

Economic Impact of Redeveloping The World Trade Center Site:

**New York City, New York State,
And the New York-New Jersey Area**

**Appleseed
October 30, 2003**

Executive Summary

The redevelopment of the World Trade Center site will benefit New York City and other communities in the region in several ways. Construction at the site will provide business opportunities for local contractors and suppliers, and job opportunities for construction workers, skilled workers in related industries such as trucking, architects, engineers and other professionals. New office buildings will accommodate the continued growth of the City's high-value office-based industries. A new complex of cultural facilities and a hotel will support the continued growth of the arts and tourism industries. The memorial, as well as new businesses and cultural activities, will attract millions of visitors whose spending will also fuel the growth of the regional economy.

To measure these effects, the Lower Manhattan Development Corporation asked Appleseed, a New York City-based economic development consulting firm, to analyze the impact of redeveloping the World Trade Center site on three geographic areas: New York City, New York State, and the eighteen-county New York-New Jersey metropolitan area. For each of these three areas, Appleseed analyzed the direct impact of spending on construction through 2009, when the first new office building on the site will be completed and occupied, as well as the indirect and induced impacts of construction spending – the “multiplier effect.” We also analyzed the direct, indirect and induced impact of construction at the site between 2010 and 2015 – the date when LMDC expects construction to be completed.

We similarly analyzed the direct, indirect and induced impacts generated by the ongoing operations of businesses and institutions located at the site, and of spending by visitors – again using 2009 and 2015 as our benchmark years. Finally, we estimated the impact of both construction and ongoing operations on City and State tax revenues.

Background and Assumptions

For purposes of this analysis, we define Phase One of the redevelopment program as including major infrastructure investments, the permanent PATH terminal and concourse, other below-grade investments, the World Trade Center memorial, a 2.8 million square foot office building (the “Freedom Tower”), 750,000 square feet of retail space, and 670,000 square feet of space for cultural uses. LMDC estimates the total cost (including actual construction costs as well as “soft” costs such as design and engineering) of Phase One to be between \$6.05 to \$6.66 billion.

Phase Two will include construction of an additional 7.2 million square feet of office space and a 600,000 square foot hotel. LMDC estimates the cost of Phase Two at \$3.98 to \$4.38 billion. The cost of the redevelopment program through 2015 is thus expected to total \$10.04 to \$11.04 billion.

(The definition of project phasing outlined above is consistent with the schedule for development outlined in LMDC's Generic Environmental Impact Statement for the World Trade Center Memorial and Redevelopment Plan (GEIS). The endpoints of each

phase – 2009 and 2015 – represent “study years” that are used in the GEIS to compare environmental impacts to baseline conditions and alternatives. The phasing plan thus reflects conservative estimates of environmental impacts, in that it assumes that more than half of all construction will occur in the first phase. In practice, the actual scheduling of construction over the course of the development will to some extent remain flexible.)

In calculating the impact of ongoing operations at the site, Appleseed made several assumptions about the companies and institutions doing business at the site. For example, we assumed that in 2009 the Freedom Tower will be 70 percent occupied and that in 2015 the 10 million square feet of office space at the site will be 90 percent occupied. We assumed that 50 percent of all retail activity at the site and 50 percent of the activities of cultural institutions will represent new economic activity for New York City; the rest would represent activity that, in absence of the World Trade Center site redevelopment, would have occurred elsewhere in the City. We assumed that the ratio of employees to newly-developed space will range from 1 per 1,000 square feet for the hotel to 4 per 1,000 square feet for office space to 6.7 per 1,000 square feet for restaurants. These assumptions reflect the findings of previous studies conducted by Appleseed on the impact of major development projects in Manhattan, as well as analyses of the demand for commercial space in Lower Manhattan conducted for LMDC in 2002 and 2003.

LMDC estimates that in 2009, 9 million people will visit the World Trade Center site; and in 2015, 5.5 million. For purposes of this analysis, Appleseed assumed that 20 percent of these will be people who come to New York to visit the site; 80 percent will be either local residents or out-of-towners who would have come to New York anyway, and are simply adding the World Trade Center site to their itinerary. In our analysis, only spending by the “new” 20 percent of visitors is counted toward the impact of redevelopment.

In calculating the “indirect and induced” impact of redevelopment (that is, the “multiplier effect,”) Appleseed used input-output models for New York City, New York State, and the New York-New Jersey metropolitan area that were created with the IMPLAN input-output modeling system – one of the most widely-used software programs for this type of analysis.

The Impact of Redevelopment

Over time, as the accompanying table shows, the redevelopment of the site will have a substantial impact on the New York area economy. Through 2015, construction activity at the site will cumulatively add as much as \$15.4 billion¹ to New York City’s total economic output, and will on average generate as many as 8,530 full-time equivalent jobs each year. Additional economic activity and additional jobs will also be created elsewhere in the New York-New Jersey region, and elsewhere in New York State as well.

¹ All dollar values used in this analysis are expressed in 2003 dollars.

After construction is finished in 2015, we estimate that the ongoing operations of businesses and institutions located at the site, along with spending by visitors, will increase New York City’s annual economic output by \$15.7 billion, and increase continuing citywide employment by 76,950 full-time equivalent jobs. And as with construction, the rest of the New York-New Jersey area and the rest of New York State also benefit.

Redevelopment of the World Trade Center Site: Summary of Economic Impact: Construction and Operations						
	Direct, Indirect, and Induced Impact of Construction through 2015			Direct, Indirect, and Induced Impact of Operations in 2015		
	Cumulative Output (\$billions) <i>Range</i>	Avg Annual Employment (FTE) <i>Range</i>	Cumulative Tax Revenue (\$millions) <i>Range</i>	Annual Output (\$billions)	Annual Employment (FTE)	Annual Tax Revenue (\$millions)
NYC	14.02 -15.42	7,760 - 8,530	149 - 184	15.70	76,950	425
NYS	16.38 -18.02	9,740 - 10,650	261 - 287	16.40	89,820	460
NY-NJ Metro ²	17.62 - 19.38	10,090 - 11,030	411 - 451	16.36	84,820 ³	865

The impact of redevelopment on the City, the State and the region is highlighted in more detail below.

Impact on New York City’s Economy

Construction:

- Between 2003 and 2015 the rebuilding of the World Trade Center would generate \$14.02 to \$15.42 billion in total economic output in New York City, and an average of 7,760 to 8,530 full-time equivalent jobs each year for thirteen years.

² NY-NJ Metro tax impacts include both state and local taxes.

³ While the impact of operations on the economic output of NY State and the NY-NJ Metro area are similar, the employment impact in the NY-NJ Metro area is significantly smaller than the NY State impact. This difference is due to the fact that the output per worker and employee compensation in the affected industries are higher in the metropolitan counties than in the rest of New York State.

