Willis

**New Jersey Schools Insurance Group
Board of Trustees Report
November 18, 2015**

Written as of November 9, 2015

July 1st Renewal Work:

1. We have nearly completed review of all treaties. There are only a few remaining and will be completed in the next couple of weeks.

Other Work:

1. Our Catastrophe Management Team completed the 2015 version of modeling the Group's property exposures for Earthquake, Hurricanes, Storm Surge and tornados. That report is attached to this report. We use it to help with determining limits to insure, as well as showing what our reinsurers will be reviewing. Each year, there is a different mix of members as well as changes in coastal exposures. Additionally, Underwriting continues to improve the quality of the information received from brokers. Most insurance companies review the 250 year return rate. The wind and storm surge number dropped from $290 million to $270 million.

2. We have been preparing for our annual renewal strategy meeting which will be held on the 19th. We look at each line of business to determine product needs, marketing, and goal setting.

3. We have also been preparing to do a coverage review with some staff next week.

4. We have nearly finalized our agenda for meetings with underwriters at Lloyds and European markets for the December 7th and 8th. We currently have eleven separate meetings set up for those two days.

Please feel free to let me know any questions that you may have in the interim.

Regards,

Dave Ritch
Executive Vice President
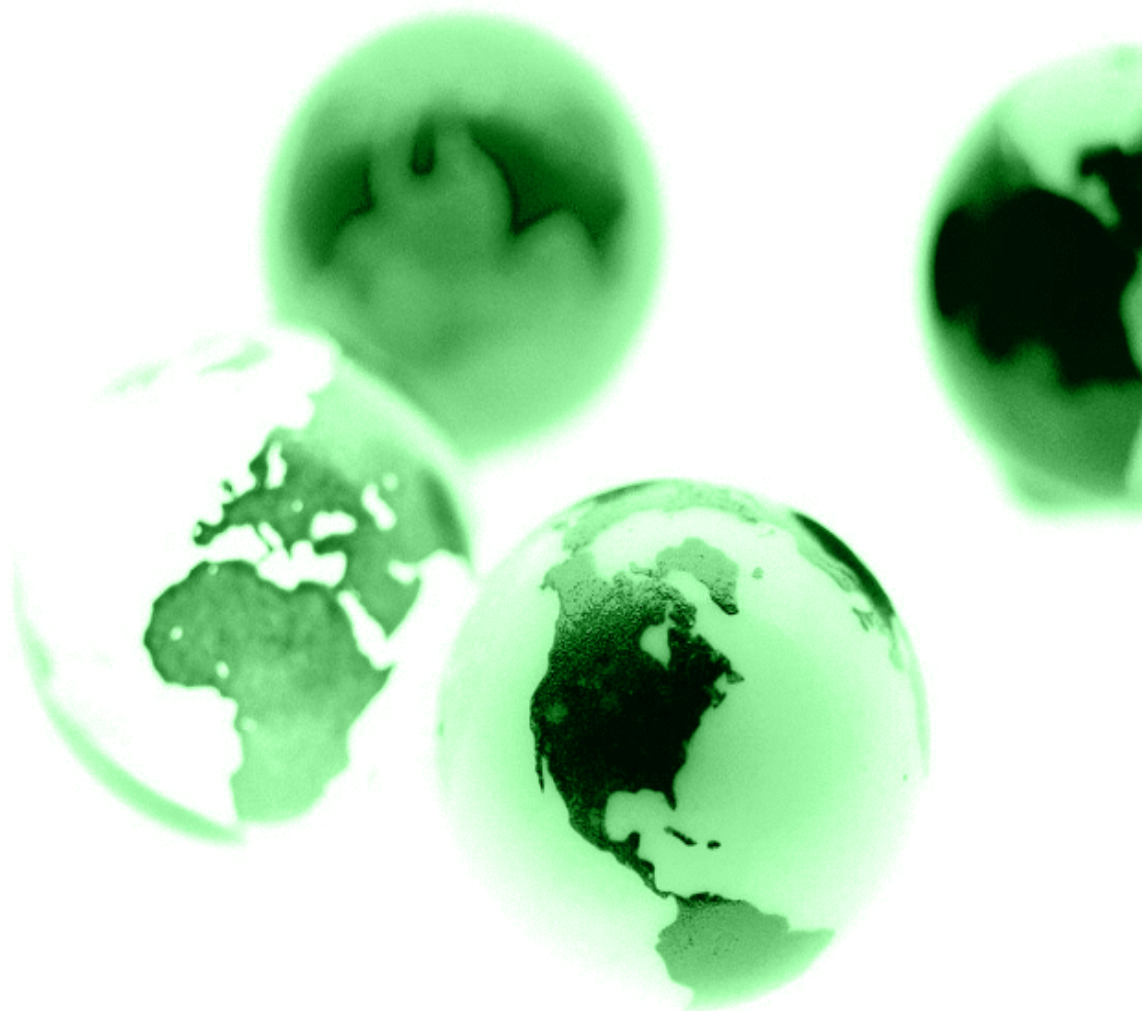Practice Group Leader

New Jersey Schools Insurance Group

Catastrophe Risk Analysis - Hurricane, Earthquake & Tornado/Hail

Tuesday, November 03, 2015

Willis

Catastrophe Management Services

Willis

Contents

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Scope & Confidentiality

Scope

The purpose of this report is to provide New Jersey Schools Insurance Group with a summary of exposures to certain perils. This report focuses on the distribution of modeled exposures, severe loss events, and probable maximum losses.

Confidentiality

This analysis has been prepared by Willis at the request of and for the exclusive and confidential use of New Jersey Schools Insurance Group.

This report is provided on the condition that New Jersey Schools Insurance Group shall treat it as strictly confidential and shall not communicate it in whole, in part, or in summary to any third party without written consent from Willis.

Willis has relied upon data provided by New Jersey Schools Insurance Group and by external data sources when preparing this analysis. No attempt has been made to independently verify the accuracy of this data.

Willis does not represent or otherwise guarantee the accuracy or completeness of such data nor assume responsibility for the result of any error or omission in the data or other materials gathered from any source in the preparation of this analysis.

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There are many uncertainties inherent in this analysis including, but not limited to, issues such as limitations in the available data, reliance on client data and outside data sources, the underlying volatility of loss and other random processes, uncertainties that characterize the application of professional judgment in estimates and assumptions, etc.

Ultimate losses, liabilities and claims depend upon future contingent events, including but not limited to unanticipated changes in inflation, laws, and regulations.

