“MANAGING MONEY”

PROJECT DELIVERY MANUAL

May, 2020

ENGINEERING
CITY OF LOS ANGELES

Bureau of Engineering

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MANAGING MONEY - PART ONE

Planning, Budgeting, and Delivering Your Capital Project

Theory & Practice

THE TOP 10 THINGS YOU NEED TO KNOW TO FINISH WITHIN BUDGET

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DO YOU CONTROL COSTS

or

DO COSTS CONTROL YOU?

🤔

MODULE GOALS

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- Explain the cost control cycle
- Understand how time affects the ability to influence project costs
- Be able to recognize various Cost and Schedule Reports
- Understand "**Total Project Cost**"

MODULE GOALS (CONT)

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- Introduction to UPRS
- Prepare a Project Cost Estimate
- Use BOE templates to determine project labor costs
- Design *QUALITY* is job #1
- Design *CLARITY* is job #2
- "Pearls of Wisdom"

THE THREE-LEGGED STOOL

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COST

TIME

PERFORMANCE

UNDERSTANDING MEASUREMENT vs. CONTROL

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- **Measurement** is your window into cost, schedule, and performance. Identify problems early.

- **Control** is then necessary to solve or mitigate problems before they permanently impact the final result

COST CONTROL CYCLE

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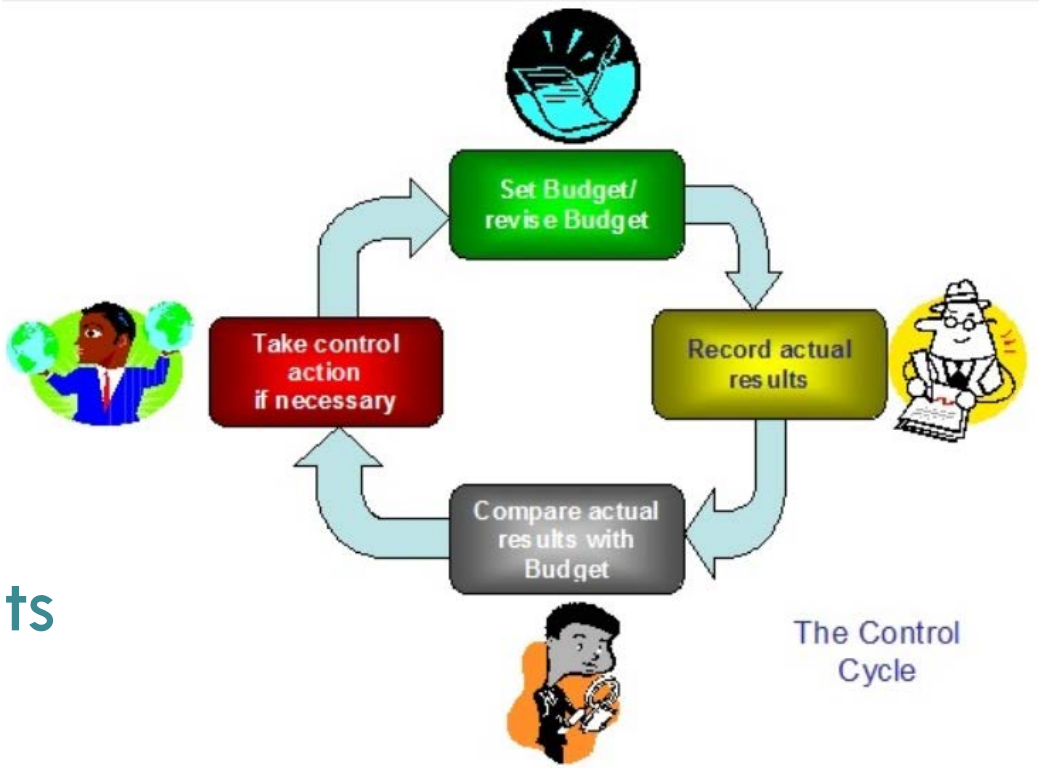
- Estimate
- Budget
- Release
- Spend
- Measure results
- Control



COST CONTROL CYCLE (CONT)

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- Estimating and Budgeting
  - Authorization to start planning
  - Work Breakdown Structure
  - Subdivided Work Descriptions
  - Schedules
  - Budgets
- Release the Work

COST CONTROL CYCLE (CONT)

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- Spend - Perform Work
- Measure the results
  - cost
  - performance
  - time
- Control
- Adjust as necessary

SUCCESSFUL PROJECTS

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- ✓ Thorough planning of work (concept)
- ✓ Good work definition
- ✓ Accurate work breakdown structure
- ✓ Clear communication of work scope
- ✓ Good estimating of time, labor and cost
- ✓ Design quality and clarity
- ✓ Disciplined budgeting and authorization of expenditures