Operations and visitor spending:

- In 2015, when the reconstruction is completed, the total impact on the City's economy from operations at the World Trade Center site and off-site visitor spending will include a \$15.70 billion increase in annual economic output and approximately 77,000 full-time equivalent jobs.

Impact on City tax revenues:

- Through 2015, construction at the World Trade Center site will cumulatively generate between \$149 and \$184 million dollars in New York City tax revenues.
- In 2015, ongoing operations at the site and spending by visitors will generate \$425 million in annual City tax revenues.

Impact on New York State's Economy

Construction:

- The cumulative impact on New York State's economy through 2015 from construction at the site would include an increase of \$16.38 to \$18.02 billion in total economic output, and an average of 9,740 to 10,650 full-time equivalent jobs each year for thirteen years.

Operations and visitor spending:

- In 2015, operations at the site and visitor spending will together produce a \$16.40 billion increase in annual economic output in New York State and approximately 89,820 full-time equivalent jobs.

Impact on State tax revenues:

- Construction activity through 2015 will cumulatively generate between \$261 million and \$287 million in State tax revenues.
- In 2015, ongoing operations and visitor spending will generate an annual \$460 million in State taxes.

Impact on the New York-New Jersey Region

Construction:

- Through 2015, construction at the World Trade Center site will generate an increase of \$17.62 to \$19.38 billion in the New York-New Jersey region's total economic output and an average of 10,090 to 11,030 full-time equivalent jobs each year for thirteen years.

Operations and visitor spending:

- In 2015, the total impact on the region's economy from operations and visitor spending will include a \$16.36 billion increase in annual economic output and approximately 84,820 full-time equivalent jobs.

Impact on state and local tax revenues:

- Region-wide, construction activity through 2015 will generate a cumulative total of between \$411 million and \$451 million in state and local tax revenues
- In 2015, ongoing operations and visitor spending will generate \$865 million in annual state and local taxes within the region.

Long-Term Effects of Redevelopment

This assessment of the economic impact of redevelopment of the World Trade Center site focuses on the direct impact of expenditures on construction, the activities of businesses and institutions that subsequently occupy new buildings at the site, and spending by visitors, as well as the secondary impact that occurs as spending by those entities, their employees and suppliers ripples outward through the local economy. In the long run, however, the redevelopment of the World Trade Center site could have implications for the local economy that are not addressed in this report. For example:

- By helping to reassert Lower Manhattan's role as a major center of commerce, redevelopment of the World Trade Center site could over time encourage further investment in commercial development at other sites in the area.
- Recent analyses of Lower Manhattan's retail potential suggest that the traffic generated by establishment of a regional retail hub at the World Trade Center site will spill over onto the surrounding streets, and induce further investment in retail development.
- Because it will be able to accommodate ten-car trains, the new PATH terminal will in the future be able to accommodate substantial growth in the number of employees commuting to Lower Manhattan from New Jersey.

- The development of new public spaces, cultural activities, retail choices and employment opportunities will make Lower Manhattan a more attractive place to live; it will thus encourage further investment in residential development in the area, and the continued revitalization of Lower Manhattan as a vibrant, twenty-four-hour live-work community.

Other pending projects – some directly related to the World Trade Center site, others located elsewhere in Lower Manhattan – would reinforce these long-term effects. These could include major investments at the Fulton Street Station and at South Ferry, as well as potential projects now under consideration including, air-rail links to John F. Kennedy and Newark Liberty airports, a direct connection to the Long Island Rail Road, and expansion of ferry services.

Over the next twenty years, these broader effects could prove to be just as important to the economy of New York City and the metropolitan area as the more directly-traceable impacts analyzed in this report. They are not, however, easy to quantify, especially at this stage of the redevelopment process. The estimates of direct, indirect and induced impacts presented here should therefore be seen as a relatively conservative definition of the ultimate impact of redeveloping the World Trade Center site.

Introduction

The redevelopment of the World Trade Center site will benefit New York City and other communities in the region in several ways. Construction at the site will provide business opportunities for local contractors and suppliers, and job opportunities for construction workers, architects, engineers and other professionals. New office buildings will accommodate the continued growth of the City's high-value, office-based industries. A new complex of cultural facilities and a hotel will support the continued growth of the arts and tourism industries. The memorial, as well as new businesses and cultural activities, will attract millions of visitors whose spending will also fuel the growth of the regional economy.

The Lower Manhattan Development Corporation asked Appleseed, a New York City-based economic development consulting firm, to assess the impact of redevelopment of the World Trade Center site on the economies of New York City, New York State, and the New York-New Jersey metropolitan area. This report presents the results of our analysis.

To measure the effects of redevelopment of the site, Appleseed analyzed the direct impact of spending on construction through 2009, when the first new office building on the site will be completed and occupied, as well as the indirect and induced impacts of construction spending – the “multiplier effect.” We similarly analyzed the economic impact of construction at the site between 2010 and 2015 – the date when LMDC expects construction to be completed.

We also analyzed the economic impact generated by the ongoing operations of businesses and institutions located at the site, and of spending by visitors – again using 2009 and 2015 as our benchmark years. Finally, we estimated the impact of both construction and ongoing operations on City and State tax revenues.

The impact of redevelopment on the City, the State and the region is highlighted in more detail in the following sections of the report. Part One provides an overview of the redevelopment program, and explains the assumptions on which our assessment of its impact is based. Part Two presents our assessment of the impact of redevelopment on the economy of New York City. Part Three deals with the impact of redevelopment on the economy of New York State, and Part Four, the impact in the New York-New Jersey metropolitan area.

Part One: Overview, Assumptions and Methodology

This analysis examines the development of the World Trade Center site in two phases, the first concluding in 2009 and the second in 2015. These years represent respectively a mid-point in the overall construction at the World Trade Center site and its eventual completion.

Phase One, concluding in 2009, includes the completion of the memorial, the Freedom Tower, the permanent PATH terminal and concourse, as well as retail and cultural uses on the World Trade Center site. Included among these cultural uses are a museum and performing arts center. Phase One also represents the completion of a major investment in infrastructure, including the permanent reinforcement of the slurry wall, and the creation of streets, parks and open spaces. It also includes major investments in other below-grade infrastructure such as parking, truck docks, security improvements and utilities. Much of this infrastructure work is likely to be completed before 2009. The reinforcement of the slurry wall is expected in 2005, with the topping-out of the Freedom Tower, the completion of the Wedge of Light Plaza, the opening of the permanent PATH terminal, and the construction of the memorial substructure to follow in 2006. The Freedom Tower is projected to be completed and ready for occupancy in 2007-8.

Phase Two, concluding in 2015, includes the completion of the remainder of the commercial office space (towers 2-5) as well as the hotel. This analysis anticipates that by 2015 a full ten million square feet of office space (the Freedom Tower as well as Towers 2-5) will be on-line and ready for occupancy.

