2.53%	11.10%	8.05%	3.53%	1.66%				0.82%
9603C:C11164	SIGN	017	$74,786.00											4.01%						
9603C:C11270	PVMK	017	$39,156.00											5.11%	2.55%					
9603C:C11365	ASPH	001	$2,473,215.50		0.32%	41.42%							0.63%	8.49%	0.40%			29.83%		
9603D:C10565	ERTH	005	$719,799.00			19.80%	0.88%					9.58%	30.01%	6.95%	8.34%	0.79%				
9603D:C11276	ERTH	010	$241,066.50	1.05%	0.17%	6.05%	39.86%					1.68%	24.21%	4.77%	9.54%	1.37%				
9603D:C92319	GEN	012	$2,140,220.07	0.11%	0.09%	14.00%		4.16%		22.12%		16.48%	3.90%	6.75%	1.17%	0.71%				0.75%
9604A:C10463R1	OLS	003	$5,123,456.78			0.18%			0.01%				0.98%	2.52%	90.82%	1.12%				0.00%
9604A:C10477	STRC	017	$999,577.43	1.88%		2.08%	4.89%	0.64%				0.94%	2.01%	6.21%	0.65%	0.16%				
9604A:C10918R	CONR	004	$230,950.40	1.63%		12.39%	0.94%			42.77%		1.30%	9.19%	8.66%	0.87%	1.43%				
9604A:C11004R	SURF	001	$819,673.10		37.15%									7.50%	1.68%	0.05%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9511B:C10952	SGNL	008		0.74%				20.42%						10.43%			60.23%			70.66%
9511C:C10217	DRNG	003	2.84%	1.88%				24.47%				8.22%	1.37%			1.00%		3.12%	0.02%	18.73%
9511C:C10701R	GEN	005		7.96%		1.78%		14.24%		1.56%			0.63%	5.35%		4.46%	14.50%	0.88%		25.82%
9511C:C10799	CGS	018		1.80%		2.85%		14.19%		0.73%	5.40%		0.19%			1.05%		0.10%	0.04%	6.76%
9511C:C10892	STRC	018		0.44%		63.39%		16.57%			0.04%	0.56%	0.05%	0.71%				1.67%	0.09%	3.06%
9511C:C11185	TUNL	022				8.96%		7.23%	48.14%											0.00%
9511C:C92804	STRC	003	1.00%	1.39%		46.48%		12.33%		0.16%	0.88%	1.81%	0.57%	0.72%		0.53%		0.14%	0.01%	4.67%
9511D:C10483	STRC	003		0.04%		81.92%		3.35%			0.36%	0.29%	0.10%	0.81%				0.01%	0.62%	1.99%
9511D:C10931	OTHR	004				9.78%														0.00%
9511D:C10954	STRC	003		0.68%		41.08%		2.38%			1.47%	4.27%	0.69%						1.07%	7.50%
9512A:C11189	ASPH	011	0.15%	1.26%		13.87%		5.68%		0.28%	0.01%	1.44%	2.33%	1.86%		1.83%	0.07%	0.95%	1.73%	10.32%
9512A:C92917	GEN	011	0.05%	1.48%		17.46%		6.49%			11.10%	7.23%	0.49%	3.25%		0.35%	0.19%	1.72%	0.11%	24.44%
9512B:C10588	PVMK	005		0.14%												99.44%				99.44%
9512C:C10908R	REST	017																		0.00%
9512C:C10950R	SGNL	008		0.54%				7.68%						29.88%			58.03%			87.91%
9512C:C92057	STRC	003	2.38%	0.64%		69.71%		3.47%			0.15%	0.92%	0.36%	0.36%		0.07%		0.04%	0.08%	1.98%
9601A:C10487	STRC	018		2.36%		35.25%		10.57%			2.22%	0.68%	0.48%	2.13%		1.60%		0.31%		7.40%
9601A:C10741	GEN	008		7.95%		0.41%		12.10%		0.07%	0.69%		0.17%	4.66%		3.44%	6.25%	0.92%	0.53%	16.66%
9601A:C10934	GEN	011	1.30%	2.53%		12.79%		8.55%	5.67%		0.18%	3.92%	1.34%			0.87%		0.28%	3.04%	9.43%
9601B:C10093	ASPH	020		11.51%				4.53%				9.98%				3.16%		0.27%	0.00%	13.41%
9601B:C10391	GEN	011		5.83%		2.25%		5.04%		1.14%	0.58%		3.24%	3.89%		3.14%	8.58%	0.67%	0.22%	20.22%
9601B:C11187	ERTH	018		0.61%		19.40%		2.29%		2.17%	2.03%	0.28%	1.91%					0.25%		4.45%
9601B:C90098	CONR	011		0.30%		4.93%		2.39%	1.18%		0.26%		1.35%	0.49%		0.50%	0.87%	0.44%	0.09%	4.00%
9601B:C92421	STRC	003	1.99%	0.49%		45.18%		7.80%			0.59%	0.62%	0.83%			0.09%		0.08%	0.22%	2.53%
9601C:C10436	ASPH	005		10.87%				7.74%					0.02%	7.12%		5.31%	12.48%	1.09%	0.00%	26.02%
9601C:C10717	STRC	018		3.44%		43.88%		5.80%			0.35%		2.88%			0.40%				3.63%
9601C:C11117	SGNL	005		1.26%		9.35%		5.08%						13.70%		3.18%	41.88%	13.02%		71.79%
9602A:C10586	STRC	003	3.30%	1.82%		50.68%		4.21%			0.46%	3.87%	0.26%	0.31%		0.57%		0.55%	0.07%	6.09%
9602A:C91052	ASPH	001						7.05%								2.24%		0.41%		2.65%
9602B:C10210	GEN	010		0.42%		0.18%		7.38%			0.63%	8.24%	1.15%	0.38%		0.51%		0.52%		11.31%
9602B:C10858	ASPH	001		2.18%		2.88%		9.61%				2.04%				1.97%		1.66%	1.46%	7.13%
9602C:C10918	CONR	004	1.28%	5.86%		5.09%		0.76%				16.46%	0.38%			0.22%		2.45%	0.06%	19.57%
9603A:C10218	GEN	003	2.39%	0.03%		7.27%		18.05%			0.37%	2.22%	1.77%			0.33%			0.04%	4.73%
9603A:C10769	ASPH	001	0.39%	0.25%		6.29%		3.50%				1.32%	0.76%			1.18%		0.26%	0.10%	3.62%
9603A:C11073	ASPH	001		1.37%				4.52%		0.01%						5.00%				5.00%
9603A:C92303	GEN	011		3.50%		0.44%		10.28%		0.24%	0.60%		1.27%			4.35%	0.46%	0.83%		7.41%
9603B:C10483	GEN	005		1.50%		1.08%		7.30%		0.20%	2.31%		0.93%	4.41%		2.15%		0.71%	1.04%	11.55%
9603B:C11081	ASPH	021		12.35%			14.98%	6.19%								2.81%				2.81%
9603B:C11318	ASPH	001		0.05%															0.04%	0.04%
9603B:C11343	STRC	002		12.84%		23.79%		28.14%				2.47%		0.55%		4.83%		0.11%		7.96%
9603C:C10998	ASPH	005		0.87%		3.28%		11.46%		0.67%		2.98%	7.63%	3.84%		0.93%	0.44%	0.79%	3.32%	19.93%
9603C:C11184	SIGN	017		19.05%														76.93%		76.93%
9603C:C11270	PVMK	017														92.34%				92.34%
9603C:C11365	ASPH	001	0.07%	3.88%		0.67%		6.84%				1.99%				5.32%	0.12%			7.43%
9603D:C10565	ERTH	005		0.52%				19.26%				6.25%	1.85%	0.27%		0.94%		0.76%	0.02%	10.09%
9603D:C11276	ERTH	010		0.23%				6.88%			1.14%		1.32%			0.39%		0.88%	0.50%	4.23%
9603D:C92319	GEN	012		8.28%		0.96%		9.85%		0.34%	0.27%		0.87%	0.91%		1.90%	3.53%	0.66%	0.20%	8.34%
9604A:C10463R1	OLS	003		0.04%				3.76%			0.04%	0.24%	0.16%	0.03%		0.07%			0.00%	0.54%
9604A:C10477	STRC	017		0.34%		56.66%		16.99%			0.73%	3.65%		1.29%				0.86%		6.55%
9604A:C10918R	CONR	004		8.57%		7.89%		1.03%			1.45%	0.52%	0.52%			0.30%		2.43%	0.11%	5.33%
9604A:C11004H	SURF	001					41.04%									11.44%		1.13%		12.57%

