

The Economic Value of Preserved Open Space

Mercer County, New Jersey

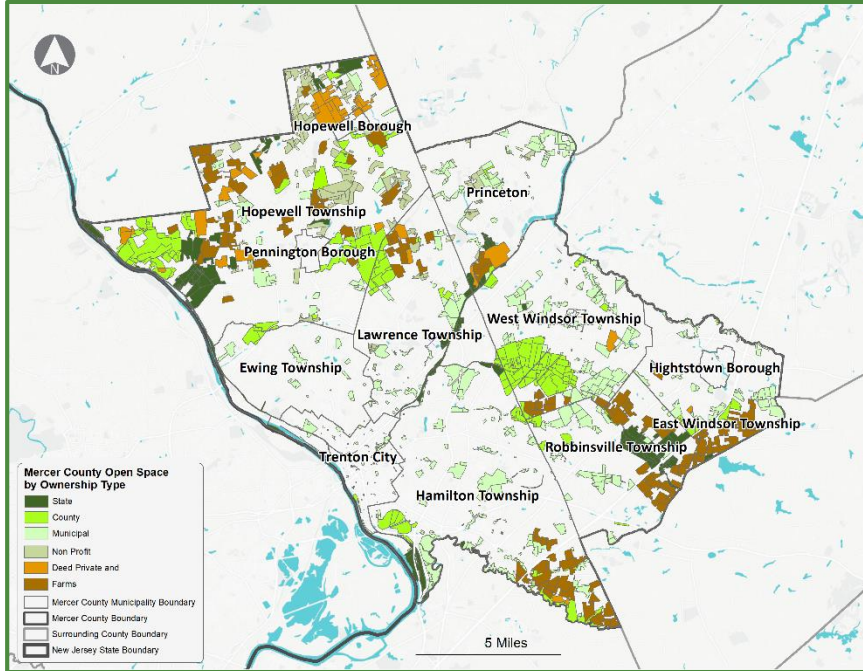


Prepared by

ESI ECONCONSULT
SOLUTIONS INC.

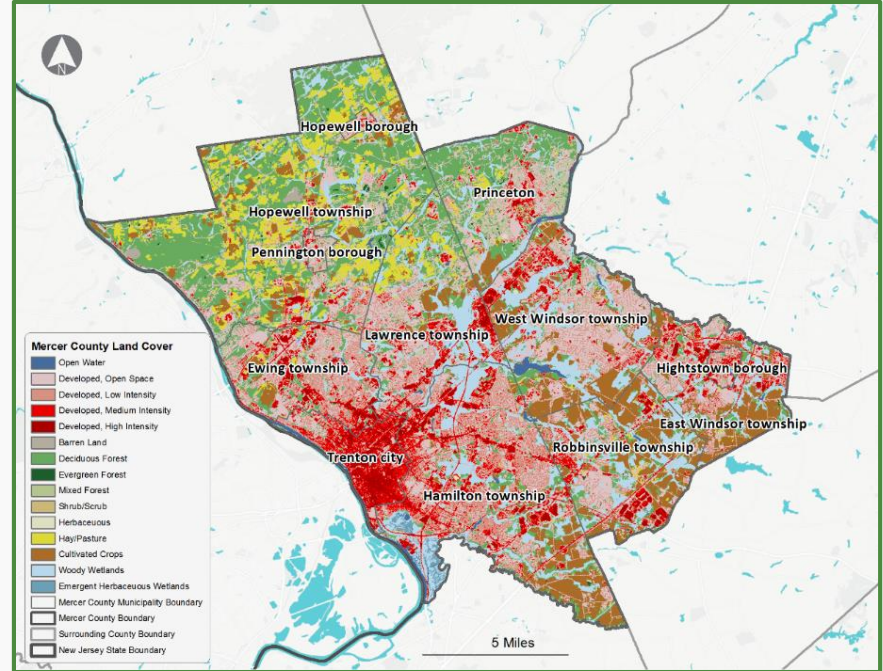
Mercer County Open Space and Land Cover

Open Space



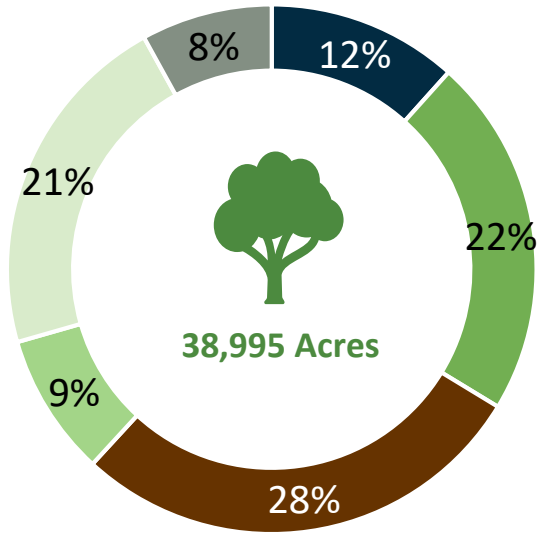
Source: Mercer County Open Space (2020)

