TNFORWARD
TOP TO BOTTOM REVIEW

Chapter 22

TRANSPORTATION

HIGHLIGHTS

- Rebuild the core competency of TDOT professional and technical staff. By reducing dependency on consultants and increasing the number, skills and capabilities of TDOT's professional staff, an estimated total of $14,500,000: in the areas of project design/development ($3,000,000); environmental inspection ($3,200,000); and construction engineering & inspection ($8,300,000), could be made available for reallocation over a period of years to additional road and bridge projects.

- Consolidate TDOT's regional construction and maintenance divisions. The increased efficiency and effectiveness resulting from this initiative could facilitate the reallocation of approximately $6,200,000 over a 3-5 year period to new infrastructure projects.

- Create a more robust, dedicated Project Management Division program that incorporates a quality control role within the PPRM process relative to plan inputs from Environmental, Design, Structures, Right-of-Way/Utilities, and Geotechnical.

INTRODUCTION

The Tennessee Department of Transportation (TDOT) is charged with planning, implementing, maintaining and managing an integrated transportation system that facilitates the movement of people and products and in so doing provides opportunity for economic prosperity and a high quality of life for Tennessee's citizens. The state owned transportation infrastructure for which the department is responsible includes highways (13,871 miles), public transit (28 transit systems), aviation (74 general aviation and 6 commercial airports), rail (19 short line and 6 Class I railroads) and waterway (946 main channel miles) transportation. Additionally, there are nine regional bicycle routes totaling approximately 1,500 miles of which one bicycle trail extends 500 miles cross-state; 8,500 roadway miles with four-foot shoulders to accommodate bicycles; 270 miles of greenways and trails; and 5,000 miles of sidewalks on all roadways in the state including local roads.

TDOT is organized into four major areas: Headquarters, Bureau of Administration, Bureau of Engineering, and Bureau of Environment and Planning. TDOT has four regional offices located in Knoxville, Chattanooga, Jackson, and Nashville; the department's headquarters are located in Nashville. Each TDOT region is comprised of five to six district offices with a total of 22 district offices located throughout the state. A TDOT county maintenance crew is located in each of the 95 counties.

The operational budget of the department is not dependent on the state's general fund. State user fees and federal funds account for approximately 88% of TDOT revenues. The remaining 12% is generated from various local revenues, fees and bond authorizations.

APPROACH/METHODOLOGY

A Top to Bottom Review team with public and private sector experience was assembled from within the department. The members chosen brought planning, program development, human resources, legal, management, business and finance expertise to the team.

A multiple choice questionnaire was sent to all 3,800 TDOT employees with approximately 1500 responses. An open ended response questionnaire was sent to 225 key upper level managers and decision makers and an additional 100 planning and operational personnel.

Face-to-face interviews were conducted with more than 400 individuals from within TDOT's headquarters divisions, its four regions and with outside stakeholders including MPO representatives, consultants, contractors and FHWA representatives.

Interviews were conducted with key personnel in other states that recently conducted a comparable reorganization initiative. Studies relating to other state's DOT organizational structure and governmental best practices were also evaluated. The team met with State Smart Transportation Initiative (SSTI) representatives to review TDOT's Top to Bottom Review and discuss it within the principles of "smart transportation" practices.

RECOMMENDATIONS

Recommendation 1: Consolidate TDOT's regional construction and maintenance divisions.

Discussion: In order to improve employee skills and abilities through training and to create a unified workforce that understands and is capable of executing maintenance and construction activities, the committee recommends the establishment of a single technical series that combines Maintenance Division and Construction Division staff.

In addition to increasing overall work efficiency in both areas, it is estimated that the department could, in time, realize a 15% reduction in positions necessary for these functions and a decrease in costs by $6,200,000.

Recommendation 2: Establish a greater and more prominent role for the Information Technology (IT) Division.

Discussion: In many areas, TDOT does not have adequate information management tools in place to make well-informed programmatic analyses. The department needs data that has a defined business value, is readily available and conducive to business analysis. The data must be accurate, available at the lowest cost and fastest speed possible and capable of being integrated.

