

Southeastern Conference on Pavement Management and Design

Changing PM To AM a 5 Phase Process

Jim Watson

NetProphet, Inc and The NTC Group

Issues That Must Be Faced

- Budgets are under unprecedented attack by State legislators.
- Current business processes are often seen operating as “Silos”, or “independent islands”
- Need to present a solid **Business Case** for fully funding Requirements.
- Need to leverage every budget dollar to produce maximum return. (Do more with less)
- Lack of integration means inaccurate data and reduced capability for central reporting and planning

Current Status

- Typically Maintenance, Repave, Structures, and Design Departments are organized as functional Islands.
- Budgets are distributed based on formula or history
- Each Department collects data only to accomplish its mission.
- Departments are in competition for finite funding
- GASB 34 has caused some changes and confusion
- Needs cannot be articulated in a manner to produce the needed funding

Recommended Approach

- Phase I
 - Business Process Flow Chart
- Phase II
 - Standardization of data inputs into various legacy management systems (CMMs, PM, Pontis, etc)
 - “Umbrella “ system to sit over other Department systems, extract and input data into Asset Management Module

Phase III

- Financial and Operational What-if Modeling
- Business Case for Optimized Budget

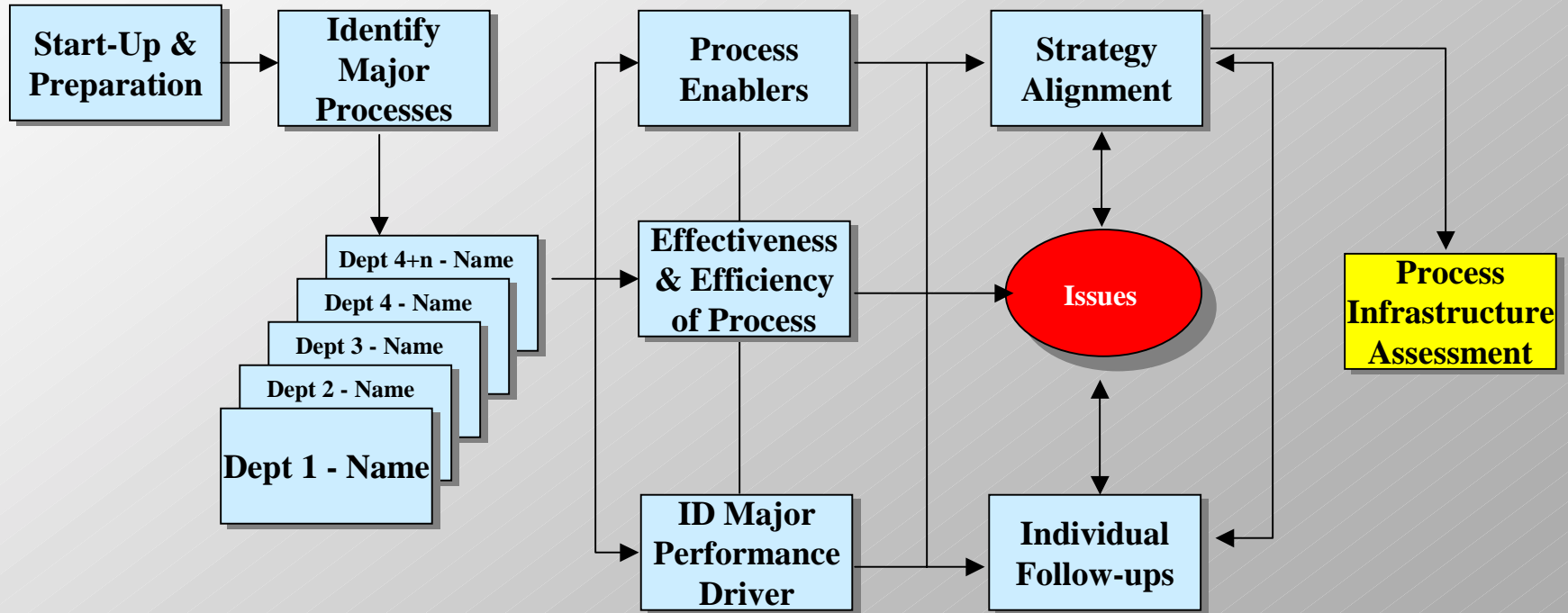
Phase IV

- Budget Implementation

Phase V

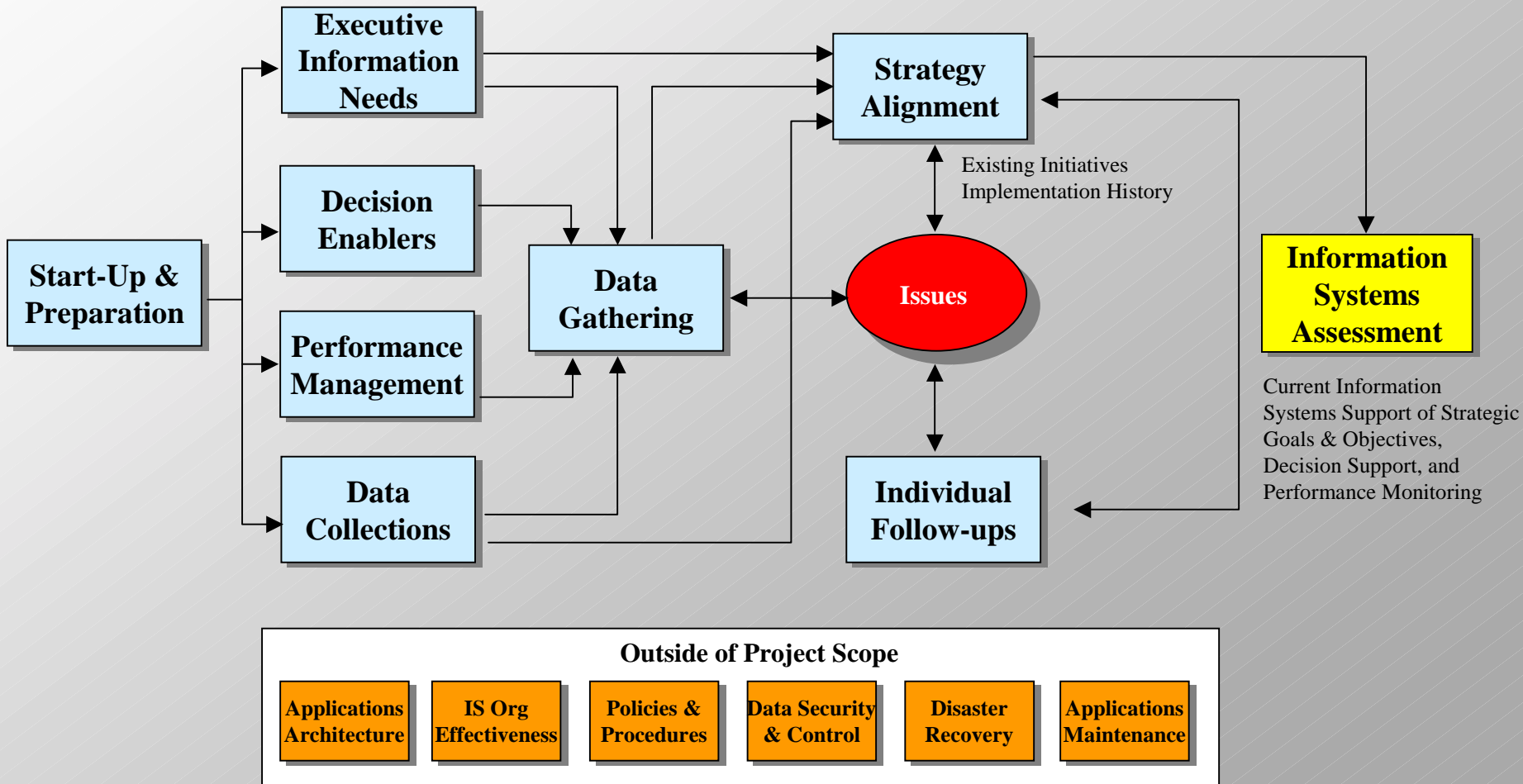
- Feed back to each MS through Asset Management module. Plus CPI

