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of Engineers**

Great Lakes & Ohio River  
Division

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# **Ohio River Mainstem Systems Study (ORMSS)**

## **Draft System Investment Plan (SIP)**

**Veronica Rife  
Project Manager**

**Inland Waterways Users Board Meeting  
13 July 2006**

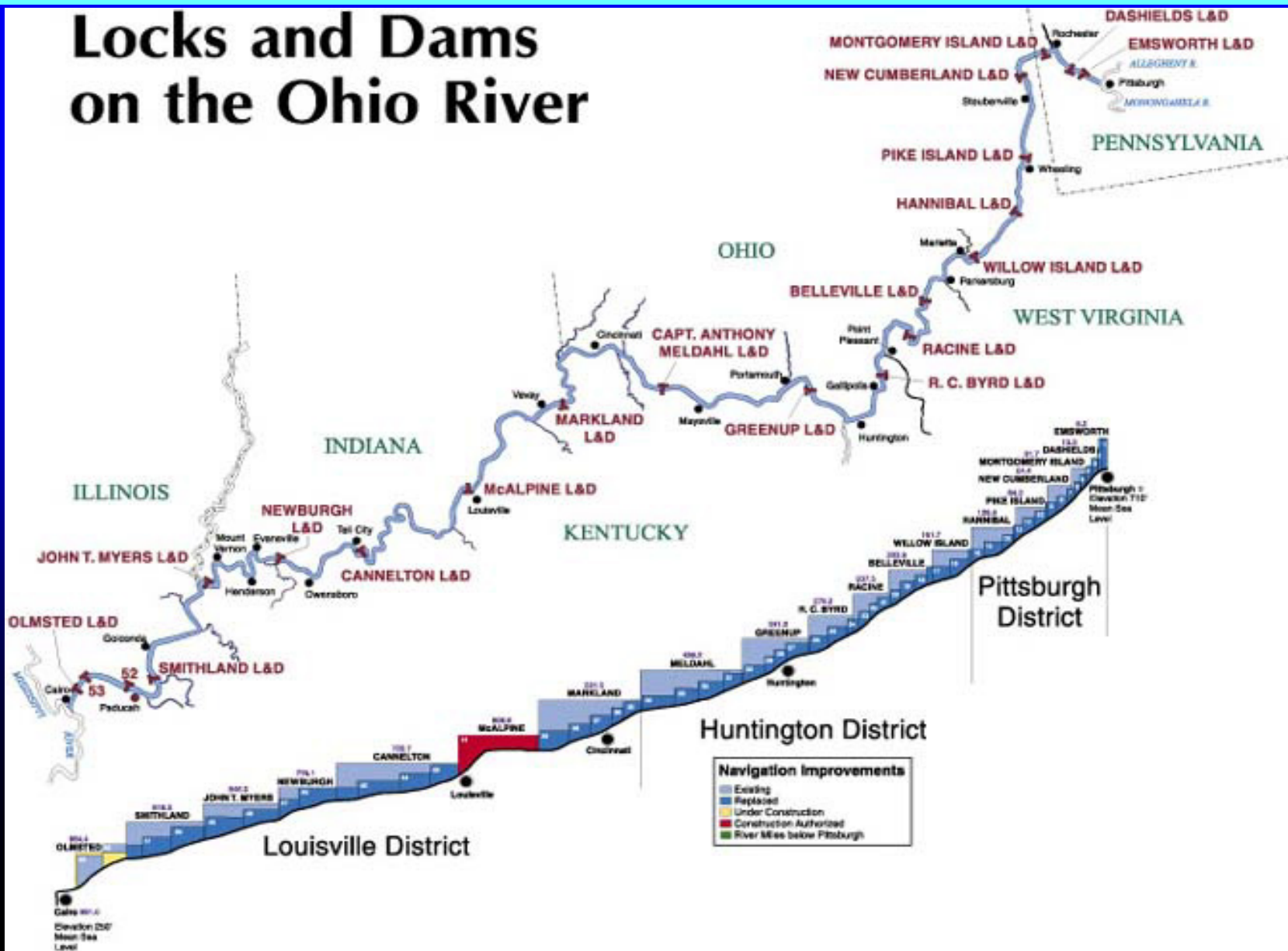


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## Locks and Dams on the Ohio River





