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**- APPENDIX E -**  
**CRITICAL FACILITIES**

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<b>Emergency Services Facilities</b>		
AMED 400 Tyrone	1216 Blair Ave	Tyrone Municipality
AMED 430 Altoona	1012 7 <sup>th</sup> Ave	Altoona Municipality
AMED 440 Roaring Spring	808 E Main St	Roaring Spring Borough
AMED 480 Lakemont	312 Lotz Ave	Logan Township
Bellwood 450	601 N 3 <sup>rd</sup> St	Bellwood Borough
Duncansville 420	1414 Peach St	Duncansville Borough
Duncansville 429	1934 Plank Rd	Allegheny Township
Hollidaysburg 410	801 Scotch Valley Rd	Hollidaysburg Borough
Hollidaysburg 419	303 W Allegheny St	Martinsburg Borough
Hollidaysburg 419	1381 Plank Rd	Allegheny Township
Williamsburg 490	420 W 2 <sup>nd</sup> St	Williamsburg Borough
Blair County Emergency Operations Center	615 4 <sup>th</sup> St	City of Altoona

<b>Fire Stations</b>				
Tyrone Blazing Arrow Fire Department	1216 Blair Ave	Tyrone	PA	16686
Northern Blair County Forest Fire Crew	1260 Lincoln Ave	Tyrone	PA	16686
Altoona Fire Department	1319 Washington Ave	Altoona	PA	16601
Claysburg Fire Department	13223 Dunnings Hwy	Claysburg	PA	16625
Bald Eagle Fire Department	13389 S Eagle Valley Rd	Tyrone	PA	16686
Freedom Township Fire Department	139 Municipal St	East Freedom	PA	16637
Greenwood Fire Department	1500 E Pleasant Valley Blvd	Altoona	PA	16602
Tyrone Neptune Fire Department	1701 Lincoln Ave	Tyrone	PA	16686
Martinsburg Fire Department	205 S Market St	Martinsburg	PA	16662
Phoenix (Hollidaysburg) Fire Department	206 Wayne St	Hollidaysburg	PA	16648
Pinecroft Fire Department	2134 Old 6th Avenue Rd	Altoona	PA	16601
Geeseytown Fire Department	215 Mary St	Hollidaysburg	PA	16648
Tipton-Antis Fire Department	269 Tipton Road	Tipton	PA	16684
Newburg Fire Department	2808 Washington Ave	Altoona	PA	16601
Williamsburg Fire Department	305 E 2nd St	Williamsburg	PA	16693
Lakemont Fire Department	312 Lotz Ave	Altoona	PA	16602
Duncansville Fire Department	313 14th St	Duncansville	PA	16635
Excelsior (Bellwood) Fire Department	399 S 1st St	Bellwood	PA	16617
Logan United Fire Department	611 Grandview Rd	Altoona	PA	16601
Allegheny Township Fire Department	651 Sugar Run Rd	Altoona	PA	16601
Sinking Valley Fire Department	710 Laurel Ln	Altoona	PA	16601
Friendship Fire Department	808 E Main St	Roaring Spring	PA	16673
Logan Township United (Kittaning Trail) Fire Department	937 Edison Ave	Altoona	PA	16601

