

***Overview of Performance Measures:
Pavement Condition to Assess
the National Highway Performance Program***

Handouts



Lessons

- **Lesson A:** TPM Legislative and Regulatory Requirements for Pavements
- **Lesson B:** Relating Pavement Performance to Planning, Asset Management and Existing Pavement Programs
- **Lesson C:** National Pavement Performance Measures
- **Lesson D:** Calculating Pavement Performance Targets
- **Lesson E:** Reporting, Accountability and Transparency



Acronyms

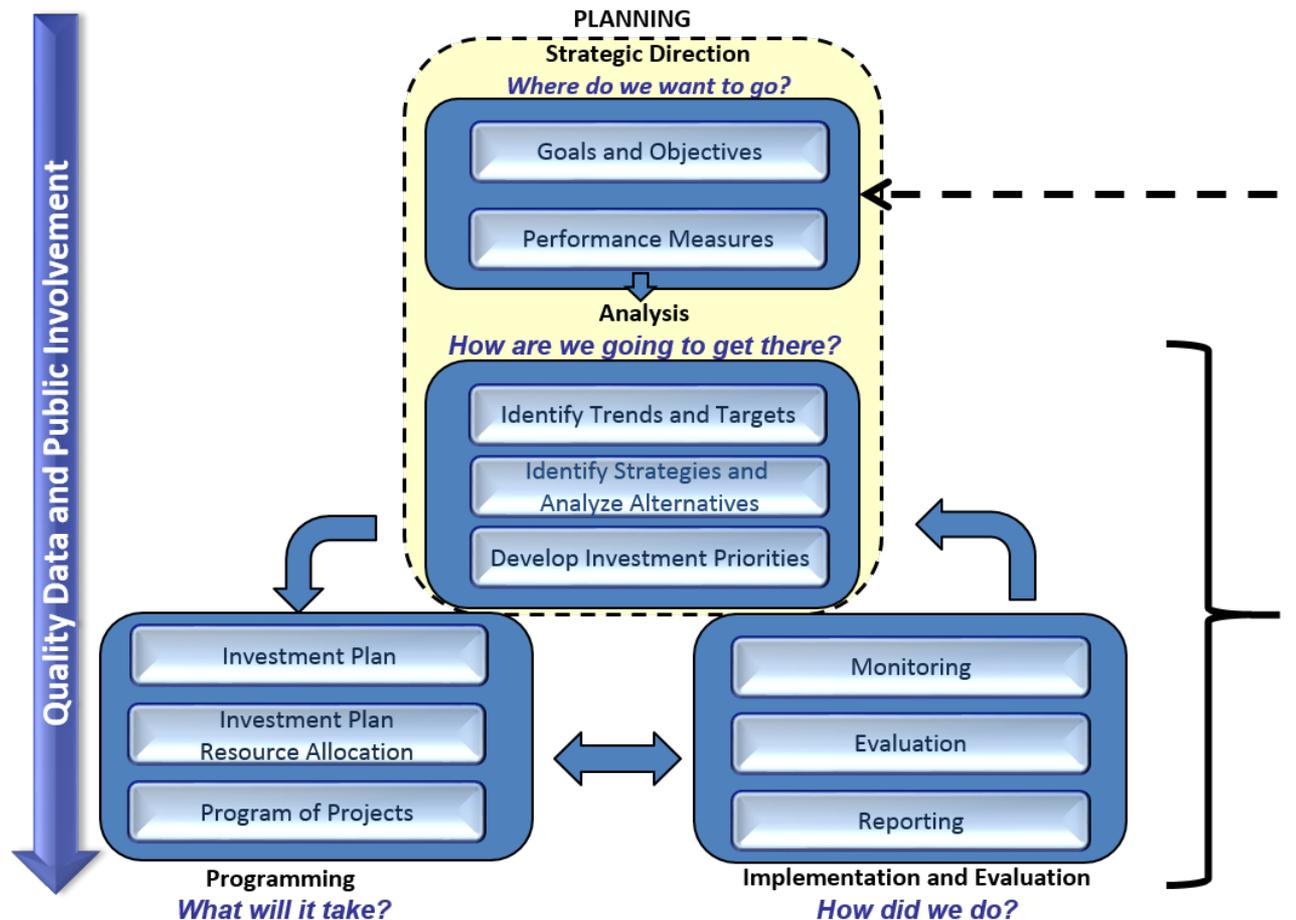
- NHPP: National Highway Performance Program
- NHS: National Highway System
- TPM: Transportation Performance Management
- TAMP: Transportation Asset Management Plan
- PBPP: Performance Based Planning and Programming
- HPMS: Highway Performance Monitoring System
- PMS: Pavement Management System
- IRI: International Roughness Index
- PSR: Present Serviceability Index
- HMA: Hot-Mix Asphalt
- JCP: Jointed Concrete Pavement
- CRCP: Continuously Reinforced Concrete Pavement



Class Discussion: Use of TPM

Performance Measure	
Calculation Approach	
Example of Target Setting Using the Pavement Measure	
Examples of Use to Support Decision Making	