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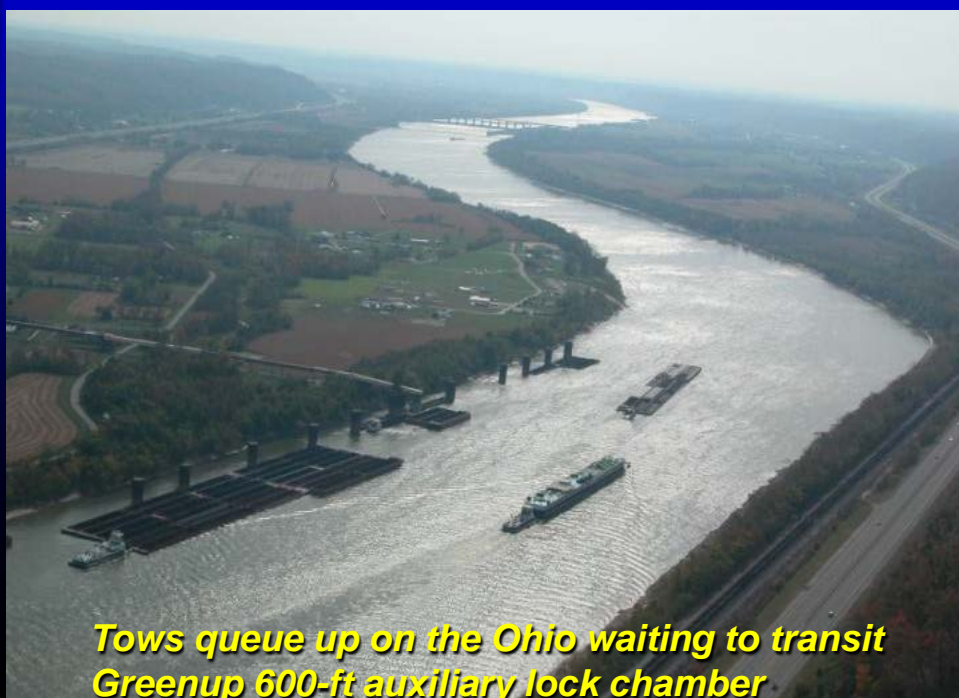
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## **Greenup Main Chamber Closure: Sep – Oct 2003**

- 18 day scheduled → 52 day closure
- 718 tows delayed
- 27,000 hrs accumulated delay
- \$13.2 million in delay costs
- Other industry costs estimated at \$30 million minimum\*