Business Process Infrastructure Assessment

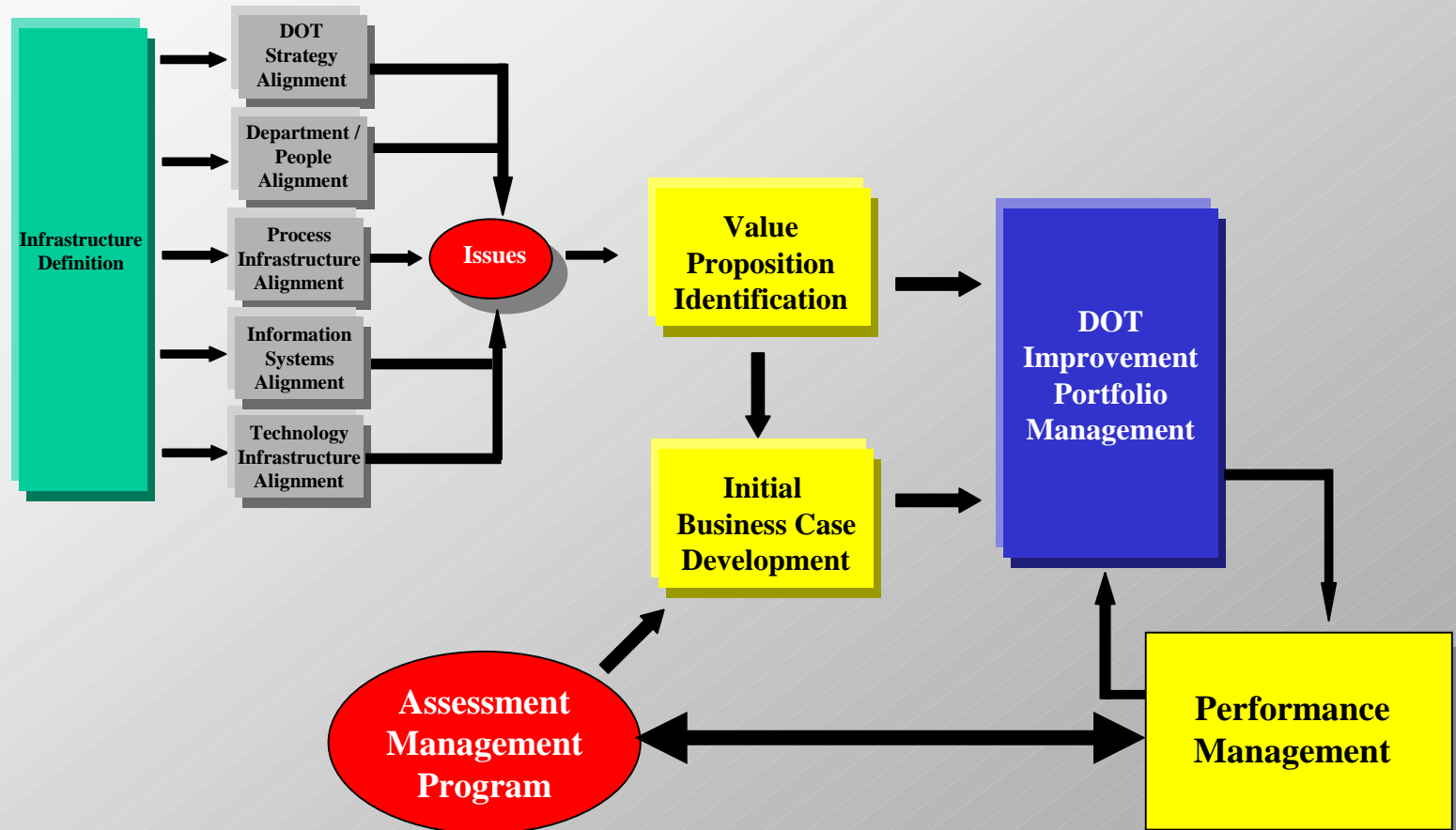


Phase I

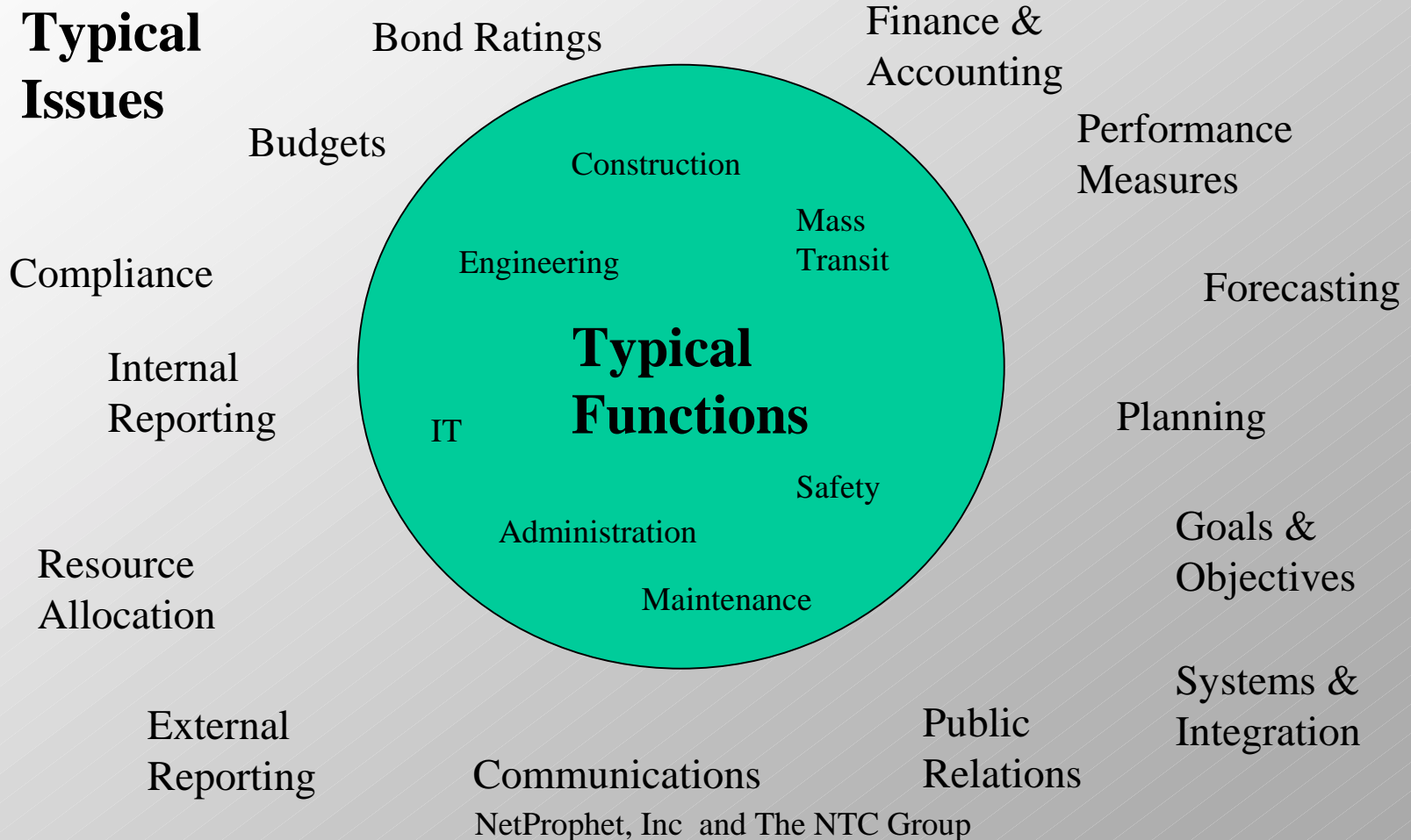
Information Systems Assessment



Strategic and Tactical Alignment



DOT Challenge – Alignment and Mission Focus



Benchmark Case

- The Pavement asset of an client represents an investment of over \$1.2 billion*
- Replacement cost of Management Unit



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- This asset is being depleted at a rate of over \$60 million per year*
 - * assumes average life of 20 years



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- With a strategic initiative to extend asset life, the potential savings in finance costs alone is over \$50 million * per year



* Cost of bonding @ 4.1%

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- *THE OPPORTUNITY*