SUCCESSFUL PROJECTS

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- ✓ Periodic re-estimation of time, performance and cost to complete
- ✓ Frequent comparisons of actual progress and expenditures vs. schedule and budget
- ✓ Remedial actions based on problems uncovered in comparisons
- ✓ Contingencies for unknowns
- ✓ Management involvement

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"Plans are nothing, planning is everything"

Dwight D. Eisenhower

34th U.S. President

Program Manager for WW II

ABILITY TO IMPACT COSTS

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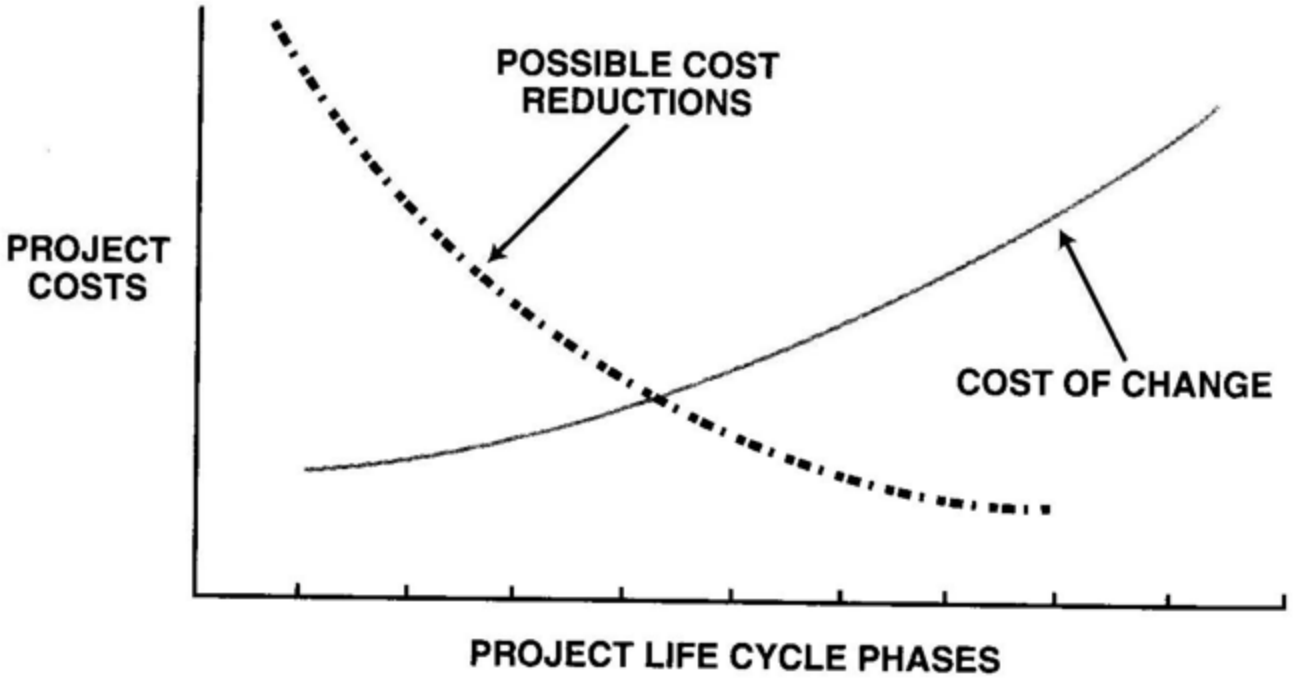

