The Economic Impacts of a Major Terrorist Attack On the Greater Washington Metropolitan Area

Prepared for

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Executive Summary

The economic impact of the hypothetical September 20, 2004 terrorist attack on the National Capital Region (NCR) would be significant and long lasting. Because of the immediate shut down of all but essential local economic activities for the first two to four weeks following the attack with a gradual resumption of business activities in the suburban areas during the second and third months, the shut down of Ronald Reagan Washington National Airport and the Washington Metro Rail system for up to six and twenty-four months respectively, and the loss of substantial portion of the leisure travel industry until 2007, the National Capital Region's economy would experience lost output value, jobs, and personal earnings of an order-of-magnitude equivalent to the economic losses associated with the Great Depression in the 1930's. Rather than achieving the projected annual growth rate of 3.5 percent over the 2004-2006 period, the economy would lose a total of $98.4 billion in foregone economic activity over the 2 and 1/4 year recovery period through 2006 for an unrealized loss of 10.3 percent.

A comparison of the forecast values for the National Capital Region's gross regional product (GRP)—the value of goods and services produced locally—and the economic output values that could be supported following the September 20th terrorist attack reveal the economic losses by sub-state area. These are presented in the following table.

Summary of Economic Costs Resulting From The September 20th Terrorist Attack On The National Capital Region (in billions of current year $s)

Year	District Of Columbia	Suburban Maryland	Northern Virginia	Metropolitan Area
2004	- $7.2	- $4.6	- $6.6	- $18.4
2005	- $25.8	- 11.2	- 15.9	- $51.9
2006	- $13.5	- 5.8	- 8.8	- $28.1
Total Losses	- $45.5	- $21.6	- $31.3	- $98.4

Source: GMU Center for Regional Analysis

*National Capital Region (NCR) references the Washington metropolitan area (PMSA) as defined by the US Bureau of the Census for data collection purposes.

All sectors of the economy would be impacted by the loss of demand (sales) or by the inability to conduct business. Even the federal government is projected to operate at below-normal spending levels due to the disruption of work and its temporary relocation to non-local sites. The building industry would experience an immediate loss of output due to the general disruption of the local economy and then experience losses in demand as residential, commercial, and public construction is deferred or canceled. With reconstruction outlays extending over a two-year period, the market-related losses would be partially offset and in 2006 could combine with the recovering suburban economy to support renewed expansion in this sector.

In contrast, the hospitality industry would be largely shut down until the NCR was deemed safe and only then would the business-travel segment begin to re-emerge on a limited basis. As major conventions are pre-scheduled many years in advance, those that were canceled in 2004, 2005 and 2006 would not be regained and future bookings could be a difficult sale. Similarly, lost leisure travel visitors would not be regained and future visitor trips would be slow to ramp up until the fears of terrorism diminish to “normal” levels. As with the September 11, 2001 terrorist attack, rebuilding the hospitality industry to pre-attack levels would be a slow process and would not be achieved until at least 2007 and possibly longer depending on subsequent terrorist events in the US or in other major tourist destinations that could permanently change leisure travel patterns to the detriment of places like the Nation’s Capital.

The economic impacts of the September 20th terrorist attack in dollars and cents terms would be large and significant by any measure. This can be seen in the costs that this lost economic activity would impose on major segments of the area’s economic and fiscal bases. The loss of almost $100 billion of unrealized economic activity translates into: the loss of 1.2 million jobs and $28.8 billion in personal earnings over the 2 and 1/4 year recovery period; this decrease represents a loss of $5.2 billion in consumer spending for goods and services in the local area; and this loss of income and consumer spending could result in the loss of $2.5 billion in retail sales, hotel, meals, parking and income tax revenues at the state and local levels. By all measures, the economic consequences of this terrorist attack would far exceed the reconstruction and clean-up costs and could permanently alter the economic future of the National Capital Region.

