HPMS: Trends & Reassessment Benefits

RPUG

Austin, TX

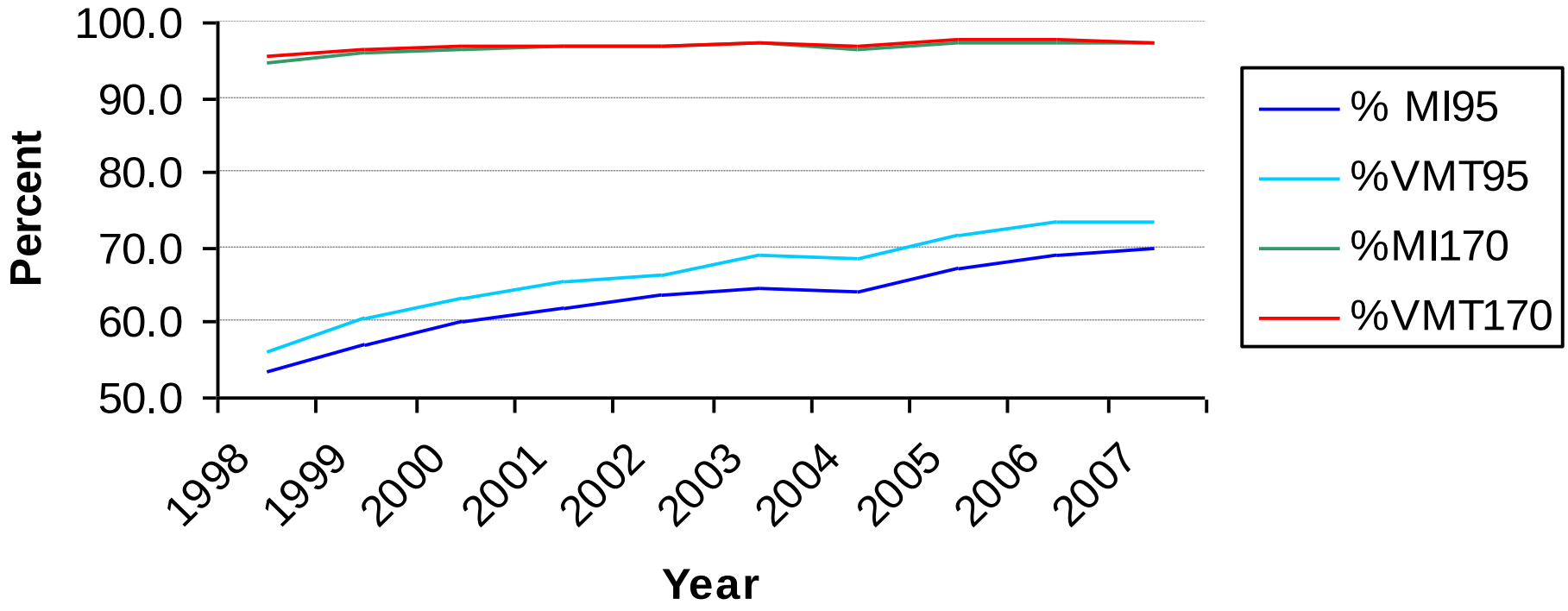
October 27, 2008

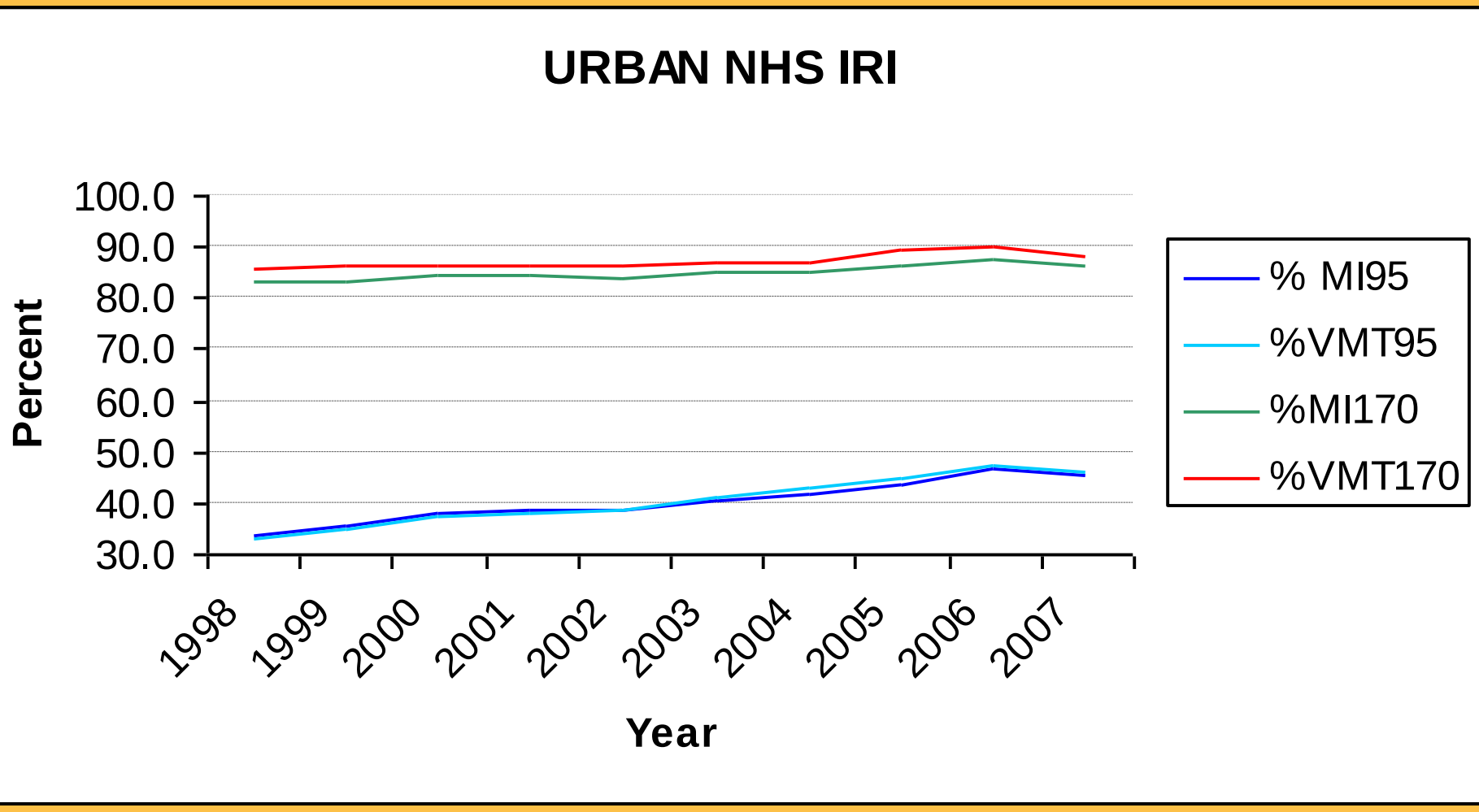
Agenda

- HPMS IRI Trends
- HPMS 2010+ Reassessment
  - Overview: pavement data, uses, & needs
  - Benefits (new data model)

HPMS IRI Reporting Requirements

- Universe: NHS, all Principal Arterials (including Interstate)
- Sample: Rural Minor Arterials
- Report Mean Roughness Index (MRI)
- Quarter-car simulation
- Recommend AASHTO R43-07/R43M
- Include structures (2010+)


RURAL NHS IRI
100.0
90.0
80.0
70.0
60.0
50.0
Percent
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Year
% MI95
%VMT95
%MI170
%VMT170