CDOT Contracts (1/1990-8/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9604A:C11103	PVMK	005	$766,902.60											0.07%						
9604A:C11277	PVMK	017	$320,647.00											0.31%						
9604A:C11369	ASPH	001	$1,555,237.05		0.85%	55.23%						0.18%	3.17%	3.41%	0.21%	1.85%		8.47%		
9604B:C11088	STRC	005	$1,701,557.20	0.04%		1.80%		0.65%				1.44%	4.23%	7.97%	0.91%					
9604B:C11148	STRC	013	$9,883,530.09	1.12%	0.01%	2.11%	0.13%	0.00%	0.04%	1.52%		3.64%	9.83%	2.70%	2.66%	0.78%				0.02%
9604B:C11279	SGNL	009	$77,402.50											1.63%	2.58%					
9604B:C11406	DRNG	017	$586,892.95	7.49%	0.07%	5.68%	0.21%					24.01%	8.04%	7.67%	0.51%	0.55%				0.46%
9604B:C11417	SGNL	009	$170,904.38			1.35%		0.92%				4.27%	4.39%	18.43%	1.14%	9.76%				
9604C:C11027	GEN	008	$2,187,799.10	0.20%	0.12%	13.55%		7.76%	0.20%	1.69%		16.58%	4.65%	5.66%	5.60%	1.04%			0.20%	
9604C:C11274	STRC	003	$1,111,878.81	3.29%	0.69%	8.47%	0.68%	0.37%				0.41%	12.25%	8.00%	3.33%	1.71%				1.84%
9604C:C11365R	ASPH	001	$1,819,745.63		0.29%	40.30%							0.86%	11.32%		0.71%		30.48%		
9605A:C10794	LSCP	017	$287,853.25	0.22%								3.91%	11.31%	8.69%	28.63%	0.35%				0.18%
9605A:C11301	GEN	013	$2,552,743.52	0.65%	0.01%	2.74%	2.43%	4.20%		25.45%		3.30%	5.28%	9.72%	2.58%	1.38%				0.21%
9605A:C11364	ASPH	020	$2,456,164.60		1.21%	45.02%		1.16%		7.39%		2.22%	4.23%	3.58%		5.25%	0.85%			
9605B:C11319	ASPH	001	$2,843,338.80			58.05%	4.26%	1.28%		17.62%			0.50%	6.80%	0.46%	0.90%				
9605B:C11368	GEN	001	$2,768,051.30		0.11%	17.84%	0.92%	27.78%		3.52%		2.01%	0.72%	7.51%	1.37%	0.81%				
9605B:C11374	ASPH	021	$878,008.88		1.14%	70.31%						3.04%	6.82%	5.11%		0.57%				
9605B:C11437	LSCP	017	$93,075.60										11.86%	8.80%		0.21%				
9605B:C93178	REST	018	$84,738.00	7.28%										11.90%					59.60%	
9606C:C11373	ASPH	001	$1,218,009.45		0.68%	70.33%		0.22%						9.87%		0.39%				
9605D:C10213	ERTH	003	$1,036,517.25	0.85%	0.98%	17.24%	5.76%	0.12%				1.64%	34.96%	6.70%	4.73%	1.21%				0.14%
9605D:C11002-CO	GEN	001	$315,372.30		0.11%	15.12%	2.80%	10.62%		1.90%		20.54%	1.78%	13.48%	8.88%					0.61%
9605D:C11172	?	018	$2,365,036.85	2.30%		5.71%	2.82%	7.50%				6.50%	20.09%	4.23%	3.30%	0.80%				0.12%
9605D:C11248	STRC	003	$4,783,891.24	1.80%	0.03%	7.69%	0.58%	2.64%	0.01%	7.72%		1.47%	1.91%	5.22%	4.32%	0.88%				
9605E:C11079	ASPH	020	$1,577,761.65		0.68%	78.39%	8.01%						0.70%	2.54%		0.82%				
9605E:C11168	CONR	017	$2,331,980.60		0.03%	1.99%				33.63%		1.69%	5.65%	7.08%	22.37%	1.03%			4.72%	
9605E:C11438	ASPH	021	$3,477,639.00		0.65%	60.29%	0.72%					0.13%	6.94%	8.20%		0.41%				
9606A:C11088R	STRC	005	$1,458,701.25	0.05%		3.37%		1.20%				1.68%	3.66%	9.12%	1.27%					
9606A:C11356	ASPH	021	$384,612.80		1.43%	64.59%						1.95%		6.50%						
9606A:C11357	ASPH	021	$586,255.50		1.72%	84.27%								10.23%		0.80%				
9606A:C11441	ASPH	001	$611,870.00			100.00%														
9606A:C11499	ASPH	001	$1,673,822.16		1.58%	71.54%	3.03%						0.57%	11.95%	0.18%	0.48%				
9606A:C93178R	REST	018	$80,778.00	15.91%										11.14%					55.86%	
9606B:C10681	ASPH	020	$4,279,082.25		0.62%	53.45%						0.06%	0.35%	4.28%	0.35%	0.86%				
9606B:C11187	ERTH	017	$995,062.00	0.21%	0.45%	8.38%	19.84%	5.76%		17.17%		0.93%	16.23%	9.85%	3.42%	0.30%				0.03%
9606B:C11233	STRC	001	$921,902.21	4.41%	0.58%	9.23%						0.11%	7.04%	5.42%	1.95%	1.74%				7.65%
9606B:C11358	ASPH	021	$599,981.93		1.35%	89.84%								2.89%		0.67%				
9606B:C11360	ASPH	021	$844,502.00			86.51%								6.83%		1.24%				
9606B:C92974	GEN	003	$1,163,819.76	1.43%	0.52%	18.90%	7.01%					2.68%	25.42%	7.14%	9.20%	1.23%				0.59%
9606C:C10087	ASPH	001	$2,478,541.09		0.40%	48.78%	7.78%						0.14%	1.41%		0.43%		19.78%		
9606C:C10213R	GEN	003	$909,062.80	0.56%	1.59%	17.95%	5.33%	0.20%				1.37%	31.56%	8.49%	2.51%	1.41%				0.20%
9606C:C11248	SURF	021	$173,339.00		33.13%									8.90%	1.44%	0.12%				
9606C:C11338	ASPH	021	$302,545.00			75.36%								9.09%		0.79%				
9606C:C11359	ASPH	021	$674,200.90		1.20%	84.66%							4.40%	1.04%		0.48%				
9606C:C11509	ASPH	001	$1,312,203.40		0.57%	32.21%	1.43%						6.19%	5.33%	1.14%	0.69%				
9606C:C91025	ASPH	003	$7,570,813.98	0.58%	4.83%	49.61%		0.08%	0.02%	0.65%		0.36%	4.95%	5.35%	0.99%	0.77%		5.87%		2.88%
9606D:C10215	ASPH	001	$325,772.50		2.12%	38.76%	2.23%						0.74%	11.97%	1.53%	2.61%				
9606D:C11079R	ASPH	020	$1,629,690.15		0.66%	78.30%	7.76%						0.68%	3.01%		0.92%				
9606D:C11320	ASPH	001	$2,194,190.75			84.71%	3.00%							5.47%	0.16%	1.66%				
9606D:C11514	ASPH	001	$2,016,337.00		0.91%	57.33%						0.07%	2.14%	3.67%		1.88%				
9606D:C91409	GEN	008	$984,000.00			18.76%	4.00%	1.12%	0.36%	23.03%		6.05%	10.70%	6.56%	1.63%	1.73%				0.27%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9604A:C11103	PVMK	005						0.46%								99.48%				99.48%
9604A:C11277	PVMK	017						7.38%								92.31%				92.31%
9604A:C11369	ASPH	001	0.78%	5.38%		1.54%		9.65%				3.49%	0.12%			5.17%		0.80%		9.38%
9604B:C11088	STRC	005	3.35%	3.51%		44.35%		9.09%			0.05%	22.29%	0.22%					0.03%	0.05%	22.64%
9604B:C11149	STRC	013	0.04%	0.50%		64.00%		4.85%			0.95%	1.72%	0.40%	1.08%		0.10%	0.02%	0.01%	1.77%	6.05%
9604B:C11273	SGNL	009		0.78%				9.85%						17.56%		2.02%	69.92%	1.58%		85.06%
9604B:C11406	DRNG	017		1.30%		4.28%		35.21%			0.12%		0.81%			5.28%		0.11%		6.32%
9604B:C11417	SGNL	009		0.91%				8.41%						9.06%		0.81%	39.31%	1.45%		50.43%
9604C:C11027	GEN	008		6.70%		9.24%		7.45%		7.68%	0.09%		2.81%	1.05%		0.69%	6.52%	0.45%	0.25%	11.68%
9604C:C11274	STRC	003	3.06%	0.13%		37.94%		16.00%			0.55%	1.72%	0.56%			0.09%		0.44%	0.47%	3.83%
9604C:C11365R	ASPH	001		2.90%				7.26%				1.15%				4.63%	0.09%			5.87%
9605A:C10794	LSCP	017				3.05%				8.19%	4.56%		27.77%	2.03%					0.91%	35.27%
9605A:C11301	GEN	013	0.05%	3.43%		11.04%		7.88%		2.52%	0.48%	1.12%	3.44%	3.56%		0.70%	2.57%	3.41%	1.83%	17.11%
9605A:C11364	ASPH	020		2.16%			8.72%	8.26%				5.46%	0.32%	0.05%		3.57%	0.33%	0.22%		9.95%
9605B:C11319	ASPH	001		4.37%		0.10%		3.04%						0.25%		1.01%	1.39%	0.48%	0.16%	3.31%
9605B:C11366	GEN	001		23.67%				7.93%		0.44%				0.62%		2.20%	2.16%	0.32%	0.23%	5.55%
9605B:C11374	ASPH	021	0.08%	0.29%		0.91%		2.62%				1.41%	3.65%			2.96%		0.87%	0.01%	8.90%
9605B:C11437	LSCP	017									0.59%		78.74%							79.33%
9605B:C93178	REST	018				5.78%												15.54%		15.54%
9605C:C11373	ASPH	001		6.06%		0.82%		3.10%				4.11%				4.04%		0.38%		8.53%
9605D:C10213	ERTH	003	1.16%	0.81%		14.85%		4.41%			0.97%	2.54%	0.81%			0.17%		0.09%	0.07%	4.65%
9605D:C11002-CO	GEN	001		12.59%		0.67%		12.87%								0.08%				0.08%
9605D:C11172	?	016		1.19%		0.38%		7.78%	4.64%		2.33%	0.56%	16.06%			0.41%		0.03%	19.28%	32.67%
9605D:C11248	STRC	003	5.02%	3.32%		33.02%		10.83%		1.97%	0.78%	0.81%	0.34%	2.42%		0.99%	3.58%	2.20%	0.46%	11.58%
9605E:C11079	ASPH	020		0.68%				4.04%				2.97%				0.86%			0.30%	4.13%
9605E:C11168	CONR	017		1.26%		0.50%		10.23%				3.34%	0.48%	3.85%		0.77%	0.03%	1.35%		9.83%
9605E:C11438	ASPH	021		1.14%	0.11%		4.03%	3.93%			0.47%	10.22%	0.52%			2.09%		0.16%		13.46%
9606A:C11088R	STRC	005	3.07%	3.49%		39.10%		11.60%			0.06%	21.75%	0.61%					0.04%	0.05%	22.41%
9606A:C11358	ASPH	021		10.83%				7.67%		0.31%						4.77%	1.96%			6.73%
9606A:C11357	ASPH	021						1.54%								1.43%				1.43%
9606A:C11441	ASPH	001																		0.00%
9606A:C11499	ASPH	001		3.75%				4.71%		0.24%						1.91%		0.05%		1.96%
9606A:C93176R	REST	018				5.98%												11.12%		11.12%
9606B:C10681	ASPH	020		13.86%		0.33%		4.89%				17.35%	0.07%			3.34%		0.16%		20.92%
9606B:C11167	ERTH	017		0.66%		1.66%		2.27%		1.70%	0.98%		1.18%	8.04%		0.27%		0.52%	0.20%	11.17%
9606B:C11233	STRC	001	1.30%	1.01%		34.72%		21.11%			0.42%	1.47%	1.26%	0.31%		0.24%		0.04%		3.74%
9606B:C11356	ASPH	021						3.46%								1.79%				1.79%
9606B:C11360	ASPH	021						3.94%								1.48%				1.48%
9606B:C92974	GEN	003	1.44%	2.78%		10.39%		5.20%		0.30%	3.54%		2.57%			0.27%		0.27%	0.13%	6.78%
9606C:C10087	ASPH	001	0.08%	1.43%		0.90%		3.41%				14.79%				0.66%		0.01%		15.46%
9606C:C10213R	GEN	003	1.10%	0.48%		15.30%		6.08%			1.30%	2.96%	1.05%			0.15%		0.13%	0.28%	5.87%
9606C:C11246	SURF	021					35.64%									19.63%		1.15%		20.78%
9606C:C11338	ASPH	021						4.87%				9.88%								9.88%
9606C:C11359	ASPH	021						5.08%								3.14%				3.14%
9606C:C11509	ASPH	001		2.70%				12.38%				15.79%	0.40%			2.47%		18.70%		37.36%
9606C:C91025	ASPH	003	0.90%	1.69%		9.48%		4.21%			0.05%	4.98%	0.67%			0.83%		0.40%	0.09%	7.03%
9606D:C10215	ASPH	001		0.66%				13.27%				23.20%				2.87%		0.04%		26.11%
9606D:C11079R	ASPH	020		0.67%				3.92%				2.88%				0.93%			0.29%	4.10%
9606D:C11320	ASPH	001		0.02%				2.90%								1.41%		0.43%	0.22%	2.06%
9606D:C11514	ASPH	001	0.11%	10.93%		1.41%		12.08%				2.53%				6.48%	0.46%			9.47%
9606D:C91409	GEN	008	1.63%	3.63%		3.02%		7.91%		4.98%	1.14%		0.47%	0.20%		1.39%		1.44%		4.64%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9607A:C10298	ASPH	005	$218,574.94		0.24%	29.95%						1.41%	14.23%	9.15%	0.82%					
9607A:C10378R	GEN	017	$109,399.20		0.12%	15.33%	4.39%			21.39%			5.92%	9.14%	7.66%	2.06%				
9607A:C10763	GEN	012	$9,053,077.26	1.37%	0.73%	26.24%	6.91%	0.70%		0.31%		2.93%	17.39%	5.90%	3.28%	1.04%			0.02%	0.29%
9607A:C11067	PVMK	005	$351,373.30											1.42%	4.27%					
9607A:C11152	GEN	003	$423,139.00	7.26%		3.05%	6.97%					9.79%	17.84%	9.45%	2.95%	0.68%				2.56%
9607A:C11339	ASPH	001	$708,894.60		28.02%	39.35%	1.90%							3.53%		0.63%				
9607A:C11478	CONR	001	$5,401,472.08	0.08%		0.80%				76.71%		0.03%	5.76%	5.55%	0.93%	0.48%				
9607A:C11512	ASPH	020	$3,447,726.20		1.15%	42.75%		0.49%		1.81%		0.27%	3.50%	3.92%		0.95%	0.62%			
9607A:C11547	PVMK	005	$84,800.01											0.00%						
9607A:C91067	STRC	003	$2,672,499.85	2.26%	0.23%	16.22%	5.33%	0.28%	0.05%			0.40%	7.30%	2.43%	2.19%	0.64%				6.21%
9607B:C11337	ASPH	022	$398,011.20		1.74%	80.31%								6.26%						
9607B:C11476	CONR	001	$12,037,278.92	0.20%		1.29%		0.03%		74.52%		1.13%	4.26%	2.33%	2.62%	0.18%				
9607C:C10213S	GEN	003	$894,173.05	0.57%	1.61%	18.25%	5.42%	0.20%				1.38%	32.09%	8.33%	2.56%	1.43%				0.21%
9607C:C10215R	ASPH	005	$325,772.50		2.12%	38.76%	2.23%						0.74%	11.97%	1.53%	2.61%				
9607C:C11380	ASPH	001	$1,238,321.49		0.96%	77.76%	2.78%					0.03%		5.68%		0.32%				
9607C:C11522	SIGN	017	$118,479.00											12.66%						
9607C:C11523	PVMK	005	$175,820.95											3.41%						
9607C:C92874R	GEN	010	$1,090,555.00	1.86%	0.57%	16.07%	8.10%					3.42%	19.00%	12.10%	6.79%	2.17%				0.25%
9608A:C11340	SURF	021	$1,174,003.50		29.80%	13.68%	0.23%	0.08%				0.50%		2.96%		6.76%				
9608B:C10470	LTNG	018	$237,373.00			2.32%		22.96%					4.92%	4.21%	12.90%				0.24%	
9608C:C11002R-C	GEN	001	$242,614.00		0.12%	18.73%	5.10%	12.04%		1.27%		23.35%	4.37%	7.42%	5.98%					1.15%
9608D:C10213T-C	ASPH	003	$1,719,196.20	0.49%	0.50%	53.45%	5.65%	0.07%				0.71%	6.27%	6.98%	2.50%	0.73%				0.23%
9608D:C11388	GEN	010	$550,884.25		0.58%	29.97%	24.73%					0.15%	15.06%	9.62%	2.09%	1.23%				
9608E:C11071	ASPH	001	$1,324,272.58		0.39%	63.21%	1.45%					0.18%		8.31%		0.29%				
9608E:C11118	OTHR	018	$87,205.00					15.68%						13.37%	4.12%	21.60%				
9608E:C11299	ASPH	001	$404,267.60			71.45%	0.96%							7.79%	0.80%					
9608E:C11378	ASPH	001	$1,194,231.68		1.15%	76.17%	2.89%						0.43%	5.03%		0.75%				
9608E:C11517	ERTH	005	$297,970.00				7.88%					6.18%	22.16%	9.58%	0.34%	1.01%				
9609A:C10301	DRNG	005	$332,251.00			5.96%		7.82%				22.08%	0.72%	11.14%	3.31%	14.62%				
9609A:C10470R	LTNG	018	$237,737.00			2.31%		24.03%						4.21%	14.80%				2.08%	
9609A:C10609	STRC	013	$6,138,305.33	0.20%	0.00%	1.28%		0.04%				3.35%	9.79%	2.92%	3.05%	3.00%				0.01%
9609A:C11340R	ASPH	001	$455,759.50			40.10%		0.14%				1.26%		7.88%		0.68%				
9609A:C11371	ASPH	020	$4,791,439.33		0.54%	50.55%		0.46%				0.05%	0.13%	2.65%	0.18%	0.33%				
9609B:C10804	CONR	012	$5,125,365.67	1.55%	0.00%	0.95%	2.20%	0.02%	0.03%	43.45%		1.57%	4.31%	3.49%	1.10%	0.61%				0.00%
9609C:C11129	GDRL	005	$1,692,272.06			3.34%		0.28%						3.46%	2.36%	0.63%				
9609C:C11152R	GEN	003	$374,493.00	5.87%			5.10%					19.71%	11.58%	13.36%	5.87%	0.93%				2.07%
9609C:C11226	ASPH	001	$512,849.10		0.15%	27.89%		8.39%				4.23%	5.00%	8.77%	2.92%	2.45%				0.04%
9609C:C11264R	GEN	017	$646,894.40			13.63%	2.48%	7.13%		5.49%		11.89%	17.81%	10.20%	7.73%	0.30%			4.08%	0.04%
9609C:C11327	CONR	012	$14,065,534.57	0.07%	0.01%	4.29%		0.05%		49.79%		0.58%	10.94%	9.48%	2.44%	0.09%				
9609C:C11495	RIPR	017	$260,802.80									0.11%	31.94%	5.78%						55.25%
9609C:C93268	STRC	003	$1,365,894.60	1.17%	0.02%	6.37%			0.12%				8.24%	8.92%	6.44%	1.32%				
9609D:C10605	STRC	011	$7,993,991.31	0.67%	0.04%	4.31%	0.27%	0.74%		3.41%		0.81%	1.38%	9.23%	1.29%	0.99%			0.02%	
9609D:C10900	SGNL	005	$195,920.00										1.22%	5.03%	0.86%	2.68%				
9609D:C88041	GEN	010	$3,845,398.00		1.10%	16.87%		0.04%				2.74%	13.57%	10.50%	31.85%	0.60%				1.51%
9610A:C10742	GEN	018	$1,815,203.22			6.77%		23.06%	0.53%	2.31%		2.82%	8.07%	6.04%	2.59%	2.05%				
9610A:C10810	STRC	007	$2,344,124.90	1.91%	0.22%	8.91%	3.99%	0.35%				10.24%	15.70%	3.54%	4.71%	0.92%				0.52%
9610B:C10300	ASPH	005	$373,868.80		0.20%	23.77%		12.57%				2.45%	6.21%	6.69%	2.01%					
9610C:C11078	STRC	002	$1,329,645.55	0.71%	0.04%	6.42%						0.11%	2.60%	8.83%	2.40%	3.08%				
9610C:C11413	SGNL	009	$52,992.10											7.87%	37.93%					
9610C:C11621	PVMK	005	$232,625.50												32.21%					
9610D:C10740	GEN	004	$1,473,676.40		0.10%	20.00%		8.84%		0.67%		4.48%	4.85%	4.34%	2.38%	3.02%				0.67%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9607A:C10298	ASPH	005		14.19%				11.83%				5.77%	1.24%	3.29%		4.26%		3.63%		18.19%
9607A:C10378R	GEN	017		12.71%		5.34%		12.92%				0.88%				0.33%	0.91%		0.90%	3.02%
9607A:C10753	GEN	012		0.84%		4.65%		5.10%		0.19%	0.61%	5.89%	2.88%	0.41%		3.41%		0.88%	7.94%	22.12%
9607A:C11067	PVMK	005		0.50%												93.61%				93.61%
9607A:C11152	GEN	003		4.52%		6.46%		15.78%			3.00%	1.28%	3.37%			0.13%			3.83%	11.71%
9607A:C11338	ASPH	001					19.39%	3.87%								3.30%				3.30%
9607A:C11478	CONR	001		2.55%				4.37%			0.66%	0.79%	0.56%			0.53%		0.17%	0.28%	2.99%
9607A:C11512	ASPH	020	0.70%	2.21%		13.62%	8.19%	8.15%			0.09%	5.35%	0.29%	2.58%		2.82%	0.31%	0.22%		11.67%
9607A:C11547	PVMK	005						11.84%								88.16%				88.16%
9607A:C91067	STRC	003	2.46%	0.91%		40.40%		4.19%			0.47%	6.06%	0.80%	0.01%		0.29%	0.08%	0.50%	0.26%	8.49%
9607B:C11337	ASPH	022						9.86%								1.81%				1.81%
9607B:C11475	CONR	001	0.13%	2.22%		3.96%		3.87%		0.11%	1.44%	0.32%	0.76%			0.29%		0.32%	0.00%	3.15%
9607C:C10213S	GEN	003	1.12%	0.48%		14.62%		6.11%			1.12%	2.87%	1.07%			0.16%		0.13%	0.29%	5.64%
9607C:C10216R	ASPH	005		0.66%				13.27%				23.20%				2.87%		0.04%		26.11%
9607C:C11380	ASPH	001		0.69%		0.65%		4.03%				5.30%				1.60%				6.90%
9607C:C11622	SIGN	017		2.76%				12.91%										71.67%		71.67%
9607C:C11523	PVMK	005				2.84%		7.37%								86.38%				86.38%
9607C:C92974R	GEN	010	1.83%	2.00%		9.83%		5.97%		0.42%	4.70%		3.14%			0.95%		0.33%	0.49%	9.61%
9608A:C11340	SURF	021		6.15%			16.81%	9.73%		0.46%						7.59%	5.26%			12.85%
9608B:C10470	LTNG	018								9.29%			8.68%	36.27%			4.21%			49.16%
9608C:C11002R-C	GEN	001		9.83%		1.01%		9.27%		0.31%						0.06%				0.06%
9608D:C10213T-C	ASPH	003	0.58%	1.19%		8.26%		5.30%			0.80%	2.66%	0.26%			1.44%		0.07%	0.07%	5.09%
9608D:C11388	GEN	010		0.07%				6.15%				8.33%	1.01%					1.03%		10.37%
9608E:C11071	ASPH	001	0.15%	8.30%		1.95%		7.18%				4.31%		0.20%		1.72%	0.75%	1.62%		8.60%
9608E:C11118	OTHR	018		0.70%		10.12%		1.03%					17.48%	15.49%				0.46%		33.37%
9608E:C11299	ASPH	001		0.52%				6.58%				7.70%				3.71%		0.49%		11.90%
9608E:C11378	ASPH	001		0.75%		2.60%		4.23%				2.11%				3.88%				5.99%
9608E:C11517	ERTH	005		7.61%		2.50%		21.87%			12.00%		8.80%							20.80%
9609A:C10301	DRNG	005		5.76%		0.32%		12.47%		6.77%				4.19%		2.55%	1.91%	1.00%		9.65%
9609A:C10470R	LTNG	018								3.28%			8.85%	36.22%			4.21%			49.28%
9609A:C10606	STRC	013		1.60%		51.08%		4.48%		4.78%	0.12%	0.99%	0.24%	0.91%		0.33%	0.64%	0.05%	11.13%	14.41%
9609A:C11340R	ASPH	001		16.23%				14.34%		1.18%						7.56%	10.66%			18.42%
9609A:C11371	ASPH	020	0.90%	16.38%		7.29%		4.56%		0.02%		8.44%		1.16%		6.11%		0.24%		15.95%
9609B:C10604	CONR	012		5.24%		8.32%		9.44%			0.25%	6.56%	0.43%	3.92%		1.50%	0.31%	3.09%	1.66%	17.72%
9609C:C11129	GDRL	005		5.33%				12.05%				70.59%	0.40%					1.13%	0.44%	72.56%
9609C:C11162R	GEN	003		1.75%		6.06%		16.80%			4.04%	1.34%	3.16%			0.32%			2.08%	10.91%
9609C:C11226	ASPH	001		9.96%				6.68%		0.09%	0.13%	1.19%	0.36%	6.75%		3.09%	7.23%	1.09%	1.67%	21.41%
9609C:C11264R	GEN	017		1.65%		0.89%		2.30%		0.02%	0.15%		0.58%	12.02%		0.92%		0.88%	0.00%	14.55%
9609C:C11327	CONR	012	0.85%	2.53%		8.57%		7.89%			0.04%	1.52%	0.47%			0.42%		0.22%		2.67%
9609C:C11495	RIPR	017		0.12%							0.12%		2.30%						4.41%	6.83%
9609C:C93268	STRC	009	2.93%	0.84%		35.26%		13.36%			0.10%	14.78%	0.31%	1.48%		0.15%		0.25%		17.03%
9609D:C10605	STRC	011		1.20%		48.41%		15.07%		1.03%	2.25%	1.58%	3.30%	1.00%		1.66%	0.18%	1.19%	0.26%	11.42%
9609D:C10900	SGNL	005						10.08%						27.34%			52.79%			80.13%
9609D:C88041	GEN	010		4.37%		0.08%		7.78%			1.02%	4.84%	2.25%			0.46%		0.18%	0.23%	8.98%
9610A:C10742	GEN	018		5.07%		3.13%		5.73%		3.23%			17.68%	4.48%		3.08%		1.97%	0.40%	27.59%
9610A:C10810	STRC	007		1.11%		35.03%		5.01%			0.44%	1.30%	0.70%	1.54%		0.48%	2.73%	0.33%	0.30%	7.82%
9610B:C10300	ASPH	005		7.48%				12.74%			0.28%		0.13%	8.74%		3.01%	12.55%	1.16%		25.87%
9610C:C11076	STRC	002	13.77%	2.25%		40.93%		12.23%	0.23%			3.29%		0.78%		0.64%	0.51%	1.12%	0.05%	6.39%
9610C:C11413	SGNL	009		0.11%				5.35%						5.86%		2.96%	39.81%	0.90%		48.73%
9610C:C11621	PVMK	005														67.78%				67.78%
9610D:C10740	GEN	004		10.81%		0.66%		9.33%		0.36%	0.54%	0.45%	0.72%	3.40%		4.55%	14.72%	2.58%	2.55%	29.51%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9610D:C11118R	GEN	016	$68,790.00					21.15%						15.26%		26.46%				
9610E:C10971	STRC	002	$2,228,113.30		0.06%	18.11%						0.02%		5.14%		2.01%				
9610E:C11146	SGNL	009	$80,455.92											1.98%	26.26%					
9610E:C11249	STRC	003	$5,276,708.00	0.99%	0.01%	1.18%	1.19%	0.08%		0.48%		1.73%	4.20%	1.90%	2.84%	9.06%				
9611A:C11231	PVMK	005	$857,824.00																	
9611B:C10486	SPEC	017	$144,939.00	4.62%								18.84%		12.28%	0.83%					
9611B:C11336	ASPH	001	$1,095,469.24		0.74%	68.44%	5.82%					0.51%		6.41%		0.82%				
9611B:C11687	SURF	021	$559,749.76		43.96%		0.13%							8.47%		0.38%				
9611C:C91066	GEN	003	$1,566,347.30	1.50%	0.22%	28.14%	0.15%					3.33%	17.77%	5.55%	4.05%	1.35%				3.48%
9611D:C11515	STRC	003	$3,478,672.07	1.33%	0.12%	10.01%		0.86%				1.08%	2.09%	11.05%	1.27%	1.47%				
9611D:C11589	SGNL	009	$268,076.65											1.92%	1.20%					
9612A:C92412	ASPH	010	$1,865,220.65	0.72%	0.32%	32.39%	8.54%	0.82%				3.24%	8.51%	11.26%	3.22%	1.39%				
9612B:C10061	GEN	012	$2,441,297.00	2.83%	0.40%	16.23%		4.45%		1.16%		6.02%	7.02%	5.33%	2.74%	0.55%				1.04%
9612B:C10301R	GEN	005	$304,391.00			7.69%		13.33%				11.76%	3.45%	6.91%	3.17%	13.27%				
9612B:C11305	PVMK	017	$395,034.00											6.33%						
9612B:C11521	GDRL	005	$28,475.00											3.51%						
9612B:C11686	STRC	017	$257,124.90									8.89%	6.80%	7.58%	2.92%	1.94%				
9612B:C93135	STRC	003	$5,935,291.28	0.83%	0.26%	3.37%	0.62%	1.98%		0.21%		2.32%	1.65%	5.49%	1.02%	1.82%				
9612C:C10581	STRC	017	$3,650,876.65	2.33%	0.15%	2.66%	0.67%	0.14%		10.35%		1.17%	7.17%	8.41%	2.72%	3.46%				1.13%
9612C:C11520	STRC	017	$153,178.20	4.12%		2.28%						0.59%	4.90%	4.57%	6.59%	0.20%				
9612C:C93267	STRC	003	$1,549,592.65	2.50%		1.12%	0.81%			5.83%			3.05%	4.13%	5.55%	1.73%				
9701A:C11292	STRC	003	$638,314.00	0.80%	0.38%	4.94%		3.86%				2.45%	1.51%	11.91%	10.31%	10.71%				0.53%
9701B:C10803	CONR	001	$6,274,540.02		0.01%	3.78%	5.47%	0.06%	0.02%	37.46%		5.43%	6.42%	5.63%	1.05%	0.73%				0.01%
9701B:C11174	REST	018	$337,464.93					3.67%						10.08%					85.81%	
9701B:C11234	STRC	014	$277,485.42					5.13%						20.49%	34.43%	1.07%				
9701B:C11611	DRNG	017	$349,568.25			7.55%						44.23%	2.11%	8.01%	9.07%	2.09%				3.34%
9701C:C10506	CONR	013	$8,027,302.39	0.60%		1.95%	7.86%	0.20%		45.41%		5.54%	12.55%	4.98%	6.63%	1.26%				0.04%
9701C:C10827	GEN	012	$7,228,479.12	0.27%	0.37%	19.85%	0.02%	3.77%		2.87%		3.85%	18.74%	4.39%	3.49%	3.42%				1.80%
9701D:C10226	ASPH	001	$2,413,182.35	0.25%	1.03%	35.42%	11.83%		0.58%			1.93%	4.28%	8.22%	5.28%	1.16%		12.01%		
9701D:C92968	ASPH	001	$4,074,031.15		0.09%	87.17%	7.35%						1.21%	1.28%	0.13%	1.01%				
9702A:C11180-AL	FNC	013	$6,349,189.39					0.02%	1.84%			0.23%	2.82%	6.60%	0.49%	0.21%				
9702B:C10305	STRC	018	$6,579,303.64	2.35%	0.13%	4.00%	1.47%	2.69%		18.27%		5.80%	5.40%	7.20%	2.16%	1.17%				1.70%
9702B:C11613	GEN	010	$2,532,995.40	1.58%	0.70%	29.06%	6.62%					6.39%	21.24%	3.79%	2.96%	0.71%				0.39%
9702C:C11181	STRC	017	$1,057,974.21	0.58%	0.03%	6.03%	0.08%					2.76%	7.17%	9.51%	15.26%					13.23%
9702C:C11546	GEN	012	$9,865,108.29	0.30%	0.02%	3.08%	0.93%	0.11%	0.09%	30.39%		3.26%	21.91%	5.69%	3.95%	0.50%				0.27%
9702D:C11316	ASPH	004	$3,477,139.60			54.56%	7.33%			2.84%		0.04%	1.99%	4.39%	0.78%	0.25%		11.43%		
9702D:C11482	ASPH	001	$824,533.00			61.90%		4.52%				0.07%		3.27%	0.36%	0.44%				
9702D:C11591	ASPH	001	$1,299,283.84		0.44%	57.67%		0.06%					1.49%	4.52%		0.59%				
9703A:C11234R	STRC	014	$221,153.73					22.65%						3.47%	38.35%					
9703A:C11341	ASPH	001	$2,758,454.75		0.70%	67.11%	1.85%	0.04%				0.07%	0.74%	2.83%	0.26%	0.40%				
9703A:C11491	ASPH	001	$1,603,349.50			80.71%	11.11%						0.37%	4.80%	0.16%	0.59%				
9703A:C11494	ASPH	001	$715,762.25			77.31%	5.83%						0.35%	9.08%	0.70%	1.98%				
9703A:C11684	ASPH	001	$136,578.59		0.70%	58.52%						0.80%	11.01%	5.13%	2.32%					
9703B:C11181R	STRC	002	$1,071,082.30	0.53%	0.03%	5.90%	0.11%					2.57%	7.76%	9.77%	13.94%					9.49%
9703B:C11741	ASPH	001	$990,032.50		0.56%	70.74%	2.02%							1.82%		0.25%				
9703C:C11041	STRC	011	$11,190,552.49	0.40%	0.06%	6.85%	0.40%	1.16%	0.02%	0.04%		2.23%	6.76%	6.76%	1.57%	0.46%				1.93%
9703C:C93197	STRC	002	$949,963.35	0.09%		1.88%							0.20%	8.42%	16.63%	0.87%				
9703D:C11504	GDRL	005	$400,425.67			9.32%	7.34%						0.39%	4.11%						
9703D:C11686	GDRL	005	$255,106.50										6.89%	12.39%						
9703D:C91033	GEN	003	$12,685,163.05	0.66%		3.52%	3.84%	0.59%		31.58%		2.12%	20.04%	6.18%	1.88%	1.36%				0.11%
9703D:C92045	STRC	003	$1,095,012.87	0.94%	0.13%	1.76%							3.04%	5.21%	0.96%	1.78%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification										Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9610D:C11118R	GEN	016		0.99%		19.07%		0.58%					2.62%	13.08%				0.78%		16.48%
9610E:C10971	STRC	002	3.02%	7.23%		34.83%		7.52%	8.74%		7.42%				1.06%	1.00%			3.87%	13.35%
9610E:C11146	SGNL	009						11.34%						9.04%			51.40%			60.44%
9610E:C11249	STRC	003		1.64%	46.11%	20.59%		0.67%	0.37%	2.58%	1.67%		0.43%	0.41%		0.09%		0.38%	1.15%	4.13%
9611A:C11231	PVMK	005		0.12%												99.88%				99.88%
9611B:C10486	SPEC	017		0.69%							2.41%		0.90%						59.43%	62.74%
9611B:C11336	ASPH	001		7.46%				5.35%		1.06%						2.29%			0.09%	2.38%
9611B:C11687	SURF	021					31.75%	4.42%								10.89%				10.89%
9611C:C91066	GEN	003	1.12%	1.71%		21.28%		6.42%			0.79%	1.86%	1.08%			1.47%		0.56%	0.14%	5.92%
9611D:C11515	STRC	003	2.51%	2.29%		42.69%		13.32%			1.49%	4.64%	0.24%	1.50%		1.01%	0.07%	0.98%	0.00%	9.93%
9611D:C11589	SGNL	009		0.04%				13.46%						30.02%			52.71%	0.62%		83.35%
9612A:C92412	ASPH	010		1.98%		0.04%		7.43%		0.18%		17.75%	0.54%			0.57%		1.12%		19.98%
9612B:C10061	GEN	012		1.41%		19.75%		5.17%		17.54%	0.63%		0.61%	1.86%		0.87%	3.73%	0.38%	0.29%	8.37%
9612B:C10301R	GEN	005		4.66%		0.91%		10.53%		13.67%				1.79%		5.21%	3.85%	0.59%		11.44%
9612B:C11305	PVMK	017						16.21%								77.46%				77.46%
9612B:C11521	GDRL	005		3.95%				17.10%				74.10%	0.63%					0.70%		75.43%
9612B:C11686	STRC	017	5.83%	1.03%		52.34%		10.74%					2.02%							2.02%
9612B:C93135	STRC	003	3.71%	1.10%		56.08%		4.98%		0.20%	0.06%	0.91%		1.39%		0.32%		0.09%	11.60%	14.37%
9612C:C10581	STRC	017	1.28%	1.53%		24.91%		11.97%	0.19%		0.28%	2.20%	0.78%	1.79%		0.47%	1.45%	0.70%	12.06%	19.73%
9612C:C11520	STRC	017		5.11%		39.77%		25.83%			0.12%		0.29%			4.39%	1.10%	0.14%		6.04%
9612C:C93267	STRC	003		1.56%		56.70%		8.87%			2.17%	4.25%	0.55%	0.66%		0.17%		0.35%	0.01%	8.16%
9701A:C11292	STRC	003		3.66%		16.77%		7.87%		1.25%	0.08%	0.85%	3.39%	2.71%		1.74%	13.48%	0.86%	0.15%	23.06%
9701B:C10603	CONR	001	0.42%	2.24%		1.46%		6.88%		0.05%	0.27%	6.74%	0.40%	7.89%		1.13%		6.54%	0.12%	22.89%
9701B:C11174	REST	016		0.64%																0.00%
9701B:C11234	STRC	014				28.12%		1.02%			0.36%		3.10%	4.89%		1.03%		0.37%		9.75%
9701B:C11611	DRNG	017		4.47%		10.15%		7.97%			1.50%		0.72%			0.49%		0.03%	0.28%	3.02%
9701C:C10506	CONR	013	0.06%	0.28%		2.77%		4.33%			0.46%	0.46%	0.36%	0.14%		1.43%	1.44%	0.34%	0.91%	5.54%
9701C:C10827	GEN	012		1.99%		9.16%		7.01%		0.94%	0.72%	1.35%	1.79%	5.29%		2.51%	2.39%	3.43%	0.68%	18.16%
9701D:C10226	ASPH	001	0.07%	0.86%		1.09%		11.29%			2.29%	0.81%	0.55%	0.39%		0.38%	0.09%	1.50%	0.76%	6.57%
9701D:C92868	ASPH	001		0.24%			0.05%						0.11%			1.10%		0.24%	0.02%	1.47%
9702A:C11180-AL	FNC	013		0.05%		14.37%		0.13%			72.60%		0.61%						0.04%	73.25%
9702B:C10305	STRC	013	0.02%	0.86%		32.71%		3.27%		2.20%	0.89%	1.07%	1.64%	1.01%		0.99%	1.35%	1.62%	0.24%	8.81%
9702B:C11613	GEN	010		1.73%		0.85%		7.06%			2.52%	1.97%	2.83%	1.23%		0.60%	0.35%	0.48%	7.55%	16.94%
9702C:C11181	STRC	017	1.14%	5.01%		20.51%		8.91%		1.61%	0.05%	1.25%	5.69%			0.69%			0.54%	8.22%
9702C:C11548	GEN	012		0.87%		0.74%		7.95%	0.28%	0.00%	0.51%	0.81%	3.62%	0.60%		0.26%	0.63%	0.30%	12.95%	19.68%
9702D:C11316	ASPH	004		3.76%		2.13%		4.33%				1.74%	0.20%			2.47%		1.75%	0.03%	6.19%
9702D:C11492	ASPH	001		7.36%				6.73%		0.06%						11.14%	4.11%		0.05%	15.30%
9702D:C11591	ASPH	001		6.41%				14.55%				5.56%		0.15%		7.14%	1.19%	0.25%		14.29%
9703A:C11234R	STRC	014				24.01%		2.45%			0.42%		5.47%	1.74%		0.62%		0.82%		9.07%
9703A:C11341	ASPH	001		1.13%				4.97%				17.67%				1.52%		0.72%		19.91%
9703A:C11491	ASPH	001		0.01%												1.61%		0.45%	0.17%	2.23%
9703A:C11494	ASPH	001		1.28%												3.10%		0.34%	0.06%	3.50%
9703A:C11684	ASPH	001		2.13%				13.46%			1.52%					3.40%				4.92%
9703B:C11181R	STRC	002	1.12%	5.28%		25.34%		8.80%		1.59%	0.05%	1.23%	5.52%			0.68%			0.30%	7.78%
9703B:C11741	ASPH	001		4.41%				4.64%				13.83%				1.73%				15.56%
9703C:C11041	STRC	011	1.33%	1.32%		21.56%		3.00%		3.29%	25.09%	0.55%	4.78%	1.25%		0.71%	1.94%	1.12%	5.40%	40.84%
9703C:C93187	STRC	002	0.35%	0.85%		51.94%		9.85%				4.75%		0.73%		0.84%		0.79%		7.11%
9703D:C11504	GDRL	005		3.86%				16.04%				58.05%						0.86%		58.93%
9703D:C11666	GDRL	005		1.90%				11.99%				66.67%						0.15%		66.82%
9703D:C91033	GEN	003	0.30%	0.45%		12.77%		7.36%			0.27%	0.24%	0.49%	1.26%		0.86%	2.32%	0.87%	0.89%	7.22%
9703D:C92045	STRC	003	1.26%	3.15%		57.64%		21.29%			0.65%		0.76%			1.33%		0.09%		2.83%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9704A:C11628	ASPH	021	$1,218,466.50	0.08%	0.94%	66.22%	1.84%					0.63%	0.35%	7.15%		0.69%				
9704A:C11743	ASPH	001	$680,103.90		1.86%	74.71%	1.74%					0.14%		9.56%		0.53%				
9704A:C11744	SURF	021	$526,201.25		51.34%		0.09%							3.48%		0.67%				
9704B:C11533	OTHR	021	$298,585.00											1.67%		980.24%				
9704B:C11740	ASPH	001	$824,392.80		0.43%	83.34%	2.07%					0.08%		5.70%		0.64%				
9704B:C11742	ASPH	021	$968,154.75			83.15%	6.18%						0.12%	2.38%		0.29%				
9704B:C11755	ASPH	001	$2,037,039.66		0.31%	58.97%							0.76%	7.48%		0.08%				
9704B:C11770	SURF	021	$1,237,165.82		14.27%									1.62%	9.23%					
9704B:C11778	ASPH	021	$1,813,799.19		0.72%	52.14%								9.54%	0.55%	0.66%				
9704C:C10223	ASPH	004	$5,298,952.48	2.26%	0.34%	39.97%	8.53%	0.05%				3.82%	5.16%	5.19%	1.04%	0.67%		10.03%		5.59%
9704C:C10770	CONR	020	$1,482,440.45		0.06%	5.24%		5.58%		61.07%		2.26%	1.88%	7.56%	1.01%	4.20%				0.34%
9704C:C11601	ASPH	001	$1,252,882.00		1.16%	43.04%		1.52%				0.96%	2.41%	6.78%	0.70%	2.35%				
9704C:C11745	ASPH	001	$1,151,470.75		0.60%	68.66%	12.55%						0.86%	9.34%		0.69%				
9704C:C11765	ASPH	001	$1,837,456.84		2.31%	63.47%	0.90%						1.11%	2.28%		0.76%		11.25%		
9704C:C11791	SURF	001	$224,665.00																	
9704C:C92413	GEN	012	$2,587,328.95			19.44%	8.84%	6.16%		0.32%		17.08%	10.89%	3.09%	3.40%	0.56%				0.06%
9704D:C10675	CONR	001	$7,608,400.47	0.78%		2.02%	0.17%	4.55%	0.08%	42.86%		8.71%	7.23%	8.31%	1.74%	0.40%				0.05%
9704D:C11272	WTMN	017	$1,113,977.85	0.52%								9.85%	0.12%	1.03%	0.49%	0.64%				
9704D:C11279	STRC	003	$568,299.70	5.39%	0.18%	3.10%	0.80%	2.94%				0.87%	7.54%	3.52%	0.88%	0.09%				1.47%
9704D:C11445	FNC	017	$42,104.22											0.24%						
9705A:C11527	PRPC	017	$225,472.00			0.93%				18.24%			0.44%	7.54%		2.67%	62.78%			
9705A:C11652	ASPH	001	$1,615,874.78			85.07%	7.11%							4.37%	0.06%	0.68%				
9705B:C11322	ASPH	001	$2,816,003.00			77.25%	5.16%							8.77%	0.28%	0.32%				
9705B:C11328	DBLD	012	$16,431,610.51	0.24%	0.01%	0.84%	0.00%	0.04%		4.12%	57.43%	1.73%	1.08%	9.43%	2.31%	0.14%				0.43%
9705B:C11655	ASPH	001	$1,298,242.00	0.14%		61.08%						1.30%		2.47%	0.66%	0.61%		18.01%		0.24%
9705B:C11656	ASPH	001	$2,820,781.72			91.83%	0.62%						0.36%	3.83%	0.27%	0.53%				
9705B:C11790	ASPH	001	$1,334,987.60		1.64%	74.97%	7.65%						0.55%	5.24%	0.41%	1.05%				
9705B:C11824	ASPH	001	$3,660,167.40		0.85%	65.41%	4.88%						2.64%	4.92%	0.69%	0.23%		14.47%		
9705C:C11350	ASPH	020	$6,828,582.88		0.36%	56.01%	0.94%	2.38%		0.68%		1.33%	5.85%	4.03%	3.52%	0.18%		4.72%		0.01%
9705C:C11412	PVMK	005	$96,587.37											1.04%						
9705C:C11651	ASPH	001	$4,178,465.90			85.57%	9.15%						0.13%	2.39%	0.12%	0.35%				
9705C:C11783	ASPH	020	$8,930,468.02		4.66%	60.37%	0.22%	0.09%				0.25%	2.44%	1.99%	0.71%	0.29%		5.03%		
9705C:C83122	GDRL	005	$990,757.20		0.31%	12.54%		1.04%				1.43%		3.46%	0.13%	1.73%				
9705D:C11334	GEN	010	$377,480.00	0.08%	0.33%	22.68%	2.36%					0.88%	28.57%	16.80%	2.65%	1.72%				
9705D:C90023	OLS	012	$25,919,172.76												100.00%					
9705E:C11221	CGS	018	$113,917.60			1.19%		57.44%				0.98%	14.01%	4.56%	1.88%	4.46%				
9705E:C11387	SGNL	009	$89,924.85						0.56%					7.45%	4.09%					
9705E:C11701	FNC	017	$257,544.61											9.76%		0.20%				
9706A:C10309	LSCP	016	$1,756,057.55	1.89%				3.14%				7.83%	3.28%	6.55%	6.95%	0.66%				0.05%
9706A:C11044	GEN	004	$2,836,190.70	3.04%	0.61%	32.11%	14.13%					2.55%	22.66%	8.78%	2.29%	0.55%				0.01%
9706A:C11508	STRC	012	$7,540,601.83	1.72%	0.03%	3.82%		0.22%				3.07%	12.58%	4.08%	3.21%	2.06%				0.93%
9706B:C11181S	GEN	017	$1,017,901.78	0.60%	0.03%	8.28%	0.05%					1.37%	8.19%	9.82%	8.22%					12.28%
9706B:C11226	SGNL	009	$619,586.00										1.29%	3.23%	1.90%	0.66%				
9706B:C11293	GEN	003	$1,631,018.95	3.85%	0.63%	8.35%	9.90%					12.45%	17.17%	9.50%	0.98%	0.81%				0.87%
9706B:C11654	CONR	004	$5,319,025.27			1.41%	1.04%			81.91%			0.70%	6.93%	5.15%	0.24%				
9706B:C11774	PVMK	017	$911,359.00											1.10%						
9706C:C11786	ASPH	001	$568,517.60		2.28%	73.83%								14.62%		3.69%				
9706C:C11787	ASPH	001	$447,539.50		1.06%	73.43%								18.99%		1.34%				
9706C:C11788	ASPH	001	$859,558.50		0.94%	82.84%								7.28%		0.76%				
9706C:C93122R	GDRL	005	$842,900.00		0.21%	20.09%		0.71%				0.28%		4.75%	0.17%	1.83%				
9706D:C11206	CONR	012	$4,936,268.04	0.82%	0.12%	4.47%	6.70%	0.03%		50.03%		1.25%	3.06%	6.01%	1.42%	0.51%				