 - For each year of additional life that investments in strategic repairs gains ...
 - Client realized \$110 million value added to its bottom line.



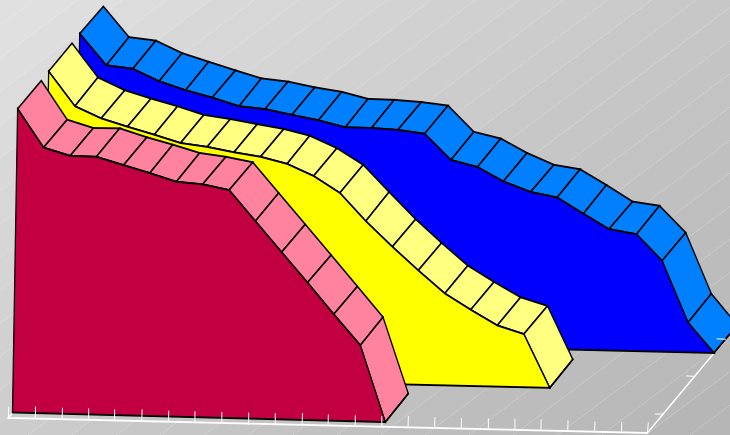
- Cost of Capital @ \$50,000,000
- Cost of Depletion @ \$60,000,000

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Program Foundation

NetProphet

is a expert knowledge system powered by a comprehensive database of actuarial tables and deterioration curves



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Condition Index (PCI)

- By the Numbers approach.
- 1000 represents a component with all of its design life remaining
- 0 represents Financial failure
- “Deduct Values” are assigned to a component’s score based on the density and severity of its observed defects