URBAN NHS IRI
Percent
100.0
90.0
80.0
70.0
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50.0
40.0
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Year
% MI95
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%MI170
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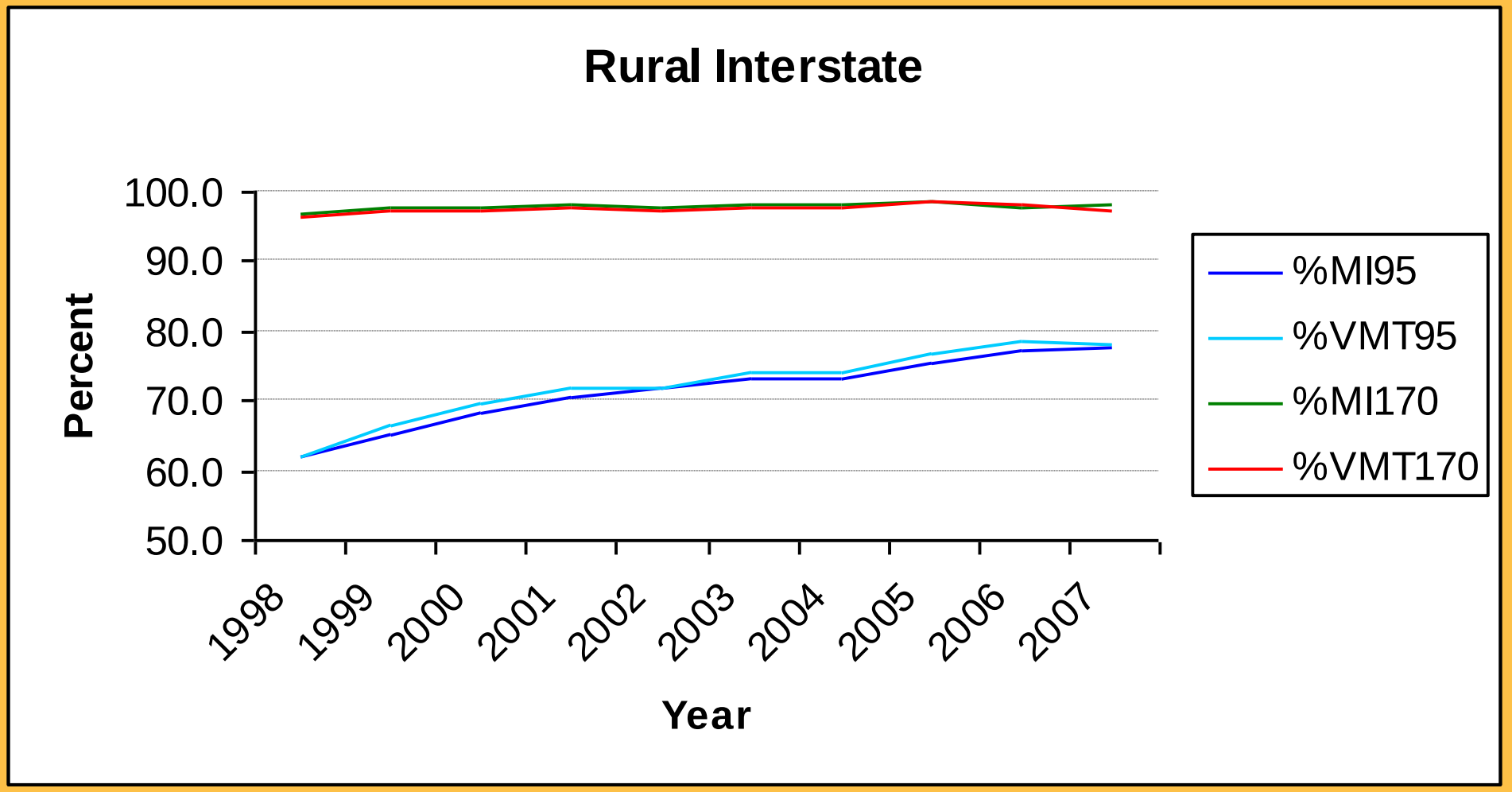
Rural Interstate
100.0
90.0
80.0