This definition of project phasing is consistent with the schedule for development outlined in LMDC's Generic Environmental Impact Statement for the World Trade Center Memorial and Redevelopment Plan (GEIS). The endpoints of each phase – 2009 and 2015 – represent “study years” that are used in the GEIS to compare environmental impacts to baseline conditions and alternatives. The phasing plan thus reflects conservative estimates of environmental impacts, in that it assumes that more than half of all construction will occur in the first phase. In practice, the actual scheduling of construction over the course of the development will to some extent remain flexible.

The Cost of Redevelopment

LMDC estimates that the total cost of the redevelopment program outlined above will range from \$10.04 billion to \$11.04 billion.⁴ These totals include the “hard” cost of actual construction work, as well as the “soft” costs of design and engineering,

⁴ Estimates are preliminary and subject to change. The cost estimate for the memorial will be refined to reflect the design selected.

construction management, insurance, legal services, etc. The derivation of this estimate is presented in Table 2.

Table 2
Construction Cost

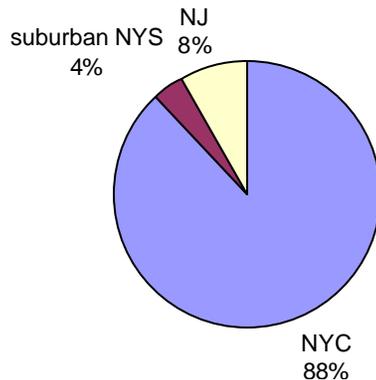
	SF (000s)	Total Construction Cost without Contingency (\$B)	Total Construction Cost with Contingency (\$B)
PHASE 1 - 2009			
Path Terminal and Concourse		\$ 1.82	\$ 2.00
Infrastructure		0.36	0.40
Below-grade Investment		1.06	1.17
Commercial	2,800	1.81	1.99
Retail	750	0.41	0.45
Museum	180	0.13	0.15
Cultural Institutions	240	0.18	0.20
Performing Arts Center	250	0.19	0.20
Memorial ⁴		0.10	0.11
Total Phase 1		6.05	6.66
PHASE 2 - 2015			
Commercial	7,200	\$ 3.67	\$ 4.03
Hotel	600	0.32	0.35
Total Phase 2		3.98	4.38
GRAND TOTAL		10.04	11.04

Sources: Port Authority and LMDC

By definition, all of the actual construction work involved in redevelopment of the World Trade Center site takes place in New York City. But some other work involved in the redevelopment process – such as administrative and construction management functions, design and engineering work, etc. – will take place off-site. As a result, some of the estimated \$10.04 to \$11.04 billion in direct spending on redevelopment will occur outside the City. In order to take this difference into account, Appleseed estimated the percentage of total direct spending that would occur in four suburban counties in New York, and in nine counties in New Jersey. As Figure 1 shows, we assume for purposes of this analysis that 12 percent of all direct spending on redevelopment will occur outside the City.⁵

⁵ This assumption reflects the findings of prior Appleseed research on the location of contractors involved in several major development projects in Manhattan. We assume that 85 percent of the value of all “hard” construction represents work that is actually done on-site, and is therefore counted as activity occurring in New York City. The remaining 15 percent of the value of contract construction represents work done off-site. We further assume that half of the off-site construction work on PATH and other infrastructure occurs outside New York City; and that 30 percent of all off-site work on building construction occurs outside New York City. “Soft” costs primarily involve work done off-site and are similarly allocated between New York City and other metropolitan counties in New York and New Jersey.

Figure 1
Location of Construction Spending



Operating Assumptions

To gauge the impact of ongoing operations at the World Trade Center site it is necessary to make some assumptions about:

- Occupancy rates for each type of use in the redevelopment program;
- For each of the uses, the average number of workers employed per 1,000 square feet of space;
- The nature of the businesses occupying commercial space; and
- The extent to which new buildings and new business at the World Trade Center site represents a net addition to the local economy, or simply a substitute for business that would be occurring elsewhere in the area.

Occupancy rates

For purposes of this analysis, we assume that in 2009:

- The 2.8 million square feet of office space developed in Phase One (that is, the Freedom Tower, to be completed in 2007-2008) will be 70 percent occupied.
- The retail space to be developed in Phase One will be 95 percent occupied. This assumption reflects the findings of several studies of the demand for retail space in Lower Manhattan that were conducted in 2002 and 2003 for the Port Authority and LMDC, as well as actual vacancy rates in the World Trade Center prior to September 11th.
- The cultural facilities will be fully occupied and in use year-round.

We further assume that in 2015, 90 percent of the 10 million square feet of office space included in the redevelopment program will be occupied. This level of occupancy is consistent with historical trends in vacancy rates for Manhattan office space, averaged over the business cycle. It also reflects analyses of long-term trends in demand for office space in Lower Manhattan, conducted for LMDC by Appleseed and Real Estate Solutions, LLC.

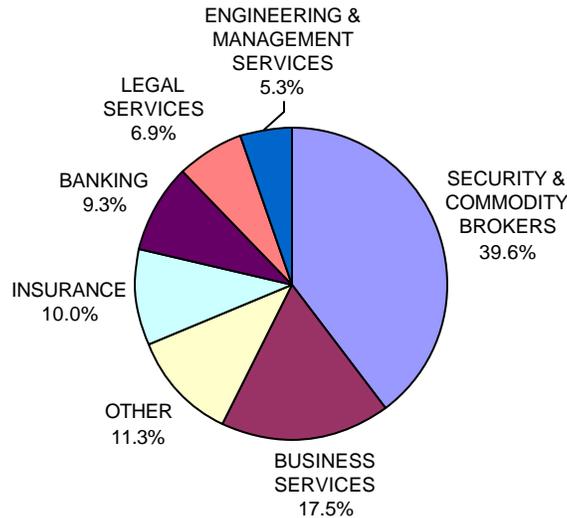
Employment ratios

The ratio of workers employed to occupied space will vary greatly from one use to another. For the purpose of this analysis Appleaseed estimates that this ratio will vary from 1 per 1,000 square feet for the hotel to 4 per 1,000 square feet for commercial office space and 6.7 for restaurants.⁶ The employment ratio for the hotel assumes that it will operate within the normal range of occupancy for Manhattan hotels. Those for cultural space are based on employment patterns at several other New York City institutions of comparable size, and as noted above, assume that those spaces are fully occupied and operating year-round.

Nature of commercial tenants

The economic impact of companies that rent space in the new office towers at the site will vary by industry. For example, IMPLAN reports that the average output per worker in the securities industry in 2000 was \$403,700, while in legal services the average per worker was \$153,900.⁷ For purposes of this analysis, we assume that the types of businesses occupying the new office buildings at the site will reflect the mix of office-based businesses found in Lower Manhattan in 2001, before the attack on the World Trade Center (Figure 2). (In reality, Lower Manhattan’s office-based economy will inevitably evolve during the next dozen years. For purposes of this analysis, however, we have not attempted to forecast how that evolution might affect the area’s industry mix.)