Performance Based Planning and Programming (PBPP) Guidebook



The Relationship

Pavement & Bridge Measures

- FHWA establish consistent performance measures across NHS
- Minimum condition standards for Interstate pavements and NHS bridges
- States and MPOs set performance targets
- States collect and report data

Asset Management Plan

- Incorporates State objectives, measures, and targets
- Perform gap, whole-life cost, and risk analysis
- Develop investment strategies using data and tools from Pavement and Bridge Management Systems
- Develop decision-making priorities and financial plans

Performance-Based Planning

- States and MPOs focus on national goals
- Develop strategy and targets
 - Focus on performance areas
 - Determine trade-offs
- Develop program
 - Develop STIP/TIP with targets
- Reporting and transparency
 - Deliver projects and strategies
 - States and MPOs report on performance



Supporting Systems: Pavement Management System (PMS)

- Collect, process, store and update pavement inventory and conditions
- Forecast pavement deterioration
- Determine benefit-cost over the life cycle of pavements to determine alternative strategies
- Identify short- and long-term budget needs
- Determine strategies for project selection that maximize overall program benefits
- Recommend pavement programs and schedules within policy and budget constraints



Pavement Condition Thresholds

	Good	Fair	Poor
IRI (inches/mile)	<95	95-170	>170
Rutting (inches)	<0.20	0.20-0.40	>0.40
Faulting (inches)	<0.10	0.10-0.15	>0.15
Cracking (%)	<5	5-20 (asphalt) 5-15 (JCP) 5-10 (CRCP)	>20 (asphalt) >15 (JCP) >10 (CRCP)

Calculation of Pavement Measures

	Pavement Type		Measures
	Asphalt and Jointed Concrete	Continuous Concrete	
Overall Section Condition Rating	3 metric ratings (IRI, cracking and rutting/faulting)	2 metric ratings (IRI and cracking)	
Good	All three metrics rated "Good"	Both metrics rated "Good"	percentage of lane-miles in "Good" condition
Poor	≥ 2 metrics rated "Poor"	Both metrics rated "Poor"	percentage of lane-miles in "Poor" condition
Fair	All other combinations	All other combinations	



Calculation of Pavement Measures

Overall Section Condition Rating	Pavements with Speed Limit less than 40 MPH	Measures
Good	$PSR \geq 4.0$	% of lane-miles in "Good" condition
Poor	$PSR \leq 2.0$	% of lane-miles in "Poor" condition
Fair	$2.0 < PSR < 4.0$	

Small-Group Exercise - Review

Sec.	Type	Speed Limit (mph)	Lanes	IRI	Cracking	Rutting	Faulting	PSR	Good Fair/ Poor
1	Asphalt	55	4	180	7	0.30	N/A	N/A	
2	Asphalt	65	8	83	3	0.17	N/A	N/A	
3	Jointed Concrete	55	2	212	8	N/A	0.18	N/A	
4	Asphalt	45	4	216	13	0.22	N/A	N/A	
5	CRCP	45	4	37	4.9	N/A	N/A	N/A	
6	Asphalt	30	2	160	21	0.41	N/A	N/A	
7	Asphalt	65	6	99	4	0.15	N/A	N/A	
8	CRCP	55	2	172	11	N/A	N/A	N/A	
9	Jointed Concrete	55	4	98	4	N/A	0.08	N/A	
10	Asphalt	30	4	N/A	N/A	N/A	N/A	3.0	
Description				Good	Fair	Poor	Total		
Lane Miles							4.0		
% of Lane Miles							100.0		