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9704A:C11628	ASPH	021		1.23%				5.05%				9.67%	1.15%			5.02%				15.84%
9704A:C11743	ASPH	001		1.36%				8.24%		0.07%						1.79%				1.79%
9704A:C11744	SURF	021					27.44%	9.67%								7.32%				7.32%
9704B:C11533	OTHR	021																		0.00%
9704B:C11740	ASPH	001		0.03%				4.35%		0.00%		1.13%				2.21%				3.34%
9704B:C11742	ASPH	021		1.55%				3.17%				1.47%				1.68%				3.15%
9704B:C11765	ASPH	001	0.46%	11.55%		3.04%		8.96%				4.67%		0.35%		4.75%	0.63%			10.40%
9704B:C11770	SURF	021					64.10%									16.78%				16.78%
9704B:C11779	ASPH	021	0.35%	4.66%		6.41%	13.03%	4.34%				5.09%				2.51%		0.01%		7.61%
9704C:C10223	ASPH	004	0.08%	1.39%		1.15%		7.82%	0.29%		0.94%	1.22%	1.57%	0.09%		0.64%		1.75%	0.39%	6.60%
9704C:C10770	CONR	020		2.56%				4.71%		0.01%	0.08%	0.29%	0.58%			2.76%			0.03%	3.74%
9704C:C11601	ASPH	001		9.33%				11.69%		0.64%	1.43%	3.18%	3.00%	1.19%		7.55%	2.93%	0.15%		18.43%
9704C:C11745	ASPH	001		0.35%				5.35%								1.60%				1.60%
9704C:C11765	ASPH	001		0.16%				7.22%				1.38%	0.56%			3.38%	5.39%	0.35%	0.07%	11.13%
9704C:C11791	SURF	001					100.00%													0.00%
9704C:C92413	GEN	012		1.49%		3.87%		7.53%		0.31%	0.39%		1.62%	0.44%		1.88%	2.06%	1.88%	6.88%	16.95%
9704D:C10575	CONR	001	0.02%	3.71%		5.17%		5.80%		0.48%	0.02%	0.40%	0.19%	5.18%		0.60%	0.56%	0.48%	0.47%	7.90%
9704D:C11272	WTMN	017		4.54%		0.95%		3.72%		76.94%			0.86%						0.35%	1.21%
9704D:C11279	STRC	003	13.02%	0.55%		35.09%		17.12%					0.60%	1.33%		0.39%			4.22%	6.48%
9704D:C11445	FNC	017		6.81%				1.21%			89.74%									89.74%
9705A:C11527	PRPC	017		0.48%				5.06%								1.86%				1.86%
9705A:C11852	ASPH	001														2.70%				2.70%
9705B:C11322	ASPH	001		2.03%		0.16%		3.32%				0.48%				2.20%			0.03%	2.71%
9705B:C11328	DBLD	012	0.50%	1.27%		6.52%		7.83%			0.62%	2.15%	0.62%	0.64%		1.14%	0.06%	0.70%	0.04%	5.97%
9705B:C11655	ASPH	001		6.83%		0.51%				0.08%						6.55%	0.50%	0.69%	0.53%	8.27%
9706B:C11656	ASPH	001		1.85%		0.58%						0.23%							0.09%	0.32%
9705B:C11790	ASPH	001		0.19%				4.24%				1.63%				2.20%		0.01%		3.84%
9705B:C11824	ASPH	001		0.07%				4.31%					0.04%			1.39%		0.10%		1.53%
9705C:C11350	ASPH	020		1.85%		1.34%		3.81%			2.20%	4.83%	2.46%	0.30%		1.93%		0.80%	0.37%	12.99%
9705C:C11412	PVMK	005						8.26%								90.68%				90.68%
9705C:C11651	ASPH	001		0.57%												1.48%		0.21%	0.03%	1.72%
9705C:C11783	ASPH	020	1.31%	2.23%		3.09%	1.46%	4.29%		0.19%		5.29%	0.27%	0.20%		4.34%		0.78%	0.49%	11.37%
9705C:C93122	GDRL	005	0.61%	1.70%		4.77%		23.44%				43.37%	0.34%	2.59%			0.16%	2.36%	0.02%	48.83%
9706D:C11334	GEN	010	0.44%	2.04%		5.98%		6.57%				4.62%	1.59%			0.43%		1.36%	1.11%	9.01%
9706D:C90023	OLS	012																		0.00%
9705E:C11221	CGS	018		1.97%				7.41%					5.82%					0.18%		5.98%
9705E:C11387	SGNL	009		2.28%				9.69%						13.85%		10.36%	51.46%	0.28%		75.93%
9705E:C11701	FNC	017		17.66%				0.12%			72.36%									72.36%
9706A:C10309	LSCP	016		0.15%				6.11%		19.39%			41.82%	0.73%			0.10%		1.34%	43.99%
9706A:C11044	GEN	004		1.20%		0.36%		5.12%			2.81%	1.02%	1.29%			0.39%		0.21%	0.68%	6.40%
9706A:C11508	STRC	012	0.09%	0.62%		46.07%		4.62%		0.13%	1.18%	1.48%	0.76%	3.17%		0.16%	0.85%	0.54%	5.71%	14.84%
9706B:C11181S	GEN	017	1.05%	6.66%		16.51%		9.88%	8.89%	1.67%	0.06%	0.97%	5.87%			1.12%			0.40%	8.42%
9706B:C11225	SGNL	009						14.05%						18.79%			58.67%	1.19%		78.85%
9706B:C11293	GEN	003	1.29%	0.06%		25.12%		8.80%			0.59%	0.78%	0.53%	0.07%		0.13%			0.12%	2.22%
9706B:C11654	CONR	004		0.28%												1.26%		0.09%	0.02%	1.37%
9706B:C11774	PVMK	017				5.93%		4.72%								88.25%				88.25%
9706C:C11786	ASPH	001						1.82%								3.74%				3.74%
9706C:C11787	ASPH	001		0.68%				2.52%								2.08%				2.08%
9706C:C11788	ASPH	001						3.58%								4.60%				4.60%
9706C:C93122R	GDRL	005	0.84%	1.50%		4.06%		18.13%				40.35%	0.47%	3.95%			0.21%	2.62%	0.02%	47.62%
9706D:C11206	CONR	012		2.40%		4.13%		13.17%			0.08%	1.75%	0.12%	1.20%		2.01%	0.14%	0.51%	0.03%	5.84%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT		Item Classification																
CONTID	WORKTYPE	WORKTYPE	BID TOTAL	AGGR	ASLQ	ASPH	BASE	CGS	CLRG	CONR	DBLD	DRNG	ERTH	MOBL	OLS	OTHR	PRPC	RCYL	REST	RIPR
9706D:C11266	STRC	012	$22,880,346.00	1.32%	0.12%	7.47%	1.43%	1.21%		0.83%		3.40%	13.19%	7.08%	14.53%	0.79%			0.44%	0.18%
9706D:C11785	ASPH	001	$457,813.80		0.88%	80.18%								13.32%		1.09%				
9706D:C11789	ASPH	001	$1,847,458.50		0.47%	68.16%								9.20%		0.32%		12.68%		
9706D:C11854	SURF	004	$695,203.94		86.96%		0.17%							7.33%		0.40%				
9708D:C92903	GEN	003	$2,391,399.74		0.23%	24.87%		0.82%				0.75%	0.67%	8.93%	0.90%	0.87%				
9707A:C11334R	GEN	010	$303,982.00	0.19%	0.15%	29.33%	3.73%					1.76%	19.75%	11.51%	3.29%	0.71%				
9707A:C11387R	SGNL	009	$89,924.85						0.56%					7.45%	4.09%					
9707B:C11490	ASPH	001	$2,041,948.42			53.88%	4.50%	0.08%				0.34%	2.74%	2.84%	4.68%	0.70%				
9707B:C11653	ASPH	001	$1,818,724.85			82.75%	3.25%	0.22%						7.97%	4.40%	0.47%				
9707B:C11774R	PVMK	017	$521,500.00											1.92%						
9707C:C11701R	FNC	017	$155,990.00											6.04%		0.77%				
9707C:C11773	ASPH	012	$708,693.73		0.84%	30.75%							14.36%	7.21%	1.43%	3.78%				
9707C:C11784	ASPH	001	$2,143,814.16		0.09%	51.14%						1.72%	0.61%	7.04%		0.37%		26.39%		
9707C:C11789R	ASPH	001	$1,867,458.50		0.46%	67.43%								10.17%		0.32%		12.54%		
9707D:C11733	ASPH	010	$533,079.00		0.85%	53.05%	10.55%					1.05%	5.65%	8.07%	2.26%	1.42%				
9708A:C11949	SURF	017	$130,240.00																	
9708B:C11490R	ASPH	001	$2,126,308.82			46.21%	3.36%	0.08%				0.08%	3.45%	6.44%	5.79%	1.31%				
9708B:C11763	CONR	012	$3,558,041.90	0.30%	0.04%	7.57%	1.12%	3.21%		19.30%		4.90%	4.88%	4.22%	8.22%	2.01%				
9708C:C11285	GEN	012	$9,205,910.87	1.01%	0.04%	3.64%		4.61%		25.98%		8.83%	7.38%	6.52%	3.16%	2.21%				0.18%
9708D:C11323	CONR	012	$4,417,274.13	0.31%	0.01%	2.45%	0.95%	2.97%	0.12%	43.04%		6.91%	7.47%	5.45%	2.13%	0.76%				0.07%
9708D:C11383	STRC	003	$1,592,970.80	1.37%	0.68%	11.69%	2.04%	0.12%				0.31%	21.02%	10.86%	1.35%	1.79%				0.45%
9708D:C11534R	OTHR	004	$299,995.00											17.29%		82.71%				
9708D:C11798	SIGN	005	$167,249.44											36.17%						
9708D:C11863	GEN	013	$5,821,398.49	0.33%	0.08%	2.70%		0.24%		0.20%		3.08%	36.54%	9.83%	9.73%	0.39%				3.77%
9708D:C92414	STRC	003	$1,256,583.76	2.98%		11.83%	4.99%	0.25%	1.15%	0.08%		1.08%	11.08%	1.63%	1.38%	2.02%				
9709A:C11513	?	012	$4,451,015.79	1.21%	0.00%	0.65%	0.08%	3.37%	0.57%	5.28%		2.78%	5.80%	3.03%	8.72%	1.15%				0.24%

CDOT Contracts (1/1990-9/1997) - As-Bid Item Dollars Expressed as a Percentage of the Winning Bid Total by Item Classification.

	NEW	CDOT	Item Classification											Specialty Items						Total
CONTID	WORKTYPE	WORKTYPE	RMVB	RMVL	SLUR	STRC	SURF	TRAF	TUNL	WTMN	FNC	GDRL	LSCP	LTNG	PAIN	PVMK	SGNL	SIGN	SPEC	Spec.
9706D:C11266	STRC	012		0.60%		25.32%		6.33%	0.67%	0.89%	0.50%	2.24%	3.87%	1.80%		1.14%	0.57%	0.23%	1.65%	12.00%
9706D:C11785	ASPH	001						2.12%								2.41%				2.41%
9706D:C11789	ASPH	001						1.66%								7.51%				7.51%
9706D:C11854	SURF	004					22.95%	21.51%								11.26%				11.26%
9706D:C92903	GEN	003	5.99%	7.21%	0.55%	19.52%		9.02%				14.09%	0.09%	0.85%		2.21%	0.78%	1.80%	0.06%	19.68%
9707A:C11334R	GEN	010	0.48%	2.30%		7.11%		8.45%				5.26%	2.34%			1.65%		0.89%	1.11%	11.25%
9707A:C11387R	SGNL	009		2.28%				9.69%						13.85%		10.36%	51.46%	0.26%		75.93%
9707B:C11490	ASPH	001		4.76%		10.47%		7.32%		0.24%		0.24%		1.65%		1.55%	3.84%	0.08%	0.11%	7.45%
9707B:C11853	ASPH	001		0.94%																0.00%
9707B:C11774R	PVMK	017				17.26%		5.75%								75.07%				75.07%
9707C:C11701R	FNC	017		18.55%				0.26%			74.36%									74.36%
9707C:C11773	ASPH	012	3.46%	3.73%				91.99%			0.76%		0.47%			0.80%		0.59%		2.62%
9707C:C11784	ASPH	001		2.63%				2.65%		0.04%		1.87%		0.46%		4.67%		0.32%		7.32%
9707C:C11789R	ASPH	001						1.64%								7.43%				7.43%
9707D:C11733	ASPH	010		2.00%				7.23%			3.04%		1.31%			2.71%		0.59%	0.14%	7.79%
9708A:C11949	SURF	017					100.00%													0.00%
9708B:C11480R	ASPH	001		5.83%		11.39%		8.43%		0.05%		0.27%		1.68%		1.50%	4.18%	0.11%	0.07%	7.78%
9708B:C11783	CONR	012	0.11%	3.81%		7.39%		7.33%		1.10%	1.26%	1.79%	3.42%	0.96%		1.46%	2.58%	1.70%	11.23%	24.50%
9708C:C11265	GEN	012	0.11%	4.48%		7.57%		4.25%		2.31%	0.06%	2.80%	0.70%	6.03%		1.00%	3.58%	2.04%	1.53%	17.74%
9708D:C11323	CONR	012		4.55%		1.04%		10.79%		6.86%	0.35%		0.55%	1.59%		0.83%	0.08%	0.33%	0.41%	4.14%
9708D:C11393	STRC	003	2.76%	0.18%		36.23%		4.47%			0.68%	1.00%	0.82%	0.21%		0.19%		0.04%	0.04%	2.76%
9708D:C11534R	OTHR	004																		0.00%
9708D:C11798	SIGN	005						13.51%										50.31%		50.31%
9708D:C11863	GEN	013		1.08%		26.57%		2.07%			0.21%		2.06%	0.15%		0.10%		0.06%	12.61%	15.39%
9708D:C92414	STRC	003	0.88%	1.27%		45.91%		11.08%			0.44%		1.19%			0.94%		0.20%	0.26%	2.43%
9709A:C11513	?	012	0.29%	0.60%		22.23%		4.70%		2.48%	28.62%	0.48%	0.82%	0.52%		0.19%	0.11%	0.14%	8.00%	36.82%

Appendix G

BAMS/DSS Item Rank Model Output

AASHTO'S BAMS/DSS Statistical Analysis Models
Colorado Department of Transportation
Item Rank Analysis for ASPHALT Contracts using Proposed Item Classifications

TOTAL DOLLARS SPENT ON ITEMS IN EACH ITEM CLASS

460 ASPH CONTRACTS BETWEEN January 11, 1990 AND August 14, 1997

ITEM CLASS	DOLLARS	PERCENT
Asphalt	$335,394,090	60.4
Mobilization	$30,599,679	5.5
Traffic Control	$23,601,118	4.3
Removals	$21,414,481	3.9
Guardrail	$20,579,533	3.7
Earthwork	$20,494,129	3.7
Recycling	$16,448,110	3.0
Pavement Marking	$13,586,006	2.4
Base	$10,359,888	1.9
Structures	$10,177,995	1.8
Liquid Asphalt	$7,111,232	1.3
Drainage	$5,830,546	1.1
Other Lump Sums	$5,170,690	0.9
Other	$4,324,253	0.8
Signals	$4,133,103	0.7
Signing	$4,011,364	0.7
Specialty Work	$3,053,180	0.6
Curb, Gutters, and Sidewalks	$2,949,442	0.5
Concrete	$2,650,328	0.5
Landscaping	$2,351,367	0.4
Fencing	$2,337,964	0.4
Lighting	$2,262,258	0.4
Surface Treatment	$2,013,232	0.4
Removal of Bridges/Structures	$1,548,510	0.3
Riprap	$880,773	0.2
Water Mains	$826,064	0.1
Miscellaneous Aggregate	$780,108	0.1
Concrete Pavement Repair	$42,330	0.0
Clearing	$35,757	0.0
Non-bid Items	$23,044	0.0
Tunnels	$17,984	0.0
Slurry Materials	$17,755	0.0
Rest Area	$9,200	0.0
	$555,035,516	100

Note: Cancelled or rejected contracts are excluded.

AASHTO'S BAMS/DSS Statistical Analysis Models
Colorado Department of Transportation
Item Rank Analysis for CONCRETE Contracts
using Proposed Item Classifications

TOTAL DOLLARS SPENT ON ITEMS IN EACH ITEM CLASS

52 CONR CONTRACTS BETWEEN February 15, 1990 AND June 26, 1997

ITEM CLASS	DOLLARS	PERCENT
Concrete	$172,920,057	55.0
Earthwork	$25,378,099	8.1
Structures	$19,493,861	6.2
Mobilization	$18,482,758	5.9
Traffic Control	$13,144,292	4.2
Asphalt	$11,897,763	3.8
Other Lump Sums	$7,643,858	2.4
Drainage	$7,632,894	2.4
Removals	$5,749,656	1.8
Lighting	$3,945,799	1.3
Base	$3,823,893	1.2
Pavement Marking	$3,099,292	1.0
Guardrail	$3,076,400	1.0
Signing	$2,406,381	0.8
Landscaping	$2,294,696	0.7
Curb, Gutters, and Sidewalks	$2,121,187	0.7
Signals	$1,950,277	0.6
Other	$1,846,731	0.6
Fencing	$1,651,271	0.5
Water Mains	$1,375,597	0.4
Miscellaneous Aggregate	$1,247,736	0.4
Removal of Bridges/Structures	$920,449	0.3
Specialty Work	$756,102	0.2
Riprap	$658,948	0.2
Liquid Asphalt	$299,566	0.1
Clearing	$130,027	0.0
Surface Treatment	$115,650	0.0
Rest Area	$113,300	0.0
Tunnels	$60,198	0.0
Concrete Pavement Repair	$27,038	0.0
Non-bid Items	$67	0.0
	$314,263,842	100

Note: Cancelled or rejected contracts are excluded.

AASHTO'S BAMS/DSS Statistical Analysis Models
Colorado Department of Transportation
Item Rank Analysis for GENERAL CONSTRUCTION Contracts using Proposed Item Classifications

TOTAL DOLLARS SPENT ON ITEMS IN EACH ITEM CLASS

164 GEN CONTRACTS BETWEEN March 8, 1990 AND July 3, 1997

ITEM CLASS	DOLLARS	PERCENT
Earthwork	$56,016,185	14.5
Asphalt	$52,905,473	13.7
Structures	$44,656,854	11.5
Concrete	$44,487,740	11.5
Drainage	$22,363,142	5.8
Traffic Control	$21,717,426	5.6
Mobilization	$21,593,289	5.6
Other Lump Sums	$16,244,607	4.2
Guardrail	$10,945,199	2.8
Specialty Work	$10,715,616	2.8
Base	$10,146,634	2.6
Curb, Gutters, and Sidewalks	$9,023,193	2.3
Removals	$8,925,472	2.3
Landscaping	$8,008,063	2.1
Lighting	$7,698,065	2.0
Fencing	$7,046,590	1.8
Signing	$5,216,842	1.3
Other	$4,876,580	1.3
Miscellaneous Aggregate	$4,611,195	1.2
Signals	$4,350,702	1.1
Water Mains	$3,799,963	1.0
Pavement Marking	$3,332,117	0.9
Riprap	$2,869,862	0.7
Removal of Bridges/Structures	$1,431,218	0.4
Rest Area	$1,205,889	0.3
Tunnels	$1,101,598	0.3
Liquid Asphalt	$1,096,034	0.3
Recycling	$246,083	0.1
Clearing	$159,611	0.0
Non-bid Items	$67,789	0.0
Slurry Materials	$48,116	0.0
	$386,907,149	100

Note: Cancelled or rejected contracts are excluded.

Appendix H

Sample Project Description Data

Sample Project Description Data

CONTID	SEQNO	DESCRIPTION	New Work Type	CDOT Work Type
C91136	001	PROJECT I(CX) 70-2(186)	LSCP	012
	002	CONSISTING OF THE PROPOGATION OF NATIVE PLANT SPECIES FOR	LSCP	012
	003	PLANTING IN GLENWOOD CANYON, ALL PLANTS MUST BE PROPAGATED	LSCP	012
	004	FROM SEED, VEGETATIVE CUTTINGS OR TRANSPLANTED MATERIAL	LSCP	012
	005	ORIGINATING IN THE STATES OF COLORADO, IDAHO, UTAH, WYOMING,	LSCP	012
	006	NEW MEXICO OR MONTANA WITH THE PREFERRED AREA BEING IN	LSCP	012
	007	GLENWOOD CANYON, ALL SITUATED IN GARFIELD AND EAGLE COUNTIES	LSCP	012
	008	STATE OF COLORADO.	LSCP	012
C91138	001	PROJECT IRD(E) 25-2(242)	GEN	012
	002	LOCATED ON SH 25 BEGINNING AT APPROXIMATELY	GEN	012
	003	56TH AVE. AND EXTENDING APPROXIMATELY 1.3 MILES	GEN	012
	004	SOUTHERLY TO SOUTH OF 48TH AVE.	GEN	012
	005		GEN	012
	006	CONSISTING OF MAJOR WIDENING WHICH INCLUDES	GEN	012
	007	GRADING, TOPSOIL, SEEDING, MULCHING, LIME TREATED	GEN	012
	008	SUBGRADE, PLANT MIX BITUMINOUS BASE, AGGREGATE BASE	GEN	012
	009	COURSE, HOT BITUMINOUS PAVEMENT, CONCRETE PAVEMENT,	GEN	012
	010	RIPRAP, BRIDGE, RETAINING WALL, DRAINAGE, GUARD RAIL,	GEN	012
	011	FENCING, SIDEWALK, CURB AND GUTTER, IMPACT ATTENUATOR,	GEN	012
	012	SIGNING, AND STRIPING	GEN	012
C91144	001	PROJECT MR 7465(1)	GEN	010
	002	LOCATED ON 32 ROAD, BEGINNING AT THE INTERSECTION OF F-ROAD	GEN	010
	003	AND EXTENDING APPROXIMATELY 0.2467 MILES SOUTHERLY	GEN	010
	004		GEN	010
	005	CONSISTING OF MINOR WIDENING, RESURFACING, AND SIGNALIZATION	GEN	010
	006	WHICH INCLUDES CLEARING AND GRUBBING, GRADING, TOPSOIL,	GEN	010
	007	SODDING, AGGREGATE BASE COURSE, HOT BITUMINOUS PAVEMENT,	GEN	010
	008	STORM SEWER, SIDEWALK, CURB AND GUTTER, SIGNALIZATION, AND	GEN	010
	009	STRIPING	GEN	010
C91145	001	PROJECT FR(CX)014-2(24)	ASPH	020
	002		ASPH	020
	003	LOCATED ON SH 14 BEGINING AT MP 179.1, APPROXIMATELY 3 MILES	ASPH	020
	004	EAST OF BRIGGSDALE, AND EXTENDING EASTERLY APPROXIMATELY	ASPH	020
	005	14.2 MILES TO MP 193.3	ASPH	020
	006		ASPH	020
	007	CONSISTING OF RESURFACING WHICH INCLUDES HOT BITUMINOUS	ASPH	020
	008	PAVEMENT OVERLAY, COLD RECYCLE AND STRIPING	ASPH	020
C91147	001	PROJECT- BRO 0004(008)	STRC	003
	002	LOCATED IN EL PASO COUNTY ON SCOTT ROAD AT A CROSSING OF BIG	STRC	003
	003	SPRING CREEK APPROXIMATELY 500' WEST OF ELLICOTT HWY	STRC	003
	004	NORTHERLY TO JUDGE ORR ROAD.	STRC	003
	005		STRC	003
	006	CONSISTING OF REMOVAL OF EXISTING BRIDGE AND REPLACING WITH	STRC	003
	007	A NEW CULVERT BOX ON THE SAME ALIGNMENT. THIS INCLUDES	STRC	003
	008	CLEARING AND GRUBBING, AGGREGATE BASE COURSE, HBP,	STRC	003
	009	GUARDRAIL, FENCE, DRAINAGE AND CONCRETE.	STRC	003
C91150	001	PROJECT NO. MR-STM 7400 (18)	ASPH	001
	002	THE PROJECT SITES ARE LOCATED AT 5 LOCATIONS IN THE CITY OF	ASPH	001
	003	GRAND JUNCTION, COLORADO. TOTAL LENGTH OF THIS PROJECT IS	ASPH	001
	004	3.12 MILES.	ASPH	001
	005		ASPH	001
	006	CONSISTING OF RESURFACING WHICH INCLUDES: AGGREGATE BASE	ASPH	001
	007	COURSE AND HOT BITUMINOUS PAVEMENT.	ASPH	001
C91150R	001	PROJECT NO. MR-STM 7400 (18)	ASPH	001
	002	THE PROJECT SITES ARE LOCATED AT 5 LOCATIONS IN THE CITY OF	ASPH	001
	003	GRAND JUNCTION, COLORADO. TOTAL LENGTH OF THIS PROJECT IS	ASPH	001
	004	2.81 MILES.	ASPH	001
	005		ASPH	001
	006	CONSISTING OF RESURFACING WHICH INCLUDES: AGGREGATE BASE	ASPH	001
	007	COURSE AND HOT BITUMINOUS PAVEMENT.	ASPH	001
C91154	001	PROJECT MR 7807(1)	ASPH	012
	002	LOCATED IN THE CITY OF LAMAR ON 9TH STREET BEGINNING AT	ASPH	012
	003	SAVAGE AVE. AND EXTENDING NORTH FOR APPROXIMATELY 0.4 MILES.	ASPH	012
	004		ASPH	012