Blair Resilience: Addressing Vulnerability & Exposure

<b>Police Stations</b>				
Martinsburg Borough Police Dept	109 S Mulberry St	Martinsburg	PA	16662
Allegheny Township Police Dept	3131 Colonial Dr	Duncansville	PA	16635
Altoona Police Dept	1106 16th St	Altoona	PA	16601
Bellwood Borough Police Dept	516 Main St	Bellwood	PA	16617
Blair Township Police Dept	375 Cedarcrest Dr	Duncansville	PA	16635
Duncansville Boro Police Dept	1146 3rd Ave	Duncansville	PA	16635
Freedom Township Police Dept	131 Municipal St	East Freedom	PA	16637
Greenfield Township Police Dept	477 Ski Gap Rd	Claysburg	PA	16625
Hollidaysburg Borough Police Dept	401 Blair St	Hollidaysburg	PA	16648
Logan Township Police Dept	100 Chief Logan Cir	Altoona	PA	16602
North Woodbury Township Police Dept	113 Cranberry Rd	Martinsburg	PA	16662
Roaring Spring Borough Police Dept	616 Spang St	Roaring Spring	PA	16673
Tyrone Police Dept	1100 Logan Ave	Tyrone	PA	16686
Williamsburg Borough Police Dept	305 E 2nd St	Williamsburg	PA	16693
Pennsylvania State Police Troop G	1510 North Juniata St	Hollidaysburg	PA	16648

<b>Hospitals</b>				
UPMC Altoona	620 Howard Avenue	Altoona	PA	16601
James E Van Zandt Va Medical Center	2907 Pleasant Valley Boulevard	Altoona	PA	16602
Healthsouth Rehabilitation Hospital Of Altoona	2005 Valley View Boulevard	Altoona	PA	16602
Tyrone Hospital	187 Hospital Drive	Tyrone	PA	16686
Nason Hospital	105 Nason Drive	Roaring Spring	PA	16673

<b>Schools</b>				
Claysburg-Kimmel El School	240 Ck Elementary Drive	Claysburg	PA	16625
Greater Altoona Ctc	1500 4th Avenue	Altoona	PA	16602
Juniata El Sch	418 N 8th Ave Juniata	Altoona	PA	16601
Logan El Sch	301 Sycamore Street Greenwood	Altoona	PA	16602
Pleasant Valley El Sch	310 Cayuga Avenue	Altoona	PA	16602
Bellwood Antis Ms	400 Martin Street	Bellwood	PA	16617
Martinsburg El Sch	415 Spring Street	Martinsburg	PA	16662
Tyrone Area Ms	1001 Clay Ave	Tyrone	PA	16686
Mowrie A Ebner El Sch	308 Hillside Avenue	Altoona	PA	16601
Spring Cove El Sch	137 Spring Cove Dr	Roaring Spring	PA	16673
Irving El Sch	110 Cherry Ave	Altoona	PA	16601
Tyrone Area El Sch	601 Clay Avenue	Tyrone	PA	16686
Altoona Area Hs	1415 6th Ave	Altoona	PA	16602
Tyrone Area Hs	1001 Clay Ave	Tyrone	PA	16686
Charles W Longer El Sch	1320 Union St	Hollidaysburg	PA	16648
Lewis M Myers El Sch	220 Martin Street	Bellwood	PA	16617
Kimmel Alternative School	900 S Jaggard Street	Altoona	PA	16602
Altoona Area Jr Hs	1400 7th Ave	Altoona	PA	16602
Juniata Gap El Sch	3365 Juniata Gap Road	Altoona	PA	16601
Foot Of Ten El Sch	450 Foot Of Ten Rd	Duncansville	PA	16635
Spring Cove Ms	185 Spring Cove Drive	Roaring Spring	PA	16673
Williamsburg Community Jshs	515 W Third St	Williamsburg	PA	16693
Frankstown El Sch	2463 Reservoir Rd	Hollidaysburg	PA	16648
Hollidaysburg Area Shs	1510 North Montgomery Street	Hollidaysburg	PA	16648
Bellwood-Antis Hs	400 Martin Street	Bellwood	PA	16617
Baker El Sch	108 W Ward Ave	Altoona	PA	16602
Hollidaysburg Area Jhs	1000 Hewit St	Hollidaysburg	PA	16648
Claysburg-Kimmel Hs	531 Bedford St	Claysburg	PA	16625
Central Hs	718 Central High Road	Martinsburg	PA	16662
Central Pa Digital Lrng Foundation Cs	721 N. Juniata St. Suite 3	Hollidaysburg	PA	16648
Penn-Lincoln El Sch	411 12th St	Altoona	PA	16602
Williamsburg Community El Sch	16 Sage Hill Dr	Williamsburg	PA	16693
Adelphoi Education At Altoona	600s. Jaggard St.	Altoona	PA	16602

