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16. Abstract

The principal objectives of this study were to evaluate the performance indicators in use at DOTD, to determine if any of these indicators appeared to be deficient, and, if so, to specify those deficiencies identified, to specify a uniform procedure for the development of future performance indicators, and to use this procedure to develop indicators as specified by the Program Review Committee.

The scope of the investigation included the study of current procedures in use at DOTD, the study of Manageware, the planning and budgeting guidelines from the Division of Administration, a survey of available current literature, and interviews with program area managers of DOTD, as well as related personnel from the Division of Administration, the Legislative Budget Office and the Office of the Legislative Auditor.

The methodology employed was that of general systems analysis; interview personnel, accumulate information, and define procedures and processes involved.

The results of the study are that the performance indicators in use by DOTD are acceptable for the current stages of development of the new process of management that is desired by the legislature through the Legislative Budget Committee. As would be expected with a new process, the management of DOTD must continue pressure upon their personnel to ascertain an across the board consistency in the development and use of performance indicators.

Management of DOTD should continue their advocacy of using performance indicators as measures of merit in the evaluation of departmental operations. Efforts should be directed at a continuing program of improving and increasing the utilization of performance indicators, working to insure that as changes are made they simplify the overall application of the technique.

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DEVELOPMENT OF PERFORMANCE INDICATORS FOR DOTD PROGRAMS

by

Thomas G. Ray, Ph.D.

Industrial and Manufacturing Systems Engineering Department
Louisiana State University
Baton Rouge, Louisiana 70803

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ABSTRACT

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IMPLEMENTATION STATEMENT

The results of the study may be implemented through ascertaining that personnel preparing performance indicators follow the generalized examples for their preparation as shown in the appendix. This implementation will require no radical departure from current methods.

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The researcher would like to thank the members of the Program Review Committee, the unit managers who graciously provided time to answer questions and discuss their operations, and, lastly, to Mr. Arthur Rogers of LTRC who was always available to aid in any requests to provide access to needed personnel or information.

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INTRODUCTION

The legislature of the state of Louisiana acting as facilitators for the Legislative Budget Committee has begun to require the inclusion of performance indicators as a part of the General Appropriations Act. For fiscal year 1997-98 performance indicators were used for informational purposes only. In the future they will be used as a basis for the full implementation of the process of performance based budgeting.

DOTD has included a significant number of performance indicators on a program-by-program basis as a part of its executive budget. These indicators are candidates which may be included in the executive budget prepared by the Division of Administration (DOA) for presentation to the legislature. Representatives of the DOA and the Legislative Budget Committee select from the indicators forwarded by DOTD a group of "key indicators" which are included as a part of the budget sent to the legislature.

As the State of Louisiana moves toward performance-based budgeting, it is essential that the department furnish information for the budgeting process that will accurately represent both the tasks accomplished and those to be accomplished. The achievement of this objective should allow DOTD programs to be shown favorably in relation to other competing state programs. It should be noted that in the opinion of the researcher, very few programs of any competing agencies are accurately represented by their performance indicators. Further, DOTD has many outputs that are physically measurable and lend themselves to quantification that is readily understood and adaptable to representation by performance indicators.

Management of DOTD initiated this study to ascertain that the procedures being used by the department in the area of performance indicators are current, valid and relevant to the task to be accomplished.

The literature related to this area is well summarized in the Transportation Research Board publication *Performance Measurement in State Departments of Transportation: A Synthesis of Highway Practice*. This 1997 publication surveys the entire area of application of performance measurement in state DOT's.

A study of the previously mentioned document would lead one to conclude that although certain specific performance indicators can be used universally, there is no one model of application for the overall program that has been universally adopted. The reason for this lack of uniformity from state-to-state is apparent: Each of the states began at a different point, and although there may be some overlapping similarities to other states, each has a unique set of additional conditions with respect to other states.

Further, with respect to the general area of performance indicators, their adoption in some cases, can be considered a step backward for certain activities. This is because/due to the fact that performance indicators are *very crude* measures of output. The intent in their original areas of adoption was to provide some basis for comparison of homogenous output in one period with the output in a succeeding period. This application was for governmental operation which had no physical outputs, such as bridges, roads, traffic signals or signs. The idea was to provide a justification for the continuation of, or

incremental increase in, funding. The method was to quantify an activity and then to show the quantity of output to justify the funding for the activity. This is indeed a more effective route for operations which previously had no quantified output. However, DOTD has hundreds, if not thousands, of measures of merit which are more relevant and accurate than many performance indicators.

To follow-up on this point, one should consider the evolution in the use of performance indicators. When they finally are adopted and employed universally, their use could become a burden; there could be performance indicators for everything. One cannot interpret the meaning of the indicators when he sees one increasing, a second holding constant, and a third and fourth indicator falling. This necessitates the next step of the process - a simplification. This is a achieved by combining performance indicators into a performance index. An index requires considerable subjective determinations since the index is essentially an effort to relate "apples to oranges." These trade-off determinations are fraught with possibilities for error. This requires more attention to detail and more actual measurement of the consumption of resources to effect an accurate trade-off in the determination of the proper relations for an index. Hence, the procedure has led to a requirement for work measurement to accurately know what is happening. DOTD was well on the way to having work standards in the area of maintenance several years ago.

It would appear that the eventual problem will be having work standards for performance indicators . If the process is begun with that in mind, DOTD may very well be prepared for the future and have a basis for accurate performance indicators and

performance indices (when they are required), and, further, DOTD would lead the state in progressive departmental management.