As a result of these uncertainties, the actual outcomes could vary significantly from Willis's estimates in either direction.

Willis makes no representation about and does not guarantee the outcome, results, success, or profitability of any insurance or reinsurance program or venture, whether or not the analyses or conclusions contained herein apply to such program or venture.

Willis Re does not recommend making decisions based solely on the information contained in this report.

Rather, this report should be viewed as a supplement to other information, including the company's specific business practice, claims experience, and financial situation.

New Jersey Schools Insurance Group is strongly urged to consult independent professional advisors of its choice with respect to the issues and conclusions presented herein and their possible application.

Willis makes no representation or warranty as to the accuracy or completeness of this document and its contents.

Insurance Group to the above.

Limitations

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RMS RiskLink DLM v15.0

The technology and licensed data used in providing this information is owned by Risk Management Solutions, Inc. and its licensors, and is based on the scientific data, mathematical and empirical models,

and encoded experience of earthquake engineers, wind engineers, structural engineers, geologists, seismologists, meteorologists, and geotechnical specialists.

As with any model of complex physical systems, particularly those with low frequencies of occurrence and potentially high severity outcomes, the actual losses from catastrophic events may differ from the results of simulation analyses.

Furthermore, the accuracy of predictions depends largely on the accuracy and quality of the data input by the user.

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Introduction

Willis is pleased to provide this exposure analysis for New Jersey Schools Insurance Group. As a property / DIC broker we feel it is important to help you identify and quantify exposures to potential losses.

The chart(s) on the following page(s) outline the best estimate of losses in excess of the given dollar amount for the corresponding probability of non-exceedance (also referred to as the return period). The model is based on the average, over the course of a 10,000 year simulation, using the median (50th percentile) losses.

Deciding which loss level is appropriate varies for different organizations. There is no one answer to an appropriate loss level. It is important to view all events and to take into consideration the current insurance marketplace, your organizations risk tolerance, your organizations ability to survive certain loss levels, etc.

This report contains results generated by performing a computer analysis of your portfolio of facilities to estimate the statistical losses. The intent is to depict the magnitude of the losses, not the precision of the loss estimates. When reviewing the losses, it is important to keep in mind that the models rely heavily on statistics. Typically a large, diverse portfolio (sample set) is expected to have a lower uncertainty.

Conversely, with a small portfolio the results may have a higher degree of uncertainty than a large, well spread risk. But, the magnitude of the losses can still be interpreted.

All exposure values and loss numbers are in US Dollar.

Losses have been calculated with loss amplification.

Policy Structure   ssumptions

Listed below is the summary of the financial structures coded for this account.

eductibles

arth uake eductible
Policy Blanket Deductible = $1M coded as blanket deductible (Policy Level)
Windstorm eductible
Policy Blanket Deductible = $1M coded as blanket deductible (Policy Level)
Severe onvective Storm Tornado ail Wind eductible
Policy Blanket Deductible = $1M coded as blanket deductible (Policy Level)

ata Summary

The portfolio had locations exposed to the perils of earthquake, windstorm and severe convective storm. A summary of the exposure data of properties is provided below.

Summary of ata Provided and naly ed

ata	naly ed	omments
Number of Locations	3,713	
Aggregate Values	$21,690,138,674	
Coverage Types	Building, contents, business interruption	Building coverage is approximately 90% of the total exposure.
Geocoding Results	3,713	Approximately 90% of the locations TIV in the portfolio are geocoded to high street or coordinate level resolution. A high level of geocoding is considered excellent, as high resolution geocoding reduces uncertainty in loss estimates.
Construction Scheme	ISO-Fire	Approximately 72% of the total exposure is classified primarily as 'Masonry Non-Combustible ' as their construction class.
Occupancy Scheme	ATC	Approximately 100% of the total exposure is classified as 'Education' as their occupancy.
Number of Stories	Yes	Number of stories is known for majority of the locations in the portfolio.
Year of Construction	Yes	Year built is known for majority of the locations in the portfolio.

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ceedance Probability nalysis: Shake

Occurrence ceedance Probability osses

ritical Prob	Return Period	Ground p	Insurer oss	lient oss
0.01%	10,000	5,632,703,035	5,631,697,733	1,000,000
0.02%	5,000	3,253,377,000	3,252,386,846	1,000,000
0.10%	1,000	176,819,752	175,809,295	1,000,000
0.20%	500	9,160,563	8,056,004	1,000,000
0.21%	475	6,111,203	5,037,524	999,999
0.40%	250	0	0	0
0.50%	200	0	0	0
1.00%	100	0	0	0
2.00%	50	0	0	0
5.00%	20	0	0	0
10.00%	10	0	0	0
20.00%	5	0	0	0
Average Annual Loss		2,175,744	2,173,226	2,518
Standard Deviation		110,984,339	110,964,745	49,824
Coefficient of Variation		51.01	51.06	19.79

ggregate ceedance Probability osses

ritical Prob	Return Period	Ground p	Insurer oss	lient oss
0.01%	10,000	5,634,097,237	5,633,092,952	1,000,000
0.02%	5,000	3,254,167,906	3,253,176,862	999,992
0.10%	1,000	176,878,954	175,870,658	999,934
0.20%	500	9,166,307	8,057,033	999,861
0.21%	475	6,112,622	5,038,209	999,853
0.40%	250	0	0	0
0.50%	200	0	0	0
1.00%	100	0	0	0
2.00%	50	0	0	0
5.00%	20	0	0	0
10.00%	10	0	0	0
20.00%	5	0	0	0
Average Annual Loss		2,175,744	2,173,226	2,518
Standard Deviation		110,984,339	110,964,745	49,824
Coefficient of Variation		51.01	51.06	19.79

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Exceedance Probability Analysis: NWS — Windstorm & Storm Surge

Occurrence Exceedance Probability Losses

Critical Prob	Return Period	Ground Up	Insurer Loss	Client Loss
0.01%	10,000	2,069,859,333	2,068,982,054	1,000,000
0.02%	5,000	1,570,648,407	1,569,835,546	1,000,000
0.10%	1,000	721,093,045	720,327,781	1,000,000
0.20%	500	465,513,247	464,646,128	1,000,000
0.21%	475	449,002,357	448,121,234	1,000,000
0.40%	250	270,125,520	269,091,279	1,000,000
0.50%	200	220,041,148	218,951,430	1,000,000
1.00%	100	102,655,922	101,372,307	1,000,000
2.00%	50	35,119,027	33,780,112	1,000,000
5.00%	20	2,802,157	1,966,966	997,610
10.00%	10	16,241	292	3,837
20.00%	5	0	0	0
Average Annual Loss		4,600,318	4,524,212	76,105
Standard Deviation		54,567,319	54,483,696	266,009
Coefficient of Variation		11.86	12.04	3.50