Sample Project Description Data

CONTID	SEQNO	DESCRIPTION	New Work Type	CDOT Work Type
C91154	005	CONSISTING OF SURFACING WHICH INCLUDES GRADING, SEEDING,	ASPH	012
	006	MULCHING, HOT BITUMINOUS PAVEMENT, CONCRETE PAVEMENT,	ASPH	012
	007	DRAINAGE, CURB AND GUTTER	ASPH	012
	008		ASPH	012
C91154R	001	PROJECT MR 7807(1)	ASPH	012
	002	LOCATED IN THE CITY OF LAMAR ON 9TH STREET, BEGINNING AT	ASPH	012
	003	SAVAGE AVENUE AND EXTENDING NORTH FOR APPROXIMATELY 0.4 MILE	ASPH	012
	004		ASPH	012
	005	CONSISTING OF SURFACING WHICH INCLUDES GRADING, SEEDING,	ASPH	012
	006	MULCHING, HOT BITUMINOUS PAVEMENT, CONCRETE PAVEMENT,	ASPH	012
	007	DRAINAGE, CURB AND GUTTER	ASPH	012
C91159	001	PROJECT BRO 0002(2)	STRC	003
	002	LOCATED ON PUEBLO COUNTY ROAD 501, GEGINNING APPROXIMATELY	STRC	003
	003	2.9 MILES NORTH OF S.H. 47 AND EXTENDS APPROXIMATELY 8.7	STRC	003
	004	MILES NORTHERLY.	STRC	003
	005		STRC	003
	006	CONSISTING OF BRIDGE REPLACEMENT AND RESURFACING WHICH	STRC	003
	007	INCLUDES: TOPSOIL, SEEDING, MULCHING, AGGREGATE BASE COURSE,	STRC	003
	008	HOT BITUMINOUS PAVEMENT, BRIDGE, CONCRETE BOX CULVERT,	STRC	003
	009	AND GUARD RAIL.	STRC	003
C91162	001	PROJECT FC NH(CX)CY 040-5(013) SUBACCOUNT 91162	CONR	012
	002		CONR	012
	003	LOCATED ON S.H. 40, BEGINNING AT THE INTERCHANGE WITH	CONR	012
	004	INTERSTATE 70, AND EXTENDING APPROXIMATELY 11 MILES	CONR	012
	005	SOUTHEASTERLY. CONSISTING OF RESURFACING WHICH INCLUDES	CONR	012
	006	CONCRETE OVERLAY, STRUCTURES, STRIPING, SIGNING, SEEDING	CONR	012
	007	AND MULCHING.	CONR	012
	008		CONR	012
	009	LOCATED ON S.H. 59, BEGINNING AT THE INTERSECTION WITH S.H.	CONR	012
	010	40 AND EXTENDING APPROXIMATELY 15 MILES NORTHERLY.	CONR	012
	011	CONSISTING OF RESURFACING WHICH INCLUDES HOT BITUMINOUS	CONR	012
	012	PAVEMENT OVERLAY, SEEDING, MULCHING AND STRIPING.	CONR	012
C91163	001	PROJECT FCU 024-3(039)	ASPH	013
	002	LOCATED ON S.H. 24 BEGINNING JUST WEST OF SHASTA DRIVE	ASPH	013
	003	AND CONTINUING TO THE EAST LEGS OF ACADEMY PARK LOOP.	ASPH	013
	004		ASPH	013
	005	CONSISTING OF: A PEDESTRIAN OVERPASS STRUCTURE,	ASPH	013
	006	RESURFACING, CURB AND GUTTER AND	ASPH	013
	007	SIDEWALK, SIGNALIZATION, SIGNING,	ASPH	013
	008	STRIPING, SEEDING AND MULCHING.	ASPH	013
C91164	001	PROJECT FC-STR-STA(CX)082-1(22)	STRC	012
	002	LOCATED ON SH 82 COMPLETING THE ADDITION OF 2 LANES	STRC	012
	003	THROUGH THE BASALT BYPASS FROM M.P. 21.0 TO 24.3	STRC	012
	004		STRC	012
	005	CONSISTING OF THE ADDITION OF 2 LANES WHICH	STRC	012
	006	INCLUDES GRADING, LANDSCAPING, AGGREGATE BASE COURSE,	STRC	012
	007	HOT BITUMINOUS PAVEMENT, MECHANICALLY STABILIZED	STRC	012
	008	EARTH WALL, DRAINAGE, CONCRETE BOX CULVERT, BRIDGE,	STRC	012
	009	FENCING, BIKEWAY, SIGNING, STRIPING.	STRC	012
C91170	001	COLORADO PROJECT NO. BRF 0287-1(20)	STRC	003
	002	LOCATED ON SH 287, BEGINNING APROXIMATELY 5.8 MI. N. OF	STRC	003
	003	SH 116 AND EXTENDING APPROXIMATELY 0.74 MILES NORTHERLY.	STRC	003
	004		STRC	003
	005	CONSISTING OF BRIDGE REPLACEMENT WHICH INCLUDES GRADING,	STRC	003
	006	TOPSOIL, SEEDING, MULCHING, HOT BITUMINOUS PAVEMENT,	STRC	003
	007	CONCRETE PAVEMENT, GUARD RAIL, BRIDGE, AND STRIPING.	STRC	003
	008		STRC	003
	009		STRC	003
C91173	001	PROJECT NO. MR 6813(1)	ASPH	017
	002	LOCATED ON SOUTH MARKET STREET BETWEEN FIRST AND	ASPH	017
	003	SEVENTH STREET; THIRD STREET BETWEEN CHESTNUT AND ASH	ASPH	017
	004	STREET; AND NORTH MARKET STREET BETWEEN MONTEZUMA AVENUE	ASPH	017
	005	AND EMPIRE STREET IN CORTEZ	ASPH	017
	006		ASPH	017

Sample Project Description Data

CONTID	SEQNO	DESCRIPTION	New Work Type	CDOT Work Type
C91173	007	CONSISTING OF RECONSTRUCTION WHICH INCLUDES HOT BITUMINOUS	ASPH	017
	008	PAVEMENT, PROCESS ASPHALT MAT FOR BASE COURSE	ASPH	017
C91174	001	PROJECT MR 5824(3)	OTHR	008
	002	LOCATED ON SOUTH BOULDER RD BEGINNING 1.25 MILES WEST OF THE	OTHR	008
	003	INTERSECTION AT SH 287 AND EXTENDING APPROXIMATELY 0.64	OTHR	008
	004	MILES EASTERLY	OTHR	008
	005		OTHR	008
	006		OTHR	008
	007	CONSISTING OF IMPROVEMENTS TO THE MEDIAN WHICH INCLUDES	OTHR	008
	008	EMBANKMENT, PATTERNED CONCRETE AND TOPSOIL	OTHR	008
C91300	001	PROJECT FC(CX) 285-4(046)	ERTH	012
	002	LOCATED ON SH 285 BEGINNING 0.3 MILES SOUTH/WEST OF SOUTH	ERTH	012
	003	TURKEY CREEK ROAD AND EXTENDING 0.9 MILES NORTH TO 0.3 MILES	ERTH	012
	004	NORTH/EAST OF PARMALEE GULCH ROAD	ERTH	012
	005		ERTH	012
	006	CONSISTING OF RECONSTRUCTION WHICH INCLUDES CLEARING AND	ERTH	012
	007	GRUBBING, REMOVAL OF CURB AND GUTTER, GRADING, LANDSCAPING,	ERTH	012
	008	AGGREGATE BASE COURSE, HOT BITUMINOUS AND CONCRETE PAVEMENT,	ERTH	012
	009	BRIDGE, CONCRETE BOX CULVERT, RETAINING WALLS, DRAINAGE,	ERTH	012
	010	GUARD RAIL, BRIDGE RAIL, FENCING, IMPACT ATTENUATOR AND	ERTH	012
	011	STRIPING.	ERTH	012
C91303	001	PROJECT NO. STA-STE-NH(CX) 024-3(41)	CONR	013
	002	LOCATED ON SH 24 BEGINNING AT FOUNTAIN BLVD. IN	CONR	013
	003	COLORADO SPRINGS AND EXTENDING APPROXIMATELY 1.8 MILES	CONR	013
	004	NORTHERLY	CONR	013
	005	CONSISTING OF GRADING, STRUCTURES, CONCRETE, PAVING,	CONR	013
	006	SIGNING, STRIPING AND UTILITIES.	CONR	013
C91306	001	PROJECT NH(CX)-CY 0115-1(5)	CONR	005
	002	LOCATED ON SH 115, BEGINNING AT SH 50(M.P. 14.00) AND	CONR	005
	003	EXTENDING NORTHERLY THROUGH PENROSE FOR APPROXIMATELY 4	CONR	005
	004	MILES.	CONR	005
	005		CONR	005
	006	CONSISTING OF RECONSTRUCTION AND MAJOR WIDENING WHICH	CONR	005
	007	INCLUDES CLEARING AND GRUBBING, GRADING, TOPSOIL, SEEDING,	CONR	005
	008	MULCHING, AGGREGATE BASE COURSE, HOT BITUMINOUS PAVEMENT,	CONR	005
	009	CONCRETE PAVEMENT, CONCRETE BOX CULVERT, DRAINAGE,	CONR	005
	010	GUARDRAIL, FENCING, CURB AND GUTTER, LIGHTING, WATERLINES,	CONR	005
	011	SIGNING AND STRIPING.	CONR	005
C91308	001	PROJECT CY 99-3000-20	ASPH	001
	002	LOCATED ON S.H. 82 IN GLENWOOD SPRINGS BEGINNING AT THE	ASPH	001
	003	INTERSECTION OF 6TH ST. AND EXTENDING APPROXIMATELY 1.4	ASPH	001
	004	MILES SOUTH, AND IN ASPEN BEGINNING AT THE EAST END OF THE	ASPH	001
	005	CASTLE CREEK BRIDGE AND EXTENDING APPROXIMATELY 1.53 MILES	ASPH	001
	006	SOUTHEASTERLY TO THE WEST END OF THE ROARING FORK BRIDGE.	ASPH	001
	007		ASPH	001
	008		ASPH	001
	009	CONSISTING OF RESURFACING WHICH INCLUDES PLANING, HOT	ASPH	001
	010	BITUMINOUS PAVEMENT, PLANT MIXED SEAL COAT AND STRIPING.	ASPH	001
C91308R	001	PROJECT CY 99-3000-20	ASPH	001
	002	LOCATED ON S.H. 82 IN GLENWOOD SPRINGS BEGINNING AT THE	ASPH	001
	003	INTERSECTION OF 6TH ST. AND EXTENDING APPROXIMATELY 1.4	ASPH	001
	004	MILES SOUTH, AND IN ASPEN BEGINNING AT THE EAST END OF THE	ASPH	001
	005	CASTLE CREEK BRIDGE AND EXTENDING APPROXIMATELY 1.53 MILES	ASPH	001
	006	SOUTHEASTERLY TO THE WEST END OF THE ROARING FORK BRIDGE.	ASPH	001
	007		ASPH	001
	008	CONSISTING OF RESURFACING WHICH INCLUDES PLANING, HOT	ASPH	001
	009	BITUMINOUS PAVEMENT AND STRIPING.	ASPH	001

Appendix I

Interim Solution for Long-Range Cost Estimation

Instructions for Long-Range Project Cost Estimation Using Historical Bid-Based Default Prices (HBBDP)

These instructions are intended to assist Colorado Department of Transportation (CDOT) Planners and Estimators when using the Historical Bid-Based Default Prices (HBBDP) table for the purposes of long-range project cost estimation. This package contains the following sections:

HBBDP Table

As the name implies, the HBBDP have been statistically derived from CDOT road construction bids in the past in order to project prices in the future. The HBBDP are grouped according to Statewide Planning work type[1]. Where sufficient data existed, the HBBDP are also broken down by terrain type within the Statewide Planning work type. Except where noted, the Unit Price is based on a unit of MILE.

Estimation Steps

The following steps will help you use the HBBDP table to calculate your project's long-range cost estimate. A Worksheet for long-range cost estimation using HBBDP is also provided.

1. Using the Statewide Planning work type definitions on the following pages, determine the appropriate work type(s) that corresponds to the projected work.[2]

2. Based on the location of the work, determine the project's terrain type(s) [A – all, M – mountainous, P – plains, R – rolling, U – urban] for each work type involved.[2]

3. In the HBBDP table, locate the Unit Price which corresponds to each work type/terrain type combination. If no price exists for this terrain type, use the Unit Price for terrain type A – all.

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[1] The current default prices exist in CDOT's Statewide Planning database according to work type classifications. These classifications are described on the following pages.

[2] To the extent possible, where a potentially large job can be broken down into separate work and terrain types (consistent with the Statewide Planning work type descriptions), the long-range estimate can be improved by estimating each portion separately.

4. At this point, having determined the Statewide Planning work type(s) and terrain type(s) and the corresponding Unit Price(s), calculate the estimated cost for each work type/terrain type combination by multiplying the Unit Price by the length of the projected work in miles for that portion of the project. If a unit of EACH is used instead, multiply the Unit Price by the number of occurrences in the projected work.

   The HBBDP table also lists the 25th and 75th Unit Price percentiles. If you are not comfortable with the calculated Unit Price, these numbers will help you adjust the final Unit Price according to your project's complexity and your own experience and instincts.

   If applicable, add the estimated costs for each portion of the project.

5. Finally, add non-construction costs such as PE, CE, ROW (described below under Assumptions).

Examples

1. A project consisting of reconstruction in rolling terrain, 6 miles in length:

   From the HBBDP table, select the Unit Price for Reconstruction (103)/terrain type R ($1,167,000) and multiply by the number of miles in the project (6).

   $1,167,000 x 6 = $7,002,000.

   Add non-construction costs to arrive at a final project estimate.

2. A project consisting of new construction in mountainous terrain, 8.3 miles in length, that also includes a rest area:

   From the HBBDP table, select the Unit Price for New Construction (119)/terrain type M ($2,384,000), multiply by the number of miles in the project (8.3), and add the cost for one rest area ($2,253,000).

   ($2,384,000 x 8.3) + $2,253,000 = $22,044,200.

   Add non-construction costs to arrive at a final project estimate.

3. A project consisting of added capacity in rolling terrain, 23 miles in length, and including improvements to a diamond interchange, and construction of a new cloverleaf interchange:

   From the HBBDP table, select the Unit Price for Capacity (101)/terrain type R ($2,307,000) and multiply by the number of miles for that terrain type (23). Then add in the cost for the two interchanges. For the diamond interchange, select the Unit Price for Improve Typical Interchange (108a)/terrain type A ($7,349,000). For the cloverleaf interchange, select the Unit Price for New Complex Interchange (107b)/ terrain type A ($20,115,000).

   ($2,307,000 x 23) + ($7,349,000 x 1) + ($20,115,000 x 1) = $80,525,000.

   Add non-construction costs to arrive at a final project estimate.

Samples of completed Worksheets, based on these examples, are also provided with these instructions.

Assumptions

The HBBDP do not take into account the following cost factors: Preliminary Engineering (PE); Construction Engineering (CE); Right-of-Way (ROW); or Force Accounts (FA). Guideline average percentages for these non-construction costs are the following:

PE	17%
CE	12%
ROW	____
FA	____

To arrive at a final cost estimate, all of these factors that apply to the project will need to be included in the estimate as a percentage of the construction costs.

CDOT Statewide Planning Work Type Classifications

The following work type classifications are the classifications that are currently defined in the CDOT Statewide Planning database and are used for long-range project estimation. In order to simplify the currently on-going project estimation procedures, this temporary estimation solution is based upon the same set of work types. Definitions for work type classifications are documented in alphabetical order following the list below.

BIKE PATH with STRUCTURE (202a)
BIKE PATH without STRUCTURE (202)
CAPACITY (101)
DRAINAGE or EROSION CONTROL (117)
GEOMETRICS (102)
GRADE SEPARATION (112)
GUARDRAIL (115)
IMPROVE INTERCHANGE (108)
IMPROVE INTERSECTION (114)
NEW HOV or BUS LANES (118)
NEW INTERCHANGE (107)
NEW CONSTRUCTION (119)
PASSING LANES (106)
PEDESTRIAN PATH with STRUCTURE (201a)
PEDESTRIAN PATH without STRUCTURE (201)
RECONSTRUCTION (103)
REST AREA (110)
TRUCK ESCAPE (109)

BIKE PATH with STRUCTURE (202a)

A bike path trail with structure may require the clearing and construction of a bike path facility, but is not incidental curb/gutter and sidewalk construction that relates to an overall general construction project. In addition, this type of construction involves the provision of a related overpass or underpass structure. Such construction may consist in part of the over/under pass structure and related grading, spreading of aggregate, asphalt, or concrete walkway, as well as the provision of incidental drainage structures, lighting, landscaping, access ramps, and other related amenities.

Frequently, bike trails will be part of a related pedestrian path.

BIKE PATH without STRUCTURE (202)

A bike path without structure may require the clearing and construction of a bike path facility, but is not incidental curb/gutter and sidewalk construction that relates to an overall general construction project. This type of construction does not include the provision of a related overpass or underpass structure. Such construction may consist in whole or in part of grading, spreading of aggregate, asphalt, or concrete walkway, as well as the provision of incidental drainage structures, lighting, landscaping, access ramps, and other related amenities.

It may also or only involve pavement marking of an existing roadway facility.

Frequently, bike trails will be part of a related pedestrian path.

CAPACITY (101)

The "Capacity" classification involves projects, the primary purpose of which is to add through capacity of one or more lanes that are not HOV or bus lanes. This classification does not include passing lane projects because these are not through lanes. "Capacity" projects may include the addition of through lanes that proceed through intersections. In such cases the proper classification of the project would be "capacity" rather than "intersection improvement". Although "capacity" includes the addition of through lanes on interstate projects as well as, conceptually, the addition of a single lane to a state road, most of the data used would involve at least the addition of two lanes.

For Reference:
CDOT Trns•port Related Work Type Definitions

Major Widening – the addition of lanes or dualization of an existing facility where the existing pavement is salvaged. Also included, where necessary, is the resurfacing of the existing pavement and other incidental improvements such as drainage and shoulder improvements.

Reconstruction – involves construction on the approximate alignment of an existing route where the old pavement structure is substantially removed and replaced. Such reconstruction may be to the existing number of lanes or may include widening to provide continuous additional through lanes.

DRAINAGE or EROSION CONTROL (117)

Drainage or erosion control projects are those involving primarily the non-incidental improvement to drainage or erosion control. Drainage projects may include the installation/rebuilding of box culverts, ditches, inlets, gutters, and/or piping structures. Erosion control may include the installation of rip rap, wire mesh netting, construction of sediment ponds, slope stabilization, retaining walls, etc.

GEOMETRICS (102)

The classification Geometrics and safety involves construction on the approximate alignment of an existing route to rectify unsafe road conditions including narrow lanes and shoulders, as well as unsafe curve radii and road cambers. It may require the removal of the old pavement structure and its substantial replacement. It typically will involve upgrading of unsafe features by reworking, stabilizing and strengthening of the base or sub-base as well as a surface overlay of paving material. It may also include widening the lanes and/or shoulders without adding through lanes. It may include incidental improvements including drainage improvements and traffic markings.

For Reference:
CDOT Trns•port Related Work Type Definitions

Restoration/Rehabilitation – involves the work to return the existing pavement (including shoulders) to a condition of adequate structural support. It may require some upgrading of unsafe features or other incidental work in conjunction with restoration/rehab. Typical improvements include pavement stabilization, reworking, or strengthening of the base or sub-base.

Minor widening – involves widening the lanes and/or shoulders of an existing facility without adding through lanes. The work may include resurfacing and other incidental improvements (shoulders/drainage improvements).

Reconstruction – involves construction on the approximate alignment of an existing route where the old pavement structure is substantially removed and replaced. Such reconstruction may be to the existing number of lanes or may include widening to provide continuous additional through lanes.

GRADE SEPARATION (112)

Grade Separation involves reconstruction on the approximate alignment of an existing route of a dual grade intersection of a highway and a railroad where the old pavement structure and intersection is removed and replaced.

GUARDRAIL (115)

Guardrail refers to the non-incidental installation of guardrail upon an existing facility. Installation of guardrail should be the primary activity related to contracts of this classification.

IMPROVE INTERCHANGE (108)

Improve Interchange includes the reconstruction or widening of an existing interchange. The project will be of varying complexity and widely varying cost depending on the nature and location of the conjoining roadways and the nature of the improvement.

For added accuracy, these projects have been analyzed in terms of "typical" interchange improvements and "complex" interchange improvements. However, there can be a wide variation of pricing even within these two sub-classifications. **Improve Typical Interchange (108a)** projects include data related to improvements made to "diamond" and "at-grade" interchanges. The **Improve Complex Interchange (108b)** classification includes improvements made to cloverleaf interchanges and interchanges at the junction of two interstate highways, and the like.

IMPROVE INTERSECTION (114)

Improve Intersection includes the minor reconstruction or minor widening of an existing intersection. It also includes non-incidental improvements to the signing and signalization at the intersection. Due to the broad nature and varying costs of these two general classifications, as well as the complexity dependent upon the number of lanes involved, reference and adjustments should be made according to the default price percentiles in the table accompanying this document.

NEW HOV or BUS LANES (118)

New HOV or Bus Lanes refers to the addition of lanes (capacity) to an existing facility for the purpose of facilitating traffic flow. Such construction may also require the incidental modification/widening of bridge or overpass/underpass structures, as well as the modification of on/off ramps, as well as incidental pavement markings and signing.

NEW INTERCHANGE (107)

New Interchange involves the construction of a new facility or structure that allows the junction of highways, usually on different levels – thereby permitting traffic to move from one to another without crossing traffic streams. The facility will be of varying complexity and widely varying cost depending on the nature and location of the conjoining roadways. The facility construction includes the connected entrance and exit ramps.

For added accuracy, these projects have been analyzed in terms of the construction of a "typical" interchange and a "complex" interchange. However, there can be a wide variation of pricing even within these two sub-classifications. **New Typical Interchange (107a)** projects include data related to construction of "diamond" and "at-grade" interchanges. The **New Complex Interchange (107b)** classification includes construction of cloverleaf interchanges and interchanges at the junction of two interstate highways, and the like.

NEW CONSTRUCTION (119)

New Construction consists of the construction of a new facility that does not replace or relocate an existing facility. The new facility will provide (a) a facility where none previously existed, or (b) an additional and alternate facility to an existing facility that will remain open and continue to serve through traffic. Construction of the new roadway will include all the usual accoutrements including clearing, grubbing, grading, earth work, base work, an overlay of bituminous or concrete pavement, incidental: drainage structures (including culverts), lighting, signing, pavement marking, landscaping, etc.

New Construction also consists of construction of a facility on a new location that replaces an existing route. The new facility carries all the through traffic with the previous facility being closed or retained as a land service road only.

PASSING LANES (106)

Passing Lanes involves the widening of an existing facility to add an intermittent lane that is not a through lane. The construction in all likelihood will involve the resurfacing of the existing pavement, and may include other incidental improvements to the shoulders, drainage facilities, and pavement markings.

For Reference:
CDOT Trns•port Related Work Type Definitions

Minor widening – involves widening the lanes and/or shoulders of an existing facility without adding through lanes. The work may include resurfacing and other incidental improvements (shoulders/drainage improvements).

Major Widening – the addition of lanes or dualization of an existing facility where the existing pavement is salvaged. Also included, where necessary, is the resurfacing of the existing pavement and other incidental improvements such as drainage and shoulder improvements.

Reconstruction – involves construction on the approximate alignment of an existing route where the old pavement structure is substantially removed and replaced. Such reconstruction may be to the existing number of lanes or may include widening to provide continuous additional through lanes.

PEDESTRIAN PATH with STRUCTURE (201a)

A pedestrian path with structure may require the clearing and construction of a pedestrian facility, but is not incidental curb/gutter and sidewalk construction that relates to an overall general construction project. In addition, this construction type involves the provision of a related overpass or underpass structure. Such construction may consist in part of the over/under pass structure and related grading, spreading of aggregate, asphalt, or concrete walkway, as well as the provision of incidental drainage structures, lighting, landscaping, access ramps, and other related amenities.

Frequently, pedestrian paths will be part of a related bikeway path.

PEDESTRIAN PATH without STRUCTURE (201)

A pedestrian path without structure may require the clearing and construction of a pedestrian facility, but is not incidental curb/gutter and sidewalk construction that relates to an overall general construction project. This construction type does not include the provision of a related overpass or underpass structure. Such construction may consist in whole or in part of grading, spreading of aggregate, asphalt, or concrete walkway, as well as the provision of incidental drainage structures, lighting, landscaping, access ramps, and other related amenities.

Frequently, pedestrian paths will be part of a related bikeway path.

RECONSTRUCTION (103)

Reconstruction involves construction on the approximate alignment of an existing route where the old pavement structure is substantially removed and replaced. Such reconstruction may be to the existing number of lanes or may include widening to provide continuous additional through lane(s) or dualizing, adding or revising interchanges, replacing other highway elements or otherwise improving the existing facility without changing the basic character of the facility.

REST AREA (110)

Rest Area includes the building of a new rest area facility including all related fixtures and accoutrements. This classification may also be used if the facility is being substantially reconstructed.

TRUCK ESCAPE (109)

Truck Escape includes the construction of a short (usually less than ¼ mile in length) ramp of earthen material, aggregate, and perhaps a cover of asphalt roadway, at a steep incline. The purpose of the construction is to provide a means of escape should a vehicle's brakes fail during the traverse of a prolonged descent in roadway elevation (decline). Substantial non-incidental application of guardrail and or impact attenuators may be constructed as a part of the project.

