Asset Management Risk Planning and Project Prioritization

Bringing PacifiCorp to the Next Level in Asset Management

Presented at the
EEI TD&M Conference
in Charlotte, NC
April 20, 2004

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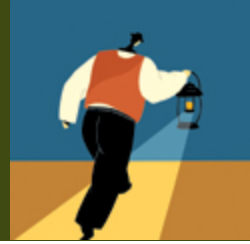
PacifiCorp is the USA-based subsidiary of Scottish Power

And is one of the West's largest and lowest-cost electric utilities



A little history and some basic statistics

1881 – Salt Lake City is 5th city in US with central station electricity

1910 - Pacific Power & Light in OR & WA

1912 - Utah Power & Light in UT & ID

1989 - PacifiCorp merger

1999 - Scottish Power merger

Headquarters: Portland, OR

Employees: 6,400

Territory: More than 135,000 square miles

Line-miles: Transmission: 15,000

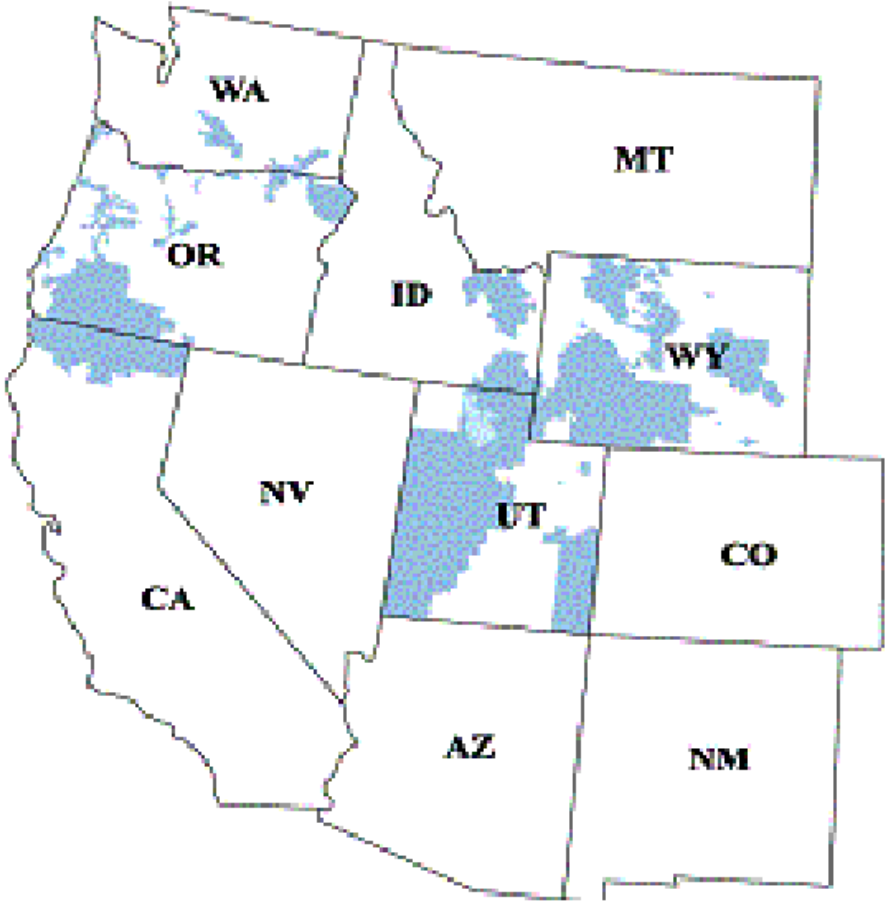
Overhead distribution: 44,000

Underground distribution: 12,000

Generation capacity: 8,300 megawatts

Customers:

Total	1,544,895
Utah	689,709
Oregon	510,254
Wyoming	122,493
Washington	120,094
Idaho	59,407
California	42,895



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T&D is a significant part of PacifiCorp's CAPEX

