vision42

Phase Six Economic Study (2017) – Update of vision42 Benefits, Costs and Fiscal Impacts

Prepared by

Urbanomics, Inc.

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vision42
an auto-free light rail boulevard for 42nd Street

Phase VI—

An Update of vision42 Modeling and Technical Studies

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vision42
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The **vision42** proposal is a citizens' initiative sponsored by the Institute for Rational Urban Mobility, Inc. (IRUM), a New York City-based not-for-profit corporation concerned with advancing cost effective transport investments that improve the livability of dense urban places.

This study, one of a second round of three technical studies that address key concerns about the feasibility of the **vision42** proposal, was made possible by a generous grant from the New York Community Trust/Community Funds, Inc., John Todd McDowell Environmental Fund.

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I. Executive Summary

The economic impacts and fiscal benefits of introducing light rail services within an auto-free 42nd Street corridor in Manhattan were updated from prior studies, using GIS and econometric modeling of established economic methodologies. The cost-benefit analysis shows that the anticipated direct net benefits will cover the entire investment in the first stabilized year of operation. Given these considerations, an LRT system for 42nd Street will be financially and economically feasible as an investment if all related financial issues, such as project timing and discount rate, are also favorable. Key benefit and cost highlights follow:

Direct Economic Benefits

The introduction of light rail services to 42nd Street will have five permanent economic benefits that are directly measurable, several non-quantifiable benefits that are also on-going, and one temporary benefit. The permanent benefits are:

- One-time property value increases for owners of offices, retail stores, residential buildings and vacant lots: ***$4.5 billion***.
- Aggregate, annual travel time savings for workers, residents, visitors, shoppers, theatergoers and students: ***$692.9 million***.
- Annual rent and occupancy increases for office properties attributable to increased transit access: ***$194.6 million***
    - New rents: ***$78.6 million***
    - Lease values from turnover at higher rental rates: ***$116.0 million***
- Expansion of retail sales and increases in hotel occupancy: ***$23.4 million***
- Operational savings of the LRT system over existing costs while at the same increasing capacity by three times: ***$82,000***
- Additional benefits would accrue due to:
    - reductions in health care and vehicular repair costs attributable to fewer accidents on 42nd Street,
    - improvements in air quality in the corridor,
    - soft site assemblages and possible transfers of development rights,
    - growth in tourism and entertainment patronage,
    - gains in on-time employee performance due to travel time savings, and
    - general health and travel service improvements for the disabled.

A temporary economic benefit will be derived from the construction of the LRT system. Typically, in New York City, nearly eight (7.5) construction and related jobs are generated for every $1 million of heavy construction value put in place in year 2013 constant dollars. Given the projected range of capital costs envisaged for the proposed LRT system, the multi-year construction project would generate from ***4,300 to 6,100*** person-years of temporary construction and related employment.

(i) Direct Economic Costs

- Cost of constructing and equipping a new 2.5 mile river-to-river light rail line in a landscaped pedestrian street will range from $570 to $807 million, using current indices of construction cost in the New York area, updated from prior studies prepared by an engineering team led by Halcrow LLC. The annual debt service to cover this cost over a 30-year period will be $36.7 to $52.0 million. (Note – the higher cost estimates assume full utility relocation will be required, while the lower estimate assume that city policies can be modified to permit use of more cost-effective

construction techniques. Recent advances in more efficient wire-free technologies could reduce these cost estimates.)

- Cost of traffic diversions for autos, trucks, and taxis from 42nd Street to parallel east/west streets in the Study Area and the aggregate annual cost of traffic delays from travel diversions to other streets: ***$113 million***, annually.
- Increased cost of deliveries to buildings on 42nd Street: ***$441,800*** annually.

Fiscal Benefits

- Monetized benefits of LRT service on 42nd Street from increases in:
  - Property and commercial rent taxes: ***$157.3 million*** annually.
    - New York City property: $150.5 million
    - New York City commercial rent: $6.8 million
  - Personal income and corporate franchise taxes: ***$51.2 million*** annually.
    - New York City: $22.2 million
    - New York State: $29.0 million
  - Retail sales and hotel occupancy taxes: ***$2.5 million*** annually.
    - New York City: $1.6 million
    - New York State: $0.9 million

Cost-Benefit Relationship

- Direct net economic and fiscal benefits of the proposed LRT system for 42nd Street: ***$986.6 million*** per year.
- Cost of debt service for capital investment: ***$36.7 to $52.0 million*** per year.
- Benefit-Cost Ratio: **26.9:1** to **19.0:1**.

II. Introduction

vision42 is a citizens' initiative to re-imagine and upgrade surface transit in Midtown Manhattan, with a low-floor light rail line running river-to-river along 42nd Street within a landscaped pedestrian boulevard. Interest in surface rail for New York City has recently been increasing, with a light rail system currently being proposed by the Mayor for the Brooklyn/Queens waterfront. As a different model that could nevertheless benefit from New York's new acceptance of light rail, **vision42** could be a prototype for an entire network of landscaped, pedestrian/light rail streets in the densest parts of the City. The **vision42** proposal is sponsored by the Institute for Rational Urban Mobility, Inc., a New York-based not-for-profit corporation.

Purpose of Study

This report represents the sixth in a series of studies performed over the past decade that have assessed the economic and financial benefits of a light rail transit system for 42nd Street in Manhattan. While they have all estimated substantial benefits, the methods and results have changed. A major economic downturn that impacted property markets, followed by an equally dramatic recovery has set the context for this analysis. Following declines in real estate value and a drop in property sales, leasing and construction, the market rebounded sharply to new heights in building activity, employment levels, and property prices.

Throughout this period, the component public data sources of analysis changed in construct, content and building classifications. New and updated data, including private data sources, became available and, with improvements, different criteria have been applied. And software tools of analyses changed, improving geospatial tools of distance measurement. The results of detailed engineering studies that estimated construction cost and the degree of traffic diversion were not changed, but these costs were updated using current regional inflation rates. All of these factors have contributed to refining and expanding the estimation of economic and financial benefits attributable to the proposed River-to-River Auto-free Light Rail Boulevard for 42nd Street.

The current effort has focused on an update of existing conditions, given the recovery in property markets and employment conditions in the study area corridor running river-to-river from 37th Street to 47th Street, as well as an expansion of the residential modeling based upon new equations calibrated on current property sales throughout Manhattan. Other aspects of the **vision42** methodology were updated and applied to the proposed light rail investment to determine increased travel time savings, gains in commercial property value, new office occupancy and rental increases, retail and hospitality spending, capital costs, and the fiscal net benefits that would be anticipated to arise within the tributary area. A careful accounting has been taken of recent and expected development in the Hudson Yards Financing District so as to exclude any LRT benefits accruing to these properties from the fiscal analysis.

The data for this analysis were drawn from the previous **vision42** research and modeling studies, the New York City Department of City Planning *Primary Land Use Tax Lot Output (PLUTO)* database, the New York City Department of Finance *Rolling Sales File for Manhattan (September 2014 to August 2015), the Hudson Yards Rezoning, and Development Program Final Generic Environmental Impact Statement (FGEIS)*, the Regional Travel Forecasting Model (RTFM) of the Metropolitan Transportation Authority

(MTA), the U.S. Bureau of the Census *American Community Survey (ACS 2010-201)* and *County Business Patterns,* and other sources. The existing conditions year of analysis is 2015 and the future year 2025. All monetized benefits are expressed in 2015 constant dollars.

Summary of Prior Study Findings

Five previous studies were prepared, key results are summarized below for each.

Phase 1 Study (2004-5)

Based primarily on travel time savings via light rail, increases in commercial property values and consequent City and State fiscal gains are projected. In this study, a *Land Use* classification of properties and the FY 2004 *Real Property Assessment Database (RPAD) Master File* were utilized, which yielded an estimate of $3.56 billion in increased land values as a result of improved access by light rail and the pedestrian street. No correction for eventual Hudson Yards development was made.

Phase 2 Study (2005-6)

Also based also on improved access by light rail, and on a 35 percent increase in pedestrian space in a landscaped 42nd Street—major increases in restaurant and retail trade, as well as some increased business for theaters and hotels in the corridor are projected—yielding additional tax revenue for the City and State. The total economic and fiscal benefits should be sufficient to pay for the project's capital costs in six to nine months.

Phase 3 Study (2006-7) Financing Report

Compared with the Phase 1 Study, the Urbanomics **vision42** *Financing Report* produced a more conservative estimate of land value increases that were attributable to improved transit access ($1.0 billion). In this phase the estimate was based upon a building classification of *Office Properties, and* utilized parcel attribute data reported by the New York City Department of City Planning *Primary Land Use Tax Lot Output* (*PLUTO)* files for FY2006. The reclassification of some properties as *Mixed Use*, together with improvements in parcel valuation data and use of the current equalization rate for New York, has produced a more reliable estimate of value capture potential. In addition, the value capture exercise included not only commercial, but residential properties as well.

It was also found that (in light of the potential substantial gains cited in these reports) the most feasible financing approach would be the formation of a Transit Improvement District, encompassing the area five blocks to the north and five blocks to the south of 42nd Street (excluding the Hudson Yards Tax Increment Financing District), to which a moderate levy would be applied to selected properties, based upon their current New York City tax rates.

Phase 4 Study (2010) Residential Property Values

Applying economic modeling and statistical analysis to over 5,000 recent sales in Manhattan, the study shows that one of the most important variables in determining the value of high-rise residential property is its distance to the nearest rail transit station. Applying this relationship to the full inventory of existing and projected high-rise residential

buildings in the 16-stop **vision42** light rail line corridor, five blocks on either side of 42nd Street river-to-river, a gain of $2.55 billion (in 2010 dollars) is projected.

Phase 5 Study (2012) A Comparison with a 10th Avenue #7 Subway Station

The construction of the 10th Avenue Station of the #7 Subway extension would have provided economic benefits to the **vision42** study area. The capital costs of the 10th Avenue Station and its subsequent benefits were compared "head to head" with those that would be attributed to the construction of the **vision42** LRT.

The basic findings were that the LRT would yield $575.8 million in economic benefit compared to only $50.9 million from the 10th Avenue Subway Station. Yet even the highest construction cost estimate for the LRT was estimated at $100 million LESS than the Subway Station.

While the subway station would produce substantial benefits, the river-to-river light rail produces three times the gains in travel time, while having lower construction cost benefits. Given existing development, this will result in one-time property value increases for **vision42** that are 3.5 times greater than those for the 10th Avenue station.

This gain far outweighs the $1.03 billion increase in the value of residential property that would result, applying the same economic model from the addition of a 10th Avenue station on the #7 subway extension. Estimates of the cost of constructing a new subway station are greater than the cost of building the full 2 ½ mile surface light rail.

Phase 6 Study (2016)

Table ES.1 on the following page provides a comparison of the property categories modeled in the 2012 and the current 2016 study, as well as the estimated increases in property value attributable to **vision42**.

As the Table shows, in current dollars of the property data year, the full value of study area property in 2015 was estimated at $43.5 billion compared to $35.4 billion in 2011. As a result of modeling, the increase in property value attributable to implementation and full operation of the LRT system would increase by $4.48 billion in 2015 dollars compared to $3.44 billion in 2011 dollars. Consequently, the property tax increase associated with this benefit, under existing tax rates without new exemptions, would amount to $150.5 million in 2015 dollars, compared to $123.7 million in 2011 dollars.