Transportation Asset

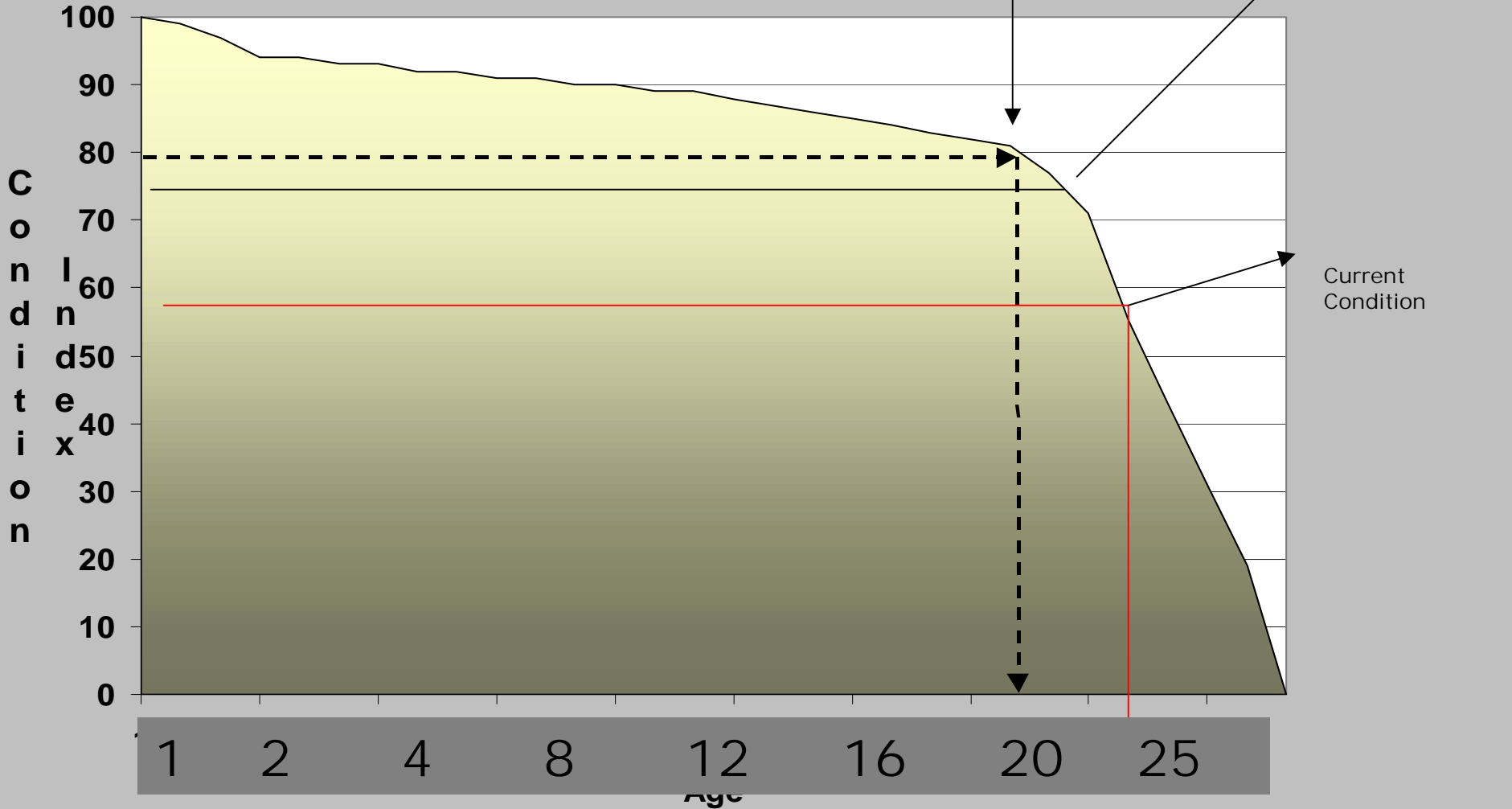
Component Condition Index

Building LT003		Facility Condition Index		510
Building LT002		Facility Condition Index		655
Highway Lt001		Asset Condition Index	795	0
Guard Rail	540	Signage	880	0
Drainage	800	Lighting	790	0
Landscaping	910	Rest Stops	810	0
Mechanical	650	Vistas	460	0
Pavement	760	Park And Ride	410	0
Bridge	850	Rails	810	0

Deterioration Curves

- A typical curve for a static exterior element (Such as a Paved Surface) can be described as an 80/20 curve
 - Eighty percent of the deterioration occurs within the last twenty percent of its life span