**Figure 2
Industry Mix of Commercial Office Tenants
In Lower Manhattan, 2001**



Source: NYSDOL

⁶ These assumptions reflect previous Appleaseed analyses of actual space-to-employment ratios in comparable space in Manhattan.

⁷ IMPLAN input-output database.

We further assume that 35 percent of the planned retail space will be allocated to restaurants and other food services, and that other types of retailing will account for the remaining 65 percent.

Substitution effects

Not all of the businesses that occupy commercial office space at the World Trade Center site will represent a net addition to the local economy. Some of the space will be occupied by businesses that, if the new buildings had not been developed, would have been located elsewhere in New York City. For purposes of this analysis, we assume that this “substitution effect” will account for 20 percent of all commercial office space at the site; conversely, 80 percent of all commercial office occupancy at the site will represent a net addition to the local economy⁸. We also assume that since the demand for hotel services will be tied primarily to the growth of office-based business activity, 80 percent of all hotel occupancy at the site will represent net new business.

The identity of the cultural institutions that will occupy space at the World Trade Center site, and the nature of their programming, is yet to be determined. We can reasonably assume, however, that the site will include some institutions (and some audiences) that will be relocating from elsewhere in New York City. For purposes of this analysis, we assume that 50 percent of all patronage at cultural facilities at the site will substitute for spending on the arts and entertainment that would have occurred elsewhere in the City. We further assume that 50 percent of all retail and restaurant sales will substitute for sales that would have occurred elsewhere in the City. The remaining 50 percent will represent net new activity.

Table 3 summarizes our assumptions about occupancy rates, substitution rates, employment ratios and net new jobs.

⁸ In effect, we are assuming that demand for commercial office space will have recovered by 2009 and that growth of the City’s office-based industries will be strong enough to support a significant volume of new construction through 2015. As noted previously, this is consistent with the results of analyses of the Lower Manhattan market conducted for LMDC by Appleseed and Real Estate Solutions, as well as analyses by several independent authorities. See, for example, Hugh F. Kelly, *New York Regional and Downtown Office Market: History and Prospects after 9/11*, August 2002.

**Table 3
Operating Assumptions**

	SF (000s)	Emp/ 1000SF	Occupancy rate	Total # WTC site jobs	Substitution	Total # WTC site new jobs
PHASE 1 - 2009						
Commercial Office Space	2,800	4	70%	7,840	20%	6,272
Retail	750	5.6	95%	3,986	50%	1,993
Museum	180	1.6	*	288	50%	144
Cultural Institutions	240	1.8	*	432	50%	216
Performing Arts Center	250	2	*	500	50%	250
Total	4,220			13,046		8,875
PHASE 2 - 2015						
Commercial Office Space	10,000	4	90%	36,000	20%	28,800
Retail	750	5.6	95%	3,986	50%	1,993
Museum	180	1.6	*	288	50%	144
Cultural Institutions	240	1.8	*	432	50%	216
Performing Arts Center	250	2	*	500	50%	250
Hotel	600	1	*	600	20%	480
Total	12,020			41,806		31,883

* not applicable

Visitor Assumptions

LMDC estimates that in 2009, 9 million people will visit the memorial and other attractions at the World Trade Center site; and that by 2015, we conservatively assume that the number of visitors will have stabilized to 5.5 million. For purposes of this analysis, we assume that 20 percent of these visitors will be people who are coming to New York City specifically to see the memorial and for other activities at the site. The remainder will be either local residents or people who would have come to New York in any case and are simply adding the site to their local itinerary.

Our assumptions about the origins of these visitors, how long they stay and their spending patterns are based on a survey of visitors to the City in 2001, conducted for New York City & Co.⁹ To avoid double counting, we further assume that 50 percent of all spending by these visitors will occur at the site; and that this on-site spending is already accounted for in our analysis of the impact of new retail, restaurant, and hotel operations at the site. The remaining 50 percent of all spending by these visitors will occur offsite, and will have an additional impact on the local economy.

⁹ New York City & Co reported the following data on 2001 leisure visitors to New York City: 1) origin - 16% international, 20% New York State, 16% New Jersey, and 48% other US; 2) average spending - \$145 for domestic visitors and \$73 for international visitors; 3) average length of stay - 1.4 nights for domestic visitors and 9 nights for international visitors.

Analyzing the Indirect and Induced Effects of Redevelopment

The economic impact of redeveloping the World Trade Center site will not be limited to the business done and the jobs created by contractors involved in the rebuilding process, and by the companies that locate at the site when construction is completed. These contractors and companies will themselves buy a wide range of goods and services – furniture, office supplies, accounting and legal services, telephone service, etc. – from other local companies. Their employees will also spend part of their incomes locally, on housing, food, clothing, utilities, entertainment, etc. The local businesses from which World Trade Center site contractors, tenant companies and employees buy goods and services will in turn buy goods and services from other local businesses, and so will *their* employees.

To measure these “indirect and induced” or “multiplier” effects, Appleseed used three models based on the IMPLAN input-output modeling system – one model for New York City, a second for New York State, and a third for the New York-New Jersey metropolitan area. Based on the assumptions outlined above, we used these models to calculate the direct, indirect and induced impact of construction spending on employment, wages and economic output for each geographic area. We similarly used the three models to calculate the direct, indirect and induced impacts on employment wages and output resulting from ongoing business activity at the site, and from spending by visitors.

Finally, we used our IMPLAN-based models, along with additional information about state and local taxes and the recently-announced agreement between New York City and the Port Authority on “payments in lieu of taxes” on the World Trade Center site, to assess the impact of redevelopment of the site on state and local revenues.

Long-Term Effects of Redevelopment

This assessment of the economic impact of redevelopment of the World Trade Center site focuses on the direct impact of expenditures on construction, the activities of businesses and institutions that subsequently occupy new buildings at the site, and spending by visitors, as well as the secondary impact that occurs as spending by those entities, their employees and suppliers ripples outward through the local economy. In the long run, however, the redevelopment of the World Trade Center site could have implications for the local economy that are not addressed in this report. For example:

- By helping to reassert Lower Manhattan’s role as a major center of commerce, redevelopment of the World Trade Center site could over time encourage further investment in commercial development at other sites in the area.
- Recent analyses of Lower Manhattan’s retail potential suggest that the traffic generated by establishment of a regional retail hub at the World Trade Center site will spill over onto the surrounding streets, and induce further investment in retail development.

- Because it will be able to accommodate ten-car trains, the new PATH terminal will in the future be able to accommodate substantial growth in the number of employees commuting to Lower Manhattan from New Jersey.
- The development of new public spaces, cultural activities, retail choices and employment opportunities will make Lower Manhattan a more attractive place to live; it will thus encourage further investment in residential development in the area, and the continued revitalization of Lower Manhattan as a vibrant, twenty-four-hour live-work community.

