

Water Utilities Department Engineering Division:

AN OPERATIONS DEFINITION FOR MANAGEMENT

(Project No. 2005-M-03)



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Engineering Division: Operations Definition for Management

A study of selected internal operations and processes of the Palm Beach County Engineering Division of the Water Utilities Department to give a detailed activity-level depiction of those functions

The purpose of this report is to provide division management with an operational overview of the Special Assessment section and the Technical Services section comprising the Plan Review group and the CAD group, annotated for staff involvement, major decision points, points of contact with internal and external customers, areas of rework, and operational performance characteristics of the selected functions.

The study focused on the activities that the division defined for each section. For the Special Assessment section the start point was defined to be the point when an item is selected from the project list, an HOA solicits an assessment, or a city may seek to identify the limits of a property. The end point comes with the final project approval by the Board of County Commissioners. The start point for the Plan Review group is when initial discussions are held prior to the time that plans are submitted to be reviewed. The end point of the Plan Review group's study area was defined as the point when the approval for meters is issued, the Developer Tracking System release. The CAD group's start point was defined as when an Engineering Design Request is made. The end point is when division management reviews the plan and the engineer requesting the services is satisfied. Study participants indicated that not all of their time is spent within the defined study areas.¹

The division director invited the Management and Program Analysis Section of OFMB (MPA) to develop a project that would promote an activity-level awareness of these study areas, defined to a clear and concise level of detail. During initial client interviews with the section's management and with the division director, specific interest areas were noted for incorporation into the project. Therefore, the report comments on activities pertaining to decision and review points, points at which the item being processed leaves the division's

¹ The activity percentages listed in the tables throughout the report account for 100% of each participant's time "in the study area."

control, and types of activities that significantly add to the elapsed time of a project.

The Operations Definition for Management (ODM) is designed for the director facing new challenges. New challenges come from such sources as receiving a promotion, implementing a new technology, providing a new service or instituting a strategic initiative, or even leading an organization through transition. During times of challenge or change, it is often beneficial for a director to have an accurate depiction of activity-level detail in the organization. Through the Operations Definition for Management, MPA offers an unbiased and information-rich depiction of the detailed, activity-level operations of an organization. The ODM project defines the “current state” of the Engineering Division’s Special Assessment, Plan Review, and CAD areas. The project satisfied four conditions that the division director stressed as important: 1) that staff involvement would be widespread; 2) that staff would be free and unimpeded to provide input into the assignment; 3) that the project would be informational in nature; and 4) that project outputs be concise and easily understood, providing accurate activity-level detail of the selected operations.

A project scope of services was agreed upon to address each of these four considerations. In practical terms, the ODM project was designed to give division management operational visibility into the Engineering Division’s current state, as well as to assess the requirements of future improvement efforts. In particular, we were asked to do the following:

- Document major activities performed by staff of the study areas, by type of occupational position, in terms of percent of time involved in each activity, percent of rework, output of the activity, and customers of the activity output;
- Depict the major activities of the study areas in activity flow chart form, showing important decision points, areas where critical communication occurs, and other relevant process characteristics;
- Identify opportunities for follow-up in the study areas.

The methodology employed in an ODM project is designed to make it a team-building experience and to produce internal staff benefits, in addition to providing division management with useful operational insights. Division staff was taken through a series of facilitated exercises intended to promote group consensus in defining the current state of the three divisional operations selected for evaluation.

The MPA consultant led the staff of the Engineering Division (project team) through two workshops: an Activity Summary Workshop and an Operations Definition Workshop. Drawing on the collective subject-matter understanding and experiences of the project team, the consultant and the project team together defined the current state of Engineering operations, including:

- Documenting the activities performed by staff by type of occupational position. Staff activities were defined in terms of percent of staff time involved, percent of re-work performed at the activity, the output of the activity and the customer(s) of the activity output.

- Creating three separate activity flow charts, one for each study area. Identifying on the flow charts activities that are major contributors to total elapsed time, and also identifying those that could be improved through cross training or adding staff resources.
- Identifying areas for improving operations from the unique perspectives such as 1) activities that are the biggest distractions from core tasks, 2) areas where communication could be improved, 3) activities where improvements would yield significant decreases in project elapsed time, 4) places where cross training would be beneficial, and 5) personal hassle areas.

Prior to conducting the two project workshops, the project consultant met with the division director and the managers of the three participating programs. The purpose of the meeting was to create an awareness of the project's objectives and the methodology that would be employed to fulfill the project objectives. The project consultant integrated "areas of interest" feedback from the program managers into the ODM methodology.

The ODM project was divided into two parts, corresponding to the two on-site workshops described above. In part 1, the Activity Summary Workshop, the project consultant worked with all assigned staff in the selected study functions to define activity-level details for each staff member. In Part 2, the Operations Definition Workshop, the project consultant led a workshop in which the project team produced a detailed, start-to-finish activities flow chart. All participants from part 1 then contributed their ideas as to where opportunity areas for improvement exist. The Activity Flow Chart contains the project team's designation of potential areas for operational improvement, selected by vote of the project team.

Part 1: Activity Summary Workshop

The objectives of the Activity Summary Workshop were three-fold: 1) to acquaint the staff of the three programs with the project scope; 2) to present the ODM methodology to the project participants; and 3) to obtain the necessary activity-level details to proceed to part 2. The Activity Summary Workshop involved 14 employees of the department, representing all occupational classifications found throughout the three study areas.

The Activity Summary Workshop participants completed an Activity Summary Worksheet. The worksheet details the major activities each position performs in the course of the year. In addition to this activity listing, information such as the estimated percentage of time spent on each activity, the estimated amount of re-work performed in each activity, and the like, were documented by the participants. Following this workshop, the project consultant created an Activity Summary Data Table (Appendix 1), the data were analyzed. Pertinent observations from the analysis have been included in the "Observations and Comments" sections appearing throughout this report. In addition, the project consultant utilized the activity data generated in the Activity Summary Workshop to create the Activity Flow Charts described later in part 2 of the report.

The Activity Summary Workshop produced Activity Summary worksheets for each of the fourteen participants. The completed worksheets were then entered into an electronic spreadsheet to create the Engineering Activity Data Collection table, a portion of which is depicted below. The full table comprises 133 activity entries.² The entire table is included as Appendix 1 to this report, along with an electronic copy of the spreadsheet file to enable division management to perform additional data sorts as desired.