Land Cover



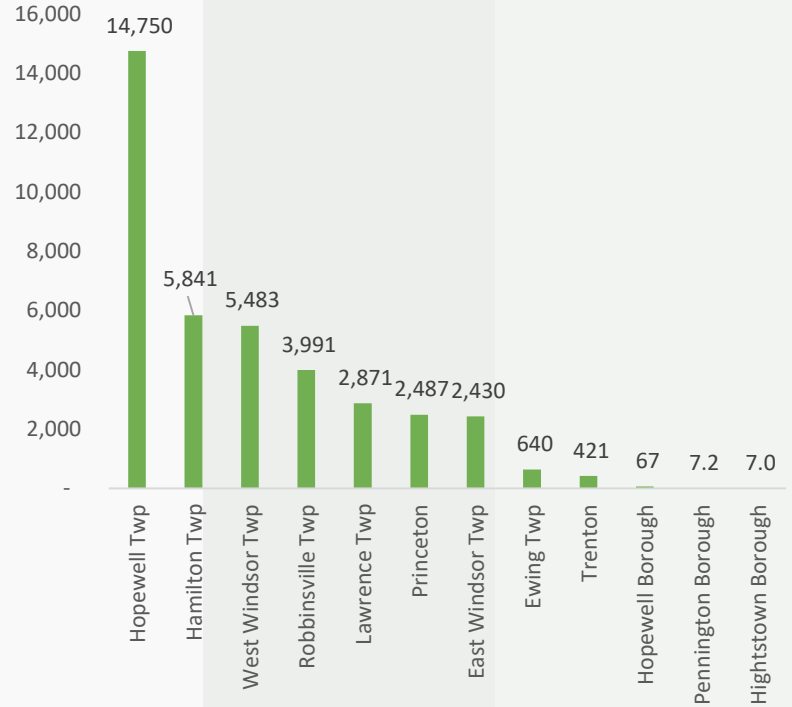
Source: Multi-Resolution Characteristics Consortium Land Cover (2019)

A total of 38,995 acres of protected open space in Mercer County



- State
- County
- Municipal
- Nonprofit
- Protected Farms
- Conservation and Deed Restricted

Area of Protected Open Space by Municipality



Source: Mercer County Open Space (2020)

Return on Environment

Open Space Adds Economic Value in Four Ways



Home and Property Values



Economic Activity



Environmental Services



Direct Use Benefits
Health & Recreation



Home and Property Values

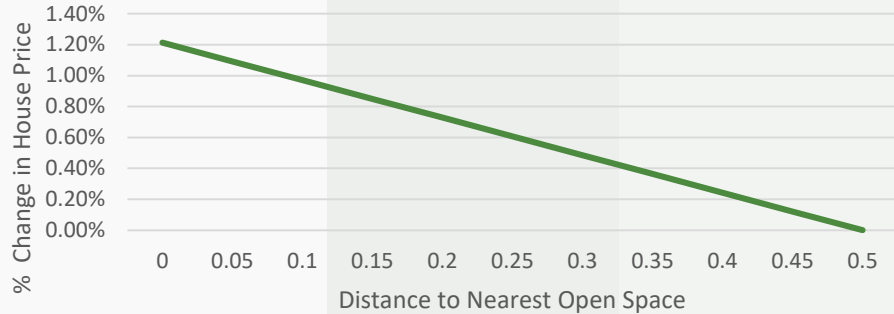
Total Economic and Fiscal Value of Proximity to Open Space



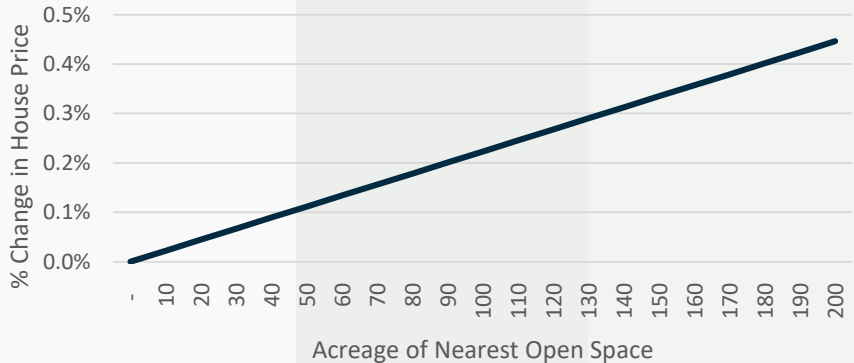
Hedonic regression models of housing transaction isolate the market value from proximity to open space, holding all other housing and community features constant.

Property Impacts from Open Space in Mercer County

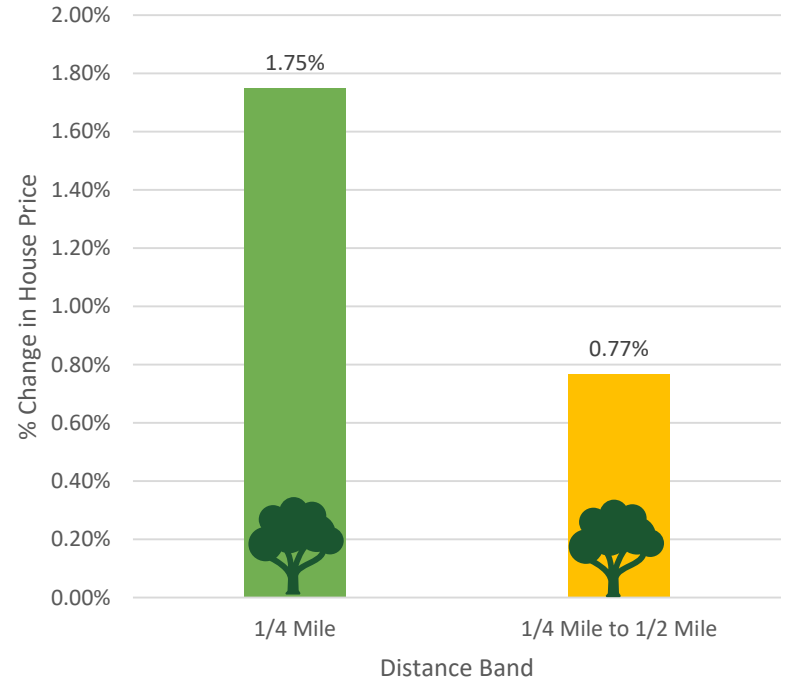
Impacts from the Nearest Open Space Dissipates as Distance Increases