TDOT's IT Division should have its responsibilities broadened to include tracking and evaluating results for all types of processes, programs, and projects, looking at trends at multiple levels as a way to identify improved practices to adopt more widely across the organization and to identify problem areas that may need to be addressed.

These factors should be monitored routinely:

- Plans and product quality
- Planned versus actual cost
- Planned versus actual schedule
- Scope management
- Return on investment
- Achievement of goals
- Performance against performance measures

The IT Division should collect and aggregate cost and performance information and make it available across the department for all who must make well informed decisions.

Users from across TDOT, not just managers, want and need quality, timely information on demand. They also want the flexibility and ease of use in engaging tools that they are familiar with (the nearly ubiquitous use of Microsoft Office). And, they want their information delivered consistently.

A first step toward achieving this environment will be researching and analyzing the concepts of business intelligence and data warehousing. Their benefits, well established in the private sector, can then be evaluated in relation to the benefits their incorporation will bring within TDOT's operational framework.

Recommendation 3: Establish a strong project management program.

Discussion: Project plan development processes and procedures were not producing the desired quality of plans nor were they efficiently utilizing funds. There is a need to implement a "cradle to grave" oversight of the plan development process.

Interviews conducted both inside and outside TDOT brought attention to the quality of construction plans, the primary product of the project development process. There was a general consensus among both TDOT's construction personnel and the contractors who construct TDOT's projects that the quality of plans is often lacking in terms of accuracy and completeness.

When problems are identified prior to opening bids, it is occasionally necessary to withdraw the project from the bid letting. This results in at least an additional six week delay before re-letting. If the problem is identified after the contract has been awarded, additional costs to the project are often incurred from change orders necessary to add work or correct other errors.
The department will create a more robust, dedicated project management program that incorporates a quality control role within the PPRM process relative to plan inputs from Environmental, Design, Structures, Right-of-Way/Utilities, and Geotechnical.

Recommendation 4: Reassess the functional scope of long-range planning and project planning.

Discussion: There seems to be no definitive measure of, or at least there is much confusion about, when planning ceases to be a "process" and when it actually becomes a central component of the "product" (i.e., the transportation project). This creates a situation where duplication of effort and expense on the part of long-range planning and project planning is likely.

The "needs assessment" process conducted in long-range planning should be reviewed and its scope and function modified to be a mechanism for early screening of projects. An early analysis of suggested projects will reduce the number upon which unnecessary studies are conducted. This will reduce the amount of funds currently being consumed by project studies that hold out little promise of becoming funded as projects. This should realize a decrease in the number of more expensive TPRs (Transportation Planning Reports) by replacing them with less expensive but just as relevant studies.