TABLE 1
Every Major Activity of Every Occupational Classification
in the Selected Study Functions was Tabulated

| # | Staff Name | Activity Description | Activity % | Rework % | Primary Output | Principle Customer |
|----|---------------------|---|------------|----------|---------------------------|---|
| 23 | Dimitrios Scarlatos | Project progress meetings (bi-weekly) | 20% | 0% | Project data, status info | Technical Aid (Debbie), Tech Assistant III (Tanya & Bilal), Project Mgr.(John), Construction Mgr. (Joe) |
| 24 | Frank Condon | Consult with staff bi-weekly on projects | 5% | 0% | Project updates | Project Coordinator |
| 25 | Frank Condon | Monitor project - review SAS projects on montly reports, bi-weekly meetings and site visits | 5% | 0% | | |
| 26 | Bilal Mujahid | Review all letters bearing my signature | 3% | 5% | Letter, document | Engineering aid |
| 27 | Bilal Mujahid | Download Final Assessment Roll to Finance | 5% | 0% | Computer downloaded info | Finance Dept., Clerks Office |
| 28 | Debbie Wilson | Process Connection Notification Letters | 10% | 0% | Letters | Homeowner |

The tables and graphs illustrate observations of selected data that define the current Engineering operation. There is an Observations and Comments section following each display. The intent of this commentary is to provide possible uses and/or insights into the information presented, and to provoke thought about the many ways to use the data that define each operation. For example, in observing the activities that consume the most staff time, a detailed look at those activities position-by-position may yield answers to the following questions:

- Does senior staff, those with a great deal of expertise, routinely perform activities that should be performed in other places or by less senior staff? If so, does this make sense in relation to the time constraints of various activities and utilization of expertise?
- Is staff performing the tasks one would expect them to be performing, both from a job description/expertise standpoint and from a work flow/work balancing perspective?
- Are all incumbents in the same job classifications performing approximately the same amount of work in the same amount of time? Are they performing roughly the same activities? Are work methods and work assignments generally uniform? If not, how are the differences explained?

² Staff participants with like positions perform some of the same activities, so 133 activity entries does not equal 133 separate and discrete activities.

- What activities—either internal or external—are most critical to meeting time constraints, or providing timely information to customers (internal and external customers)? Identify activities based on agreed upon criteria, and then optimize them via procedural changes, use of efficiency tools and work reassignments.

The activity percentages found in the report tables and referenced in examples throughout the report reflect consensus staff estimates for the activities cited, and are “accurate” to that degree. The ODM methodology does not involve independent tests to confirm accuracy, but assumes that estimates made by the staff represent their perceptions of work distribution and time commitments. Discussions with the project team participants in those areas and further observations would be required to lend greater confidence to the data. The commentary and examples are presented as a means of illustrating ways to view the data.

TIME CONSUMING ACTIVITIES

From the Activity Data Collection Table (Appendix 1) one can readily identify the activities that require the largest amounts of time, by individual staff position. To put the hours per year spent on the activity described into context, consider that there are 2,080 hours available per staff per year.

TABLE 2

Time Consuming Activities by Section & Staff

| Program & Staff Name | Activity Description | Hrs/Year Spent on the Activity | Activity No. Reference |
|--|--|--------------------------------|------------------------|
| Special Assessments Section | | | |
| Technical Assistant III / Special Assessment Coordinator, Tanya Tyson | 1) Prepare Agenda Items (resolution, tax roll, map, cost, work authorization, organize Final Info Meeting (CD present, Letter notification, legal advertisement (Project tentative)) | 1) 582 | 1) #47 |
| | 2) Review and coordinate consultant service authorization (B), review & communicate 90% Design Plans, Finalize tentative cost (M). (PE) | 2) 291 | 2) #22 |
| Regulatory Compliance Specialist, Frank Condon | 1) Prepare the cost estimate | 1) 374 | 1) #19 |
| | 2) Revise the cost estimate | 2) 250 | 2) #48 |
| Technical Assistant III, Bilal Mujahid | 1) Answer (project) questions to public inquiries | 1) 312 | 1) #33 |

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OPERATIONS DEFINITION FOR MANAGEMENT

| Program & Staff Name | Activity Description | Hrs/Year Spent on the Activity | Activity No. Reference |
|--|---|--------------------------------|------------------------|
| Technical Services Section, Plan Review | | | |
| Engineering Asst. III, Ramiro Vega | 1) Answer questions – Clarify data / analysis | 1) 832 | 1) #43 |
| Registered Engineer, Henry Melendez | 1) Road Project Coordination – Create conflict / final disposition of conflicts | 1) 624 | 1) #6 |
| | 2) Road Project Coordination – Attend and discuss projects at Utility Coordination Meetings | 2) 416 | 2) #37 |
| Engineering Asst. III, Richard Nolan | 1) Conduct additional Plan Review – approve & process permit applications | 1) 520 | 1) #45 |
| | 2) Review and record drawing submittals | 2) 416 | 2) #47 |
| Technical Assistant I, Dottie Pruitt | 1) Set up new jobs in DTS system – track info | 1) 520 | 1) #5 |
| Technical Services Section, CAD | | | |
| CAD Technician, Manuel Ramirez | 1) CAD design | 1) 749 | 1) #3 |
| CAD Technician, Matt Buckner | 1) Prepare CAD drawings for engineers | 1) 520 | 1) #5 |
| | 2) Prepare new drawings per redesign of initial project (see prepare CAD dwg. for eng.) | 2) 520 | 2) #19 |
| | 3) Receive misc. minor requests for drawing updates and make minor changes to drawings | 3) 416 | 3) #12 |
| CAD Technician, Adrian Mendoza | 1) Set-up base for CAD file (Ex. Easements) | 1) 499 | 1) #2 |

Time-Consuming Activities Observations and Comments

The purpose for the discussion and examples below is to indicate the possible ways that data from Table 2 can be used in the management of division activities. Specifically, the data draw attention to the array of core activities that occur in the three areas, and in some cases, following the logic that the biggest impacts can be made by improving those activities that currently take the greatest share of time; they may identify areas of opportunity for improving operations. Specific uses of Table 2 data are as follows:

- Check the listings in Table 2 against management’s perception of what the most time-consuming single activities are;
- Cross reference the time-consuming activities that are in Table 2 with other areas of the report, such as opportunity areas for improvement identified by staff in Tables 4, 6, 8. Activities that are listed repeatedly based on different kinds of analysis may point to activities that could be improved.


Time consuming activities that are also performed under time constraints, or time consuming activities that involve inter-divisional or customer communication, are good starting places to evaluate needs for improvement. In some instances there may be activities or parts of activities that are performed in one section, which could more efficiently be performed in another section, or by a different staff member of the same section. The report contains different sections that report on activity sorts based on differing criteria, time-consuming activities may also be listed in the “rework” section, or in the staff selected opportunity areas section of the report, if so, these other sections of the report can be used to prioritize which time consuming activities to improve first. Improving time consuming activities has the potential to yield the biggest improvement benefits.

Review Table 2 activities, along with the Activity Flow Chart developed in part 2 of the Operations Definition for Management, to identify time consuming groups of activities. The estimated elapsed time for whole sections of activities is documented on the Activity Flow Chart for each study area. Seek out areas to improve where the biggest decrease of elapsed time can take place. Every increment of time eliminated from these time consuming activities can be used to decrease the elapsed time of projects, or to handle increased workload or expanded job responsibilities, service offerings, etc., thereby 1) increasing inter-divisional customer satisfaction; 2) increasing external customer satisfaction; and 3) increasing operational efficiency.

