



BrM Annual User Group Meeting Welcome Structure and Bridge

Kendal R. Walus, PE
State Structure and Bridge Engineer
September 12, 2017

Structure and Bridge Division

- **Assistant S&B Engineers**
 - Design Engineering – Prasad Nallapaneni
 - Engineering Services – Junyi Meng
 - Maintenance – Adam Matteo
 - Safety Inspection – Chris Williams

- **District Bridge Engineers**
 - Bristol – Gary Lester
 - Culpeper – Teresa Gothard
 - Fredericksburg – Annette Adams
 - Hampton Roads – Shannon Ternes (Acting)
 - Lynchburg – Frank Lukanich
 - Northern Virginia – Gary Runco
 - Richmond – Jeff Hill
 - Salem – Dean Hackett
 - Staunton – Rex Pearce

S&B Strength

- Admin/Program Management/Design = 145
- Safety Inspection = 127
- Bridge Maintenance = 291
- Grand Total = 563

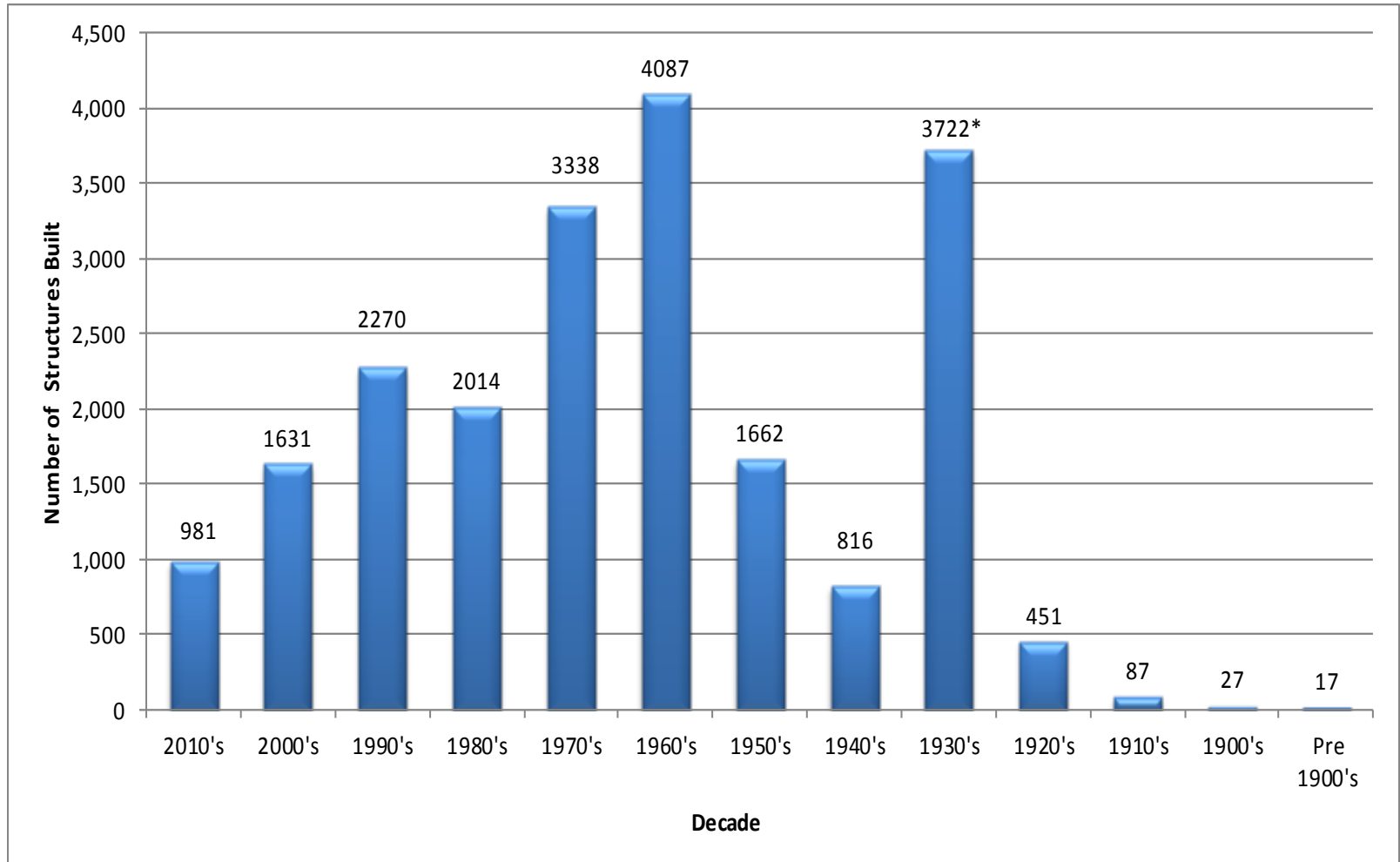


VDOT Inventory