COST REPORTING

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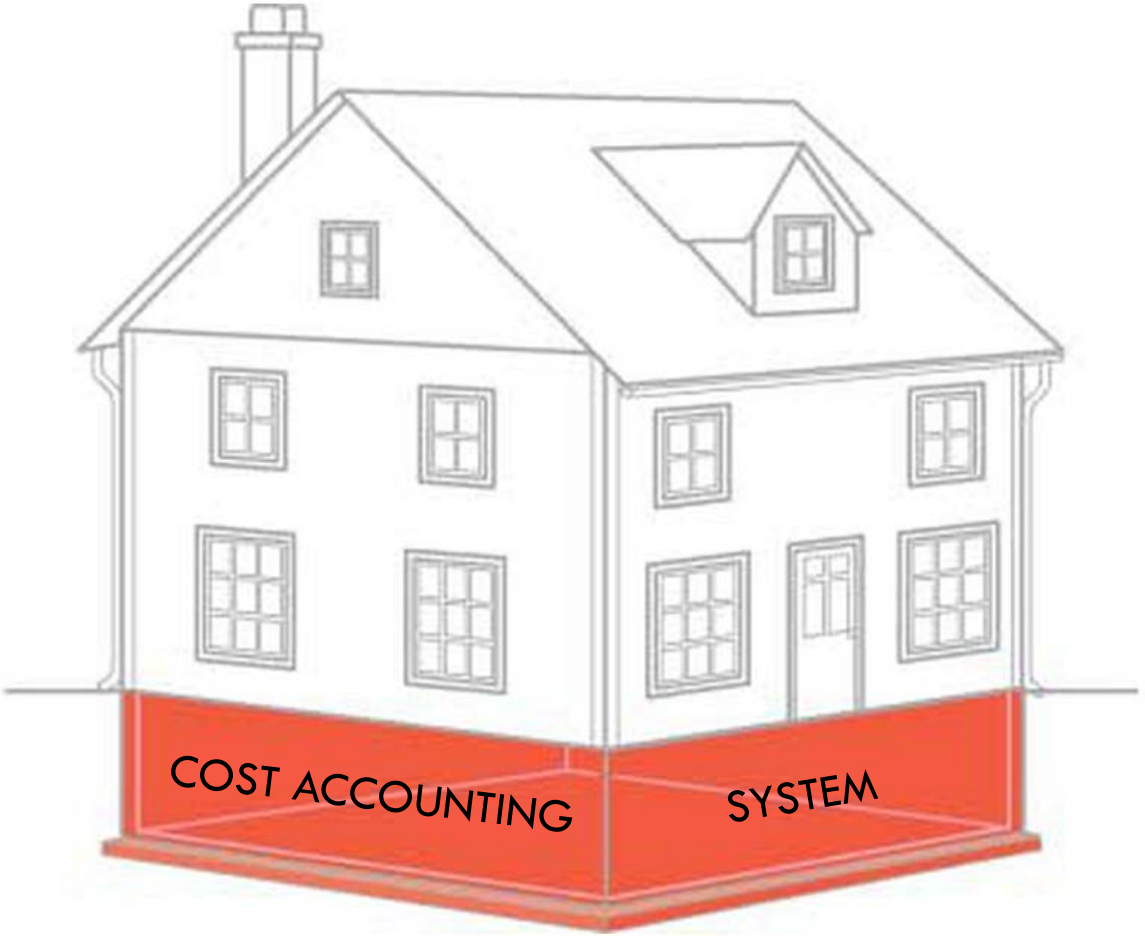
THE FOUNDATION IS THE COST ACCOUNTING SYSTEM



BOE's COST ACCOUNTING SYSTEM

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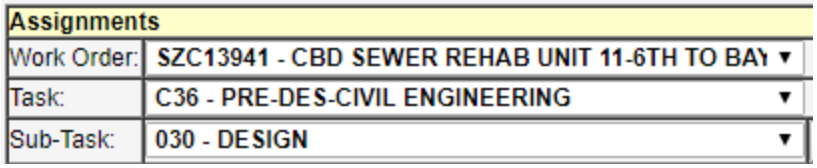
- Every project has one work order number. Some have more than one.
- Work orders are unique to the project.
- Three layers of definition
  - Phase identifier
  - Task codes
  - Subtask codes
  - Example: SZC13941 – C36 - 030



BOE's COST ACCOUNTING SYSTEM
Phase Identifier

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- Task A - Management and Admin
- Task C - Pre-Design
- Task D - Design
- Task E - Bid and Award
- Task F - Construction
- Task G - Post-Construction
- Task J - Services

COST REPORTING

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- Basic Requirements:
  - Reasonable level of detail
  - Personal responsibility for input data
  - Input should be automated
  - Different levels of detail needed for task leaders, PM's and management
  - System should provide info often and regularly

FINANCIAL MANAGEMENT SYSTEM(FMS)

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- Official Cost Accounting System for the City
- Costs entered by Office of Accounting
- Report formats are “accounting-like”
- Many types of reports are available - “canned” and ad-hoc
- FMS is a database maintained in the cloud.