With a projection for declining T&D CAPEX in the next few years

Judi Johansen
President & CEO

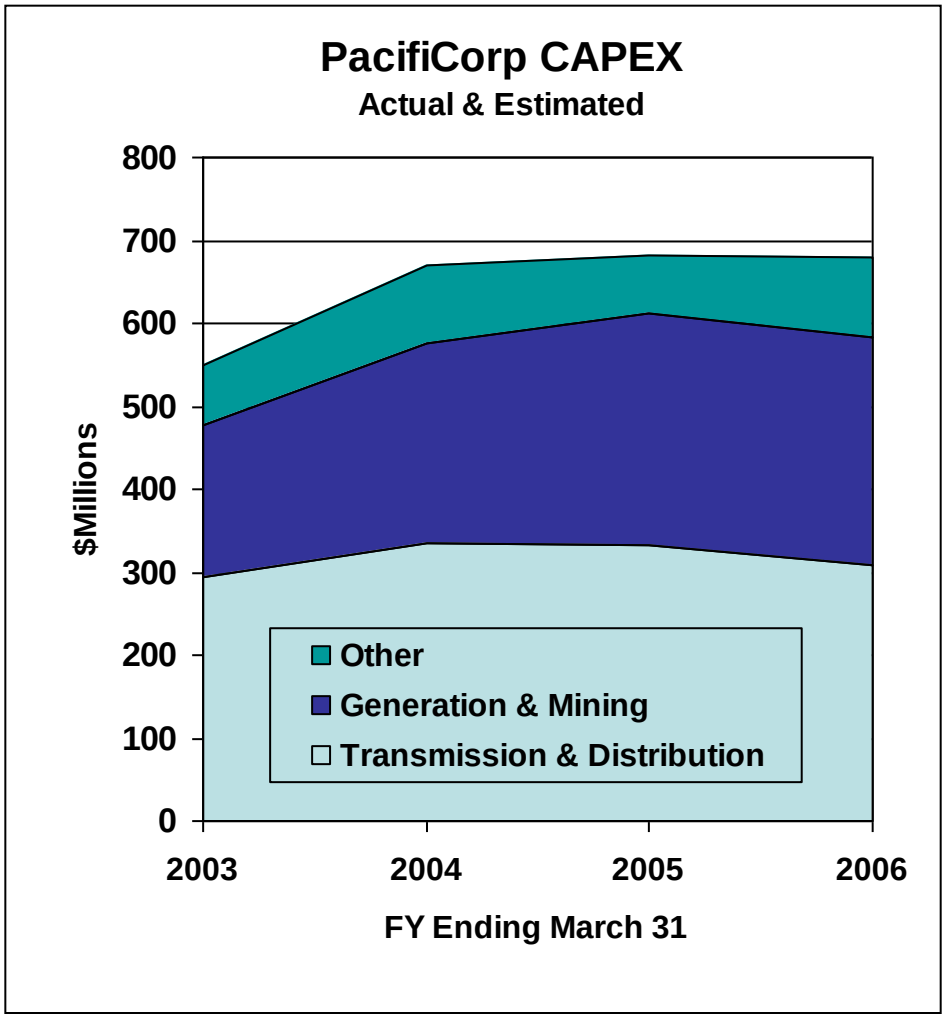
Matthew Wright
EVP Power Delivery

Darrell Gerrard
VP T&D Engineering
& Asset Management

Alec Burden (ret.)
MD Asset Management

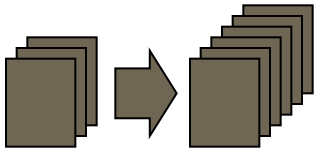
Tom Waters
Dir. Asset Planning

Tom Eyford
Risk Manager