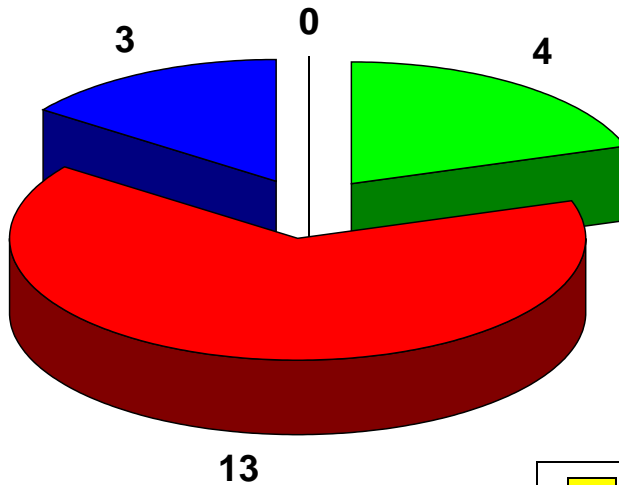
\* unofficial study results



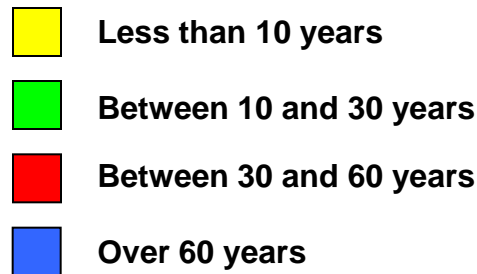
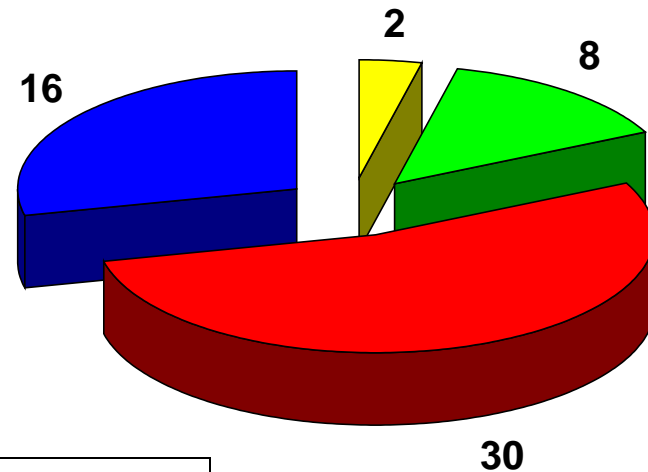