Aggregate Exceedance Probability Losses

Critical Prob	Return Period	Ground Up	Insurer Loss	Client Loss
0.01%	10,000	2,075,831,896	2,074,867,907	2,058,623
0.02%	5,000	1,576,070,943	1,575,168,401	2,000,224
0.10%	1,000	725,005,093	724,135,674	1,999,808
0.20%	500	468,518,564	467,542,987	1,894,105
0.21%	475	451,935,554	450,960,761	1,851,021
0.40%	250	272,221,866	271,114,200	1,021,752
0.50%	200	221,841,179	220,680,013	1,000,347
1.00%	100	103,618,051	102,273,283	1,000,104
2.00%	50	35,476,921	34,087,419	1,000,042
5.00%	20	2,832,878	1,983,340	998,197
10.00%	10	43,829	36,506	3,852
20.00%	5	0	0	0
Average Annual Loss		4,600,318	4,524,212	76,105
Standard Deviation		54,567,319	54,483,696	266,009
Coefficient of Variation		11.86	12.04	3.50

Exceedance Probability Analysis: AWS – Severe Convective Storm

Occurrence Exceedance Probability Losses

Critical Prob	Return Period	Ground Up	Insurer Loss	Client Loss
0.01%	10,000	144,336,166	144,400,101	1,000,000
0.02%	5,000	107,314,106	106,836,809	1,000,000
0.10%	1,000	49,375,811	48,195,533	1,000,000
0.20%	500	33,446,147	32,216,878	999,999
0.21%	475	32,437,457	31,206,124	999,999
0.40%	250	21,507,532	20,308,036	999,999
0.50%	200	18,433,389	17,251,068	999,999
1.00%	100	11,098,832	9,975,842	999,997
2.00%	50	6,661,371	5,598,841	999,995
5.00%	20	3,632,763	2,484,341	999,987
10.00%	10	2,225,648	1,101,832	998,782
20.00%	5	1,148,037	256,912	938,647
Average Annual Loss		1,131,612	624,870	506,741
Standard Deviation		4,304,023	4,110,723	613,864
Coefficient of Variation		3.80	6.58	1.21

Aggregate Exceedance Probability Losses

Critical Prob	Return Period	Ground Up	Insurer Loss	Client Loss
0.01%	10,000	145,597,254	145,119,781	4,272,864
0.02%	5,000	108,576,395	107,516,128	4,004,612
0.10%	1,000	50,541,951	48,779,620	3,416,617
0.20%	500	34,571,279	32,745,857	3,105,373
0.21%	475	33,555,921	31,729,956	3,084,301
0.40%	250	22,586,229	20,780,246	2,896,781
0.50%	200	19,500,307	17,706,016	2,810,336
1.00%	100	12,145,875	10,372,718	2,468,196
2.00%	50	7,654,927	5,910,494	2,106,716
5.00%	20	4,347,249	2,657,247	1,784,393
10.00%	10	2,700,435	1,176,911	1,310,525
20.00%	5	1,405,446	273,149	1,000,539
Average Annual Loss		1,131,612	624,870	506,741
Standard Deviation		4,304,023	4,110,723	613,864
Coefficient of Variation		3.80	6.58	1.21

posure by overage Type
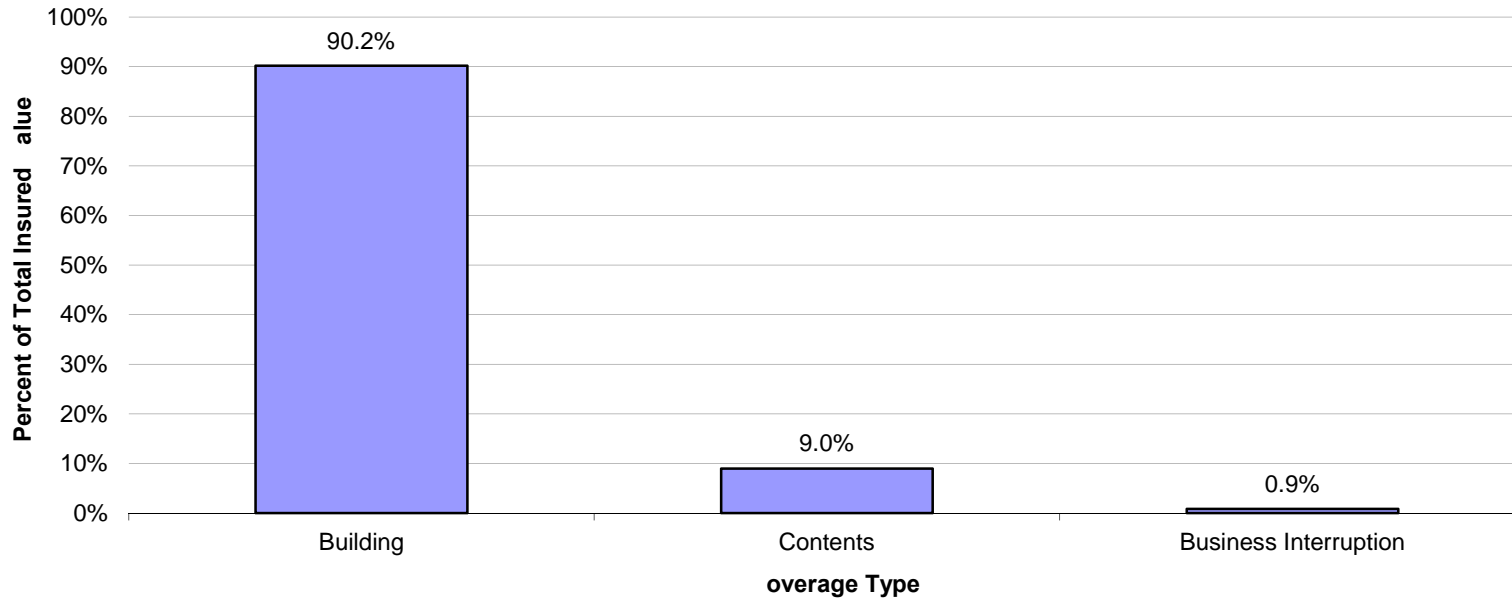
ountry	ocations	Building	ontents	Business Interruption	Total alue
US	3,713	19,555,156,557	1,946,430,357	188,551,761	21,690,138,674
Total	**, 1**	**1 ,555,15 ,55**	**1, , 0, 5**	**188,551, 1**	**21, 0,1 8,**