Blair Resilience: Addressing Vulnerability & Exposure

Lighthouse Christian School	4200 Broad Ave	Altoona	PA	16601
Lone Pine School	133 Lone Pine Ln	Tyrone	PA	16686
Bishop Guilfoyle Catholic High School	2400 Pleasant Valley Blvd	Altoona	PA	16602
Blair County Christian School	925 Blacks Lane	Duncansville	PA	16635
Great Commission Schools	1100 6th Ave	Altoona	PA	16602
Harbor House Center Early Academics	113 Byron Ave	Altoona	PA	16602
Hollidaysburg Catholic School	321 Spruce St	Hollidaysburg	PA	16648
Penn Montessorri Academy	131 Holliday Hills Dr	Hollidaysburg	PA	16648
Shady Pond School	560 Golf Course Rd	Altoona	PA	16601
St Matthew Elementary School	1105 Cameron Ave	Tyrone	PA	16686
St Patrick School	731 Patrick Ln	Newry	PA	16665
St Rose Of Lima School	5519 6th Ave	Altoona	PA	16602
Tender Love For Children Child Care	1401 12th Ave 1st Lutheran Ch	Altoona	PA	16601
Faith Tabernacle School	439 5th Ave	Altoona	PA	16602
White Oak School	5791 Kettle Rd	Tyrone	PA	16686
St John The Evangelist School	311 Lotz Ave	Altoona	PA	16602
Altoona Central Catholic School	1400 4th Ave	Altoona	PA	16602
Living Water Christian Academy	1960 William Penn Hwy	Williamsburg	PA	16693
Northwestern Human Services Autism School	1012 8th Ave	Altoona	PA	16602
Piney Creek Parochial School	982 Piney Creek Rd	Martinsburg	PA	16662
Cove Lane Parochial School	1769 Cove Lane Rd	Martinsburg	PA	16662
Emmanuel Baptist Christian School	480 Emmanuel Dr	Claysburg	PA	16625
Greater Altoona Career & Technology Center	1500 Fourth Avenue	Altoona	PA	16602
Altoona Beauty School Inc	1528 Valley View Blvd.	Altoona	PA	16602
The Salon Professional Academy-Altoona	415 D Orchard Avenue	Altoona	PA	16601
Pennsylvania State University-Penn State Altoona	3000 Ivyside Park	Altoona	PA	16601
Yti Career Institute-Altoona	2900 Fairway Dr	Altoona	PA	16602
Yellow Springs Mennonite School	2474 William Penn Highway	Williamsburg	PA	16693

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**- APPENDIX F -**  
**HAZUS METHODOLOGY AND**  
**RESULTS REPORT**

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## Hazus: Flood Global Risk Report

**Region Name:** Blair\_County  
**Flood Scenario:** 100yr  
**Print Date:** Thursday, August 01, 2019

**Disclaimer:**

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.



**FEMA**

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Increasing Resilience Together



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### General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Pennsylvania

**Note:**

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is approximately 527 square miles and contains 5,654 census blocks. The region contains over 52 thousand households and has a total population of 127,089 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 53,225 buildings in the region with a total building replacement value (excluding contents) of 13,407 million dollars. Approximately 91.92% of the buildings (and 72.14% of the building value) are associated with residential housing.