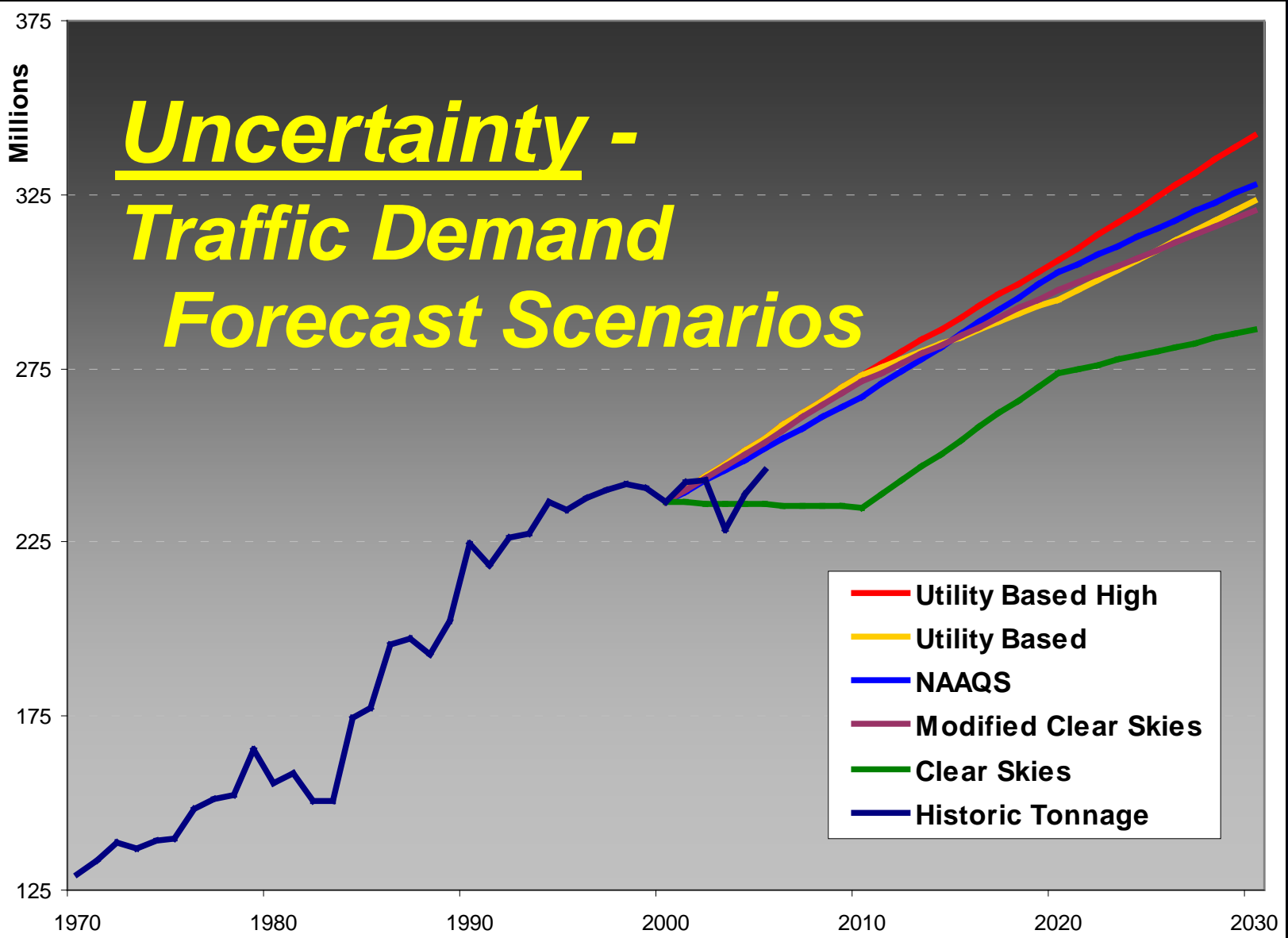
# Aging Infrastructure

**Distribution of Mainstem 2006  
Main Chamber Lock Ages**



**Distribution of ORS 2006  
Main Chamber Lock Ages**

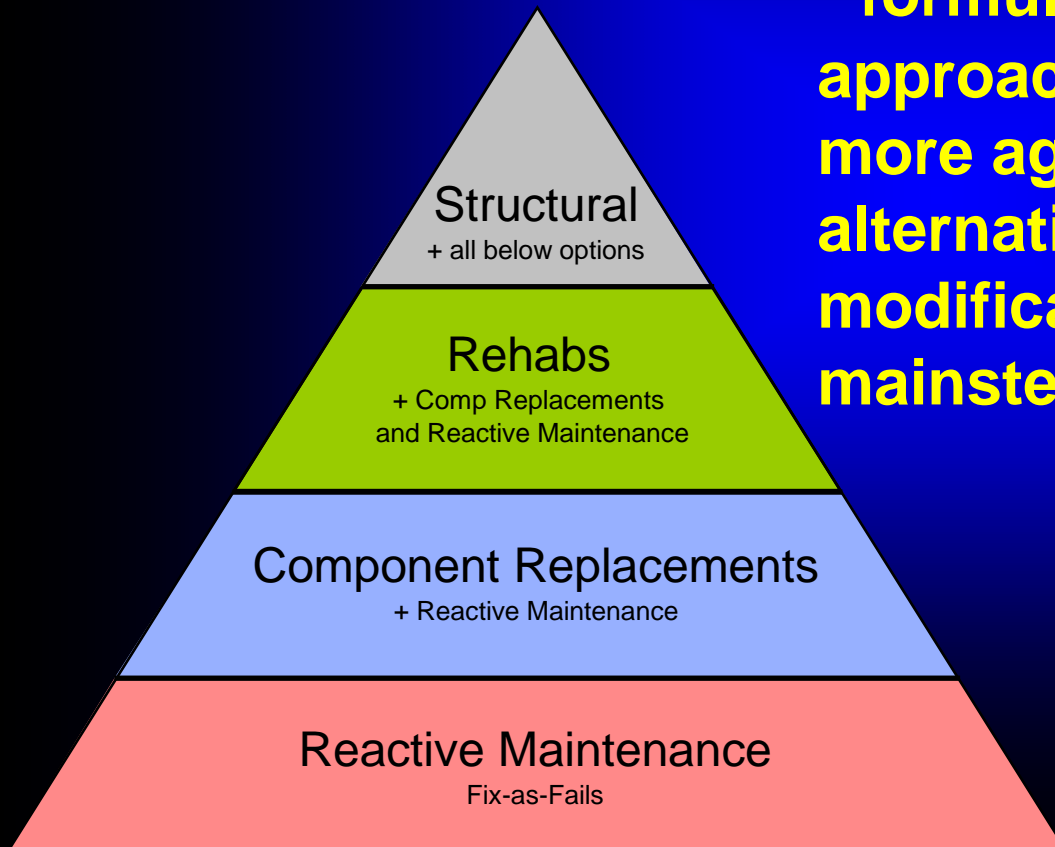






## SIP Analysis

**“formulated using a stepwise approach optimizing increasingly more aggressive maintenance alternatives, including structural modifications, at each of the mainstem projects”**