posure by Geocoding Resolution
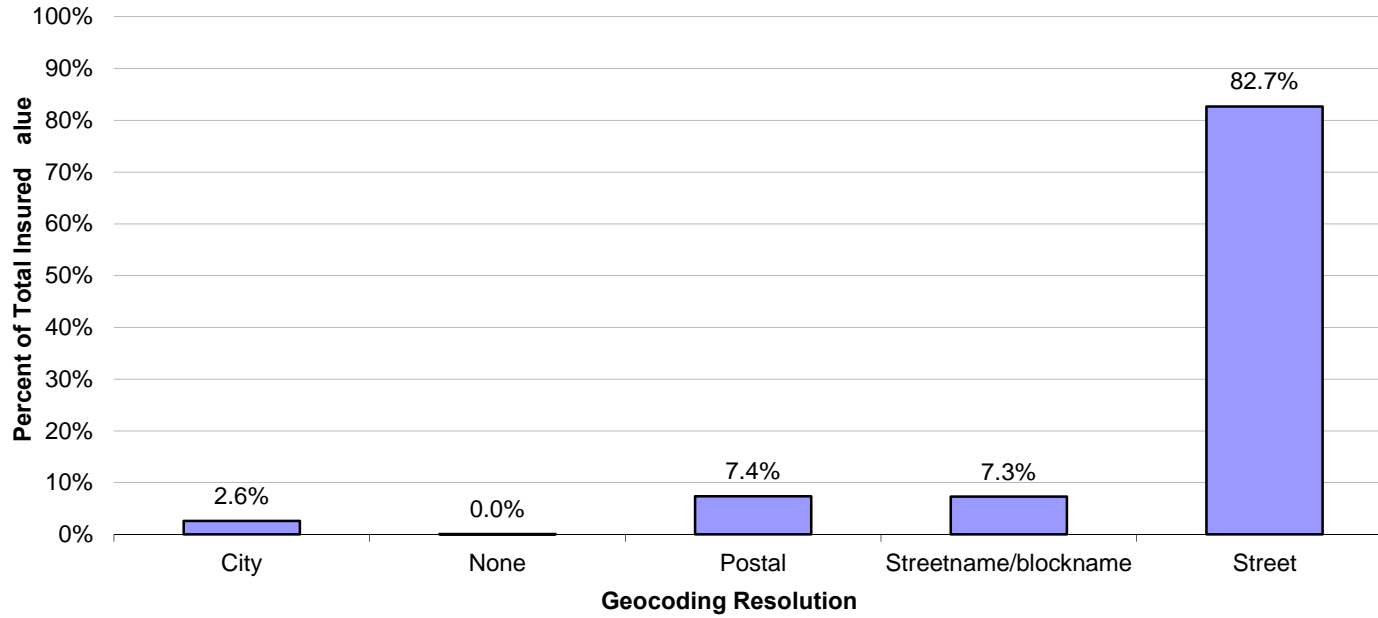
| ountry	Geocoding Resolution	ocations	alue	of Total
US	City	126	563,264,075	2.6%
US	None	4	9,250,916	0.0%
US	Postal	454	1,604,439,570	7.4%
US	Streetname/blockname	298	1,582,311,921	7.3%
US	Street	2,831	17,930,872,192	82.7%
	Total	**, 1**	**21, 0,1 8,**	**100 0**

*Negligible values are not plotted on graph.

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posure by onstruction lass
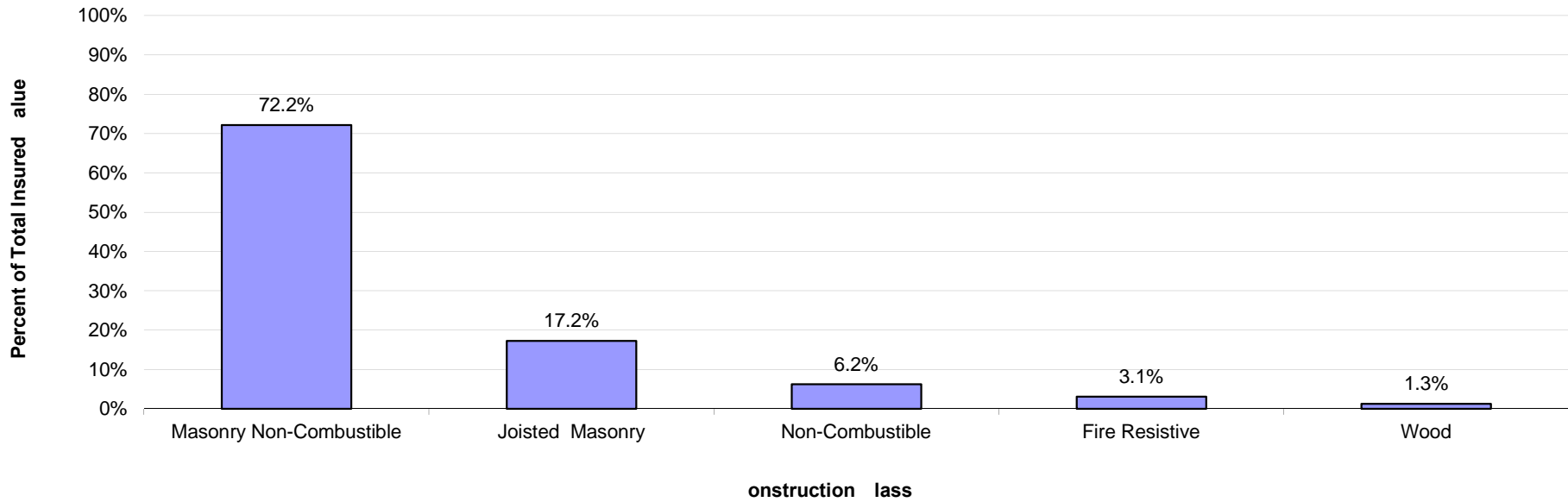
onstruction Scheme	onstruction lass	onstruction lass I	ocations	alue	of Total
FIRE	Masonry Non-Combustible	4	933	15,422,085,206	72.2%
FIRE	Joisted Masonry	2	846	3,685,704,854	17.2%
FIRE	Non-Combustible	3	344	1,329,734,917	6.2%
FIRE	Fire Resistive	6	102	659,132,074	3.1%
FIRE	Wood	1	767	271,687,903	1.3%
FIRE	Modified Fire Resistive	5	35	176,916,187	0.8%
FIRE	Unknown	0	686	144,877,534	0.7%
	Total		**2, 2**	**21, 8, , 5**	**100 0**