Generic 80/20 Curve

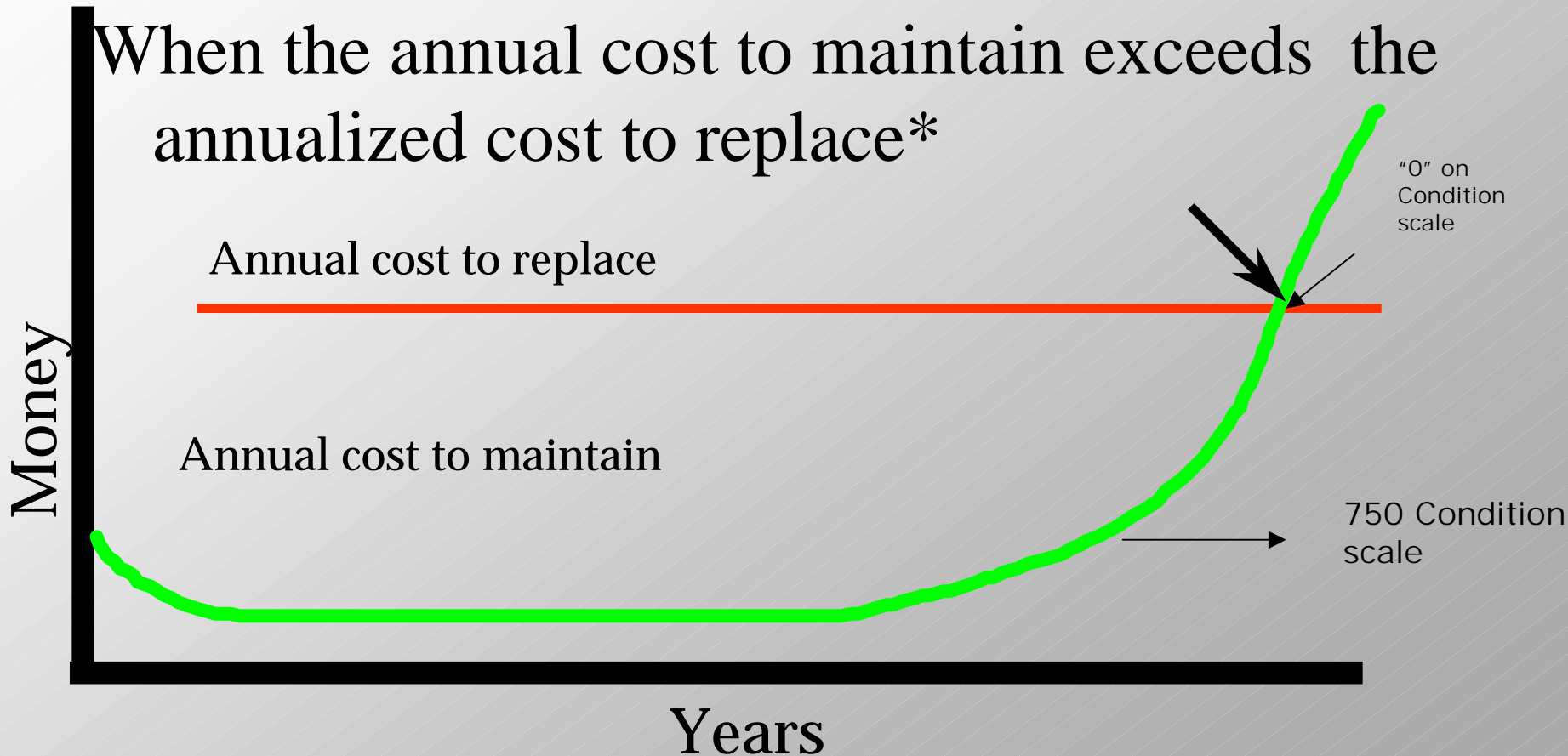


The Meaning of Life

by James Watson
United States

Financial Life (Remaining Life (RL))