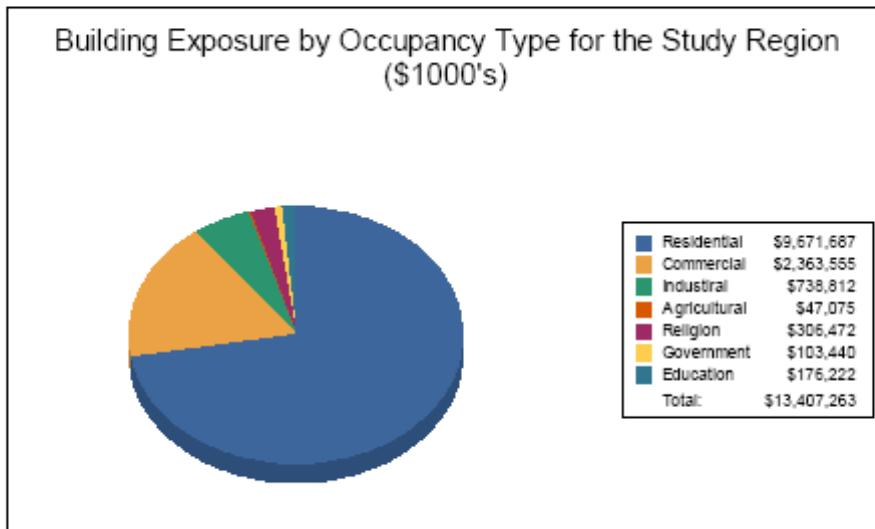
**Building Inventory**

**General Building Stock**

Hazus estimates that there are 53,225 buildings in the region which have an aggregate total replacement value of 13,407 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

**Table 1**  
**Building Exposure by Occupancy Type for the Study Region**

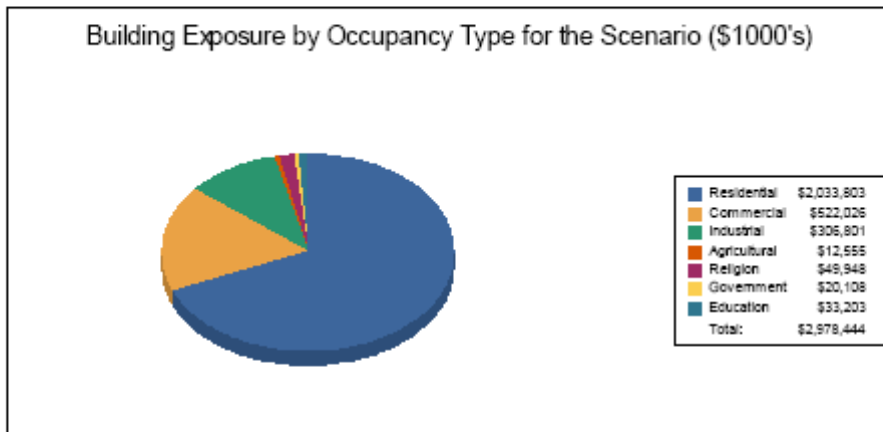
Occupancy	Exposure (\$1000)	Percent of Total
Residential	9,671,687	72.1%
Commercial	2,363,555	17.6%
Industrial	738,812	5.5%
Agricultural	47,075	0.4%
Religion	306,472	2.3%
Government	103,440	0.8%
Education	176,222	1.3%
<b>Total</b>	<b>13,407,263</b>	<b>100%</b>





**Table 2**  
**Building Exposure by Occupancy Type for the Scenario**

Occupancy	Exposure (\$1000)	Percent of Total
Residential	2,033,803	68.3%
Commercial	522,026	17.5%
Industrial	306,801	10.3%
Agricultural	12,555	0.4%
Religion	49,948	1.7%
Government	20,108	0.7%
Education	33,203	1.1%
<b>Total</b>	<b>2,978,444</b>	<b>100%</b>



**Essential Facility Inventory**

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 598 beds. There are 80 schools, 28 fire stations, 16 police stations and 1 emergency operation center.