Previously, the intent of providing a comparison of homogenous outputs in successive periods was mentioned. In many activities outputs are non-homogenous. Performance Comparison of homogenous and non-homogenous activities can lead to erroneous assumptions. For example, assume that there is a certain type of repair that is done by a maintenance unit. In a base year the unit was budgeted $295,000 and the number successful/completed of repairs was 1,670. The second year the budget was the same and the unit completed only 1,270 repairs. A performance indicator, using the base year as a benchmark with the number of repairs compared to the base year, would indicate inefficient performance (.76 efficiency). This is a result, however, of the assumption of homogenous units. In effect, the performance in the second year was identical to that in the first. It so happened that there were four levels of severity in the repairs accomplished by the unit. These four levels, in increasing order of severity, required $150, $250, $500 and $1,000, respectively, in resources to accomplish. During the first or base year, the mix of repairs was 1,500, 100, 50 and 20 respectively. In the second year these numbers were 1,000, 100, 100, and 70.

The major fallacy in this case is the linear assumption of homogeneity. This situation can reflect poor budget reduction performance. The most critical repairs as a

result, would be accomplished first, consuming more resource per repair while the least critical repairs, would be delayed. This approach skews the average cost per repair, making it increase, and reduces the total number of repairs that can be accomplished with the smaller budget. In general, non-homogeneity in the work units cause a non-linear drop in efficiency as reflected by a performance indicator. The percentage drop in efficiency far exceeds the percentage reduction in the budgeted resource for activity accomplishment.

In the beginning of the process of adapting to a new system, there is a natural resistance to change on the part of the personnel involved. This resistance, in many cases, is sufficient to overcome the management's desire to change. It thus thwarts the change and causes the system to revert to the old way of "doing business." For the case at hand, no resistance to change by personnel involved will be sufficient to overcome management's to commitment change. This change, after all, is necessitated to comply with the law as passed by Legislature.

Even though this change must occur, natural resistance does and exist must be recognized. Hence, the department must persist with a firm approach to the use of performance indicators and the process of continued innovation in their selection and improvement. Department management must be aware of the pitfalls stated within this report.

OBJECTIVE

The objective of the research to evaluate the performance indicators currently in use at DOTD, determining if any deficiencies exist with those that are sent forward as a part of the executive budget. A further objective was to examine the procedures used for the determination of performance indicators within the department and to specify a uniform procedure for the preparation of these indicators. The final objective was to apply the procedure to a representative group of DOTD units, as specified by the PRC.

SCOPE

The scope of the study was limited due to the time and resource commitment specified by the RFP. At the outset of this project the researcher expressed concern that the research would necessarily have to be of limited scope because of the large size of the department. At that point, members of the PRC stated that they were well aware that the scope would be limited. General direction was given by the PRC to look at the key indicators included in the executive budget and determine their appropriateness. Further, PRC members expressed an interest in inputs from the researcher that were related to the problem but not necessarily delineated in the problem statement. These later items would be information related to interactions of the performance indicators with the overall environment in which they are used and, later, to point out any observed areas in which the department might encounter difficulties with the progressive of performance indicators as a management tool. Finally, the purpose of this study was to prepare a general application procedure in the preparation of performance indicators and to apply the procedure to the preparation of appropriate performance indicators for a set of representative units. Their concern was that the work look at the "key" indicators as presented in the executive budget and some representative indicators that were used by organizational groups that comprised a major part of the departmental staff (i.e., a district operation would represent a high percentage of DOTD personnel.)

METHODOLOGY

The problem was approached initially by an literature survey to augment that information that was presented to the PI by LTRC personnel. This survey provided a basis for validation of the information that the researcher had previously accumulated, and it also documented the validity of literature that had been accumulated by LTRC. With the literature survey, the researcher became somewhat familiar with *Manageware* and the process of planning and budgeting. An examination was made of a representative set of strategic plans as submitted by DOTD units. Next, meetings were scheduled and conducted with management of a representative set of DOTD units. At these meetings discussions were related to unit activities, budgets, and performance indicators. Finally, a procedure for selection of relevant activities for which performance indicators should be calculated was specified and the determination and calculation of these relevant indicators was begun.

DISCUSSION OF RESULTS

The department is in very good position with regard to the implementation of performance indicators. A presentation by the Legislative Fiscal Office to the Legislative Budget Committee in March 1998 revealed that 110 state agencies submitted no performance indicators with their budgets. Comments by the Fiscal Office on the DOTD performance indicators was positive and not in conflict with the researchers' general conclusion. Without a doubt, it will be necessary to refine some indicators. Further, as with any major change in procedural operation, acceptance will come with time rather than immediately.

Representatives of the Legislative Budget Committee and the Division of Administration expressed concern that DOTD was changing programs after they were approved by the Legislature without informing the Legislative Budget Committee of these changes. They cited two programs where the budgeted and accomplished work were significantly different. They expressed a desire to "stick to the program that was budgeted." A DOTD representative, when informed of the specific instances, stated that the committee was informed but probably did not read their departmental correspondence. Further, it was stated that the reason for the change was something that was outside of departmental control and that the decision was made to use the resources to accomplish more on the second program since efforts on the first could not begin in the time frame as planned.

The department has more information on performance than will be required in the near future. Major concerns should be in keeping departmental management aware of the

aware of the pitfalls possible in the use of performance indicators. Briefly, these problems come from uninformed people drawing conclusion about what performance indicators are. Leadership of the department must be prepared to explain these indicators and their limitations. The general information about the pitfalls is as follows:

-*Non-linearity :* A property of indicators that are prepared from data that lumps differing operations together;

-*Independence:* A required property for indicators if contingency budgeting is not used;

-*Indicator vs: Measure*: An indicator indicates; it does not measure. Even a group of performance indicators cannot measure. Their nature is such that even when grouped they can allow activities to be disregarded. (Note: The new procedure, discussed in the appendix, is an attempt to lessen the amount of resources that are untouched by performance indicators.)