Financial Failure

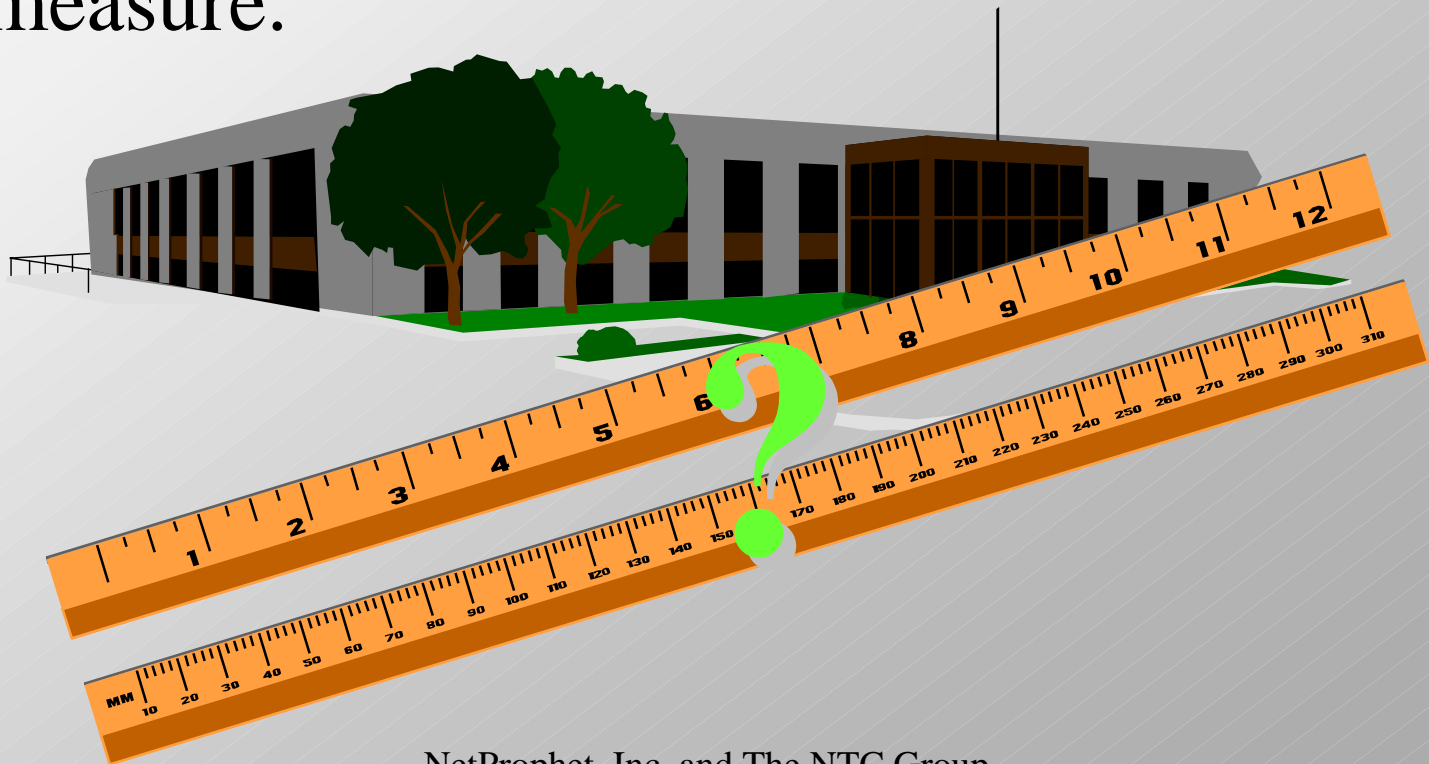


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***Annualized Replacement cost includes the cost of capital**

A New Metric Required

- “You can’t manage what you can’t measure.”



NetProphet

Integrated Highway Management System

The breakthrough Integration Tool.

*Modeling the impact on system
deterioration(Cost) of several funding
options*

Strategically Distributed Fully-Funded Budget

	2000	2001	2002	2003	2004	TOTALS
Capital	850,697	310,128	53,88	31,640	75,211	1,321,557
Patch L,H,S	10,223	8,371	11,371	18,927	5,280	54,172
Perm. Repairs	172,998	39,371	23,124	37,882	4,129	277,504
Total	1,033,918	357,870	88,376	88,449	84,620	1,653,233

PCI 767 771 763 758 759 763

Optimized Funding	\$1,653,232
Investment in Repairs	\$331,676
Value Generated	\$1,435,413
Return on Investment	423%
Value of ROI	\$1,103,737

Constrained Budget

	2000	2001	2002	2003	2004	TOTALS	
Capital	284,381	870,702	45,395	284,171	67,500	1,552,149	TOTALS
Patch, L,H,S	37,418	30,433	23,959	43,533	33,762	169,105	1,321,557
Perm Repairs	135,330	44,657	73,086	64,765	27,369	345,207	54,172
Total	457,129	945,792	142,440	392,469	128,631	2,067,461	277,504
	Total	1,033,918	357,870	88,376	88,449	84,620	1,653,233