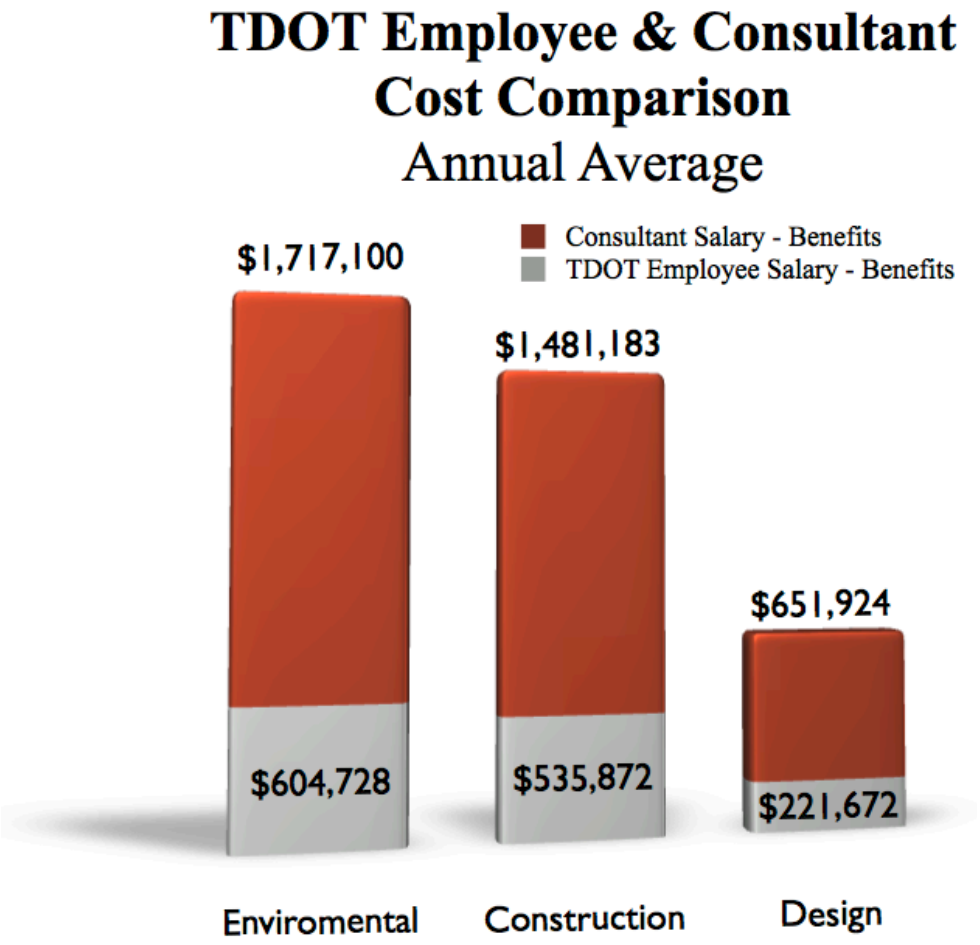
Recommendation 5: Improve TDOT's plan development process and plan quality.

Discussion: A number of design positions from headquarters will be moved to regional design offices to upgrade the quality of those offices as needed and to provide sufficient qualified staff to assume responsibility for a greater proportion of the department's roadway design work. This should result in the reduction of plans produced by more expensive consultants and a potential reallocation of $3,000,000 to additional infrastructure projects over a 3-5 year period.

Recommendation 6: Restructure the process of Erosion Prevention/Sediment Control (EPSC) environmental compliance inspections and quality assurance/quality control oversight.

Discussion: Internal and external interviews with staff, consultants, and contractors indicated a concern that duplicative efforts with respect to quality assurance/quality control and EPSC inspections are causing increased costs and delays in construction and a delay in the decision-making process.

TDOT will move to restructure the process of EPSC environmental compliance inspections and quality assurance/quality control oversight in a manner that reduces the redundancy of inspections and streamlines the process by ensuring TDOT staff is adequately trained and familiar with applicable environmental regulations. Doing so should also realize more clarity in decision-making authority and accountability for storm water permit



compliance on construction projects, as well as more timely decisions, while retaining independent program oversight and training through the quality assurance/quality control program.