REWORK ACTIVITIES DATA

In a division that manages extensive capital projects, reviews complex plans, and creates detailed drawings, it is not entirely unexpected to see some degree of second reviews, and some amount of drawing updates. What is critical for division management to determine, is what are acceptable levels of rework, what is the impact of rework on elapsed time of projects, and what amount of rework is within the control of the division to improve. To facilitate an understanding of the breadth, impact and major causes of rework the MPA Consultant has created Table 3.

In this table, the consultant provides rework activity data for the project study areas of Plan Review, CAD and Special Assessments based on activity data gathered from the Activity Summary Workshop. Rework activities are defined as instances where work is processed (seen or handled) two or more times, or where extra work is performed because whoever was supposed to do the work previously has passed the job on without completing their responsibility. Table 3, Rework Activities, was created by sorting staff activities that described performing a task for the 2nd or 3rd time. One way to use this information is to determine if there are acceptable levels of rework, and then develop ways to alter behavior so that rework decreases to the acceptable levels.

The graphic  in the left most column of Table 3 can be cross referenced to the Activity Flow Chart to locate activities associated with rework. Table 3 also lists the common causes of the rework, as developed by the division’s ODM project team. The causes of rework can be correlated to the total elapsed time

occurring in these areas of the activity flow. One use of this information could be to identify the top three or four causes of rework and then systematically develop procedures, checklists, forms, training, or even policy changes to limit the occurrence of these causes. The justification for making changes can be found in the positive impact on the elapsed time of a project. The project team estimated existing elapsed project times for sections of the Activity Flow Chart. These estimates are documented in column 3 of Table 3.

TABLE 3

Rework Activities

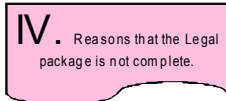
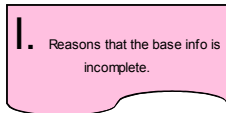
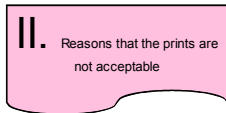
| Area of Activities | Common Cause of Rework (Re-reviews) | Estimate of Elapsed Work Days per Area of Activities |
|--|---|---|
| Technical Services Section, Plan Review | | |
| Plan Submittal and Review Package | <ol style="list-style-type: none"> 1) Failure to follow minimum design guidelines as stated in the manual 2) Landscape, Fire Marshall, paving and drainage requirements are not submitted 3) Water and sewer plans don't agree with paving and drainage or landscape plans 4) Fittings, valves FH's aren't labeled, called out 5) Lift station calculations are missing 6) Missing conflicts (conflicts with other utilities) 7) The last review comments are not addressed 8) The engineer has changed the design from the last submission 9) The engineer (consultant) does not review plans prior to submitting 10) Incomplete review, or changes in comments by Plan Reviewer | <p>Initial Review: Best Case = 7-10 Average Case = 12-14 Worst Case = 20</p> <p>Second Review: Best Case = 7-10 Average Case = 12-14 Worst Case = 20</p> <p>Third Review: Best Case = 5 Average Case = 8 Worst Case = 14</p> |
| Pre-Construction Review (Pre-Work) | <ol style="list-style-type: none"> 1) Unacceptable shop drawings (ie. manholes, grease traps & lift 2) The required permits are not submitted 3) No final landscape plans 4) Missing inspection fees and contractor licenses 5) The consultant does not review / submit required items | <p>Initial Reviews: Best Case = 2-3 Average Case = 7 Worst Case = 10</p> <p>Subsequent Reviews: Best Case = 2-3 Average Case = 7 Worst Case = 10</p> |
| As-Built Review | <ol style="list-style-type: none"> 1) Station offsets and T.O.P. elevations are missing or suspicious 2) Incorrect station & offsets, missing valve numbers, and missing crossing as-built data 3) Stations & offsets of fittings. Valves is missing 4) Crossings are not identified or have improper clearances 5) Services are not acceptable 6) Non-Compliance with State Coordinates Requirements | <p>Initial As-Built Review: Best Case = 5 Average Case = 10-15 Worst Case = 20+</p> <p>Subsequent Reviews: Best/Ave Case = 21-28 Worst Case = 40-60</p> |

I. Reasons that the 1st, 2nd, 3rd, etc. package is not approved.

II. Reasons that the pre-work package is not complete.

III. Reasons that the As-Built package is not complete.

(continued on next page)

| Area of Activities | Common Cause of Rework (Re-reviews) | Estimate of Elapsed Work Days per Area of Activities |
|---|--|--|
| <p>Legal Package Review</p>  | <ol style="list-style-type: none"> 1) Signatories, notary forms are missing or forms are incomplete 2) Manhole, hydrant and valve list is incomplete or wrong 3) The easement is not recorded 4) The proposed PBC UE legal description and sketch do not match as-built drawing data 5) Easement title insurance is not submitted 6) Easement / Plat language or description does not match as-built | <p>Best Case = N/A Average Case = N/A Worst Case = N/A</p> |
| Technical Services Section CAD Area | | |
| <p>Base information (to begin CAD drawing)</p>  | <ol style="list-style-type: none"> 1) Wrong, incorrect data for the project (existing locations of utilities) 2) Incomplete survey information (ie. 40%) 3) Surveyor's data is inaccurate or incomplete 4) Legibility of handwriting (design mark-ups) is poor 5) Poor or incomplete CAD work | <p>Reference Part I, II, III, and IV Elapsed Time Estimates on the Activity Flow Chart</p> |
| <p>Final prints and design approval</p>  | <ol style="list-style-type: none"> 1) Request for additional data (distances from centerline, right of way line, etc.) 2) Standard details from the permitting agency are missing 3) Standard details are outdated, not applicable 4) Clearances between pipes, structures, are not sufficient 5) Newly obtained field data (preexisting conditions) require a redesign 6) A road project redesign/design update/timing change makes a plan revision necessary 7) Internal changes in pipe sizes, pipe materials, missing easements, or new priorities 8) Conflicts are not identified 9) Poor or incomplete CAD work | <p>Reference Part I, II, III, and IV Elapsed Time Estimates on the Activity Flow Chart</p> |
| Special Assessment Section | | |
| <p>Rework, per se, was not as apparent from the activity data defined by the Special Assessments project participants. Nonetheless the section could, using this project methodology, estimate best case, average and worst case elapsed times for sections of the special assessment process. One such break down of the special assessment process could be: a) preliminary design & project boundaries, b) petitioning, c) design and permitting, d) BCC meeting activities, e) construction, and f) connection. The primary reasons for elapsed time could then be documented and analyzed for ways to be improved.</p> | | |