Larger Nearest Open Space Generates Bigger Impacts

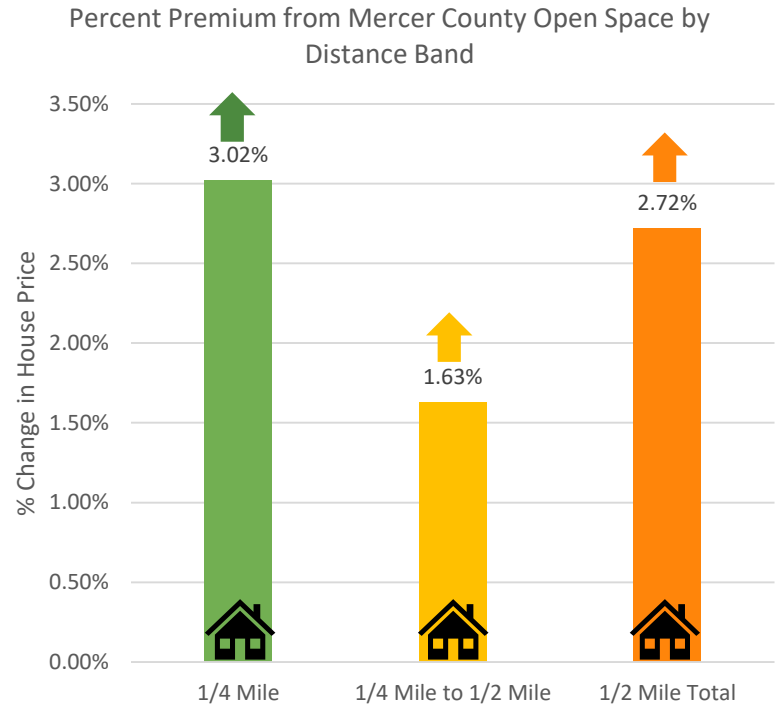


More than 50 Acres of Total Open Space within ¼ mile and ½ Mile Distance Band Generates Additional Impacts

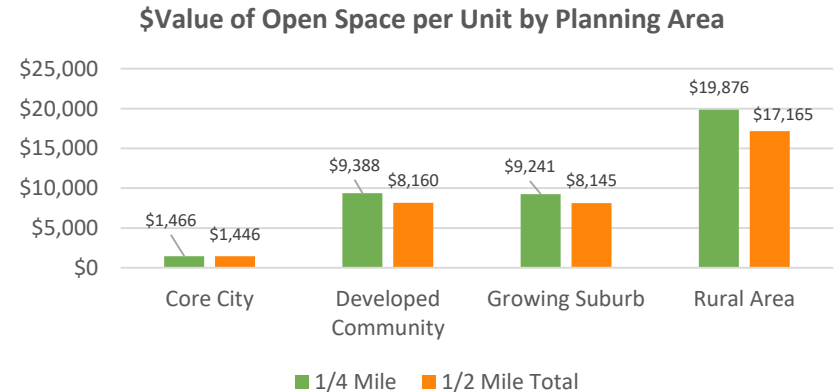
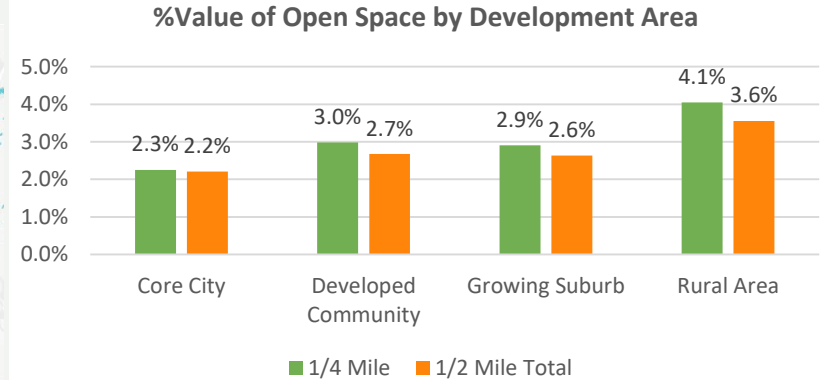
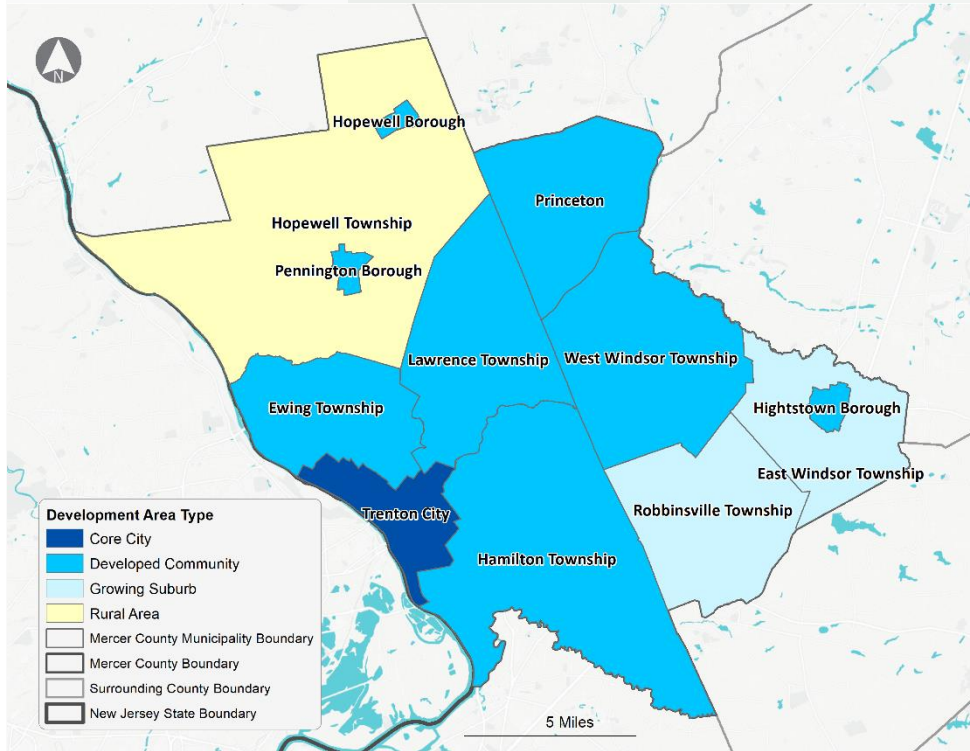