CONCLUSIONS

The researcher's conclusions are that the department is in good condition at this point in its progression toward the development and use of performance indicators as a management tool. Necessarily, the performance indicators must be changed with time as management discovers problems with those in current use. Further, the usage of the indicators will require changes in procedures and in the attitudes of personnel throughout the organization. This will require time and the persistence of upper management.

RECOMMENDATIONS

The overall recommendation is that the department should move in the direction of further quantifying the resource content of required departmental activities. The initial step of the evolutionary process, which has begun with the implementation of performance indicators, ultimately will lead to measured work content as the justification for funding. Efforts directed, in the near future, toward this long term goal will be hailed as visionary. Certainly, the department should continue with the current process of providing performance indicators to comply with the legislative mandate. The quality of performance indicators can be much improved, however, as the knowledge base of the relationships between departmental activities and resources consumed is improved. Ultimately, this data base would lead to extremely accurate program management and budgeting which is the objective of performance based budgeting, the legislature's long-range goal.

APPENDIX

This Appendix has been dedicated to the coverage of five topics. They are as follows:

1. Introduction to the material with some general comments.
2. Problems observed with the strategic planning process and suggestions for changes.
3. The Researcher's evaluation of the "Key" indicators from the Executive Budget.
4. Observations regarding the strategic plans and performance indicators provided by six different DOTD units together with some suggestions for performance indicators that would meet current requirements.
5. A procedure for the determination of performance indicators.

INTRODUCTION

The problems with performance indicators currently being faced by management personnel of DOTD are significant. They involve trying to satisfy two groups, to which they must respond, who for the most part give mixed signals regarding the implementation of performance indicators. Since performance indicators are to some extent subjective, it will be impossible to satisfy everyone wanting information with a fixed set of indicators unless every activity is covered by its own indicator. Since completing the body of this report, it has become evident that the points stated in the report "there will be demands for performance indicators for everything" and that " the next step will be requirements for performance indices which pull together several performance indicators which are difficult to interpret directly" are coming to pass in the DOA/LBC/DOTD relationship. In some cases it is not practical or feasible to give four performance indicators for each objective/strategy. For example, in some cases it would be as expensive to provide a quality indicator as to perform the work. Hence, this falls into the category of activity where management must decide "Is the book worth the

candle?" and conclude that it is not feasible. In other situations it is possible that the proper information can be provided by an input indicator and that an output indicator is not necessary. DOA has indicated that in these cases an explanation can be given and the indicator omitted.

Although the scope of this project did not relate to the strategic planning process, the researcher would be remiss in not stating some conclusions regarding this process at this point.(A more extensive discussion of this area will follow.) It appears that there has been somewhat of a change in emphasis from what was stressed by the related parties (the agencies involved) at the beginning of this activity. This may be a misinterpretation on the part of the researcher, but it now seems that the intent is to be much more comprehensive in the planning process than what was being indicated one year ago. Not that this is bad, but that a Legislative mandate has been made without regard to the resource requirements for accomplishment of the activities involved. Observation of the requirements would lead one to believe that the accomplishment of the activities for the strategic planning process could involve several man-years for a large agency such as DOTD. Unfortunately, the department has approximately 60 days from the time of the Strategic Planning Workshop until its plan is due.

Problems with the Strategic Planning Process and Suggestions for Improvement

In this process there have been constantly changing targets for accomplishments. This is due largely to the fact that this process is entirely new for those involved outside the department. In any situation where a new effort is being initiated, there most certainly will be directions given which are later found to be non-productive or counter-productive in terms of the desired objectives. These directions must be retracted and changed in order to arrive at the desired result. In the case at hand, these problems are more pronounced because of the lack of management experience on the part of those issuing the directives. It is essential for the department that an approach be taken that looks toward the end that must be achieved and directs the largest commitment of resources to where the program must ultimately lead. Further, the maintenance of an attitude of acceptance of the current reality, a transitional state with some organizational maladies, is essential. Without such an attitude, on the part of departmental leadership, the results would be devastating to departmental accomplishments. Previous attempts in this area of strategic planning have lead personnel to conclude that this is just an exercise that is required by another agency and that it is of no value to the department. They, in effect, label it as a non-relevant discontinuity in the work process. It is understandable that such opinions would develop in the early stages of movement into the new process. It was not made to be relevant by those who lacked foresight as to where the program would eventually go. It was a step through which the current departmental planning process must pass on the way to an improved system. Possibly this could have been changed, but until the legislative mandate, the change could have fallen by the wayside as other changes have in the past. Nevertheless, at this time the change has become relevant and must be accepted..

Part of the problem with the resistance to change is that this resistance in a natural part of the human personality. People feel vulnerable when they are asked to change. They are afraid of making mistakes in the new process. They are afraid that they will encounter difficulties and not be able to cope. In short, the change is perceived as a threat and the natural response to a threat is "fight or flight". What they tend to do is sabotage the process in their state of fear. Management must take action to alleviate the fears of involved personnel. This action should come through improved communication, encouragement and reassurance that the initial efforts are not expected to approach perfection.

One critical facet of the process of strategic planning is the involvement of the "stakeholders". Everyone needs to be allowed to input to the process and the results of the process should reflect the large number of ideas input. With respect for, and the involvement of, stakeholders, the organization will begin to change toward improved productivity. In order to involve the stakeholders this researcher suggests the inclusion of Interpretive Structural Modeling (ISM) in the planning process. This method is briefly discussed as a separate topic under its own heading.