District	Number of Bridges				
	Interstate	Primary	Secondary	Urban	Total
1 Bristol	136	547	1,555	189	2,427
2 Salem	113	487	1,341	72	2,013
3 Lynchburg	0	364	799	40	1,203
4 Richmond	281	487	673	99	1,540
5 Hampton Roads	337	350	310	216	1,213
6 Fredericksburg	23	143	217	6	389
7 Culpeper	71	258	677	11	1,017
8 Staunton	205	506	1,366	66	2,143
9 NOVA	257	338	549	17	1,161
Statewide	1,423	3,480	7,487	716	13,106

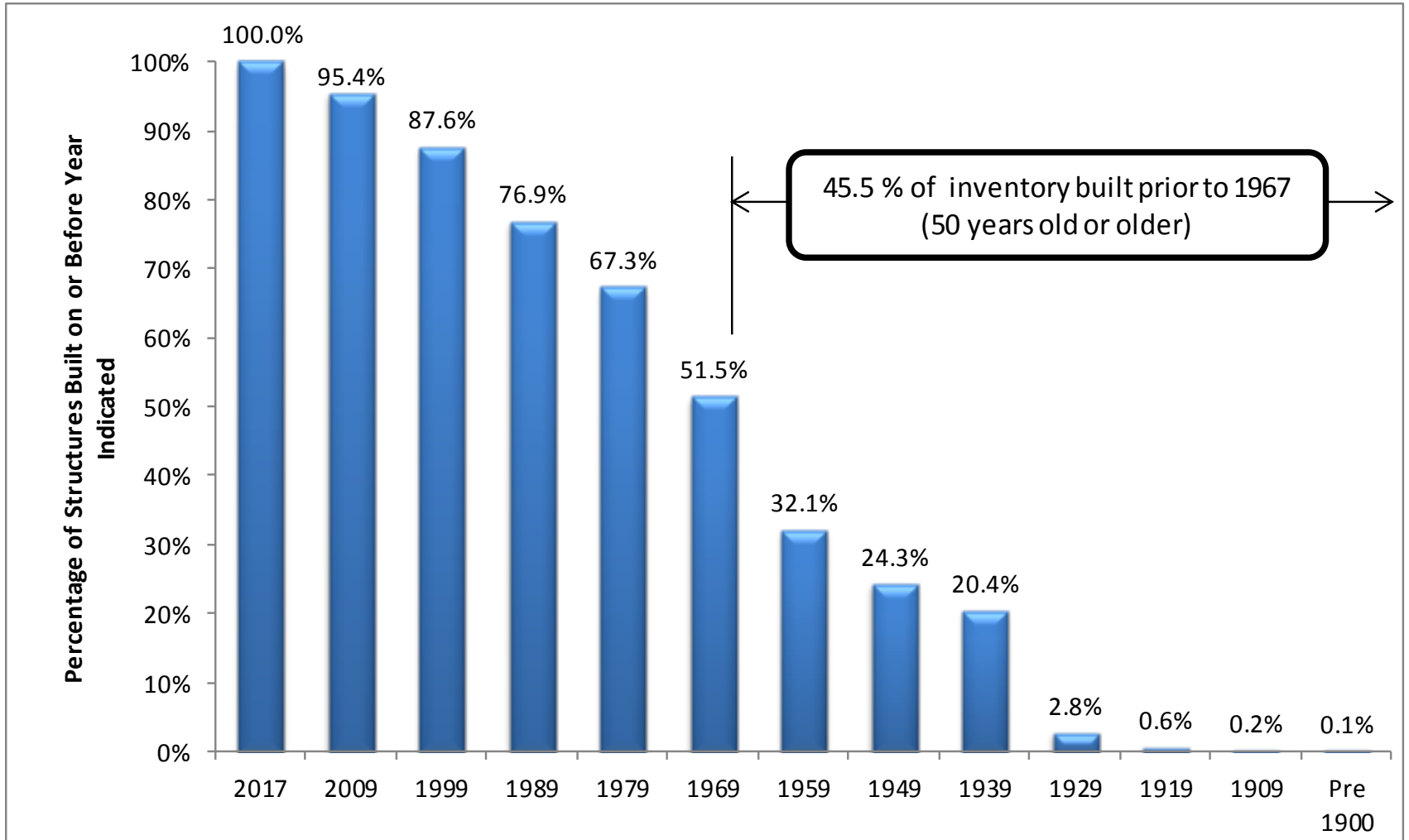
District	Number of Large Culverts				
	Interstate	Primary	Secondary	Urban	Total
1 Bristol	80	408	475	17	980
Salem	98	332	587	29	1,046
3 Lynchburg	0	295	565	18	878
4 Richmond	239	291	455	60	1,045
5 Hampton Roads	121	118	199	70	508
6 Fredericksburg	57	111	264	1	433
7 Culpeper	50	243	391	11	695
8 Staunton	225	320	759	46	1,350
9 NOVA	121	208	705	28	1,062
Statewide	991	2,326	4,400	280	7,997