Total Open Space Impacts within ¼ mile and ½ Mile Distance Band

	1/4 Mile	1/4 Mile – 1/2 Mile	1/2 Mile Total
Total Number of Houses	87,776	22,726	110,502
Total Assessment Value (\$M)	\$22,837	\$6,219	29,056
Total \$ Value of Open Space (Assessed Value, \$M)	\$690	\$101	\$791
Total % Value of Open Space	3.02%	1.63%	2.72%
Total \$Value/Housing Unit (Assessed Value)	\$7,857	\$4,448	\$7,156
Total Property Tax Value (\$M)	\$19	\$3	\$21
Total Property Tax/Housing Unit	\$214	\$119	\$194



Total Open Space Impacts within ¼ mile and ½ Mile Distance Band by Different Development Areas

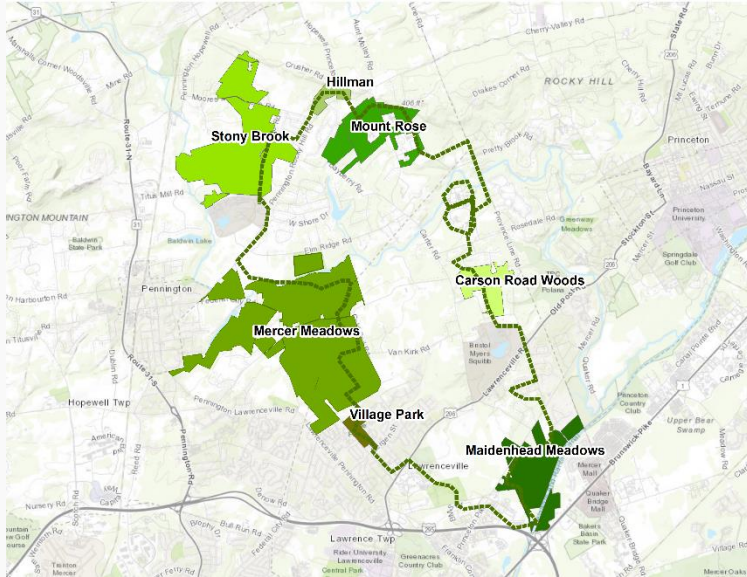


Source: Econsult Solutions (2018), DVRPC (2015)

The Economic Impacts of Preserved Open Space in Mercer County, New Jersey

Case Study: Preserved Open Space near Lawrence Hopewell Trail

Including Mercer Meadows, Stony Brook, Village Park, Carson Road Woods, Mount Rose, Hillman, Maidenhead Meadows



Case Study: Preserved Open Space near Lawrence Hopewell Trail

Including Mercer Meadows, Stony Brook, Village Park, Carson Road Woods, Mount Rose, Hillman, Maidenhead Meadows



Total Property Impact within ½ Mile from Parks near Lawrence Hopewell Trail

	1/2 Mile Total
Total Number of Houses within 1/2 Mile	4,810
Total Assessment Value	\$2,230,860,700
Total \$ Value of Open Space	\$352,578,640
Total % Value of Open Space	15.8%
Total \$Value/Housing Unit (market value)	\$73,301
Total Tax Value	\$2,328,594
Total Tax/Housing Unit	\$484

Case Study: Preserved Open Space near Lawrence Hopewell Trail

Including Mercer Meadows, Stony Brook, Village Park, Carson Road Woods, Mount Rose, Hillman, Maidenhead Meadows



\$0.5M in total annual Air Pollution Removal Benefits

- Ozone: \$436,604
- Particulate Matter-10: \$12,016
- Nitrogen Dioxide: \$40,784
- Sulfur Dioxide: \$5,179
- Carbon Monoxide: \$998



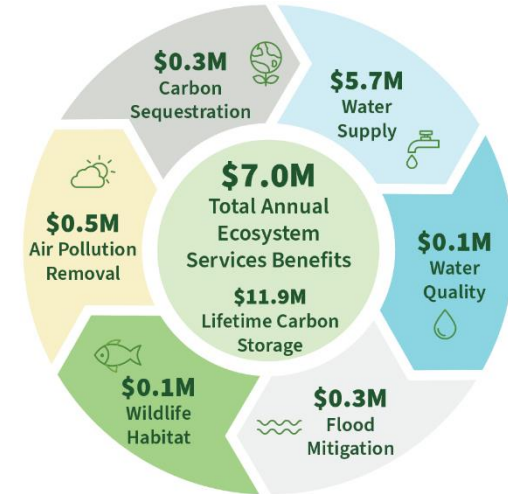
\$11.9M in lifetime carbon storage

- 69,978 tons of carbon stored in a lifetime

\$0.3M annually in carbon sequestration

- 1,707 tons of carbon sequestered annually

Annual Environmental Benefits by Type Parks near Lawrence Hopewell Trail



Case Study: Mercer Meadows



Total Property Impact within ½ Mile from Mercer Meadows

	<u>1/2 Mile Total</u>
Total Number of Houses within 1/2 Mile	839
Total Assessment Value	\$396,161,600
Total \$ Value of Open Space	\$59,958,387
Total % Value of Open Space	15.1%
Total \$Value/Housing Unit (market value)	\$71,464
Total Tax Value	\$1,622,118
Total Tax/Housing Unit	\$1,933