HISTORICAL BID-BASED DEFAULT PRICES (HBBDP) TABLE

Statewide Planning Type	Description	Terrain* Type	Unit	HBBDP Unit Price**	Price Range 25th %tile	Price Range 75th %tile	Statewide Planning Default Price
101	Capacity	A	Mile	2,878,000	1,338,000	5,225,000	
101	Capacity	M	Mile	3,882,000	722,000	6,006,000	3,000,000
101	Capacity	P	Mile	1,720,000	927,000	2,471,000	2,000,000
101	Capacity	R	Mile	2,307,000	1,666,000	2,622,000	2,500,000
101	Capacity	U	Mile	4,190,000	1,816,000	8,572,000	4,500,000
102	Geometrics	A	Mile	909,000	516,000	1,952,000	
102	Geometrics	M	Mile	1,063,000	361,000	1,972,000	750,000
102	Geometrics	P	Mile	297,000	334,000	520,000	425,000
102	Geometrics	R	Mile	703,000	531,000	1,061,000	500,000
102	Geometrics	U	Mile	2,651,000	744,000	2,389,000	1,000,000
103	Reconstruction	A	Mile	2,191,000	944,000	3,859,000	
103	Reconstruction	M	Mile	1,485,000	804,000	1,972,000	3,000,000
103	Reconstruction	P	Mile	2,945,000	1,899,000	3,483,000	1,500,000
103	Reconstruction	R	Mile	1,167,000	755,000	2,680,000	2,000,000
103	Reconstruction	U	Mile	3,426,000	1,322,000	5,365,000	3,300,000
106	Passing Lanes	A	Mile	986,000	479,000	1,248,000	
106	Passing Lanes	M	Mile	858,000	538,000	880,000	850,000
106	Passing Lanes	P	Mile	796,000	334,000	894,000	500,000
106	Passing Lanes	R	Mile	793,000	453,000	1,049,000	550,000
106	Passing Lanes	U	Mile	1,318,000	666,000	4,662,000	1,200,000
107a	New Typical Interchange	A	Each	4,815,000	1,857,000	5,786,000	10,000,000
107b	New Complex Interchange	A	Each	20,115,000	14,923,000	26,689,000	10,000,000
108a	ImproveTypical Interchange	A	Each	7,349,000	1,386,000	12,593,000	2,000,000
108b	Improve Complex Interchange	A	Each	19,830,000	7,541,000	39,469,000	2,000,000
109	Truck Escape	A	Each	982,000	370,000	1,288,000	750,000
110	Rest Area	A	Each	2,253,000	364,000	3,610,000	3,000,000
112	Grade Separation	A	Each	4,293,000	1,591,000	7,965,000	2,000,000
114	Improve Intersection	A	Each	863,000	200,000	749,000	450,000
115	Guardrail	A	Mile	277,000	108,000	522,000	200,000
115	Guardrail	M	Mile	327,000	108,000	522,000	
117	Drainage or Erosion Cntl	A	Mile	611,000	425,000	2,257,000	1,300,000
117	Drainage or Erosion Cntl	M	Mile	402,000	390,000	798,000	
118	New HOV or Bus Lanes	A	Mile	3,086,000	1,146,000	5,939,000	
118	New HOV or Bus Lanes	M	Mile	3,206,000	538,000	6,006,000	2,700,000
118	New HOV or Bus Lanes	R	Mile	1,349,000	1,349,000	1,349,000	2,200,000
118	New HOV or Bus Lanes	U	Mile	3,467,000	1,675,000	7,370,000	4,500,000
119	New Construction	A	Mile	3,231,000	1,761,000	6,006,000	
119	New Construction	M	Mile	2,384,000	269,000	6,238,000	3,000,000
119	New Construction	P	Mile	942,000	216,000	1,991,000	2,000,000
119	New Construction	R	Mile	2,460,000	1,761,000	3,040,000	2,200,000
119	New Construction	U	Mile	4,492,000	2,638,000	8,572,000	4,800,000
201	Pedestrian w/o Structure	A	Mile	197,000	102,000	433,000	100,000
201	Pedestrian w/o Structure	U	Mile	187,000	102,000	488,000	
201a	Pedestrian w/Structure	A	Mile	3,255,000	3,117,000	3,687,000	
201a	Pedestrian w/Structure	U	Mile	3,389,000	3,174,000	3,687,000	
202	Bike Path w/o Structure	A	Mile	203,000	136,000	433,000	150,000
202	Bike Path w/o Structure	U	Mile	199,000	165,000	453,000	
202a	Bike Path w/Structure	A	Mile	3,255,000	3,117,000	3,687,000	
202a	Bike Path w/Structure	U	Mile	3,389,000	3,174,000	3,687,000	

* Terrain: A - All, M - Mountain, P - Plains, R - Rolling, U - Urban.

** Adjusted to 1997 dollars.

WORKSHEET FOR LONG-RANGE COST ESTIMATION
Using Historical Bid-Based Default Prices

A. Project Description and Location:

_____

_____

_____

_____

_____

_____

B. Determine the appropriate Statewide Planning work type(s) for the project.

Statewide Planning Work Type: 1. _____ 2. _____ 3. _____

C. Determine the appropriate terrain type(s) for each work type (A-All, M-Mountain, P-Plains, R-Rolling, U-Urban).

Terrain Type: 1. _____ 2. _____ 3. _____

D. Select the Unit Price from the HBBDP table for each work type/terrain type combination in the project. (If none exists, use the Unit Price for terrain type A).

HBBDP Unit Price: 1. _____ 2. _____ 3. _____

E. Enter the number of units for each work type/terrain type combination in the project (miles or occurrences).

Number of Units: 1. _____ 2. _____ 3. _____

F. Multiply the HBBDP Unit Price by the Number of Units for each work type/terrain type combination in the project.

Estimated Cost: 1. _____ 2. _____ 3. _____

G. Aggregate the estimated costs for each work type/terrain type combination in the project.

Estimated Construction Cost: _____

H. Add applicable non-construction costs.

Preliminary Engineering (17% of construction cost): _____

Construction Engineering (12% of construction cost): _____

Right-of Way (___% of construction cost): _____

Force Accounts (___% of construction cost): _____

Estimated Non-Construction Cost: _____

I. **PROJECT ESTIMATE:** _____

WORKSHEET FOR LONG-RANGE COST ESTIMATION
Using Historical Bid-Based Default Prices

A. Project Description and Location:

Example 1: A project consisting of reconstruction in rolling terrain, 6 miles in length.

B. Determine the appropriate Statewide Planning work type(s) for the project.

Statewide Planning Work Type: 1. 103 2. _____ 3. _____

C. Determine the appropriate terrain type(s) for each work type (A-All, M-Mountain, P-Plains, R-Rolling, U-Urban).

Terrain Type: 1. R 2. _____ 3. _____

D. Select the Unit Price from the HBBDP table for each work type/terrain type combination in the project. (If none exists, use the Unit Price for terrain type A).

HBBDP Unit Price: 1. $1,167,000 2. _____ 3. _____

E. Enter the number of units for each work type/terrain type combination in the project (miles or occurrences).

Number of Units: 1. 6.0 2. _____ 3. _____

F. Multiply the HBBDP Unit Price by the Number of Units for each work type/terrain type combination in the project.

Estimated Cost: 1. $7,002,000 2. _____ 3. _____

G. Aggregate the estimated costs for each work type/terrain type combination in the project.

Estimated Construction Cost: $7,002,000

H. Add applicable non-construction costs.

Preliminary Engineering (17% of construction cost): $1,190,340

Construction Engineering (12% of construction cost): $840,240

Right-of Way (___% of construction cost): _____

Force Accounts (___% of construction cost): _____

Estimated Non-Construction Cost: $2,030,580

I. **PROJECT ESTIMATE:** $9,032,580

WORKSHEET FOR LONG-RANGE COST ESTIMATION
Using Historical Bid-Based Default Prices

A. Project Description and Location:

Example 2: A project consisting of new construction in mountainous terrain, 8.3 miles in length, that also includes a rest area.

B. Determine the appropriate Statewide Planning work type(s) for the project.

Statewide Planning Work Type:	1. 119	2. 110	3.

C. Determine the appropriate terrain type(s) for each work type (A-All, M-Mountain, P-Plains, R-Rolling, U-Urban).

Terrain Type:	1. M	2. A	3.

D. Select the Unit Price from the HBBDP table for each work type/terrain type combination in the project. (If none exists, use the Unit Price for terrain type A).

HBBDP Unit Price:	1. $2,384,000	2. $2,253,000	3.

E. Enter the number of units for each work type/terrain type combination in the project (miles or occurrences).

Number of Units:	1. 8.3	2. 1.0	3.

F. Multiply the HBBDP Unit Price by the Number of Units for each work type/terrain type combination in the project.

Estimated Cost:	1. $19,787,200	2. $2,253,000	3.

G. Aggregate the estimated costs for each work type/terrain type combination in the project.

Estimated Construction Cost:	$22,040,200

H. Add applicable non-construction costs.

Preliminary Engineering (17% of construction cost):	$3,746,834
Construction Engineering (12% of construction cost):	$2,644,824
Right-of Way (___% of construction cost):	
Force Accounts (___% of construction cost):	
Estimated Non-Construction Cost:	$6,391,658

I. **PROJECT ESTIMATE:** $28,431,858

WORKSHEET FOR LONG-RANGE COST ESTIMATION
Using Historical Bid-Based Default Prices

A. Project Description and Location:

Example 3: A project consisting of added capacity in rolling terrain, 23 miles in length, improvements to a diamond interchange, and construction of a new cloverleaf interchange.

B. Determine the appropriate Statewide Planning work type(s) for the project.

Statewide Planning Work Type:	1. 101	2. 108a	3. 107b

C. Determine the appropriate terrain type(s) for each work type (A-All, M-Mountain, P-Plains, R-Rolling, U-Urban).

Terrain Type:	1. R	2. A	3. A

D. Select the Unit Price from the HBBDP table for each work type/terrain type combination in the project. (If none exists, use the Unit Price for terrain type A).

HBBDP Unit Price:	1. $2,307,000	2. $7,349,000	3. $20,115,000

E. Enter the number of units for each work type/terrain type combination in the project (miles or occurrences).

Number of Units:	1. 23.0	2. 1.0	3. 1.0

F. Multiply the HBBDP Unit Price by the Number of Units for each work type/terrain type combination in the project.

Estimated Cost:	1. $53,061,000	2. $7,349,000	3. $20,115,000

G. Aggregate the estimated costs for each work type/terrain type combination in the project.

Estimated Construction Cost:	$80,525,000

H. Add applicable non-construction costs.

Preliminary Engineering (17% of construction cost):	$13,689,250
Construction Engineering (12% of construction cost):	$9,663,000
Right-of Way (___% of construction cost):	
Force Accounts (___% of construction cost):	
Estimated Non-Construction Cost:	$23,352,250

I. **PROJECT ESTIMATE:** $103,877,250

Appendix J

National Transit Data

The National Transit Database (NTD) is the Federal Transit Administration's (FTA) national database of statistics for the transit industry. The NTD is the repository for financial and operating data reported to the FTA by the nation's mass transit agencies. All applicants and direct beneficiaries of Federal assistance under 49 USC 5307 (formerly Section 9 of the Federal Transit Act, as amended) are subject to the reporting requirements. The full database for the 1997 Report Year is comprised of 476 individual reporters.

The NTD Reporting System has evolved from cooperative government and industry efforts that began in the late 1970s. Each year, FTA publishes a *National Transit Database Annual Report*. The following information is abstracted from the *1997 Annual Report*, which consists of three publications:

- *1997 National Transit Summaries and Trends*
- *1997 Transit Profiles*
- *1997 Data Tables*

The *1997 National Transit Summaries and Trends* (NTST) provides an overview of the nation's mass transit industry. The NTST highlights the aggregate financial and operational characteristics and trends of mass transit for the five-year period from 1993 to 1997. It provides a national transit profile for 1997, followed by chapters on capital funding; operating funding and expenses; service supplied and consumed; safety and security; and reliability and maintenance. In particular, the Capital Funding chapter begins with a review of the sources of capital funding (Federal/State/Local), then discusses the uses of capital funds by transit mode and category of use. Data on transit infrastructure and other variables directly affected by capital investments are also presented.

Capital investment in transit infrastructure expansion and rehabilitation increased by 10% in 1997 compared to 1996, with $7.6 billion invested in capital projects nationwide. Urbanized areas with a population of more than one million inhabitants accounted for nearly $6.9 billion, or 90.5% of the 1997 capital investment. This was due to the substantial number of fixed guideway systems in place, or being developed, in large metropolitan areas. These systems require large fleets of vehicles to accommodate passenger needs, in addition to maintaining significant capital assets, such as sophisticated signaling systems and maintenance facilities.

Uses of transit capital funds in 1997 are identified by mode and category of use in Table J-1. In the aggregate, rolling stock represented 29.3% of capital expenditures while facilities and other represented 70.7%. Rail modes consumed the majority of capital expenditures, with Heavy Rail, Commuter Rail and Light Rail expending 66% of the capital investment in 1997.

Table J-2 reflects the amount of fixed guideway segment miles by mode for 1993 to 1997 and shows a continuing investment in the development and operation of fixed guideway systems. This investment is most prominent for Bus, which has increased fixed

guideway segment miles by 36.7% since 1993. Heavy Rail had an increase of 5.2% for the 1993-1997 time frame. Commuter Rail had an increase of 8.8% from 1993 to 1997. The increase in Light Rail is more noticeable, at 22.5%, which is due in part to new starts during this period.

The NTST also includes a chapter on Key Modal Characteristics and Uses of Capital by Transit Agencies. This chapter provides 1997 data on operations, performance, infrastructure, and uses of capital for the fifteen largest Bus and Demand Response transit agencies and for all transit agencies operating Heavy Rail, Commuter Rail, Light Rail, Trolleybus, Ferryboat, and Automated Guideway systems.

The fifteen Bus agencies listed in Tables J-3 and J-4 are those with the largest number of vehicles operated in maximum service, which includes Denver-RTD. Table J-3 indicates that the majority of the fifteen agencies have at least some exclusive or shared rights-of-way for their Bus operations, with ten of the systems having more than 20 directional route miles of such rights-of-way. These fifteen agencies accounted for over 40% of the buses operated in maximum service. Table J-4 provides capital investment information for these Bus operators. Together these agencies accounted for 47.3% of the national total capital expenditures for Bus, and for 53.7% of the national total for Facilities and Other capital investments, in 1997. Of the fifteen transit agencies, ten had more Facilities and Other capital expenditures in 1997 than Denver-RTD. These agencies, in particular, represent a potential source of historical cost data for Bus-related systems.

Table J-5 provides infrastructure data for all Light Rail operators, 20 in all, which includes Denver-RTD. The data show that five agencies -- Massachusetts Bay Transportation Authority (MBTA) in Boston, Southeastern Pennsylvania Transportation Authority (SEPTA) in Philadelphia, San Francisco Municipal Railway (Muni), Los Angeles County Metropolitan Transportation Authority (LACMTA) in Los Angeles, and the San Diego Trolley -- accounted for 57.8% of the vehicles operated in maximum service, over 46.6% of the Light Rail stations, and 46.4% of the directional route miles. In 1994, new systems in Denver and St. Louis added new fixed guideway directional route miles for Light Rail, and a new Light Rail system in Dallas began revenue service in 1996. This is reflected in the average fleet age data for these transit agencies. Table J-6 provides data for all transit agencies that invested capital dollars in Light Rail systems in 1997, a total of 21 agencies. This includes two additions (Cincinnati-SORTA and Salt Lake City-UTA) and one deletion (Galveston-Island Transit, Texas) compared to Table J-5. Of the 21 transit agencies, ten had more Facilities and Other capital expenditures in 1997 than Denver-RTD. These agencies represent a potential source of historical cost data for Light Rail systems. Portland-Tri-Met in Oregon, with over $223 million in Facilities and Other capital investment in 1997, and the new Light Rail investments in Salt Lake City are also likely sources of cost data, as well as the most recently implemented systems in St. Louis and Dallas, as well as in Denver itself.

Table J-1
Use of 1997 Capital Funds by Mode
(Millions)

Mode	Rolling Stock[1]	Facilities[2]	Other Capital[2]	Total
Bus	$1,145.0	$705.9	$377.1	$2,228.0
Heavy Rail	$298.3	$1602.6	$445.2	$2,346.1
Commuter Rail	$372.4	$1330.4	$114.6	$1,817.4
Light Rail	$211.6	$622.8	$38.9	$873.2
Demand Response	$65.0	$23.9	$15.6	$104.4
Other	$144.7	$110.0	$12.1	$266.9
Total	**$2,237.0**	**$4,395.6**	**$1,003.5**	**$7,636.1**

Notes:

1 - Rolling Stock includes all expenditures related to revenue vehicles used to provide transit service for passengers.

2 - Facilities and Other Capital expenditures include everything not related to rolling stock. This category includes items such as:

- Construction and rehabilitation of maintenance facilities.
- Crime prevention and security equipment.
- Line equipment and structures.
- Signals and communications.
- Power equipment and substations.
- Transit malls and transfer facilities.
- Intermodal terminals.
- Shelters and passenger stations.
- Depots and terminals.
- High-occupancy vehicle facilities.
- Transit ways and track.
- Park-and-Ride facilities.
- Vehicle diagnostic equipment and real-time data acquisition systems.
- Computer hardware and software.
- Fare collection equipment.

Source: *1997 National Transit Summaries and Trends*, Federal Transit Administration.

Table J-2
Fixed Guideway Miles by Mode
(Actual Segments)
1993-1997

Mode	1993	1994	1995	1996	1997
Bus[1]	925.6	958.7	1,029.5	1,121.6	1,265.7
Heavy Rail	1,451.7	1,455.2	1,458.0	1,477.6	1,526.8
Commuter Rail	5,875.1	6,033.4	6,161.7	6,363.7	6,392.9
Light Rail	537.4	561.9	567.6	637.5	658.5
Demand Response[2]	-	-	-	-	-
Other - Ferryboat	475.6	486.5	489.5	477.0	496.3
- Trolleybus	405.2	416.9	411.6	415.8	419.8
- All other	21.7	26.5	18.3	26.7	25.8
Total	**9,692.3**	**9,939.1**	**10,136.2**	**10,519.9**	**10,785.8**

Notes:

1 - For Bus, both exclusive and controlled access rights-of-way are included.
2 - Demand Response is not a fixed guideway mode and, therefore, does not have any fixed guideway miles.

Source: *1997 National Transit Summaries and Trends*, Federal Transit Administration.

Table J-3
Key Bus Infrastructure Characteristics of Individual Agencies
1997

ST	Agency Name	Fixed Guideway DRM (1)	DRM Exclusive ROW	DRM Controlled ROW	Vehicles Operated in Maximum Service	Vehicles Available for Maximum Service	Average Fleet Age
CA	LA-LACMTA-Metro	45.9	44.4	1.5	1,754	2,548	9.7
CO	Denver-RTD	58.9	32.3	26.6	696	849	7.9
DC	Washington-WMATA	50.7	0.0	50.7	1,155	1,299	12.0
IL	Chicago-RTA-CTA	3.7	3.7	0.0	1,551	1,882	7.3
MA	Boston-MBTA	2.4	2.4	0.0	855	1,070	7.0
MD	Baltimore-Maryland-MTA	20.0	0.0	20.0	770	959	9.4
MN	Minneapolis-St.Paul-MCTO	139.9	55.8	84.1	755	894	7.3
NJ	New Jersey Transit	29.6	0.0	29.6	1,726	2,098	10.3
NY	NY-MTA-NYCTA	39.4	2.3	37.1	3,248	3,867	7.9
NY	New York City DOT	0.0	0.0	0.0	819	1,033	8.8
PA	Philadelphia-SEPTA	3.6	2.5	1.1	1,076	1,299	7.8
PA	Pittsburgh-PAT	41.3	41.3	0.0	756	911	5.7
TX	Dallas-DART	45.9	36.6	9.3	463	543	10.8
TX	Houston-Metro	148.3	143.7	4.6	935	1,202	7.9
WA	Seattle-Metro	143.8	137.6	6.2	894	1,114	7.4
	Individual Agencies Total	**773.4**	**502.6**	**270.8**	**17,451**	**21,568**	
	Weighted Average						**8.6**
	Total Bus Mode	**1,663.0**	**826.1**	**837.5**	**43,708**	**54,946**	
	Weighted Average						**8.1**

Notes:

1 – DRM (Directional Route Miles) is defined as the mileage in each direction over routes that public transportation vehicles travel while in revenue service. DRM are a measure of the facility or roadway, not the amount or frequency of service carried on the facility, i.e. number of routes or vehicle revenue miles. They are determined by the direction of service, but not by the number of traffic lanes or rail tracks existing in a given right-of-way. If vehicles travel in only one direction within a right-of-way, each mile is counted once. If vehicles travel in both directions, each mile is counted twice. In this table, data reflect fixed guideway operated by each Bus transit agency. In many of the larger metropolitan areas, several Bus agencies operate on the same fixed guideway segments. Hence, data for Total Bus Mode is greater than actual segment data reported in Table 6.

2 - Vehicles Operated in Maximum Service is the revenue vehicle count taken during a reporting transit agency's maximum season of the year, on the week and day that this maximum occurs (excluding special events). This fleet size measure provides a more meaningful measure of a transit agency's operating characteristics because it does not include spare and stored vehicles.

3 - Vehicles Available for Maximum Service include spares, out of service vehicles, and vehicles in or awaiting maintenance. They do not include vehicles held for sale, emergency contingency use, etc.

Source: *1997 National Transit Summaries and Trends*, Federal Transit Administration.

Table J-4
Uses of Bus Capital Funds by Individual Agencies
(Thousands)
1997

ST	Agency Name	Rolling Stock	Facilities And Other	Total
CA	LA-LACMTA-Metro	$58,935.8	$68,929.1	$127,864.9
CO	Denver-RTD	$34,031.3	$11,861.1	$45,892.5
DC	Washington-WMATA	$340.9	$27,458.1	$27,799.0
IL	Chicago-RTA-CTA	$24,856.5	$23,541.9	$48,398.3
MA	Boston-MBTA	$18,061.4	$6,944.4	$25,005.8
MD	Baltimore-Maryland-MTA	$38.1	$10,749.5	$10,787.6
MN	Minneapolis-St.Paul-MCTO	$3,350.2	$5,892.5	$9,242.7
NJ	New Jersey Transit	$4,551.0	$115,381.0	$119,932.0
NY	NY-MTA-NYCTA	$87,463.2	$44,791.1	$132,254.2
NY	New York City DOT	$267.5	$16,966.6	$17,234.0
PA	Philadelphia-SEPTA	$112,788.2	$30,073.7	$142,861.9
PA	Pittsburgh-PAT	$14,205.4	$93,784.2	$107,989.6
TX	Dallas-DART	$926.1	$11,315.4	$12,241.4
TX	Houston-Metro	$49,427.5	$92,557.7	$141,985.2
WA	Seattle-Metro	$62,759.7	$21,458.0	$84,217.6
	Total	**$472,002.7**	**$581,704.1**	**$1,053,706.9**
	Percent of National Bus Total	**41.2%**	**53.7%**	**47.3%**

Source: *1997 National Transit Summaries and Trends*, Federal Transit Administration.

Table J-5
Key Light Rail Infrastructure Characteristics of Individual Agencies
1997

ST	Agency Name	Fixed Guideway DRM (1)	Miles Of Track	Number Of Stations	Vehicles Operated in Maximum Service	Vehicles Available for Maximum Service	Average Fleet Age
CA	LA-LACMTA-Metro	82.4	85.8	36	48	69	8.0
CA	Sacramento-RT	36.2	34.0	28	32	36	8.9
CA	San Diego-The Trolley	48.3	48.3	41	64	85	7.2
CA	San Francisco-Muni	49.7	54.2	11	100	136	23.1
CA	San Jose-SCCTD	39.0	41.1	34	33	53	14.0
CO	Denver-RTD	10.6	12.7	15	16	17	2.9
LA	New Orleans-RTA	16.0	13.7	9	22	36	59.6
MA	Boston-MBTA	55.9	77.5	95	141	173	14.2
MD	Baltimore-Maryland-MTA	43.6	35.3	24	30	35	5.0
MO	St. Louis-Bi-State	34.0	36.2	18	26	31	4.3
NJ	New Jersey Transit	8.3	8.3	11	16	22	50.5
NY	Buffalo-NFTA	12.4	14.1	14	23	27	12.9
OH	Cleveland-RTA	30.8	33.0	33	26	47	16.0
OR	Portland-Tri-Met	30.2	33.4	27	25	30	12.1
PA	Philadelphia-SEPTA	69.3	171.0	64	111	147	17.9
PA	Pittsburgh-PAT	38.1	46.5	13	38	59	14.5
TN	Memphis-MATA	4.3	4.0	20	9	10	23.9
TX	Dallas-DART	40.8	46.7	20	36	40	1.0
TX	Galveston-Island Transit	4.9	4.9	3	4	4	9.0
WA	Seattle-Metro	3.7	2.1	14	3	5	69.2
	Total Light Rail Mode	**658.5**	**802.8**	**530**	**803**	**1,062**	
	Weighted Average						**15.9**

Notes:

1 - DRM = Directional Route Miles.

Source: *1997 National Transit Summaries and Trends*, Federal Transit Administration.

Table J-6
Uses of Light Rail Capital Funds by Individual Agencies
(Thousands)
1997

ST	Agency Name	Rolling Stock	Facilities and Other	Total
CA	LA-LACMTA-Metro	$0.0	$4,922.8	$4,922.8
CA	Sacramento-RT	$0.0	$16,644.8	$16,644.8
CA	San Diego-The Trolley	$678.9	$59,327.0	$60,005.9
CA	San Francisco-Muni	$60,405.1	$69,828.9	$130,234.0
CA	San Jose-SCCTD	$281.7	$36,863.2	$37,144.9
CO	Denver-RTD	$5,583.2	$14,499.1	$20,082.3
LA	New Orleans-RTA	$2,575.5	$7,081.9	$9,657.5
MA	Boston-MBTA	$71,025.7	$16,451.9	$87,477.7
MD	Baltimore-Maryland-MTA	$8,887.2	$34,718.2	$43,605.4
MO	St. Louis-Bi-State	$5,230.1	$10,424.1	$15,654.2
NJ	New Jersey Transit	$0.0	$4,132.1	$4,132.1
NY	Buffalo-NFTA	$0.0	$858.6	$858.6
OH	Cincinnati-SORTA	$0.0	$5,210.5	$5,210.5
OH	Cleveland-RTA	$0.0	$12,602.2	$12,602.2
OR	Portland-Tri-Met	$12,647.8	$223,042.7	$235,690.5
PA	Philadelphia-SEPTA	$8,261.3	$674.4	$8,935.7
PA	Pittsburgh-PAT	$247.1	$20,238.9	$20,486.0
TN	Memphis-MATA	$1,553.6	$5,048.9	$6,602.5
TX	Dallas-DART	$20,679.3	$78,724.5	$99,403.8
UT	Salt Lake City-UTA	$13,395.5	$40,281.8	$53,677.3
WA	Seattle-Metro	$108.8	$109.6	$218.3
	Light Rail Total	$211,560.9	$661,686.0	$873,246.9

Source: *1997 National Transit Summaries and Trends*, Federal Transit Administration.

The *1997 Transit Profiles* consists of individual profiles for each reporting transit agency, published in two volumes: Agencies in Urbanized Areas Exceeding 200,000 Population; and Agencies in Urbanized Areas with a Population of Less Than 200,000. The data contained in each profile consists of general and summary reports, as well as modal, performance, and trend indicators for the 1997 Report Year. Sources of Capital Funds Expended and Uses of Capital Funds are included in the financial information profiled. By way of example, Figure J-1 shows the 1997 transit profile for Denver-RTD, which is classified as an urbanized area exceeding 200,000 population.

The *1997 Data Tables* contains tables detailing the financial and operating characteristics of the 476 individual transit agencies, as reported for 1997. The tables are organized into four major groupings: transit revenues, transit expenses, non-financial operating data, and performance indicators. Within each table, the data are organized alphabetically by agency name within each State. The transit revenues grouping includes tables summarizing capital funds applied by funding source and type of expenditure. This data is compiled from the FTA Capital Funding form (103). Table J-7 shows a breakdown of capital funds applied by mode and type of service for the Colorado transit agencies, compiled from Table 9 of the *1997 Data Tables*.

The data contained in the individual transit agency statistics tables in the Annual Report are available on diskettes, organized by report table in Lotus 1-2-3 format, for report years 1983 through 1997. Further information on diskette availability and costs is available from the McTrans Center (512 Weil Hall, University of Florida, Gainesville, FL 32611-9988, Tel:352-392-0378) or from PC-Trans (University of Kansas, Transportation Center, 2011 Learned Hall, Lawrence, KS 66045, Tel:913-864-5655). Editions of the Data Tables for Report Years 1993 through 1997 can be downloaded from FTA's Web site at www.fta.dot.gov. The files are in Lotus format.