Introduction

A major terrorist attack in the National Capital Region would have profound and long-lasting impacts on the regional economy. These impacts can be calculated and expressed in terms of lost output from the disruption to normal economic processes. As forgone economic activity, these impacts would be seen as decreases in gross regional product—the value of goods and services produced within the metropolitan area—and can be translated into lost jobs and personal earnings equivalents. Hence, the disruption of the local economy because of a terrorist attack would reduce the ability of the economy to achieve the projected levels of output and result in lost employment and personal earnings.

This lost income would have significant implications to the region's and states' tax bases, especially reducing the income and sales tax revenues generated by the economic activities operating during the recovery period following the terrorist attack. Additionally, selected sectors would be impacted differentially by a terrorist attack as was experienced following the terrorist attack on the Pentagon on September 11, 2001. Among the most vulnerable sectors would be the hospitality industry, entertainment and restaurant enterprises, retailers, the real estate industry, and the construction industry. While this list is not all-inclusive, it points up the breadth of vulnerability and also a range of impact potentials. With the exception of the building industry, all other sectors would be expected to experience lost sales as a consequence of a terrorist attack while the construction industry potentially could experience an increase in activity because of spending associated with reconstruction of damaged buildings and public facilities. The duration of impact will also vary across these vulnerable sectors. Additionally, some sectors would experience permanent losses while others might only experience a deferral of activity.

The economic impacts of a terrorist attack would also have differential effects across the region depending on the nature and location of the attacks. The magnitude and duration of these impacts would reflect the nature of the economy in the effected area; that is, the downtown DC area would be impacted differently than the suburban-based economies of surrounding suburban jurisdictions.

The calculation of economic impacts presented in the following pages relates directly to the proposed Scenario developed for this exercise including its six Blocks: the regional distribution of anthrax by Metro Rail including the contamination of Ronald Reagan Washington National Airport; a chlorine gas release in the rail tunnel under Capitol Hill; a kinetic explosion in the Metro tunnel under the Potomac River between Rosslyn, Virginia and Foggy Bottom in the District of Columbia; a car bomb explosion at the Pentagon City parking garage adjacent to the Macy's Department Store; and kinetic explorations near the emergency rooms of Fairfax INOVA and Washington Adventist Hospitals. For purposes of this analysis, the events that comprise the terrorist attack scenario begin on Monday, September 20, 2004 and extend over the subsequent 24 hours.

While each of the terrorist events would cause its own destruction, loss of life, and direct reconstruction costs, these consequences would not be the primary emphasis of this analysis. Rather, the impact of these events on the productive capacity and operation of the approximately $300 billion National Capital Region's economy will be the focus of this analysis as these costs would be significantly greater than the immediate economic consequences associated with the six hypothetical targets of the terrorist attacks.

The economic impact analysis presented herein is organized by the geographic scale of its economic costs. As the NCR's economy is unusually interdependent, a terrorist attack that disrupts activities in one location would have consequences that extend over the entire region and beyond (5 percent of the area's workforce resides beyond the NCR boundaries). As a result of the regional distribution of these economic impacts, it is necessary first to calculate them for the National Capital Region in total and then differentiate them for the major core industry that constitute the primary sources of non-locally generated sales and income supported by external markets.

The sub-state area breakdown of these regional economic impacts is presented in the second section. Here, an attempt will be made to assign the regional impacts of the terrorist attack to the major political divisions within the region—the District of Columbia, Suburban Maryland and Northern Virginia. This assignment of the economic impacts will reflect commuter patterns as determined in the 2000 Census and the distribution of the region's job base as reflected the BLS payroll survey in July 2004.

Finally, the implications of these economic impacts can be interpreted by translating them to fiscal terms and to their effect on a particular category of business. This latter analysis is offered for its illustrative value with the expectation that it will provide some tangible dimensions to the interpretation of the large dollar values associated with calculated economic impacts.

The assumptions and methodological process underlying the calculation of economic impacts are presented in the following section.