Case Study: Mercer Meadows



\$0.2M in total annual Air Pollution Removal Benefits

- Ozone: \$142,750
- Particulate Matter-10: \$3,950
- Nitrogen Dioxide: \$13,350
- Sulfur Dioxide: \$1,700
- Carbon Monoxide: \$350



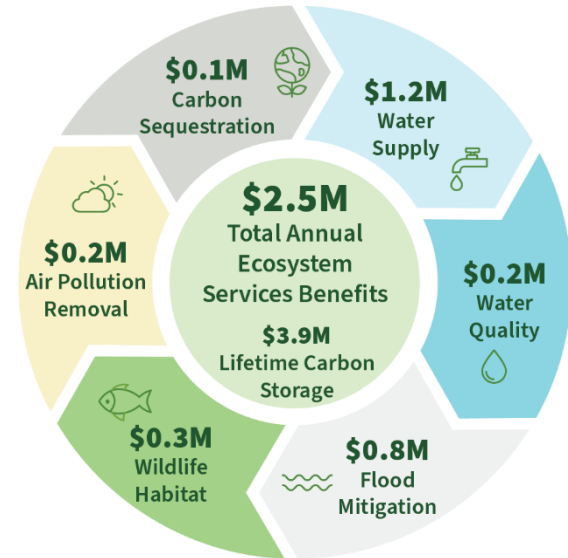
\$3.9M in lifetime carbon storage

- 22,880 tons of carbon stored in a lifetime

\$0.1M annually in carbon sequestration

- 560 tons of carbon sequestered annually

Annual Environmental Benefits by Type Mercer Meadows



Case Study: South Riverwalk Park



Case Study: South Riverwalk Park



Total Property Impact within 1/4 Mile

	1/4 Mile Total
Total Number of Houses within 1/4 Mile	742
Total Assessment Value	\$44,648,900
Total \$ Value of Open Space	\$1,713,829
Total % Value of Open Space	3.8%
Total \$Value/Housing Unit (market value)	\$2,310
Total Tax Value	\$87,799
Total Tax/Housing Unit	\$118



Economic Activity

Economic Activity

Categories of Economic Impact



Protected Farmland

Agricultural activities occurring on protected farmland.



Protected Open Space

Management and maintenance expenditures at public parks (state, county, and municipal).



Open Space Related Tourism

Expenditures associated with protected open space tourism.

Total Annual Economic and State Tax Revenue Impact

OPEN SPACE RELATED TOURISM

\$42M Annual Impact

Supporting 410 Jobs

\$14M in Earnings

\$900K Generated in State Taxes



\$42M
Open Space
Related
Tourism

PROTECTED FARMLAND

\$7M Annual Impact

Supporting 110 Jobs

\$2M in Earnings,

\$120k Generated in State Taxes



\$7M
Protected
Farmland



\$55M
Protected
Open Space

PROTECTED OPEN SPACE

(maintenance & upkeep)

\$55M Annual Impact

Supporting 460 Jobs

\$24M in Earnings,

\$890k Generated in State Taxes

Case Study: Agricultural Diversity in Mercer County



Annual Estimated Economic Impact of Ancillary Spending from Attendees of Howell Living History Farm

	Mercer County
Direct Output (\$M)	\$1.8
Indirect and Induced Output (\$M)	\$1.0
Total Output (\$M)	\$2.7
Employment	30
Labor Income	\$1.0

Environmental Services



Economic Activity

Categories of Environmental Services



Air Pollution Removal



Water Supply Protection



Water Quality Improvement



Flood Mitigation

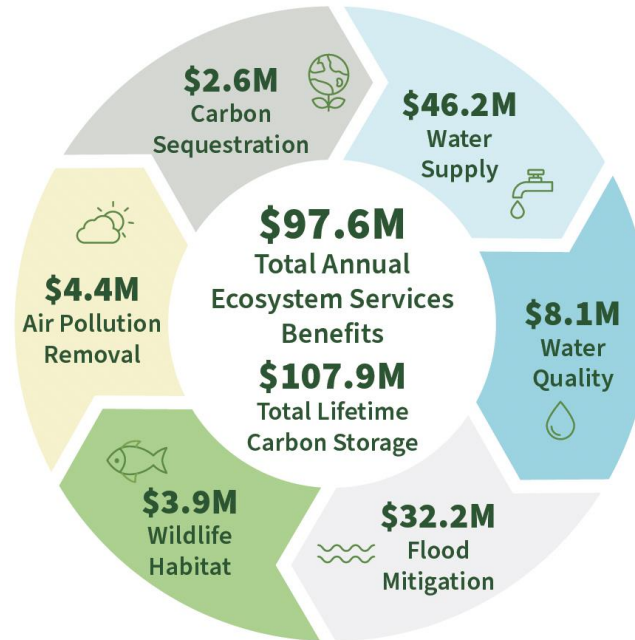


Wildlife Habitat Conservation



Carbon Sequestration and Storage

Total Environmental Benefits Summary



Air Pollution Removal and Carbon Sequestration and Storage Benefits Summary



\$4.5M in total annual Air Pollution Removal Benefits

- Ozone: \$3.9 million
- Particulate Matter-10: \$108,000
- Nitrogen Dioxide: \$368,000
- Sulfur Dioxide: \$46,000
- Carbon Monoxide: \$9,000