70.0
60.0
50.0
Percent
1998
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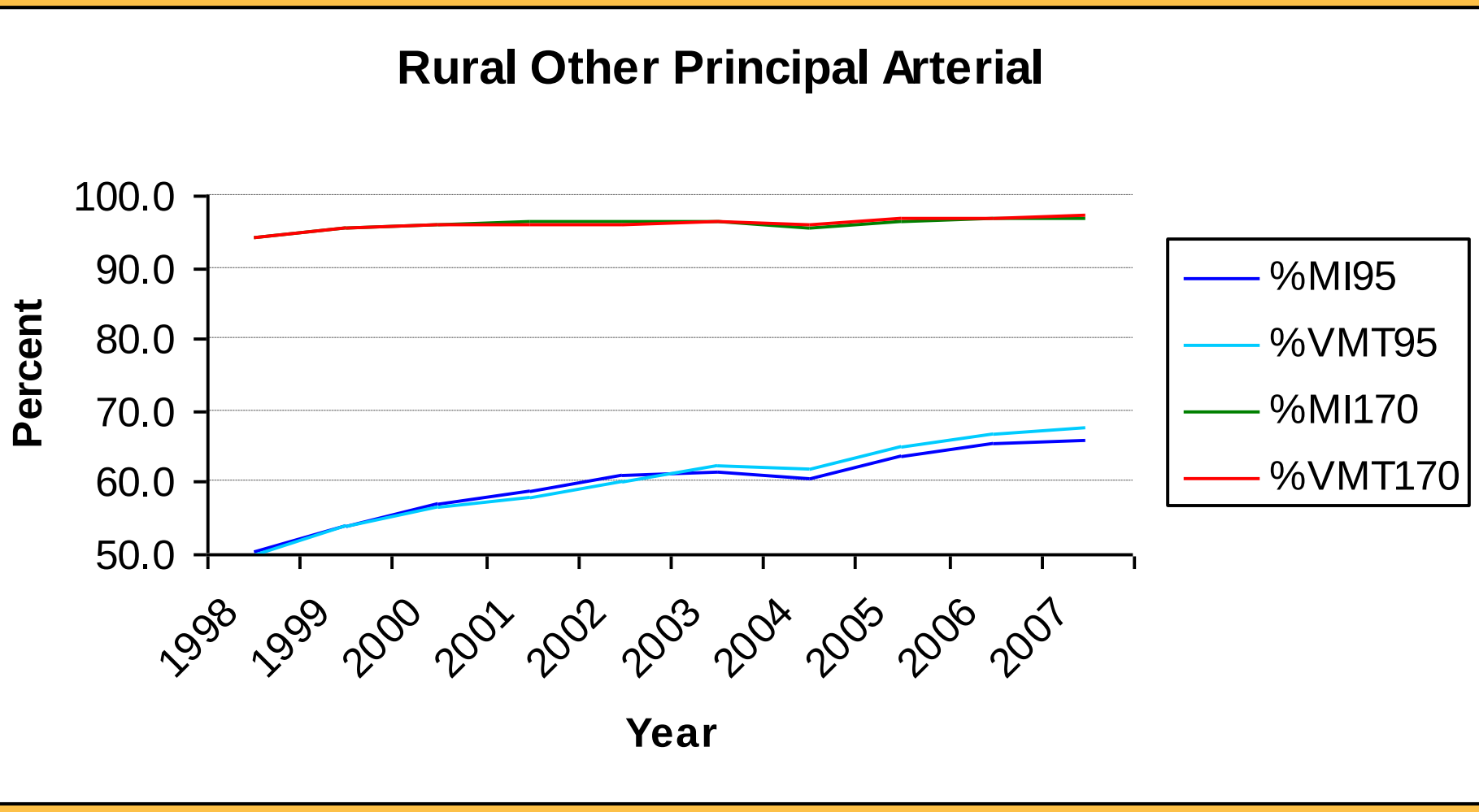
Rural Other Principal Arterial
100.0
90.0
80.0
70.0
60.0
50.0
Percent
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2005
2006
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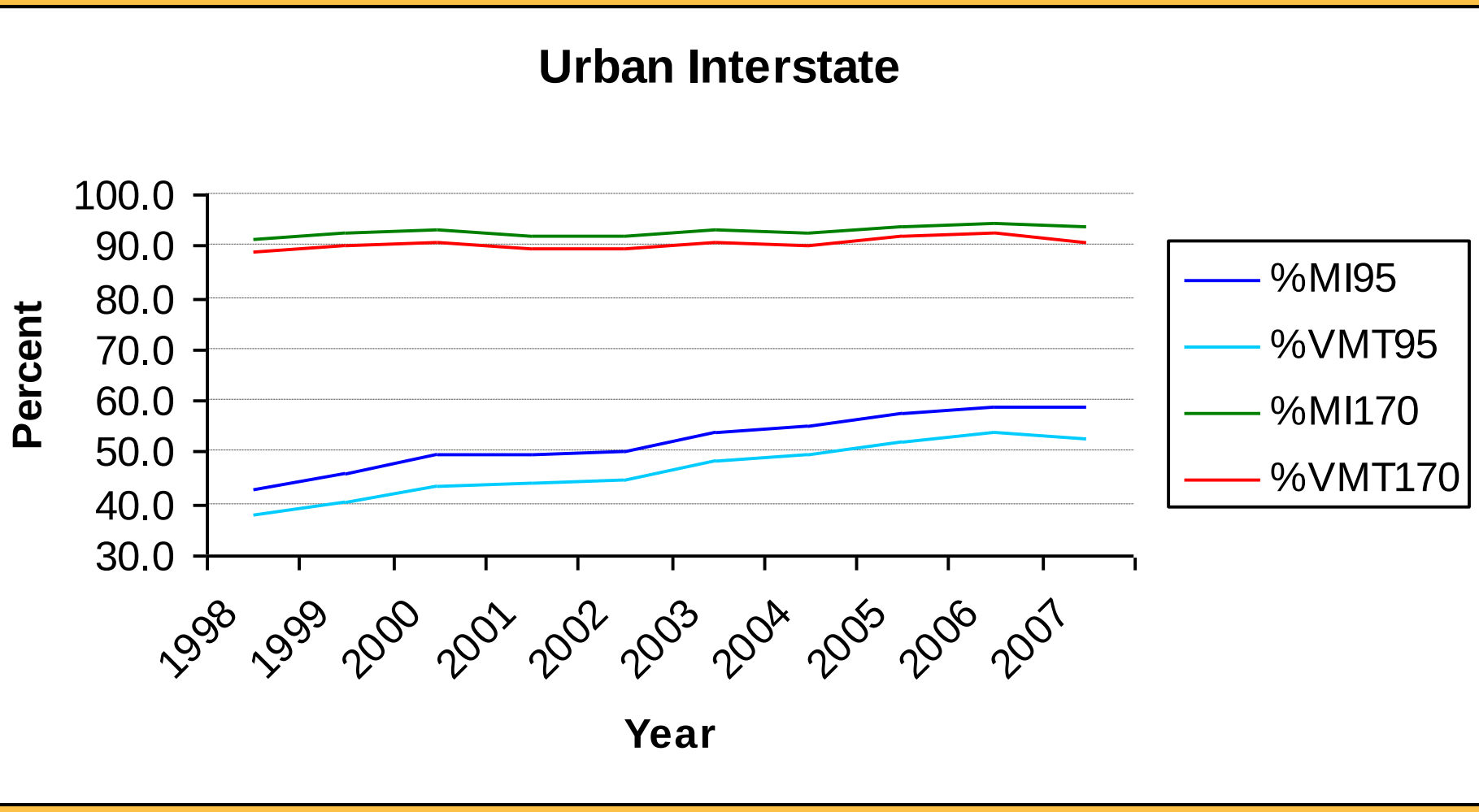
%VMT170