Table I.1. Comparison of 2012 and 2016 Reports: Property Value Categories and Estimated Increases

2012 Report with 2011 Data			
Property Type	**Full Value of Property in 2011 $000,000**	**Increase in Property Value by LRT $000,000**	**Property Tax Increase in 2011 $000,000***
Total Commercial	**$28,712.4**	**$1,660.5**	**$45.5**
Office Buildings**	$26,295.2	$1,569.3	$42.8
Commercial Buildings with Retail	$2,153.7	$11.1	$0.5
Vacant Lots	$263.5	$80.0	$2.2
Total Residential	**$6,705.70**	**$1,782.6**	**$78.2**
Grand Total	**$35,418.1**	**$3,443.1**	**$123.7**
2016 Report with 2015 Data			
Property Type	**Full Value of Property in 2015 $000,000**	**Increase in Property Value by LRT $000,000**	**Property Tax Increase in 2015 $000,000***
Total Commercial	**$34,998.1**	**$2,165.8**	**$56.6**
Office Buildings	$32,864.2	$2,079.3	$53.3
Commercial Buildings with Retail	$1,631.8	$5.3	$0.3
Vacant Lots	$502.1	$81.2	$3.0
Total Residential	**$8,484.1**	**$2,317.0**	**$93.9**
123 Family Buildings	$359.5	$26.5	$0.9
Walkup Condos	$7.4	$1.3	$0.1
Walkup Rental Buildings	$1,053.2	$548.8	$31.7
Walkup Co-op Buildings	$99.7	$51.9	$2.3
Elevator Condos	$191.0	$29.2	$1.3
Mixed Use Building Elevator Condos	$2,321.9	$450.7	$21.6
Elevator Rental Buildings	$3,151.6	$1,029.6	$28.1
Elevator Co-op Buildings	$917.3	$138.9	$7.9
Cond-ops	$202.7	$39.4	$0.1
Apartment Hotels	$177.5	$0.7	$0.0
Residential Loft Buildings	$2.4	$0.0	$0.0
Grand Total	**$43,482.2**	**$4,482.8**	**$150.5**

Note: (*) The property tax net increase in 2011 and 2015 is based upon the taxable value of all parcels in the Study Area and does not exclude parcels in the Hudson Yards Financing District. (**) The 2011 NYC *PLUTO* data file contained an error in the GSF of the United Nations parcel that was not detected until the 2015 NYC *PLUTO* file was analyzed in comparison. This correction has lowered the increase in property asset value from $3,047.45M to $1,569.33M and reduced the % increase in property value from 11.59% to 5.97%. Because the United Nations is tax exempt this does not require a correction of the taxable property benefit or the tax increase in 2011.
Source: Urbanomics

III. The Methodology and Findings

i. Property Values

a. Transit Access and Land Value Model

The increased accessibility and ease of use afforded by light rail systems go some way to explain their impact on public transit ridership as well as on neighboring property values. Numerous studies have shown that properties located within walking distance of rail stations tend to rent or sell at a premium, particularly in areas with strong real estate markets, available land, and government policies promoting new development. Such policies can result in zoning changes, increasing the density around stations, or partnerships where private companies contribute to the cost of transportation improvements in exchange for development rights. Prior studies prepared for **vision42** reported on the impact of light rail services on commercial rents and residential sales values in a dozen US cities and several European or Canadian cities.[1]

A multiyear study on the relationship between land value and transit access, prepared by Regional Plan Association for the Federal Transit Administration, established the methodology for estimating the value capture potential of transit in New York City, calibrated on the relationship between parcel-specific land values and the distance to public transit stations.[2] This model, and updated values of the independent variables used to explain the portion of land value attributable to transit access, was previously deployed to estimate the difference in property value of any office, retail, residential or vacant parcel in the **vision42** study area when serviced by the proposed LRT system versus the existing transit system. Subsequent analyses improved upon the residential modeling, and for purposes of the current study, all four prominent land uses have been subjected to updating and broader application.

As part of this approach, all residential property sales in Manhattan over the past year (September 2014 through August 2015) were compiled by detailed building class and coupled with a broad array of physical, transport, and socioeconomic variables at the parcel level, including walking distance from a station or transit line and actual operating characteristics of the system. Using *Eviews* econometric software, the multivariate regression analysis solved for changes in market values for each of 8 different residential building classes based upon nearly 18,000 reported sales of residential buildings with some 47,000 units borough-wide. Thus, in addition to being cross-sectional, rather than time dimensional, this econometric approach is highly specific, providing a policy analyst with the tool for predicting parcel-specific, neighborhood-wide, corridor level, or aggregate system-wide impacts of alternative actions.

A wide array of explanatory variables was incorporated in multivariate regression equations to estimate a land price function in a built environment, when development has already taken place. While the choice of the dependent variable in such an analysis is clear, that is, the unit price of land, the choice of independent variables necessitates a process of stepwise regression or factor analysis of all such explanatory factors. Given the

[1] See Tables 11 and 12 of *Economic and Fiscal Impacts of Proposed LRT Services in a Pedestrianized 42nd Street on Retail, Restaurants, Hotels & Theatres in the 42nd Street Corridor,* 2006

[2] Anas and Armstrong, *Transit Access and Land Value,* 1993.

magnitude of data assembled, the model was stratified by land use and residential building class, to estimate separate equations for office and retail buildings, vacant land, and 8 different classes of residential, including single family, rental buildings, condominiums, and cooperative properties. For each use, some 60 parcel-specific, neighborhood, and access-related factors were tested for their potential significance as independent variables in explaining parcel land value.

b. Model Application to the Study Area

The Study Area for application of the value capture equations on a parcel specific basis was defined as all respective properties situated between 37th and 47th Streets, river to river in Manhattan. For land uses and building classes of interest in the Study Area, current values of the following variables were compiled on a parcel-specific basis for application of the value capture equations. The number of parcels or buildings for which data was separately acquired is shown as:

- Office Building Parcels (408)
    - Land value per sq ft of land area
    - Walking distance in meters to:
        - Subway platform
        - LRT stop
    - Percent of households in Census Tract below poverty level, 2013
    - Airline distance to nearest body of water in meters
    - Employment of work places in Zip Code Area, 2013

- Commercial Buildings with Retail Parcels (175)
    - Land value per sq ft of land area
    - Walking distance in meters to:
        - Subway platform
        - LRT stop
    - Employment of work places in Zip Code Area, 2013
    - Percent of households in Census Tract below poverty level, 2013

- Vacant Lot Parcels (48)
    - Land value per sq ft of land area
    - Walking distance in meters to:
        - Subway platform
        - LRT stop
    - Airline distance to nearest body of water in meters
    - Walking distance to nearest park in meters
    - Percent of households in Census Tract below poverty level, 2013
    - Employment of work places in Zip Code Area, 2013
    - Miles to Midtown Manhattan CBD
    - Transit minutes to Downtown CBD
    - Crime rate of Police Precinct for rape, 2015

- 123 Family Residential Buildings (91)
    - Land value per sq ft of land area
    - Walking distance in meters to:
        - Subway platform
        - LRT stop
    - Median Household Income of Census Tract in 2013 Dollars

  - Total Crimes Reported in Precinct, 2015

- Walk-up Condominium Units (4)
  - Land value per sq ft of land area
  - Walking distance in meters to:
    - Subway platform
    - LRT stop
  - Unit Gross Square Feet
  - Year Structure Built
  - Passenger volume of the nearest transit station (average weekday ridership trend over 2012-2014 period)
  - Walking distance to nearest park in meters
  - Percent of households in Census Tract below poverty level, 2013
  - Airline distance to nearest body of water in meters

- Walk-up Rental Buildings (371)
  - Land value per sq ft of land area
  - Walking distance in meters to:
    - Subway platform
    - LRT stop
  - Year Structure Built
  - Building Gross Square Feet
  - Passenger volume of the nearest transit station (average weekday ridership volume in three years, 2012-2014)
  - Walking distance to nearest park in meters
  - Median Household Income of Census Tract in 2013 Dollars
  - Average Travel Time to Work of all modes for resident workers in Census Tract, 2013
  - Crimes Reported in Precinct for robbery, 2015

- Elevator Condominium Units (8)
  - Land value per sq ft of land area
  - Walking distance in meters to:
    - Subway platform
    - LRT stop
  - Unit Gross Square Feet
  - Year Structure Built
  - Building Gross Square Feet
  - ZIP Code location
  - Airline distance to nearest body of water in meters
  - Walking distance to nearest park in meters
  - Crimes Reported in Precinct for rape, 2015
  - Average employment size of work place establishments in Zip Code Area, 2013
  - Passenger volume of the nearest transit station (average weekday ridership trend 2012-2014)
  - Median Household Income of Census Tract in 2013 Dollars
  - Percent of households in Census Tract below poverty level, 2013

- Mixed Used Building Elevator Condominium Units (43)
  - Land value per sq ft of land area
  - Walking distance in meters to:

        - Subway platform
        - LRT stop
    - Unit Gross Square Feet
    - Year Structure Built
    - Building Gross Square Feet
    - ZIP Code location
    - Airline distance to nearest body of water in meters
    - Walking distance to nearest park in meters
    - Crimes Reported in Precinct for rape, 2015
    - Average employment size of work place establishments in Zip Code Area, 2013
    - Passenger volume of the nearest transit station (average weekday ridership trend over 2012-2014 period)
    - Median Household Income of Census Tract in 2013 Dollars
    - Percent of households in Census Tract below poverty level, 2013

- Elevator Rental Buildings (101)
    - Land value per sq ft of land area
    - Walking distance in meters to:
        - Subway platform
        - LRT stop
    - Median value of owner occupied housing in Census Tract. 2013
    - Total Crimes Reported in Precinct, 2015
    - Year Structure Built
    - Airline distance to nearest body of water in meters
    - Walking distance to nearest park in meters
    - Passenger volume of the nearest transit station (average weekday ridership trend over 2012-2014 period)
    - Percent of housing units vacant in Census Tract, 2013
    - Percent of households in Census Tract below poverty level, 2013

- Elevator Co-op Buildings (44)
    - Land value per sq ft of land area
    - Walking distance in meters to:
        - Subway platform
        - LRT stop
    - Unit Gross Square Feet
    - Year Structure Built
    - Building Gross Square Feet
    - Airline distance to nearest body of water in meters
    - Walking distance to nearest park in meters
    - Crimes Reported in Precinct for robbery, 2015
    - Median Household Income of Census Tract in 2013 Dollars
    - Percent of housing units vacant in Census Tract, 2013
    - Percent of households in Census Tract below poverty level, 2013

- Apartment Hotels (4)
    - Land value per sq ft of land area
    - Walking distance in meters to:
        - Subway platform
        - LRT stop
    - Unit Gross Square Feet
    - Year Structure Built

In addition, value capture equations could not be econometrically solved for three residential building classes – Walkup Co-op Buildings, Cond-op Buildings, and Residential Loft Buildings – with any degree of statistical reliability. These classes consisted of 41 buildings and nearly two thousand residential units, or less than 5 percent of all housing units in the Study Area. Based upon the value capture findings of related residential structures, value increases were attributed to these three building classes.