Number of Structures Built by Decade



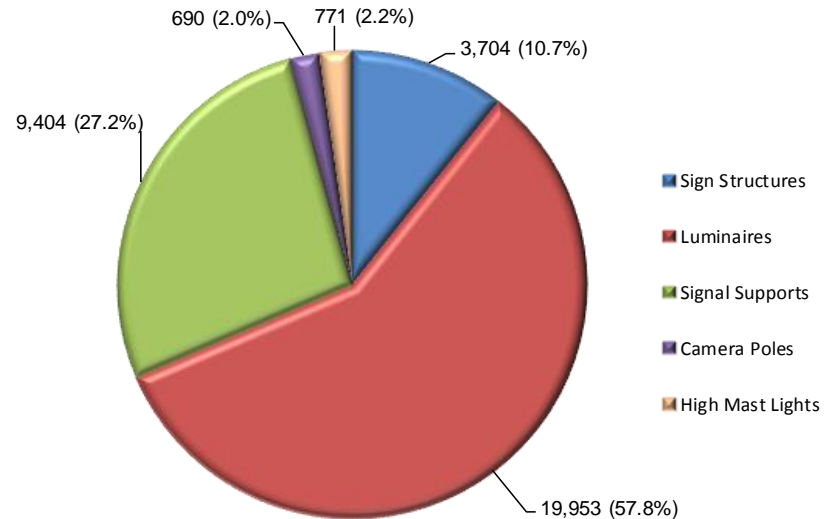
* County bridges added to the VDOT Inventory during this period with unknown construction dates.

Cumulative Age Distribution of Bridges and Large Culverts



Distribution of Ancillary Structures by Type

- 34,522 Ancillary Structures
 - Sign Structures
 - Overhead
 - Cantilever
 - Butterfly
 - Bridge Parapet Mounted
 - Luminaires
 - Ground Mounted
 - Bridge Parapet Mounted
 - Signal Supports
 - Span Wire
 - Cantilever
 - Bridge Parapet Mounted
 - Camera Poles
 - High Mast Lighting