One of the major disconnects of the current process of strategic planning is the failure of personnel to recognize the relationship between the operational plan and the strategic plan. In reality the strategic plan should be the sum of five year's operational plans. In the opinion of the researcher this failure to relate has occurred because of the process advocated. In the area of strategic planning there are basically three approaches; reactionary planning, trend planning and goal planning. Reactionary planning is essentially no strategic plan. This process would involve just annual operation plans with no long range goals other than to continue what has been done. Trend planning looks at the future as an extension of the present with some possible changes due to planning and more efficient use of resources. Goal planning, the process of identifying the future that is desired and then structuring the goals required to make that future, is the method

currently being advocated by most proponents of strategic planning. Goal planning is a fantastic technique for situations in private enterprise where the resources to accomplish the objective are unlimited. (For example: Walmart can obtain the capital to build as many stores as they want. Their constraints are identification of locations and availability of management personnel. Additional funds can be used to solve either of these impediments, hence their only constraint becomes "How much growth is practical to sustain?".) For the case at hand, however, DOTD as well as other state Departments, has a finite and very limited set of resources. To be very realistic, one must take these limitations into account in the planning process. Certainly, management should dream to some extent in planning and establishing the vision, but these dreams must be limited in the strategic plan to the trend relationships of the budget funded by the legislature and include certain other "contingent activities" should the funds become available. Although the researcher is unfamiliar with exactly what happened in the past, one might conclude that the strategic plan may have been over zealous at some time in the past, thereby contributing to the disconnect with the operational personnel who were "grounded in reality".

The limitations of the process, in essence, prescribe the proper approach to planning for situations such as that currently faced by the department. The primary goals of the strategic plan should be achievable without significant changes in funding. Expanded goals should be achievable with the additional funds requested. If operational plans were specified for 5 years they should provide, essentially, the strategic plan. The only reason that a five year operational plan is not feasible is that the actual operational plan is contingent upon what actually happens to expanded goals. If the expanded goals are funded their presence will effect the next year's operational plan. Hence, if funding was totally stagnant, with no expanded funds, the five operational plans should add up to be identical to the strategic plan in their overall results. Other goals contained within the strategic plan would relate to changes in the way of doing business. These "stretch" objectives should be things that can be achieved without increased funding. Their

accomplishment is related to more efficient management of resources: the improvement of work procedures and the better utilization of materials. Managers cringe when they are told this. Yet, there are ways that these things can be accomplished, and these ways will improve overall working conditions and relationships also.

How then can this idea be more readily sold to the department? A critical facet of selling the idea will be the providing of information related to the new process. A continued emphasis on statements by leadership that there is an understanding of the frustration involved with the changes being undergone in the process will lessen to some extent the perceived threat. Further, statements regarding a attitude of tolerance toward the results of the efforts necessitated by the change will help.

Finally, involvement of the personnel of the department into the planning process and the use of their ideas to develop the structure of the system will assure a "grass roots" buy-in to make the overall procedure work to achieve the desired results. Who knows best how to "reduce the cost of mowing right-of-way"? Obviously, the answer is the people who are doing the work. Currently, if DOTD is similar to most organizations, these people get no respect. They are told what to do and are seldom allowed to give their opinions. These people will be the basis for attaining "stretch" objectives. They know why things don't work and they know how to make them work more efficiently.

Management of DOTD should be involved in developing the strategic plan. All ideas presented within a problem context should be heard and incorporated. Techniques, such as Interpretative Structural Modeling (ISM) are available for dealing with problems such as this within a complex context. These techniques should be adopted by DOTD as a basis for improvement of the planning process.

Interpretive Structural Modeling.

The nature of complexity is that it is composed of many intertwined concepts. A technique was developed by researchers at Battelle Columbus Laboratories in the 1970's as a tool for studying these complex and intertwined problems. This technique classifies all problems into subsets of elements, relations and structures. The study of the structures defined by elements and relations provides tremendous problem insight. Yet, the greater benefit that is derived from the approach is the team spirit which evolves when involved people see their opinions respected by their peers and superiors. This is, in effect, the major payback from a commitment to the use of ISM.

To apply the technique, in elementary examples, one should understand the following ideas:

Elements consist of noun phrases, relations are transitive verbs or verb phrases and structures are representations of interaction patterns to which a set of elements are restricted to by a given relation. For the elements "organizational personnel" and the relation "reports to" the structure would be an organization chart. For the elements "ideas to reduce cost" and the relation "is more important than" the structure would be a priority hierarchy or ordering or priorities. For the elements "ideas to reduce cost" and the relation "would support the accomplishment of" the structure would be a "goal support hierarchy" or sequenced action plan.

By using this procedure information can be extracted, organized and made meaningful. By allowing effected people to participate in defining the element sets all ideas are incorporated and these people see their input as a part of the program. When people are given the opportunity to participate and actually shape the program they "buy in" to making it work. This is the benefit to be achieved by the use of this technique in the on-going planning and management process.

A Suggested Approach to the Future with Strategic Planning Using ISM

Get Real. Make certain that the ideas of all unit and program level managers are incorporated into the strategic plan. Pull together unit level managers and seek their input prior to the executive level strategic planning session. *Eliminate nebulous and esoteric terminology from the Executive Level Strategic Plan.* Make certain that the strategic plan is achievable with effort and improvement.

Get involvement. The fact that each person sees his/her idea(s) incorporated into the overall program provides the basis for development of a "team spirit".

Get results. When people buy-in to the program, results will follow. This "buy-in" results from the gain in respect given by the "grass roots" worker who is allowed to make his input into the process.

The Program of Strategic Planning.