Recall the context within which prioritization is done

Prioritization is only a part of asset management and risk planning

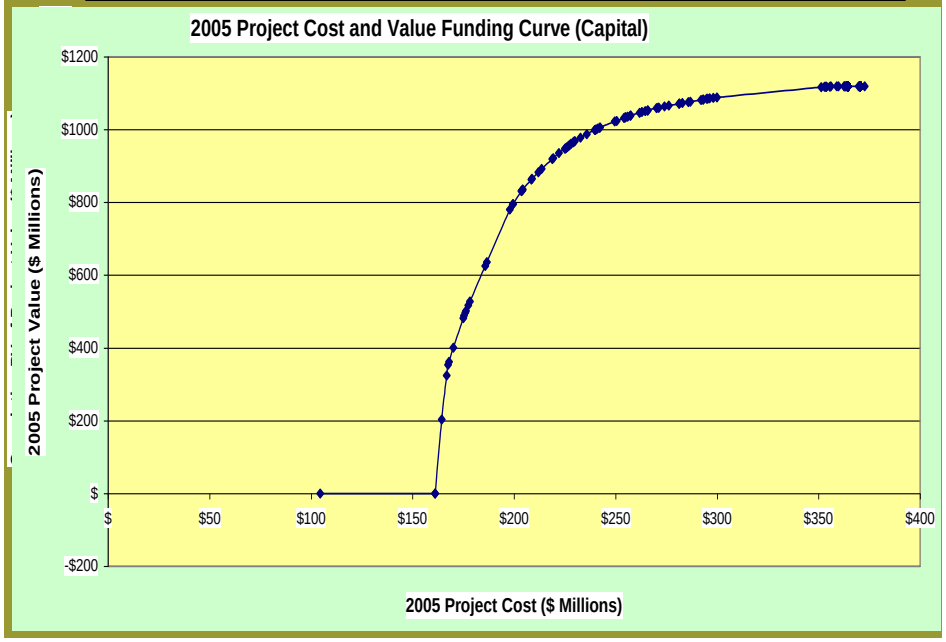


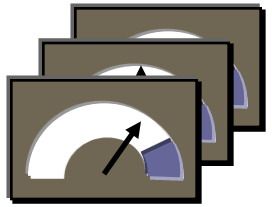
Option Development

Developing cost-effective alternatives for possible funding

- Additions
- Upgrades
- Replacement
- Maintenance
- Standards
- Systems

Funding Curve