Rework Activities Observations and Comments

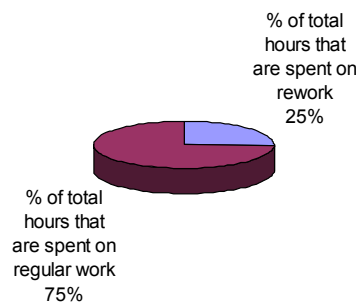
The purpose for the discussion and examples below is to indicate the possible ways that information from Table 3 can be used in the management of program activities. Specifically, the table draws attention to the array of core activity areas where rework occurs. It identifies the repeating reasons for rework, and it lists the project team’s estimates for elapsed time through the series of activities described in the table (best case, average case and worst case). Management can cross reference this table with the project team’s list of opportunity areas for improvements in Tables 4, 6, 8 to investigate and target areas for improvement. Together, the four tables define the operations by identifying the areas where rework occurs (Table 3 used in conjunction with the Activity Flow Chart), by listing the major causes of rework (Table 3), and by identifying the specific activities recommended by staff as opportunity areas for improvement (Tables 4, 6, 8). Specific uses of Table 3 data are as follows:

- Because rework increases elapsed time, check the listing of rework areas in Table 3 against management’s perception of what the most time-consuming areas of the operation are;
- Use Table 3 to review the estimated elapsed time against management’s perception of the elapsed days per area of activities. Consider charting the number of projects that fall within the best case, average case and worst case scenarios, respectively;
- Use Table 3 to check management’s perception of the major causes of rework; consider which causes of rework management can affect policy, procedure and training means.

The following figures present the rework data in a different way. The figures are created by sorting Activity Workshop data and performing the associated calculations (reference the Activity Summary Data Table in Appendix A). For Figure 1 and Figure 2, the MPA Consultant sorted all activities that had associated rework. The Consultant created Figure 3 by sorting the activities that describe “initial review” versus “second or additional reviews.”

FIGURE 1

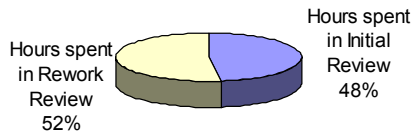
Special Assessments Rework Activities (For All Activities with Rework)



Percentage of all rework to total activity hours.
16%

FIGURE 2

**Plan Review Rework Activities
(For Review Activities)**

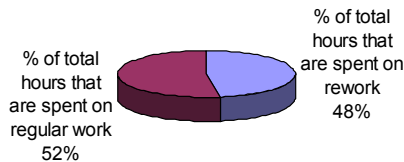


Percentage of all rework to total activity hours.

26%

FIGURE 3

**CAD Rework Activities
(For All Activities with Rework)**



Percentage of all rework to total activity hours.

28%

There are many ways that management can use the information presented in this section of the report. For example, in cases where applicant/submission information is incomplete, determine if there are some types of missing information that can be “fast tracked” - where the submission is not returned in total, or where the submitter is notified electronically of what is required and given a time limit to provide the missing information prior to the submission being returned in total? Likewise, if there are instances where outside entities return the work that the division has submitted, can ways be developed whereby the problem is corrected where the documents or information reside, without lengthening the process by document travel time and queue time? This example is offered as the type of thought progression and analysis that could lead to improvements in the activity flow and a decrease in project elapsed time. Division management can determine the applicability of such ideas at each area of the activity flow. Rework and its effect on elapsed time (as well as regular

activity time) can be significantly improved through changes in procedure, policy, communication and training.

Every increment of time eliminated from rework activities can be used to process the current work load more quickly, thereby 1) decreasing elapsed time (items move from point A to point B quicker with shorter activity times or fewer steps); 2) increasing customer satisfaction (internal department customers and the public sector clients get what is asked for more quickly); and 3) increasing operational efficiency, thereby increasing the productive capacity of the organization's existing staff.

ACTIVITY SUMMARY WORKSHOP REVIEW

Provided below are samples of the observations available through analysis of the project team's activity data. The activity data can be used in conjunction with the various outputs from part 2, the Operation's Definition Workshop, to gain a well-defined understanding of the Engineering operation.

- The Activity Summary Data Table (Appendix 1) can be sorted a variety of ways depending on the area of interest (activities, re-work, output item, customer, etc.). Table 2 and Figures 1, 2, 3 are examples of sorting the activity data. Department staff can add additional columns to the electronic copy of the table supplied to the division director for future analysis.
- There are 14 individual activities of more than 300 hours per year (300/2080 hours available = 15% of an employees time is spent on a single activity) listed in Table 2).
- For activities that have associated rework, the Plan Review area and the CAD area each spend about as much time on rework as they do on initial, regular work (Figures 2 and 3). This amount of rework may or may not be attributable to the nature of an evolving project.
- The Plan Review and CAD areas spend more than a quarter of their overall time performing rework, as opposed to 16% spent performing rework in Special Assessments (Figures 1, 2 and 3). Again this may or may not be expected. The estimates of rework and the comparisons are meant to define the operation in terms that help management decide if there is a rationale for further investigation based on the estimates of staff.

In part 2 the project team did all of the following things: 1) placed the activities defined in the Activity Summary Workshop into an activity flow diagram; 2) sectioned off the activities flow per study area and estimated elapsed time per section from a best case, average case, and worst case perspective; 3) further defined the Engineering operation by identifying groups of activities as "opportunity areas for improvement."

Part 2: Operations Definition Workshop

One objective of the Operations Definition Workshop was to define the Engineering Division by placing the activities identified in the Activity Summary Workshop into a sequenced activity flow in order to, 1) allow the workshop's project team to identify and fill in any activity gaps that were evident from the work generated in the first workshop; and 2) document the key decision points and key decision makers that impact the flow of items being processed through the sequence of activities.

An additional objective of this workshop was to apply the unique expertise of project team members to define the Engineering operations by identifying opportunity areas for improvement. The project team identified 1) activities that are the biggest distractions from core tasks, 2) areas where communication could be improved, 3) activities where improvements would yield significant decreases in project elapsed time, 4) places where cross training would be beneficial, and 5) personal hassle areas.

ACTIVITY FLOW CHART

The MPA consultant led the Operations Definition Workshop with two participants from each of the three study areas (Special Assessments, Plan Review, and CAD). All participants had previously taken part in the Activity Summary Workshop. In the Operations Definition Workshop, the six-person project team sequenced the activities from those identified in the first workshop into an activities flow chart. Activities that take place in sequence approximately 85% of the time were put onto a wall-sized chart, separating activities that occur in the initial part of the process from those that occur in the middle part, from those occurring at the end of the process.