PROGRAM REVENUE AND EXPENDITURE REPORTS

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- Revenue
  - Annual Revenue Budget (expected)
  - Billed
  - Realized to Date
- Expenditures
  - Annual Expenditure Budget
  - Revised Budget
  - Actuals to Date
  - Breakdown by Categories
    - Capital Projects
    - Emergency Projects
    - Engineering Services
    - Program Support Activities
  - Breakdown by Divisions/Groups

UNIFORM PROJECT REPORTING SYSTEM (UPRS)

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- The central database for BOE projects
- Project, budget, actuals, and schedule information
- Can generate many levels of reports
- Automatically downloads actuals from FMS
- KISS - “Keep it simple…”

EXECUTIVE DASHBOARD

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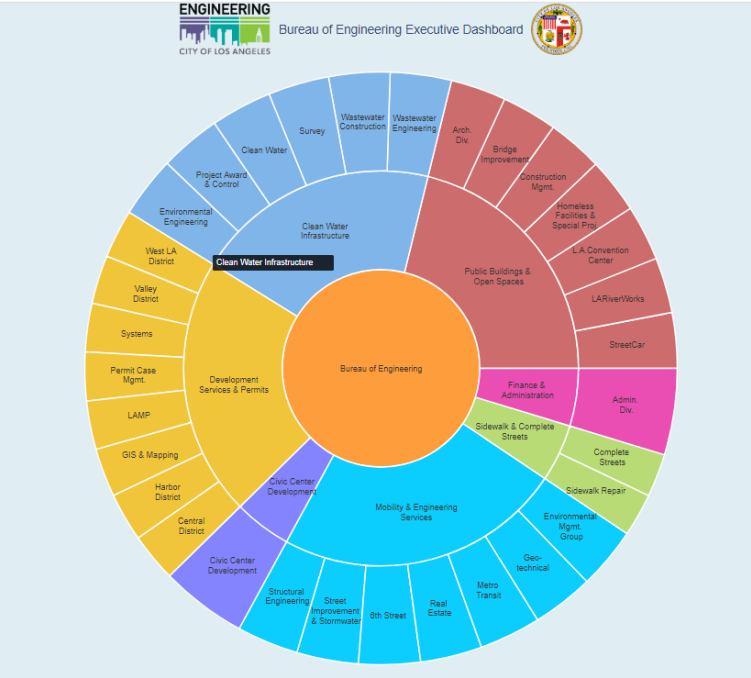
- Management Tool
- Available to City staff - https://eng.insidela.org/
- Data pulled from UPRS
- Update regularly, Check often



Project Management

Reports

- Executive Dashboard
- Master Schedules
- Projects Information Reports
- PSCS Reports
- UPRS Reports
- Envision Projects
- Envision Handbook

UNIFORM PROJECT REPORTING SYSTEM (UPRS)

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- Information here drives many other reports and tools
  - BOE Executive Dashboard
  - Program Master Schedules
  - Project info into GIS database.
  - Bureau's annual labor requests
  - Capital project lists and CIPs

PROGRAM MASTER SCHEDULES

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- All Capital Projects with activity within the next 3-year period
- Schedule - planned vs progress for each project
- Construction Cost - planned vs. actual expenditures
- Labor needs to deliver the projects

COMMON CAUSES FOR AN OVER-BUDGET PROJECT

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The Pre-Design Phase

- No alternatives assessment
- Limited alternatives assessment
- Poor estimates result in poor budgets
- Inadequate WBS leaves out costs
- No plan for "expected but as yet unidentified" problems
- Unrealistic optimism (time, budget, effort)
- Unrealistic appraisal of capability

COMMON CAUSES FOR AN OVER-BUDGET PROJECT

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The Design Phase

- Scope creep
- Poor work breakdown structure
- Poor tracking of planned vs actual costs
- Don't understand customer's requirements
- Unauthorized charging to project
- Inadequate QA/QC plan
- Failure to DESIGN TO BUDGET
- Don't understand the "100% design" package.

COMMON CAUSES FOR AN OVER-BUDGET PROJECT

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The Construction Phase

- Poor design - Quality was not Job #1
- Specs aren't clear - Clarity was not Job #2
- Issues transferred from design to CM.
- No control over owner initiated changes
- Failure to resolve disputes or negotiate change orders in a timely manner
- Adversarial vs partnering attitude

SOME THOUGHTS ON PARTNERING

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- Partnering is BOE's and BCA's approach to CM.
- It is our business plan based on years of experience.
- Resolving disputes is less costly than litigating them.
- It is the best approach to achieve the lowest total project cost.

COMMON CAUSES FOR AN OVER-BUDGET PROJECT

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The Post-Construction Phase

- Slow closeout
  - As-builts not completed
  - Issues not resolved, final CO's not issued.
  - Office Contract Compliance problems
  - No CPER (contractor performance evaluation report)
  - Lessons learned not finished
- Failure to close the work order

TOTAL PROJECT COST ESTIMATING

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- The PM is responsible.
- It's the PM's responsibility!!
- Who did you say? It's the PM!!
- I'm still not clear.