Annual planning meetings of the program level managers should be conducted using the Interpretative Structural Modeling(ISM) approach. These meetings should be preceded by planning sessions for unit level managers where the same context sets are approached. The output of the unit managers meetings should be incorporated into the appropriate context sets of the program level managers. This would assure the incorporation of all ideas into the process of planning. The output of this process would then be passed down through the organization for appropriate action at the program and unit levels.

A separate, yet organically related, part of the process would be to conduct ISM sessions for personnel directly involved in the accomplishment of "stretch" objectives. An overall stretch objective might be to reduce the cost of current operations by 2% per year without reducing services rendered. This goal could be approached with related personnel in a

session whose objective was to construct a goals hierarchy for reducing the operations cost of the mowing gangs. The session would start with a contextual statement such as " How can we reduce the cost of our mowing operation?" There might be twenty ideas that result from this question. These ideas can be structured into a goal hierarchy which support this objective. Then action plans can be structured for improvement in the area. Performance indicators can be specified and the process becomes relevant.

This approach to planning and structuring of goals and objectives is a learning experience for all involved. In many cases managers find out that the process of accomplishment of an activity is not as they believed and that a simple change, as suggested by a subordinate, can greatly improve the activity at no cost. These changes in procedures lead to reductions in costs and to overall savings that require no one to work harder.

It is obvious that if this approach is to be used the planning process becomes an ongoing activity. Efforts should be directed at developing the inputs far in advance of formal document presentation. It is an effort that can be developed one unit at a time if resources are limited.

The Overall Strategic Planning Process.

In summary the process could be accomplished as stated below:

1. Prepare the Executive Level Strategic Plan with inputs from the unit level managers obtained from ISM sessions. This plan would consist of goals and objectives for the overall department. All jargon and esoteric terminology should be removed from the document.

2. Have the program managers add specifics related to their area of endeavor. These specifics would include the inputs of their unit managers obtained from ISM sessions.

3. Thirdly, the District or Section level managers would prepare their strategic plan incorporating the department and program goals into their specific area. They should account for continuation and stretch objectives in each task area assignment. In areas where additional funding was being sought, expanded goals and objectives would be included as a contingency. For each of these areas of goals, strategies, action plans and performance indicators, as required, would be structured.

4. The first year's commitment toward the strategic plan then becomes the operational plan. In the preparation of the operational plan for the second and subsequent years, one would examine what was left to be done toward the strategic plan in a given area, and choose an appropriate commitment for the following period.

5. Updating of the strategic plan should provide a periodic extension to the current goal areas or add new relevant areas that can be approached in a transitional manner with the advance knowledge of the impending addition/change in objectives.

KEY PERFORMANCE INDICATORS

Program Level Performance Indicators

The comments made here relate to the Key performance indicators presented as a part of the executive budget as prepared by DOA. These indicators are assumed to have been chosen from the DOTD's strategic plan. Before commenting on the indicators as a group it is necessary to establish a context for comment. We must assume that this information is a part of a document used by management at the highest level. Here, management is concerned with general accomplishments of an agency. They must not be belabored with excessive detail.

In this context, one could conclude that these indicators give a feel for what is being done by DOTD. Certainly an argument could be made that certain indicators should not be included, for example: those related to LOTA. This is a program that is under DOTD and in which the legislators have an interest. Although it consumes no resources of the department, the LBC wishes to have information reported related to the activity. This is the reason for its inclusion.

Other indicators are available to answer a large number of general questions about departmental accomplishments. Hence, in the opinion of the researcher, the chosen set is adequate for general information. For detailed information, it would be necessary to refer to the department's strategic plan which is available to interested parties.

There are 46 key performance indicators, chosen for representing DOTD programs to the legislature in the budget. These Indicators are listed and discussed below:

DOTD Key Performance Indicators

The key performance indicators are listed below by programs along with the opinion of the researcher as to why they are deemed relevant.

Program Name: Louisiana Offshore Terminal Authority

The general comment regarding this program was made in the introduction. This set of indicators is here because the Legislative Budget Committee wants the information shown. The question is then "What do they want as information?" and one must presume that this met their requirements.

1. Barrels/day handled by port

   This is a basic output indicator. It provides an idea of the volume of the oil handled by the port. As such it is an appropriate indicator of volume.

2. Revenues earned by port (thousands of dollars)

   Another output indicator and indicator of economic impact. The question here might be as to how much of these funds relate to Louisiana. The Legislative Auditor(LA) noted this in comments. Some clarification should be made in this indicator. One might think that DOTD received these funds for the state. The indication should be of economic impact upon the state. What percent of the funds earned by the port go to the state or it's residents.

3. Number of safety/environmental incidents

   This indicator as it is shown should be sufficient. The LA suggested the addition of an outcome indicator "percent reduction". The number of incidents are small and the overall weight of the number of indicators dedicated to this would lead one to conclude that this extra statistic is nonessential.

Program Name: Support Services

This program encompasses a large number of services for the department that are unrelated. The indicators used are selected to represent some significant major areas of program activities of concern to legislators. These do not represent all the activities of the program area which must be greatly abbreviated to present at this level.

4. Agency-wide percentage of administrative staff

This is an outcomes indicator which is effected by staff requirements and management decisions. It could be used as a "benchmark" for future year comparisons or compared to other agencies doing similar work under similar conditions. The upward trend in this indicator would be cause for questioning why this is happening. The downward trend should indicate better management.

5. Percentage of fleet in continued use beyond economic service life

This is an outcomes indicator which indicates a need for additional funding for equipment. Keeping equipment beyond its economic life indicates that you are paying more to operate and maintain the equipment that corresponding new equipment would cost to maintain and operate. This indicator should show the legislature a need for additional funds in the area of equipment.

