

ASSET MANAGEMENT: NDDOT STYLE



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Asset Management Language

- Asset Class = each type of asset
 - Pavement preservation
 - Bridge preservation
 - Equipment
 - Signs
 - Etc.



- Cross-Asset = analysis between/among asset classes
 - E.g. compare pavement preservation to signs



Asset Management Language

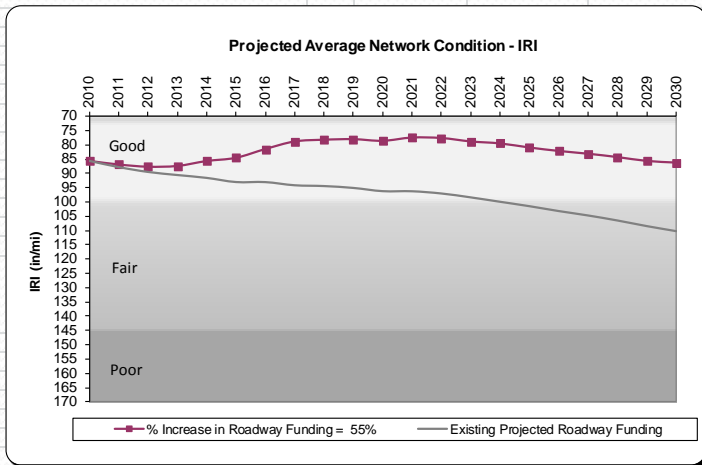
- Acronyms:
 - AASHTO = American Assoc. of State Highway & Transportation Officials
 - BMS = Bridge preservation Management System
 - HPCS = Highway Performance Classification System
 - FHWA = Federal Highway Administration
(United States of America)
 - LOS = Level of Service
 - MMS = Maintenance Management System
 - NDDOT = North Dakota Department of Transportation
 - P/AM = Planning/Asset Management Division (NDDOT)
 - PMS = Pavement preservation Management System
 - STIP = Statewide Transportation Improvement Program
 - TAM = Transportation Asset Management
 - TAMP = Transportation Asset Management Plan

Asset Management Language

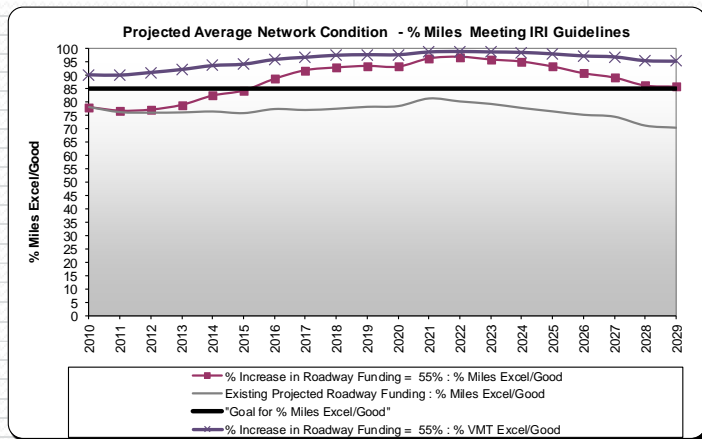
- Tradeoff Analysis
 - Like a “slider” moving \$’s from one asset class to another.
 - Shows estimated outcome of investment decisions.
- Optimization Analysis
 - A logic-driven computation recommending the “best” investment regimen for or between asset classes.
 - Typically, based on benefit-cost analysis.