Other pending projects – some directly related to the World Trade Center site, others located elsewhere in Lower Manhattan – would reinforce these long-term effects. These could include major investments at the Fulton Street Station and at South Ferry, as well as potential projects now under consideration such as Air Rail links to John F. Kennedy and Newark Liberty airports, a direct connection to the Long Island Rail Road, and expansion of ferry services.

Over the next twenty years, these broader effects could prove to be just as important to the economy of New York City and the metropolitan area as the more directly-traceable impacts analyzed in this report. They are not, however, easy to quantify, especially at this stage of the redevelopment process. The estimates of direct, indirect and induced impacts presented here should therefore be seen as a relatively conservative definition of the ultimate impact of redeveloping the World Trade Center site.

Part Two:

Impact on New York City's Economy

To assess the impact of redevelopment of the World Trade Center site on New York City's economy, we analyzed the direct, indirect and induced impact of spending on construction during Phase One and Phase Two, and the direct, indirect and induced impact of operations and visitor spending in 2009 and 2015. We also estimated the increase in state and local tax revenues that this increased economic activity would produce.

Construction

Total

Through 2015, LMDC estimates that the total cost of redeveloping the World Trade Center site (including actual construction as well as soft costs such as architecture and engineering) will range from \$10.04 to \$11.04 billion¹⁰. We estimate that direct spending on construction will annually generate between 4,500 and 4,950 full-time equivalent jobs in construction and related industries in New York City for 13 years.

Taking into account direct, indirect and induced impacts, the total impact on New York City's economy from 2003 through 2015 from construction at the site would include:

- *A cumulative increase of \$14.02 to \$15.42 billion in total economic output and*
- *An average of 7,760 to 8,530 full-time equivalent jobs each year.*

Phase One

LMDC estimates that through 2009, the total cost of redeveloping the World Trade Center site will range from \$6.05 billion to \$6.66 billion (in 2003 dollars). Based on these costs, we estimate that redevelopment of the site through 2009 will generate an average of 4,800 to 5,280 full-time equivalent jobs each year for seven years in New York City.

Taking into account direct, indirect and induced impacts of Phase One construction, the total impact on New York City's economy through 2009 from construction at the site would include:

- A cumulative increase of \$8.19 to \$9.01 billion in total economic output; and
- An average of 8,350 to 9,180 full-time equivalent jobs each year for seven years.

Phase Two

Between 2010 and 2015, direct spending on redevelopment will range from \$3.98 to \$4.38 billion. This direct spending will generate between 4,150 and 4,560 full-time equivalent jobs annually in New York City for six years.

¹⁰ All dollar values used in this analysis are expressed in 2003 dollars.

Construction at the site would have the following direct, indirect, and induced impact on the City's economy between 2010 and 2015:

- A cumulative increase of \$5.83 to \$6.42 billion in total economic output; and
- An average of 7,070 to 7,770 full-time equivalent jobs each year for six years.

Table 4 summarizes the impact of construction on the World Trade Center site on New York City's economy in terms of output, employment, and employee compensation.

**Table 4
New York City
Construction Impact**

	Direct	Indirect and Induced	Total
Phase 1			
Minimum			
Output (\$B)	5.14	3.04	8.19
Employee Compensation (\$B)	1.94	1.20	3.14
Employment (annual FTEs)	4,804	3,543	8,347
Maximum			
Output (\$B)	5.66	3.35	9.01
Employee Compensation (\$B)	2.13	1.32	3.46
Employment (annual FTEs)	5,284	3,898	9,182
Phase 2			
Minimum			
Output (\$B)	3.68	2.16	5.83
Employee Compensation (\$B)	1.35	0.85	2.20
Employment (annual FTEs)	4,150	2,916	7,066
Maximum			
Output (\$B)	4.05	2.37	6.42
Employee Compensation (\$B)	1.48	0.94	2.42
Employment (annual FTEs)	4,566	3,209	7,775
Total			
Minimum			
Output (\$B)	8.82	5.20	14.02
Employee Compensation (\$B)	3.29	2.06	5.34
Employment (annual FTEs)	4,502	3,254	7,756
Maximum			
Output (\$B)	9.71	5.72	15.42
Employee Compensation (\$B)	3.61	2.26	5.88
Employment (annual FTEs)	4,953	3,580	8,532

Operations and Visitor Spending

In 2009

With the completion of Phase One of the reconstruction in 2009, we estimate that direct employment in commercial office buildings, retail space, and cultural facilities planned for the World Trade Center site will total approximately 13,050 full-time equivalent jobs. After taking into account the likelihood that some of these jobs would be relocating from elsewhere in New York City – or would substitute for new jobs that otherwise be created elsewhere in the City – we estimate that net new employment at the site will total 8,870

full-time equivalent jobs. These net new jobs will represent approximately \$2.20 billion in added economic output.

Combining direct, indirect and induced impacts, we estimate that in 2009 the total impact on the City's economy from new business and institutional operations at the World Trade Center site will include:

- A \$3.53 billion increase in annual economic output; and
- Approximately 18,500 continuing full-time equivalent jobs.

Based on LMDC's estimate that 9.0 million people will visit the site in 2009, we estimate that *incremental* off-site spending by these visitors will generate¹¹:

- A \$380 million increase in annual economic output in New York City; and
- Approximately 4,500 continuing full-time equivalent jobs.

Combining the impact of on-site operations and off-site visitor spending (and excluding the impact of construction), we estimate that the total impact of redevelopment on the City's economy in 2009 will include:

- *A \$3.91 billion increase in annual economic output, and*
- *Approximately 23,000 continuing full-time equivalent jobs.*

In 2015

With the completion of the redevelopment of the site in 2015, we estimate that commercial office, retail, cultural and hotel operations at the World Trade Center site will directly employ approximately 41,800 people on a full-time equivalent basis, roughly equivalent to the number of people who worked at the World Trade Center prior to September 11th. Of these, 31,900 will represent net new jobs. These net new jobs will represent approximately \$9.62 billion in added economic output in New York City.

Combining direct, indirect and induced impacts, we estimate that in 2015 new business and institutional operations at the site will have the following the total impact on the City's economy:

- A \$15.47 billion increase in annual economic output; and
- Approximately 74,200 continuing full-time equivalent jobs.

Based on LMDC's estimate that 5.5 million people will visit the site in 2015, we estimate that *incremental* off-site spending by these visitors will result in:

- A \$233 million increase in annual economic output in New York City; and

¹¹ We excluded from our impact calculations the spending of visitors who live in New York City as, by definition, they would be in New York City in the absence of the memorial.

- Approximately 2,740 continuing full-time equivalent jobs.