Urban Interstate
Percent
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
1998
1999
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2001
2002
2003
2004
2005
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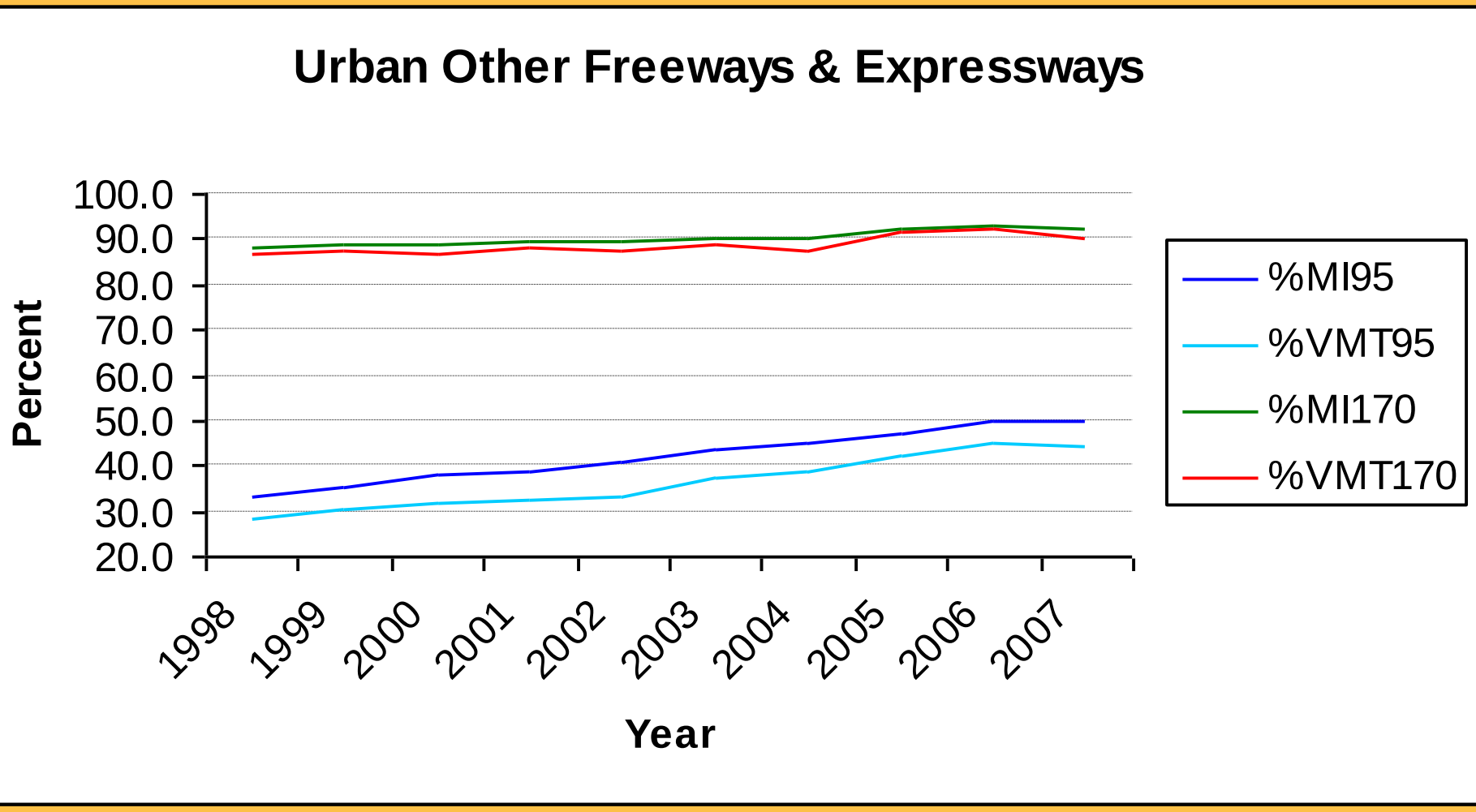
2007
Year
%MI95
%VMT95
%MI170
%VMT170