Assumptions and Methodology for Calculating the Economic Impact Of A Terrorist Attack on the National Capital Region

The analytical approach employed to calculate the economic cost of the hypothetical September 20, 2004 terrorist attack builds from the forecasts for the National Capital Region's (Primary Metropolitan Statistical Area as defined by the US Census) gross regional product—the value of goods and services produced within the region—prepared by the GMU Center for Regional Analysis. These forecasts for 2004, 2005 and 2006 and their core industry breakouts were converted to employment equivalents by sub-state portion of the metropolitan area. The terrorist attacks, as articulated in the Scenario and its six Blocks, were fitted to a time line extending from the initial incident to the full resumption of effected services and related economic activities indicating the geography of the area being impacted during the respective recovery periods.

The impact of the September 11, 2001 terrorist attack on the Pentagon and the World Trade Center towers in New York City, as well as less traumatic but still disruptive events such as Topical Storm Isabel and blizzards in January 1996 and February 2002 provide important evidence on how large-scale disruptions to mobility within the National Capital Region affect short-term patterns of consumer spending, the costs of lost work days, the accumulation of lost business and hospitality-related activities (especially restaurant and hotel sales), and the differential impacts of deferred and lost economic activities among primary core industries and across the geographic divisions of the region. These impact patterns, although of relatively small magnitude and duration compared to those projected to result from the hypothetical September 20, 2004 terrorist attack, were real and measurable and establish a factual basis for calculating the potential consequences of a major terrorist event on the local economy.

The loss of economic output associated with lost work days for the region's labor force—the foregone economic activity due to the disruptions associated with the terrorist attacks—was calculated by time period over the two and one-quarter years of the recovery period. These values were subtracted from the projected level of economic activity that had been forecast for each period in the absence of the terrorist attack to determine the cost of the attack.

The percentage recovery for each segment of the economy in each sub-state portion of the region during each three-month period, starting with the 4th quarter of 2004, reflected an even ramp-up progression from the first two-week period, when only emergency services were functioning, on through the full two and one-quarter year recovery period. These percentages are gross estimates of the share of the economy being affected, the suburbs having a smaller percentage of loss at any one time than the District, and while not based on finite evidence, do reflect a logical sequence of recovery over time, thus providing a realistic order-of-magnitude summation of economic losses.

The recovery time lines and magnitude and geographic distribution of economic disruption were guided by the assumptions listed below.

1. The region's civil authority remains in tack and law and order it maintained in the immediate aftermath of the attacks;

2. The federal government continues to operate its essential functions either locally or from back office locations including all functions of the Federal Reserve Board, Departments of Defense, Homeland Security Treasury, Justice, Transportation, and other essential agencies;

3. The Federal Government does not relocate its national capital functions to remote locations on a permanent basis;

4. Electrical, gas, and telecommunications systems remain operational in the unaffected jurisdictions and local services (with the exception of WMATA bus

and transit) are restored within a maximum of two weeks throughout the Washington region;

5. Transportation services to the National Capital Region (ground and telecommunications) are not severed and, where delays or disruption to schedules have occurred, these are limited to a three months including MARC and AMTRAK services to Baltimore and northward and VRE service from Northern Virginia;

6. Air service to the National Capital Region is restricted by the closing of Ronald Reagan Washington National Airport for up to six months however Dulles International Airport resumes its regularly scheduled services within four weeks and adds services within the Northeast Corridor (Shuttle) to accommodate demand ordinarily met by flights into/out of Reagan National Airport;

7. The region's intra-regional transportation system (with the exception of Metro Rail and bus) is not affected by the attack;

8. Metro Rail service throughout the National Capital Region is disrupted for more than one year; by January 1, 2005 limited suburban service resumes including service in Northern Virginia terminating at the Rosslyn Station from which bus service will connect to Downtown Washington, DC locations, Green Line Service to Union Station, from New Carrollton terminating at the SW Federal Center, Red Line service from Montgomery County terminating at the Dupont Circle Station, and Yellow Line service across the Potomac. Tunnel repair on the Blue line will require more than one year and the central portion of the system through Metro Center will not be fully operational for up to two years.

9. The effects of the chlorine gas explosion, including affected buildings, are dissipated/cleaned up within four weeks while the clean up associated with the Anthrax attack will continue for a minimum of one year with Union Station being cleaned up within three months and Reagan National Airport taking up to six months.