16,283 acres of tree cover

\$2.6M annually in carbon sequestration

- 15,400 tons of carbon sequestered annually

\$107.9M in lifetime carbon storage

- 632,000 tons of carbon stored in a lifetime

Stormwater Runoff and Pollution Mitigation Analyses

- Protected open space generates much less stormwater volume than unprotected lands and allows much less rainfall to reach streams as runoff, mitigating erosion, flooding, and pollutant loadings that degrade water quality.
- DVRPC hired Stroud Water Resource Center to run their Model My Watershed program to estimate:
 - the avoided stormwater runoff from 2-year storm events and annual averages
 - the avoided increase in annual average pollutant loadings for total nitrogen, total phosphorus and sediment
- Stroud's analysis funded through a separate program, the DRWI Data, GIS and Modeling Help Desk, supported by William Penn Foundation.

Avoided Increase in Stormwater Runoff Due to Protected Open Space in Mercer County

	Total Avoided Stormwater Volume	Percent Increase in Stormwater Volume – Protected Open Space vs Unprotected Lands
Average Annual Runoff	1.62 billion gallons per year	8.5%
2-Year Storm Event Runoff	255 million gallons per storm event	5%

Stormwater Pollutants Avoided Due to Protected Open Space in Mercer County

Pollutant	Total Increase in Annual Pollutant Loading – Watershed (lbs / year)	Total Avoided Annual Pollution Reduction Cost (\$)	Average Annual Cost per year per Acre of Protected Space (\$)
Total Nitrogen	69,162	\$314,400	\$8
Total Phosphorus	22,822	\$7.6 million	\$196
Sediment	64.7 million	\$94.1 million	\$2,149
		\$102.1 million	\$2,623

Stormwater Management Costs Avoided

Avoided Capital Costs for Construction of Infrastructure for 2-Year Storm Event

\$0.26 per gallon runoff

\$66.8 million total capital costs

\$1,167 per acre of protected open space

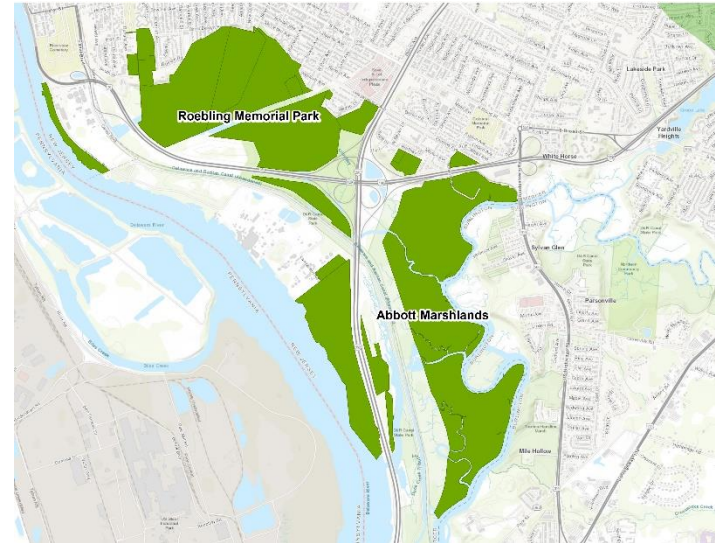
Avoided Annual Costs for Operation and Maintenance of Infrastructure for 2-Year Storm Event

\$0.03 per gallon runoff

\$8.9 million per year O&M cost

\$156 per year per acre of protected open space

Case Study: Roebling Memorial Park and the Abbott Marshlands



Case Study: Roebling Memorial Park and the Abbott Marshlands



Total Property Impact within ½ Mile Roebling Memorial Park and the Abbott Marshlands

	<u>1/2 Mile Total</u>
Total Number of Houses within 1/2 Mile	3,433
Total Assessment Value	\$466,417,000
Total \$ Value of Open Space	\$15,742,958
Total % Value of Open Space	3.4%
Total \$Value/Housing Unit (market value)	\$4,586
Total Tax Value	\$465,816
Total Tax/Housing Unit	\$136

Case Study: Roebling Memorial Park and the Abbott Marshlands



\$0.1M in total annual Air Pollution Removal Benefits

- Ozone: \$69,150
- Particulate Matter-10: \$1,900
- Nitrogen Dioxide: \$6,450
- Sulfur Dioxide: \$800
- Carbon Monoxide: \$150



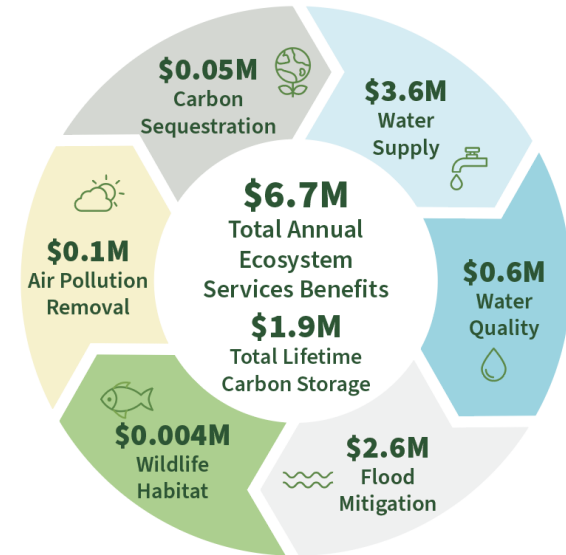
\$1.9M in lifetime carbon storage

- 11,085 tons of carbon stored in a lifetime

\$0.05M annually in carbon sequestration

- 270 tons of carbon sequestered annually

Annual Environmental Benefits by Type Roebling Memorial Park and the Abbott Marshlands