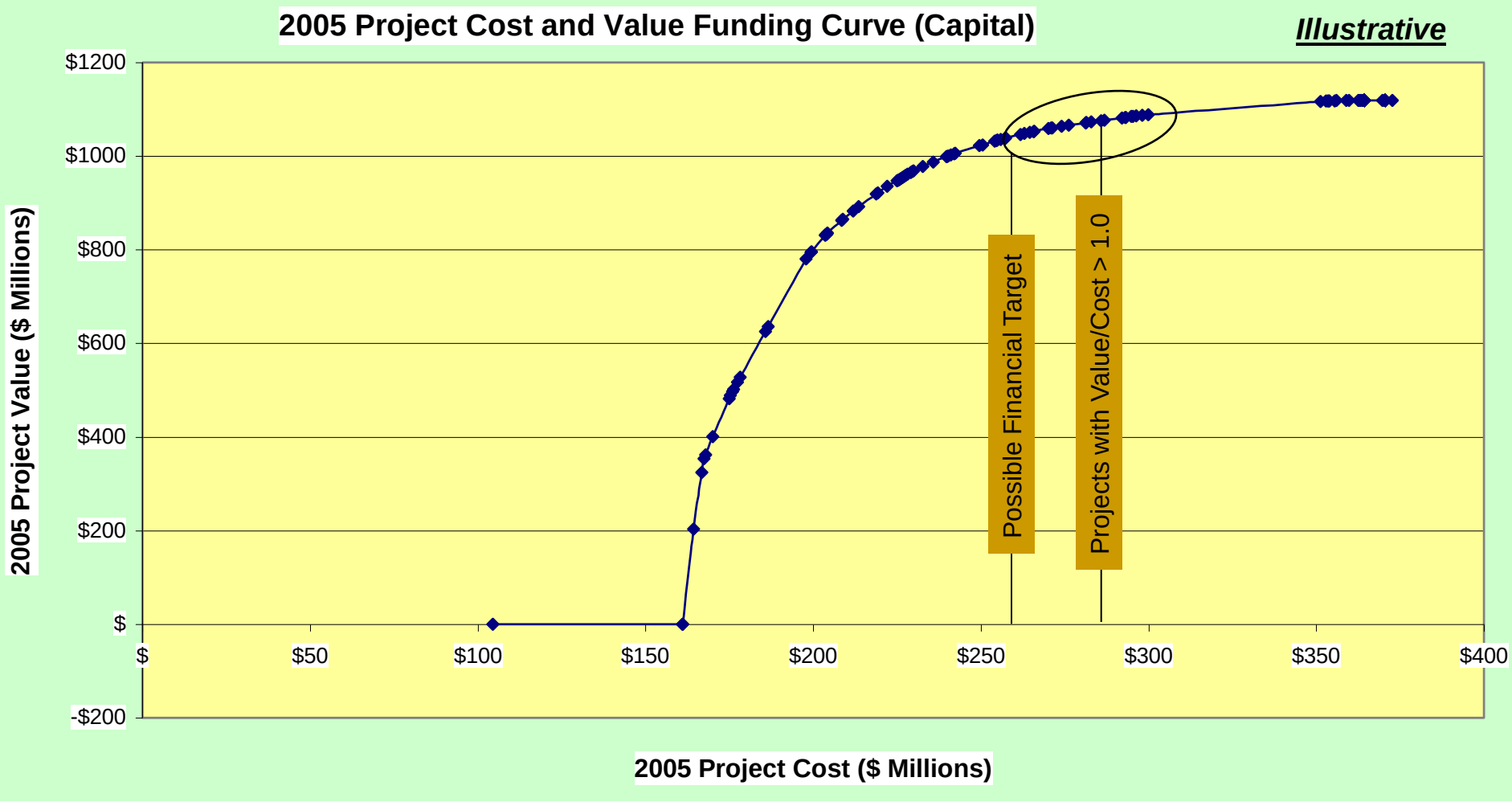
Results Monitoring

Measuring & managing the drivers of the funded projects and processes

- Benchmarking
- Unit costs
- Failure rates
- Event impacts
- Value added

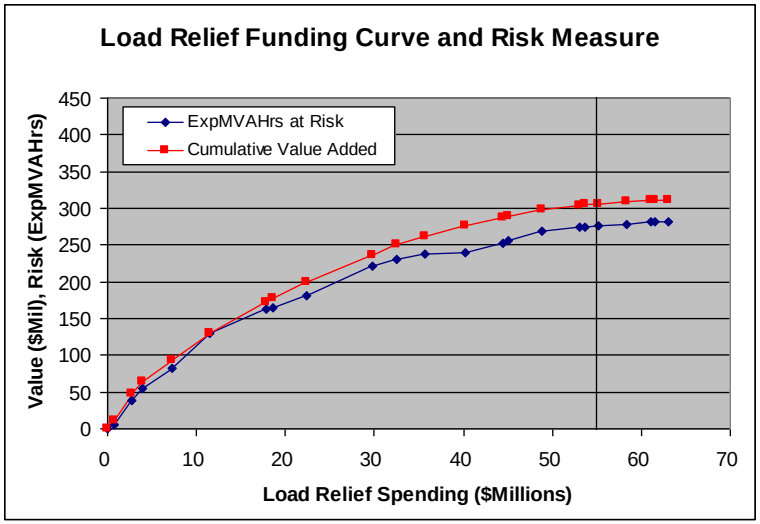
‘Must Do’ is limited at about half the budget

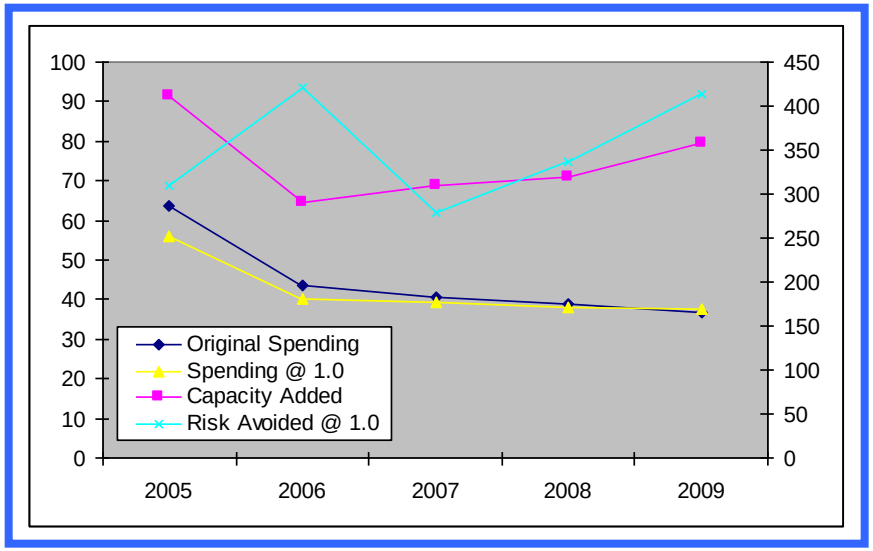
These categories need to be forecast well, and then fully funded