Performance Measure

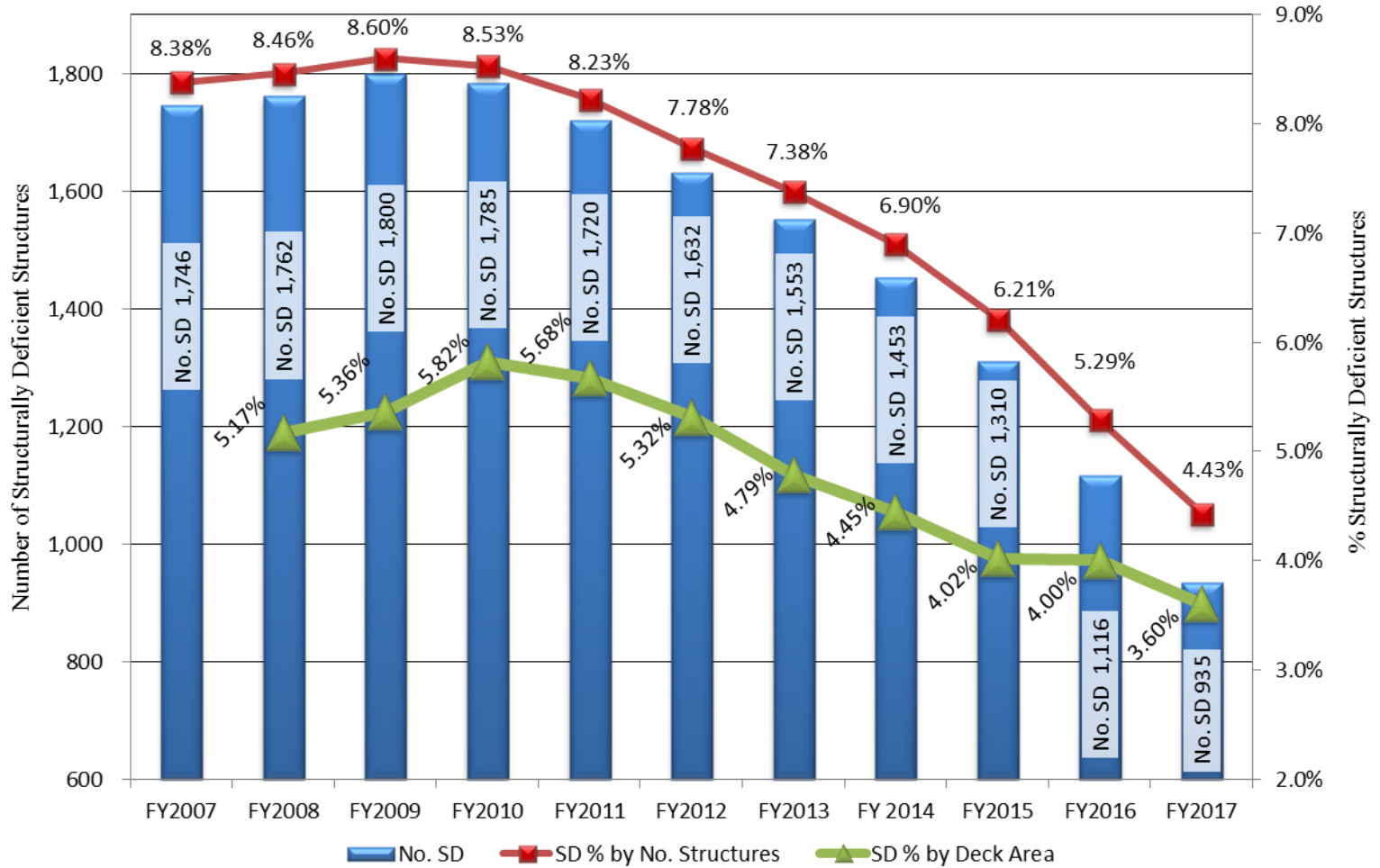
- Performance Measure is Tracked on the Dashboard
- VDOT's Bridge Performance Measure
 - Less Than 4.5% of Bridges/Large Culverts Rated as Structurally Deficient
 - Less Than 10% Deficient Deck Area
- Closing in on the 900 Milestone



Today:
 4.3% SD
 3.6% Deck Area

Bridge Condition	
	907
	5083
	15131
Green and Yellow Percent: 95.7%	

Structurally Deficient Structures Trend



VDOT Measures for Reducing Long Term Maintenance Cost

- Measures:

- Late 1970's – Latex Modified Concrete and Epoxy Deck Overlays
- 1982 – 3 Coat Zinc Coating
- 2003 – High Performance Concrete in All Bridge Elements
- 2009 – Corrosion Resistant Reinforcing Steel
- 2011 – Jointless Bridge Design Philosophy
- 2015 – Low Shrinkage Deck Concrete
- 2015 – The Addition of Hydrodemolition
- 2016 – Stainless Steel and Carbon Fiber Prestressing Strands for Piles and Beams
- 2016 – Stainless Steel Post-Tensioning Strands
- 2017 – Elastomeric Concrete Plug Joints
- 2017 – Inverted Tee Beams

Pontis to BrM

- VDOT History Using Pontis and BrM:
 - Began Collecting Element Level Data in 1995
 - Began Using the Pontis Bridge Management Tool in 2005
 - Locked in Using Pontis Version 4.4 in 2008
 - Continued Using Pontis Version 4.4 until 2016
 - Transition to BrM 5.2.1 – February 2016
 - Transition to BrM 5.2.3 – August 2017
 - Initiating Transition to BrM 5.3 – September 2017

Cost to Upgrade

- BrM 5.2.1 to 5.2.3 Upgrade Cost VDOT Approximately \$800K
 - IT Cost = \$350K
 - Approximately 4300 Hours
 - Upgrade of Application
 - Integrations
 - S&B Division Cost = \$347K
 - Approximately 4000 Hours
 - Ensure Continuity Between Other VDOT Systems
 - Testing, Validation and Problem Resolution of Reports
 - Coordination with VDOT IT, Bentley and IT Consultant
 - 10 AASHTO Services Units = \$100K (IT Consultant)
 - Does Not Include Costs for Element Modeling Portion of BrM
- Cost to Move From Pontis 4.4 to BrM 5.2.1 was Comparable



In Closing

- Upgrades Take Resources Away From Core Mission
- Recommendations
 - Reduce the Frequency of Software Updates
 - Provide Support (Patch) to Current Software for a Set Time Period
 - Recognize the Resource Demands Associated with Upgrades
- Hopeful for the Future of BrM
 - Provides Great Possibilities for Inventory Management and Decision Making
 - Enhances the Dialog with Executive Leadership
 - Provides a Friendly User Interface to Encourage Use by Personnel



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