10. Congress officially opens its new session in January and the Presidential Inauguration takes place at the Capitol as scheduled on January 20th although the work of the Congress is dispersed to locations in the suburbs during the first half of 2005 and all legislative functions do not return to Capitol Hill until September 2005.

11. Within eight weeks, all basic business activities are functioning within the suburban portion of the region with many downtown offices relocating temporarily to their suburban branch locations; some workers are working from telecommuting centers or at home; car pooling and other commuting strategies have substantially reduced rush-hour vehicular volumes moving towards the

District of Columbia, most suburban public school systems are back in session by December 1st while the District school system reopens January 4th.

12. The time line for resumption of normalcy within the National Capital Region is as follows: first two weeks, all business and public service activities with exception of emergency and critical support activities are shut down with a broad-based curfew in effect; during the third and four weeks following the terrorist attack public services are repaired (except Metro Rail) and suburban-based activities experience partial resumption; by the end of the 8th week, suburban activities are 75 percent back to normal and most school systems and universities have reopened and, by the end of three months, suburban activities are 90 percent normal; the Pentagon City Mall reopens in January 2005 but the Macy's store and north end of the parking garage do not reopen until October 2005; inter-regional ground transport is operating on normal schedules after January 1, 2005 with Reagan National Airport operating with normal schedules by April 1, 2005; 2005 is a recovery year for the economy with functions located in the Downtown area back on-line by the end of the year (2005) with the exception of tourism which does not recover fully until the spring 2007 season. By January 2006, all repairs and clean up are completed with the exception of the portions of the Metro-rail system that had experienced flood damage—it resumes full operation by September 2006 after two-years of decontamination and reconstruction. By 2007 the National Capital Region's economy is operating normally.

National Capital Region Economic Impacts

The economic cost of the hypothetical September 20, 2004 terrorist attack on the NCR, as measured by the loss of output value associated with the Washington metropolitan area economy, would result from the loss of work, the disruption of business transactions, and a decrease in consumer and visitor spending. This latter source of economic loss would consist of a combination of deferred purchases and foregone spending the net effect being a potential loss of economic activity central to the vitality of the area's economy. While some sectors would be more vulnerable to permanently lost and/or deferred sales and some portions of the NCR would experience greater magnitudes of these losses over longer periods than other portions of the region, the aggregate loss of economic activity would be large and, because of the interdependencies within the area economy, would impact every resident, worker, and jurisdiction within the area.

Additionally, these economic impacts would extend well beyond the regional boundaries due to the large number of commuters working in the region but not living in it as well as the large number of non-local customers and suppliers that have business linkages to the area economy. These business linkages extend nationwide and globally, especially relating to the region's national capital functions.

Table 1

Economic Impact of the September 20th Terrorist Attack
On the National Capital Region
(in billions of current year $s)

Year	Forecast GRP	Post-Attack GRP	Lost GRP
2004	$301.63	$283.22	- $18.42
2005	318.98	267.07	- 51.91
2006	334.34	306.30	- 28.04
Total Cost			- $98.37

Source: GMU Center for Regional Analysis
Notes: Forecast GRP (value of goods and services produced locally) in the absence of a terrorist attack; Post-Attack GRP is the calculated output value generated by the NCR economy during the reconstruction and recovery period following the terrorist attack; Lost GRP is the value of goods and services foregone due to the terrorist attack over the 2004-2006 period. Some under-performance may extend beyond this 2 and 1/4 year period.

The economic cost of the September 20th terrorist attack accumulated over the anticipated two and one-quarter year recovery period is calculated as the loss of output value from projected levels in each year. These calculations for the forecast gross regional product (GRP) and post-attack GRP total $98.4 billion and are presented in Table 1. Of this almost $100 billion loss (or unrealized earnings), almost 20 percent would occur during the first three months following the attack. 2005 would be a transition year with Ronald Reagan Washington National Airport reopening after a six-month closure and the suburban economy ramping back up to 90 percent of expected output by the end of the year.