Combining the impacts of operations and visitor spending (and excluding the impact of construction), we estimate that in 2015 the redevelopment of the World Trade Center will generate:

- *A \$15.70 billion increase in annual economic output in New York City, and*
- *Approximately 76,950 continuing full-time equivalent jobs.*

The impact of operations and visitor spending on New York City's economy in terms of output, employment and employee compensation is summarized in Table 5.

Table 5
New York City
Operating and Visitors Impacts

	Direct	Indirect and Induced	Total
2009			
Operations			
Output (\$B)	2.20	1.33	3.53
Employee Compensation (\$B)	1.04	0.55	1.59
Employment (annual FTEs)	8,875	9,638	18,513
Visitors			
Output (\$B)	0.23	0.15	0.38
Employee Compensation (\$B)	0.10	0.06	0.16
Employment (annual FTEs)	3,299	1,203	4,502
Total			
Output (\$B)	2.44	1.48	3.91
Employee Compensation (\$B)	1.14	0.61	1.75
Employment (annual FTEs)	12,174	10,841	23,015
2015			
Operations			
Output (\$B)	9.62	5.84	15.47
Employee Compensation (\$B)	4.56	2.45	7.00
Employment (annual FTEs)	31,883	42,320	74,203
Visitors			
Output (\$B)	0.14	0.09	0.23
Employee Compensation (\$B)	0.06	0.03	0.10
Employment (annual FTEs)	2,008	735	2,743
Total			
Output (\$B)	9.76	5.94	15.70
Employee Compensation (\$B)	4.62	2.48	7.10
Employment (annual FTEs)	33,891	43,055	76,946

Impact on New York City Revenues

The economic activity generated by redevelopment of the World Trade Center site will yield increased tax revenues for New York City. Direct tax impacts will include income taxes paid by City residents employed in construction at the site or who work for the companies and institutions that locate there; business taxes paid by contractors involved

in the rebuilding process and by companies that locate at the site; sales taxes paid on retail transactions at the site; hotel taxes; and “payments in lieu of taxes” on the property, in accord with the agreement between New York City and the Port Authority of New York and New Jersey announced in October 2003.

Because the indirect and induced activity generated by construction, ongoing operations and visitor spending is spread widely across all sectors of the City’s economy, it will yield additional revenues in virtually every major category of City taxes, including income, sales, business and property taxes.

Taking into account direct, indirect and induced effects, we estimate that:

- Through 2009, construction activity will cumulatively generate between \$98 and \$108 million in City tax revenues.
- Construction activity between 2010 and 2015 will cumulatively generate between \$51 million and \$77 million in City tax revenues.
- In 2009, ongoing operations and visitor spending will generate \$120 million in City tax revenues.
- In 2015, ongoing operations and visitor spending will generate \$425 million in City tax revenues.

These impacts are detailed in Table 6.

**Table 6
New York City
Tax Revenues**

	New York City Tax Revenue (\$ millions)
Construction (cumulative impact)	
Phase 1 - Min	\$ 98
Phase 1 - Max	108
Phase 2 - Min	51
Phase 2 - Max	77
Operations (annual impact)	
Phase 1	120
Phase 2	425

Part Three:

Impact on New York State's Economy

To assess the impact of redevelopment of the World Trade Center site on New York State's economy – just as we did for New York City – Applesseed analyzed the direct, indirect and induced impact spending on construction during Phase One and Phase Two, and the impact of operations and visitor spending in 2009 and 2015. We also estimated the increase in state tax revenues that this increased economic activity would produce.

The impact of redevelopment on employment and output at the state level is greater than the impact on New York City, for several reasons.

- For purposes of this analysis, we assumed that 3.9 percent of all construction spending will occur in New York State communities outside the City; direct spending in New York State is thus greater than the direct spending that occurs within the City.
- In addition to buying goods and services from companies located in New York City, World Trade Center site contractors, tenant companies and their employees also buy goods and services from companies located elsewhere in New York State – an area with a population (approximately 19 million) and an economy more than double those of New York City.
- Some of the workers employed in rebuilding at the site, or subsequently employed by tenant companies, will live in New York State communities outside the City. They will spend a significant portion of their earnings within those communities – on housing, groceries, clothing, services such as dry cleaning and day care, entertainment, etc.

Construction

Total

Through 2015, LMDC estimates that the total cost of redeveloping the World Trade Center site will range from \$10.04 to \$11.04 billion. We estimate that this direct spending will annually generate between 4,770 and 5,170 full-time equivalent jobs in construction and related industries in New York State.

Taking into account direct, indirect and induced impacts, the total impact on New York State's economy through 2015 from construction at the site would include:

- *A cumulative increase of \$16.38 to \$18.02 billion in total economic output; and*
- *An average of 9,740 to 10,650 full-time equivalent jobs each year for 13 years..*

Phase One

We estimate that through 2009, direct spending on redevelopment of the World Trade Center site will generate an average of 5,170 to 5,690 full-time equivalent jobs in New York State each year for seven years. Through 2009, construction at the site would have

the following total impact (that is direct, indirect and induced impact combined) on New York State's economy:

- A cumulative increase of \$9.68 to \$10.65 billion in total economic output; and
- An average of 10,650 to 11,720 full-time equivalent jobs each year for seven years.

Phase Two

Between 2010 and 2015, direct spending on redevelopment will generate between 4,290 and 4,570 full-time equivalent jobs annually in New York State.

Taking into account direct, indirect and induced impacts, between 2010 and 2015, construction at the site would generate:

- A cumulative increase of \$6.69 to \$7.36 billion in New York State's economic output; and
- An average of 8,680 to 9,400 full-time equivalent jobs within the state each year for six years.

Table 7 summarizes the impact of construction on the World Trade Center site on output, employment and employee compensation in New York State.

**Table 7
New York State
Construction Impact**

	Direct	Indirect and Induced	Total
Phase 1			
Minimum			
Output (\$B)	5.46	4.22	9.68
Employee Compensation (\$B)	2.06	1.57	3.63
Employment (annual FTEs)	5,173	5,480	10,652
Maximum			
Output (\$B)	6.01	4.65	10.65
Employee Compensation (\$B)	2.27	1.73	3.99
Employment (annual FTEs)	5,687	6,028	11,716
Phase 2			
Minimum			
Output (\$B)	3.79	2.91	6.69
Employee Compensation (\$B)	1.39	1.08	2.46
Employment (annual FTEs)	4,291	4,386	8,677
Maximum			
Output (\$B)	4.17	3.20	7.36
Employee Compensation (\$B)	1.52	1.19	2.71
Employment (annual FTEs)	4,573	4,825	9,398
Total			
Minimum			
Output (\$B)	9.25	7.13	16.38
Employee Compensation (\$B)	3.44	2.65	6.09
Employment (annual FTEs)	4,766	4,975	9,741
Maximum			
Output (\$B)	10.17	7.84	18.02
Employee Compensation (\$B)	3.79	2.91	6.70
Employment (annual FTEs)	5,173	5,473	10,646

Operations and Visitor Spending

In 2009

Net new employment at the World Trade Center site in 2009, and the increased economic output directly associated with those jobs, will be the same for New York State as for New York City – 8,870 full-time equivalent jobs, and \$2.20 billion in added economic output.