Then, the project team reviewed the activities and added activities that were previously overlooked. One of the objectives of the Operations Definition Workshop was to create a visual representation of operations in the Engineering study areas. The result was the documentation of the major activities involved in the unique parts of the process. Once group consensus was reached as to the accuracy of the activity descriptions and their sequencing, the project team added decision points to the chart, further defining the interdependence of the activities and highlighting the decisions that must be made prior to moving from one activity to the next.

Decision points relate to the questions that must be answered in order to move work product through important activities. Documenting decision points is valuable input in the understanding of the operation under review and for the design of database systems. The elapsed time of the overall process is heavily dependent on how effortlessly these individual decision points can be bridged. If the response to a decision point routinely lengthens the elapsed time through an area, then focus process improvement efforts at that point. Determine the reasons why information is routinely not included or incorrect, and develop ways to emphasize the importance of including the information. Develop

incentives/disincentives, if possible, to promote good practices, to change behavior.

On the Activity Flow Chart, the project team documented activities performed outside of the Engineering Division (by customers, other WUD divisions, external private and public entities, and so on). The result of these workshop tasks was to visually show activities that take place outside of the Engineering Division and to visually document where these activities take place. Following the Operations Definition Workshop, the project consultant transferred the wall-sized draft activity flow chart into an electronic version. The consultant documented and analyzed the project team's work from the Operations Definition Workshop. Pertinent observations from this analysis are discussed in the comments sections below. The activities flow chart, complete with decision points, has been supplied to the division director in hardcopy form and as a CAD drawing.

OPPORTUNITY AREAS FOR IMPROVEMENT

Based on a variety of perspectives, the project team selected areas of the Activity Flow Chart where there are high leverage points to improve operations. For each of the voting perspectives, each member of the project team received a limited number of "votes" to be placed on any activity area. The top consensus opportunity areas for improvement for each of the study areas are listed in Tables 4, 6, 8. These tables represent approximately 75% of all votes cast; the remaining 25% are spread across other activities with none receiving more than 2 votes. These other areas can be viewed on the Activity Flow Chart.

In each of the following three sections an introductory paragraph explains the criteria used to select the opportunity areas for improvement – staff has determined these are high leverage point activities to improve operations. Following each table, the MPA Consultant offers observations and comments pertinent to the table. One possible use of Tables 4, 6, 8 would be to cross-reference the opportunity areas voted on by the project team with the time consuming activities (Table 2), the rework activities (Table 3), or other areas identified from the Activity Summary Workshop data. If the same activity is mentioned repeatedly, based on varied criteria, it may be a prime candidate for evaluation and improvement. Cross referencing Tables 4, 6, 8 data in this way should clarify and justify opportunity areas in which to concentrate improvement efforts.

Special Assessments Opportunity Areas

The Special Assessments project participants first voted on activities that they considered personal hassle areas, defined as activities that they find unpleasant to perform for some reason - activities that are part of their responsibilities, but that they don't particularly enjoy. Next, the project team reviewed the elapsed time estimates occurring per section of the Activity Flow Chart, and then the project team voted on the activities where cross-training or additional staff would significantly impact elapsed time taken for that section of the activities flow. Finally, the project team voted on activities where improvement should take place, places that can greatly decrease the elapsed time of a project.

TABLE 4

**Opportunity Areas for Improvement
Selected by the Special Assessments Project Participants**

| | | | Division participants voting from their perceived viewpoint of: | | |
|----------------|--------------|---|---|---|---|
| Activity Group | Activity No. | Activity Description | Personal hassle areas | Cross-training or more staff would decrease lead time | Improved activities would decrease elapsed time |
| A | 3 | - Determine assessment method and frontage | | | |
| | 2 | - Input property info. Into computer | 1 | 5 | 2 |
| | 12 | - Investigate assessable properties | | | |
| B | - | - Research returned mail. Determine if address needs updating, update address in SAS | 2 | 3 | 2 |
| | - | - Send 3 rd letter notification | | | |
| | - | - John Rich processes CSA (design, survey, easement) | | | |
| C | 47 | - Prepare Agenda Items (agenda resolution, tax roll, map, cost, work authorization., organize Final Info Meeting (PowerPoint presentation, Letter notification, legal advertisement (Project tentative) | 0 | 4 | 2 |
| D | 10 | - Review SAS tentative cost estimates for projects | | | |
| | 20 | - Review SAS design plans | | | |
| | 17 | - Analyze boundary & cost input, determine assessable & non-assessable costs, input costs into SAS database (review tax rolls) Project Estimated (PE) | 1 | 1 | 4 |
| E | 11 | - Identify next group of SAS projects for cost analysis | | | |
| | 4 | - Coordinate CCRT participation (determine if projects qualify for CCRT funds) | 3 | 0 | 2 |
| | 6 | - Collect tax maps, plats | | | |
| F | 28 | - Process Connection Notification Letters, answer the question, "Has the Construction Coordinator forwarded to CRC?" | 2 | 1 | 1 |
| G | 21 | - Follow-up project status / coordinate with design consultant | | | |
| | 22 | - Review and coordinate consultant service authorization (B), review & communicate 90% Design Plans, Finalize tentative cost (M). (PE) | 2 | 1 | 1 |

Special Assessments Opportunity Areas for Improvement Observations and Comments

As you review Table 4, first review the activity group-activity descriptions from top to bottom (based on total votes received). Next, observe which activity areas received the most votes from each of the “voting perspectives.” Insight may follow which will enable the division to create improvement strategies. The data in the table can be analyzed through several approaches. Activity groups receiving the most votes from a variety of perspectives could lead management to prioritize improvement efforts in those activity groups.

- Interestingly, the top three areas receiving votes - Groups A, B, and C - represent activities that occur at the beginning, middle and end of the operation. Also of note, is the fact that these same activities were overwhelmingly selected by project participants as candidates for cross-training. Groups A, B, and C encompass 21 votes or 53% of votes in the table.
- Groups A, D, and E might be classified as “upfront, project origination, start of project activities.” These groups encompass 19 votes or 48% of all votes in the table.

Analyzing the results of the table could lead the department to focus improvement efforts in these activity groups, making certain to involve the perspectives most impacted as demonstrated by the voting spread. Example insights can be made, as follows.

- Group E received the most votes from the “personal hassle” perspective. If these areas are to be the focus of improvement, then the improvement should take into account this view point.
- Group D received the most votes from the “improvement would yield decreases in elapsed time” perspective. If this area is to be the focus of improvement, then the improvement should take into account the desired impact on elapsed time.

Special Assessments Project Participants Table 4 Commentary

Another possible use of Table 4 data would be to determine why the project team voted as it did on the activities listed. This could be accomplished easily enough by asking representatives to use the points of view in the table to provide input into what they like and what they don't about the activity groups listed in the table. In fact, following the Operations Definition workshop, three of the five participants did respond with written explanations of their voting selections. The project team reviewed the placement of their votes on the activity flow chart (the top 75% of which are tallied in Table 4). Their reasoning for how they voted is paraphrased in Table 5. Within these responses, opportunity areas to target for improvements can be determined.