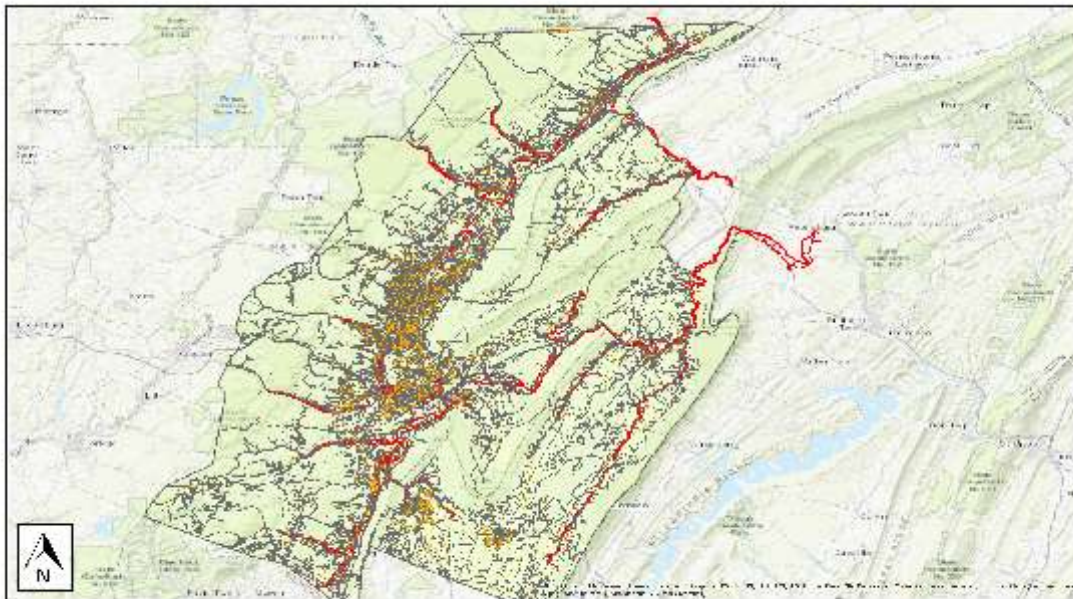
### Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Blair_County
Scenario Name:	100yr
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-ifs

### Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure





## Building Damage

### General Building Stock Damage

Hazus estimates that about 797 buildings will be at least moderately damaged. This is over 83% of the total number of buildings in the scenario. There are an estimated 25 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map





Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	6	75	1	13	1	13	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	4	67	2	33	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	396	33	531	45	170	14	45	4	22	2	25	2
<b>Total</b>	<b>406</b>		<b>534</b>		<b>171</b>		<b>45</b>		<b>22</b>		<b>25</b>	

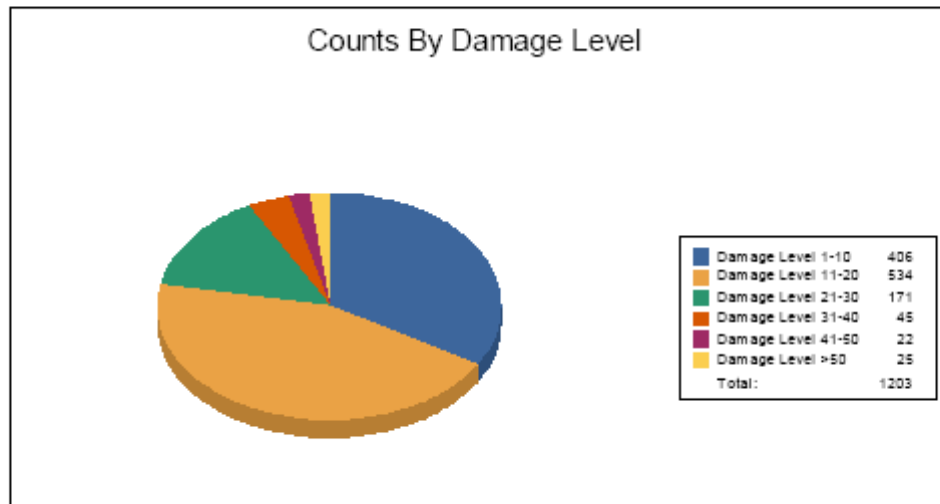




Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	1	100	0	0	0	0	0	0	0	0	0	0
Manuf/Housing	2	67	0	0	0	0	0	0	0	0	1	33
Masonry	113	35	146	45	42	13	12	4	6	2	5	2
Steel	6	75	1	13	1	13	0	0	0	0	0	0
Wood	283	33	386	45	128	15	33	4	16	2	19	2



FEMA





**Essential Facility Damage**

Before the flood analyzed in this scenario, the region had 598 hospital beds available for use. On the day of the scenario flood event, the model estimates that 598 hospital beds are available in the region.