posure by Occupancy Type

100.0%
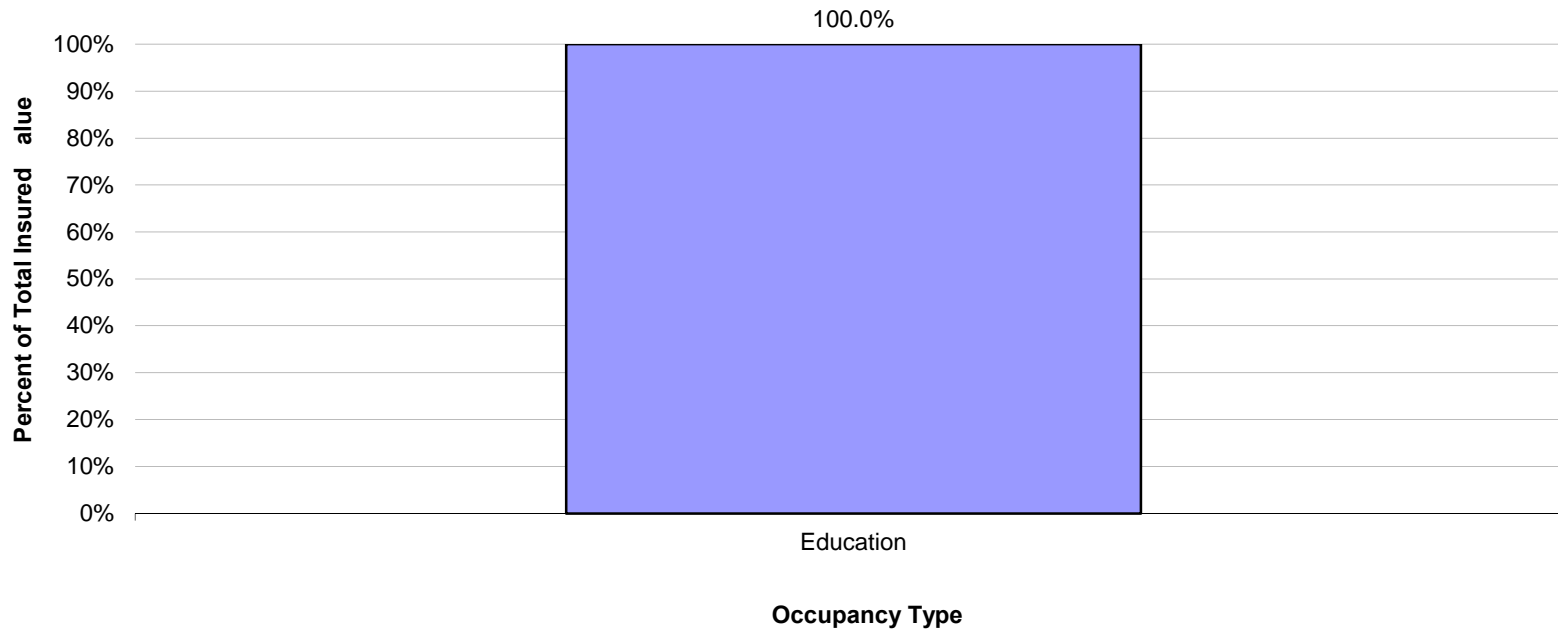
Occupancy Type

Occupancy Type	Occupancy I	ocations	alue	of Total
Education	25	3,713	21,690,138,674	100.0%
Total		**, 1**	**21, 0,1 8,**	**100 0**

posure by Number of Stories
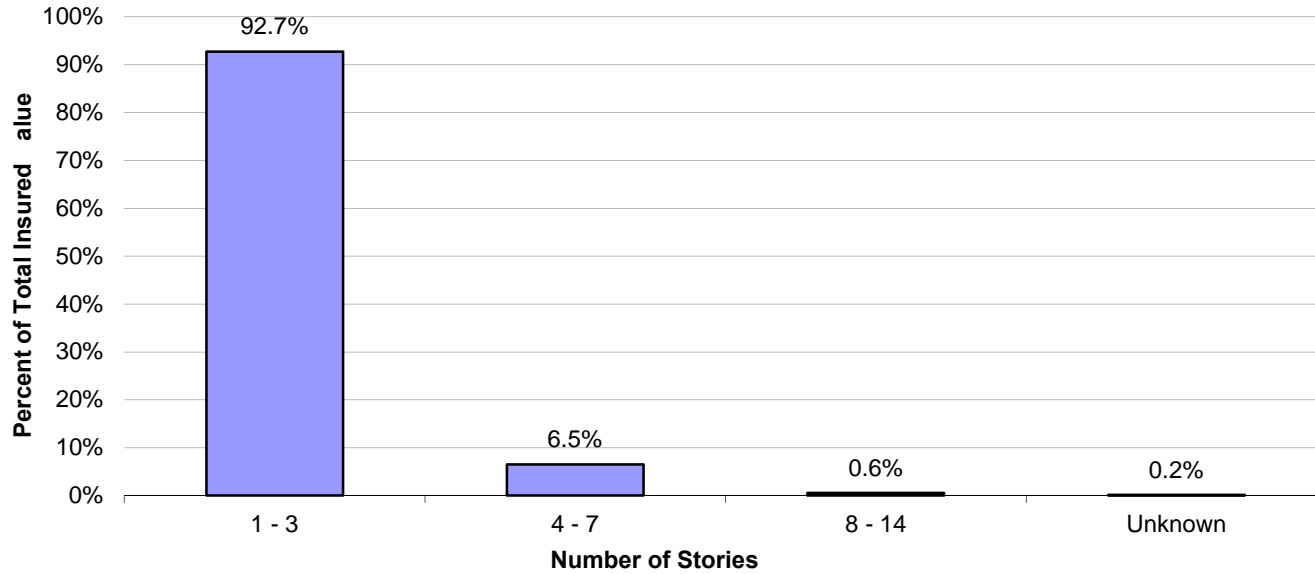
Number of Stories	ocations	alue	of Total
1 - 3	3,513	20,113,615,063	92.7%
4 - 7	65	1,411,402,058	6.5%
8 - 14	6	123,433,570	0.6%
Unknown	129	41,687,983	0.2%
Total	**, 1**	**21, 0,1 8,**	**100 0**