Data were compiled for the model variables from the following sources:

- Land value per sq ft of land area – New York City Department of City Planning, BYTES of the BIG APPLE software, *PLUTO* 2015 land use and geographic data at the tax lot level containing more than 70 fields derived from data maintained by city agencies, include building address and zip code, building structure size, year structure built, number of residential units and residential square feet
- Walking distance in meters to subway platform and LRT stop – Transit Network Model and Walking Time Model inputs by tax parcel.
- Airline distance to nearest body of water in meters – measured by parcel to nearest river on GIS platform established for Study Area
- Walking distance to nearest park in meters – measured by parcel to nearest park on GIS platform established for Study Area
- Miles to Midtown Manhattan CBD – assumed to be zero (42nd & Fifth)
- Employment and establishment size of work places in Zip Code area – US Census Bureau County Business Patterns data for zip zones, 2013
- Percent of households in Community District below poverty level – *2013 American Community Survey of US Census Bureau*
- Percent of housing units vacant in Community District – *2013 American Community Survey of US Census Bureau*
- Median household income in Community District – *2014 American Community Survey of US Census Bureau*
- Median value of owner occupied housing in Community District - *2013 American Community Survey of US Census Bureau*
- Travel time to work in minutes of workers residing in Community District – *2013 American Community Survey of US Census Bureau*
- Miles to Midtown Manhattan assumed to be zero.
- Transit minutes to Downtown Manhattan CBD – MTA timetable for Chambers and Brooklyn Bridge stations by line from 42nd Street, averaged on the am/pm peak from the nearest subway station
- Crime rates of Police Precinct – New York City Police Department, 2015
- Passenger volume of the nearest transit station – MTA New York City Transit, 2012-2014

For each parcel of a given land use or residential building class, the coefficients of the value capture equations were applied to the current values of all independent variables. The first application was based upon walking distance to the subway station, the second application on walking distance to the LRT station. The difference between the subway- and LRT-based cumulative values was taken to represent the more valuable increase in property assets that were attributable to LRT access.

c. Benefits of Property Value Increases

Based on the model, the aggregate value of an asset increase in property values for 1,338 parcels, including 408 office buildings, 175 retail buildings, 48 vacant lots and 707 residential structures in the Study Area was estimated at $4.48 billion in constant 2015 dollars, as Table 1.1 shows:

Table 1.1. Economic Benefits of Property Value Increases

Beneficiary	Asset Value in 2015 $000,000	Increase in Asset Value in 2015 $000,000	% Increase in Property Value	Average Increase per SF
Total Commercial	**$34,998.1**	**$2,165.8**	**6.2%**	
Office Buildings	$32,864.2	$2,079.3	6.3%	$286
Commercial Buildings w/ Retail	$1,631.8	$5.3	0.3%	$7
Vacant Lots	$502.1	$81.2	16.2%	$107
Total Residential	**$8,484.1**	**$2,317.0**	**27.3%**	
123 Family Buildings	$359.5	$26.5	7.4%	$176
Walk-up Condos	$7.4	$1.3	17.5%	$125
Walk-up Rental Buildings	$1,053.2	$548.8	52.1%	$605
Walkup Co-op Buildings	$99.7	$51.9	52.1%	$444
Elevator Condos	$191.0	$29.2	15.3%	$361
Mixed Use Building Elevator Condos	$2,321.9	$450.7	19.4%	$684
Elevator Rental Buildings	$3,151.6	$1,029.6	32.7%	$739
Elevator Co-op Buildings	$917.3	$138.9	15.1%	$298
Cond-ops	$202.7	$39.4	19.4%	$790
Apartment Hotels	$177.5	$0.7	0.4%	$26
Residential Loft Buildings	$2.4	$0.01	0.4%	$2
Grand Total	**$43,482.2**	**$4,482.8**	**10.3%**	

Source: Urbanomics

The one-time increase in asset value of real properties in the Study Area represents the largest single economic benefit, equivalent to more than six (6.5) years of annual savings in travel time savings. Although massive in dollar terms, this gain represents a fraction of the aggregate value of property in the Study Area. For example, 408 office properties estimated to realize a $2.1 billion increase in asset value are currently worth $32.9 billion, for a 6.3 percent gain, while 48 parcels of vacant land, predicted to gain $81.2 million in asset value, are currently worth $502 million in market value. The model projects that 707 residential properties can expect a $2.3 billion increase, or a 27.3 percent increase in asset value. This is greater than the commercial gains because residential properties are located at the far ends of the corridor where the light rail travel time savings are greater than the commercial gain because of where they are located. Compared to empirical measures of property value increases around new LRT stations, reported elsewhere, these predicted gains are within the range of relative responses.

ii. Travel Time Savings

a. Travel Time Savings Model & Refinements

The Travel Time Savings Model was developed to estimate travel time savings benefits to riders expected to result from the construction of the proposed LRT. An important part of such savings is due to the extension of rail access to new parts of the study area, particularly on the far west and east sides, resulting in shorter travel times compared to existing bus service and/or shorter walks than from current subway stations. However, overall travel time is affected by a number of factors including time taken to transfer between platforms when changing vehicles; waiting time for the vehicle at the new platform; time required to climb stairs (for subways) and walk corridors to reach the station exit at the destination station; and time needed to walk from a given station exit to the final destination. The Travel Time Savings Model is designed to account for each of these components in determining total travel time for a given trip option available for a rider to reach his or her destination. Potential travel timesaving, on a per trip basis, is then estimated as the difference in total travel time between the fastest available trip option under the no-build situation and the fastest available trip option with the construction of the LRT. The benefit of time savings is expressed in 2015 dollar terms based on the weighted value of time for various categories of riders. The number of trips is assumed to not be constrained by capacity.

The calculation of travel time savings can be broken down conceptually into two components: 1) the estimation of *per trip* time savings to any given study area location from various places of origin, and 2) the calculation of total time savings for all trips generated by that location. This conceptual division is reflected in the subdivision of the Travel Time Savings Model into two major parts: the Trip Time Savings Sub-Model and the Trip Generation Sub-Model. The first of these can likewise be broken down into two components: 1) travel time within the transit network itself, and 2) time taken to walk between the given study area location and the relevant transit stop. Therefore, the Trip Time Savings Sub-Model is itself subdivided into two parts. The Transit Network Model refers to the calculations used to estimate *per trip* time within the transit system itself. The Walking Time Model refers to estimates of *per trip* time between study area transit stops and final destinations within the study area. All of these components taken together are referred to as the Travel Time Savings Model.

It should be noted that the ONLY criteria influencing choice of transportation modeled was time savings.

More detail on the travel time savings model may be found in the Phase I Economic Technical Study: The Anticipated Economic Impacts of Introducing Light Rail to New York City's 42nd Street on the **vision42** website: www.vision42.org/_pdf/economic_study.pdf.

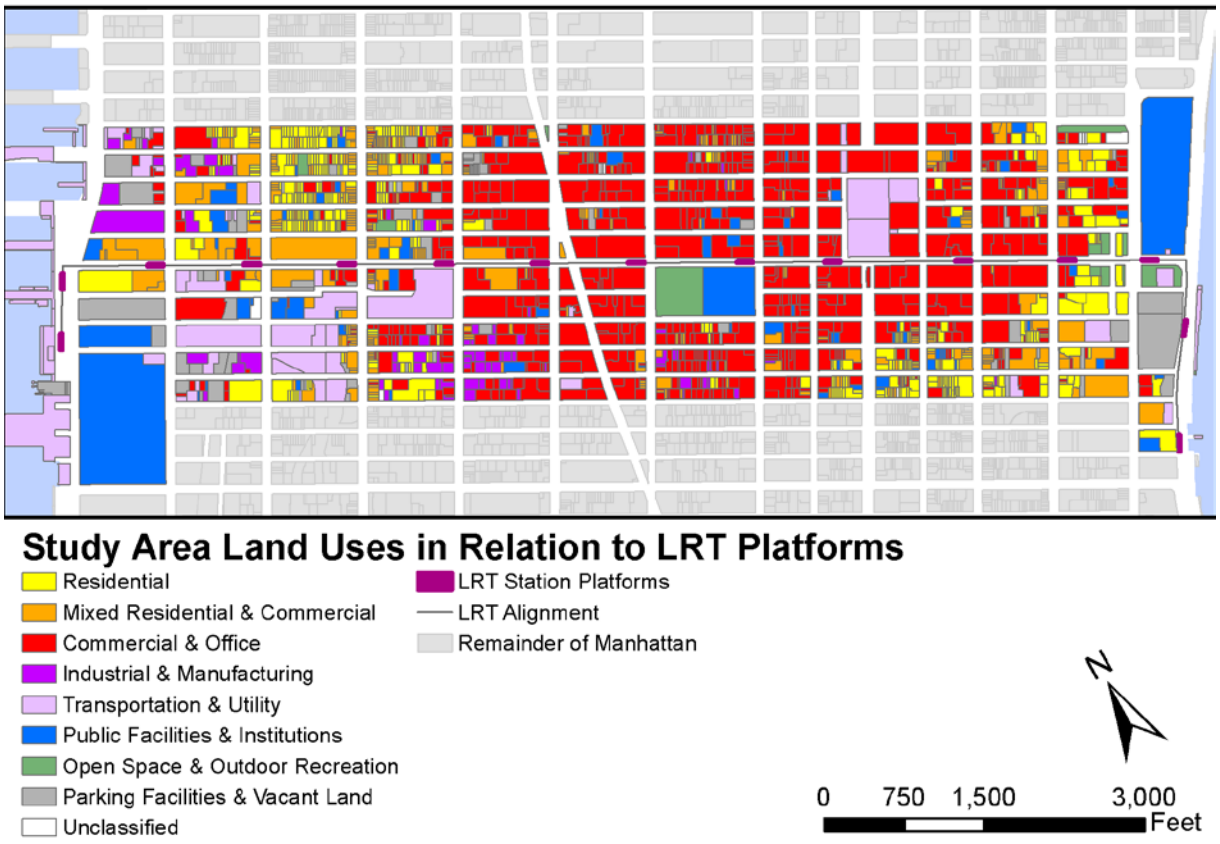
Model Updates

The eleven (11) years between the initial Cost-Benefit Study, the four (4) years since the comparison of benefits of the LRT and #7 extension, and the present have seen changes in real estate, settlement patterns, and data availability.

Real Estate

In the study area, especially on the west side, new residential and hotel properties, as well as the continued shift from manufacturing to service uses have changed both trip types and wage rates in the study area.

Figure 2.1



The table that follows summarizes changes to assessed values, total office floorspace and total building floorspace in the New York City Department of City Planning's *PLUTO* data.

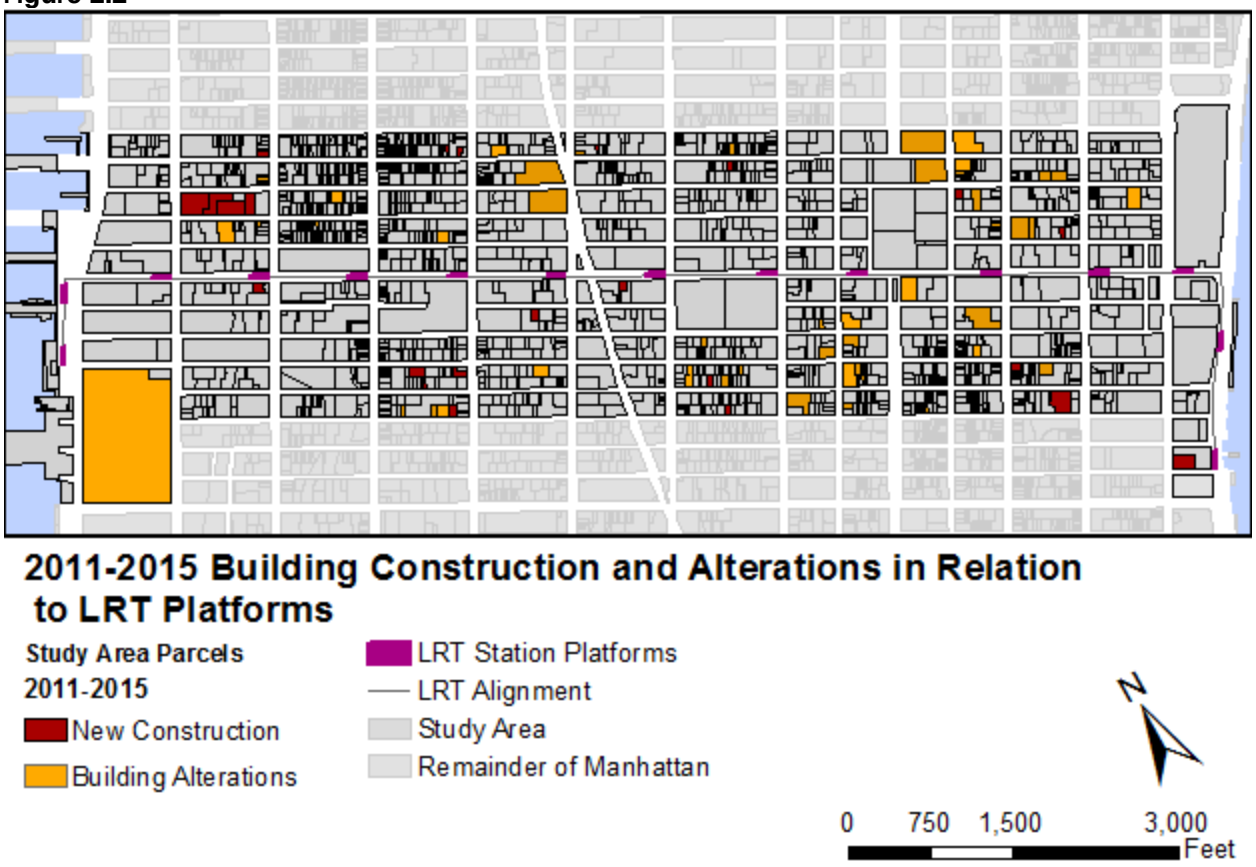
Table 2.1 Property Summary 2005, 2011, 2015

	2005	2011	2015
Assessed Land	$5,668,819,801	$6,411,778,869	$6,616,354,402
Assessed Total	$14,109,319,670	$21,033,890,796	$26,362,210,943
Office Floorspace (SF)	93,824,067	111,228,412	100,369,503
Total Building Area (SF)	164,727,433	192,246,722	165,409,395

Source: *PLUTO* 2005, *PLUTO* 11v1, *PLUTO* 15v1

A significant number of properties have seen new construction or alterations as shown in Figure 2.2 below and in Table 2.2 on the following page.[3] Many of these are on the edges of the study area where travel time savings are substantially higher.