## Near Term Draft SIP Findings

Project	Clear Skies	Modified Clear Skies	NAAQS	Utility Based	Utility Based High
Dashields	New 600' - 2011	New 600' - 2010	New 600' - 2010	New 600' - 2010	New 600' - 2010
Emsworth	New 600' - 2010	New 600' - 2010	New 600' - 2010	New 600' - 2010	New 600' - 2010
Hannibal	MR - 2012	MR - 2011	MR - 2011	MR - 2012	MR - 2011
Markland	CR	MR - 2010	MR - 2010	MR - 2010	MR - 2010
Meldahl	MR - 2013	MR - 2010	MR - 2010	MR - 2010	MR - 2010
Montgomery	New 600' - 2010	New 600' - 2010	New 1200' - 2010	New 600' - 2010	New 600' - 2010
Pike Island	MR - 2016	MR - 2015	MR - 2015	MR - 2016	MR - 2015

Note: All lock projects at a minimum have component replacements, some have rehabs and others have indicate a need for lock replacement with a new chamber.

**CR - Component Replacements** -- economically justified, scheduled replacement of major lock features (such as lock gates, hydraulic and electrical systems, culvert vales and so on) prior to component failure.

**MR - Major Rehabilitation** -- economically justified, scheduled replacement of multiple major lock features.

**New 600' or 1200'** -- new single chamber built on the site of existing auxiliary lock chamber. The old 600' main chamber becomes the auxiliary chamber.



## Mid-Range Draft SIP Findings

Project	Clear Skies	Modified Clear Skies	NAAQS	Utility Based	Utility Based High
Belleville	CR	MR - 2017	MR - 2017	MR - 2017	MR - 2028
Cannelton	MR - 2017	MR - 2017	MR - 2016	MR - 2017	MR - 2017
Newburgh	MR - 2025	MR - 2016	MR - 2016	MR - 2016	MR - 2016
Racine	MR - 2020	MR - 2019	MR - 2020	MR - 2019	MR - 2019

Note: All lock projects at a minimum have component replacements, some have rehabs and others have indicate a need for lock replacement with a new chamber.

**CR - Component Replacements** -- economically justified, scheduled replacement of major lock features (such as lock gates, hydraulic and electrical systems, culvert vales and so on) prior to component failure.

**MR - Major Rehabilitation** -- economically justified, scheduled replacement of multiple major lock features.

**New 600' or 1200'** -- new single chamber built on the site of existing auxiliary lock chamber. The old 600' main chamber becomes the auxiliary chamber.





# Long-Range Draft SIP Findings

Project	Clear Skies	Modified Clear Skies	NAAQS	Utility Based	Utility Based High
RC Byrd	CR	MR - 2044	MR - 2020	MR - 2030	MR - 2033
Willow Island	MR - 2027	MR - 2027	MR - 2027	MR - 2027	MR - 2028
Markland Aux	CR	CR	CR	CR	MR - 2052

Note: All lock projects at a minimum have component replacements, some have rehabs and others have indicate a need for lock replacement with a new chamber.

**CR - Component Replacements** -- economically justified, scheduled replacement of major lock features (such as lock gates, hydraulic and electrical systems, culvert vales and so on) prior to component failure.