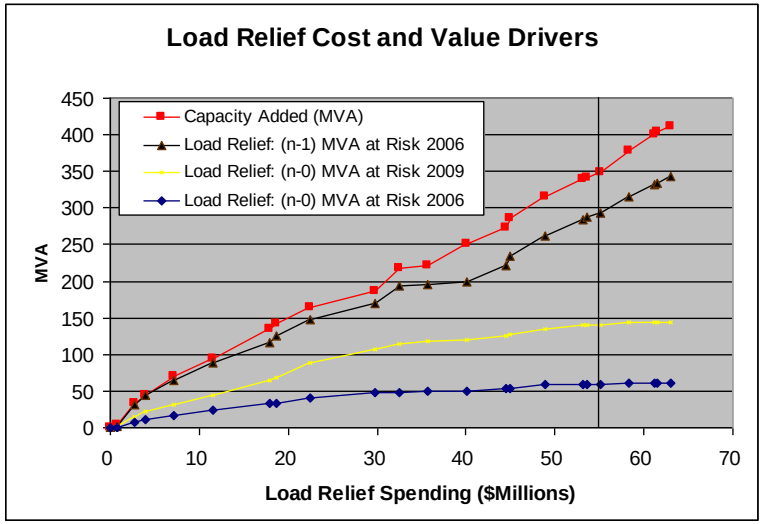


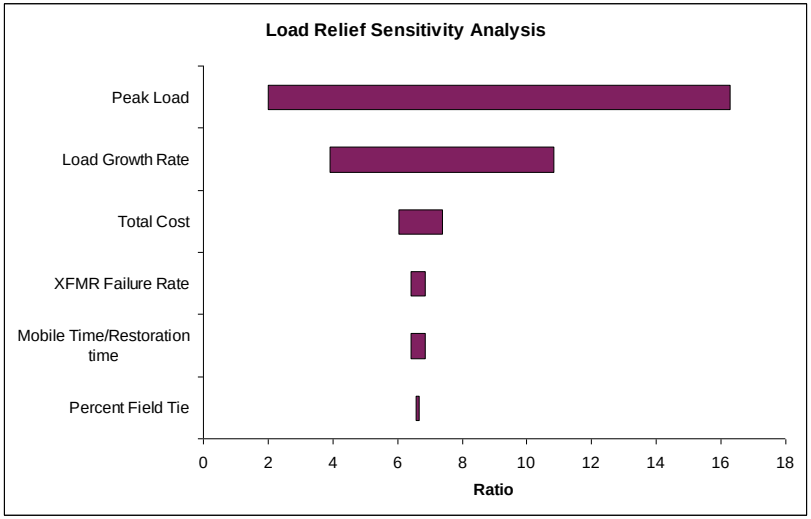
Load relief is a major part of the capital budget