6. Total number of contracts let

This indicator shows a work volume which can be compared to previous periods. A significant and sustained decrease in the value might point out

that personnel reductions might be in order.

7. Total number of federal funds contracts let

This indicator, by itself, is not highly informative. If it were combined with the dollar volume of federal contracts it would be more useful. A disturbing trend would then be a decrease in number and average size of federally funded projects which might lead one to conclude that the federal government was requiring the state to shoulder a higher percentage of the costs of highway improvements, allowing the legislature with foresight to begin to plan as to how to approach the problem in the future.

8. $ Value of contracts let (in millions)

The comment above relates to this indicator. If all projects funded are with federal funds, then the comment becomes moot. If, however, there are projects funded solely with state funds, some clarification could be made in this area.

Program Name: Highways

9. Agency-wide percentage of administrative staff

This indicator can be used to benchmark or compare with other similar operations.

10. TIME program mileage completed

This is an output indicator of importance to the legislators in determining what is being accomplished with this special program.

11. Other 4-laning and reconstruction mileage completed

This output indicator is valuable as a major contributor to the overall change in roadway conditions and justification for the departments consumption of significant resources.

12. Interstate rehabilitation mileage completed

See comment on 11. above.

13. New interstate mileage

See comment on 11. above.

14. Overlay mileage completed

See comment on 11. above.

15. Percent of overlay budget spent

This outcomes indicator gives an idea of what is yet to be accomplished. Legislators might be concerned as to why the effort was not completed.

16. Percent of overlay budget obligated

This outcomes indicator shows what percent is in the works even though all of the effort has not been completed.

17. Bridges replaced

This indicator relates to the comment with indicator 11. above. It is a justification for departmental existence and a major indicator of an activity that is a significant resource consumer.

Program Name: Bridge Trust Operations

18. Tolls Collected: Crescent City Connection

See comment on #20 below.

19. Tolls Collected: Crescent City Connection Ferries

See comment on #20 below.

20. Toll revenue as a percentage of operating cost: Crescent City Connection Ferries

Indicators 18,19 & 20 in combination allow the legislators to evaluate the economic viability of this operation.

21. Tolls collected: Sunshine Bridge

See comment on #22 below.

22. Toll revenue as a percentage of operating cost: Sunshine Bridge

Indicators 21 & 22 in combination allow the legislators to evaluate the economic viability of this operation.

Program Name: Water Resources

23. Water Wells Inspected

This output indicator is essentially a measure of service rendered. It would be helpful to have a companion indicator of "requests for well inspections" or to substitute an outcomes indicator "% of inspection requests completed".

24. Statewide flood construction contracts completed

This output indicator shows the progress toward improvement in flood control. A companion indicator of "% of scheduled projects completed" should be of interest.

25. Statewide flood control benefits per dollar invested

This outcomes indicator is an economic benefit-to-cost ratio.

26. Insurance reduction from meeting minimum federal flood plain requirements

This outcomes indicator is essentially redundant when taken in combination with the preceding indicator since the reduction in insurance premiums is a component of the benefits included in the B/C ratio.

27. Port priority construction contracts completed

This output indicator is informative but would be more so if taken in combination with a companion indicator "value of projects completed".

Program Name: Aviation

28. Number of airports in state (public owned)

This is a baseline input indicator.

29. Number of airports inspected

This output indicator when used in combination with the preceding indicator gives management information as to the expected frequency of airport inspections.

30. Safety issues detected by inspection

This indicator might be more informative if it were broken into two classes of safety issues, say "Major/Minor safety issues detected".

Program Name: Maintenance and District Operations

31. Miles of roadway

This input indicator gives basic information for analysis of several indicators that follow.

32. (% of miles rated) Poor

This outcomes indicator, when compared with indicators for previous years allows the legislator/manager to determine the direction of movement of the system.

33. (% of miles rated) Fair

See comment on #32 above.

34. (% of miles rated) Good

See comment on #32 above.

35. (% of miles rated) Very Good

See comment on #32 above.

36. Pavement Miles Resurfaced

This output indicator shows accomplishment from using resources and should account for part of the movement percentages between categories in indicators 32-35 above.

37. Tons of mix used to repair potholes

This input indicator by itself shows very little other than a commitment of some magnitude to repair of potholes.

38. Number of traffic signals repaired or replaced

This output indicator would be more useful if accompanied by a baseline indicator "total system signals" and a companion output indicator " new signals installed".

39. Tolls collected on ferries

This outcome indicator when used in conjunction with the following indicator allows the legislator to judge the magnitude of subsidy to the ferry system.

40. Tolls as a percentage of ferry operating costs

See remark on #39 above.

41. Average time between mowings on state highways during mowing season (months)

One would suppose that this outcome indicator is for informational purposes.

Program Name: Public Transportation

42. Passenger trips provided (rural program)

This output indicator is presented for informational purposes.

43. Passenger trips provided (E&D program)

This is another indicator for informational purposes.

44. Number of van drivers trained annually

This is an output indicator which in my opinion is not a key indicator.

45. Average cost per passenger trip (Rural systems)

This efficiency indicator is an excellent example of what will be required more frequently in the future. It combines output with resource to give an excellent basis for decision making.

UNIT PERFORMANCE INDICATORS

Six different and differing DOTD units were observed to study the extent to which performance indicators were being implemented as well as to provide a critique on the performance indicators being used. These units were a District, Traffic Services, Real Estate, Truck Permits, Support Services, and Road Design. This activity involved interviews with unit management personnel, an examination of the Strategic Plan for objectives and performance indicators and review of any Legislative Auditor comments related to these groups. It should be noted that in the case of the district the group interviewed differed from the strategic plan examined.

