

Marcellus Shale Advisory Commission
Infrastructure
May 9, 2011

Highway System Impacts

Scott Christie, P.E., Deputy Secretary
Highway Administration
PA Department of Transportation

Statewide Highway Statistics

- **122,000 miles of roadway in Pennsylvania**
 - 75,000 miles are considered Rural
- **PennDOT owns and operates 40,000 miles, including 25,000 bridges.**
- **Municipalities own and operate 78,000 miles**
- **Other agencies own and operate 4,000 miles**



Marcellus Truck Summary

- Road/Pad Construction
 - 6 to 8 wells per pad
 - 250-300 trucks
- Drilling Activities
 - 25-30 trucks
- Fracking Activities
 - 1,000 - 1,200 trucks
- Average ~1,400
Trucks per well



Roadway Deterioration – Pavement to Mud



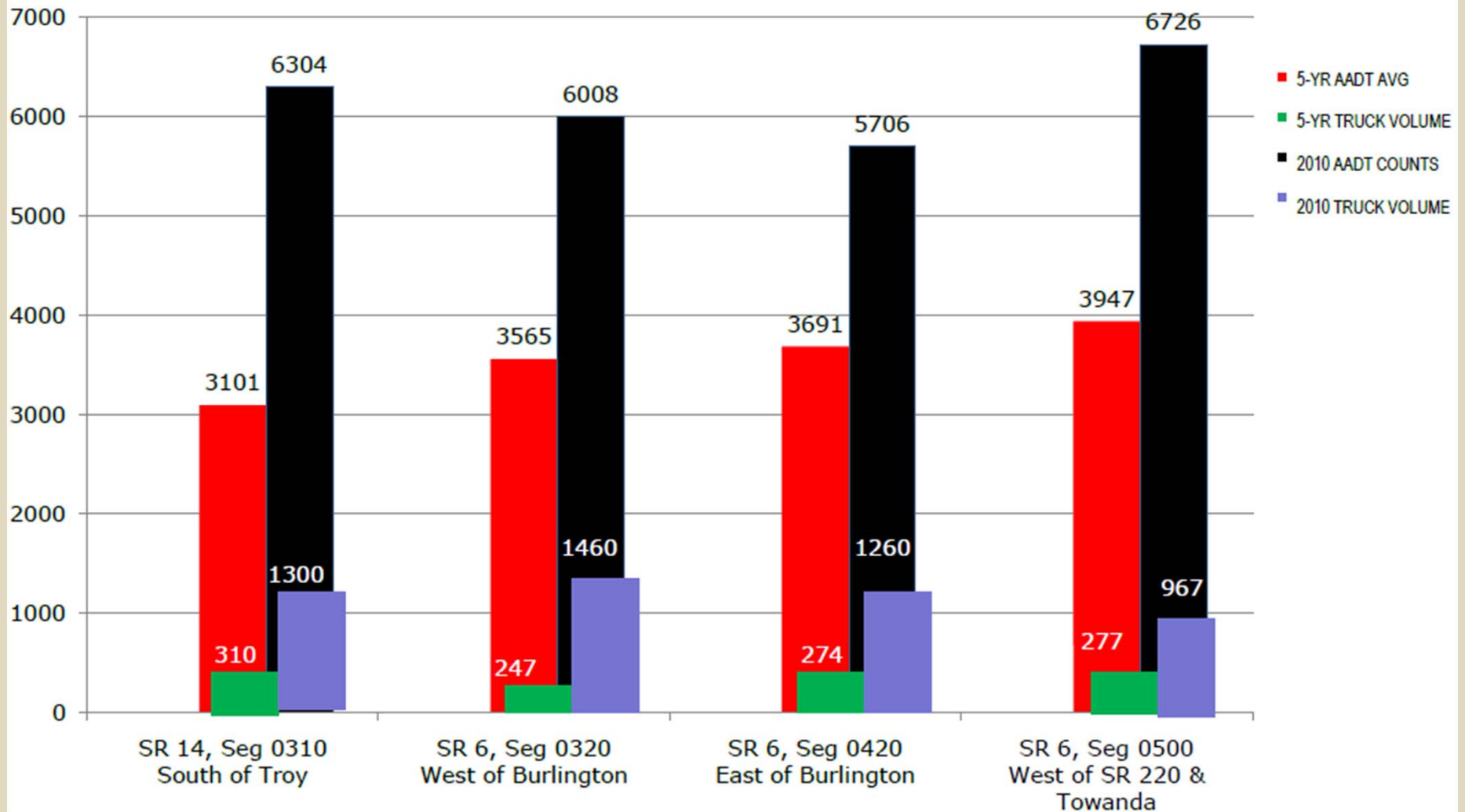
SR 3020 Bradford County – 8/23/2009



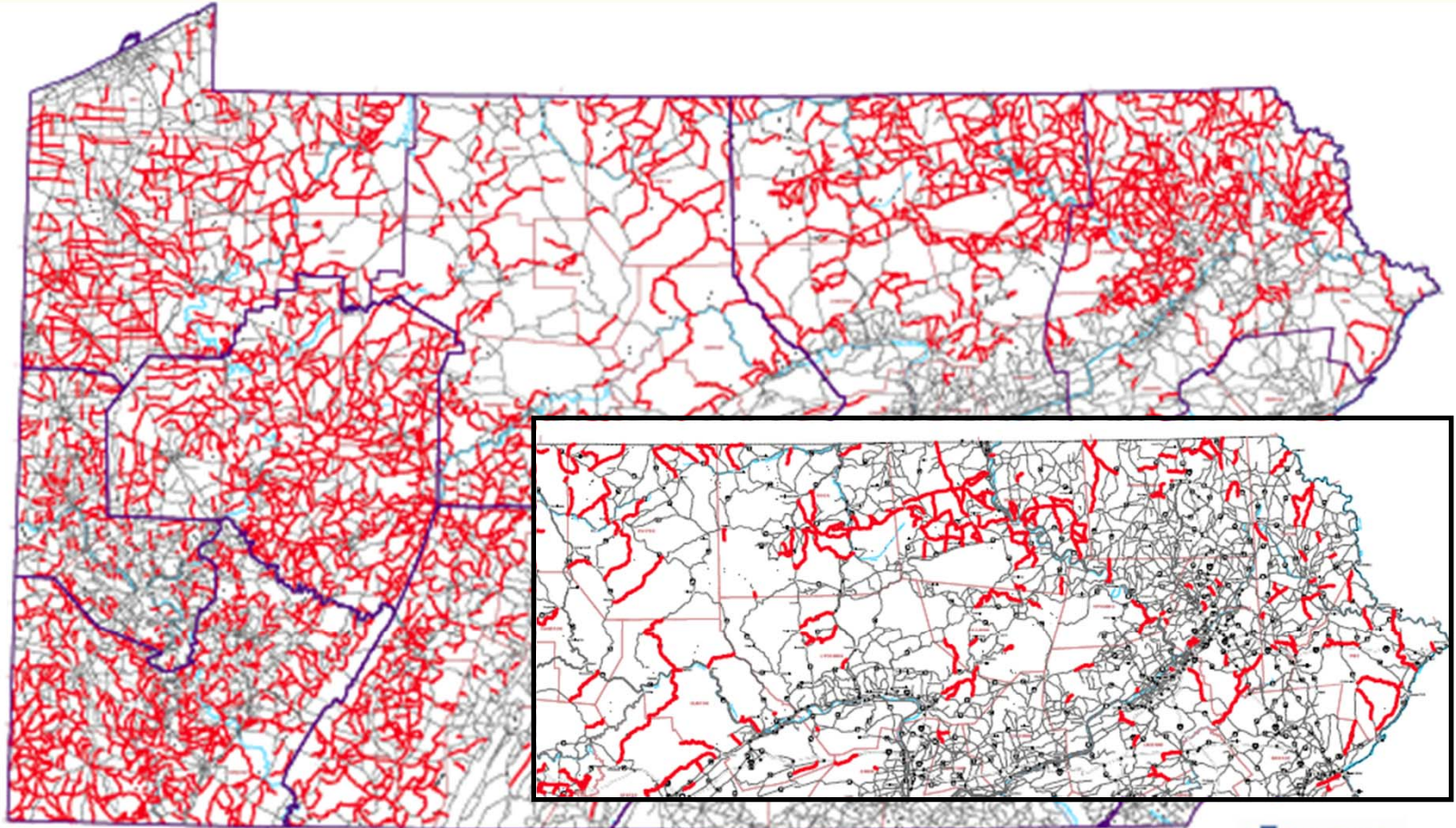
SR 3020 Bradford County – 3/16/2010

Truck Traffic Increase

Bradford County Traffic 5-Year Average vs. 2010 Counts



Posted State Routes



Legend

— Posted State Roads



Process to Haul on Posted Roads

1. Sign Excess Maintenance Agreement
2. Provide security
 - Usually \$12,500/mi.
3. Document initial condition
4. Obtain Permit

Process allows Dept. to
recover damage costs



Bonded and Damaged Miles

Districts	Marcellus Bonded Data		
	Bonded Miles	Miles of Minor Damage	Miles of Significant Damage
1	16	0	0
2	288	96	0
3	1026	349	165
4	313	19	4
9	39	0	0
10	97	2	3
11	6	0	0
12	673	452	3
Totals	2,458	918	175

Data as of 05.06.2011

Infrastructure Costs

Non-posted roads



Current Miles of Accelerated Damage:

- NHS (Non-Interstate): ~100 miles
- > 2000 ADT: ~325 miles
- <2000 ADT: ~1,000 miles
- No process to recover damage costs

Based on 35,000 wells by 2020

- ~50M trucks to support well activities
- \$40M annual damage cost



Damage Assessment

Current Damage

- Perform weekly surveys on industry routes
- Notifications to ensure damages are fixed
- Needed for State and Local roads

Future Impacts

- Expand current study of non posted State and Local roads
- Update to keep current with industry projections