We estimate that in 2009 the total impact on the State’s economy from new business and institutional operations at the World Trade Center site (including direct, indirect and induced effects) will include:

- A \$3.69 billion increase in annual economic output; and
- Approximately 21,460 continuing full-time equivalent jobs.

Based on LMDC’s estimate that 9 million people will visit the site in 2009, we estimate that *incremental* off-site spending by these visitors will generate¹²:

- A \$360 million increase in annual economic output in New York State; and
- Approximately 4,190 continuing full-time equivalent jobs.

Combining the impact of on-site businesses and institutions and off-site visitor spending (and excluding the impact of construction), we estimate that in 2009 redevelopment of the site will generate:

- *A \$4.05 billion increase in annual economic output, and*
- *Approximately 25,650 continuing full-time equivalent jobs within the state.*

In 2015

As in 2009, net new employment at the site and the associated direct output in 2015 will be the same at the State level as it is for New York City – 31,900 net new jobs and approximately \$9.62 billion in added economic output.

Combining direct, indirect and induced impacts, we estimate that in 2015 the total impact on the State’s economy from new business and institutional operations at the World Trade Center site will include:

- A \$16.18 billion increase in annual economic output; and

¹² We excluded from our impact calculations the spending of visitors who live in New York State. We assumed that their visit-related spending does not constitute new economic activity. In other words, we conservatively assumed that they would spend the same amount within the State if they did not visit the memorial.

- Approximately 87,270 continuing full-time equivalent jobs.

Based on LMDC’s estimate that 5.5 million people will visit the site in 2015, we estimate that incremental off-site spending by visitors will produce:

- A \$220 million increase in annual economic output in New York State; and
- Approximately 2,560 continuing full-time equivalent jobs.

Combining the impacts of operations and visitor spending (and excluding the impact of construction), we estimate that in 2015 the redevelopment of the World Trade Center will generate:

- *A \$16.40 billion increase in annual economic output in New York State, and*
- *Approximately 89,820 continuing full-time equivalent jobs.*

The impact of operations and visitor spending on New York State’s economy is summarized in Table 8.

Table 8
New York State
Operating and Visitors Impact

	Direct	Indirect and Induced	Total
2009			
Operations			
Output (\$B)	2.20	1.49	3.69
Employee Compensation (\$B)	1.04	0.58	1.62
Employment (annual FTEs)	8,875	12,586	21,461
Visitors			
Output (\$B)	0.20	0.16	0.36
Employee Compensation (\$B)	0.09	0.06	0.14
Employment (annual FTEs)	2,771	1,419	4,190
Total			
Output (\$B)	2.40	1.65	4.05
Employee Compensation (\$B)	1.13	0.64	1.76
Employment (annual FTEs)	11,646	14,005	25,651
2015			
Operations			
Output (\$B)	9.62	6.56	16.18
Employee Compensation (\$B)	4.56	2.58	7.13
Employment (annual FTEs)	31,883	55,383	87,266
Visitors			
Output (\$B)	0.12	0.10	0.22
Employee Compensation (\$B)	0.05	0.03	0.09
Employment (annual FTEs)	1,690	867	2,557
Total			
Output (\$B)	9.74	6.66	16.40
Employee Compensation (\$B)	4.61	2.61	7.22
Employment (annual FTEs)	33,573	56,250	89,823

Impact on New York State Revenues

As it does for New York City, the economic activity generated by redevelopment of the World Trade Center site will yield increased tax revenues for New York State. Direct tax impacts will include income taxes paid by state residents employed in construction at the site or who work for the companies and institutions that locate there, business taxes paid by contractors involved in the rebuilding process and by companies that locate at the site, and sales taxes paid on retail transactions at the site. Indirect and induced activity generated by construction, ongoing operations and visitor spending will also yield income, sales, and business taxes.

Taking into account direct, indirect and induced effects, we estimate that:

- Construction activity through 2009 will cumulatively generate between \$155 and \$170 million in State tax revenues.
- Construction activity between 2010 and 2015 will cumulatively generate between \$106 million and \$116 million in State tax revenues.
- In 2009, ongoing operations and visitor spending will generate \$113 million in annual State tax revenues.
- In 2015, ongoing operations and visitor spending will generate \$460 million in annual State tax revenues.

These impacts are detailed in Table 9.

Table 9
New York State
Tax Revenues

	New York State Tax Revenue (\$ millions)
Construction (cumulative impact)	
Phase 1 - Min	\$ 155
Phase 1 - Max	170
Phase 2 - Min	106
Phase 2 - Max	116
Operations (annual impact)	
Phase 1	113
Phase 2	460

Part Four:

Impact on the Economy of the New York-New Jersey Region

The regional nature of the New York area economy means that residents of New Jersey, and businesses located there, will also share in the opportunities created, and the benefits generated by, redevelopment of the World Trade Center site. Some of the work required for rebuilding will be done off-site by New Jersey-based contractors. Some of those employed in on-site construction and ongoing operations will be New Jersey residents, and some of the indirect and induced effects of construction and operations will spill over into nearby New Jersey counties.

To capture these effects, we assessed the direct, indirect and induced impacts of construction, operations and visitor spending across the eighteen-county New York-New Jersey metropolitan area – a region with a population of approximately 17.4 million.¹³

Construction

Total

Through 2015, LMDC estimates that the total cost of redeveloping the World Trade Center site will range from \$10.04 to \$11.04 billion. We estimate that this direct spending will annually generate between 5,210 and 5,660 full-time equivalent jobs in construction and related industries in the New York-New Jersey region.

Through 2015, construction at the site would have the following total impact (including direct, indirect, and induced effects) on the New York-New Jersey region's economy:

- *A cumulative increase of \$17.62 to \$19.38 billion in total economic output; and*
- *An average of 10,090 to 11,030 full-time equivalent jobs each year for 13 years.*

Phase One

We estimate that through 2009, direct spending on redevelopment of the World Trade Center site will generate an average of 5,790 to 6,370 full-time equivalent jobs in the New York-New Jersey region each year for seven years.

Taking into account direct, indirect and induced impacts, the total impact on the region's economy through 2009 from construction at the site would include:

- A cumulative increase of \$10.65 to \$11.71 billion in total economic output; and
- An average of 11,290 to 12,420 full-time equivalent jobs each year for seven years.