Urban Other Freeways & Expressways
Percent
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
1998
1999
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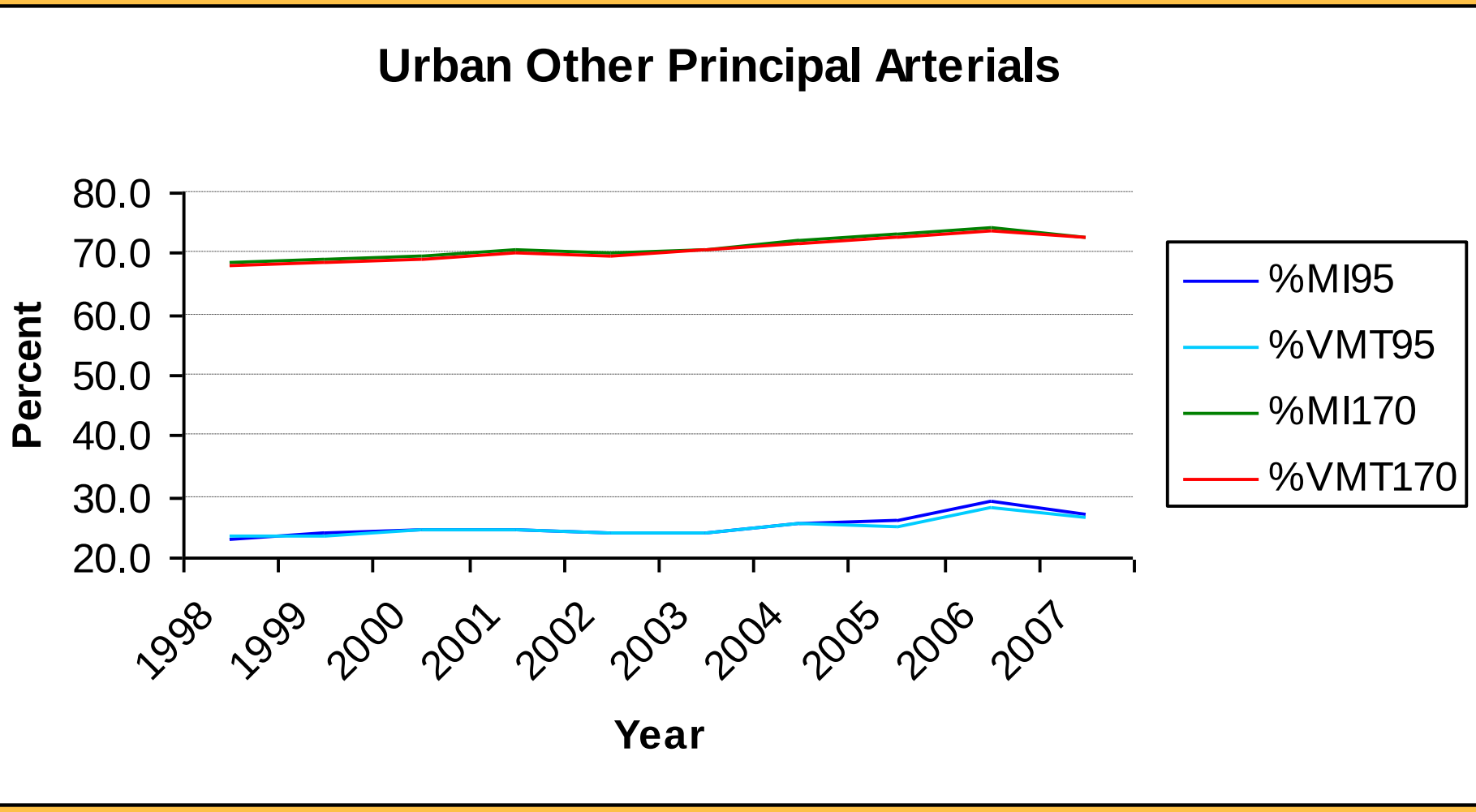
Urban Other Principal Arterials
Percent
80.0
70.0
60.0
50.0
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2002
2003
2004
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2006
2007
Year
%MI95
%VMT95
%MI170
%VMT170