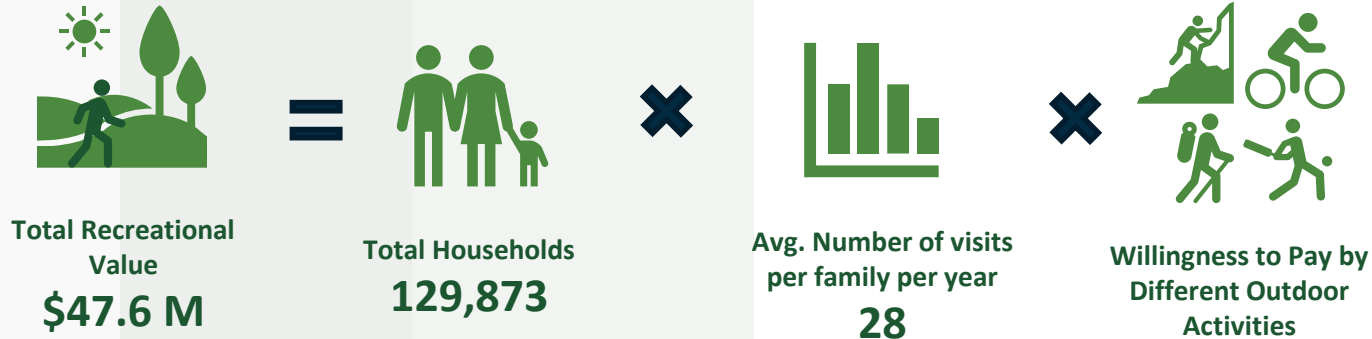


Direct Use Benefits



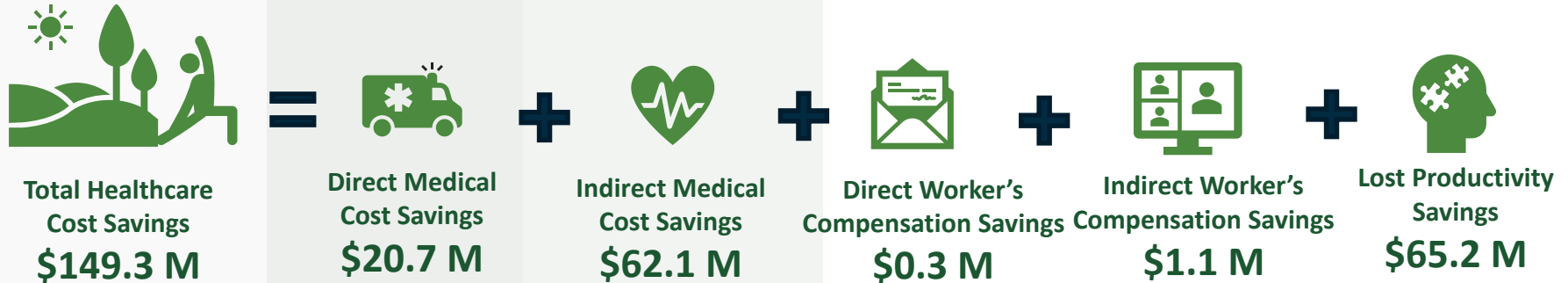
Direct Use Benefits

- Preserved open space provides value through the recreational activities enjoyed on the open space
- Values are determined based on a consumer's "willingness to pay" (WTP) for the recreational experience
- The amount of money residents save by not having to pay market rates to partake in the recreational activities provided by the open space

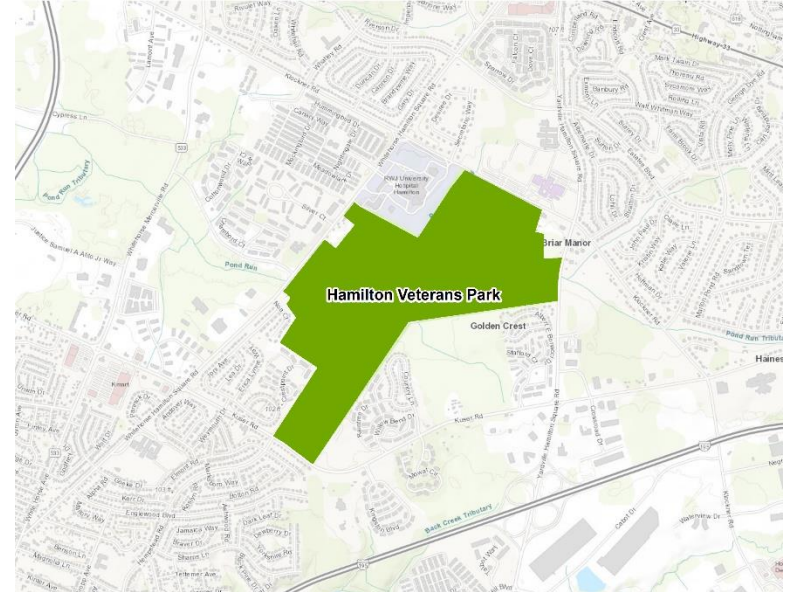


Healthcare Cost Savings

- There is a positive relationship between the number of recreational opportunities available to an individual and the frequency of his or her participation in physical activity.
- This section seeks to use US Census data, National Outdoor Recreation Survey to quantify those benefits derived from engaging in physical activity on Mercer County's protected open spaces.