posure by ear Built
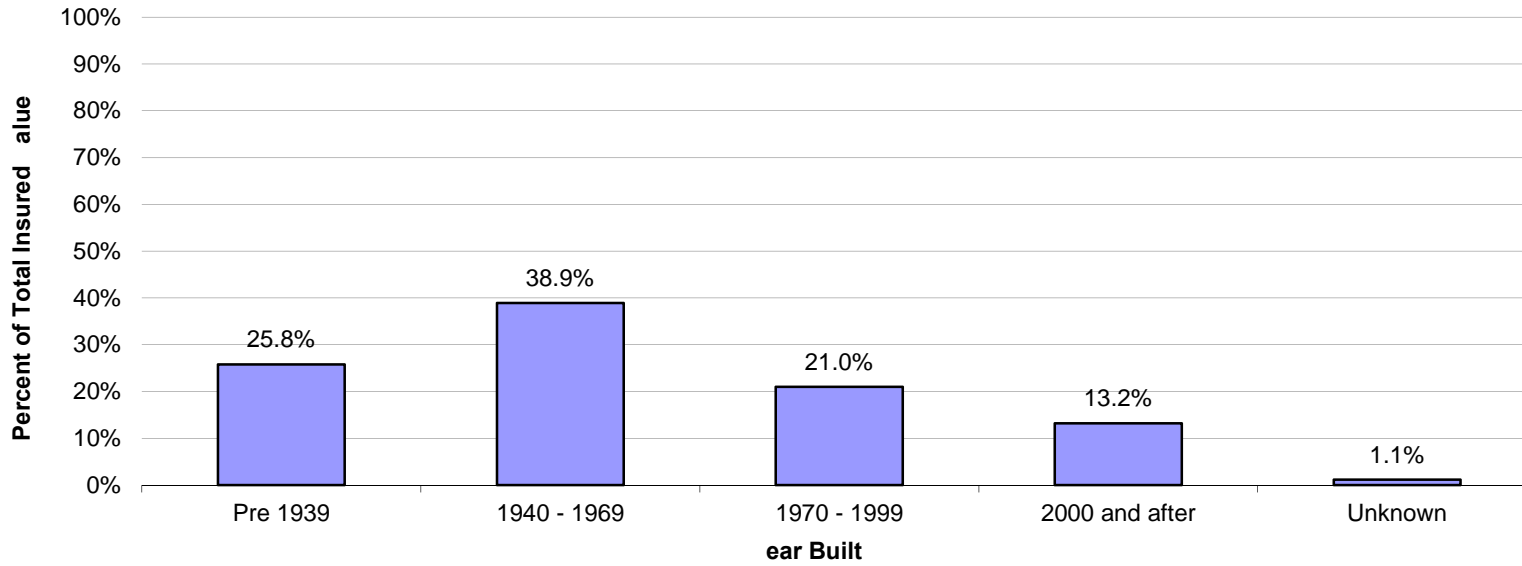
ear Built	ocations	alue	of Total
Pre 1939	479	5,597,830,028	25.8%
1940 - 1969	836	8,436,660,760	38.9%
1970 - 1999	1,055	4,546,282,007	21.0%
2000 and after	403	2,862,994,981	13.2%
Unknown	940	246,370,899	1.1%
Total	**, 1**	**21, 0,1 8,**	**8**

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verage nnual oss By ocation:Shake

The ground up AAL is represented by bars in the graph whereas the horizontal red lines indicate the damage ratio. Placing these statistics on the same graph highlights, which risks are most vulnerable to damage, versus which produce the highest AAL.

Geo ode Resolution	Street Name	ity	State ode	Postal ode	Ground p	of Total	alue	Ground p amage Ratio
Street	2500 KENNEDY BLVD	UNION CITY	NJ	7087	18,357	0.8%	184,651,838	0.01%
Street	750 RIDGE ROAD	MONMOUTH JUNCTION	NJ	8852	15,332	0.7%	155,500,506	0.01%
Street	1ST STREET & BEECH STREET	HACKENSACK	NJ	7601	14,500	0.7%	56,667,050	0.03%
Street	160 BROAD STREET	BLOOMFIELD	NJ	7003	14,403	0.7%	95,335,160	0.02%
Street	200 RUES LANE	EAST BRUNSWICK	NJ	8816	13,720	0.6%	140,686,714	0.01%
Street	100 BEHMER RD	PISCATAWAY	NJ	8854	11,962	0.5%	117,855,529	0.01%
Street	380 CRANBURY ROAD	EAST BRUNSWICK	NJ	8816	10,998	0.5%	84,190,098	0.01%
Street	35 COLGATE STREET	JERSEY CITY	NJ	7302	10,400	0.5%	73,333,242	0.01%
City	5501 PARK AT 55TH & 56TH STS	WEST NEW YORK	NJ	70935223	9,707	0.4%	48,101,539	0.02%
Street	17 PARKER AVENUE	MAPLEWOOD	NJ	7040	9,629	0.4%	72,147,920	0.01%
Total					**12 ,008**	**5**	**1,028, ,5**	
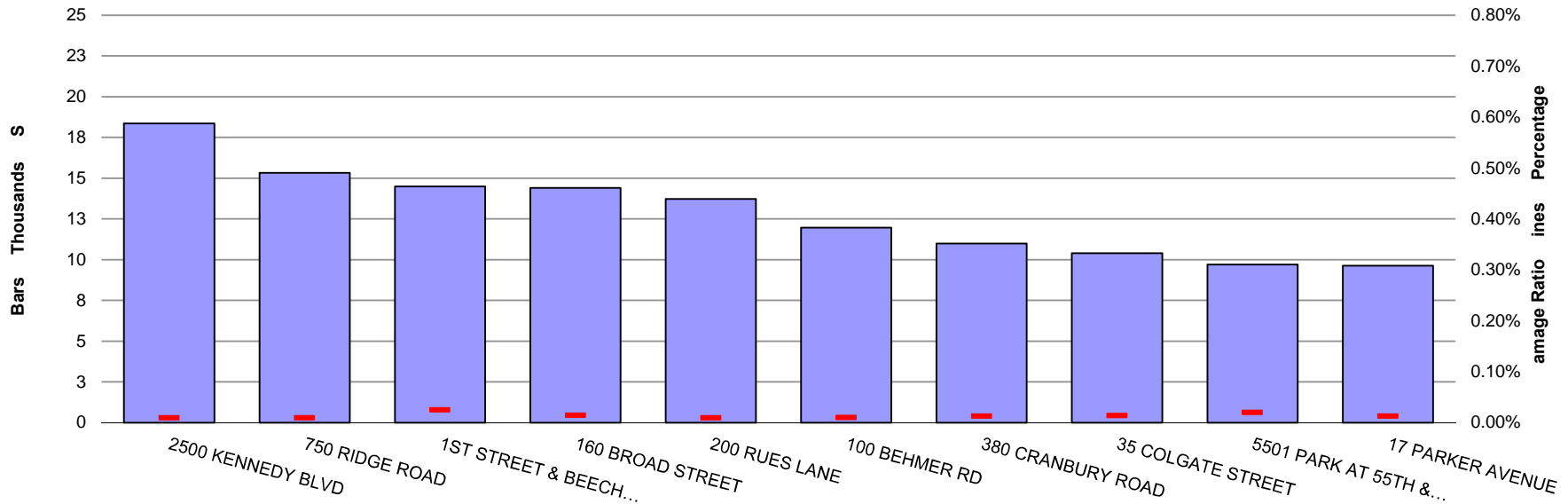
** verage   nnual   oss   By   ocation:** **Windstorm   Storm Surge**