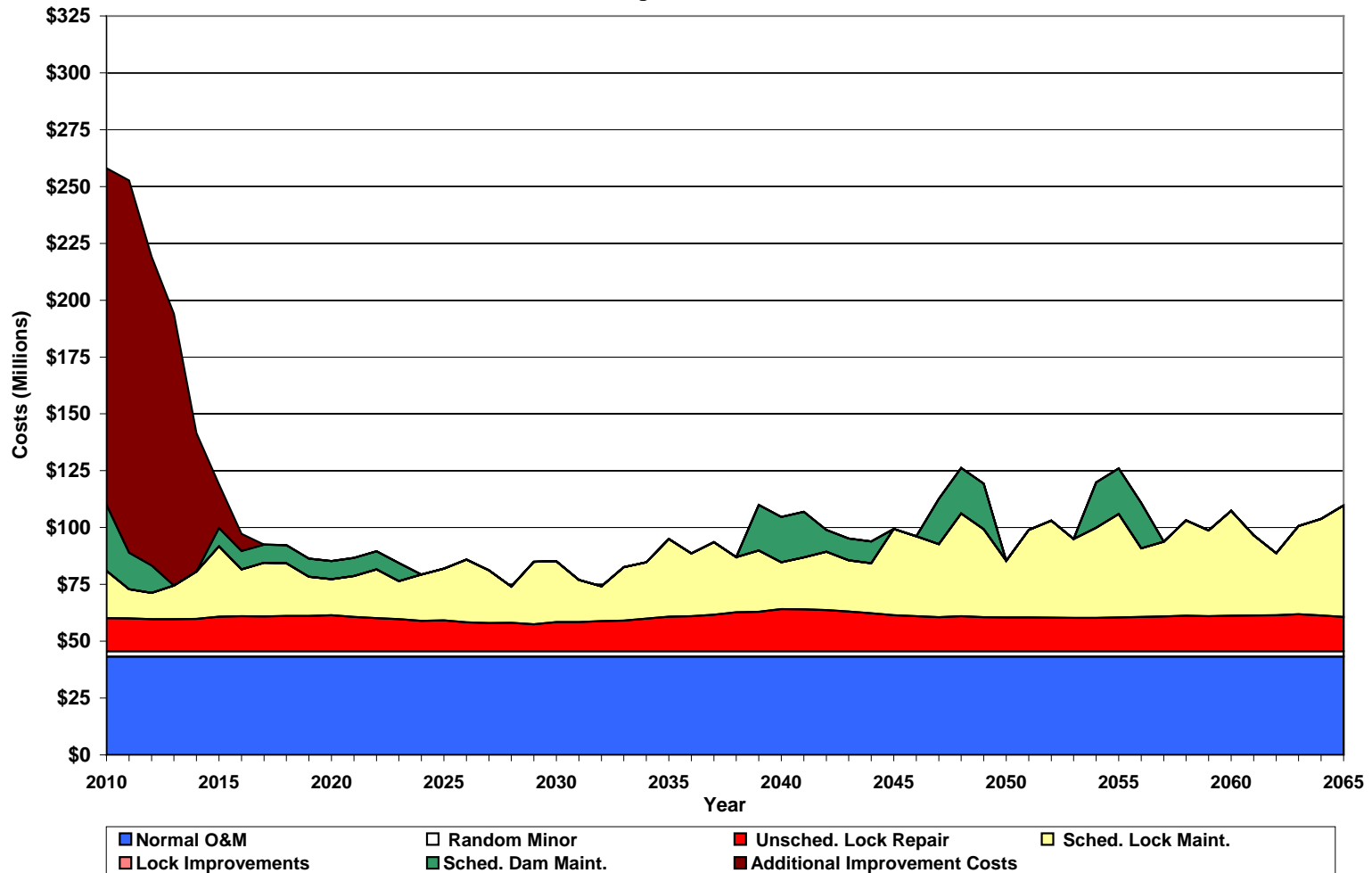
**MR - Major Rehabilitation** -- economically justified, scheduled replacement of multiple major lock features.

**New 600' or 1200'** -- new single chamber built on the site of existing auxiliary lock chamber. The old 600' main chamber becomes the auxiliary chamber.