Asset Management in General

ROADWAY FUNDING SCENARIO



% Increase in Roadway Funding = 55%
 % Decrease in Roadway Funding = 0%



Year	Existing Projected Roadway Funding	Increased or Decreased Roadway Funding	Avg Network IRI	% Miles Excel/Good	% VMT Excel/Good
2010	\$ 193,410,000	\$ 266,785,500	85.63	78.08	90.17
2011	\$ 145,310,000	\$ 225,230,500	86.90	76.74	90.06
2012	\$ 146,970,000	\$ 227,803,500	87.68	77.13	91.05
2013	\$ 155,150,000	\$ 240,482,500	87.42	78.90	92.16
2014	\$ 161,360,000	\$ 250,108,000	85.69	82.41	93.64
2015	\$ 166,200,000	\$ 257,610,000	84.56	84.27	94.16
2016	\$ 171,180,000	\$ 265,329,000	81.49	88.67	95.92
2017	\$ 176,320,000	\$ 273,296,000	78.83	91.91	96.73
2018	\$ 181,610,000	\$ 281,495,500	78.24	92.93	97.51
2019	\$ 187,060,000	\$ 289,943,000	78.04	93.52	97.71
2020	\$ 192,670,000	\$ 298,638,500	78.61	93.23	97.70
2021	\$ 198,450,000	\$ 307,597,500	77.47	96.32	98.73
2022	\$ 204,400,000	\$ 316,820,000	77.64	96.94	98.91
2023	\$ 210,530,000	\$ 326,321,500	78.83	95.92	98.74
2024	\$ 216,850,000	\$ 336,117,500	79.53	95.13	98.57
2025	\$ 223,360,000	\$ 346,208,000	80.96	93.28	98.01
2026	\$ 230,060,000	\$ 356,593,000	82.16	90.77	97.24
2027	\$ 236,960,000	\$ 367,288,000	83.14	89.12	96.88
2028	\$ 244,070,000	\$ 378,308,500	84.31	86.13	95.48
2029	\$ 251,390,000	\$ 389,654,500	85.65	85.67	95.29
2030	\$ 258,930,000	\$ 401,341,500	86.24	84.52	95.43

*Based on dTIMS analysis with 7% inflation and 3%/yr increase. (rural network, 2009 base data).

**Max 100% increase, max 75% decrease.

*Yr 2010 includes Stimulus Funding

IRI ranges	
Excellent	<=60
Good	61-99
Fair	100-145
Poor	>145

2010 includes 60 mill stimulus

Total 2010-2014= (State O.A. - \$10,000 seals - \$5,000 bridges - \$2,500 T.E. - 10% safety, capacity, & misc.) + 15% state mat