More detailed data on the individual agencies (including required-level data not published in the annual report), all voluntary-level data, and data for prior report years are also available on magnetic tape. Further information is available from the Volpe National Transportation Systems Center at the following address:

NTD Project
U.S. Department of Transportation
Volpe National Transportation Systems Center
DTS-49, Kendall Square
Cambridge, MA 02142
Tel: (617) 494-2259
Fax: (617) 494-3260
E-mail: Lyons@volpel.dot.gov

Table J-7
Capital Funds Applied by Type of Expenditure
Colorado Transit Agencies
(Thousands)
1997

Agency Name	Mode[1]	TOS[2]	Rolling Stock	Facilities	Other	Total
Colorado Springs Transit	Bus	DO	0.0	0.0	2,672.0	2,672.0
	Bus	PT	0.0	0.0	338.0	338.0
	Total		0.0	0.0	3,010.0	3,010.0
Denver-RTD	LR	DO	5,583.2	14,325.5	173.6	20,082.3
	Bus	DO	34,031.3	8,794.2	3,066.9	45,892.5
	Total		39,614.5	23,119.7	3,240.5	65,974.8
Fort Collins-Transfort	Bus	DO	1,168.6	59.9	151.6	1,380.2
Grand Junction-MesABILITY	DR	PT	16.7	0.0	59.8	76.5
Greeley-The Bus	DR	DO	11.0	11.1	0.0	22.1
	Bus	DO	1,174.8	36.3	0.0	1,211.1
	Total		1,185.8	47.4	0.0	1,233.2
Pueblo-CityBus	Bus	DO	0.0	2,231.8	0.0	2,231.8

Notes:

1 - LR = Light Rail; DR = Demand Response.
2 - TOS = Type of Service; DO = Directly Operated; PT = Purchased Transportation.

Source: *1997 Data Tables*, Table 9. Federal Transit Administration.

Denver-Regional Transportation District (RTD)

1600 Blake Street
Denver, CO 80202
(303)628-9000

Chief Executive Officer: John Caldara,
Chairman of the Board
ID Number: 8006

System Wide Information

General Information

Urbanized Area (UZA) Statistics - 1990 Census
Denver, CO

Square Miles	459
Population	1,517,977
Population Ranking Out of 405 UZA's	22
Other UZA's Served:	226, 385

Service Area Statistics

Square Miles	2,406
Population	2,100,000

Service Consumption

Annual Passenger Miles	312,655,714
Annual Unlinked Trips	70,904,532
Average Weekday Unlinked Trips	239,716
Average Saturday Unlinked Trips	114,015
Average Sunday Unlinked Trips	66,328

Service Supplied

Annual Vehicle Revenue Miles	32,064,797
Annual Vehicle Revenue Hours	1,874,461
Total Fleet	1,406
Vehicles Operated in Maximum Service	854
Base Period Requirement	370

Vehicles Operated in Maximum Service

	Directly Operated	Purchased Transportation
Bus	534	162
Demand Response	14	128
Light Rail	16	0
Total	**564**	**290**

Financial Information

Sources of Operating Funds Expended

Passenger Fares	$36,746,800
Local Funds	118,031,475
State Funds	0
Federal Assistance	6,678,989
Other Funds	15,877,296
Total Operating Funds Expended	**$177,334,560**

Summary of Operating Expenses

Salaries/Wages/Benefits	$93,949,111
Materials & Supplies	18,574,416
Purchased Transportation	31,075,118
Other Operating Expenses	17,182,626
Total Operating Expenses	**$160,781,271**
Reconciling Cash Expenditures	$7,552,533

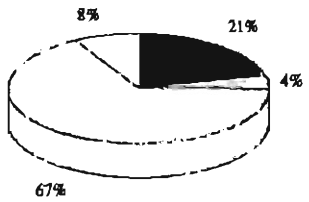
Sources of Capital Funds Expended

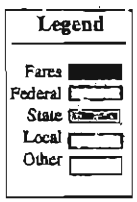
Local Funds	$24,564,206
State Funds	0
Federal Assistance	41,410,574
Total Capital Funds Expended	**$65,974,780**

Uses of Capital Funds

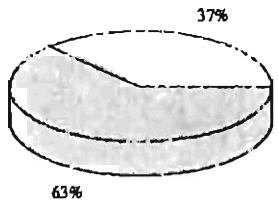
	Rolling Stock	Facilities and Other	Total
Bus	$34,031,331	$11,861,125	$45,892,456
Demand Response	0	0	0
Light Rail	5,583,200	14,499,124	20,082,324
Total	**$39,614,531**	**$26,360,249**	**$65,974,780**

Sources of Operating Funds Expended





Sources of Capital Funds Expended



Modal Information

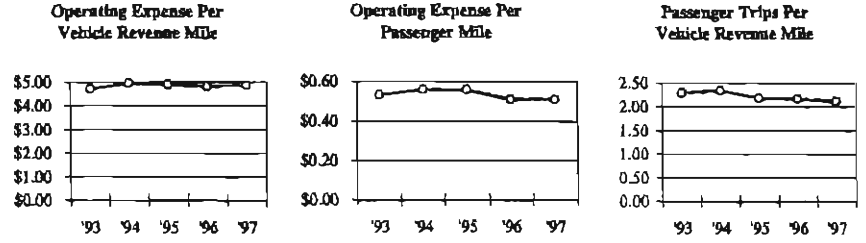
Characteristics

	Bus	Light Rail	Demand Response
Operating Expense	$152,201,176	$7,423,969	$1,156,126
Capital Funding	$45,892,456	$20,082,324	$0
Annual Passenger Miles	299,157,898	12,026,642	1,471,174
Annual Vehicle Revenue Miles	31,246,619	648,291	169,887
Annual Unlinked Trips	66,342,984	4,428,085	133,463
Average Weekday Unlinked Trips	224,511	14,791	414
Annual Vehicle Revenue Hours	1,815,474	43,915	15,072
Fixed Guideway Directional Route Miles	58.9	10.6	N/A
Total Fleet	849	17	540
Average Fleet Age in Years	7.9	2.9	6.8
Vehicles Operated in Maximum Service	696	16	142
Peak to Base Ratio	1.9	1.6	N/A
Percent Spares	22%	6%	280%

Performance Measures

Service Efficiency			
Operating Expense/Vehicle Revenue Mile	$4.87	$11.45	$6.81
Operating Expense/Vehicle Revenue Hour	$83.84	$169.05	$76.71
Cost Effectiveness			
Operating Expense/Passenger Mile	$0.51	$0.62	$0.79
Operating Expense/Unlinked Passenger Trip	$2.29	$1.68	$8.66
Service Effectiveness			
Unlinked Passenger Trips/Vehicle Revenue Mile	2.12	6.83	0.79
Unlinked Passenger Trips/Vehicle Revenue Hour	36.54	100.83	8.86

Bus



Light Rail

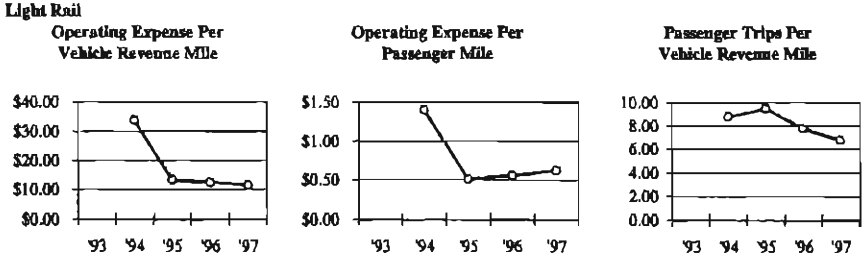


Figure J-1. Denver-RTD Transit Profile – 1997.

Source: 1997 National Transit Database

Appendix K

Inventory of HOV Facilities

OPERATIONAL CHARACTERISTICS OF SELECTED FREEWAY/EXPRESSWAY HOV FACILITIES AS OF JANUARY 1998

HOV Facility	Number of Lanes	Project Length km (miles)	HOV Operation Period[1]	General Eligibility Requirements	Changes in Rules Since Opening
Busway					
Miami, FL (US 1, southwest corridor)	1 each direction	5 (3)	24 hours	Buses only	Feeds Metro rail line
Ottawa, Ontario, Canada 32.2 km (19.3 miles)					
Southeast Transitway	1 each direction	10 (6)	24 hours	Buses only	No
West Transitway	1 each direction	8.5 (5.1)	24 hours	Buses only	No
Southwest Transitway	1 each direction	3.6 (2.2)	24 hours	Buses only	No
East Transitway	1 each direction	6.6 (4)	24 hours	Buses only	No
Central Transitway	1 each direction	3.5 (2.1)	24 hours	Buses only	No
Pittsburgh, PA					
East Patway	1 each direction	9.9 (6.2)	24 hours	Buses only	No
West Patway	1 each direction	6.6 (4.1)	24 hours	Buses only	No
Minneapolis, MN					
U of M Intercampus Busway	1 each direction	1.8 (1.1)	24 hours	Buses only	No
Dallas, TX					
Southwest Texas Medical Center busway	1 each direction	1 (0.6)	24 hours	Buses only	No
Barrier-Separated: Two-Way					
Los Angeles, CA					
I-10 (El Monte) San Bernardino Fwy.	1 each direction	6.4 (4)	24 hours	3+ HOVs	Changed from buses only in 1978
I-105/I-110 fwy/fwy connectors	1 each direction	1.6 (1)	24 hours	2+ HOVs	No
Orange County, CA I-5	1-2 each direction	7.2 (4.5)	24 hours	2+ HOVs	No
Houston, TX I-610/US 290 elevated, opposing flow not separated	1 each direction	2.4 (1.5)	5 am to 12 noon, 2-9 pm	2+ HOVs	No
Seattle, WA I-90	1 each direction	2.4 (1.5)	24 hours	2+ HOVs	No
Barrier-Separated: Reversible-Flow					
Denver, CO I-25	2 reversible	12 (7.5)	6 am to 10 pm	2+ HOVs	Yes, from buses only
Northern Virginia					
I-395 (Shirley Hwy.)	2 reversible	24 (15)	24 hours	2+ HOVs	No
Houston, TX					
I-10 (Katy Freeway)[5]	1 reversible	21 (13)	5 am-12 noon, 2-9 pm, 5 am-5 pm WB Sat., 5 am-9 pm Sun.	3+ peak hours, 2+ other times	Opened for authorized buses and vanpools, lowered and raised since, 2-occ. toll pending
I-45 (Gulf Freeway)	1 reversible	19.4 (12.1)	5 am to 12 noon, 2-9 pm	2+ HOVs	No
US 290 (Northwest Freeway)	1 reversible	21.6 (13.5)	5 am to 12 noon, 2-9 pm	2+ HOVs	No
I-45 (North Freeway)	1 reversible	21.6 (13.5)	5 am to 12 noon, 2-9 pm	2+ HOVs	Started with buses and vanpools only, changed operation periods
US 59 (Southwest Freeway)	1 reversible	20 (12.5)	5 am to 12 noon, 2-9 pm	2+ HOVs	No
San Diego, CA I-15[5]	2 reversible	16.3 (9.8)	6-9 am, 3-6:30 pm	2+ HOVs/ toll SOVs	No
Minneapolis, MN I-394[5]	2 reversible	8 (5)	6-10 am, 2-7 pm	2+ HOVs	No
Pittsburgh, PA I-279/579	1-2 reversible	6.6 (4.1)	5-9 am, noon-8 pm	2+ HOVs, all traffic NB after 8 pm during sports games	Changed from 3+ and operating periods, all traffic allowed to use lanes during sports games downtown
Norfolk, VA I-64	2 reversible	12.8 (8)	5-8:30 am WB, 3-6 pm EB, mixed flow other times	2+ HOVs	No
Seattle, WA					
I-5 North (Express Lanes)	2-3 reversible	SB 4.2 (2.6), NB 2.6 (1.6)	5-8:30 am SB, 12 noon-4 am NB	2+ HOVs	Changed from 3+ NB
I-90	2 reversible	9.9 (6.2)	24 hours	2+ HOVs	No
Concurrent-flow: Buffer-Separated/					

(Continued)

OPERATIONAL CHARACTERISTICS OF SELECTED FREEWAY/EXPRESSWAY HOV FACILITIES AS OF JANUARY 1998

HOV Facility	Number of Lanes	Project Length km (miles)	HOV Operation Period[1]	General Eligibility Requirements	Changes in Rules Since Opening
Non-Separated					
Phoenix, AZ					
I-10	1 each direction	33.6 (21)	6-9 am, 4-7 pm	2+ HOVs	Changed from 3+
SR 202	1 each direction	12.8 (8)	6-9 am, 4-7 pm	2+ HOVs	Changed hours
I-17	1 each direction	9.6 (6)	6-9 am, 4-7 pm	2+ HOVs	Changed hours
Vancouver, BC, Canada					
H-99	1 each direction	SB 6.4 (4), NB 1.6 (1)	24 hours	3+ HOVs	Changed from buses only
Los Angeles County, CA					
I-10 (El Monte) San Bernardino Fwy.-(wide buffer separation)	1 each direction	12.8 (8)	24 hours	3+ HOVs	Changed from buses only in 1978
I-105	1 each direction	25.6 (16)	24 hours	2+ HOVs	No
I-110	2 each direction	17.8 (10.7)	24 hours	2+ HOVs	No
I-210	1 each direction	30.8 (18.5)	24 hours	2+ HOVs	No
I-405 (includes Orange Co. line to I-710)	1 each direction	45.6 (27.4)	24 hours	2+ HOVs	No
SR 91	1 each direction	22.9 (14.3)	24 hours	2+ HOVs	Changed from peak periods only
SR 118	1 each direction	18.2 (11.4)	24 hours	2+ HOVs	No
SR 134	1 each direction	22.1 (13.3)	24 hours	2+ HOVs	No
SR 170	1 each direction	9.8 (6.1)	24 hours	2+ HOVs	No
I-605	1 each direction	11.6 (7)	24 hours	2+ HOVs	No
SR 57	1 each direction	7.5 (4.5)	24 hours	2+ HOVs	No
SR 30	1 each direction	3.8 (2.3)	24 hours	2+ HOVs	No
Orange County, CA					
I-5	1-2 each direction	54.4 (34)	24 hours	2+ HOVs	No
SR 55	1 each direction	19.7 (12.3)	24 hours	2+ HOVs	No
I-405	1 each direction	38.4 (24)	24 hours	2+ HOVs	No
SR 57	1 each direction	19.2 (12)	24 hours	2+ HOVs	No
SR 91	1 each direction	4.2 (2.6)	24 hours	2+ HOVs	No
SR 91 toll/HOV lanes[2]	2 each direction	16.2 (10.1)	24 hours	3+ HOVs reduced toll	On 12/97 tolls were placed on 3+ HOVs
Riverside County, CA SR 91	1 each direction	27.2 (17)	24 hours	2+ HOVs	No
San Bernardino County, CA					
SR 60	1 each direction	16 (10)	24 hours	2+ HOVs	No
SR71	1 each direction	5 (3)	24 hours	2+ HOVs	No
Santa Clara/San Mateo Counties, CA					
US 101	1 each direction	51.6 (31)	5-9 am, 3-7 pm	2+ HOVs	No
SR 237	1 each direction	9.6 (6)	5-9 am, 3-7 pm	2+ HOVs	No
SR 85	1 each direction	35.2 (22)	5-9 am, 3-7 pm	2+ HOVs	No
I-280	1 each direction	17.6 (11)	5-9 am, 3-7 pm	2+ HOVs	No
Capitol Expy. (shoulders)	1 each direction	8.3 (5)	5-9 am, 3-7 pm	2+ HOVs	No
Lawrence Expy. (shoulders)	1 each direction	17 (10)	5-9 am, 3-7 pm	2+ HOVs	No
Montague Expy. (shoulders)	1 each direction	9.6 (6)	5-9 am, 3-7 pm	2+ HOVs	No
San Tomas Expy.(shoulders)	1 each direction	12.8 (8)	6-9 am, 3-7 pm	2+ HOVs	No
Alameda County, CA					
I-880	1 each direction	15 (9)	5-9 am, 3-7 pm	2+ HOVs	No
Contra Costa County, CA					
I-80	1 each direction	16.1 (10)	5-9 am, 3-7 pm	3+ HOVs	No
I-680	1 each direction	23 (14.4)	6-9 am, 3-6 pm	2+ HOVs	No
I-580	1 each direction	9.8 (6.1)	7-8 am, 5-6 pm	2+ HOVs	No
Marin County, CA US 101 (2 projects)	1 each direction	16.7 (10)	6:30-8:30 am, 4:30 -7 pm	2+ HOVs	Changed from 3+
Sacramento, CA SR 99	1 each direction	6.2 (3.9)	6-10 am, 4-7 pm	2+ HOVs	Reduced hours
Denver, CO, US 36 Boulder Turnpike	1 EB only	6.6 (4.1)	6-9 am	Buses only	No
Hartford, CT					

(Continued)
OPERATIONAL CHARACTERISTICS OF SELECTED FREEWAY/EXPRESSWAY HOV FACILITIES AS OF JANUARY 1998

HOV Facility	Number of Lanes	Project Length km (miles)	HOV Operation Period[1]	General Eligibility Requirements	Changes in Rules Since Opening
I-84 (wide buffer separation)	1 each direction	16 (10)	24 hours	2+ HOVs	Changed from 3+
I-91 (wide buffer separation)	1 each direction	14.4 (9)	24 hours	2+ HOVs	No
Ft. Lauderdale, FL I-95	1 each direction	43.2 (27)	7-9 am, 4-6 pm	2+ HOVs	No
Concurrent-flow (Continued)					
Miami, FL					
I-95	1 each direction	52 (32)	7-9 am SB, 4-6 pm NB	2+ HOVs	No
I-95 freeway/freeway ramp	2-way	5 (3)	7-9 am SB, 4-6 pm NB	2+ HOVs	No
Orlando, FL I-4	1 each direction	48 (30)	7-9 am SB 4-6 pm NB	2+ HOVs	No
Atlanta, GA					
I-20	1 each direction	14 (8.5)	6:30-9:30 am WB, 4:30-7 pm EB	2+ HOVs	No
I-75/I-85 central section	1 each direction	12.5 (7.5)	24 hours	2+ HOVs	No
I-75	1 each direction	19.3 (11.6)	24 hours	2+ HOVs	No
I-85	1 each direction	18.2 (10.9)	24 hours	2+ HOVs	No
Honolulu, HI					
Moanaloa Fwy.	1 each direction	3.8 (2.4)	6-8 am, 3:30-6 pm	2+ HOVs	No
Kalanianaole Hwy.	1 (WB only)	3.2 (2.0)	5-8:30 am	2+ HOVs	No
H-1	1 each direction	12.8 (8)	6-8 am, 3:30-6 pm	2+ HOVs	No
H-2	1 each direction	13.1 (8.2)	6-8 am, 3:30-6 pm	2+ HOVs	No
Montgomery County, MD					
US 29 (shoulders)	1 each direction	4.8 (3)	Peak periods only	Buses only	No
I-270	1 each direction	25.8 (15.5)	Peak periods only	2+ HOVs	
I-270 (western spur)	1 each direction	5 (3)	Peak periods only	2+ HOVs	
I-270 (eastern spur)	1 each direction	5 (3)	Peak periods only	2+ HOVs	No
Boston, MA I-93 North	1 (SB only)	1.8 (1.1)	6:30-9:30 am	2+ HOVs	Changed from 3+
Minneapolis, MN					
I-35W	1 each direction	8 (5)	6-9 am NB, 4-7 pm SB	2+ HOVs	No
I-394	1 each direction	11.2 (7)	6-9 am EB, 4-7 pm WB	2+ HOVs	No
Morris County, NJ					
I-80	1 each direction	17.6 (11)	Peak periods only	2+ HOVs	No
New Jersey Turnpike	1 each direction	16 (10)	Peak periods only	3+ HOVs	No
I-287	1 each direction	20 (12)	Peak periods only	2+ HOVs	Temp. closed in late 97, reopens 1/19/98
Suffolk County, NY I-495	1 each direction	19.2 (12)	6-10 am, 3-8 pm	2+ HOVs	Yes, changed hours
Ottawa, Ontario, Canada					
Hwy. 417 Kenta (EB shoulder)	1 (EB only)	4.8 (3)	7-9 am	Buses only	No
Hwy. 17 Orleans (WB shoulder)	1 (WB only)	4.8 (3)	7-9 am	Buses only	No
Memphis, TN I-40	1 each direction	10 (6)	NA	2 + HOVs	Opened Aug. 97
Nashville, TN					
I-65 (South)	1 each direction	11.5 (7.2)	7-9 am NB, 4-6 pm SB	2+ HOVs	No
I-40	1 each direction	8.3 (5)	7-9 am WB, 4-6 pm EB	2+ HOVs	No
Dallas, TX					
I-35E (Stemmons Freeway)	1 each direction	SB 11.7 (7.3), NB 9.7 (6.0)	24 hours	2+ HOVs	No
I-635 (LBJ Freeway)	1 each direction	EB 11 (6.8), WB 9.8 (6.1)	24 hours	2+ HOVs	No

(Continued)
OPERATIONAL CHARACTERISTICS OF SELECTED FREEWAY/EXPRESSWAY HOV FACILITIES AS OF JANUARY 1998

HOV Facility	Number of Lanes	Project Length km (miles)	HOV Operation Period[1]	General Eligibility Requirements	Changes in Rules Since Opening
Concurrent-flow (Continued)					
Northern Virginia					
I-66 (outside Capital Beltway)[4]	1 each direction	11.2 (7)	6-9 am, 3:30-6 pm	2+ HOVs	No
I-66 (inside Capital Beltway)	2-3 each direction	15.4 (9.6)	6:30-9 am EB, 4-6:30 pm WB	2+ HOVs	Changed operating periods and from 3+
Norfolk/Virginia Beach, VA					
SR 44[4]	1 each direction	6.4 (4)	5-8:30 am WB, 3-6 pm EB	2+ HOVs	No
I-64	1 each direction	8 (5)	Peak periods only	2+ HOVs	No
I-564	1 EB only	3.2 (2)	3:30-6 pm EB	2+ HOVs	No
I-264	1 each direction	6.4 (4)	Peak periods only	2+ HOVs	No
Seattle, WA					
I-5 North	1 each direction	SB 22 (13.6), NB 18 (11.3)	24 hours	2+ HOVs	Changed from 3+
I-5 South	1 each direction	30 (19)	24 hours	2+ HOVs	No
I-90	1 each direction	11.7 (7.3)	24 hours	2+ HOVs	General purpose lane conversion
I-405 (median and shoulders)	1 each direction	SB 36 (22.5), NB 35 (21.7)	24 hours	2+ HOVs	No
SR 167	1 each direction	6.7 (4.2)	24 hours	2+ HOVs	No
SR 520 (shoulder)	1 WB only	3.7 (2.3)	24 hours	3+ HOVs	Changed from bus only in AM peak period
Contraflow					
Honolulu, HI					
Kalanianaole Hwy.	1	WB 7 (4.4), EB 1.6 (1)	5-8:30 am, 4-6:30 pm	2+ HOVs	Changed from 3+
Kahekili Hwy.	1	1.8 (1.1)	5:30-8:30 am, 3:30-7 pm	2+ HOVs	No
New Jersey, Rte. 495 (to Lincoln Tunnel)	1 EB only	4 (2.5)	6-10 am	Buses only	No
New York City, NY I-495 Long Island Expy.	1	6.4 (4)	7-10 am	Buses, vanpools taxis	No
Dallas, TX I-30 East, (R.L. Thornton Fwy.)	1 each peak direction	8.3 (5.2)	6-9 am, 4-7 pm	2+ HOVs	No
Boston, MA I-93 Southeast Expy.	1 each peak direction	9.6 (6)	6-10 am, 3-7 pm	3+ HOVs	Additional hour added in AM period
Montreal, Quebec, Canada Rte. 10/15/20 Champlain Bridge	1	6.9 (4.3)	6:30-9:30 am NB, 3:30-7 pm SB	Buses only	Speed limit reduced
Queue Bypasses					
Bay Area, CA					
S.F./Oakland Bay Bridge toll plaza, I-80	3	1.4 (0.9)	6-9 am, 3-6 pm	3+ HOVs	Number and location of lanes reoriented
Dumbarton Bridge toll plaza, SR 84	1	3.2 (2)	Peak periods	2+ HOVs	Changed from 3+
San Mateo Bridge toll plaza, SR 92	1	1.6 (1)	Peak periods	3+ HOVs	No
SR 4	1	0.8 (0.5)	Peak periods	3+ HOVs	No
Various freeway entrance ramps	1	0.2 (0.1)	When demand warrants	2+ HOVs	No
Los Angeles and Orange Counties, CA					
Over 250 entrance ramps	1	0.2 (0.1)	When demand warrants	2+ HOVs	No
San Diego, CA					
Various entrance ramps			As warranted	2+ HOVs	No
Coronado Bridge toll plaza	1 (WB only)	0.2 (.1)	24 hours	2+ HOVs	No
A Street entrance ramp to I-5 freeway	1	0.6 (0.4)	24 hours	Buses only	No
I-5/Mexico port of entry	4 gates	0.2 (0.1)	24 hours M-F	4+ HOVs	No
Honolulu, HI, H-2	1 (SB only)	1.3 (0.8)	6-8 am,	2+ HOVs	No

(Continued)
OPERATIONAL CHARACTERISTICS OF SELECTED FREEWAY/EXPRESSWAY HOV FACILITIES AS OF JANUARY 1998

HOV Facility	Number of Lanes	Project Length km (miles)	HOV Operation Period[1]	General Eligibility Requirements	Changes in Rules Since Opening
			3:30-6 pm		
Queue Bypasses (Continued)					
Illinois, Chicago, I-90 toll plaza	1 (EB only)	0.8 (0.5)	Peak periods	Buses only	No
Minneapolis, MN, Various entrance ramps	1	0.6 (0.2)	Peak periods	2+ HOVs	No
New Jersey					
Ft. Lee, I-95 (to George Washington Br.)	1 (EB only)	1.6 (1)	7-9 am	3+ HOVs	No
Union, Rte. 495 (Lincoln Tunnel toll plaza)	1 (WB only)	0.5 (0.3)	6-10 am	Buses only	No
Seattle, WA					
SR 509 shoulder	1 (NB only)	1.3 (0.8)	24 hours	2+ HOVs	Changed from 3+
SR 526	1	0.8 (0.5)	24 hours	Buses only	No
Freeway entrance ramps (69)[3]	1	0.2 (0.1)	24 hours	2+ HOVs	No
Ferry terminal dock, downtown	1-2	0.2 (0.1)	24 hours	Registered carpools/ vanpools only	No

Footnotes
[1] Part-time periods are 5-day week, typically in peak directions as noted.
[2] This project is a privatized toll road with congestion pricing. Registered 3+ HOVs can travel free.
[3] Included are 39 metered ramps and 30 non-metered ramps.
[4] HOV is converted from left side general purpose lane, while outside shoulder becomes a general purpose lane.
[5] These projects are operating or planned toll lanes for 2-occupant or SOV "buy-in" under FHWA congestion pricing demonstration program.