The District of Columbia economy would be the hardest hit because of its greater dependency on pubic transportation, the loss of business and leisure visitors, including lobbyists and other government-related visitors, and convention-related business activity, and the lingering fears associated with the consequences of the biological and chemical attacks. As a result, its economic recovery would be slower and more stretched out achieving only 70 percent of its potential output value by the end of 2005.

The NCR monetary losses resulting from the continuing disruption to the economy in 2005 are estimated to total almost $52 billion or 53 percent of the total two and one-quarter year loss. This magnitude of unrealized gain would represent a loss of 16.3 percent GRP.

The impacts of these economic losses across the economy's major core industries, as presented in Table 2, show that all sectors would be vulnerable with the hospitality industry experiencing the greatest percentage loss (50%) over the 2004-2006 period while the building industry's loss would be the smallest (3%). This differential pattern of impacts across the economy's primary core industries was experienced following the terrorist attack of September 11, 2001. The average economic cost (foregone sales/lost output value) of the area's primary core industries over the post-attack recovery period ranges from 15 percent in 2004 to 6 percent in 2006 for a combined loss totaling $65.4 billion or 30 percent.

Table 2

Economic Impact of the September 20th Terrorist Attack
On the National Capital Region's Core Industries
(in billions of current year $s)

Core Industries	2004 Before*	2004 After**	2005 Before	2005 After	2006 Before	2006 After
Federal Government	$104.3	$88.6	$112.1	$100.9	$119.4	$113.4
Technology	46.0	39.1	48.8	43.9	51.1	48.5
Building	19.6	16.7	20.4	20.4	21.3	22.4
International	16.7	14.2	17.2	15.5	17.6	16.7
Hospitality	7.1	5.3	7.5	1.9	7.8	3.9
Total Losses		$29.8		$23.3		$12.3
Percent Loss		- 15.4		- 11.3		- 5.7

Source: GMU Center for Regional Analysis
*projected core industry contribution to GRP in the absence of the terrorist attack;
**projected core industry contribution to GRP with the terrorist attack;
Note: core industry contributions are not mutually exclusive as industries are Interdependent; i.e., one core industry may purchase goods and services from another.

Sub-State Area Economic Impacts

The economic impact of the September 20th terrorist attack would not be shared evenly among the National Capital Region's sub-state portions. As shown in Table 3, the District of Columbia's economy would experience a disproportional impact losing an estimated $45.5 billion in economic output over the 2 and 1/4 year recovery period. With just 11 percent of the metropolitan area's population and 21 percent of its total employment base, its share of the economic costs would account for 46 percent of the region's total economic loss. Based on the relative sizes of the suburban economies, the Suburban Maryland jurisdictions would experience an economic loss of $21.6 billion or

21.9 percent of the region's total economic cost while the Northern Virginia jurisdictions would lose $31.3 billion of output accounting for 31.8 percent of the region's total economic cost.

With the District of Columbia receiving a disproportional share and duration of economic impacts resulting from the terrorist attacks compared to the suburbs, the region's short- and long-term residential market patterns will experience some shifts in demand. Some immediate but temporary relocation of residents from the District to the suburbs will occur to escape the effects of mobility interruptions and fears regarding personal safety. However, immediate massive relocations on a permanent basis would not result, as the supply of housing in the suburbs is insufficient to accommodate large-scale out-migration from the District. Still, on a longer-term basis, the desirability of in-city living will have been diminished as a result of the proven vulnerability of the District to terrorist events. This is likely to have some negative effect on demand for housing in the District (and price-depressing effect, too) although, as the entire region was initially impacted by the terrorist attack, wholesale changes in residential demand patterns are not likely to occur.