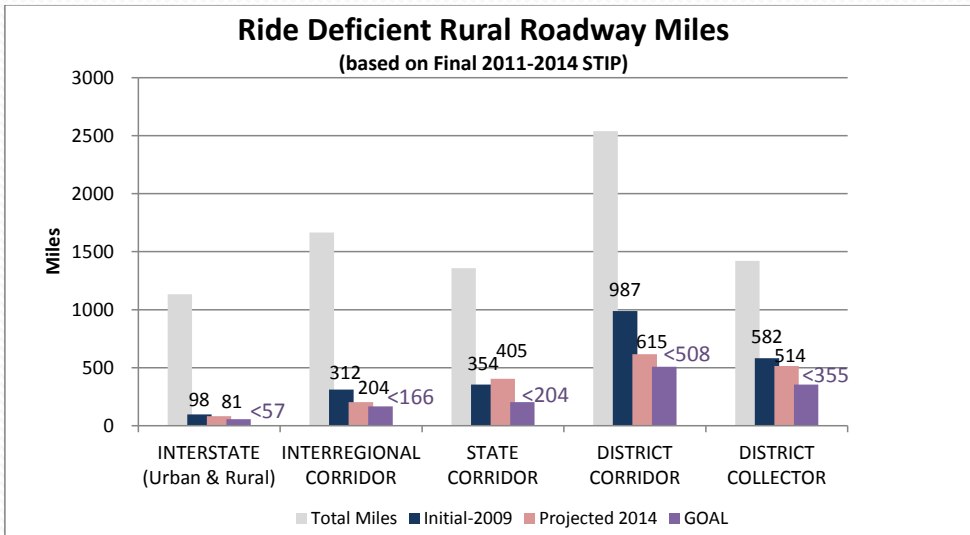
Total 2015 = Total 2014 * 1.03

Asset Management in General

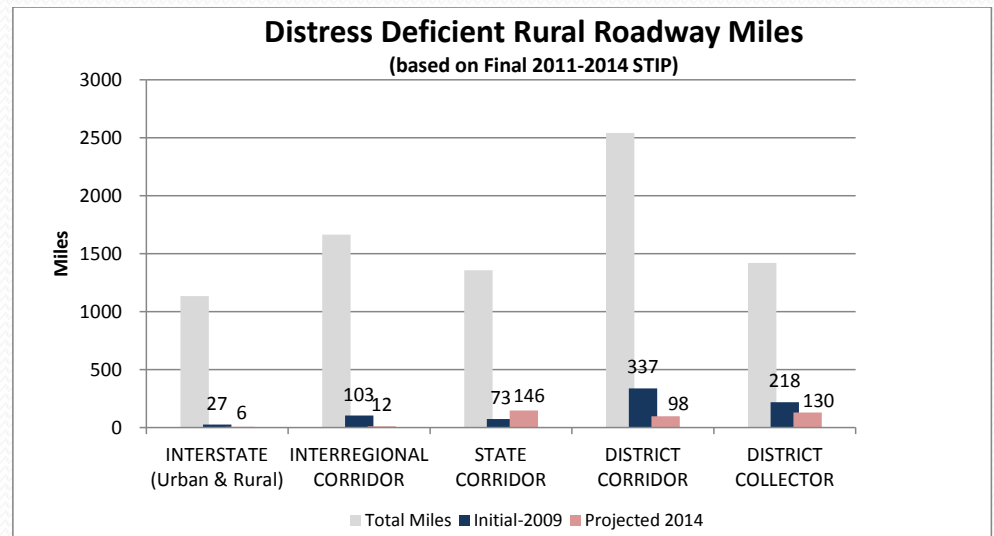
- NDDOT uses
 - Tradeoff for cross-asset information
 - Typically, optimization within asset classes
- Two ways to use TAM
 - Strategic-level tool
 - System-wide analysis
 - E.g. “the average condition is predicted to be...”
 - Tactical-level tool
 - Project and operational elements are recommended
 - E.g. “the recommended optimum series of projects to do is...”

Asset Management in General

Strategic Level



System-wide analysis



Asset Management in General

Tactical Level

Hwy	Dir	From Description	To Description	District	dTIMS Suggested Treatment	Year	Length	Committed Treatment	Com Year	Treatment from Priority System	Year
81	N	RP: 175 + 0.2914 N EDGE ARDOCH	RP: 181 + 0.2458 MINTO	6	Minor Asphalt	2014	6.0027		---	TLO	2014
17	E	RP: 82.122 + 0 JCT 1 E	RP: 96 + 0.973 ADAMS	6	PM Asphalt	2015	14.8148	Chip Seal	2012	Chip Seal	2012
17	E	RP: 118.119 + 0 N JCT 18 E	RP: 127.738 + 0 HILL AVE-GRAFTON(US81)	6	PM Asphalt	2016	9.6151		---	TLO	2015
81	N	RP: 169 + 0.619 LEVANT	RP: 175 + 0.2914 N EDGE ARDOCH	6	PM Asphalt	2016	5.6676		---	TLO	2017
81	N	RP: 192 + 0.4135 NORTH URBAN LIMITS	RP: 196 + 0 RPT 196.000	6	PM Asphalt	2016	3.5814		---	TLO	2016
17	E	RP: 106.314 + 0 JCT 32 E	RP: 111 + 0.31 PARK RIVER	6	PM Asphalt	2017	4.9956		---	TLO	2016
17	E	RP: 112 + 0.063 MUNICIPAL 11	RP: 112 + 0.848 PARK RIVER E	6	Minor Asphalt	2017	0.785		---	TLO	2016
32	N	RP: 139 + 0.712 1 MI S OF JCT 15	RP: 140.714 + 0 JCT 15 N	6	PM Asphalt	2017	1		---	None	
35	N	RP: 0 + 0.401 MICHIGAN N	RP: 12 + 0.183 CO LINE N	6	PM Asphalt	2017	11.7745		---	None	
81	N	RP: 202.271 + 0.621 TRUCK INSPECT	RP: 204.273 + 0.18 N JCT 66 ST THOMAS	6	PM Asphalt	2017	1.561		---	TLO	2016
81	N	RP: 204.273 + 0.18 N JCT 66 ST THOMAS	RP: 218.53 + 0 JCT 5 HAMILTON	6	PM Asphalt	2017	14.0779	Slurry Seal	2011	None	