Pci=763

PCI=640

Total Investment based on Optimized Funding

Total Investment in Repairs

Value of life Extension Generated

Return on Investment

Value of ROI

\$1,653,232

\$331,676

\$1,435,413

423%

\$1,103,737

\$2,067,461

\$514,312

\$1,198,358

133%

\$684,046

Penalty Cost of Under-Funding

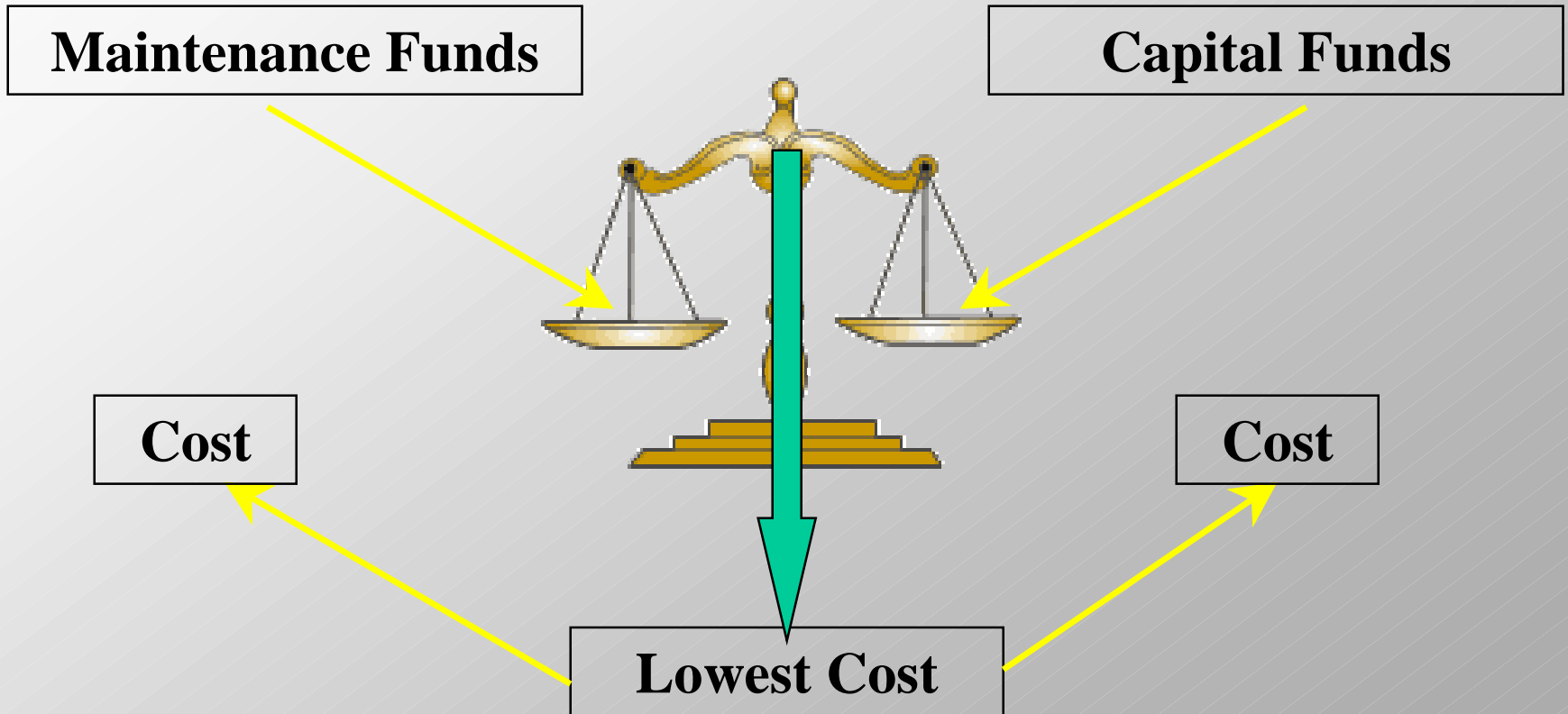
- Benefit of Deferral: Cost to rent \$600,000 for 1 year-- or **\$24,000** savings
- Increased Cost: **\$420,000** additional over five years
- Penalty Cost (Increased cost of Maintenance)
 $\$420,000 - \$24,000 = \underline{\$396,000}$ (*NPV = \$350,000*)

Other Penalties to Consider

- Accelerated structural damage
(Loss of Leveling course, Loss of Base.)
- Damage to Autos
- Safety Issues
- Increased Drive Time
- Loss of Tourist Dollars

The Need

Measured Budget



GASB 34 AM Adds Value

- Asset Management for Financial Returns
- Cost avoidance initiatives
- Provable Stewardship Metric
- Lets Public know the penalty cost of underfunding requirements

The Process

- Stage I – Process Flow Study
- Stage II – Integration of Legacy Data
- Stage III- Predictive Modeling
- Stage IV- Strategic Planning
- Stage V- Plan Implementation and CPI

The Holistic Perspective