Previously mentioned changes have occurred since the outset of this study which have made the opinion of the researcher as to the extent, specification of and proper method for determining performance indicators moot. The legislative mandate and directives from DOA now are preeminent and must become the basis for operation. The legislative requirement for four performance indicators for each objective and a requirement to explain why any one of the four required is not present leaves little flexibility other than in the selection of objectives. The researcher is not so presumptuous as to assume knowledge of what objectives should be for the given units. Experienced persons in these particular areas are far better qualified to make such a determination. However, in order to pursue the modified request by the PRC, a set of objectives will be chosen from those presented by the chosen units in their strategic plans or stated as an assumed objective for the unit by the researcher. Then, in the context of the current situation, an example approach to the specification of appropriate performance indicators for the unit will be presented.

The researcher is pleased to note that the process as outlined in the LTRC Memorandum dated March 19, 1997 entitled "Development of 1997 DOTD Strategic Plan" is adequate for preparation of a strategic plan when updated to include the four performance

indicators per goal requirement currently mandated. The major problem for this requirement is the time constraint for preparation of the plan and the problem with unit to unit consistency of the plans prepared when little training has been given. Examples of performance indicators for the various units will be discussed in the following pages.

Real Estate Directorate

The strategic plan of this unit listed no performance indicators. Copies of quarterly reports made available by the group show more than adequate information for the preparation of any desired group of indicators. In the opinion of the researcher the most significant activity of this unit is to deliver parcels of right-of -way on time for construction projects. Hence a significant objective for this group would relate to on time delivery of parcels and it should have related performance indicators. Specifically, an outcome indicator "% of parcels delivered on time" . Other indicators would be an input indicator such as "parcels required" probably corresponding to "total owners" in the quarterly report. An efficiency indicator which would probably relate would be "average time to procure-amicable owner" and "average time to procure-expropriation". The indicator "percent amicable owners", as shown in the quarterly report would be an outcomes indicator.

Performance Indicators Suggested:

Input:	Parcels required
Output:	Parcels procured
Outcome:	Percent of parcels delivered on time
	Percent amicable owners
Efficiency:	Average time to procure - amicable owner
	Average time to procure - expropriation

Other internal activities of this unit would require the construction of the various indicators that relate to specific objectives. In the strategic plan many action plans are specified involving objectives/activities that are not SMART in accordance with Manageware. Philosophically, this is an excellent plan, however many tasks lack specificity and are not defined so as to be measurable. An example of this would be under Objective 4. Section 4.1 is the Strategy to "Assign and challenge employees with meaningful work." Under the Action Plan section 4.1.1 is the activity "Provide cross training in all areas of Acquisition Division operations." this could be changed to state "Develop a cross training schedule for the Acquisition division operations by December 31, 1997 for the first six months of 1998 detailing personnel to be cross-trained and assignments."

Performance indicators could then be developed for this objective. These could be as follows:

Input:	# of people in unit
Output:	# of people completing cross-training
Outcome:	% of people cross-trained
Efficiency:	$ per individual cross-trained (average cost of wages during cross-training if no other measure is defined)

The strategic plan of this unit reflects a significant effort. It needs only the "fine-tuning" that comes with time and further clarification of what is expected by departmental management.

<u>District Operation</u>

The representative district strategic plan examined contained a number of performance indicators.

The performance indicators given would need augmentation by addition of further

indicators to make up the group required by the mandate. It is noted that in a number of unit strategic plans the major points of the executive level strategic plan are addressed. By reading the related strategies and action plans together with the associated performance indicators, one would necessarily reach the conclusion that in many cases these are included at the unit level in order to give "lip service" to the point in the executive level plan. An example of this in the district plan examined is as follows: "Assign challenging and meaningful work to employees." The action plan delegates the responsibility to all section heads and gang supervisors and specifies the time frame as ongoing.
If nothing is going to be done, why waste time and paper in including this in a unit level strategic plan. Some work is just work - some jobs have very little that is challenging other than to learn to persevere and hope that down the line an opportunity will come to advance to a better job. Frankly, this item should not be the responsibility of low level supervisors. This would require a major effort on the part of highly trained individuals to accomplish in most cases. Hence, without specific directives as to how it is to be accomplished, it is an absurd inclusion. If "challenging and meaningful work" means to "cross-train all employees on one additional job" then a gang supervisor can do that. Performance indicators can be structured and the progress can be easily measured. In short, why include an action plan that is nebulous and cannot be measured.

Within the more quantitative areas of the district operation in areas such as construction the performance indicators are well defined. Some of these are the basis for the key indicators of the Executive Level Budget used by DOA. Other areas have the essential beginnings of adequate indicators. They will require augmentation to provide the four basic indicators of the legislative mandate.

Truck Permit Section

This is an example of a single function unit. Its' strategic plan was very abbreviated. No performance indicators were listed. Suggestions for performance indicators for this

section are as follows: Since this is a service unit, interfacing directly with the public indicators of every type are essential. An input indicator would be the budget for accomplishment of the job as well as the number of permits requested. An output indicator would be the number of permits issued. An outcomes indicator would be the percent of permits issued as well as a percent declined if such an action is taken. A very meaningful set of outcome indicators would be average time to process permit, maximum time to process and minimum time to process permit. A quality indicator of "% satisfied customers" or "number of customer complaints" could be readily obtained by supplying each permit applicant with a survey form.

Design

This is a large and very important function of DOTD. Its complexity is far to great to accurately critique in the limited time exposure given the units during this project. The strategic plans of the unit appear to be relevant and have a number of performance indicators. However, many strategies in the plans have no related performance indicators. It may be that these plans need to re-define objectives as goals, thereby making the "non-SMART" definition acceptable. Then the strategies could be re-named as objectives and made SMART to comply with the legislative mandate.