TABLE 5

Special Assessments Project Participants Voting Commentary

| Ref. Group No. | ODM Activity No. | Activity Description |
|----------------|------------------|---|
| A | 3, 2, 12 | <ul style="list-style-type: none"> - Determine assessment method and frontage - Input property info. Into computer - Investigate assessable properties <ul style="list-style-type: none"> • One person primarily does this, if he is out of the office no one else knows how to load the project. • We could greatly reduce the elapsed time and delays if more than one person was proficient with inputting property information into the SAS computer program. • The continuity of the program is lost when the primary person responsible for this activity is away. |
| C | 47 | <ul style="list-style-type: none"> - Prepare Agenda Items (Agenda resolution, tax roll, map, cost, work authorization., organize Final Info Meeting (PowerPoint presentation, Letter notification, legal advertisement (Project tentative) <ul style="list-style-type: none"> • If a project is large (contains a large number of property owners) these task can become very time consuming and maybe overwhelming for one single individual to perform in a timely manner. Assistance by other staff members for large project would greatly reduce lead time. Currently, portions of this task are conducted by only one staff member (Debbie W. for some portions, and Tanya T. for other portions). • Tanya does all of these things with the exception of letters. Cross training would take pressure off of her. |
| D | 10, 20, 17 | <ul style="list-style-type: none"> - Review SAS tentative cost estimates for projects - Review SAS design plans - Analyze boundary & cost input, determine assessable & non-assessable costs, input costs into SAS database (review tax rolls) Project Estimated (PE) <ul style="list-style-type: none"> • We currently have four different staff members (Adam G, Steve M., Dimitrios S., John R.) review plans or give design input and each usually has a differing opinion regarding design of water mains for each SA project and when all agree it is certainly a redundancy. I recommend one individual should approve the overall design and have two people review plans two make sure the design is executed as such. • Many of these variables are determined by one individual or another. As in #1, other staff could be trained to do many of these tasks when the principal staff member is away. |
| E | 11, 4, 6 | <ul style="list-style-type: none"> - Identify next group of SAS projects for cost analysis - Coordinate CCRT participation (determine if projects qualify for CCRT funds) - Collect tax maps, plats <ul style="list-style-type: none"> • Currently, processing the CSA's is a very lengthy process, so staff waits on the upfront activities to be done. • We currently do not have a system in place that allows us to prioritize which group of projects we will work on next. It is important to determine if a project qualifies for CCRT funding. Currently this entire task is conducted by only one staff member (Bilal M.) Cross training would yield reduction in lead time because more than one individual can work on the different steps of this task. • This is a staff coordination/organization issue. It would be helpful if upcoming projects could be prioritized. Currently work may be proceeding on cost estimates for last year as well as this year. Sometimes, new projects are prioritized ahead of older ones. |

Special Assessments Project Participant Voting Commentary Observations and Comments

The project participants recognize Activity Group A as containing sole source activities, activities performed by primarily one person. They recommend cross training in these activities in order to reduce elapsed time of projects through this area. One key thought mentioned in Table 5 under Activity Group A should be emphasized - the notion that cross training should produce *proficiency*, which will in turn increase efficiency in various activities during the course of each project. To insure proficiency all cross trainees should routinely practice what they have learned in training by being responsible for performing the work they have been trained to do. In other word, don't wait until the primary person is out to find out if the rest of your "trained" workforce is actually proficient at the task!

One additional comment is important concerning having only one staff member proficient in key tasks: cross training and work sharing are often a key part of management's succession strategy. They allow management to develop continuity of operations and a consistent delivery of service, even as staff and management move out of the division. In addition to the insights provided by staff in Table 5, staff also gave the following input, paraphrased here by the Consultant:

- We need to work as a team, be supported as a team, and be held accountable as a team for producing good work products.
- We could improve communication with the Engineering staff (i.e. Pipeline design and construction coordination, etc.) The Engineering Division should investigate creating a position that would keep track of all projects from start to finish. All projects would be coordinated and updated by this centralized position. Ideally, current staff would provide input into how the new coordinator position would function, thereby developing the justification for the new position.
- Dealing with mortgage companies is a difficult experience in need of improvement.

Table 5 adds experiential input and explanation to the Table 4 activity area rankings. Table 4 and Table 5 are but two ways the project team has defined the operational area under study – by identifying where they believe improvement should take place. In the previous sections of this report, the results of sorting the project participant's activity level information by various criteria are also valuable in defining the operation and possibly determining where future improvement actions could be focused.

Plan Review Opportunity Areas

The Plan Review project participants first voted on activities that they considered personal hassle areas, defined as activities that they find unpleasant to perform for some reason, activities that are part of their responsibilities, but that they don't particularly enjoy. Next, the project participants selected activities where improved communication or automating communication

should be considered. Finally, the project participants selected activities where there is a significant opportunity to decrease the elapsed time to process work through a particular area.

TABLE 6

**Opportunity Areas for Improvement
Selected by the Plan Review Project Participants**

| | | | Division participants voting from their perceived viewpoint of: | | |
|----------------|----------------------|--|---|---|---|
| Activity Group | Activity No. | Activity Description | Personal hassle areas | Communication areas to be improved (or automated) | Improved activities would decrease elapsed time |
| A | 20 | - Conduct Initial Plan Review (plans reviewed: water, sewer, paving, drainage, prelim Plat, landscape plans, and write review letter w/ forms) | | | |
| | 10 | - Review the initial project submission, verify existing services, prepare project letter | 1 | 5 | 3 |
| | 13 | - Review plans / initial submittals for pr water utilities projects | | | |
| B | 47 | - Review 2nd project submission, verify prior review comments are addressed | | | |
| | 60 | - Conduct additional Plan Review - approve & process permit applications | 2 | 3 | 1 |
| | - | - Conduct multiple reviews, developer resubmits plans, Adam G discusses 3 rd review with consultants | | | |
| C | - | - Meet with consultants to discuss new projects (Adam G) | 0 | 3 | 1 |
| D | 33 | - Review initial submittal of "As-Built" drawing | | | |
| | 38 | - Review As-Built - Collect tax maps, plats | 0 | 1 | 3 |
| | 62 | - Review and record drawing submittals | | | |
| | - | - Determining if submissions are acceptable | | | |
| E | 30 | - Work w/ contract mgt. to set approvals for hydrant meters / misc. meters | | | |
| | 52 | - Process Fence Permits, and Process Easement Abandonment Requests | 8 | 1 | 2 |
| | 9 | - Plan Review - Provide information over the phone | | | |
| | Non-Sequential Tasks | | | | |

Plan Review Opportunity Areas for Improvement Observations and Comments

As you review Table 6, first review the activity group-activity descriptions from top to bottom (based on total votes received). Next, observe which activity areas received the most votes from each of the “voting perspectives.” Insight may follow which will enable the division to create improvement strategies. The data in the table can be analyzed from several different approaches. Activity groups receiving the most votes from a variety of different perspectives could lead management to prioritize improvement efforts in those activity groups.