LISTING OF PROPOSED MAJOR FREEWAY/EXPRESSWAY HOV FACILITIES AS OF JANUARY 1998 (Listed by State/Province)

Project	Project Length		Status or Anticipated Opening
	Route-kilometers (miles)	Lane-kilometers (miles)	
Arizona, Phoenix			
Route Loop 202 (East Papago Freeway) I-10 to SR 101 concurrent-flow lanes	1.6 (1)	3.2 (2)	1998
I-10 (91st to Chandler Rd.) concurrent-flow lanes	8 (5)	16 (10)	1998
I-17(SunCap/Univ.-Berkeley) concurrent-flow lanes	1.6 (1)	1.6 (1)	1998
British Columbia, Vancouver, Canada			
Trans Canada Highway, concurrent-flow-lanes	12.8 (8)	25 (16)	Late 1990s
California, Bay Area			
I-80 (Contra Costa County) concurrent-flow lanes	16.1 (10))	112 (70)	Partially open through 1998
US 101 (Marin County) concurrent-flow lanes	4.8 (3)	9.6 (6)	Late 1990s
I-80/580/880 (Alameda County) concurrent-flow lanes	27 (17)	52 (32.3)	Staged through late 1990s
I-680 (Contra Costa County) concurrent-flow lanes	9.6 (6)	18 (11.2)	Staged through 1999
I-880 (Santa Clara County) concurrent-flow lanes	9.6 (6)	17 (10.8)	Late 1990s
SR 85 (Santa Clara County) concurrent-flow lanes	3.2 (2)	6.4 (4)	1999
SR 101 (Santa Rosa) concurrent-flow lanes	8 (5)	16.6 (10.4)	Late 1990s
California, Los Angeles County			
I-10 (San Bernardino Fwy.) concurrent-flow lanes	33 (20.3)	66 (41)	On hold
I-10 (Santa Monica Fwy.) concurrent-flow lanes	15 (9.3)	30 (18.6)	2020
I-405 concurrent-flow lanes	(24.9)	(49.8)	1998-2005
I-605 concurrent-flow lanes	(13.7)	(27.4)	1998-2000
I-710 concurrent-flow lanes	13 (8)	26 (16)	Beyond 2015
I-5 concurrent-flow lanes	56 (35)	111 (69)	2003-2009
SR 14 concurrent-flow lanes	58 (36)	115 (72)	1998-2003
SR 30 concurrent-flow lanes	(6)	(12)	2005
SR 60 concurrent-flow lanes	30 (19)	61 (38)	1998-2003
California, Orange County			
I-5 concurrent-flow lanes (SR 22 to SR 91)	15 (9)	30 (18)	2002-2004
SR 91 concurrent-flow lanes	14 (9)	30 (18.8)	2000
SR 57/91 HOV ramp flyover	1.6 (1)	3.2 (2)	2000
SR 55/405, 57/91 interchanges, HOV ramps	9.6 (6)	21 (13)	2000-2005
SR 73 concurrent-flow lanes	4.8 (3)	7 (4.4)	Planning studies
I-605 concurrent-flow lanes	4.8 (3)	9.6 (6)	Planning studies
SR 22 concurrent-flow lanes	19 (12)	38 (24)	Planning studies
California, San Bernardino County			
I-10 concurrent-flow lanes	16 (10)	32 (20)	1999
SR 30 concurrent-flow lanes	36 (22)	72.4 (45)	Beyond 2000
SR 71 concurrent-flow lanes	13.5 (8.4)	27 (16.8)	1998
I-215 concurrent-flow lanes	8 (5)	16 (10)	1999
SR 60 concurrent-flow lanes	32 (20)	62 (39)	1998
California, Riverside County			
SR 71 concurrent-flow lanes	9.6 (6)	19 (12)	Planning studies
I-215 concurrent-flow lanes	11.2 (7)	22 (14)	2000-2002
California, Sacramento			
SR 99 concurrent-flow lanes	11.3 (7)	22.7 (14.1)	1998-2001
US 50 concurrent-flow lanes	44 (27.3)	88 (54.7)	Planning studies
I-80 concurrent-flow lanes	13.7 (8.5))	27.3 (17)	Planning studies
California, San Diego County			

(Continued)
LISTING OF PROPOSED MAJOR FREEWAY/EXPRESSWAY HOV FACILITIES
AS OF JANUARY 1998 (Listed by State/Province)

Project	Project Length		Status or Anticipated Opening
	Route-kilometers (miles)	Lane-kilometers (miles)	
I-5 concurrent-flow lanes	37 (23)	73 (45.6)	Staged through 2010
I-15 concurrent-flow lanes or transitway	14 (9)	27 (16.8)	Beyond 2000
Colorado, Denver			
I-25, barrier-separated reversible lanes ramps	6.4 (4)	12.8 (8)	Late 1990s
Connecticut, Hartford			
I-84 WB concurrent-flow lane	2.4 (1.5)	2.4 (1.5)	1998
Florida, Orlando-Tampa			
I-4 exclusive 2-way barriered lanes	64 (40)	141 (88)	Beyond 2000
I-4 interim reversible lane (Orlando)	9.6 (6)	9.6 (6)	Late 1990s
Florida, Ft. Lauderdale			
I-95 concurrent-flow lanes	17.7 (11)	93 (58)	Beyond 2000
Florida, Miami			
South Busway (extension to Metrorail Line)	10 (6)	20 (13)	1999
Georgia, Atlanta			
I-85 concurrent-flow lane extensions	20 (12)	40 (24)	1999
I-75 concurrent-flow lanes extensions	34 (20.5)	68 (41)	Before 2005
Maryland			
SR 141, SR 301 concurrent-flow lanes	(NA)	(NA)	Late 1990s
I-95/495 Capital Beltway concept to be determined	(NA)	(NA)	Planning studies
Massachusetts, Boston			
I-93 north contraflow lanes	12.8 (8)	26 (16)	2004
SR 3 south concurrent-flow lanes	18 (11)	36 (22)	Planning studies
I-93 Southeast Expy. reversible flow lane	12.8 (8)	12.8 (8)	2004
I-93 Central Artery concurrent-flow lanes	6.4 (4)	12.8 (8)	2004
Route 128 (I-95) concurrent-flow lanes	22 (13.7)	44 (27.4)	2004
Route 3 North (concept to be determined)	35 (22)	70 (44)	Late 1990s
I-90 Massachusetts Turnpike queue bypasses	1.6 (1)	1.6 (1)	Late 1990s
Minnnesota, Minneapolis			
I-35W concurrent-flow lanes	8 (5)	16 (10)	2003
Hiawatha Ave./Hwy. 55 Transitway (busway)	16(10)	NA	2002
New Hampshire			
I-93 concurrent-flow lanes	32 (20)	64 (40)	Planning studies
New Jersey, Morris and Somerset Counties			
I-287 concurrent-flow lanes (project extension)	10 (6)	20 (12)	Late 1990s
New York, New York			
I-495 Long Island Expy. concurrent-flow lanes	48 (30)	96 (60)	Staged through 2003
Gowanus Expy., concurrent-flow lanes	8 (5)	16 (10)	Late 1990s
North Caroling, Charlotte			
US 74, reversible lane and ramps	6.9 (4.3)	6.9 (4.3)	1997-2001
Various busways	NA	NA	Planning studies pending
Ontario, Toronto area, Canada			
H-403 median concurrent-flow lanes	16 (10)	32 (20)	Beyond 2000
H-403 outside concurrent-flow lanes	5 (3)	10 (6)	Late 1990s

(Continued)
LISTING OF PROPOSED MAJOR FREEWAY/EXPRESSWAY HOV FACILITIES
AS OF JANUARY 1998 (Listed by State/Province)

Project	Project Length		Status or Anticipated Opening
	Route-kilometers (miles)	Lane-kilometers (miles)	
H-404 (Hwy. 401 to Maj. Mackenie Drive) concurrent-flow lanes	15.5 (9.3)	31 (18.6)	Beyond 2000
H-427 (Hwy. 401 to 407) concurrent-flow lanes	(7.6)	(15.2)	Beyond 2000
H-401			Under study
H-410			Under study
Ontario, Ottawa, Canada			
Highway 17-Orleans concurrent lane in EB shoulder	5 (3)	5 (3)	Beyond 2000
Highway 417-Kenta concurrent lane in WB shoulder	3.3 (2)	3.3 (2)	Beyond 2000
Pennsylvania, Pittsburgh			
Airport Busway	8 (5)	16 (10)	2000
Wabash Tunnel reversible HOV lane	1.6 (1)	1.6 (1)	Late 1990s
East Busway extension	NA	NA	Beyond 2000
Tennessee, Nashville			
I-24	15 (9)	30 (18)	Under construction
Texas, Austin			
Various corridors	NA	NA	Studies pending
Texas, Dallas			
I-35 E (R.L.Thornton) interim reversible lane	6.4 (4.0)	12.8 (8.0)	1999
US 67 interim concurrent-flow lanes	6.4 (4.0)	12.8 (8.0)	1999
US 75 (North Central Expy.) reversible lane	8 (5)	16 (10)	2005
I-635 HOV/Express lanes (3 ea. dir.)	16 (10)	NA	Planning studies
Texas, Houston			
US 59 (Eastex Fwy.) reversible-flow lane	32 (20)	32 (20)	1998-2000
I-45 (North Fwy.) reversible-flow lane extension	10 (6.2)	10 (6.2)	Late 1990s
I-45 (Gulf Fwy.) reversible-flow lane extension	6.4 (4)	6.4 (4)	Late 1990s
I-10 (Katy Fwy.) reversible-flow downtown extension	4.8 (3)	4.8 (3)	1998
I-10 (Katy Fwy.) reversible and 2-way transitways	42 (25)	96 (58)	2002-2005
I-610 (North and West Loop) in study	NA	NA	Planning studies (MIS*)
Tomball (SH 149) corridor, busway	NA	NA	Planning studies pending
Westpark corridor, reversible flow lane	7.8 (4.7)	7.8 (4.7)	2000 (also MIS* pending)
Texas, San Antonio			
I-35 North Pan Am Fwy. HOV/Express lanes	NA	NA	Planning studies
Utah, Salt Lake City			
I-15 concurrent-flow lanes	32 (10)	64 (20)	2000-2005
Virginia, Norfok/Virginia Beach			
Route 44 concurrent-flow lanes	32 (10)	64 (20)	Late 1990s
I-64 concurrent-flow lanes	NA	NA	Planning studies (MIS)
Virginia, Washington D.C. Area			
I-66 concurrent-flow lanes	12 (7.5)	24 (15)	Late 1990s
I-95/495 Capital Beltway concept to be determined	32 (20)	64 (40)	To be determined
Dulles Tollroad	16 (10)	32 (20)	1998
Washington, Seattle/Tacoma/Everett			
I-405 extensions to concurrent-flow lanes (median)	12.8 (8)	26 (16)	Staged through 2000
I-5 South, extensions to concurrent-flow lanes	30 (19))	60 (38)	Staged through 2000
I-5 North, extensions to concurrent-flow lanes	8 (5)	16 (10)	Staged through 2000
SR 520 concurrent-flow lanes	6.4 (4)	12.8 (8)	Staged through 2000

(Continued)
LISTING OF PROPOSED MAJOR FREEWAY/EXPRESSWAY HOV FACILITIES
AS OF JANUARY 1998 (Listed by State/Province)

Project	Project Length		Status or Anticipated Opening
	Route-kilometers (miles)	Lane-kilometers (miles)	
SR 525 concurrent-flow lanes	4.8 (3)	9.6 (6)	Staged through 2000
SR 167 extensions to concurrent-flow lanes	9.6 (6)	19 (12)	Staged through 2000
SR 16 concurrent-flow lanes	9.6 (6)	16 (10)	Staged through 2000
SR 526 queue bypass	1.6 (1)	1.6 (1)	NA

NA Not available
* Major Investment Study

Appendix L

Bicycle/Pedestrian Data Sources

Bicycle and Pedestrian Data: *Sources, Needs, & Gaps*

U.S. Department of Transportation

BTS
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Bicycle and Pedestrian Data: *Sources, Needs & Gaps*

U.S. Department of Transportation

BUREAU OF TRANSPORTATION STATISTICS

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FACILITIES

Data on pedestrian and bicycle facilities may describe the type of facility (sidewalk, shared-use path, on-road bike lane, pedestrian bridge, etc.), location, length, width, physical condition, topography, intersection characteristics, and other relevant features. Data on road facilities, such as number of lanes, lane width, pavement quality, and intersection characteristics, can also be relevant to analysis of bicycle and pedestrian travel.

Data on individual facilities need to be geographically referenced in some way to be meaningful. This referencing may occur in a format as simple as a paper map or a list of roads by jurisdiction. Increasingly, however, Geographic Information Systems (GIS) are being used to maintain facility databases. GIS can include databases in the form of lines (e.g., route segments) or points (e.g., intersections or bridges). GIS software packages provide a variety of analysis and visual display capabilities that take advantage of the geographic nature of the data.

Data on facilities can also be reported in summary formats. These might include, for example, percentage of a city's street network with continuous sidewalks, or miles of bike route by type and pavement condition within a city. An example of aggregate reporting on road and highway facilities is the Federal Highway Administration's annual *Highway Statistics* (USDOT FHWA 2000).

Potential sources of data on bicycle and pedestrian facilities include:

- The U.S. Census Bureau's Topologically Integrated Geographic Encoding and Reference (TIGER) files,
- The National Transportation Atlas,
- The Rails-to-Trails Conservancy's recreational trails database,
- State road databases, and
- Local road information.

Census TIGER Files

The U.S. Census Bureau maintains its TIGER database, a digital database of geographic features, including roads, covering the entire United States. The database contains information about these features, such as location in latitude and longitude, name, type of feature, address ranges for most streets, geographic relationship to other features, and other related information. TIGER/Line files are publicly available and can be imported into most GIS software packages.

The TIGER/Line street network is comprehensive. It has been used in pedestrian analysis to analyze the connectivity of local street networks and, thus, the directness of pedestrian pathways (Hsaio 1997). Its usefulness for pedestrian and bicycle analysis is somewhat limited because it does not contain any facility attributes such as street widths, number of lanes, presence of sidewalks, etc. In addition, it does not contain pedestrian and bicycle connections that are not part of the street network, such as alleys, walkways, or pathways. It can, however, serve as a base map for additional mapping of facilities and characteristics at the local level.

National Transportation Atlas

The National Transportation Atlas Databases (NTAD) are a collection of geospatial databases, developed by the U.S. Department of Transportation and other federal agencies, depicting transportation facilities, networks, and services of national significance. The databases are designed to be used with GIS software. Elements of the NTAD can be downloaded or ordered through the Bureau of Transportation Statistics (BTS) website.

One element of the NTAD is the National Highway Planning Network, a network database representing approximately 400,000 miles of federal-aid roads in the 50 states and Puerto Rico. It is a topologically connected line database depicting the locations and centerline alignments of nationally significant roads. Attributes include route names or numbers, capacity measures, various network classifications, and traffic volumes.

The NTAD is currently of very limited usefulness for bicycle and pedestrian planning since it does not include local roads or bicycle and pedestrian facilities. However, it does contain a few attributes (e.g., capacity and traffic volumes) that may be relevant to bicycle and pedestrian planning. It also demonstrates the potential of GIS technology to make information on transportation facilities readily available and usable on a national scale.

National-level inventories of pedestrian and bicycle facilities, similar to those maintained for roads and highways, have not been developed.

Recreational Trails Database

The Rails-to-Trails Conservancy maintains a database of trails in the United States that utilize former railway alignments. The database currently includes information on the location, mileage, type of surface, contacts, and other information as available for specific trails. Summary data on total trails and mileage, both existing and projected, are available by state. The database may be useful for tracking trends in the provision of off-road travel/recreation facilities. It is

also a potential repository for other relevant information, such as the number, characteristics, and trip patterns of trail users by trail as well as characteristics of trail access and the surrounding area. If enough data of reasonable quality could be assembled, this might provide the basis for analysis of factors influencing both recreational and utilitarian nonmotorized travel.

State Road Databases

State departments of transportation maintain road databases for the purposes of statewide transportation planning and programming as well as maintenance activities. These databases generally include U.S. and state highways. Attributes may include facility type, number of lanes, capacity, traffic volume, pavement quality, crashes by type, whether the road is an established bike route, and other information. The types, quality, and format of the data vary from state to state. In many states, these data have been incorporated or expanded into statewide management systems established by Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).[2] Many states also have developed, or are developing, statewide road databases in GIS format.

State road databases have been used for statewide bicycle route planning in a number of states, including Illinois, Maine, and North Carolina. Bicycle suitability inventories and route maps have been developed that rate highways for suitability according to facility type, traffic volume, shoulder width, pavement quality, and other characteristics. The specific variables and methods for determining suitability vary from state to state and are summarized in a recent report by the Texas Transportation Institute (Turner 1997) (see box 2-2). Also, in some states such as California, the data have been used as a basis for crash studies because pedestrian and bicycle crashes can be tied to various facility and locational features.

State databases suffer from the obvious drawback that they do not include local roads. They also may not include some of the most important characteristics relevant to bicycle and pedestrian planning and analysis (e.g., not all states include shoulder width in their inventories). Relevant characteristics could be added, however, given sufficient resources for data collection. Also, updates may only be performed every five-to-eight years. State road databases may be most useful for bicycle route planning and crash analysis in areas where state and federal highways make up a significant proportion of through routes. The databases could also be used to report the mileage or percentage of state and federal roads, by area, considered suitable for bicycling.

[2] ISTEA required states to develop six management systems to track transportation assets and system performance. Three-pavement, bridge, and public transportation-are asset management systems. The other three-congestion, safety, and intermodal-relate to system performance. The requirement to develop management systems has since been dropped, although many states have continued with their development.

Box 2-2
Statewide Bicycle Suitability Criteria

The Texas Transportation Institute (TTI) recently undertook a survey to determine the extent to which state Departments of Transportation (DOTs) have developed bicycle suitability criteria for use in state roadway planning. The survey revealed that 70 percent (11 of 16 sampled states) had bicycle suitability criteria in place. The two most common criteria (one or both were used in every case) were the traffic volume and the width of outside lanes or shoulders. Thirty-five percent of the states with suitability criteria also indicated that they looked at heavy vehicles when considering traffic volume, 25 percent considered pavement conditions, and 15 percent included traffic speed or speed limit criteria.

The conclusions from the survey indicate that, with some exceptions, state implementation of various bicycle suitability criteria is still in its inception. The majority of those states that had bicycle suitability criteria in place had done so to meet state legislation that mandated their formation and use as a part of a multimodal transportation plan. It appeared that the use of traffic volume and lane width as primary suitability criteria was closely related to the fact that this information was available in state DOT databases. In addition to surveying current practice, the TTI report also makes recommendations for developing and adopting bicycle suitability criteria.

SOURCE: S.M. Turner, C.S. Schafer, and W.P. Stewart, Bicycle Suitability Criteria: Literature Review and State-of-the-Practice Survey, Research Report 3988-1, prepared by the Texas Transportation Institute, College Station, TX, 1997, Internet: tti.tamu.edu.

Local Road Information

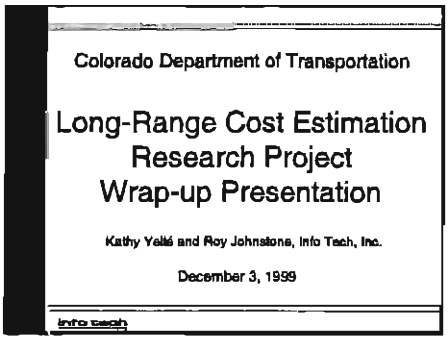
Cities, counties, or MPOs also maintain records of transportation facilities within their jurisdiction. Increasingly, this information is being stored in electronic format, primarily with GIS databases. At one end of the electronic spectrum, one can find basic mapping tools showing the location of public roads. As the databases are enhanced, one can find information on roadway geometry, including width of pavement, pavement condition, traffic volumes, presence of sidewalks, etc. At the other end of the spectrum one might find geo-coded information describing the compatibility of each facility with bicycling and/or walking. Portland, OR, for example, has used GIS databases to develop factors that describe the quality of an area for walking based on sidewalk continuity, ease of street crossings, and street connectivity.

These more sophisticated tools are typically used in areas that have well-developed networks of bicycle facilities or pedestrian activity, or in areas that have well-developed city or regional pedestrian or bicycle programs. While useful for local planning and system management functions, the data are not typically organized in a way that can be easily shared with others.

Appendix M

Cost Estimation Research Project – Slide Presentation

Slide 1



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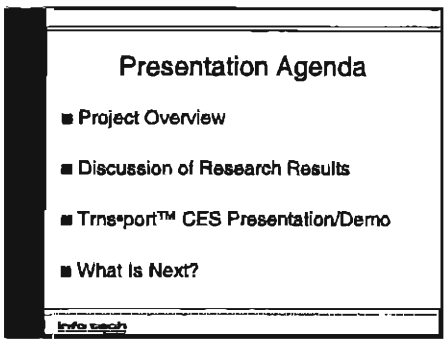

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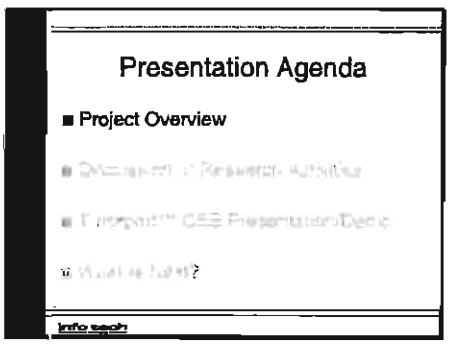

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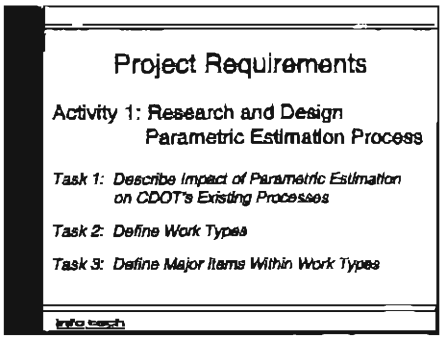

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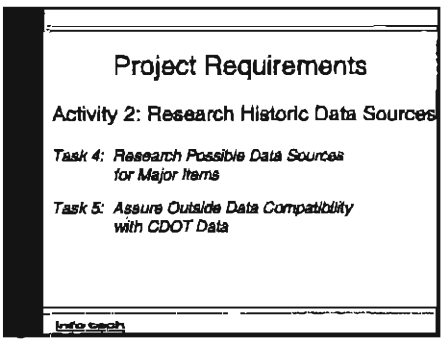

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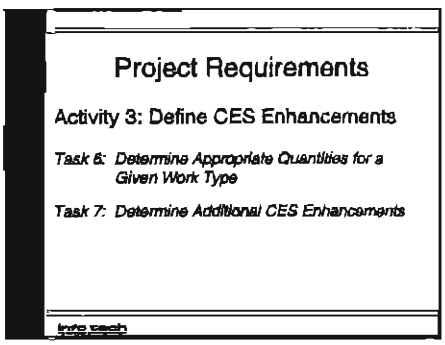

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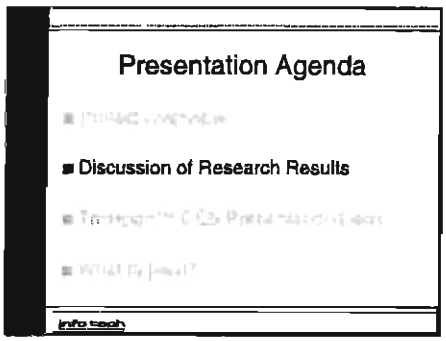

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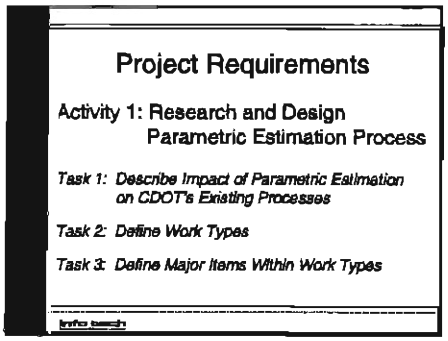

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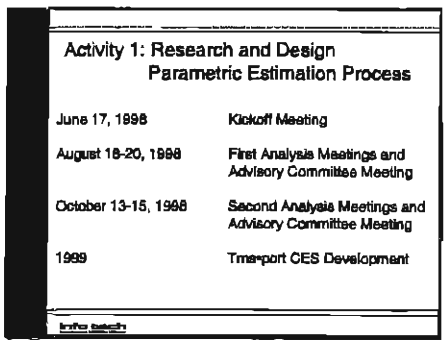

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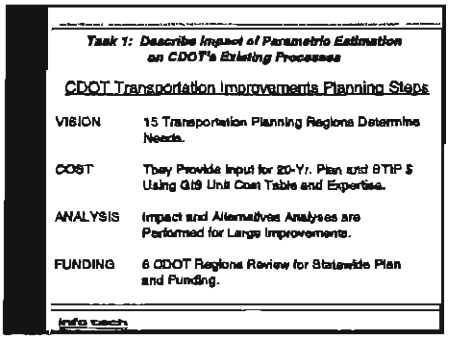

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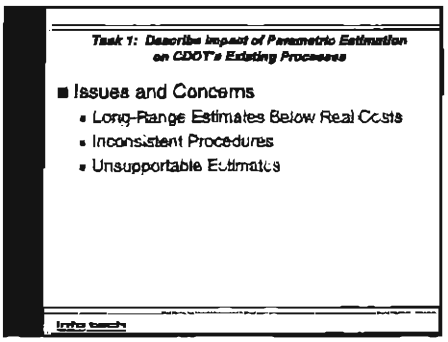

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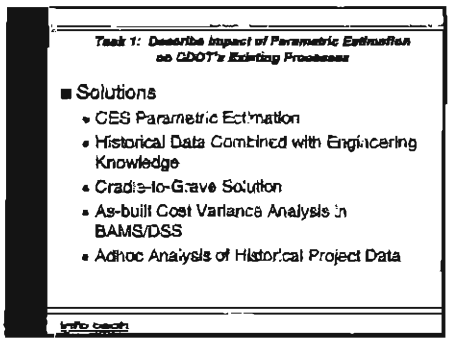

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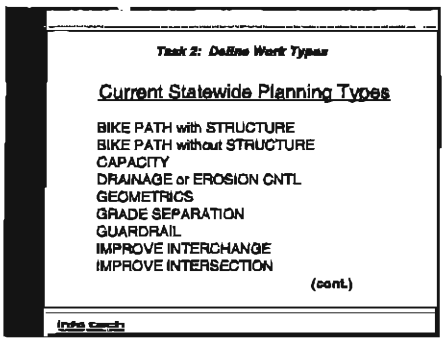

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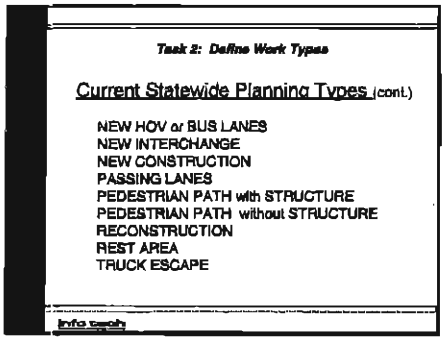

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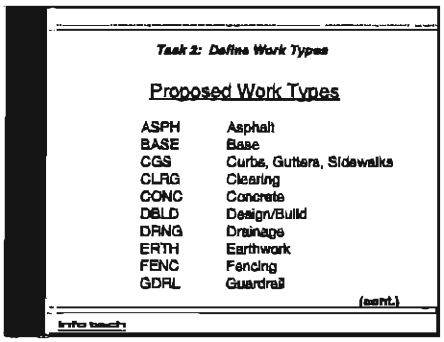

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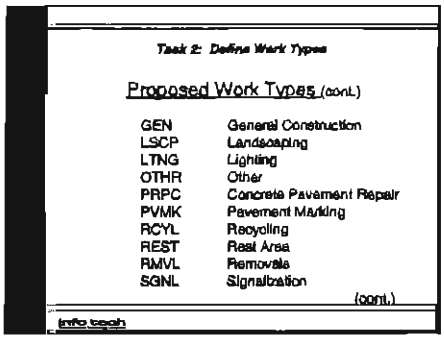

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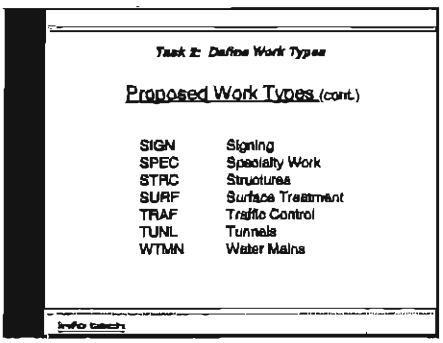