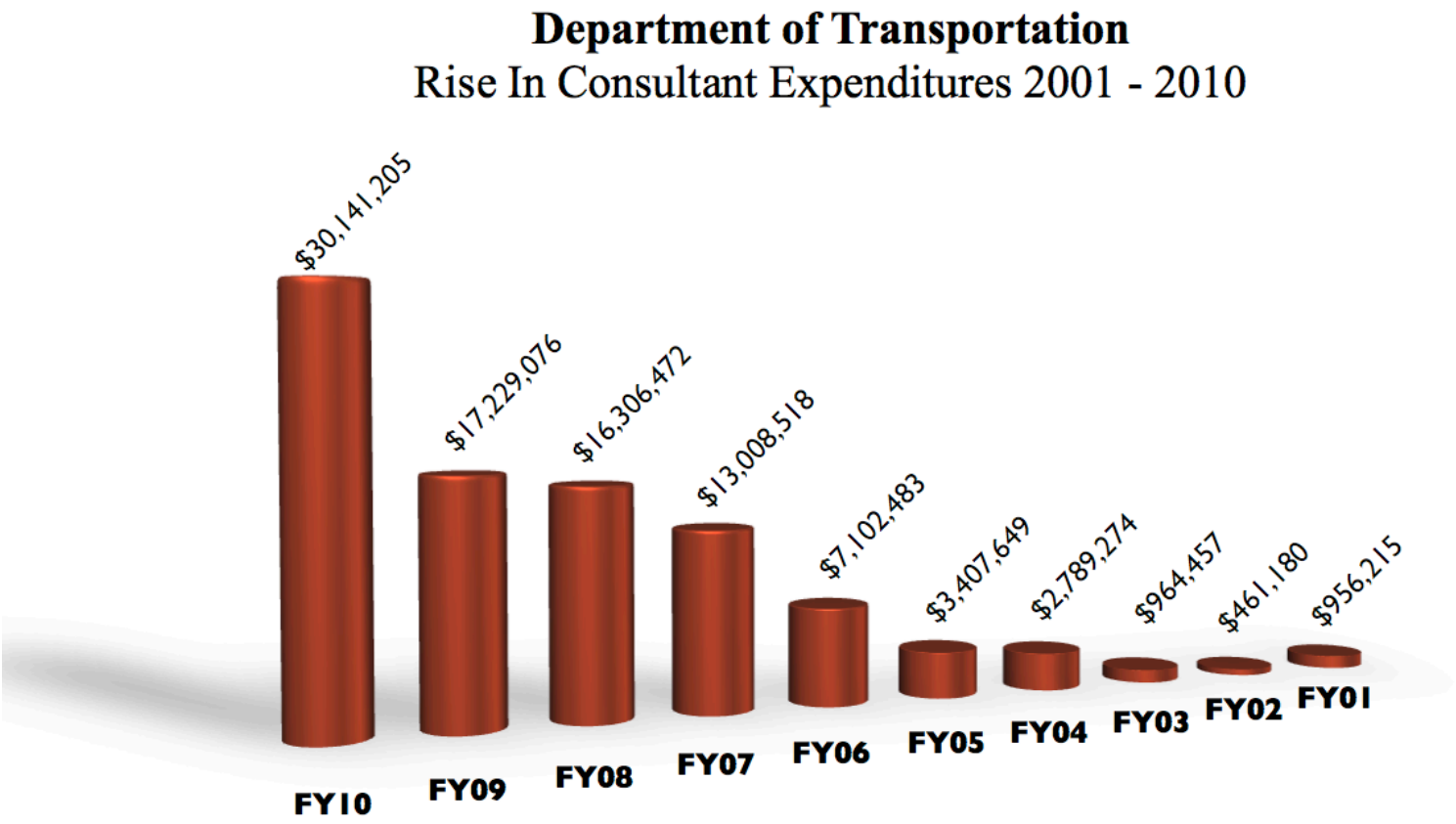
Additionally, this should result in less reliance on outside inspection services and reduce the time delays currently ingrained in the system. A reduction in the annual use of environmental consultants will realize an approximate net cost savings of $3,200,000 that can be reallocated toward additional infrastructure improvements.

Recommendation 7: Rebuild the TDOT construction staff to a level that facilitates increased in-house departmental construction engineering and inspection.

Discussion: As a result of having an inadequate number of TDOT construction staff with which to perform construction engineering and inspection of all TDOT let highway projects, it has been and is increasingly necessary to utilize consultants to supplement TDOT staff performing inspections. This practice results in project costs higher than necessary because the nature of many projects to which CEI's are assigned do not reach the level of difficulty or expertise that justifies the much higher costs of an outside consultant. This also requires TDOT personnel to train CEI inspectors on TDOT's processes.

Vacant construction positions should be reviewed and a determination made of the number that should be filled and where the positions should be located with the general goal to increase field construction staff to a level that is adequate to handle construction contract administration and inspection on the typical annual highway and bridge construction program. At the same time, the intent should be to use CEI consultants primarily on construction projects that are large, complex and/or require specialized skills, or to supplement staff in periods of peak demands.

It is expected that a reduction from the last two years average annual usage of CEI consultants would begin to rebuild the core competency of TDOT's construction offices while also facilitating the reallocation of approximately $8,300,000 to the building and maintenance of highways and bridges over a 3-5 year period



Recommendation 8: Create an action plan to address departmental sub-recipient monitoring weaknesses.