- The top two areas receiving votes, Activity Groups A, and B, deal with initial review submission, and subsequent re-review activities of the initial submission. Interestingly, Pre-Work reviews, As-Built reviews, and Legal reviews were not selected as big opportunity areas even though these review activities also involve frequent re-reviews. Groups A and B encompass 15 votes or 44% of votes in the table. In fact, Groups A, B, and D might be classified as “review activities.” These groups encompass 19 votes or 56% of all votes in the table.
- Further analysis of Activity Group A shows that it also received the most votes from the perspective that communication could be improved (or automated) in these activities. It did not receive many votes from the “personal hassle area” perspective which could reflect a staff acceptance of receiving poor quality or incomplete submissions.

Analyzing the results of the table could lead the department to focus improvement efforts in these activity groups, making certain to involve the perspectives most impacted as demonstrated by the voting spread. Example insights can be made, as follows.

- Activity Groups A and D received the most votes from the “improvement would yield decreases in elapsed time” perspective. If these areas are to be the focus of improvement, then the improvement should certainly take into account the desired impact on elapsed time.
- Activity Group E received the most votes from the “personal hassle area” perspective. Group E contains non-sequential, unexpected activities that are part of the job, but that disrupt the completion of sequentially occurring activities. This group received 11 votes or 33% of all votes cast. The large number of votes for this group indicates that these types of activities affect most of the staff.

Plan Review Project Participant Table 6 Commentary

Another possible use of Table 6 data would be to determine why the project team voted as it did on the activities listed. This could be accomplished easily enough by asking representatives to use the points of view in the table to provide input into what they like and what they don’t about the activity groups listed in the table. In fact, following the Operations Definition workshop, one of the six participants did respond with written explanations of that individual’s

voting selections. The reasoning for how the individual voted is paraphrased in Table 7. Within this response, and those of other project participants, opportunity areas to target for improvements can be more accurately determined.

TABLE 7

Plan Review Project Participants' Voting Commentary

| Ref. Group No. | ODM Activity No. | Activity Description |
|----------------|------------------|--|
| A | 20, 10, 13 | <ul style="list-style-type: none"> - Conduct Initial Plan Review (plans reviewed: water, sewer, paving, drainage, prelim Plat, landscape plans, and write review letter w/ forms) - Review the initial project submission, verify existing services, prepare project letter - Review plans / initial submittals for pr water utilities projects |
| | | <ul style="list-style-type: none"> • Could save time if detailed check sheet was available to check off for specific items and check off for general items (sort of a reminder) |
| C | -- | <ul style="list-style-type: none"> - Meet with consultants to discuss new projects (Adam G) |
| | | <ul style="list-style-type: none"> • Adam should conduct the first meeting and give detailed comments to the project designer and when the first package for review comes in he should check for compliance to the concept and then turn the package over to reviewers for detailed checking. • Could save time if a brief synopsis of the comments was included in the file when the first review set of plans came in. |
| D | 33, 38, 62 | <ul style="list-style-type: none"> - Review initial submittal of "As-Built" drawing - Review As-Builts - Collect tax maps, plats - Review and record drawing submittals - Determining if submissions are acceptable |
| | | <ul style="list-style-type: none"> • This area has many opportunities for improvement. A detailed check sheet at this stage would be beneficial and a change in policy that would require the design firm to be the as-built certifier would reduce the amount of comments. Right now present policy allows a different engineer or a surveyor to submit the As-Builts and then our staff has to lead them through the whole process. |
| E | 30, 52, 9 | <ul style="list-style-type: none"> - Work w/ contract mgt. to set approvals for hydrant meters / misc. meters - Process Fence Permits, and Process Easement Abandonment Requests - Plan Review - Provide information over the phone |
| | | <ul style="list-style-type: none"> • This group illustrates the overall problem of too many interruptions and too many different policies and procedures to follow. • The work flow is extremely convoluted, disconnected and demands a large amount of personal knowledge, and written guidelines are not readily available. • I have overheard policy decisions made that were not conveyed to everyone, sort of find out through the grapevine on a need to know basis and oh yeah it might be different tomorrow. |

Plan Review Project Participant Voting Commentary Observations and Comments

The project participants recognize Activity Groups A and C as containing opportunities to ensure that Plan Reviewers receive plan submissions that are as complete as possible. The use of a detailed checklist could produce more complete submissions, if a required item is not checked off (i.e. being submitted complete), then the package is not reviewed. Also, staff expressed concern that details concerning submissions are agreed to at meetings that they do not attend, and that their unawareness of these agreements can elongate the review process. If an opportunity exists where plan reviewers are involved in the last of the preliminary meetings with consultants, this may facilitate the full understanding of the project and of the Plan Review expectations, between all parties involved – consultants, management, and reviewers.

One additional comment about checklists, meetings and communication – it would be beneficial to have an effective way to quickly determine if the agreed upon review elements have been submitted by the consultant; if the submission is incomplete, there could be well defined incentives or disincentives to encourage good practices, to change behavior. Ideally a win-win strategy could be developed along the lines just described. In addition to the insights provided by staff in Table 7, staff also had the following input, paraphrased by the Consultant:

- The divisions' submission policies and procedures should be clearly communicated to customers. In addition, the division should document and communicate the effect of materials that are submitted incorrectly or with incomplete information. The division should develop (dis)incentives and follow a consistent approach in dealing with customers that continuously submit documents that are incorrect or incomplete.
- If the engineering community would prepare a proper submittal, we could find all the errors on the initial review 98% of the time. This would yield a huge savings in elapsed project time.

Table 7 adds experiential input and explanation to the Table 6 activity area rankings. Table 6 and Table 7 are but one way the project team has defined the operational area under study – by identifying where they believe improvement should take place. In the previous sections of this report, the results of sorting the project participant's activity level information by various criteria are also valuable in defining the operation and possibly determining where future improvement actions could be focused.

CAD Opportunity Areas

The CAD project participants first voted on activities that they considered personal hassle areas, defined as activities that they find unpleasant to perform for some reason, but where changes in how the activity is performed could yield big improvements. Next, the project participants reviewed the activities that take them away from their primary function of CAD design, and they voted on the activities that are the biggest distractions, activities that elongate the elapsed

time of the CAD design function. The votes in this last group are displayed in Activity Groups D and E of Table 8.