2007 HPMS IRI Reporting

- 3 functional systems where PSR is required if no IRI reported-- sample sections only
  - Rural Major Collector: 72% has IRI (20 States report 100%)
  - Urban Minor Arterial: 63% has IRI (15 States report 100%)
  - Urban Collector: 51% has IRI (13 States report 100%)

- 92% off-State system OPA miles have IRI coded where required.

2007 HPMS IRI Reporting

All Principal Arterials (IRI required)

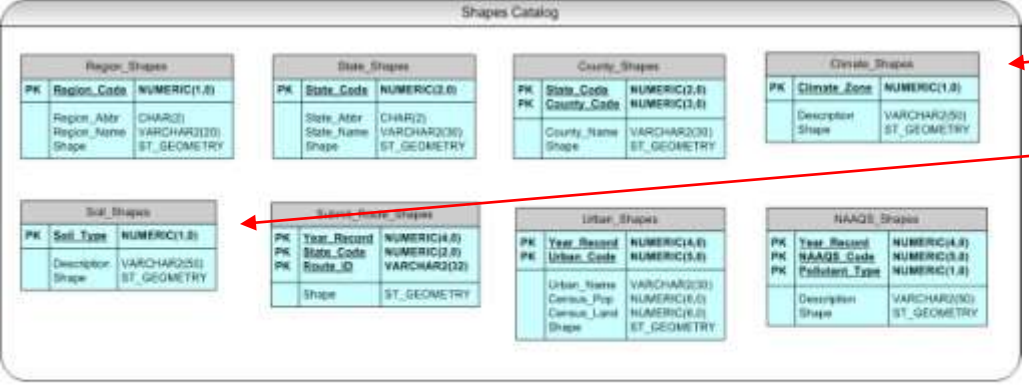
OWNERSHIP	TOTAL MILES	% IRI=0
State Hwy.	191,834	0.5
County	4,796	10.1
Town/Township	1,230	28.4
Municipal Hwy.	14,535	6.5
Other State	3,355	0.4
Other Local	385	21.1
Federal	267	2.4
Other	4	0.0

Uses of HPMS Pavement Data

- National pavement needs 2010+
  - *Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance*
  - Need to update models using enhanced HPMS pavement data (HERS and NAPCOM)
  - Performance measure (NHS IRI)
  - FHWA publications (*Highway Statistics, etc.)*
    - » IRI, PSR, and Pavement Type only
- Other studies

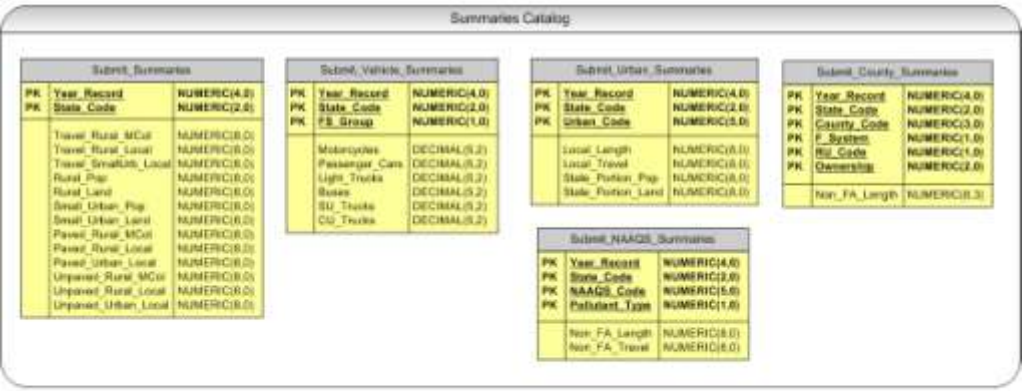
Pavement Models

- Enhanced FHWA pavement models:
  - Need to calculate remaining service life (RSL)
  - Need to improve HERS predictions
  - Need to improve cost estimates for the C&P Report
  - Want to capitalize and update models based on recent developments, capabilities (ME-PDG, etc.), and technology
  - Basically need better than what FHWA has now
- Sensitivity analysis:
  - Used ME-PDG and LTPP data to identify model inputs having greatest impact on predictions
  - Identified critical State PMS data needed for National-level analysis
  - ME-PDG offers default values that can minimize data burden for HPMS

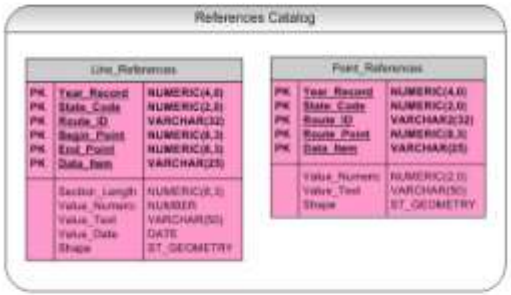


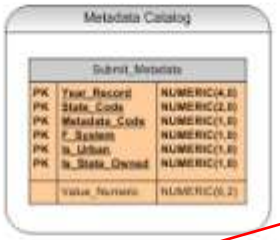
Climate_Shapes (4 LTPP zones)

Soil_Shapes



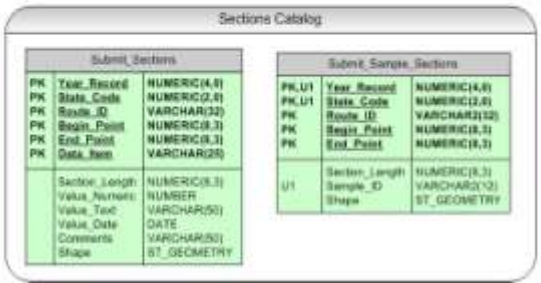
New HPMS Data Model





Metadata

Section data



Estimates

New HPMS Data Model (Geospatial)

- Essential that accurately measured routes be used as backbone of the system.
- Data collected on the same network will provide the most accurate match (no transfer).
- Thus, HPMS will require submittal of the State network with the data.