The ground up AAL is represented by bars in the graph whereas the horizontal red lines indicate the damage ratio. Placing these statistics on the same graph highlights, which risks are most vulnerable to damage, versus which produce the highest AAL.
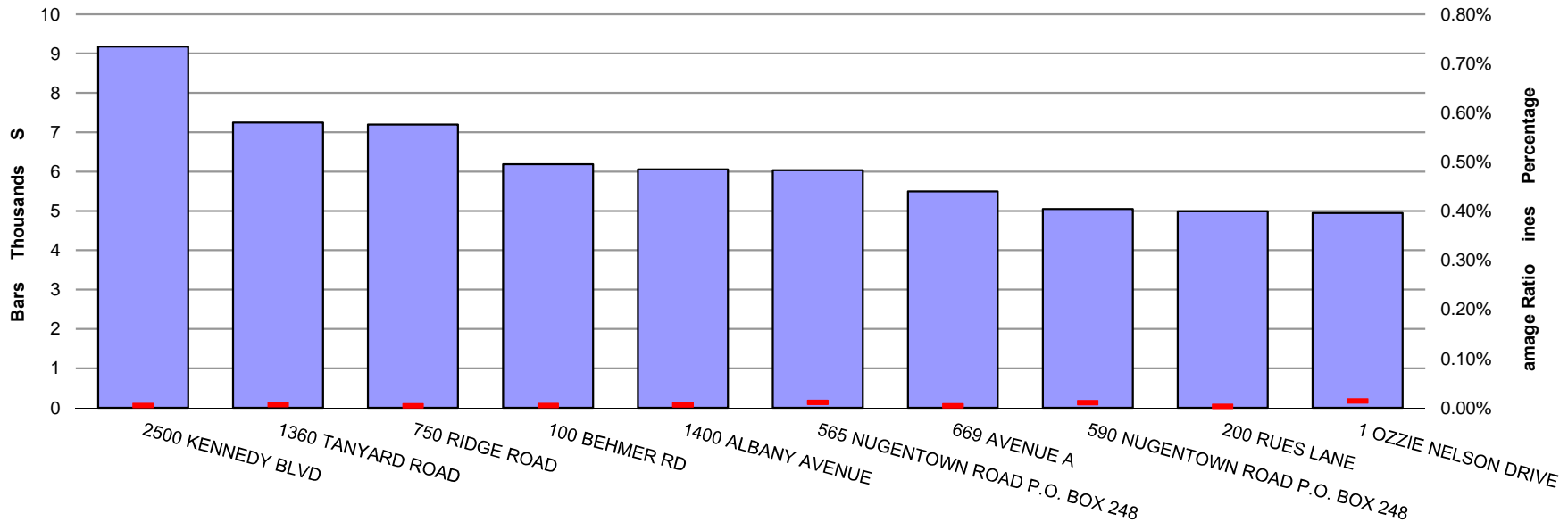
Geo ode Resolution	Street Name	ity	State ode	Postal ode	Ground p	of Total	alue	Ground p amage Ratio
Block group	1400 ALBANY AVENUE	ATLANTIC CITY	NJ	8401	101,972	2.2%	96,761,150	0.11%
City	565 NUGENTOWN ROAD P.O. BOX	LITTLE EGG HAR	NJ	80870248	67,748	1.5%	52,585,266	0.13%
City	590 NUGENTOWN ROAD P.O. BOX	LITTLE EGG HAR	NJ	80870248	57,129	1.2%	45,467,000	0.13%
Street	188 CREST HAVEN RD	CAPE MAY COUR	NJ	8210	49,662	1.1%	64,650,700	0.08%
Street	501 ATLANTIC AVENUE	OCEAN CITY	NJ	8226	41,211	0.9%	58,092,237	0.07%
Street	4300 PACIFIC AVENUE	WILDWOOD	NJ	8260	33,147	0.7%	23,673,690	0.14%
Postal	323 MADSON AVENUE	ATLANTIC CITY	NJ	8401	31,351	0.7%	22,502,150	0.14%
Street	1700 MARMORA AVENUE	ATLANTIC CITY	NJ	8401	30,727	0.7%	26,327,040	0.12%
Street	73 HAINES STREET	LANOKA HARBOI	NJ	8734	29,863	0.6%	70,207,000	0.04%
Street	74 RIDGE ROAD	RUMSON	NJ	7760	27,173	0.6%	48,936,790	0.06%
Total					**, 8**	**10 2**	**50 ,20 ,02**	