Recommended funding reduces risk to acceptable levels









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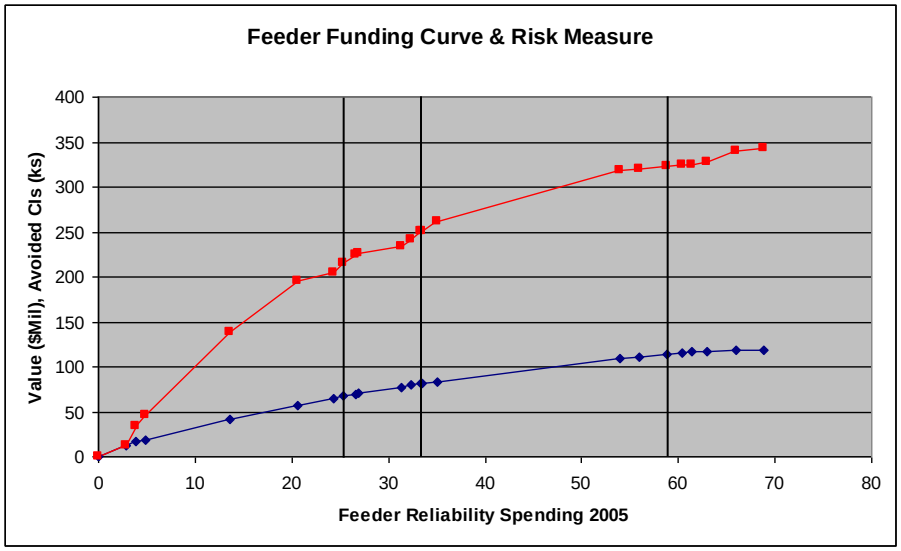
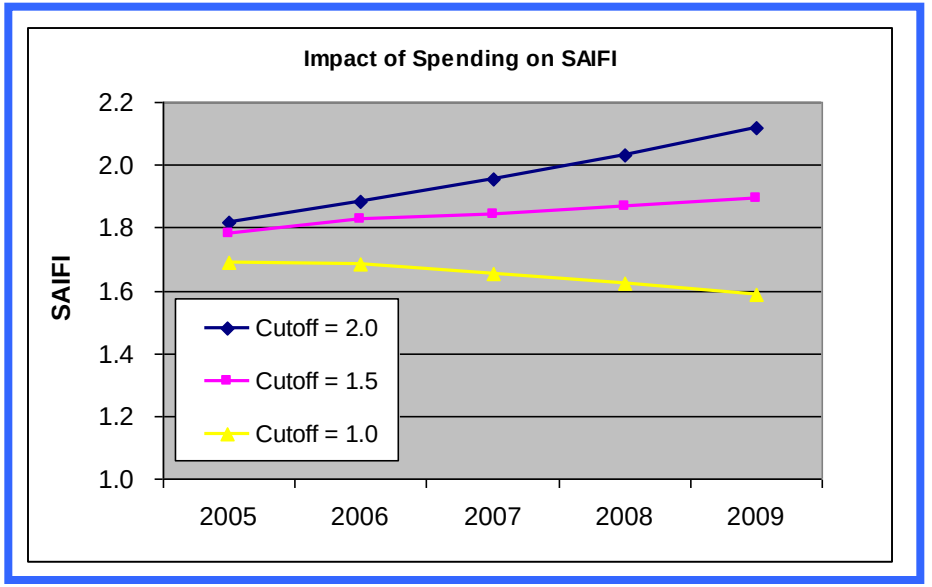
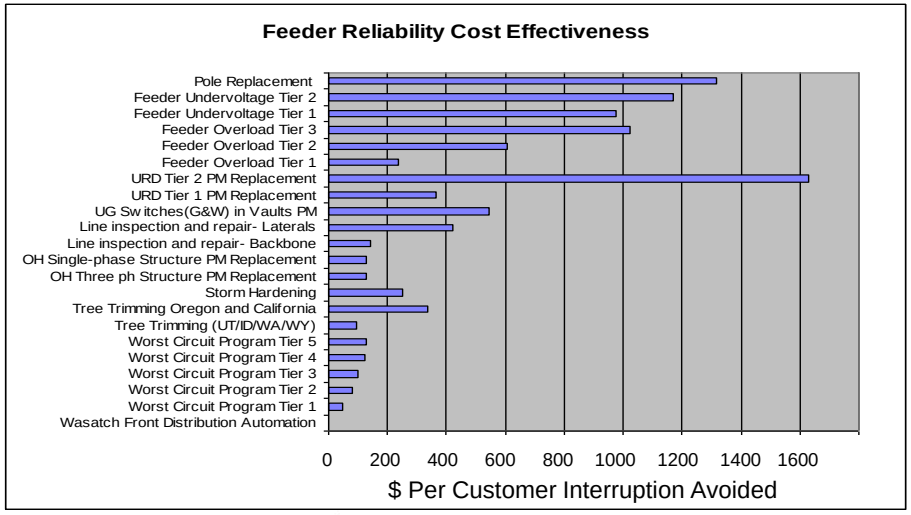
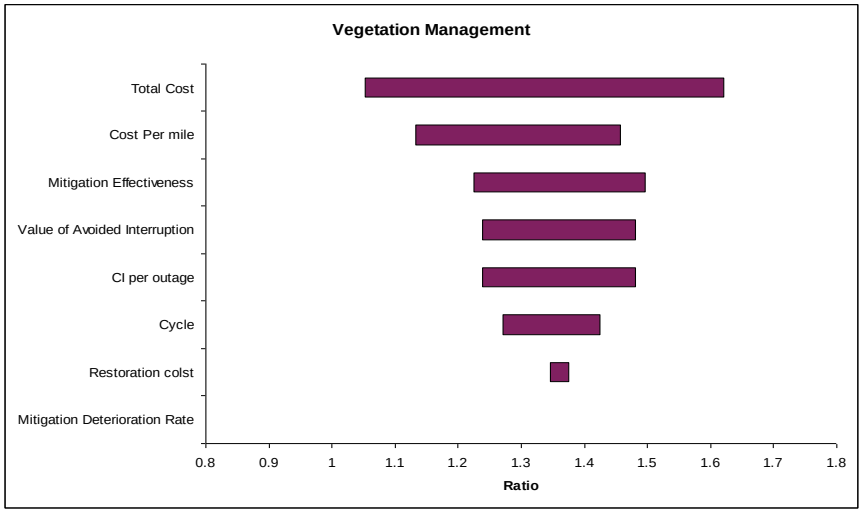
Feeder reliability has a direct impact on SAIDI-SAIFI

