



Bridge Asset Management or IT'S THE MONEY DUMMY

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Asset Management

Asset management is a strategic, risk-based approach to cost effectively and efficiently manage the physical assets of your transportation system.



Asset Management

Creation of a sustainable asset management program Requires:

Data: (collected, stored, analyzed)

Inventory, condition of inventory

Performance measures: Simple, easy to understand, lead to a state of “good repair”

Money

The Money

- Where is it?
- Who controls it?
- How do you get it?
- How do you keep it?
- How do you get more?

DATA IS DOLLARS

\$1,000,000 per year for Bridge Washing?



Floor beam 6 after cleaning





How did we get the money

- Pilot program washing bridges ongoing.
- Permitting agencies willing to allow washing because of data.
- Skagit river showed effects of not cleaning steel truss bridges
- Pilot program provided cost data. Already had data on state steel truss bridges
- FHWA sent letter to bridge saying trusses not clean enough for fracture critical insp.

Where Does the State Fuel Tax Go?

49.4¢ PER-GALLON • STATE FUEL TAX •



* Of the 9.5 cents, 8.5 cents is used by the state for highway projects, 1 cent goes to cities and counties for street and road improvements.

** The 11.9-cent gas tax increase will be phased in over the next two years. The first 7.0-cent increase occurred on August 1, 2015, followed by a 4.9-cent gas tax increase on July 1, 2016.

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Connecting Washington

- \$16.2B total revenues over 16 years
 - \$4.762B bond proceeds
- 11.9¢ gas tax increase
 - 7¢ August 2015
 - 4.9¢ July 2016
 - 6th highest in the nation to 4th highest
- \$8.759B state and local
- \$1.225B highway preservation*
- \$100M highway maintenance*
- \$300M fish passage
- \$52M facilities
- \$50M traffic operations



- Connecting Washington recognizes the importance of preserving our aging transportation infrastructure and helps make a dent in our preservation backlog
- \$1.2 Billion on state highway preservation. The new revenue investment **reduces the rate** at which the preservation **backlog will grow**, improves bridges and contributes funds to maintenance and traffic operations.

Practical Solutions

- The legislature recognized and incorporated anticipated savings from practical design into a fund for preservation projects and additional capital projects in the outer years of the package.

Bridge Asset Performance

- Percent of bridges in fair or better. Goal 90% or better, current 91.2%
- # of bridges load posted 126
- Steel bridge painting backlog – 414 million
- 10 year forecast paint backlog- \$707 mil
- Decks due or past due – \$115.6 mil
- Projected 10yr deck backlog - \$727 mil
- SD NHS state bridges goal under 10%, current 9.3%

The intelligent ask.

- Have the data ready.
- Know what the data says.
- Know what you need.
- Know what you can do.
- Ask for the money.
- Keep asking.

Stretching the Money

Practical solutions

- Preservation funding to maintenance
- 17 – 19 Biennium \$6 million of P funds to M + one time \$1M of M \$s for equip for crews
- 2 new bridge crews,
- Focus initially on catching up on repairs, move to a PM plan

Strategic Preservation

- Pavement
- Bridges

Pavements

- HMA
 - P-1 or M-2: Life extension, crack seal, dig outs, rut fills. (Region maintenance crews work with materials engineer to extend pavement life)
 - Overlays, chip seal, slurry seal
- Concrete
 - P-1, M-2, Crack seal, patch, rut fill, panel replacement
 - P-1, dowel bar retrofit and grind, panel replacement, precast or pour in place.

Bridges

- PM: (M-2 or P-2) Clean, seal concrete, seal joints, treat timber, waterproof, remove LWD, scour protection, spot and area paint, EQ retrofits, etc.
- Funding to maintenance 17-19 Eastside and NW bridge crews added. 1/2 M ea. OR & SW regions.
- Repairs: (M-2 or P-2)
- P-2 Rehab/Replace

Bridge Maintenance Funding

	Bridge 15-17	Br Funding	Bridge	fund
Region	Funding	percent	15-17 fixed only	percent
NW	\$ 15,668,296	55%	\$ 6,170,641	40%
NC	\$ 679,028	2%	\$ 679,082	4%
OL	\$ 7,578,570	27%	\$ 3,903,425	26%
SW	\$ 1,412,810	5%	\$ 1,412,810	9%
SC	\$ 1,952,343	7%	\$ 1,857,378	12%
EA	\$ 1,233,940	4%	\$ 1,233,940	8%
Total	\$ 28,524,987	100%	\$ 15,257,276	100%