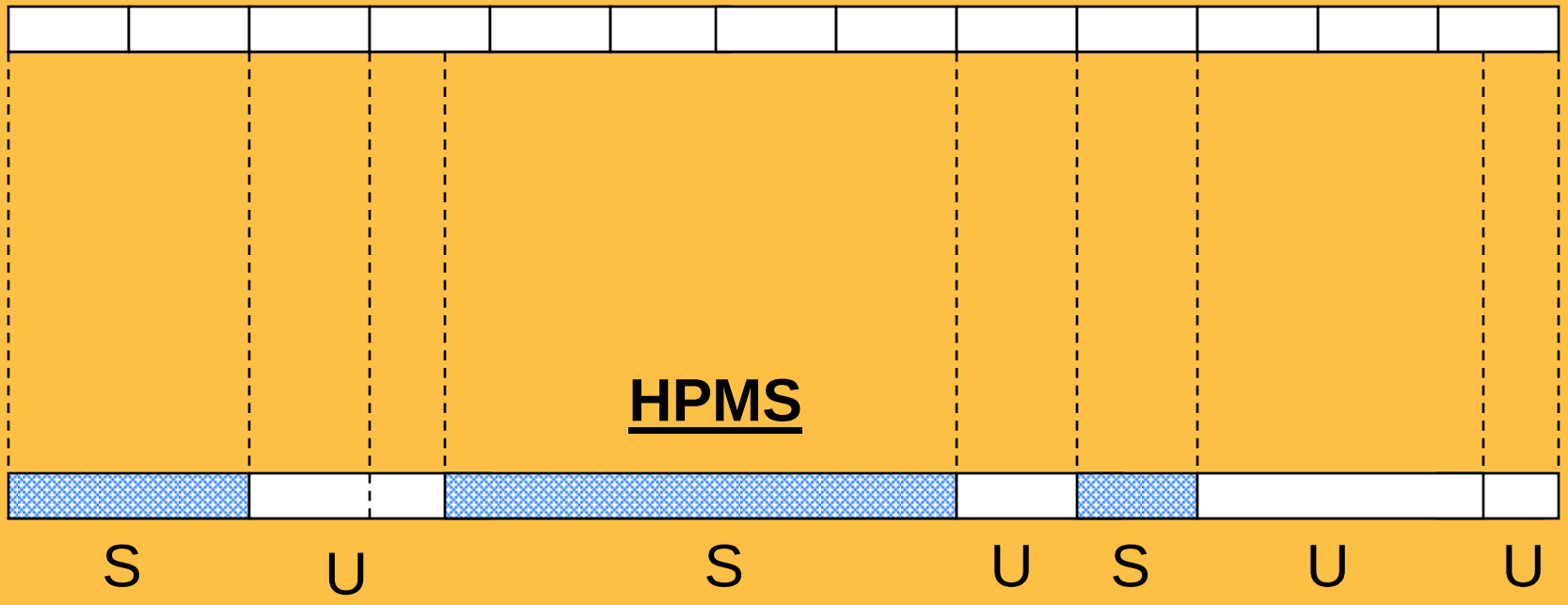
New HPMS Data Model (Geospatial)

- 6 “philosophies”:
  - HPMS does not drive requirements.
  - No “HPMS” data; only data that is used in HPMS.
  - HPMS data base only contains existing feature data or data calculated/estimated from source, not where feature doesn’t exist.
  - Data model is flexible and allows for growth, improvement, and modification.
  - Do not request data where it is already known.
  - Changes in a data element should not affect others.

New HPMS Data Model (Geospatial)

Reporting Pavement Items

State Inventory



U= universe

S= sample

New HPMS Data Model (Geospatial)

- Utilizes State's own geospatial network
- Streamlines State HPMS data submittal process
  - FHWA receives State geo-coded data directly (no "translation" to HPMS)
- Intended to help improve data quality and enhance analytic capabilities
- Expands coverage of "linkable" HPMS data
  - Easier link to other data files and "routable" networks (FAF, NBI, Safety, NHPN, etc.)

“The man with one watch always knows what time it is, the man with two is never sure.”

--George Carlin

Conclusion

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