Traffic Services

The strategic plan as prepared by a previous manager was well organized. It lacked some specificity in the performance indicators supplied. Some objectives were hazy at best. For example, the Traffic Signals Operations Unit's first objective, "Increase the number of traffic signal installations and modifications" would probably be more accurate is stated as follows:

"Increase the efficiency of the installation and modification of traffic signals." Relevant performance indicators would then be as follows: An input indicator of "number of

requests for signal installation or modification", an output indicator of "Number of requests completed", and an outcomes indicator of " average time to complete request". A related quality indicator could be "percent of jobs completed requiring follow-up work within *90 days*".

The comments above apply in general to the several areas of the strategic plan. It needs more detail and performance indicators that relate to the ongoing operations that are SMART.

This unit accomplishes several functions which are very sensitive politically. Although none of its indicators are chosen as "key" indicators it needs indicators that reflect its problems to upper level management of DOTD. Its plans are, in many cases, upset by political pressure. In the opinion of the researcher it should have a set of performance indicators that reflect problems caused by changes in normally scheduled plans. Indicators that would be very meaningful would be things such as "percent of projects rescheduled as a result of preemptive priorities assigned by outside direction" and "percent of projects delayed as a result of equipment being taken for preemptive priority projects.

Support Services

This unit is a conglomeration of different services pulled together for purposes of organization. The overall performance indicators used in the unit is the sum of transactions accomplished. This indicator is an output indicator which can be compared to that of previous periods to show relative changes. The inclusion of an input indicator of "total funding" would allow the calculation of an outcome indicator, "$ per transaction".(Although these are not homogenous transaction units.) A quality indicator could be provided by having a return card available for customers from outside the department. The quality indicator could then be "complaints per 100 external transactions" or some similar evaluation. In the group that provides copies of plans to contractors or others requesting such plans a relevant efficiency indicator could be "% of

cost recovery from operations". This information along with the other indicators such as "number of requests for plans", "total number of plans requested", and "average time to fulfill request" would provide an excellent basis for knowledge of relevant management data.

Although this unit is service oriented and has no key performance indicators in the executive level strategic plan it can adopt for management purposes sets of indicators that will provide information to unit management as to how efficiently the resources are being used. In general, a listing of the resources dedicated to the unit together with listings of activities performed by the different groups in the unit can provide a basis for the development of meaningful indicators. For example consider the security guards. How many are assigned? What is the budget for the operation? What activities do they perform? With regard to this later point, possibly they monitor the sign-in desk during normal office hours. They may also punch security clocks at various check points in and around the buildings and grounds at designated times. These are indeed ongoing activities with specific daily goals as outlined in a procedure for the job. There are records generated by these activities and they can be inspected to verify that the activities transpired.

PROCEDURE FOR THE DETERMINATION OF PERFORMANCE INDICATORS

The first step of this procedure, at the level of the Executive Planning Session, is to determine the goal to be accomplished and to define the measures by which management will measure its accomplishment.(Performance indicators should be established that relate to this overall goal.) Note: This differs from the *Manageware* approach which defines the goal in nebulous terms.

The following steps are required at the Unit/Section level:

Step two is to determine a strategy for the accomplishment of the goal by defining a set of activities that if accomplished would move toward achievement of the goal.

The third step is to prioritize the activities and to define sequential relationships that exist between any related activities.

Next, a determination must be made as to which activities will be accomplished in which periods of the planning horizon. This leads to a plan for the movement toward the goal.(Action plan.)

For those activities scheduled for the next operating period, define performance indicators of the types required.

Example

For the problem of low job morale, management decides to adopt a goal to "Increase employee job satisfaction". This goal is discussed and it is decided to modify it to include a standard for judging the accomplishment. The modified goal becomes "Increase employee job satisfaction as measured by % annual turnover and average satisfaction as reflected by an employee job satisfaction survey to be conducted each six months."

When addressing this goal in the Executive Level Strategic Plan a unit manager might choose the following set of strategies for accomplishment of the goal.

1. Interview a random sample of unit personnel to see what are their primary concerns.
2. Determine job titles that have higher than average turn-over rates.
3. Interview each person in the job area where high turn-over exists.
4. Specify major problems creating dissatisfaction.

This set of activities could be *scheduled* for accomplishment in the first year's operation plan. Simple indicators could be set for these strategies. Assume that the results of the interviews and samples indicate a major cause of job dissatisfaction was that people believed that their jobs were not important, not challenging and not rewarding. A strategy for changing this belief could be as follows:

1. Expand job content by cross-training and using flexible assignments.
2. Procure departmental training programs that are available currently for personnel who have not attended such training. Schedule refresher courses as required.

An objective for the first strategy would be to "determine personnel who are suitable for cross training and implement a program to achieve said training by December 31, 1998.

Performance indicators for this objective could be as follows:

Input:	Number of Unit personnel eligible for cross-training.
Output:	Number of personnel cross-trained this year
Outcome:	Percent of eligible personnel cross-trained
Efficiency:	Cost per person cross-trained

If job content were a cause of dissatisfaction then this expansion of content could in some measure reduce dissatisfaction. Hopefully, across the department, different ideas would be tried to increase job satisfaction. If responses coming from different units reflect that one approach is superior, it then could then be adopted department-wide to improve the overall measures of merit reflected by the stated goal.

NOTE: The researcher believes that there are problems with semantics involved in the area of strategic planning. The basic ideas stated here are sufficient to accomplish the requirements of the program. Certainly, it would be advantageous for everyone to talk using the same terms when relating to this area. Possibly this standardization of terminology was the intent of Manageware. It is believed that what is here suggested is not in significant conflict with that document.

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