Priority-1 Structural Repair Backlog Increase

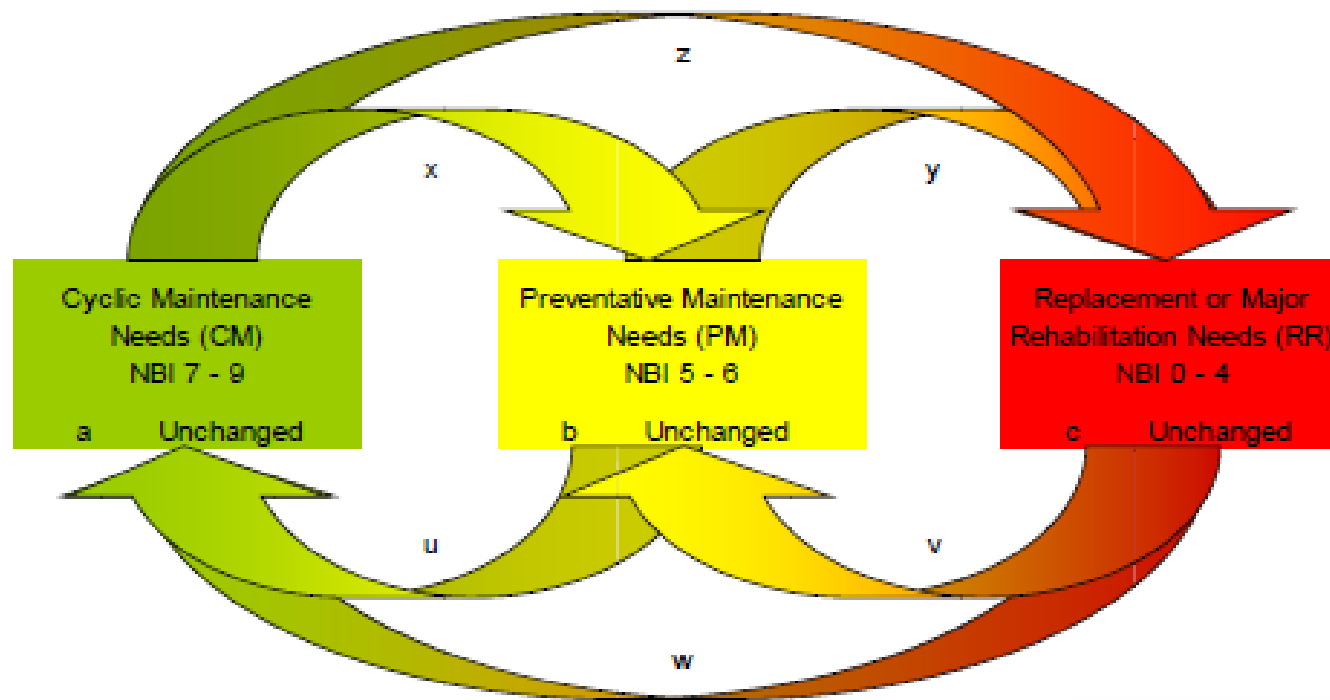
Structural Repairs from Bridge Repair List										
Change from July 2010 to July 2016										
Region	P-1 Structural repairs								Increase 2010 to 2016 of region repairs	Percent increase 2010 to 2016 of P-1 Repairs
Year date	Jul-10	%	Jul-11	%	Jul-15	%	Jul-16	%		
NW	60	29%	70	37%	434	57%	393	44%	333	555%
NC	10	5%	7	4%	50	7%	14	2%	4	40%
OL	59	28%	39	21%	45	6%	77	9%	18	31%
SW	20	10%	13	7%	31	4%	123	14%	103	515%
SC	41	20%	34	18%	142	19%	196	22%	155	378%
EA	19	9%	25	13%	58	8%	97	11%	78	411%
Total	209	100%	188	100%	760	100%	900	100%	691	331%