Figure 2.2



Of these recent property alterations, some 10.6 million square feet of it is office space.

Table 2.2. New Construction and Alterations, 2011-2015

	All Floorspace	New Construction	Alterations
Total	**17,334,903**	**2,123,796**	**15,211,107**
All Commercial	15,529,441	736,811	14,792,630
Residential	1,652,776	1,234,299	418,477
Office	10,624,867	407,026	10,217,841
Retail	664,872	57,029	607,843
Garage	248,207	79,323	168,884
Storage	2,478,839	61,446	2,417,393
Other	4,421,353	251,127	4,170,226

Source: *PLUTO* 11v1, *PLUTO* 15v1

[3] Buildings listed in *PLUTO* with a recent construction date were checked to determine that they have been completed.

In addition to the net change in floorspace since 2005, there has been a nationwide trend reducing the amount of floorspace per office worker to only 120 square feet. Anecdotal information from construction cost estimators working in New York City suggests that new office construction in the study area is intended to house one (1) worker per every 100 square feet. The current model assumes 120 sf per worker.

Regional Settlement Pattern and Workplace Changes

There has been significant gentrification throughout the metropolitan area in the past decade, resulting in population distribution shifts, with increasing numbers of study area workers living in Hudson County, NJ and in once-blue collar neighborhoods in Brooklyn and Queens. Of key importance in reflecting these shifts in residential and workplace transportation patterns, the 2010 Census Transportation Planning Package (CTPP) modal split by origin/destination data were acquired and used to update the 2000 CTPP data used in the original iteration of the travel time savings model, replacing the combination of 2000 CTPP modal split inputs and the Longitudinal Employer Household Dataset (LEHD) origin/destination inputs used in the 2011 version of the model.

Work trip travel time savings is estimated only for those worker who take public transportation to get to and from work (i.e., transit riders). The number of transit riders working in the study area has increased to 413,933 in the 2010 CTPP, or 81.4 percent of all workers.

The models were updated to reflect 2015 property conditions using the most recent *PLUTO* files. The *PLUTO* files provide property value, lot size, and floorspace data for both residential and commercial aspects of each building. In the Travel Time Savings model, the floorspace estimates by commercial type (i.e., office, retail, garage, other, etc.) were used to distribute 2010 CTPP data by block group to determine the number of workers by type to be input into the worktrip models of travel time savings.

Non-Work Trip Generation

There has been significant change in corridor land uses in the recent past. Changes to the non-work trip generation methodologies are described below. This includes the addition of travel time savings estimates for both dwelling units and hotel visitors in this iteration of the model.

Retail

Several changes have been made to the definition of "shoppers" in the retail calculations since the first model was constructed in 2005. The initial model run was only for trips generated in 42nd Street stores. The 2012 model was run for all retail space in the study area. The 2015 shopper modeling is for the entire study area.

In the analysis of previous models leading up to the 2015 build, it was discovered that retail workers had been double counted in both the 2005 and 2012 models—having been included in both the worker and shopper categories. The 2015 model strips work trips out of the floorspace-generated retail trip generation.

Since the development of the first model, retail establishments in Midtown Manhattan have almost universally shifted to a 365 day per year shopping calendar to accommodate

both tourists and residents alike. As such, this model estimates retail trips for 365 days instead of 312 as in previous models.

Restaurants have a lower trip generation rate than other retail establishments (173 trips per 1000 sf vs. 205 trips per 1000 sf). To reflect the increased number of restaurants in the study area, the trip generation rate for retail floorspace as designated in *PLUTO* has been reduced to 189, an average of the two rates.

Hotel Guests

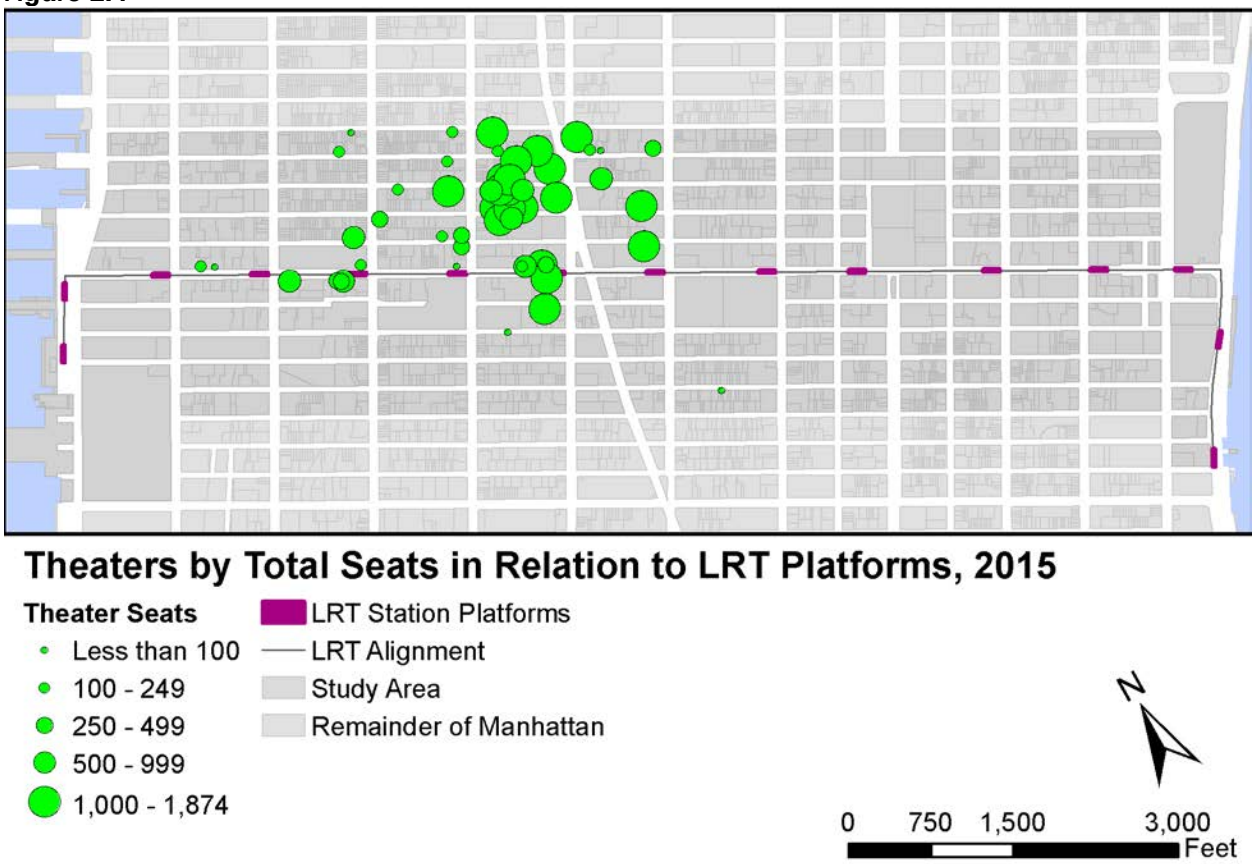
When the first model was developed, there were fewer hotels in the study area and it was assumed that office visitors, theatergoers, and shoppers would include the majority of tourist trips. In the past decade however, changes to zoning have allowed the development of small hotels throughout the study area. The map below shows the location of study area hotels as of 2015.

Figure 2.3

Theatergoers

Trip generation rates for theatergoers were updated to include new theaters that have opened in the study area and to reflect current attendance rates (80% capacity) for eight (8) shows per week.

Figure 2.4



Residents

Residential development in the study area has continued to grow in the past decade. To reflect this increasingly significant share of the population, trip generation rates of 8.075 trips per dwelling unit, per day were applied within the study area.

Distance from Parcel to Transit

The ArcGIS 3D Analyst extension of spatial analysis software was used to determine distances from parcel boundaries to the nearest LRT station entrance. These results differ from the results of previous iterations prepared using the now defunct CommunityViz™ spatial analysis software.

Transit segment travel times were updated to current time distance between stops within the corridor. Subway entrances are located as shown in the previous modeling effort.

b. Model Application to the Study Area

Existing Travel in Study Area

There are 550,000 persons working within the study area and 36,000 permanent residents. In addition there are 100 million square feet of office space and 9 million square feet of retail/restaurant space, 39,000 theatre seats, 7,261 hotel rooms, and ten schools of higher education—these latter are described in detail in Chapter 4. Each of these uses generate trips—work, residents, school, shopping, hotel visitors, theatre. On any given day, within the study area there are roughly:

- 829,000 transit work trips
- 137,000 non-employee office visits
- 230,000 hotel guests
- 220,000 residential building trips
- 1,700,000 shopping trips
- 25,000 theater trips
- 10,000 university school trips

A portion of these trips are made using public transportation and further a share of these may be expected to be directed to the **vision42** LRT. The travel time savings models were used to estimate the numbers of trips that would be logically directed to the transit options described based upon convenience, i.e., travel time savings.

The travel time saved has a value to each of the beneficiary groups. To a worker, the value of time spent in transit is roughly equal to their wage. For an office visitor, an hour traveling is equal to 1.5 times their hourly wage. Whereas for shoppers, theatergoers and students, travel time is worth only one half of their hourly wages.

It also should be noted that travel time savings vary from parcel to parcel depending upon the portal of entrance that each beneficiary is using to enter the study area. The portals used in this model are Portal 6, Port Authority Bus Terminal; Portal 7, Times Square; Portal 8, 42nd Street and 6th Avenue (Bryant Park); Portal 10, Grand Central Terminal; and Portal 16, Penn Station.[4] As explained in detail in the original study, using the origin destination and mode matrix, trips are distributed based upon portal of entry. For example, a worker taking commuter rail to work from Westchester County is assumed to be entering the study area zone through Portal 10, Grand Central Terminal.

Forecasted Travel in the Study Area

For the purposes of the travel time savings modeling effort, the 2025 buildout year conditions are altered based solely upon the floorspace and employment reflective of the completion of the following office properties located within the study area.