Asset Management Principles

TAM is a
way of thinking
not a
piece of software



Asset Management Principles

- Provides information to decision makers...
does **not** make decisions
- Fundamentally, TAM is a:
 - Goal-Oriented,
 - Data-Driven
 - Decision-Making Process



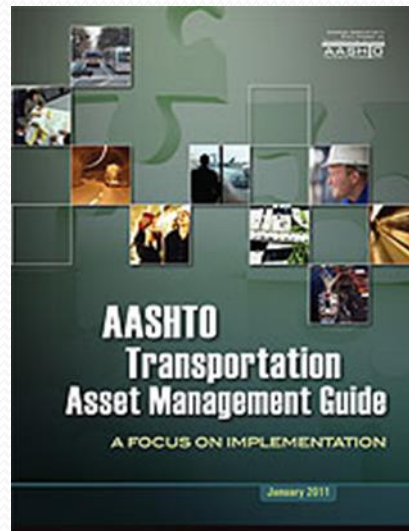
History of TAM in NDDOT

- Formal performance reporting & TAM for ~10 yrs.
- Progress made in some areas (not in others); in common:
 - Provided information
 - e.g. during STIP approval, showed predicted HPCS report.
 - Asked for feedback on outputs & processes.
 - Made simplifying assumptions
 - e.g. straight line deterioration curves
 - System-level forecasting vs. segment-level processes.
 - Talked about system-level performance measures



History of TAM in NDDOT

- Jan. 2011 – Planning/Asset Mgmt. Division formed
 - No TAM experience at practitioner level
- Stood up AASHTO TAM Guide Study Group (08/2012)
 - Maintenance, Bridge, FHWA, Programming, and P/AM (11 people)



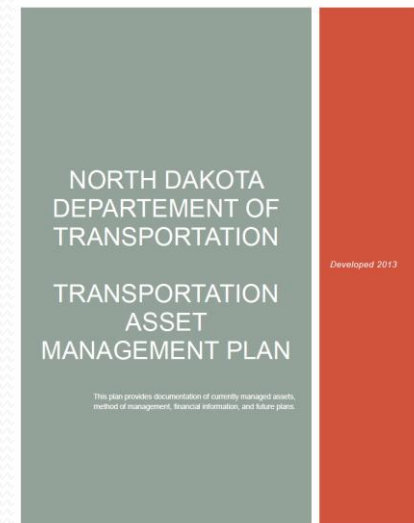
Planning Process Flow

Continuous Improvement



History of TAM in NDDOT

- Wrote our first Draft TAMP
 - Based on self assessment & gap analysis outlined in TAM Guide Vol. II
 - Mostly documents current processes
 - Details improvement plan (implementation plan)
 - Process plan, not roadway project list