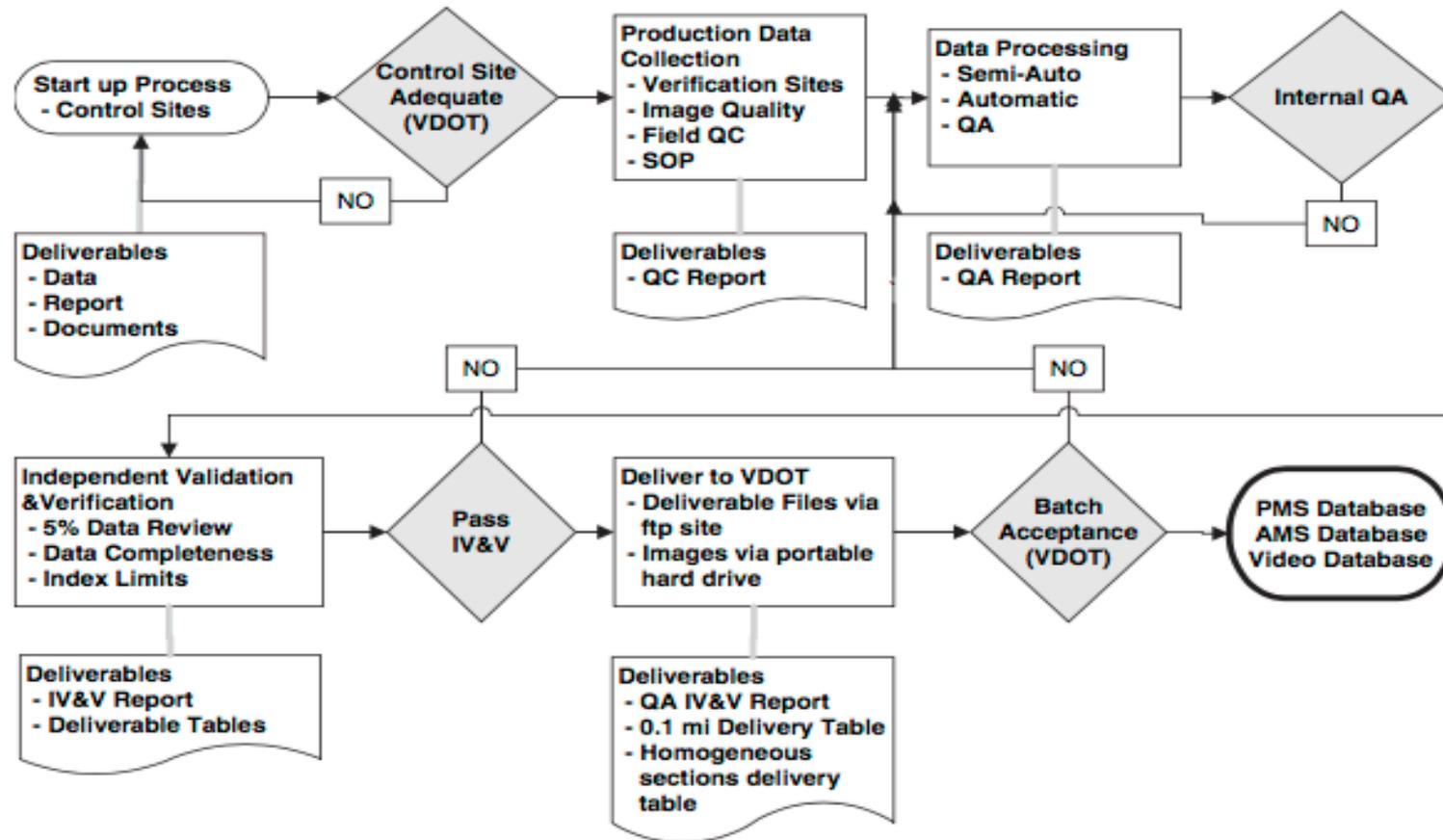


Data Quality Management Plan Requirements

- Data collection equipment calibration and certification
- Certification process for persons performing manual data collection
- Data quality control measures to be conducted before data collection begins and periodically during the data collection program
- Data sampling, review and checking processes
- Error resolution procedures and data acceptance criteria



Example of Data Quality Process: Virginia DOT



Factors Impacting Performance Target Setting

Decision-Making Process

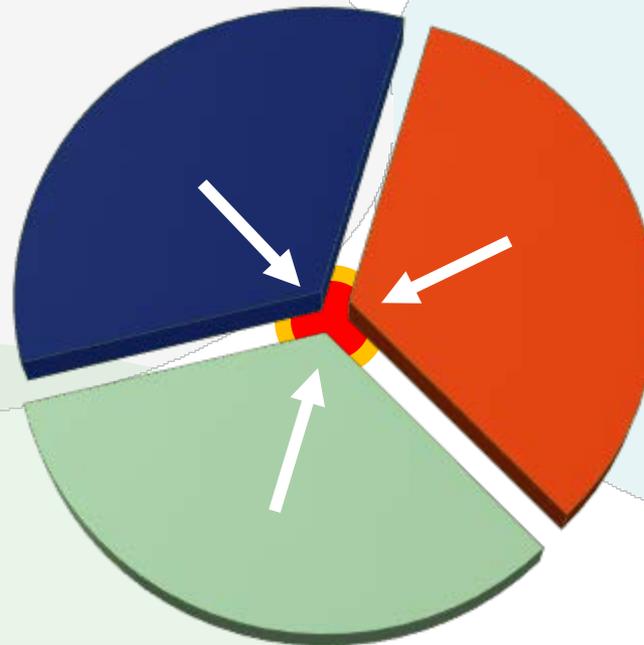
- Relates to long-term planning goals
- Accurate revenue projections
- Timely project delivery
- Good operational management
- Decisions reflect user expectations

Existing Commitments

- Current programs
- Competing programs

Staff Capacity and Priorities

- Strong leadership and commitment
- Key people focused on all initiatives
- Strong strategic framework & buy-in
- External communications and internal feedback with asset management and planning



Performance Progress Report Contents

Contents	Baseline	Mid Period	Full Period
2-year targets	X		
4-year targets	X		
Basis for targets	X		
Baseline conditions	X		
Ties to other plans	X		
Actual conditions		X	X
Progress discussion		X	X
Investment strategy discussion		X	X
Adjusted four-year targets		X	
Extenuating circumstances		X	X
NHPP target achievement discussion		X	X

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