Bridge Maintenance Repairs Remaining

	Northwest	North Central	Olympic	Southwest	South Central	Eastern	State Totals
Structural repairs from bridge repair list left 6/30/16	393	14	77	123	196	97	900
Structural Repair estimate remaining repairs	\$ 4,131,000	\$ 195,000	\$ 1,863,200	\$ 1,075,000	\$ 2,490,000	\$ 1,230,500	\$ 10,984,700
Deck Repairs Left 6/30/16 from repair list	102	13	17	26	69	16	243
Deck Repair estimate from repair list thru 6/30/16	\$ 630,000	\$ 135,000	\$ 271,000	\$ 325,100	\$ 587,000	\$ 104,000	\$ 2,052,100
PM repairs left from br repair list as of 6/30/16	87	2	8	21	11	8	137
PM estimate from Br repair list as of 6/30/16	\$ 622,000	\$ 10,000	\$ 53,000	\$ 117,300	\$ 195,000	\$ 63,500	\$ 1,060,800
Number of clearance sign postings needed	86	9	8	0	0	12	115
Vertical Clearance sign needed posting cost	\$ 355,000	\$ 39,000	\$ 24,000			\$ 110,000	\$ 528,000
Total Actual P-1 Repairs left 6/30/16	668	38	110	170	276	133	1395
P-1 Repair estimates All P-1s	\$ 5,738,000	\$ 379,000	\$ 2,211,200	\$ 1,517,400	\$ 3,272,000	\$ 1,508,000	\$ 14,625,600
Below are estimated repairs based on averages							
Emergent repairs/bien/ estimated number	131	49	78	38	24	64	384
Emergent repairs/bien estimated cost	\$ 1,377,000	\$ 682,500	\$ 1,887,397	\$ 332,114	\$ 304,898	\$ 811,876	\$ 5,395,785
New Repairs to end of bien(Average new annually)	100	10	60	52	70	40	332
New repairs cost (Average estimated cost per repair)	\$ 1,051,145	\$ 139,286	\$ 1,451,844	\$ 454,472	\$ 889,286	\$ 507,423	\$ 2,965,869
Region Repair # total = actual plus est new thru June-2017	899	97	248	260	370	237	2111
Total Accumulated Maint Repair cost estimate 15-17	\$ 8,166,145	\$ 1,200,786	\$ 5,550,441	\$ 2,303,986	\$ 4,466,184	\$ 2,827,299	\$ 22,987,254
Bridge Maintenance funding remaining 6/30/16- less movables and tunnels.	\$ 2,052,675	\$ 282,319	\$ 1,128,734	\$ 969,679	\$ 635,501	\$ 716,359	\$ 5,785,267
Repairs beyond Maintenance that need to go to contract as of 6/30/2016. *	37	9	12	21	9	11	99

Preservation Cycle

Bridge Condition Diagram



General Targets:

$v \geq y$ $u \geq x$

$u+v+w \geq x+y+z$

Strategic Bridge Preservation Pilots

- 167/32 E, Joint Replacement
- TNB Travelers -Practical solution
- 113/5 Beaver Creek Deck

167/32 E, Steel Plate Joints

- Project scheduled for 2021, est \$907,000
- Steel plates were loose and fracturing now. (Liability Issue)
- NW region similar joint on I-5 made headlines(I-5 shutdown).
- Requested \$250,000 in Preservation funds to do in summer 2016.
- Completed work for \$226,000.

167/32E Joint replacement P2 funds



TNB Lower Travelers

- Project estimate to build 3 - \$12.5 M
- Needed, a paint platform.
- Travelers are expensive to build and maintain, and have a limited load capacity.
- Cost to purchase removable platform \$400,000. Save \$12.1 M.

Beaver Creek 113/5





Asset Management

Pilot the asset management elements

Identify champions in each area

Communicate: maps showing needs,
condition based, by legislative district

Show savings of actions

Request funding to meet goals



Practical Design Is For the Long Term

- Bridges constructed of easy to maintain materials.
 - Elastomeric bearings
 - Concrete
- Bridges designed with easy to maintain details.
 - Drainage off the bridge
 - No or limited joints
 - Use simple joints that can be maintained
 - Eliminate piers in the water
 - Urban design to discourage homeless condos
 - Rails that are not valuable when metal prices rise.
 - Details that discourage bird nesting
 - Eliminate large flat surfaces attractive to urban artists
 - Standard components that do not require keeping a large inventory of parts
 - Bridges with sufficient clearance to prevent over height load hits
- Eliminate or at least minimize skew angles in bridges
- Design with protective measures where corrosive salts and/or studs are used during the winter

Treat concrete w/ waterproofing agents





Construction

- Built as designed
- Discuss changes with designer of record
- Notify design of construction problems with the design
- Materials meet specifications
- Work is complete
- Site is cleaned
- Contractor damages repaired
- As built plans are completed



Asset Management

There is never enough money to do it all.
Set Priorities, ADT, critical routes,
Orphans
Small dollar contracts



Soldier pile wall with timber lagging

Estimated life of lagging 20 years. Wall is 19 years old.



sign bridges?

QUESTIONS?