TABLE 8

**Opportunity Areas for Improvement
Selected by the CAD Project Participants**

| | | | Division participants voting from their perceived viewpoint of: | |
|---|--------------|---|---|--|
| Activity Group | Activity No. | Activity Description | Personal hassle areas where the biggest improvement could occur | Activity areas that are the biggest distractions from CAD design |
| A | 1 | - Acquire survey information (Ex. Easements) | 8 | N/A |
| | 5 | - Prepare CAD drawings for engineers | | |
| | 3 | - CAD design | | |
| B | 18 | - Start design for engineering – water & sewer; Revise drawing for re-design | 4 | N/A |
| | - | - Project engineer provides design input | | |
| C | 14 | - Ongoing discussions with engineer involved in the project | | |
| | - | - The Project Engineer ok's the prints and forwards to Adam G. Adam G. return prints to Project Engineer with updates | 3 | N/A |
| The following activities are the most time consuming non-sequential, non-regularly occurring "other" activities that the CAD staff performs in addition to those of the study area. | | | | |
| D | 12 | - Receive misc. minor requests for drawing updates and make minor changes to drawings | N/A | 4 |
| E | 15 | - Provide technical support for software | N/A | 3 |

CAD Opportunity Areas for Improvement Observations and Comments

As you review Table 8, first review the activity group-activity descriptions from top to bottom (based on total votes received). Next, observe which activity areas received the most votes from each of the "voting perspectives." Insight may follow which will enable the division to create improvement strategies.

- The Activity Group receiving the most votes as an opportunity area for improvement was Group A. Of note is the fact that Group A activities occur at the *beginning* part of the operation. This activity was overwhelmingly

selected by project participants. Group A, encompasses 8 votes or 53% of votes for regularly occurring, sequential activities.

- The next two groups selected by project participants, Activity Groups B and C, seem to deal with the interaction between the CAD Technician and the Project Engineer. These groups encompass 7 votes or 47% of votes for regularly occurring, sequential activities.

These types of observations could lead the department to focus improvement efforts in these activity groups, making certain to involve the perspectives most impacted as demonstrated by the voting spread. Additional insights can be made, as follows.

- Activities in Groups D and E received the most votes as the biggest distractions from normally occurring, sequential CAD design activities. If these areas are to be the focus of improvement, then the improvement should certainly take into account this view point.

CAD Project Participants Table 8 Commentary

Another possible use of Table 8 data would be to determine why the project team voted as it did on the activities listed. This could be accomplished easily enough by asking representatives to use the points of view in the table to provide input into what they do and don't like about the activity groups listed in the table. In fact, following the Operations Definition workshop, one of the three participants did respond with written explanations of that individual's voting selections. The reasoning for how the individual voted is paraphrased in Table 9. Within this response, and those of other project participants, opportunity areas to target for improvements can be determined.

TABLE 9

CAD Project Participants Voting Commentary

| Ref. Group No. | ODM Activity No. | Activity Description |
|----------------|------------------|--|
| A | 1 | - Acquire survey information (Ex. Easements) |
| | | <ul style="list-style-type: none"> • Getting the right information from the beginning of the project can save a lot of time. |
| | | (continued on next page) |
| B | 5, 3, 18 | <ul style="list-style-type: none"> - Prepare CAD drawings for engineers - CAD design - Start design for engineering - water & sewer; Revise drawing for re-design - Project engineer provides design input advertisement (Project tentative) |
| | | <ul style="list-style-type: none"> • Improper information creates conflicts with the design. |

(continued on next page)

| Ref. Group No. | ODM Activity No. | Activity Description |
|----------------|------------------|--|
| C | 14 | <ul style="list-style-type: none"> - Ongoing discussions with engineer involved in the project - The Project Engineer ok's the prints and forwards to Adam G. Adam G. return prints to Project Engineer with updates <ul style="list-style-type: none"> • This affects everyone; there are problems with people writing comments clearly, penmanship. |
| D, E | 15 | <ul style="list-style-type: none"> - Receive misc. minor requests for drawing updates and make minor changes to drawings - Provide technical support for software <ul style="list-style-type: none"> • This may be difficult to improve, because we have different skills, and also some engineers have different confidence with our staff, they always go to the same person. |

CAD Project Participant Voting Commentary Observations and Comments

The project participants have noted the various interruptions to their primary function of CAD design. These interruptions occur at the start of the CAD design process with incomplete survey information, and continue with periodic interruptions as projects are updated or otherwise changed from their initial scope and finally activities aside from CAD design work are requested of the CAD technicians. Further investigation may determine whether the interruptions noted are at acceptable levels for this type of job function, or whether there are improvements possible in areas that the CAD technicians have clearly noted as opportunity areas to be improved.

Table 9 adds experiential input and explanation to the Table 8 activity area rankings. Table 8 and Table 9 are but two ways the project team has defined the operational area under study – by identifying where they believe improvement should take place. In the previous sections of this report, the results of sorting the project participant’s activity level information by various criteria are also valuable in defining the operation and possibly determining where future improvement actions could be focused.

MANAGEMENT INTEREST AREAS

The project consultant integrated the division director’s “areas of interest” into the ODM project outputs. In addition to tables and observations already presented, the report’s companion output, the activity flow chart provides additional definition of the operation: it color codes opportunity areas for improvement, defines the points where the item being processed leaves the division’s control, and identifies the types of activities that significantly add to the elapsed time of the project. Identifying these activities on the activity flow chart, management can clearly see the flow, interaction and interdependence of staff activities related to these “areas of interest.”

Visually defining the operation on an activity-level basis is a useful step toward understanding the interaction between the different job types and job functions. The sections of this report have attempted to put the tabulated

volume of activity level data into perspective through a series of sorts and observations. Management's review of the presented sections in conjunction with areas identified by staff as opportunity areas for improvement could lead to the development of a focused strategy to improve the operation.

ODM Project Summary

The Operations Definition for Management project outputs, observations and comments are designed to create a concise and working depiction of the study area selected by the Engineering Director. The ODM project satisfied all of the elements that department management stressed as preferable: 1) that staff involvement would be widespread; 2) that staff would be free and unrestricted in providing input; 3) that the project would be informational in nature; and 4) that project outputs be concise and easily understood depictions of activity-level detail among the selected functions of the department.

In practical terms, the observations and comments found throughout the ODM report are designed to stimulate thought and serve as pointers to, a) develop priorities for operational improvement; b) guide change and decision making; c) develop new employee training programs; and d) develop cross training programs. If requested, the Management and Program Analysis Section can assist in the development of organizational solutions that promote operational effectiveness by equipping the department with contemporary management practices that respond to these issues. Examples of such assistance are the development of: 1) management reporting systems; 2) goals and objectives setting; 3) performance measurement and reporting; 4) policies and procedures; 5) support systems, such as training programs.

Appendix 1

Appendix 2

Project Team Listing

Matt Buckner
Frank Condon
Joe Lammert
Henry Melendez
Adrian Mendoza
Bilal Mujahid
Richard Nolan
Dottie Pruitt
Manuel Ramirez
John Roberts
Dimitrios Scarlatos
Tanya Tyson
Ramiro Vega
Debbie Wilson