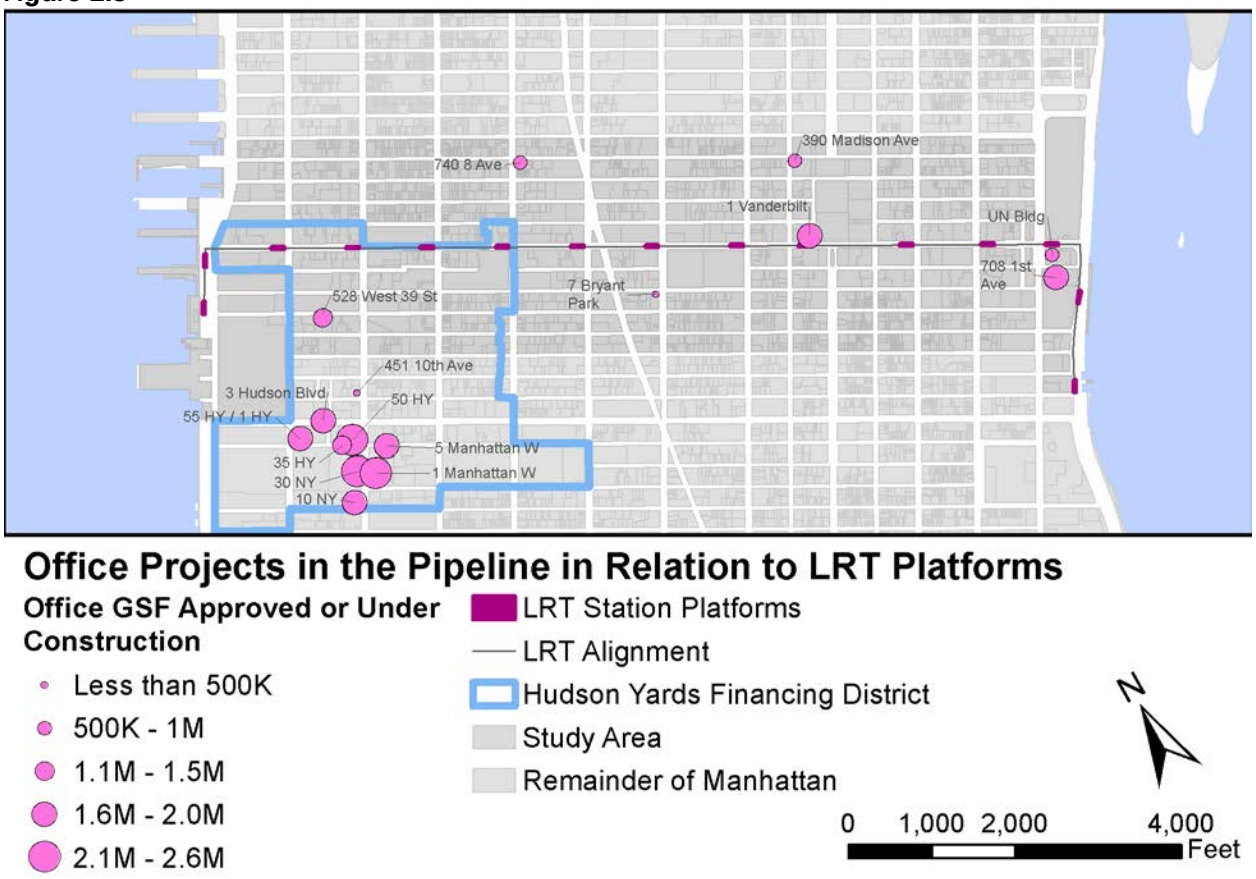
1. United Nations Expansion: 900,000 square feet, 7,500 jobs
2. Solow Building on Con Edison Site: 1,532,437 square feet, 12,000 jobs
3. 7 Bryant Park: 471,000 square feet, 3,925 jobs

[4] Penn Station, while not within the study area, is the primary portal of entry for rail commuters from New Jersey and Long Island regardless of the secondary means of transportation within the corridor.

4. 390 Madison Avenue: 900,000 square feet, 7,500 jobs
5. 528 West 39th Street: 1,000,000 square feet, 8,300 jobs
6. 1 Vanderbilt: 1,516,352 square feet, 12,600 jobs
7. 740 Eighth Avenue: 900,000 square feet, 7,500 jobs

While there will undoubtedly be other commercial and residential development within the study area in the next 18 years, these projects totaling 7.2 million square feet are planned and the 60,165 jobs and 33,692 office visits they represent are the most significant driver of future travel time savings. A significant number of new buildings are being constructed in Hudson Yards, which, while not located within the study area, will receive some additional travel time savings benefits from the proposed LRT. Figure 2.6 shows the locations of each of the planned buildings in the study area as well as in the immediate vicinity.

Figure 2.5



In addition to the office development estimates, the 35 percent increase in retail shoppers and two percent increase in theater-goers estimated by store and venue owners/managers in the second study were used to inflate estimates of shopping and theater trips given the existence of the LRT in the buildout year.

c. Benefits of Travel Time Savings

Utilizing the model designed in 2005 by Urbanomics and described above, the travel time savings in terms of hours and dollar value of those hours was determined given the introduction of the **vision42** LRT over the existing subway system. In order to ascertain that the model updates were running within the same parameters of the previous work, the results of the 2005 and 2012 travel time savings models were adjusted for inflation to 2015 dollars and compared to the current model. A comparison of the annualized[5] economic benefits of LRT travel time savings between the previous two (2005 and 2012) and current (2015) runs are shown in Table 2.3 below in total and by beneficiary group.

Table 2.3 Annualized Travel Time Savings Benefits of LRT Travel Time Savings Comparison of 2005, 2012 and 2015 Reports

	2005 Report		2012 Report		2015 Report	
Beneficiary	2003 Existing Conditions (millions 2015$)	2010 (Buildout Value in millions 2015$)	2011 Existing Conditions (millions 2015$)	2025 Buildout (millions 2015$)	2015 Existing Conditions (millions 2015$)	2025 Buildout (millions 2015$)
Total	$159.60	$195.09	$173.67	$206.75	$692.85	$779.71
Workers	$113.93	$139.34	$120.75	$139.55	$326.50	$377.20
Office Visitors	$24.89	$30.45	$13.76	$15.86	$82.20	$96.40
Shoppers[6]	$19.64	$24.05	$34.55	$46.52	$15.80	$21.30
Theatergoers	$0.95	$1.05	$3.47	$3.57	$1.90	$1.90
University Students	$0.21	$0.21	$1.16	$1.16	$0.64	$0.60
Residents	NA	NA	NA	NA	$153.12	$169.48
Hotel Guests	NA	NA	NA	NA	$112.70	$112.70

Source: Urbanomics

The most obvious change is the inclusion of resident and hotel guest travel time savings. Just as significant however, are the changes in work and office development patterns as shown by the increases in worker and office visitor travel time savings. The office visitor category is a non-work trip classification driven by the location of office space as determined in the 2015 *PLUTO* data. 2015 version of the travel time savings model produces very similar results for three of the other non-work trip categories (shoppers, theatergoers, university students).

Annual Travel Time Benefits

As shown in the table that follows, if the LRT were currently in service, the total estimated travel time savings for trips in the study area to the beneficiary group over the existing subway system is 5.1 million hours, having a monetary value of $692.9 million. The greatest value share of this would benefit study area workers at $326.5 million derived from 3.4 million hours of time savings. Residents would gain 839,000 hours valued at $153.1 million. Hotel guests would gain $112.7 million per year from 485,520 hours of travel time savings.

[5] Annualization of work trips, office visits and students assumes two trips per day for 250 work days per year. Daily shopping savings are annualized to 312 shopping days per year, and theatergoers are annualized to 180 show dates at 75% occupancy rates.

[6] The definition of "shoppers" has changed for each of the models, both in geography and trips included.

Office Visitors are the next greatest beneficiaries in the area with 187,756 hours of travel time savings valued at $82.2 million. Residents and shoppers follow with $27.0 million and $15.8 million in travel time savings, respectively. Theatergoers would see $1.9 million in savings based upon 52,177 saved hours of travel. University students, with 61,832 hours of saved travel time, but only $0.64 million in monetary benefit.

Table 2.4. Existing Conditions: Annualized Travel Time Savings Benefits of LRT

	Travel Time Savings (Hours)	Travel Time Savings (millions 2015$)
Total	**5,085,842**	**$692.85**
Workers (2 trips per day, 250 days per year)	3,351,481	$326.50
Residents (365 days per year)	839,001	$153.12
Hotel Guests (365 days per year)	485,520	$112.70
Office Visitors (250 days per year)	187,756	$82.20
Shoppers (365 days per year)	108,075	$15.80
Theatergoers (8 shows per week at 80% capacity)	52,177	$1.90
University Students (250 days per year)	61,832	$0.64

Source: Urbanomics

As shown in Table 2.5, under buildout conditions, the total annualized travel time savings is 8,334,701 hours or $779.71 million. The distribution of value to the beneficiaries remains much the same, but with worker trip savings increasing to $377.24 million per year, or 3,872,174 hours and office visitor benefits increasing to $96.4 million for 220,217 hours of travel time savings each year. The number of dwelling units in the study area would increase by 9,485 by 2025--yielding a travel time savings of 928,000 hours valued at $169.5 million. Based on the estimates of increased numbers of shoppers (35%) and theater-goers (2%) due to the LRT and the pedestrianization of 42nd Street as determined by surveys of owners and managers in the second economic study, the number of hours of travel time savings for shoppers is 3,495,836 hours with a value of $27 million and a 53,221 hours of time savings for theater goers with a value of $1.92 million each year.

Table 2.5. Buildout Conditions: Annualized Travel Time Savings Benefits of LRT

	Travel Time Savings (Hours)	Travel Time Savings (millions 2015$)
Total	**5,767,522**	**$779.71**
Workers (2 trips per day, 250 days per year)	3,872,174	$377.24
Residents (365 days per year)	928,657	$169.48
Hotel Guests (365 days per year)	485,520	$112.75
Office Visitors (250 days per year)	220,217	$96.36
Shoppers (365 days per year)	145,901	$21.3
Theatergoers (8 shows per week at 80% capacity)	53,221	$1.92
University Students (250 days per year)	61,832	$0.64

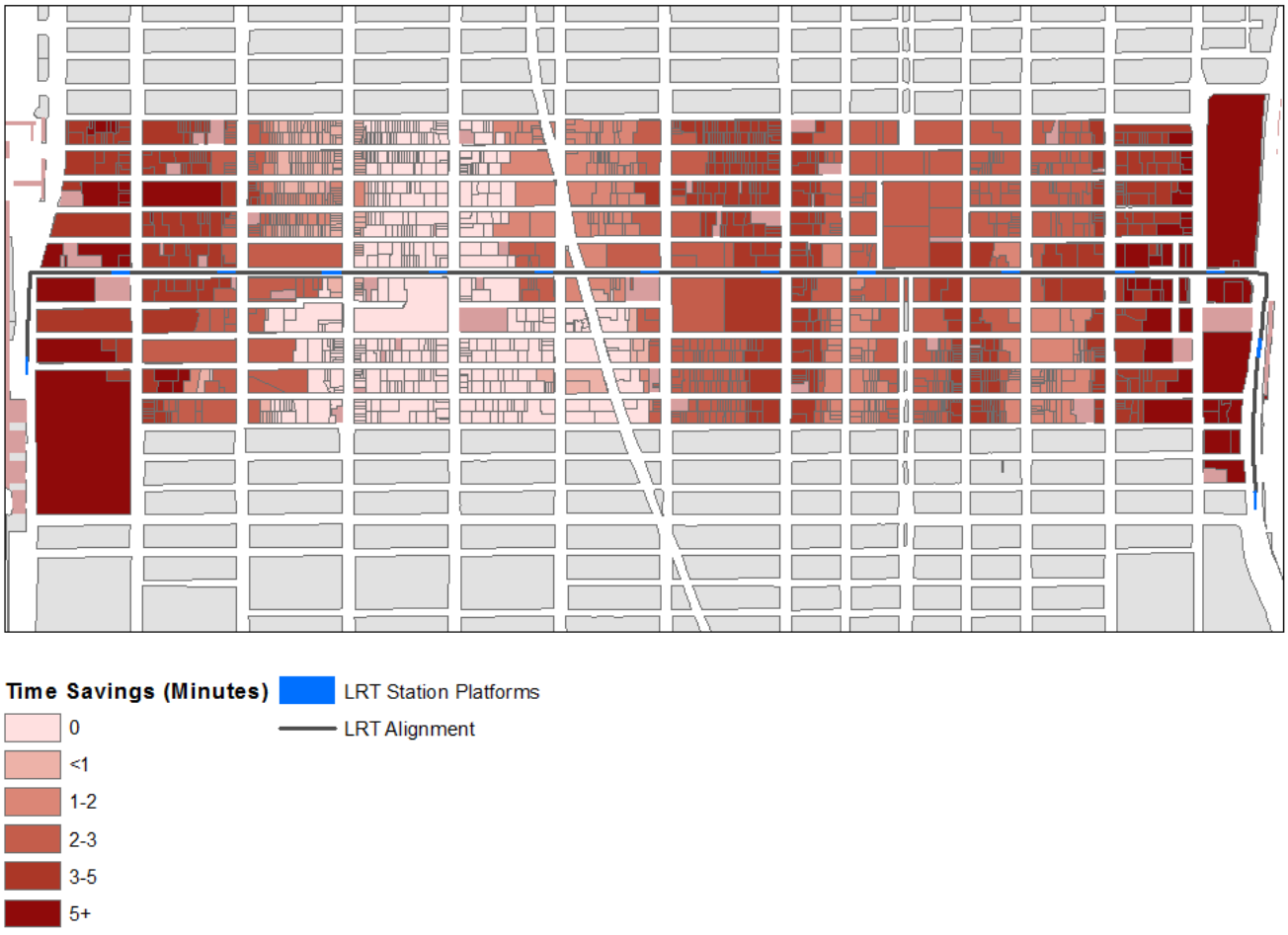
Source: Urbanomics

A total of 273,873 area workers would benefit from substituting the LRT for parts of their commute. The travel time savings for these would average 2.06 minutes per day or 8.6 hours per year. As expected, the individuals working on the far eastern and western edges of the study area accrue the greatest benefit, with daily travel time savings per person of up to 29 minutes, totaling 120 hours each year.