THE PM IS RESPONSIBLE !

TOTAL PROJECT COST ESTIMATING

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- Must include everything:
  - Construction
  - Right of way, buildout, permits
  - Contingencies, escalation, and allowances
  - Delivery costs
    - Planning and Pre-design
    - Design
    - Specialty services – environmental, geotech, structures, real estate, architecture, process, electrical, mechanical, I&C
    - Bid & Award
    - CM, inspection, and closeout costs.
    - Other Department costs
    - Consultants
  - Hopefully no litigation costs

LABOR COST TEMPLATES

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- Use PDM attachment as example, reference attachment 3.7-1

Budget Templates

BUDGET GUIDELINES FOR EMERGENCY SEWER REPAIRS

	Construction Cost
	0.0 - 250.0K
	% of construction cost - BOE targets
Design Phases	EMGY
Totals	0.00
Design Totals	0.00
Construction Phases	
Construction	3 months
Con Ad	7.50
CONSTRUCTION MANAGEMENT DIVISION - 48/42	3.50
GEOTECHNICAL SERVICES GROUP-46	1.00
Lead Division (PE) CM (**Template lead division**)	7.00
STRUCTURAL ENGINEERING DIVISION-54	0.50
SURVEY DIVISION 63	0.50
WW CONVEYANCE CONSTRUCTION DIV - 44	3.00
Totals	23.00
Post-Construction	3 months
Con Ad	1.50
Lead Division (PE) CM (**Template lead division**)	1.50
WW CONVEYANCE CONSTRUCTION DIV - 44	0.50
Totals	3.50
Construction Totals	26.50

Divisions marked as "Template lead division" only appear in the template. When hours are distributed in the schedule, these divisions are rolled up into the actual lead division for the project that uses this template.

LABOR COST References

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- CA Multi-Agency Benchmarking, https://eng.lacity.org/camb

- 2019 Report, Updated in 2019
  - 596 representative projects > $100K

– Design costs	25% of CV avg
– CM costs	20%
– Total Delivery	46%

USING CONTINGENCIES

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- Estimating contingency
- Construction budget contingency
- Additional Project contingency
- Program contingency

ESCALATION

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- Escalate to mid-point of construction phase
- A contractor bids assuming payments over the life of construction
- Typical to use 5% per year
- 10% per year has been used on occasion

USING ALLOWANCES

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Used for work items that are:

- Not biddable by contractor
- To provide equitable bidding by contractors
- Keep < 2 % +/- of CV

USING ALLOWANCES

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EXAMPLES

- Permits
- Offsite inspection
- Field office equipment
- Potholing
- Partnering
- Start Up

RESPONDING TO REQUESTS FOR ESTIMATES ON NEW PROJECTS

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- Use the official "PROJECT COST ESTIMATE SHEET" or equal
- Include a field investigation report along with the estimate.
- Each program may have a different procedure based on the source of the request and type of project.

RESPONDING TO REQUESTS FOR ESTIMATES ON NEW PROJECTS

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- The right way - lots of thought, understanding scope, and estimating
- The other way - "give me an estimate in one hour on _____ "

PROGRAM LABOR NEEDS

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- Covers both BOE employees and consultants working for us
- Total Labor Needs for the Program
  - capital projects (from UPRS)
  - engineering services
  - program support

PROGRAM LABOR NEEDS

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- From UPRS - Based on labor budgets for all projects in the program.
  - template values
  - or specific budgets
- Yields cost of labor and the number of person-days or FTE's

PROGRAM LABOR NEEDS

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- FTE stands for Full-Time Equivalent and is defined as 2080 hours of work
- 2080 hours is the estimate of chargeable hours if an employee works all year long

BOND PROGRAM – OVERSIGHT COMMITTEE REPORT

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- Special Format at request of Oversight Committees
- Trying to make uniform across all Bond Programs with Oversight Committees
- Doesn't measure against time and performance

“PEARLS OF WISDOM”

By Tim Haug, former Deputy City Engineer

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- Clear project scope,
- Communicate the scope,
- Estimate well,
- Temper the Engineer’s eternal optimism,
- Design quality is job #1,
- Design clarity is job #2,
- Design to your construction budget,
- Measure and track costs. Try to control them,
- Try to contain scope creep,
- Partner during construction.

"PEARLS OF WISDOM"

By Tim Haug, former Deputy City Engineer

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- Focus on total project cost efficiency.
- With a little luck you'll be within budget, on schedule, with a project that works.
- If not,
  - learn from the experience
  - prepare your "lessons learned" memo
  - move on
  - remember, despite your best efforts some projects will be "stinkers"
- Good luck to you all!