Case Study: Hamilton Veterans Park



Case Study: Hamilton Veterans Park



Total Property Impact within 1/2 Mile Hamilton Veterans Park

	1/2 Mile Total
Total Number of Houses within 1/2 Mile	4,139
Total Assessment Value	\$891,913,480
Total \$ Value of Open Space	\$84,893,240
Total % Value of Open Space	9.5%
Total \$Value/Housing Unit (market value)	\$20,511
Total Tax Value	\$2,322,679
Total Tax/Housing Unit	\$561

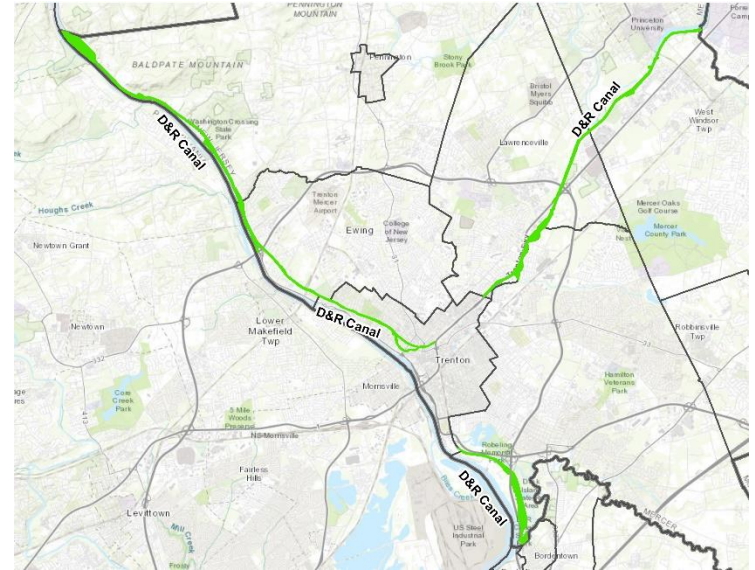
Case Study: Hamilton Veterans Park



**Total Population and Age 55+ Population in
Census Tracts within ½ Mile from Hamilton Veterans Park**

Year	Total Population	Age 55+	Age 55+ %
2010	28,356	9,398	33%
2015	27,557	10,656	39%
2019	27,388	11,184	41%

Case Study: Delaware and Raritan (D&R) Tow Path



Case Study: Delaware and Raritan (D&R) Tow Path



Total Property Impact within 1/2 Mile D&R Tow Path

	<u>1/2 Mile Total</u>
Total Number of Houses within 1/2 Mile	13,102
Total Assessment Value	\$2,161,378,400
Total \$ Value of Open Space	\$192,716,645
Total % Value of Open Space	8.9%
Total \$Value/Housing Unit (market value)	\$14,709
Total Tax Value	\$6,427,577
Total Tax/Housing Unit	\$491

Case Study: Delaware and Raritan (D&R) Tow Path



\$0.1M in total annual Air Pollution Removal Benefits

- Ozone: \$109,223
- Particulate Matter-10: \$3,006
- Nitrogen Dioxide: \$10,203
- Sulfur Dioxide: \$1,296
- Carbon Monoxide: \$250



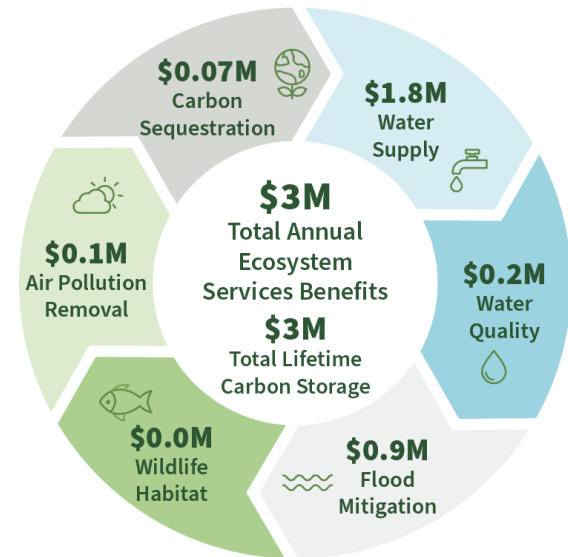
\$3.0M in lifetime carbon storage

- 17,506 tons of carbon stored in a lifetime

\$0.07M annually in carbon sequestration

- 427 tons of carbon sequestered annually

Annual Environmental Benefits by Type Delaware and Raritan (D&R) Tow Path



Summary of Impacts



**Home and
Property Values**



**Economic
Activity**



**Environmental
Services**



**Direct Use
Benefits**
Health & Recreation



PROPERTY VALUE

\$791M

added to the value of housing stock located within a ½ mile of protected open space.

\$7,100+

average increase in the value of homes that are located within a ½ mile of protected open space.

\$21.5M

in annual property tax revenues



ECONOMIC ACTIVITY

\$104M annually

from expenditures associated with protected open space.

980 jobs supported

from open space-related upkeep, protected farmland, and open-space tourism.

\$40M annually

in salaries.



ENVIRONMENTAL

\$97.6M annually

from water supply replenishment, water quality improvement, flood mitigation, wildlife habitat, air pollution removal, and carbon storage in trees.

\$107.9M

value of carbon storage in trees.

\$102.1M annually

in avoided stormwater system maintenance and pollutant removal costs.



DIRECT USE

\$47.6 million annually

in recreation benefits for residents.

\$84.1M annually

in medical costs avoided.

\$65.2M annually

in lost productivity costs avoided.

Thank you!