

# Pennsylvania's Climate Change Activities

Danielle Spila  
Pennsylvania DOT  
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# Climate Change Action Plan

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- 2008 - Advisory Committee established
- October 2009 – Action plan developed
  - 42% CO2 reduction below 2000 levels by 2020
  - 52 work plans recommended to Governor
- Sectors include:
  - Electricity generation, transmission and distribution
  - Residential and commercial buildings
  - Land use and transportation
  - Industry
  - Waste
  - Agriculture
  - Forestry
- Update every three years

# Transportation and Land Use

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- ◉ PA Clean Vehicles Program
- ◉ Biofuel Development
- ◉ Diesel Anti-Idling Program
- ◉ Low Rolling Resistance Tires
- ◉ Eco-driving
- ◉ Public transportation
  - Increase ridership through existing and new programs
- ◉ Federal funding for freight and transit
- ◉ Land use program
  - More efficient use of existing programs and new laws and programs

# State Climate Adaptation Plan

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- ◉ Deliver to CCAC January 2011
- ◉ Working Groups
  - Natural Resources
  - Public Health and Safety
  - **Infrastructure**
  - Tourism and Outdoor Recreation
- ◉ Priorities and Practical Recommendations

# Climate Change Adaptation Subcommittee on Infrastructure

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- ◉ Water infrastructure
- ◉ Energy
- ◉ Land Use
- ◉ Insurance
- ◉ Land Development
- ◉ Buildings
  
- ◉ **Transportation**

# Topics for Consideration

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- Vulnerabilities
- Risks
- Implementation strategies and data gaps
- Prioritization

**Pennsylvania Climate Change Adaptation Plan**

**Infrastructure Subcommittee**

July 19, 2010

Current and Future Climate Changes Relevant to Infrastructure	Sector	Vulnerabilities	Risk	Adaptation Strategy Recommendations
Higher Temperatures during summer months and extreme heat events	Transportation	Buckling of roadways and/or bridges due to concrete expansion and softening of bituminous pavements	State maintains over 40,000 miles of roadways and 25,000 bridges . Local system includes over 70,000 miles of roadway and 6,300 bridges over 20 feet in length and an unknown number of bridges less than 20 feet.	Review available research for potential materials that can withstand higher temperatures
		Higher temperatures may impact construction schedules due to impacts on materials and personnel	Materials may not set or cure due to higher temperatures and works are more susceptible to heat related injuries	Perform work activities during cooler portions of the day, i.e. work during the night time hours
		Buckling of paved runways	Pavement deformations create a hazard to aircraft tires during critical high-speed takeoffs and landings.	More frequent inspections and installation of heat/pressure sensors in the pavement for real-time anticipation of failure.
		Thermal misalignment of passenger and freight railways	Extreme heat can cause rail lines to expand creating the phenomenon known as a sun kink or nervous rail. This adversely affects the rail gauge and if left unrepaired could cause trains to derail.	More frequent inspections and additional tie anchors will need to be installed to all of the approximately 12,000 miles (2 rails per 6,000 liner miles of track) of track in the Commonwealth.
		High impact thunderstorms	Increased risk of lightning strikes, hail and tornados causing airport closures, delays	Improve forecasting techniques Prepare for flight delays and diversions
		Invasive plant species management	Invasive species encroach on right of way and limit sight distances causing safety issues.	Research and employ herbicide management techniques to control invasive species

# PA Climate Changes Relevant to Infrastructure

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- Higher temps during summer months/extreme heat events
- Drier summers/Drought
- More high impact storms with more flooding
- **Wetter winters/more intense winter storms**
- Sea Level Rise – salt water intrusion



# Wetter Winters/More Impact Storms

draft

Vulnerability	Risk	Adaptation Strategy Recommendation
Winter Flooding – increased damage from ice jams/debris blocking water flow	25,000 state owned Bridges -Increased funding for emergency maintenance -Safety and economic issues due to flooded roadways and closed/restricted bridges	Design Standard changes  Improved emergency procedures including communication
Roadway degradation due to more water in soil and increased Freeze thaw cycle	Increased funding required to fix potholes and supportive road bases	Research and employ different materials that reduce roadway penetration
Runway degradation	Pavement deformation creates hazards for 134 public use airports	More frequent inspections/ real time pothole repair
Wind Shear	Closure of airports/aircraft mishaps  Cancellation of more flights	More terminal space needed for delayed flights/ purchase additional forecasting equipment
Erosion of rail beds and ballast	6000 miles of railroads. Many parallel rivers and are susceptible to erosion, undercutting, complete washout	Increased inspection – Construction of comprehensive levee system.

