

## Chitauri Invasion of New York City

### Post Event Damage Estimate

#### Summary

The May 4<sup>th</sup>, 2012 invasion by the Chitauri through an inter-dimensional portal caused significant damage to the New York City area. As with past natural, anthropogenic, and unnatural catastrophes, it often takes months or years to generate an accurate damage and loss estimate. Using sophisticated computer models, Kinetic Analysis Corporation (KAC) can provide damage forecasts days or even weeks ahead of time for events that can be anticipated or hypothesized (hurricanes, winter storms, asteroid impacts, etc.), as well as estimates of damage from unforeseen events such as earthquakes and associated tsunamis, industrial disasters, monster attacks, or alien invasions, usually within minutes of their occurrence. Using computer models created by KAC R&D for estimating nuclear weapons effects, as well as techniques developed for use in predicting damage in Japan from attacks by ゴジラ (Godzilla), モスラ (Mothra), and particularly メカゴジラ (Mechagodzilla), the damages and losses resulting from this weekend's invasion by the Chitauri have been estimated.

KAC expects the physical damage from the invasion to be \$60 to \$70 Billion Dollars, with secondary economic impacts from cleanup, loss of business, disruptions to commerce and services, etc. causing an additional \$90 Billion dollars. Casualties are undoubtedly in the high thousands. Therefore, we estimate the total economic impact to be at least \$160 Billion dollars. This compares with the direct impact from the September 11<sup>th</sup> 2001 attacks of \$30 Billion dollars (total impact \$83 Billion). For additional context, comparable disasters include the 2011 Tōhoku Earthquake and Tsunami (\$122 Billion), the 1995 Kobe Earthquake (\$140 Billion), and Hurricane Katrina at over \$90 Billion.

#### Damage Assessment and Discussion

A combination of satellite imagery, documentary footage, and news reports were used for the damage assessment. The pre-event exposure was derived from KAC's spring 2012, US High Resolution infrastructure database. The island of Manhattan contains some of the most valuable and densely populated property in the world. Within one mile of the invasion site is over \$40 Billion Dollars of residential property, and at least 10 times that amount of commercial property.

Although at least two dozen buildings suffered extensive structural damage or collapse during the attack and defense of the city, most of the damage appeared to be to windows, facades and exterior features of the buildings. For buildings that did not suffer significant structural failure or penetration by the fighting, interior contents damage should be limited. However, damage to the upper levels of a large number of buildings will be costly and time consuming to repair, as the number of companies equipped to undertake such efforts is limited. Price gouging and demand surge, the inflation in prices due to limited supplies and significant damage in a local area, may be a problem if state and local officials are not vigilant.

Numerous vehicles were damaged or destroyed during the attack, as well as significant infrastructure such as roads and bridges. The extensive damage to Grand Central Terminal could prove highly disruptive, depending on the sub-surface damage to the subway system. Although such damage appeared unlikely, as the 9/11 events showed, collapsing buildings can cause significant damage to sub-surface infrastructure such as gas, communications, and electrical systems. Detailed site surveys will be required to assess the state of the subterranean infrastructure.

As noted in the estimate, recovery costs are likely to be greater than direct costs, especially debris cleanup and removal. Cleanup from monster attacks and alien invasions often have complications not found in natural catastrophes. Although hazardous waste is always a factor in post-event cleanup (such as the significant contamination from damage to industrial facilities after Katrina), the radioactive and chemical contamination in a post-invasion environment are often extreme. The Chitauri themselves, being organic, almost certainly constitute a biohazard and the cleanup of their remains will have to be conducted with appropriate decontamination protocols.

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## Financing, Insurance and Liability Issues

Immediate expenses such as cleanup and casualty assistance will have to be borne by various government agencies and private individuals. The impacts on local, state, and federal budgets are likely to be severe in the short term. The insurance industry will no doubt provide some immediate assistance for public relations reasons if nothing else; however, the ultimate costs of rebuilding and how those costs are allocated are highly contract specific. Most insurance policies have special provisions for acts of war, civil unrest, or terrorism. Given the involvement of individuals considered deities in some cultures (Thor, Loki), there is even the potential to classify the event as an “Act of God”, although that designation would be subject to strenuous theological and legal debate. Many policies have special provisions or exclusions for acts of war or terrorism. After the September 2001 attacks, the Terrorism Risk Insurance Act (TRIA) was passed to provide a federal “backstop” for insurance claims related to acts of terrorism. TRIA will no doubt come in to play over this event. At this time the exact breakdown of Federal, State, local, and private costs is difficult to assess. With previous catastrophic loss events there was often a scramble to transfer liability between the various parties.

As a quasi-governmental organization, S.H.I.E.L.D. is in all likelihood protected from liability through sovereign immunity. While gratitude over repelling the invasion will persist in the short term, in the longer term the events leading up to the opening of the portal will in all likelihood be examined in detail, and that immunity probed for legal weakness (recall the regulatory and legal consequences to the Ghostbusters over the Gozer incident of 1984). In addition, there was considerable collateral damage of questionable necessity by at least one of the S.H.I.E.L.D. operatives (Hulk). Given the dollar amounts involved, the litigiousness of American society, and the high density of skilled attorneys surviving in the New York City area, the exact classification of this event, financial liability, and ultimate responsibility will no doubt be subject to extensive litigation for many years to come.

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## Estimate created by KAC R&D

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