As mentioned previously, travel time savings per worker per parcel vary based upon the portal of entry into the study area. The resulting patterns show the degree of benefit by geographic point of entrance accrued to these workers as well as shoppers, students, theater-goers and office visitors. The maps that follow (Figures 2.6-2.10) show the average daily travel time savings per worker (under buildout conditions) by the parcel of work and portal of entry into the study area corridor.

Bus commuters as well as those traveling on the A/C/E subway lines enter the study area through the Port Authority Portal.

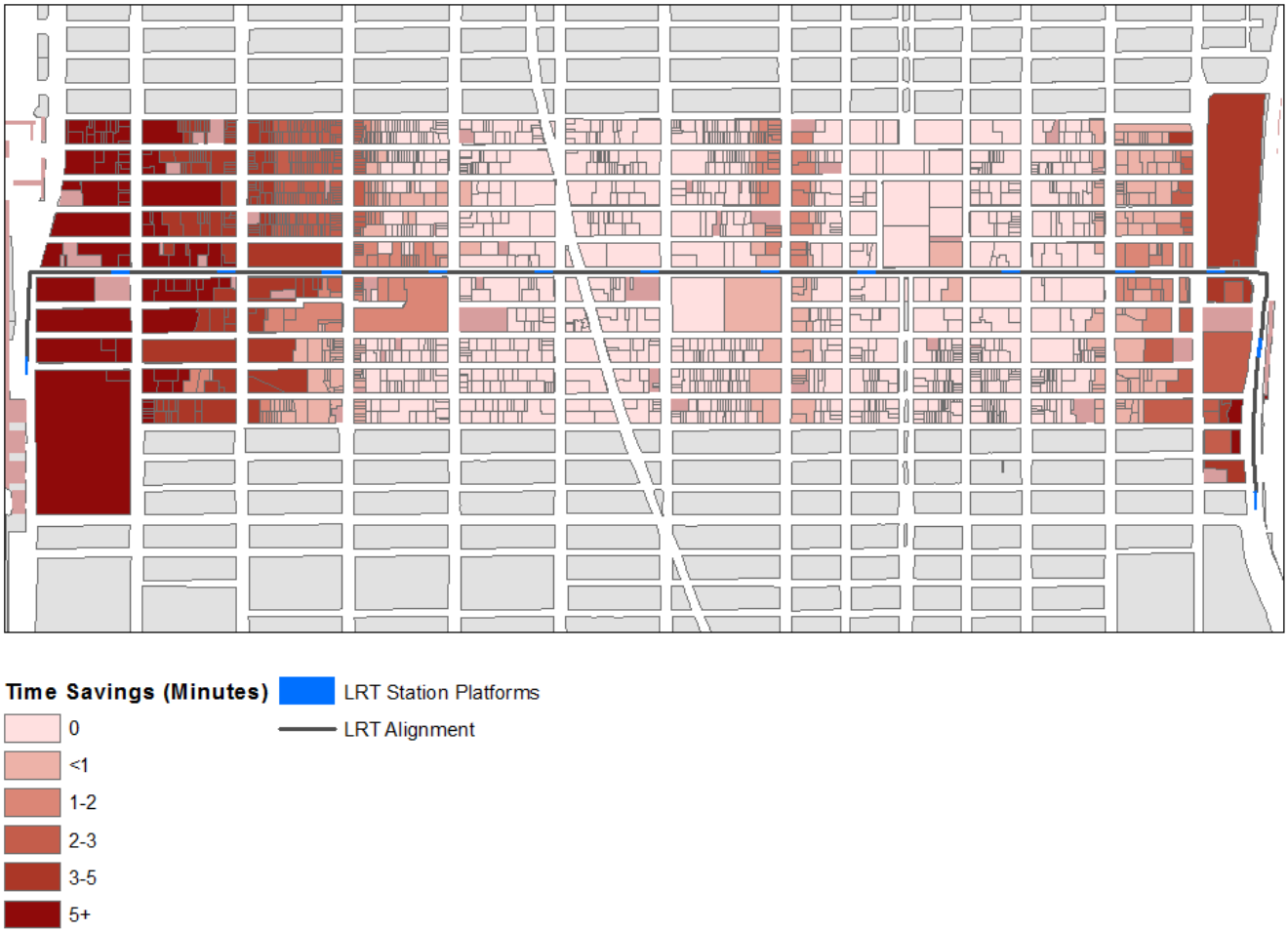
Figure 2.6 Portal 6: Port Authority Travel Time Savings with LRT



As shown in Figure 2.6, the vast majority of workers, regardless of place of work, would save more than five minutes per day (20.8 hours per year) using the LRT for at least part of their trip. This benefit to travelers entering through Port Authority is yielded to those working west of 9th Avenue and east of 6th Avenue.

Times Square is the point of entry for those who take the 1/2/3, the N/Q/R/W and a share of #7 trains. As seen in Figure 2.7 below, the greatest time savings benefits accrue to those workers on the East River or west of 8th Avenue.

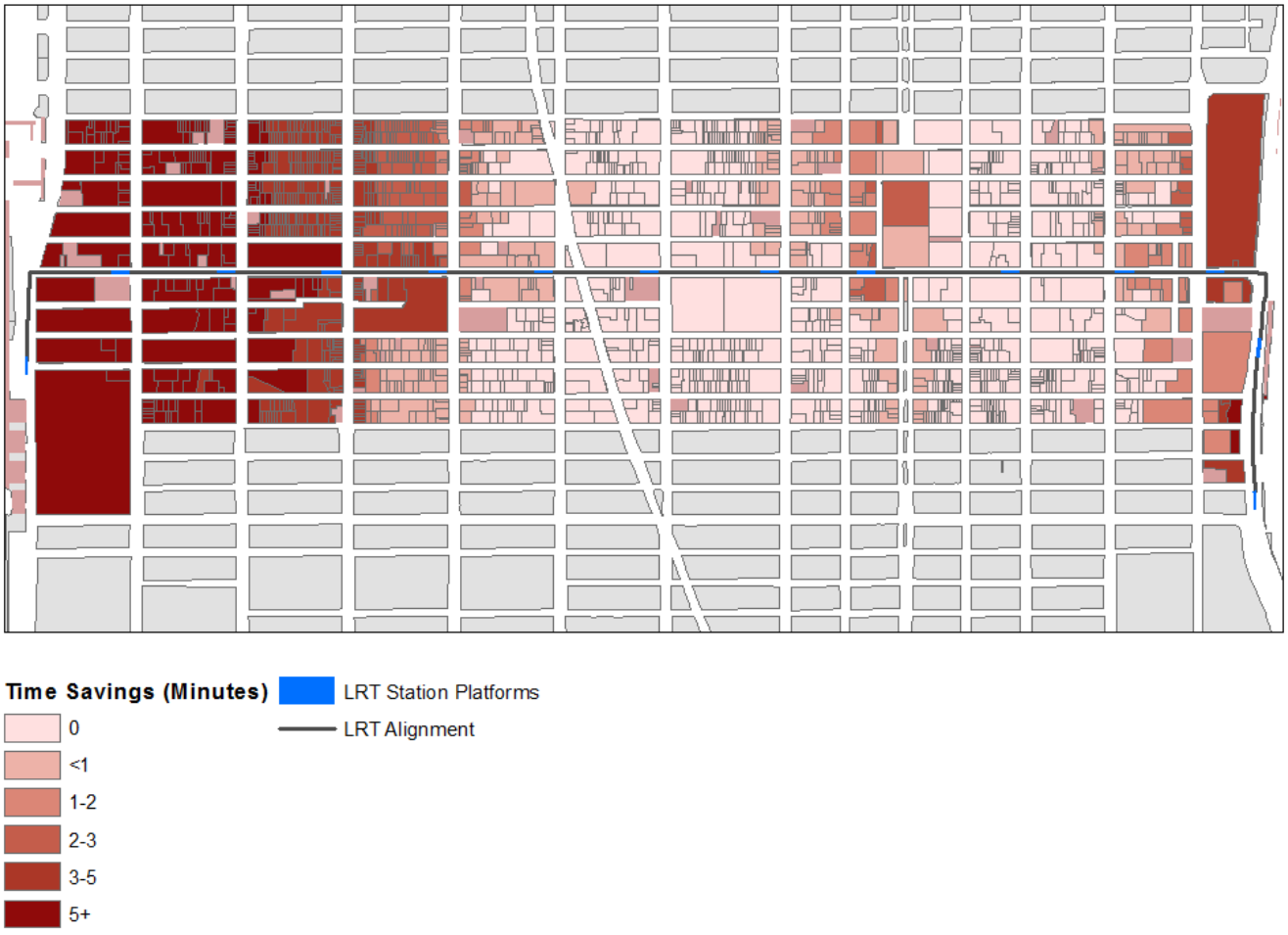
Figure 2.7 Portal 7: Times Square Travel Time Savings with LRT



The lack of time savings in the corridors between 6th and 3rd Avenues reflects the likelihood of transfer from the north/south subways to the #7 train to reach Grand Central Terminal. It should be reiterated that the ONLY criteria influencing choice of transportation modeled was time savings. The LRT would likely draw even greater ridership due to the attractiveness of the mode.

Located on 42nd Street and 6th Avenue, the Bryant Park portal includes B, D and M train riders as well as a portion of #7 train riders. The greatest benefits to those entering the study area at Bryant Park are those with destinations to the north and west of Broadway, the corridor between Park and Fifth Avenues, as well as the East River properties to be developed.