Purpose of TAM for NDDOT

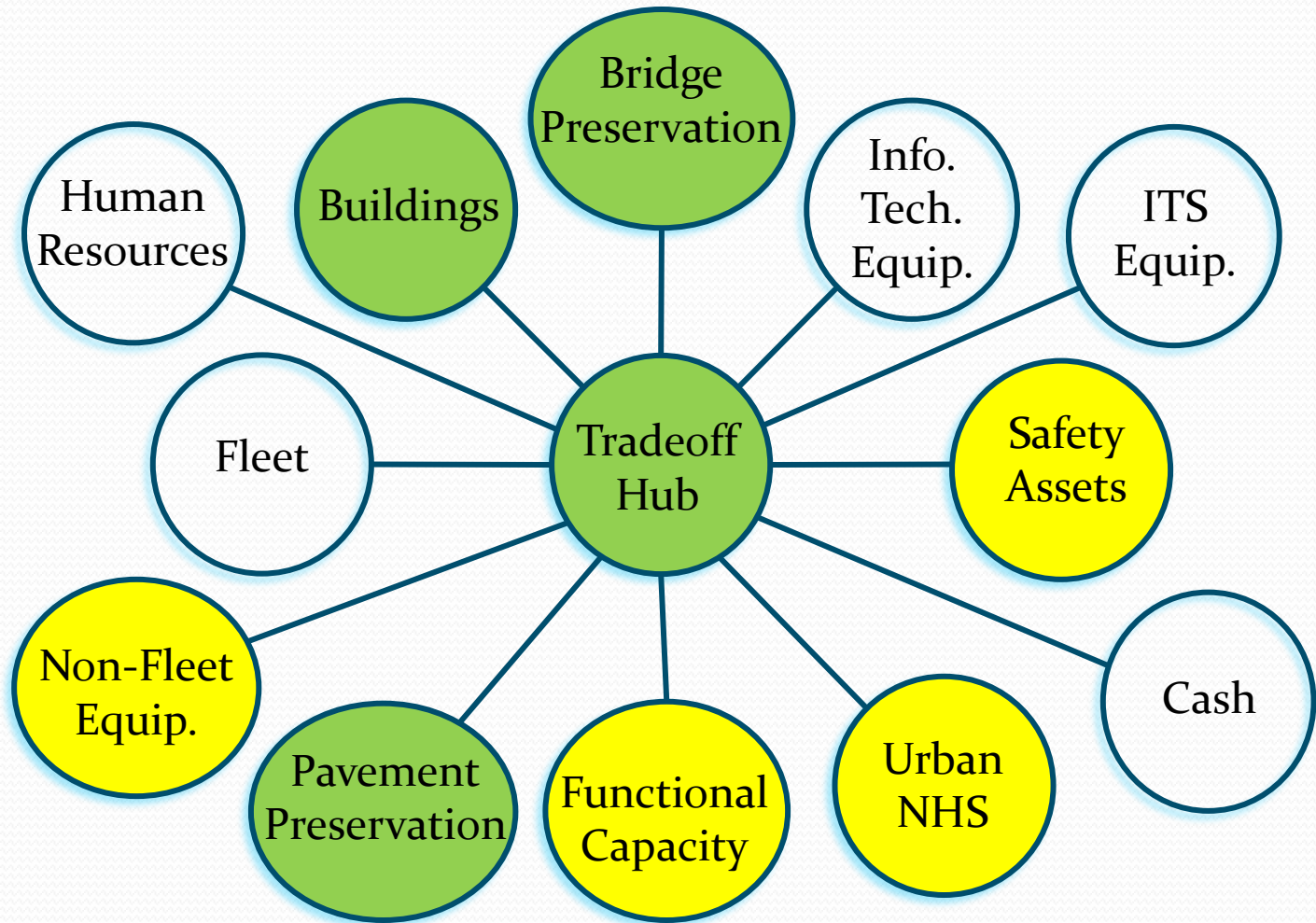
- Goals are to answer:
 - How much funding is needed to maintain LOS?
 - What LOS can be provided for a given funding level?
 - Where is the best place to spend any given dollar?