# Reactive Maintenance Federal Costs

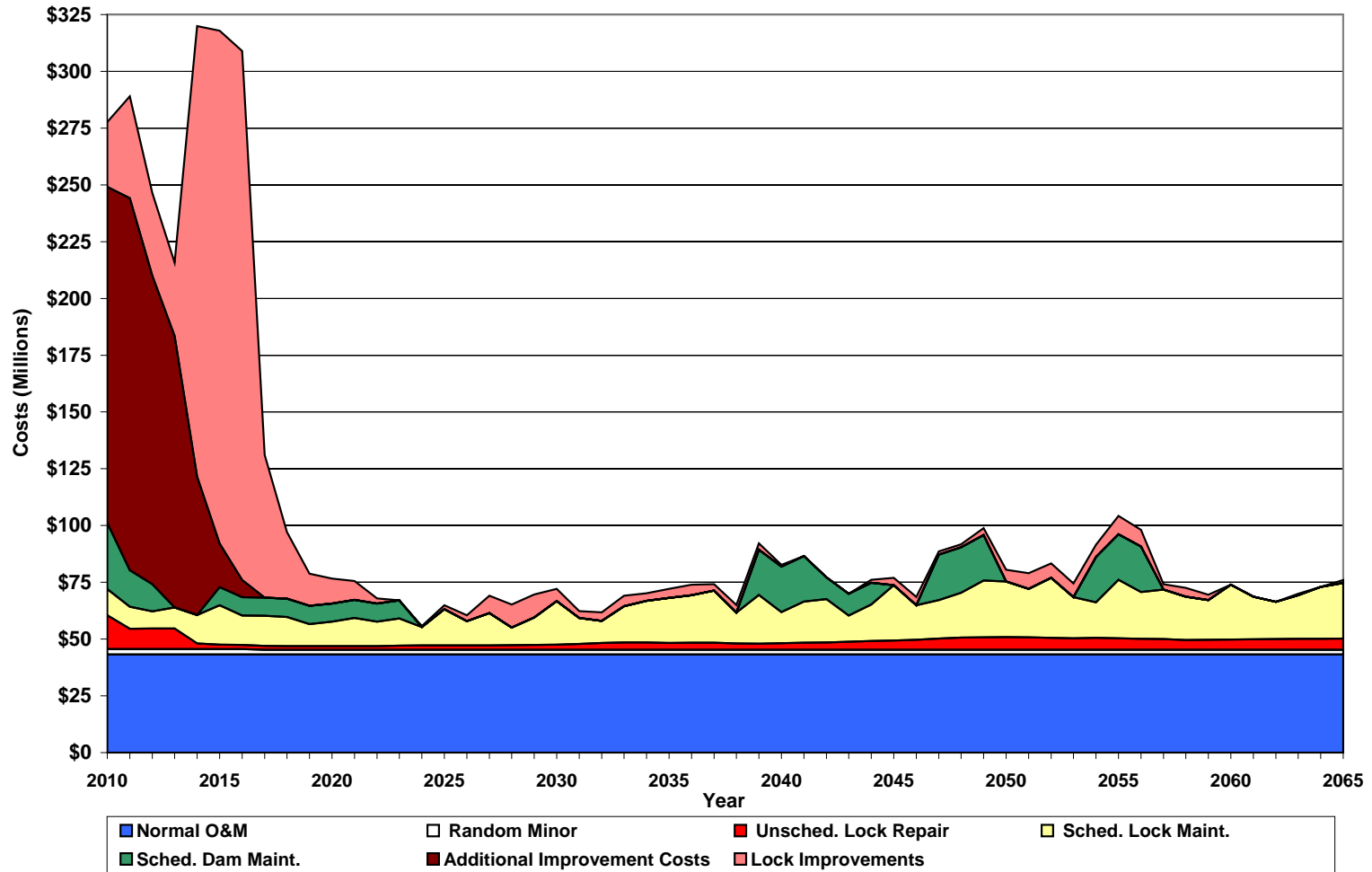
ORMSS Forecast of Annual Reactive Maintenance - Federal Costs  
Average of 5 Forecasts





# System Investment Plan Federal Costs

ORMSS Forecast of Annual Federal Costs of Extensions and Optimized EDM  
Average of 5 Forecasts