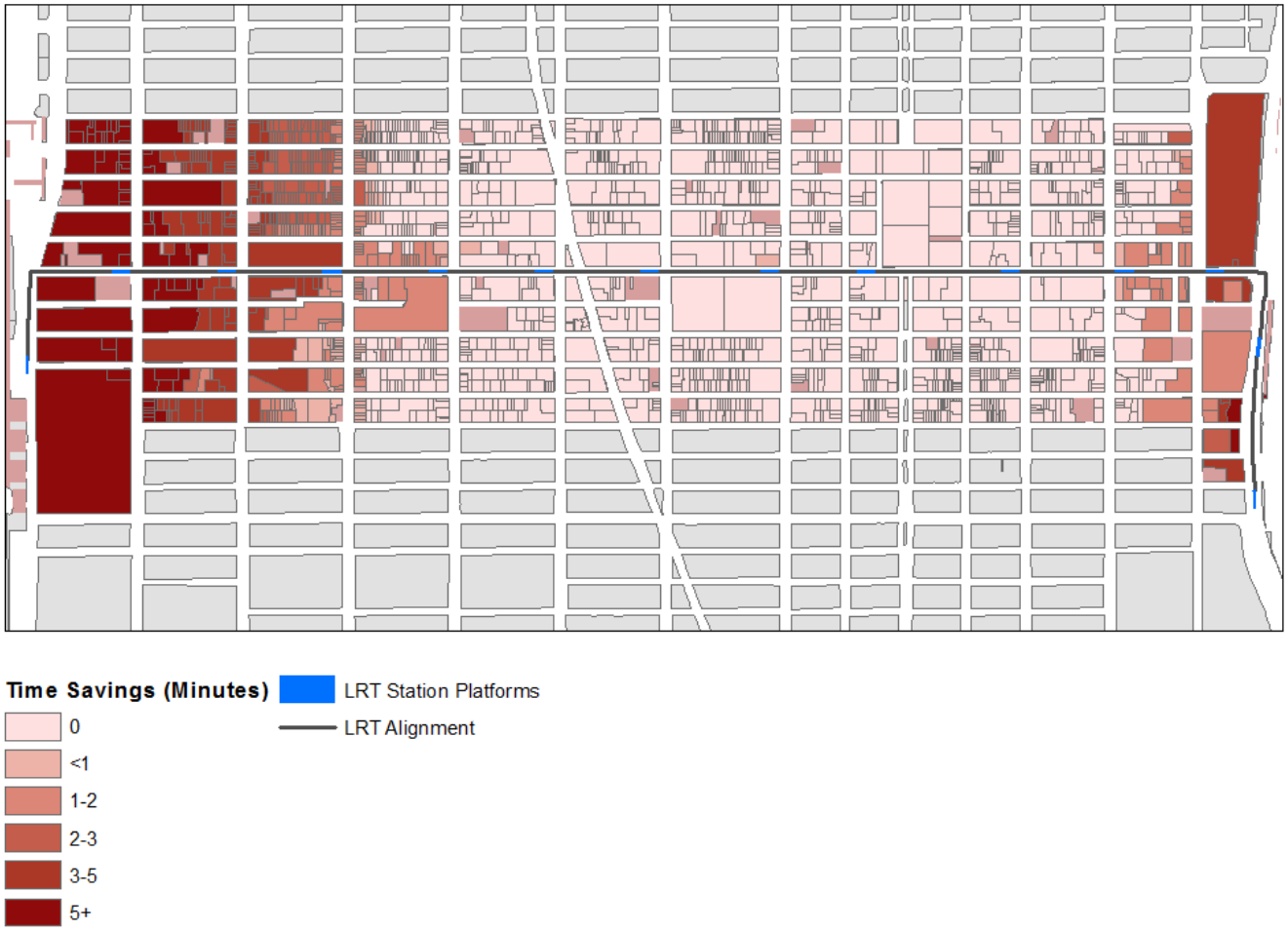
Figure 2.8 Portal 8 Bryant Park Travel Time Savings with LRT



As was the case with Times Square entrants, the areas receiving the least travel time savings benefits are those limited areas served by the #7 train.

The Grand Central portal receives commuters taking the Metro North Railroad as well as those subway riders on the Lexington (4/5/6) line and the #7 train.

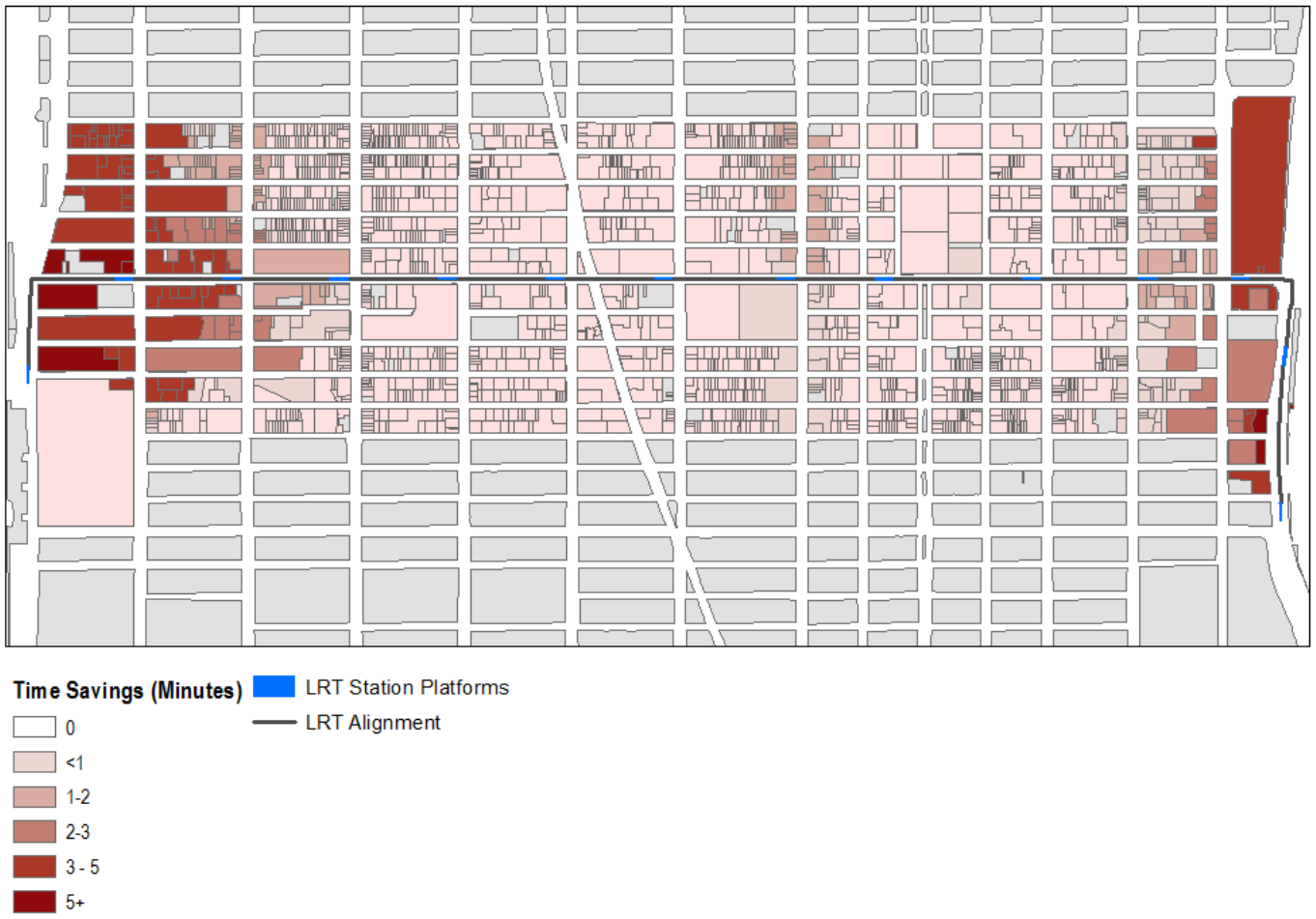
Figure 2.9 Portal 10: Grand Central Travel Time Savings with LRT



The greatest benefit to Grand Central travelers entering is to those working east of 2nd Avenue and west of 8th Avenue.

Figure 2.10 portrays the travel time savings accruing to travelers who enter the study area through Penn Station—primarily those commuters arriving via Long Island Railroad and NJ Transit trains.

Figure 2.10 Portal 16: Penn Station Travel Time Savings with LRT



The greatest travel time savings benefits for persons entering the study area through the Penn Station portal will go to those traveling to the East River properties or between 5th and 6th Avenues.

iii. Office Rent and Occupancy

With the database compiled for the 408 office properties in the Study Area, an analysis was undertaken to estimate the impact of improved property value from LRT access on increasing office asking rents and occupancy over the forecast period. Each office parcel was identified by the property's market class, rank ordered from Class A through Class C, and assigned to the respective real estate submarket. Average vacancy and asking rent information was attributed to each parcel from the office submarket reports of Cushman & Wakefield. Consistent with prior research, this update assumed that thirty percent (30%) of building space would turnover for occupancy between 2015 and 2020. Future rents were based upon the assumption that access-related property value increases would be capitalized into office rents, while increased leasing performance of partially occupied

buildings was based upon the submarket class deviation between the direct vacancy rate and the total vacancy rate. Existing rents were applied to turnover space and new rents to future leased space for a measure of increased office rental income.

Table 3.1. Economic Benefits of Office Rent and Occupancy Increases

Beneficiary	Increase in Constant $ Asking Rent	Existing $ Value of Added Leases	Constant $ Increase in Leases to 2020	Aggregate Increase in Benefit
Office Properties	$7.11 psf	$78.6 million	$116.0 million	$194.6 million

Source: Urbanomics

iv. Retail Sales and Hotel Occupancy

Transportation investments often have a positive impact on retail sales at adjacent properties. In addition to an increase in retail values, studies have shown a measurable rise in visitors at tourist destinations accessible by light rail. For 42nd Street and Times Square, referred to as the Crossroads of the World, a rise in tourism benefits the many hotels, legitimate theaters and other tourist destinations that line the corridor.

In Fall 2015, fully 175 stores, hotels, theaters, restaurants and other retail businesses were in operation on 42nd Street from river to river. An additional 12 shops were occupied by non-retail businesses and 21 were vacant, for a 10 percent vacancy rate. Collectively, the 175 establishments were estimated to annually earn $665 million of sales and employ some 5,730 workers. The 9 hotels were the major source of employment, accounting for nearly half of all earnings with annual sales of $284 million, followed by 61 eating and drinking places, including 22 full-service and 35 limited-service restaurants as well several take-away shops, earning $134 million.

42nd Street's other major tenant -- a growing presence on the western end -- consisted of 24 legitimate theaters which were estimated to have sold $84 million in tickets over the course of a year. In addition, two movie theater complexes and three tourist attractions, including Madame Tussaud's wax museum, supplemented the arts and entertainment with nearly $18 million in business. While all non-retail uses flourished and represented nearly 80 percent of business on 42nd Street, some 76 smaller stores actively served shoppers in apparel, pharmacy, book and souvenir stores, sporting goods places, grocery and other shops. Collectively, these retailers accounted for some $145 million of sales in 2015.

Under current conditions, 42nd Street's existing uses generate sales and income taxes, commercial rent and hotel taxes, as well as payroll and corporate income taxes in addition to real estate taxes. With an increase in pedestrian activity and the improved accessibility of light rail service along 42nd Street, these uses can be expected to expand in business. When asked if they anticipated a change in business from completion of **vision42** by type of operation, a majority expected business to increase with the gain commonly thought to be between 5 percent and 10 percent.[7] The following Table 4 presents the major uses and related business characteristics in 2015, as well as the proportion estimated to experience a long term increase in business. Based upon the survey responses, the

[7] 2012 in-person survey responses of 69 establishments; the 2016 electronic survey did not provide a statistically reliable response rate.

subsequent Table 5 presents the estimated business increase and the increment in taxes generated on business income, sales, employee earnings and rent or hotel room leasing.