Table 3

Sub-state Area Economic Impacts of the September 20th Terrorist Attack
On the National Capital Region
(in billions of current year $s)

Year	District of Columbia		Suburban Maryland		Northern Virginia	
	Before*	After**	Before	After	Before	After
2004	$69.2	$62.0	$96.0	$91.4	$136.4	$129.8
2005	72.1	47.3	101.5	90.3	145.4	129.5
2006	74.4	60.9	104.0	98.2	156.0	147.2
Total Loss***		$45.5		$21.6		$31.3
% Loss		21.1		7.2		7.2
Share of Loss		46.3%		21.9%		31.8%

Source: GMU Center for Regional Analysis
*projected GRP in the absence of the terrorist attack
**projected GRP with the terrorist attack
***GRP not achieved due to the terrorist attack over two and one-quarter years.

Economic Impact Implications

The loss of $98.4 billion in gross regional product (GRP) resulting from the September 20, 2004 terrorist attack can be translated into impacts on the labor force and on household income. The loss of this output not only would cost the region jobs and personal earnings but would also be seen in reduced disposable income and the concomitant loss of retail sales and reductions in all other forms of consumer spending. Discretionary retail and personal service spending would experience the greatest impacts; spending for grocery and drug store items would be the least affected. This pattern of impact on consumer spending was seen in the immediate aftermath of the September 11, 2001 terrorist attack on the Pentagon and a lesser extent during and after weather-related events such as blizzards and tropical storms. Estimates of the magnitudes of these economic impacts are as follows:

- The loss of $98.4 in GRP would result in the loss of 1.2 million jobs over the recovery period with approximately 275,000 of these losses occurring in the District of Columbia, 400,000 in Suburban Maryland and 525,000 in Northern Virginia;

- The loss of economic output in the NCR would result in reducing total personal earnings in the region by a total of $28.8 billion over the impact period;

- The loss of $28.8 billion in personal earnings would impact all types of consumer spending; e.g., non-grocery store retail sales could lose a total of $2.6 billion in sales over the 2 and 1/4 year recovery period and cost the retail industry 124,000 jobs with about one-half of these being lost in 2005;

Fiscal Impact Implications

Reduced retail spending would impact sale tax collections that constitute a major source of state and local tax revenue. And, with the loss of personal earnings, income tax revenue would be impacted at the state level, in Maryland and Virginia, as well as in the District of Columbia and in the Suburban Maryland counties that rely on this revenue source second only to the real estate tax.

The real estate tax would not be exempt from the impact of a weaker economy although these impacts might lag at least a year due to the re-assessment cycle. Still, it seems reasonable to expect that with the economy supporting fewer jobs and generating less income and with total output diminished that both commercial and residential real estate across the region would lose value and, with this reduction in value, the real estate tax revenue available to finance local government would also decline. And this loss of value would be not short term. Even as the economy recovers to pre-attack output levels in 2007, the demonstrated vulnerability of the region to attack and the associated increase in investment risk in the NCR would depress real estate value for an extended period.

While it is not in the scope of this analysis to cost out the fiscal implications resulting from the economic cost of the September 20^{th} terrorist attack, some of the more major fiscal implications can be calculated on an order-of-magnitude basis as follows:

- The sales tax implications of lost non-grocery store retail sales are significant: the State of Maryland could lose $51.8 million in sales tax revenues from its five Suburban Maryland jurisdictions and the Commonwealth of Virginia could lose $64.8 million in sales tax collections from its Northern Virginia jurisdictions while sales tax losses in the District of Columbia are estimated to total $14.9 million.

- Reductions in personal earnings across the region also would reduce income tax collections: in the District of Columbia, this could total $203 million in lost revenue while in Virginia, lost income tax revenue could total $553 million. In Maryland, the state could experience a reduction of income state revenue of $662 and in the Suburban Maryland counties, lost income tax revenue could total $331 million over the two and 1/4 year impact period; and,

- Tax revenue losses associated with the hospitality industry would occur in all jurisdictions but would impact the District of Columbia more severely than its suburban neighbors. These revenue losses would include hotel, meals, parking and sales taxes. With hospitality industry losses estimated at $11.1 billion over the 2 and 1/4 year recovery period and with approximately 70 percent of these losses occurring in the District, its tax revenue losses (hotel, meals, retail, and parking) could total as much as $650 million.