TAM Self Assessment

- System Monitoring and Feedback
- Proactive Role in Policy Formulation
- Decision Support Tools

Hub and Spoke Design

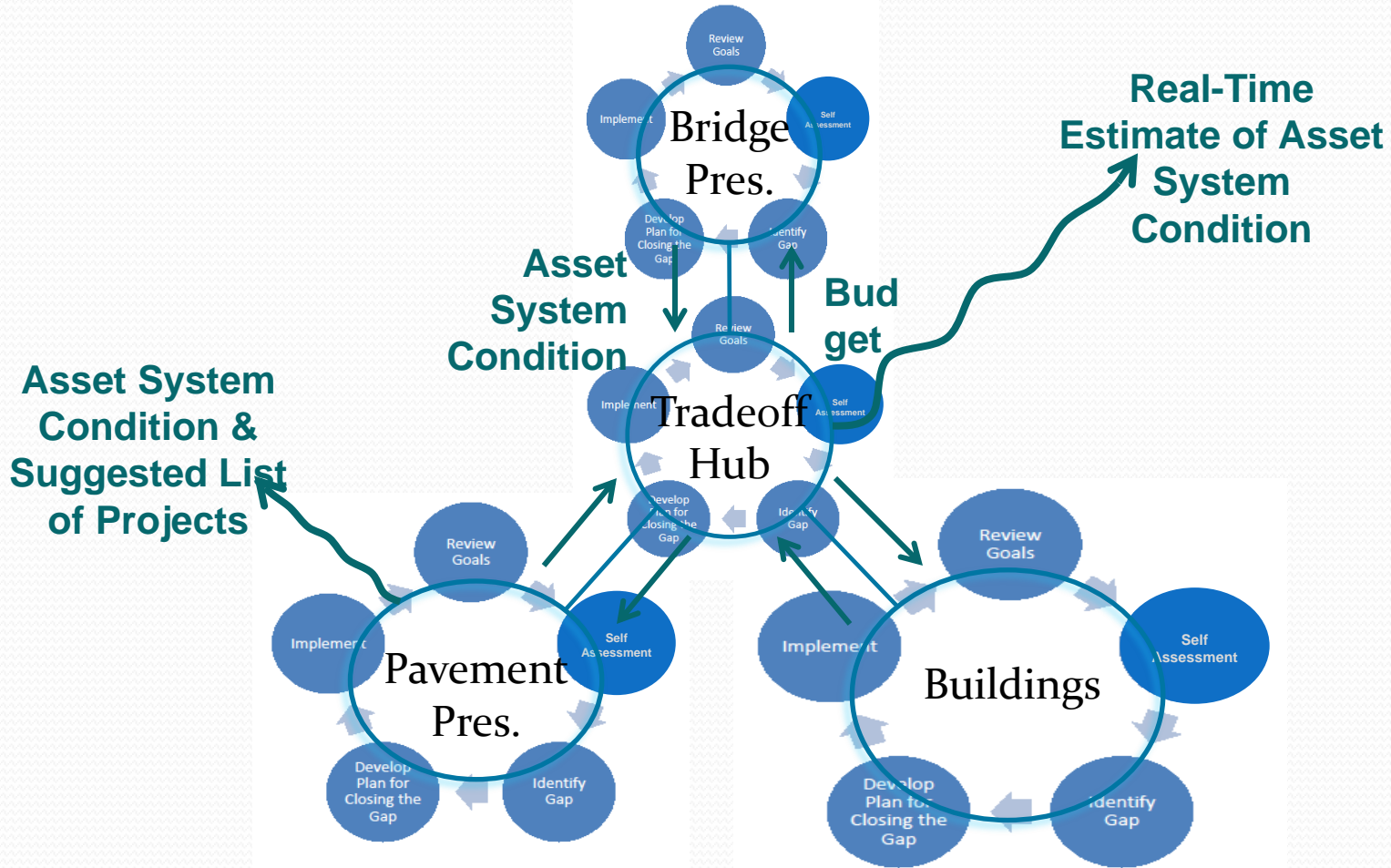


Planning Process Flow

Continuous Improvement



Overall TAM Process



TAM Conclusions

- **TAM = a way of thinking**
 - It's a process to reach a specific goal
 - It is not a piece of software.
- Will never be “implemented”...always implementing
 - Continuous-improvement, incremental process.
- Don't expect to skip stages of development maturity
 - If parts are at “Initial” stage, they won't be “Best Practice” tomorrow.

Thank You!



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