**Table 5: Expected Damage to Essential Facilities**

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	28	5	0	5
Hospitals	6	0	0	0
Police Stations	16	1	0	1
Schools	60	2	0	2

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.







## Induced Flood Damage

### Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

**Analysis has not been performed for this Scenario.**





## Social Impact

### Shelter Requirements

Analysis has not been performed for this Scenario.



Flood Global Risk Report



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## Economic Loss

The total economic loss estimated for the flood is 504.01 million dollars, which represents 10.04 % of the total replacement value of the scenario buildings.

### Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

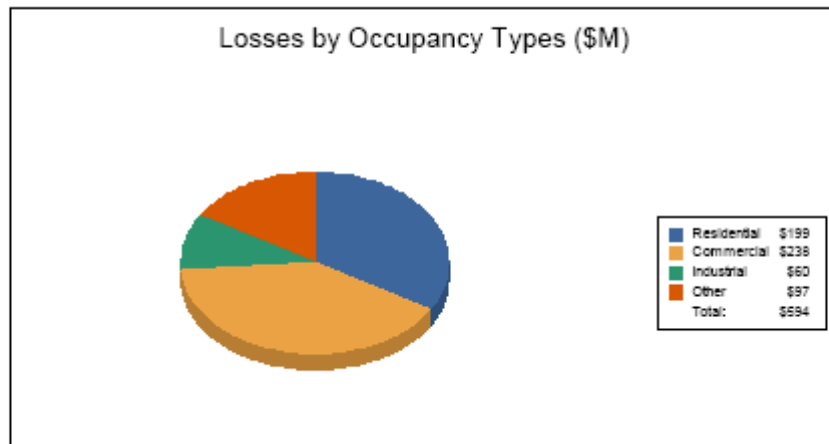
The total building-related losses were 312.51 million dollars. 47% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 33.50% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.





Table 6: Building-Related Economic Loss Estimates  
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<b>Building Loss</b>						
	Building	90.25	22.05	12.83	3.79	128.92
	Content	49.49	70.04	34.42	21.27	175.22
	Inventory	0.00	2.16	5.90	0.32	8.38
	<b>Subtotal</b>	<b>139.74</b>	<b>94.26</b>	<b>63.15</b>	<b>25.37</b>	<b>312.61</b>
<b>Business Interruption</b>						
	Income	2.16	51.29	1.97	8.16	63.58
	Relocation	36.79	17.95	2.00	4.78	61.53
	Rental Income	15.23	12.84	0.46	0.68	29.22
	Wage	5.10	61.25	2.47	58.35	127.18
	<b>Subtotal</b>	<b>69.28</b>	<b>143.34</b>	<b>6.90</b>	<b>71.98</b>	<b>281.60</b>
<b>ALL</b>	<b>Total</b>	<b>199.02</b>	<b>237.60</b>	<b>60.05</b>	<b>97.35</b>	<b>594.01</b>





Appendix A: County Listing for the Region

- Pennsylvania
  - Blair



Flood Global Risk Report



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**Appendix B: Regional Population and Building Value Data**

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
<b>Pennsylvania</b>				
Blair	127,089	9,671,687	3,735,576	13,407,263
<b>Total</b>	<b>127,089</b>	<b>9,671,687</b>	<b>3,735,576</b>	<b>13,407,263</b>
<b>Total Study Region</b>	<b>127,089</b>	<b>9,671,687</b>	<b>3,735,576</b>	<b>13,407,263</b>