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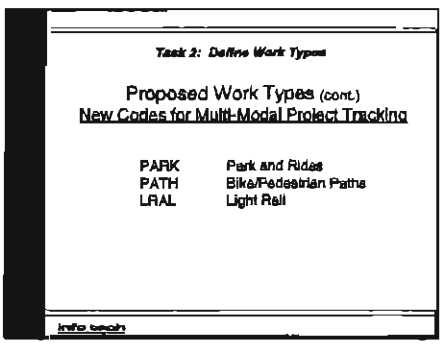

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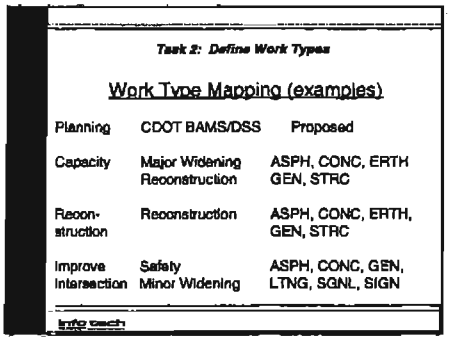

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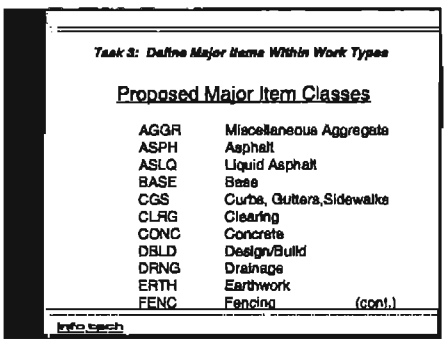

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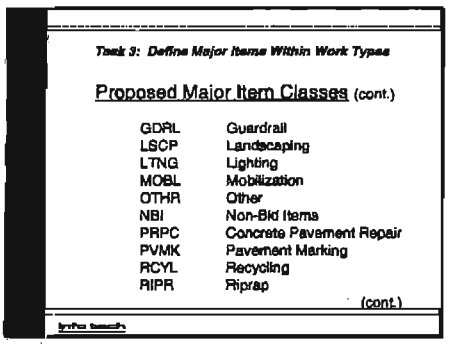

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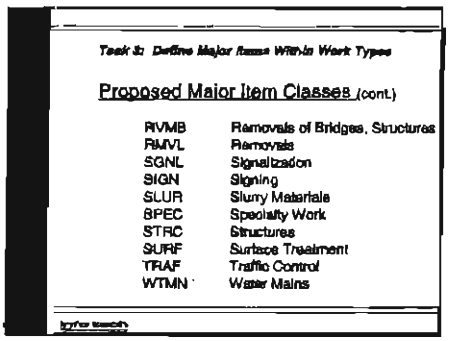

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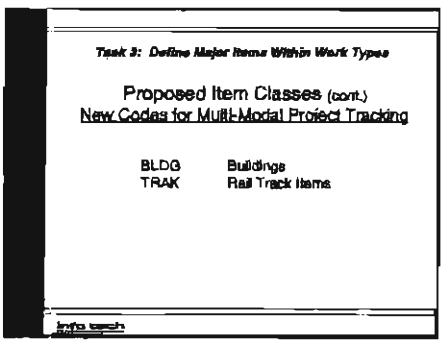

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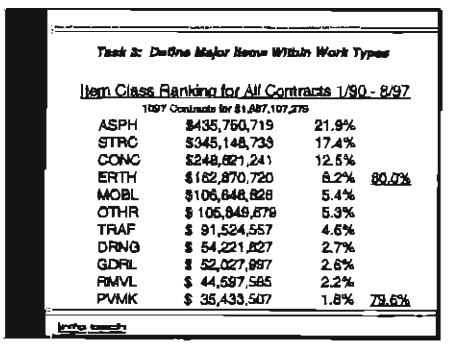

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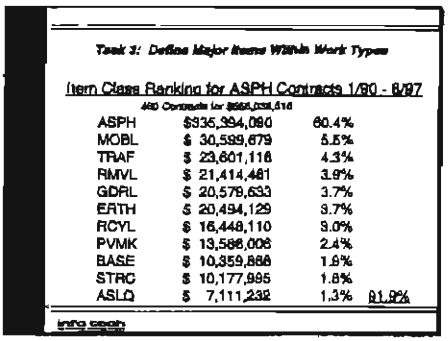


Task 3: Define Major Items Within Work Types

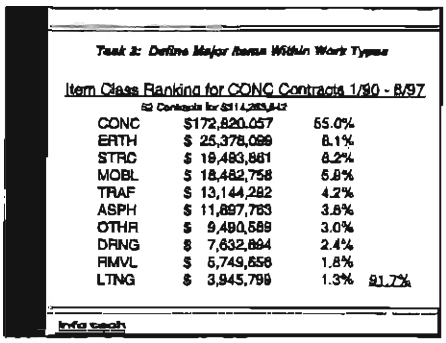
Item Class Ranking for ASPH Contracts 1/90 - 8/97

460 Contracts for $555,038,516

ASPH	$335,394,090	60.4%	
MOBL	$ 30,599,679	5.5%	
TRAF	$ 23,601,116	4.3%	
RMVL	$ 21,414,461	3.9%	
GDRL	$ 20,579,633	3.7%	
ERTH	$ 20,494,129	3.7%	
RCYL	$ 16,448,110	3.0%	
PVMK	$ 13,586,006	2.4%	
BASE	$ 10,359,888	1.9%	
STRC	$ 10,177,995	1.8%	
ASLQ	$ 7,111,232	1.3%	91.9%

Info needs

Slide 26



Task 3: Define Major Items Within Work Types

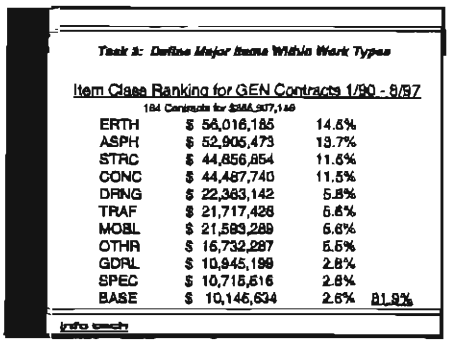
Item Class Ranking for CONC Contracts 1/90 - 8/97

82 Contracts for $314,283,842

CONC	$172,820,057	55.0%	
ERTH	$ 25,378,099	8.1%	
STRC	$ 19,493,861	6.2%	
MOBL	$ 18,482,758	5.9%	
TRAF	$ 13,144,282	4.2%	
ASPH	$ 11,897,763	3.8%	
OTHR	$ 9,490,589	3.0%	
DRNG	$ 7,632,894	2.4%	
RMVL	$ 5,749,556	1.8%	
LTNG	$ 3,945,799	1.3%	91.7%

Info needs

Slide 27



Task 3: Define Major Items Within Work Types

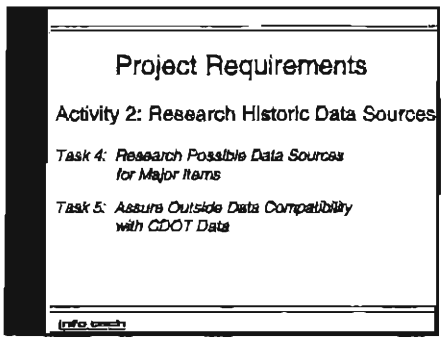
Item Class Ranking for GEN Contracts 1/90 - 8/97

184 Contracts for $384,927,149

ERTH	$ 56,016,185	14.6%	
ASPH	$ 52,905,473	13.7%	
STRC	$ 44,856,854	11.6%	
CONC	$ 44,467,740	11.5%	
DRNG	$ 22,383,142	5.8%	
TRAF	$ 21,717,428	5.6%	
MOBL	$ 21,583,289	5.6%	
OTHR	$ 16,732,287	5.5%	
GDRL	$ 10,945,198	2.8%	
SPEC	$ 10,715,616	2.8%	
BASE	$ 10,146,634	2.6%	91.9%

Info needs

Slide 28



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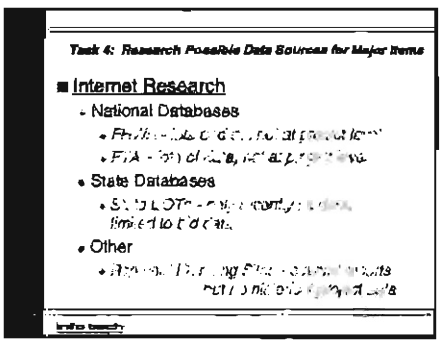

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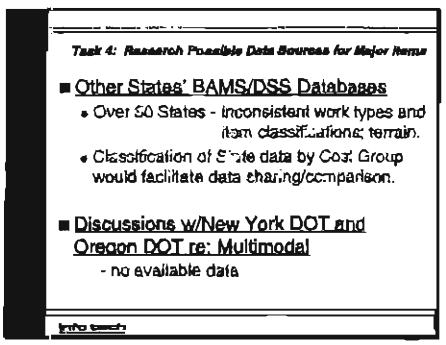

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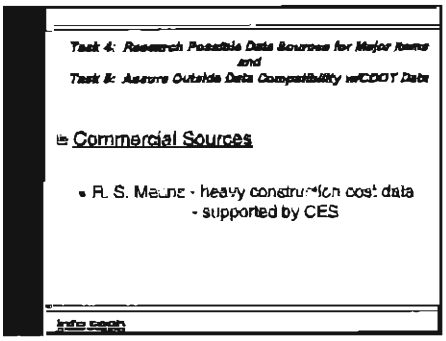

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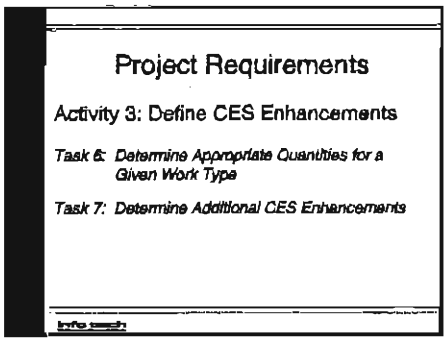

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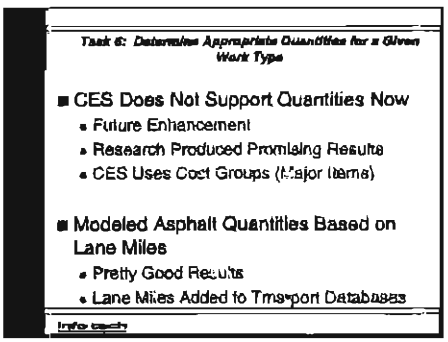

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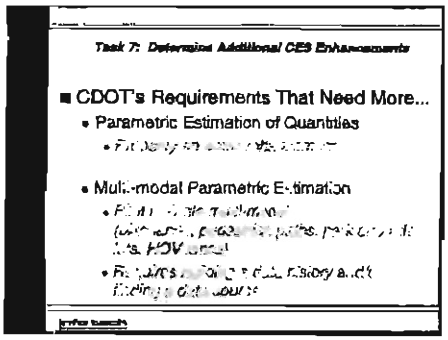

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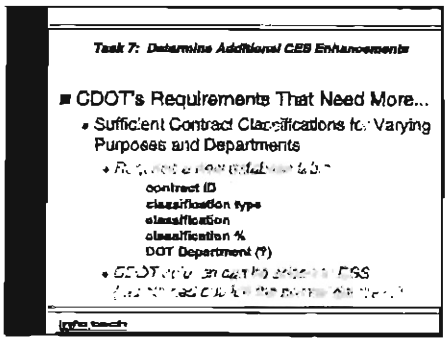

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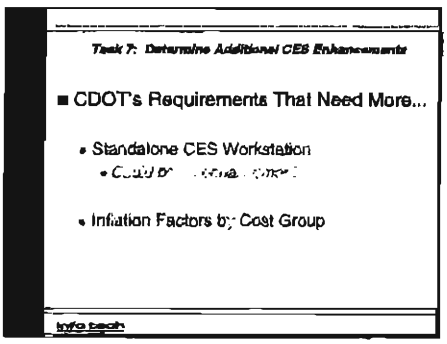

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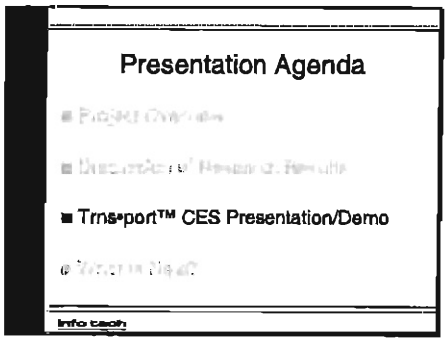

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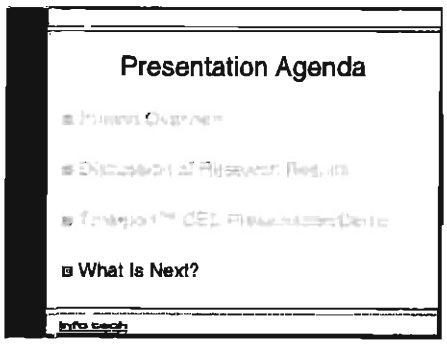

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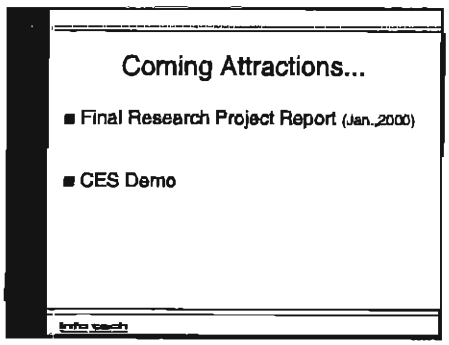

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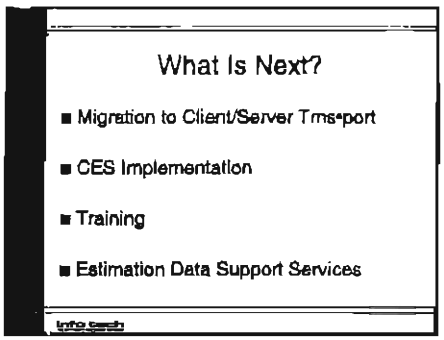

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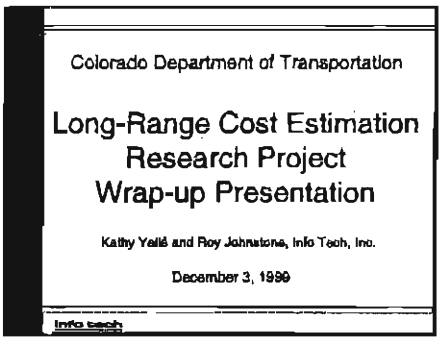

Addendum

Project Work Plan

Workplan for Parametric Estimation Research Project Utilizing Trns•port™ Estimation and Decision Support Software

prepared for the

Colorado Department of Transportation

May 29, 1998

Submitted By:

info tech
The Information Technology Company

5700 SW 34th Street, Suite 1235
Gainesville, Florida 32608-5371
(352) 375-7624

Contents

CDOT Workplan for Parametric Estimation Research

Overview

This workplan outlines the tasks and efforts that, when accomplished, will help the Colorado Department of Transportation (CDOT) attain two principal goals: to generate consistent and reliable long-range parametric cost estimates when little is known about a project, and to understand the issues surrounding CDOT's long-range estimating procedures. This effort involves five primary activities:

- Researching and designing parametric estimation process
- Researching historic data sources
- Defining client/server Trns•port CES™ enhancements
- Implementing client/server Trns•port CES*
- Enhancing client/server Trns•port CES if required*

This workplan focuses on the first three activities, describing them at the task level including cost breakdowns. The last two activities are described at a higher level with no cost breakdowns because they are not included in this current project; however, these activities should be performed at a later time when the client/server Trns•port CES software is released, currently scheduled for mid-1999.

The work schedule herein is based upon a tentative start date of July 15, 1998.

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* Not in the scope of this project.

Some of the activities described in this workplan will require an on-site presence at CDOT. The direct costs associated with these visits are noted in the direct costs column of the cost estimates. These numbers include other direct costs such as telephone charges, copying, and shipping. The labor dollars in this workplan are based upon an average labor rate from the AASHTO 1998-99 Maintenance, Support and Enhancements contract for the level of staffing required for this project. All proposed costs will be valid for all work contracted before May 15, 1999.

Communication between CDOT and Info Tech regarding this project will be accomplished through electronic means as much as possible, supplemented by contact via phone, facsimile, traditional mail, and the scheduled on-site visits.

Scope of Work

This project will primarily entail Info Tech, Inc. analysts doing the following:

- Conducting research and analysis in the area of long-range parametric estimation at the CDOT and in other states.
- Designing sound parametric estimating procedures based upon both mathematical principles and logical and realistic expectations of the estimators.
- Researching viable sources for historic data to support parametric estimation.

The five primary areas of activity outlined in the previous Overview section are described in greater detail in the following pages. The last two areas of activity are not included in this project.

Activity 1: Research and Design Parametric Estimation Process

Task 1 – Describe Impact of Parametric Estimation on CDOT's Existing Processes

Info Tech analysts will examine CDOT's current sketch planning cost estimating practices and the current bid estimation practices. Info Tech will propose revisions to those practices which would have to occur to achieve the objective of developing consistent and reliable cost estimates when little is known about a project. These revisions might include enhancements to current CDOT practices, introduction of methods not currently used at CDOT, implementation of client/server Trns•port CES, and enhancements to client/server Trns•port CES. CDOT will provide guidance and baseline information on the processes to Info Tech. In addition, Info Tech will propose an interim method of simple cost estimating that can be used as a generic framework for the upcoming regional planning process for a limited number of work types. This simple

method could employ generic unit values for the work types and be linked to a simple formula or spreadsheet to input quantities and to calculate a total project cost.

Task 2 – Define Work Types

CDOT will produce a written description of work types that closely match current planning project types where possible. This list will include the work types for multi-modal projects that will be needed for CDOT's new vision for transportation. CDOT staff will work with the various entities within CDOT and with outside modal agencies which can contribute their expertise. The work types will be expanded to include those being utilized by Statewide Planning. In addition, some work types, such as *Safety*, will be expanded to reflect the differences within a work type. Such expansion will occur by incorporating FHWA work types. The work types will be defined broadly enough to allow a significant number of projects to fall within each definition. Info Tech will evaluate the work types proposed by CDOT and will provide a written description of any work process or Trns•port software modifications that would be required to incorporate the new and expanded work types.

Task 3 – Define Major Items Within Work Types

CDOT and Info Tech will work together on defining a preliminary list of major items, using the Trns•port BAMS/DSS IRANK (Item Rank) model. This list will include the major bid items which are typically associated with each work type by default. These default items can be easily updated. The major items will cover the most important elements either in quantity or percentage of total cost for the work type. Info Tech will review the list and suggest additional items for work types new to CDOT. Info Tech will provide CDOT with written documentation describing each of the new major items. The documentation will indicate any variable to consider with each item or work type and what unit of measure is most appropriate. The documentation will also include any changed process that should occur for better estimating. For example, these types of questions would be addressed: "As part of work type 'reconstruction,' should interchanges be estimated separately? If so, what processes need to change?"

Activity 2: Research Historic Data Sources

Task 4 – Research Possible Data Sources for Major Items

Info Tech will conduct research that cites a number of possible sources for historic data not currently residing in CDOT databases, and will propose the most appropriate sources for such data. Colorado sources will be considered first, but in some instances, it may be necessary to access regional and national sources. Sources for highway projects will likely be available from CDOT, although it may be necessary to check with cities and counties. Sources for multi-modal projects may need to be accessed at a national level. For example, although RTD has a light rail system, it may be more appropriate to look to national sources for other light rail projects in order to have an adequate database. It may

also be helpful to seek data from other states in the Rocky Mountain region for certain work types.

Task 5 – Assure Outside Data Compatibility with CDOT Data

To assure compatibility of outside data sources with CDOT's existing DSS database, Info Tech will review and compare the format and content of all data. Info Tech will recommend methods to adjust outside data in order to integrate it into CDOT's databases.

Activity 3: Define Client/Server Trns•port CES Enhancements

Task 6 – Determine Appropriate Quantities for a Given Work Type

Info Tech will investigate if client/server Trns•port CES will produce an analysis by starting with major items as the primary input rather than work type. If this will be possible, the quantities for new work types should be obtained through the use of default files. These files should contain the default bid items, as well as quantity and price multipliers which would be appropriate for a given work type. For existing work types, this effort should provide an alternate means of obtaining quantities for a given project. If there are sufficient historic projects, then CES should determine the quantities based on a comparison with the other projects that have the same family of work types.

Task 7 – Determine Additional Client/Server Trns•port CES Enhancements

Info Tech will evaluate client/server Trns•port CES for any other modifications that need to be made to meet the requirements that are defined for CDOT's parametric estimation processes as a result of this project, including multi-modal project estimation. Each enhancement will be described in detail, including cost estimates.

Activity 4: Implement Client/Server Trns•port CES

Under an extension of this project or a separate project, Info Tech can assist CDOT in its implementation of client/server Trns•port CES. Implementation support can include some or all of the following services:

Installation	Install and test the hardware and software.
Training	Conduct System Manager training and User training.
Data Collection	Populate BAMS/DSS data, CES data, CES cost sheets.
Customization	Create CES formulas and other customizable options.
Interfaces	Build interfaces between CES and non-Trns•port systems.
Reports	Write CDOT-specific customized reports.

Estimates Work with CDOT to generate estimates.

Activity 5: Enhance Client/Server Trns•port CES If Required

Under an extension of this project or a separate project, Info Tech can perform some or all of the enhancements defined for the client/server Trns•port CES software. Enhancements can be added to an AASHTO Trns•port system via multiple funding methods. The first enhancement funding method is to go through the ballot process, and then if the enhancement is ranked high enough and there are enough funds for enhancements, the Trns•port Task Force (TTF) will approve funding the enhancement. This is usually a two to three year process.

If an enhancement is one that benefits multiple states, many states opt for a second method whereby a state or multiple states will fund the enhancement(s) and get approval from the TTF to add the enhancement(s) to the generic AASHTO-supported system for future maintenance and support. The turnaround time on the state-funded option is much faster than the ballot process option.

Work Tasks List

This section of the workplan lists each major activity and task to be accomplished under this research project, followed by a description of each task. Subsequent sections define the work schedule and costs related to the tasks described below.

Activity	Task	Short Description
PAR		**Research and design parametric estimation process in CDOT**
PAR	**ANA**	Analyze CDOT's current long-range estimating procedures and the requirements CDOT has for its future parametric estimation procedures. Produce a report including a prioritized "wish list."
		Design a parametric estimation procedure that meets CDOT's requirements including a short-term interim process. Produce a design report that categorizes design elements as "required" or "non-required."
		Both of these reports will be separate chapters in a single document that will be produced for this project.
PAR	**WRK**	Analyze the current work types and define a final list of appropriate work types. Add this information to the final project report.
PAR	**ITM**	Define the major items in each of the final work type classifications. Add this information to the final project report.

Activity	Task	Short Description
DAT		**Research Historic Data Sources**
DAT	**SRC**	Research possible historic data sources new to CDOT, including multi-modal historic data. Design methods for passing data from the sources into CDOT's parametric estimation systems.
		Report this information in a separate chapter of the final project report.
DAT	**CMP**	Determine the compatibility of outside data with CDOT's existing data. Define adjustments that may need to be made to the outside data before passing it into CDOT's systems. Add this information to the final project report.
CES		**Define Client/Server Trns•port CES Enhancements**
CES	**QTY**	Work with the client/server Trns•port CES development team to determine if CES can and will support automated input of item quantities.
		Report this information in a separate chapter of the final project report.
CES	**ENH**	Work with the client/server Trns•port CES development team to determine which CDOT requirements will be supported in the new CES and which ones should be considered as future enhancements to the system. Estimate the cost of the enhancements. Add this information to the final project report.

Table 1. Work Tasks List

Deliverables

There will be two deliverables for this project. For the first deliverable, a separate report will be written documenting the results of each task, and then each of these reports will be compiled as separate chapters of a single project report, *CDOT Parametric Estimation Research Project Results*. This report will document the findings and recommendations from all phases of the project, and will include process examples as needed for clarification. Ten hard copies and a corresponding electronic copy in Acrobat® format will be delivered to CDOT. The second deliverable, a Microsoft® PowerPoint® slide presentation, will also be delivered to CDOT in electronic form along with ten hard copies.

Schedule

Table 2 represents a work schedule of the tasks in this workplan.

Activity	Task	Jul-98	Aug-98	Sep-98	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99
PAR	ANA								
PAR	WRK								
PAR	ITM								
DAT	SRC								
DAT	CMP								
CES	QTY								
CES	ENH								

Table 2. CDOT Parametric Estimation Research Project Schedule

A schedule of milestones for this project is shown in Table 3.

Date	Milestone
7/15/98	Begin work – initial parametric estimation research and prep for analysis visit.
8/18-8/20/98	**First analysis visit** for PAR task research (2 people).
10/9/98	*CDOT Parametric Estimation Research Project Results* document with chapters reporting the PAR task results to CDOT for review.
10/13-10/15/98	**Second analysis visit** to review results of the PAR task, present and train on an interim parametric estimation solution, and research for the DAT and CES tasks (2 people).
1/20/99	*CDOT Parametric Estimation Research Project Results* document to CDOT for review.
2/3/99	CDOT acceptance of the *CDOT Parametric Estimation Research Project Results* document, or feedback regarding modifications if necessary.
2/17/99	Final *CDOT Parametric Estimation Research Project Results* document if revisions were required.
2/24-2/25/99	**Final project wrap-up visit** (with presentation if desired) (2 people).

Table 3. Schedule of Project Milestones

A different start date will result in an adjusted schedule that will need to be coordinated with pre-existing commitments. On-site visit dates are subject to availability of project-critical staff, both by CDOT and Info Tech. These dates will be met if at all possible but may require some flexibility. The on-site visits will include meeting with CDOT's advisory committee for this project. After the July 15, 1998, begin date, Info Tech will arrange a project commencement conference call with CDOT.

Project Costs

The labor and direct costs for this project, both in time and dollars, are shown in Table 4.

Activity	Task	Task Description	Task Hours w/Mgt	Task Labor Cost	20% Direct Costs	Total Task Cost
PAR	ANA	Describe Impact of Parametric Est. on CDOT's Existing Processes	389	$35,010	$7,002	$42,012
PAR	WRK	Define Worktypes	125	$11,250	$2,250	$13,500
PAR	ITM	Define Major Items Within Worktypes	84	$7,560	$1,512	$9,072
DAT	SRC	Research Possible Data Sources for Major Items	168	$15,120	$3,024	$18,144
DAT	CMP	Assure Outside Data Compatibility with CDOT Data	63	$5,670	$1,134	$6,804
CES	QTY	Determine Appropriate Quantities for a Given Work Type	126	$11,340	$2,268	$13,608
CES	ENH	Determine Additional Trns.port Client/Server CES Enhancements	63	$5,670	$1,134	$6,804
		TOTALS	1018	$91,620	$18,324	$109,944

Table 4. CDOT Parametric Estimation Research Project Costs

The estimated average hourly rate, based on the anticipated level of the project team at AASHTO rates, is $90. Direct expenses for travel costs, duplication and copying, facsimile, telephone, shipping, and so forth, are anticipated to be approximately 20% of the labor cost. Project management is typically 5% of the labor cost and has been included in the task hour estimates.

Monthly invoices for the project percent complete will be mailed to CDOT. Info Tech will work with CDOT on an invoice format that meets CDOT's requirements.