¹³ For purposes of this analysis, we define the region as the five boroughs of New York City; Nassau, Suffolk, Westchester and Rockland counties in New York; and Bergen, Passaic, Hudson, Essex, Union, Middlesex, Monmouth, Morris and Somerset counties in New Jersey.

Phase Two

Between 2010 and 2015, direct spending on redevelopment will generate between 4,530 and 4,840 full-time equivalent jobs annually in the eighteen-county area.

Taking into account direct, indirect and induced impacts, the total impact on the New York-New Jersey region economy between 2010 and 2015 from construction at the site would include:

- A cumulative increase of \$6.97 to \$7.67 billion in total economic output; and
- An average of 8,690 to 9,410 full-time equivalent jobs each year for six years.

Table 10 summarizes the impact (in terms of output, employment and employee compensation) of construction on the World Trade Center site on the New York-New Jersey region's economy.

Table 10
NY-NJ Metro Area
Construction Impact

	Direct	Indirect and Induced	Total
Phase 1			
Minimum			
Output (\$B)	6.05	4.60	10.65
Employee Compensation (\$B)	2.29	1.76	4.05
Employment (annual FTEs)	5,789	5,504	11,294
Maximum			
Output (\$B)	6.66	5.06	11.71
Employee Compensation (\$B)	2.52	1.93	4.46
Employment (annual FTEs)	6,369	6,053	12,422
Phase 2			
Minimum			
Output (\$B)	3.99	2.99	6.97
Employee Compensation (\$B)	1.46	1.14	2.60
Employment (annual FTEs)	4,534	4,156	8,690
Maximum			
Output (\$B)	4.38	3.28	7.67
Employee Compensation (\$B)	2.50	1.25	3.75
Employment (annual FTEs)	4,838	4,571	9,410
Total			
Minimum			
Output (\$B)	10.04	7.58	17.62
Employee Compensation (\$B)	3.76	2.89	6.65
Employment (annual FTEs)	5,210	4,882	10,092
Maximum			
Output (\$B)	11.04	8.34	19.38
Employee Compensation (\$B)	5.02	3.18	8.21
Employment (annual FTEs)	5,662	5,369	11,031

Operations and Visitor Spending

In 2009

Net new employment at the World Trade Center site in 2009, and the increased economic output directly associated with those jobs, will be the same for the eighteen-county area as for New York City – 8,870 full-time equivalent jobs, and \$2.20 billion in added economic output.

In 2009 the total (including direct, indirect and induced) impact on the region's economy from new business and institutional operations at the World Trade Center site will include:

- A \$3.69 billion increase in annual economic output; and
- Approximately 20,350 continuing full-time equivalent jobs.

Based on LMDC's estimate that 9 million people will visit the site in 2009, we estimate that *incremental* off-site spending by these visitors will generate¹⁴:

- A \$360 million increase in annual economic output in the region; and
- Approximately 4,150 continuing full-time equivalent jobs.

Combining the impact of on-site operations and off-site visitor spending (and excluding the impact of construction), Appleseed estimates that the total impact of redevelopment on the region's economy in 2009 will generate:

- *A \$4.05 billion increase in annual economic output, and*
- *Approximately 24,510 continuing full-time equivalent jobs.*

In 2015

As in 2009, net new employment at the site and the associated direct output in 2015 will be the same for the New York – New Jersey Metro area as it is for New York City – 31,900 net new jobs and approximately \$9.62 billion in added economic output.

Combining direct, indirect and induced impacts, we estimate that in 2015 the total impact on the New York-New Jersey region's economy from new business and institutional operations at the World Trade Center site will include:

- A \$16.14 billion increase in annual economic output; and
- Approximately 82,300 continuing full-time equivalent jobs.

Based on LMDC's estimate that 5.5 million people will visit the site in 2015, we estimate that incremental off-site spending by these visitors will generate:

¹⁴ Spending of visitors who live in the NY-NJ metro area is excluded from this analysis.

- A \$220 million increase in annual economic output in New York State; and
- Approximately 2,530 continuing full-time equivalent jobs.

Combining the impacts of operations and visitor spending (and excluding the impact of construction), we estimate that in 2015 the redevelopment of the World Trade Center will result in:

- *A \$16.36 billion increase in annual economic output in the region, and*
- *Approximately 84,820 continuing full-time equivalent jobs.*

The impact of operations and visitor spending on New York-New Jersey region's economy is summarized in Table 11.

Table 11
NY-NJ Metro Area
Operating and Visitors Impacts

	Direct	Indirect and Induced	Total
2009			
<u>Operations</u>			
Output (\$B)	2.20	1.48	3.69
Employee Compensation (\$B)	1.04	0.59	1.63
Employment (annual FTEs)	8,875	11,479	20,354
<u>Visitors</u>			
Output (\$B)	0.20	0.16	0.36
Employee Compensation (\$B)	0.09	0.06	0.15
Employment (annual FTEs)	2,837	1,318	4,154
<u>Total</u>			
Output (\$B)	2.41	1.64	4.05
Employee Compensation (\$B)	1.13	0.65	1.78
Employment (annual FTEs)	11,712	12,797	24,508
2015			
<u>Operations</u>			
Output (\$B)	9.62	6.52	16.14
Employee Compensation (\$B)	4.56	2.62	7.18
Employment (annual FTEs)	31,883	50,410	82,293
<u>Visitors</u>			
Output (\$B)	0.12	0.10	0.22
Employee Compensation (\$B)	0.05	0.04	0.09
Employment (annual FTEs)	1,724	803	2,527
<u>Total</u>			
Output (\$B)	9.74	6.62	16.36
Employee Compensation (\$B)	4.61	2.66	7.27
Employment (annual FTEs)	33,607	51,213	84,820

Impact on State and Local Revenues

As it does for New York City, the economic activity generated by redevelopment of the World Trade Center site will yield increased state and local tax revenues throughout the eighteen-county New York-New Jersey region. Because these effects can be difficult to sort out across state lines, we will present here estimates of the aggregate, region-wide impact of redevelopment on state and local sales, income, and property tax revenues.

Taking into account direct, indirect and induced effects, we estimate that:

- Construction activity through 2009 will cumulatively generate between \$249 and \$273 million in state and local tax revenues.
- Construction activity between 2010 and 2015 will cumulatively generate between \$162 million and \$178 million in state and local tax revenues.
- In 2009, ongoing operations and visitor spending will generate \$212 million in annual state and local tax revenues.
- In 2015, ongoing operations and visitor spending will generate \$865 million in annual state and local tax revenues.

These impacts are detailed in Table 12.

Table 12
NY-NJ Metro Area
Tax Revenues

	State and Local Tax Revenue (\$ millions)
Construction (cumulative impact)	
Phase 1 - Min	\$ 249
Phase 1 - Max	273
Phase 2 - Min	162
Phase 2 - Max	178
Operations (annual impact)	
Phase 1	212
Phase 2	865