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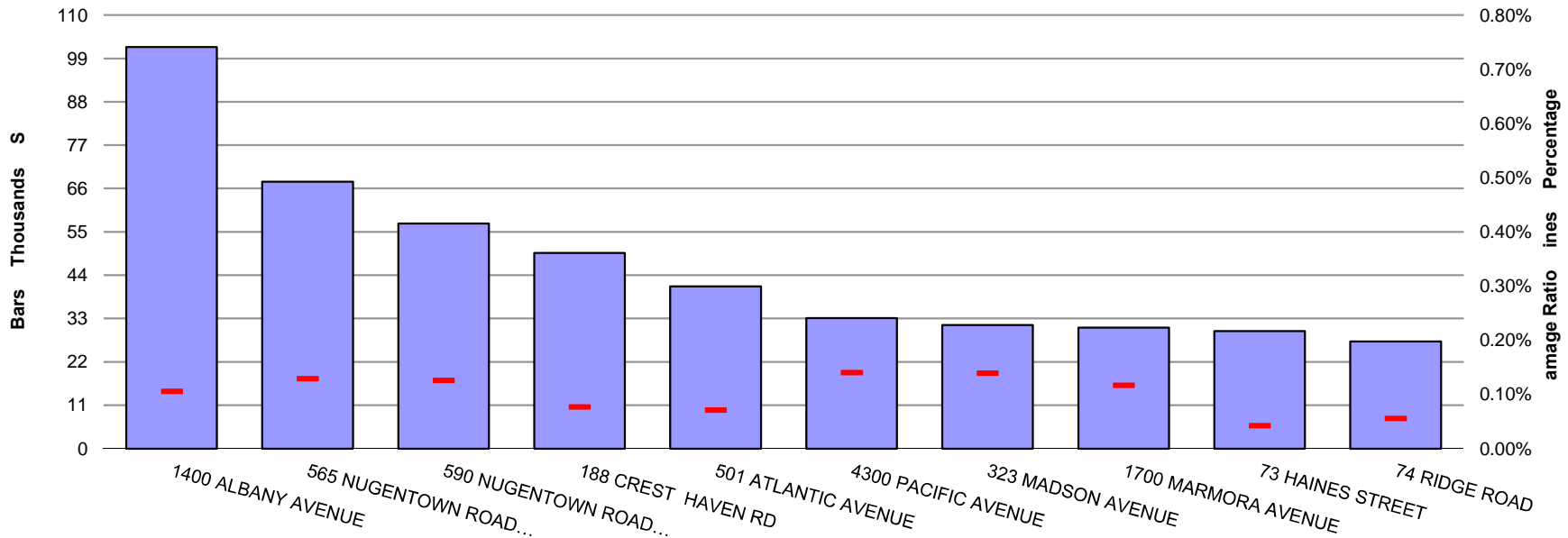
verage nnual oss By ocation: **Severe onvective Storm**

The ground up AAL is represented by bars in the graph whereas the horizontal red lines indicate the damage ratio. Placing these statistics on the same graph highlights, which risks are most vulnerable to damage, versus which produce the highest AAL.

Geo ode Resolution	Street Name	ity	State ode	Postal ode	Ground p	of Total	alue	Ground p amage Ratio
Street	2500 KENNEDY BLVD	UNION CITY	NJ	7087	9,184	0.8%	184,651,838	0.00%
Street	1360 TANYARD ROAD	SEWELL	NJ	8080	7,248	0.6%	103,431,000	0.01%
Street	750 RIDGE ROAD	MONMOUTH JUN	NJ	8852	7,199	0.6%	155,500,506	0.00%
Street	100 BEHMER RD	PISCATAWAY	NJ	8854	6,191	0.5%	117,855,529	0.01%
Block group	1400 ALBANY AVENUE	ATLANTIC CITY	NJ	8401	6,059	0.5%	96,761,150	0.01%
City	565 NUGENTOWN ROAD P.O. E	LITTLE EGG HAR	NJ	80870248	6,042	0.5%	52,585,266	0.01%
Street	669 AVENUE A	BAYONNE	NJ	7002	5,504	0.5%	119,293,110	0.00%
City	590 NUGENTOWN ROAD P.O. E	LITTLE EGG HAR	NJ	80870248	5,048	0.4%	45,467,000	0.01%
Street	200 RUES LANE	EAST BRUNSWIC	NJ	8816	4,996	0.4%	140,686,714	0.00%
Postal	1 OZZIE NELSON DRIVE	RUMSON	NJ	7760	4,951	0.4%	33,959,400	0.01%
Total					**2, 22**	**5 5**	**1,050,1 1,51**	

Glossary of Terms

Aggregate Exceedance Probability (AEP)	AEP measures the probability that one or more occurrences will combine in a year to exceed the threshold.
Average Annual Loss (AAL)	The expected annual loss on a long-term average basis. Mathematically, it is the expected value of the aggregate loss distribution, or alternatively, the area under the AEP curve.
Client Loss	The losses that the client/insured are responsible for.
Coefficient Variation (CV)	The spread of loss around the mean is represented by the coefficient variation, and reflects the secondary uncertainty in the size of loss.
Exceedance Probability (EP)	Also known as "exceeding probability" or "EP", it is the probability of exceeding specified loss thresholds. In risk analysis, this probability relationship is commonly represented as a curve (the EP curve) which defines the probability of various levels
Exposure Value	The total reported values at risk potentially subject to a peril or event against which it is insured.
Ground-Up Loss	Total amount of loss sustained before deductions, underlying coverages and reinsurance are applied.
Insurer Loss	The insurer's or cedant's loss after deductibles, attachment point(s), and limits are applied, but before any reinsurance.
Loss Amplification	The increase in claims cost due to a unique set of economic, social, and operational factors.
Mean Damage Ratio	The ratio of the expected loss to the replacement value of exposed properties.
Occurrence Exceedance Probability (OEP)	OEP measures the probability that a single occurrence will exceed a certain threshold.
Return Period	The number of years between occurrences of an event of a given size in the region. In general, the larger the event, the larger the return It represents the likelihood that a loss will equal or exceed the loss amount displayed.
Standard Deviation	The square root of the variance of the same aggregate loss distribution.
475 year return period	One typical industry measurement of a "PML" (Probable Maximum Loss) is from the Uniform Building Code (ICBO, 1994) which includes the 475 year return period requirement for life-safety design of a building or structure. This represents a 10% probability of exceedance in 50 years. If the construction at a given site has been designed for a 475 year return period, then the damage resulting from this type of event should not be so extensive to be life threatening. The ASTM E2026-99 recently introduced the term PL (Probable Loss), which is nearly synonymous with PML.
250 year return period	Another view is that of lending institutes. Although rating agencies such as Standard & Poors often require a loss assessment based on a 10% probability of exceedance in a 50-year time period (similar to that of the ICBO), this may be too conservative. The use of a 20-year or 30-year exposure period (a PML with a 195 year or 285 year return period) appears more appropriate, given an average loan life of less than 10 years.