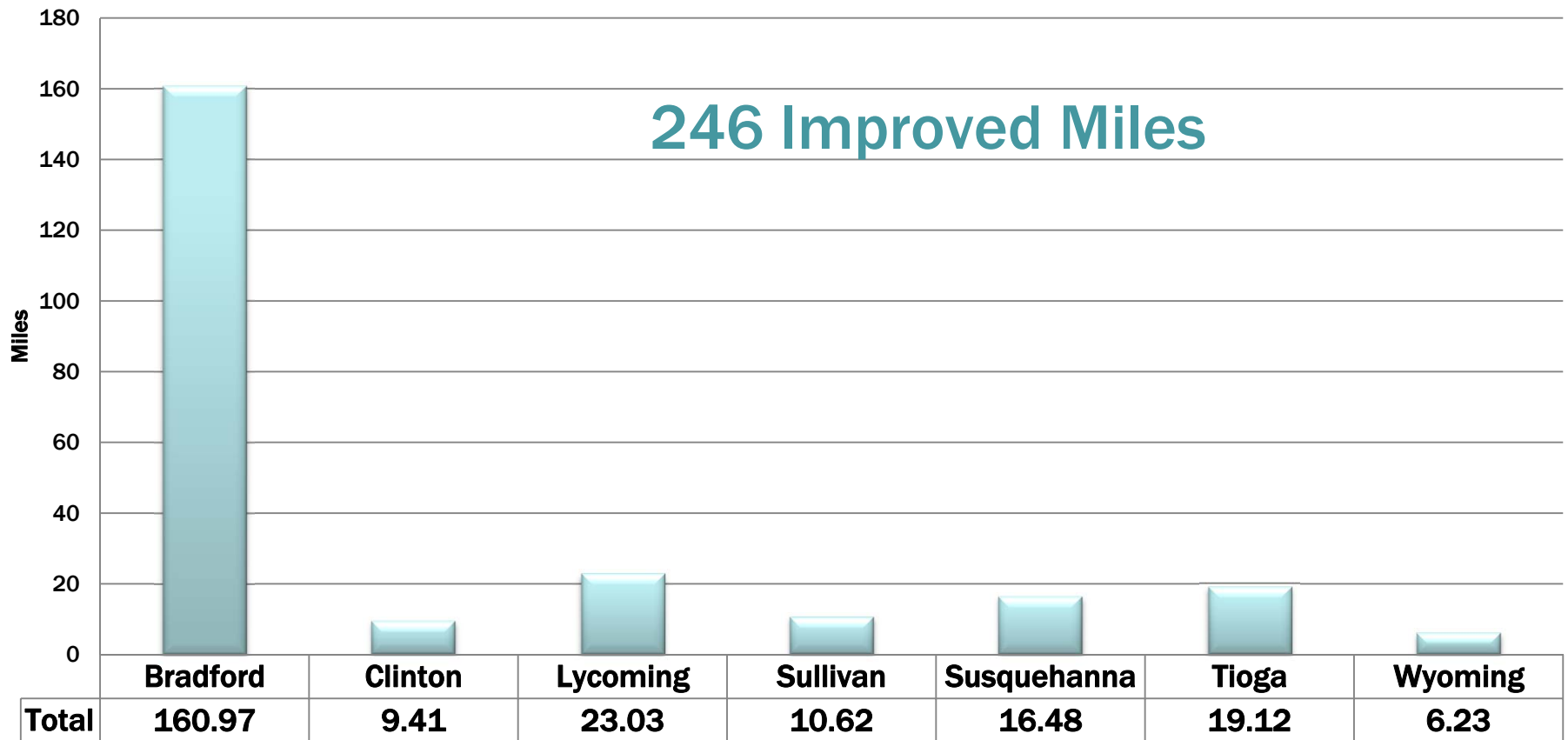
Other Department Costs

- **Initial Posting**
 - Engineering studies
 - Making / installing signs
- **General Administration**
 - Process agreements/permits
 - Coordination with haulers
 - Damage enforcement
 - Invoices preparation
- **Plan Reviews for Roadway Improvements**
- **Policy / Central Office staff**
- **Inspections (\$1M billed to industry in 6 mo.)**
 - Weekly surveys
 - Construction (repairs / improvements)

~3-4M / year

Industry Improvements

Miles of Roadway Improvements



Industry Improvements

- Improvements include
 - Full Depth Reclamation
 - Structural Overlays
 - Mill and Fill
- PennDOT est. of \$75M
- Planned improvements
 - Already aware of 65 miles of improvements started or planned for 2011
 - Main construction season just starting



SR 3006 Susquehanna County

Industry Improvements

- **Full Depth Reclamation** (124 miles, \$54.1M)
 - 6" to 12" of old asphalt/base pulverized
 - Mix with cement and water
 - Compacted to make durable base
 - Overlay with asphalt (2" to 7")

\$150,000/mile ave.

~\$44,000/inch/mile
- **Structural Overlays** (103 miles, \$16.2M)
 - 3" to 7" of asphalt on top of existing asphalt

~\$44,000/inch/mile
- **Mill and Fill** (10 miles, \$2.7M)
 - Grinding away 2" to 7" of existing pavement
 - Replace with new asphalt

~\$17,000/inch/mile

~\$44,000/inch/mile

Industry Improvements



SR 3020 Bradford County – Nov. 2010

IMPACT SUMMARY

- **Cost Recovery on Non Posted Roads – State and Local**
- **Recovery of Support/Administration Costs**