Recommended funding reduces risk to acceptable levels



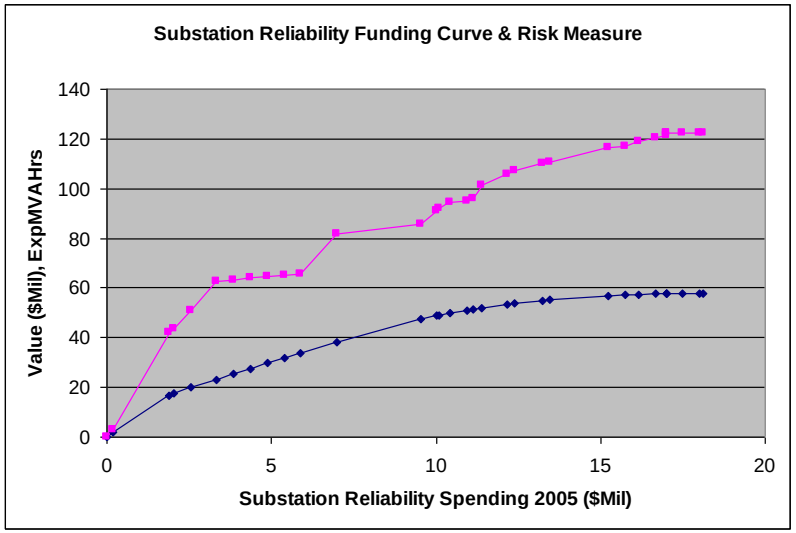


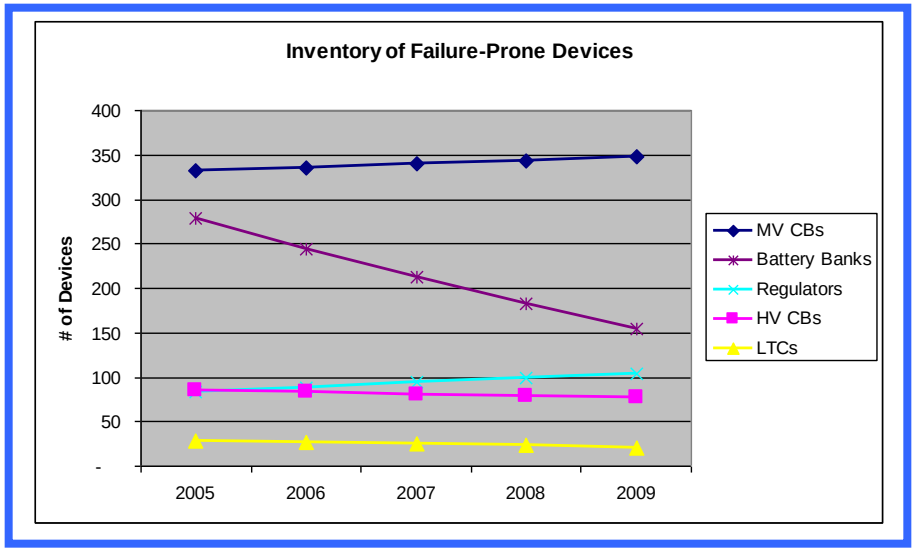


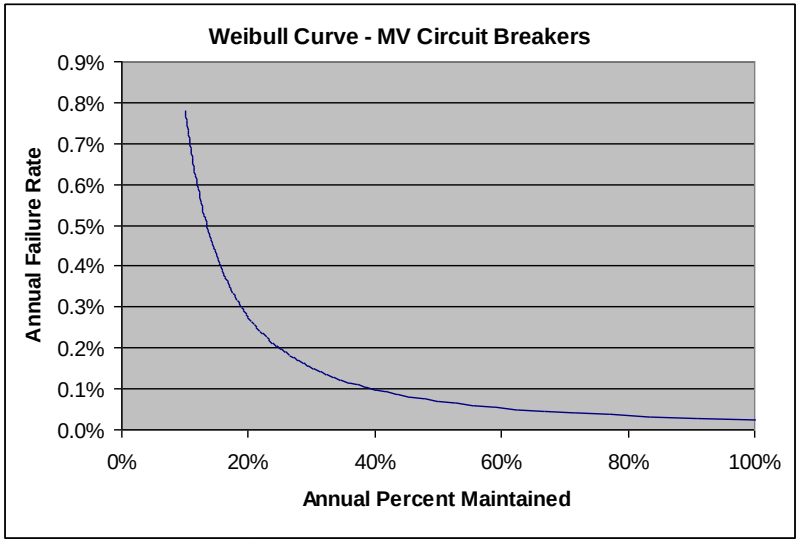


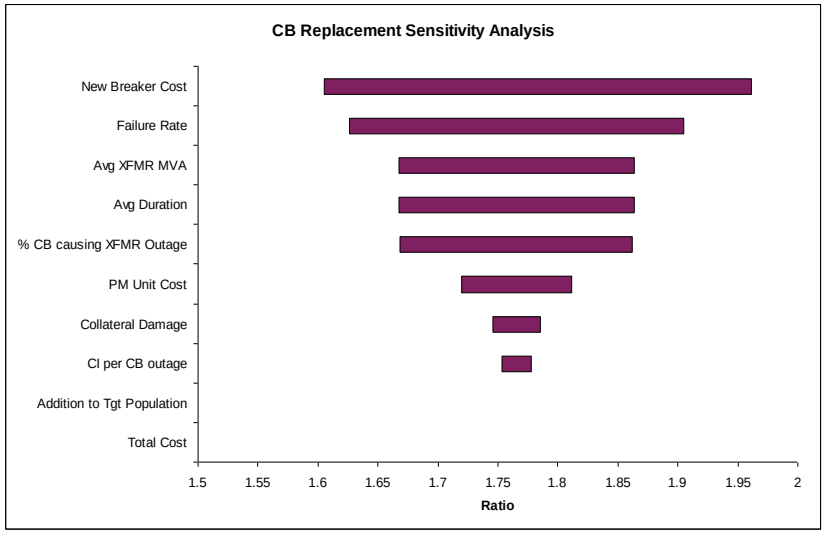
Substation reliability addresses selected assets

With programs to replace the most trouble-prone assets



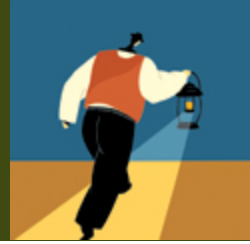






The process has brought some key insights

Which will allow PacifiCorp to save money and reduce risk



- **Optimal timing of load relief projects**
  - **Model shows that some should be deferred, some accelerated**
  - **Emphasizes the need for exploration of cost-effective alternatives**
- **Identifies critical data based on sensitivity analysis**
  - **Failure rates, condition of certain assets, load growth rates, unit costs**
- **Quantifies how reliability value can drive allocation**
  - **$25,000/MWH, $25/CI are good baselines for further refinement**
- **Causal relationships built in**
  - **Weibull curves and condition-state models address key questions on PM**
- **Good feedback for planners**
  - **Gives an early indication of project value versus cost**
- **Improved cost-effectiveness**
  - **'Sharper pencil' on URD, worst circuits, etc. from analysis of failure rates**

Next Steps

While initial estimates are satisfactory, more can be learned

- 10-year plan
- 2006 Plan and Budget
- Transmission grid
- Model and data refinements (continuous)