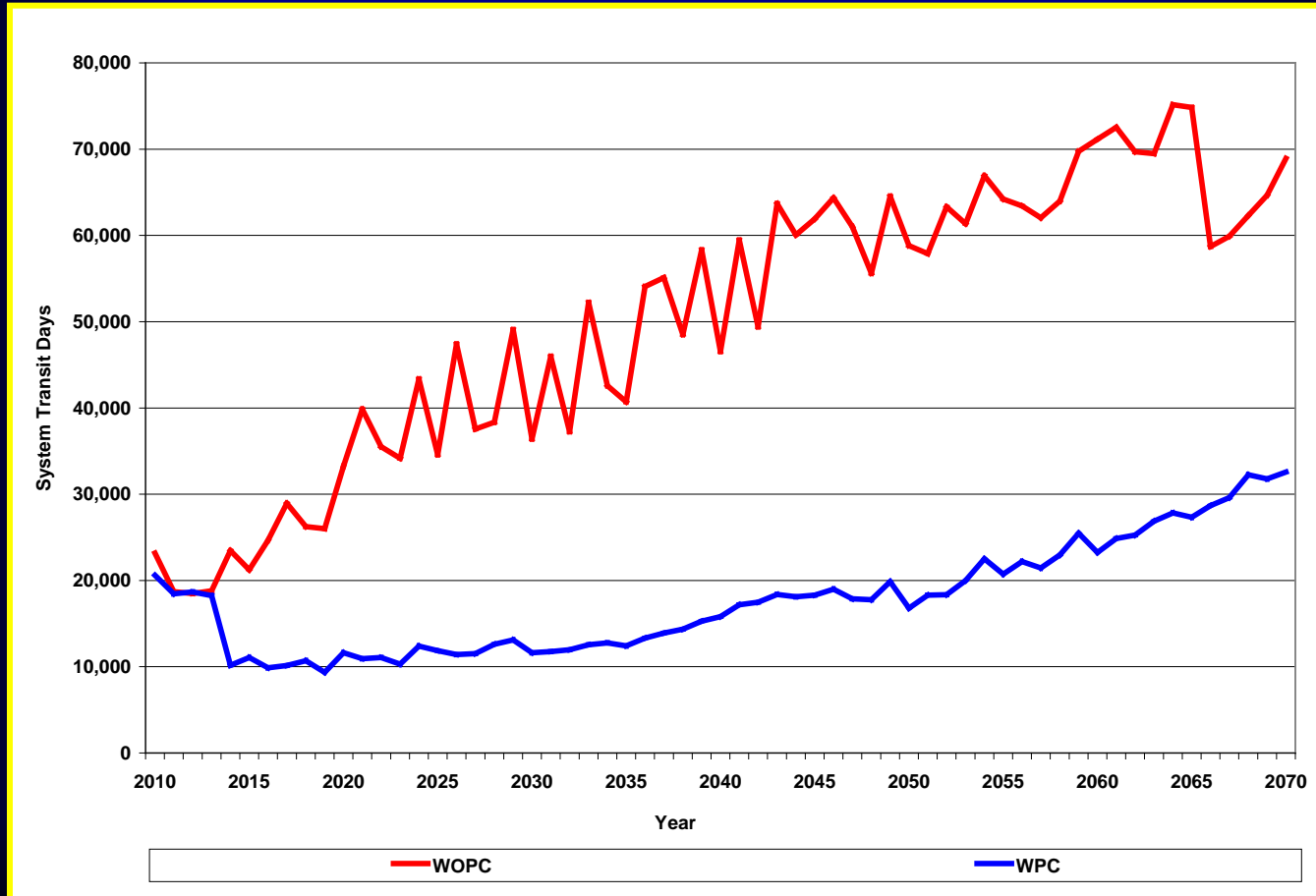


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# Transit Days to Accommodate Equilibrium Traffic





## Conclusions

- ◆ All traffic scenarios indicate future growth.
- ◆ The mainstem locks will degrade without proactive maintenance.
- ◆ Proactive maintenance is robustly justified.
- ◆ Replacement of very old upper Ohio Locks are justified.
- ◆ Need to complete the Upper Ohio River study and initiate studies for several major lock rehabilitations.
- ◆ In general resources are sustainable with the exception of Mussels and Riparian/floodplain resources.
- ◆ Opportunities exist to improve ecosystem sustainability for the Ohio River.
- ◆ The SIP is not budget constrained. Need to develop a budget constrained and comprehensive Inland Navigation System SIP



# Recommendations

- ◆ **Increase O&M funding**
- ◆ **Complete all authorized navigation improvements**
- ◆ **Complete work on the Markland gates as soon as possible**
- ◆ **Provide optimal funding for the Upper Ohio River Study**
- ◆ **Initiate main chamber rehabilitation studies for Meldahl, Hannibal, and Myers**
- ◆ **Finalize Endangered Species Act consultation (Section 7)**
- ◆ **Seek funding for the Ohio River Ecosystem Restoration Program**
- ◆ **Initiate Ohio River Navigation Stewardship program**
- ◆ **Initiate Ohio River Basin Comprehensive Study**



## Remaining Steps

- ◆ **Draft SIP Report 60 day public review period ends 25 July**
- ◆ **Public meetings were held in June 2006**
  - **Metropolis, IL; Evansville, IN; Covington, KY; Marietta, OH; Huntington, WV; Monaca, PA**
- ◆ **Revise SIP based on public comments received**
- ◆ **For more information:**  
**<http://www.lrl.usace.army.mil/ORMSS/>**

*Changing today to meet tomorrow's  
challenges!*



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