Discussion: Both the April 2011 Performance Audit Report and the Single Audit Report for the Year Ended June 30, 2010 identified weaknesses in departmental sub-recipient monitoring. State sub-recipient monitoring guidelines are outlined in Department of F&A's Policy 22 and the Tennessee Sub-recipient Contract Monitoring Manual.

Priority for grant oversight is inconsistent throughout the department. Audit findings seem to generate concern, but there are no overall long-term actions to ensure that future findings do not reoccur.

TDOT shall review skill sets and job requirements for individuals performing grant functions, research and find available training for grants management including what is provided by federal oversight agencies, evaluate the current grant administration workflows of each grants management division and create and implement protocol standardization to the greatest extent possible. These standardized rules of administration shall be applied to the grant monitoring and oversight functions and responsibilities and the utilization of grants management tools.

Recommendation 9: Develop and implement standardized rules and regulations that govern administrative requirements as well as the responsibilities and expectations of each Multimodal Transportation Resources Division program.

Discussion: The primary activity of the Multimodal Division appears to be federal grant management and administering state matching funds. The division, however, provides little leadership in developing transit policy, statewide coordination of resources, transit planning or commuter ridesharing.

The purpose and mission of the Multimodal Transportation Resources Division (MTRD) will be revisited, clearly defined, and clearly communicated to the staff. Standardized rules and regulations that govern the administrative requirements, responsibilities and expectations of each program should be developed and communicated to both MTRD and stakeholder staff. An appropriate training program about the aforementioned rules and regulations will be initiated for both MTRD and stakeholder staff.
This shall result in enhanced integration with the planning component for the department and improved grant management and monitoring

Recommendation 10: Implement the TDOT garage Inventory Standardization and Consolidation program.

Discussion: Over many years of operation that utilized an inventory based system, a situation evolved where a single inventory item number served as identifying item/stock numbers for multiple vendors and often with greatly differing price points. This was completely incompatible with Edison, which was implemented in July, 2009, as it would accept only one vendor, one item description and one price per individual, unique item number.

In the attempt to correct this issue it was discovered that common practice was to purchase different items having identical functions and application but with widely varying costs under a single item number and from multiple vendors. By standardizing and consolidating inventory items throughout TDOT's regional and district garages there will be an increased accountability of garage inventory reducing loss, a reduction of expenditures on duplicated items and unnecessary higher priced items and a reduction of surplus items each year.

Recommendation 11: Evaluate TDOT's 95 county maintenance facilities and review staff allocations.

Discussion: Currently TDOT maintains a county maintenance office in each of the 95 counties. A highway maintenance staff of ten is typically required to perform maintenance activities including establishing work zones, mobilizing equipment, and providing traffic control. Currently, there are fifteen county highway maintenance offices that have a staff of less than ten.

There is no apparent correlation between the distribution of maintenance staff and lane miles to

be serviced and other key factors. Current county facility locations will be evaluated and staff allocation reviewed. It is recommended a staffing standard be established for highway maintenance facilities based on key criteria, such as lane miles per authorized position.

Recommendation 12: Create a Top to Bottom implementation team to develop tracking tools and protocol and oversee the progress of implementation.

Discussion: The easy part of managing change is figuring out the direction toward which the department is to go. The hard part is getting from here to there—from the current state to the future state—and persuading sufficient numbers of the right people to overcome their fears, skepticism, and resistance and join you on that journey.

TDOT leadership shall create an implementation team of change champions to be integrated into a senior implementation leadership team and empowered with authority to plan and lead change.

Recommendation 13: Incorporate LEAN into TDOT as a perpetual business management program.

Discussion: Create a permanent "Business Management Office" that is charged with not only implementing change resulting from accepted Top to Bottom Review findings but also with initiating and implementing a continual program of process improvement throughout the department.

The utilization of LEAN by this office would be a primary, though not exclusive, tool in effecting this initiative. This office would be charged not only with applying LEAN itself, but also with educating the TDOT organization on the utilization of LEAN and constructing and installing a LEAN program that is integrated within TDOT as a standard administrative/operational tool for improvement.