Table 4.1. Economic Characteristics of Existing Hotel, Entertainment, Restaurant and Retail Uses Directly on 42nd Street

Business	*# on 42nd St*	*Annual Sales ($M)*	*Estimated Employment*	*Payroll & Benefits Expense ($M)*	*Rent Expense ($M)*	*Anticipating Increase in Business (%)*
Total	**175**	**$665.1**	**5,732**	**$339.2**	**>$12.6**	**52%**
Hotels	9	$284.0	2,233	$156.3	$7.7	40%
Legitimate Theaters	24	$83.9	470	$58.7	$4.9	44%
Cinemas	2	$8.9	80	$5.0	na	50%
Other Amusements	3	$8.8	44	$3.6	na	52%
Eating & Drinking Places	61	$134.1	1,966	$68.9	na	58%
Retail Establishments	76	$145.4	939	$46.7	na	52%

Source: Reference USA and Urbanomics

Table 4.2. Economic Benefits of Increased Hotel Occupancy, Retail and Theater Sales Directly on 42nd Street

Business	*# Gain Business on 42nd St*	*Gain in Annual Sales ($M)*	*NYC & NYS Business Income Tax ($000)*	*NYC & NYS Sales Tax ($000)*	*NYC & NYS Hotel Tax ($000)*	*NYC & NYS Personal Income Tax ($000)*
Total	**91**	**$23.4**	**$501.5**	**$2,081.2**	**$593.9**	**$867.9**
Hotels	4	$8.5	$235.0	$756.1	$593.9	$345.9
Legitimate Theaters	11	$2.8	$89.2	$248.3	na	$144.3
Cinemas	1	$0.3	$9.6	$29.6	na	$13.8
Other Amusements	2	$0.3	$11.8	$30.4	na	$10.4
Eating & Drinking Places	35	$5.8	$116.4	$515.0	na	$219.7
Retail Establishments	39	$5.7	$39.5	$501.8	na	$133.8

Source: Urbanomics

v. Operational Transit Savings

The 42nd Street corridor is presently served by the M42 crosstown bus. Replacement of bus service with higher occupancy LRT service would result in an annual operating cost savings of $82,000 for the Metropolitan Transportation Authority (MTA), as Table 5.1 shows. On a per passenger basis, the cost savings would be more significant.

Table 5.1. Economic Benefits of LRT Operational Savings

Beneficiary	Annual Operating Cost	LRT	Replaced Bus Service
MTA	Vehicle Operations	$5,218,000	$6,893,000
	Vehicle Maintenance	$1,421,000	$1,065,000
	Non-Vehicle Maintenance	$887,000	$61,000
	General Administration	$472,000	$61,000
	Total	**$7,998,000**	**$8,080,000**

Source: Urbanomics, based upon an update of Halcrow/Langen estimates by NYC CPI, 2005-2015.

vi. Qualitative Assessment of Other Benefits

Additional benefits would accrue from the reductions in health care and vehicular repair costs attributable to fewer accidents on 42nd Street, the improvement in air quality in the corridor as well as other non-quantifiable events or actions. These might include an increase in soft site assemblages and the possible transfer of development rights, a growth in tourism and entertainment patronage, and gains in on-time performance of employees due to their travel time savings. Tourism gains can certainly be expected as the LRT route will link, river-to-river, with such tourist attractions as Times Square, Fifth Avenue, the New York Public Library, and the United Nations.

Low-floor light rail is by definition handicapped-accessible. This could be of real benefit with the average age of New York's population projected to increase substantially in the coming years.

The value of accident reduction might be gleaned by assuming that 100 accidents with injuries might occur on 42nd Street between pedestrians and motor vehicles per year. At an accepted national average value of $14,200 per injury, this reduction would entail a savings of $1.4 million. Cost savings would be more considerable for the avoidance of fatalities. Even one (1) fatality averted would represent an additional cost savings of $3.5 million annually.

vii. Direct Economic Costs

The introduction of light rail services to 42nd Street will have one one-time and two permanent, or annual, economic dis-benefits or costs that are directly measurable.

a. Construction Costs

Costs of constructing and equipping a new 2.5 mile river-to-river light rail line in a landscaped pedestrian street will range from $570 to $807 million using current indices of construction costs[8] in the New York area, updated from prior studies prepared by an engineering team led by Halcrow LLC. The annual debt service to cover this cost over a 30-year period would be $36.7 to $52.0 million. (Note – the higher cost estimates assumes full utility relocation will be required, while the lower estimate assume that city policies can be modified to permit use of more cost-effective construction techniques. Recent advances in more efficient wire-free technologies could reduce these cost estimates.)

[8] The ENR construction cost index for New York City was used to update the construction costs from the 2004 study.

b. Costs of Traffic Diversions

Auto, truck and taxi traffic will be diverted to other streets with development of an LRT system on 42nd Street. Prior analysis by Sam Schwartz LLC predicted average weekday traffic diversions under full build-out conditions, estimating total delay hours by mode for the peak and off-peak periods. Average hourly wage rates for auto occupants were valued on Manhattan average worker earnings in 2014, consistent with assumptions of the Travel Time Savings Model by peak and off-peak period, while average hourly wage rates for truckers were based on reported occupational earnings. Out-of-pocket taxi costs, including driver earnings and fuel costs, were updated using the New York Consumer Price Index (CPI) gain between 2003 and 2015.

As Table 7.1 shows, the aggregate annual cost of traffic delays from travel diversions to other streets is estimated to be $113 million in 2020, in constant 2015 dollars.

Table 7.1. Economic Costs of Traffic Diversions

Average Weekday	Total Delay Hours of Average Weekday by Mode				
	Auto	**Truck**	**Taxi**	**Taxi Occupant**	**Total**
Peak period	3,470	191	1,033	1,033	5,727
Off-peak period	3,731	249	746	746	5,472
	Average Hourly Wage or Out-of-Pocket Costs by Mode				
	Auto	**Truck**	**Taxi Operator**	**Taxi Occupant**	**Total**
Peak period	$33.17	$21.75	$39.24	$33.17	$33.87
Off-peak period	$49.76	$21.75	$39.24	$49.76	$47.08
	Annual Cost of Travel Delay from Traffic Diversion				
Peak period	$28.8 million	$1.0 million	$10.2 million	$8.5 million	$48.5 million
Off-peak period	$46.4 million	$1.4 million	$7.3 million	$9.3 million	$64.4 million
Total	**$75.2 million**	**$2.4 million**	**$17.5 million**	**$17.8 million**	**$112.9 million**

Source: Urbanomics and Sam Schwartz LLC estimate of hours, with updated 2015 wage costs provided by NYDOL.

c. Increased Costs of Delivery

A prior analysis performed by Sam Schwartz LLC estimated that some 150 hand freight entrances serving 42nd Street retail facilities would experience average delivery time increases of 1:18 minutes per 15 daily inbound deliveries and 10 outbound deliveries as a consequence of the closure of 42nd Street to auto and truck traffic. The following table depicts the anticipated cost of increased delivery time at $441,800 annually, assuming the average hourly wage of a local trucker at 2015 levels provided by the New York State Department of Labor.

Table 7.2. Economic Costs of Increased Delivery Time

Average Weekday	# 42nd St Entrances	# Deliveries per Entrance	Average Increase in Delivery Time (min)	Average Hourly Trucker Wage	Delay Hours per Weekday	Annual Delivery Cost Increase
Inbound	150	15	1:18	$21.75	243.75	$265,100
Outbound	150	10	1:18	$21.75	162.50	$176,700
Total	150	25	1:18	$21.75	406.25	$441,800

Source: Urbanomics and Sam Schwartz LLC estimate of hours, with updated 2015 wage costs provided by NYDOL.

viii. Fiscal Benefits

The direct economic benefits of LRT access that will accrue to corporations and individuals with a cash value will have a fiscal impact on New York City and New York State tax revenues. Benefits with a non-pecuniary value, such as those generated by travel time savings, will accrue as a "consumer surplus" or increase in purchasing power that does not have a directly measurable tax impact. Fiscal impacts on public revenues are quantified for monetized benefits, while fiscal impacts on public expenditures are not known. Ten tax revenue sources of New York City and New York State are expected to generate $211.0 million annually from the monetized benefits of LRT service on 42nd Street. Tax revenues accruing to New York City would be $181.1 million and to New York State, $29.9 million, based upon the following taxes.

New York City administers six taxes that pertain to doing business by commercial occupants of buildings on 42nd Street:

- ***Property Tax*** on non-exempt assessed value of real property by class, ranging from Class 1 (residential property up to three units), Class 2 (all other residential property), Class 3 (utility property), and Class 4 (commercial and industrial property).
- ***Business Corporation Tax*** on C-corporations doing business, employing capital, owning or leasing property in a corporate capacity, or maintaining an office in New York City (effective January 1, 2015) and ***General Corporation Tax*** on S-corporations doing business, employing capital, owning or leasing property in a corporate capacity, or maintaining an office in New York City.
- ***Personal Income Tax (PIT)*** on earned income of persons residing or working for New York City on an adjusted gross income basis
- ***Commercial Rent Tax*** on tenants who occupy or use a property for commercial activity in Manhattan south of 96th Street.
- ***Sales Tax*** on retail sales of certain tangible personal property and services, including hotels.
- ***Hotel Tax*** on room occupancy per day of every occupied unit in a hotel in New York City and on aggregate room rents of hotels in New York City.

New York State administers four taxes that pertain to doing business by commercial occupants of buildings on 42nd Street:

- ***Personal Income Tax*** on earned income of persons residing or working for New York State on an adjusted gross income basis
- ***Franchise Tax on General Business*** of domestic C- and S-corporations incorporated in New York State or foreign corporations doing business, employing capital,

owning or leasing property, or maintaining an office, or derives receipts from activity in the State

- ***Sales Tax*** on retail sales of certain tangible personal property and services, including hotels.
- ***Hotel Unit Fee*** on room occupancy per day of every occupied unit in a hotel in New York City.

Table 8.1 presents the bases, bounds and rates for tax liability and the annual fiscal benefit to New York City and New York State. Because data are not available on the allocation of business net income to the City or the State on the basis of incorporated status, it is not possible to separately estimate the tax liability of increased sales by C-corporation, S-corporation and unincorporated businesses. All are presented as liable for Business Corporation or Franchise Tax on General Business.

Table 8.1. Tax Liability and Fiscal Benefits of Selected Revenue Sources by Jurisdiction

Tax Source & Beneficiary	Bases & Bounds	Rate	Annual Revenue Increase in 2015 $000,000
New York City Taxes			***$181.11***
Property Tax	Assessed Value not exempt	19.554% -12.883% -10.656%	$150.50
Corporation Tax:	Allocated Net Income	8.85%	$12.41
Personal Income Tax	Adjusted Gross Income	3.43% (effective)	$9.75
Commercial Rent Tax	An'l Rent > $250,000	3.9% (effective)	$6.75
Sales Tax (incl MTA):			
Hotel	Sales	4.875%	$0.42
Retail	Sales	4.875%	$0.28
Restaurants	Sales	4.875%	$0.28
Entertainment	Admissions	4.875%	$0.17
Hotel Tax:			
Room Occupancy	Rent > $40/day	$2.00/unit	$0.05
Room Rents	Aggregate rents	5.875%	$0.50
New York State Taxes			***$29.92***
Franchise Tax	Allocated Net Income	7.1%	$9.98
Personal Income Tax	Adjusted Gross Income	5.73% (effective)	$18.97
Sales Tax:			
Hotel	Sales	4.00%	$0.34
Retail	Sales	4.00%	$0.23
Restaurants	Sales	4.00%	$0.23
Entertainment	Admissions	4.00%	$0.14
Hotel Unit Fee			
Room Occupancy	Rent/day	$1.50/unit	$0.04
Grand Total Taxes			***$211.03***

Source: Urbanomics

Increased property tax revenues will flow from increased property value of residential and commercial structures, and vacant tax parcels in the Study Area. Assessed at 45 percent (45%) of market value, with the exception of 1-2 Family residences which are assessed at six percent (6%), the commercial properties are currently taxed at 10.656 percent (10.656%) of assessment and the residential properties at 19.554 percent (19.554%) for 1-2 Family residences and 12.883 percent (12.883%) for all other residences.
As noted previously in the Methodology and Table 1.1, the full value of commercial property in the study area in 2015 was $34,998.1 million and the full value of residential property was $8,484.1 million. Based upon the model, the benefit of LRT access would increase commercial property value by $2,165.8 million and residential property by $2,317.0 million, for a combined increase of $4,482.8 million. The $2,165.8 million increase in office, retail and vacant lot property value would generate $56.6 million in annual property taxes if no new exemptions pertain.[9] Taxed at 19.554 or 12.883 percent (19.554% for single family and 12.883% all other residences), the $2,317.0 million increase in residential value would generate $93.9 million in annual property taxes if no new exemptions pertain. The combined property tax yield would thus be $150.5 million.

Employment increases in the Study Area that are directly attributable to the benefit of LRT service will consist of new employment housed in existing office space that is newly leased because of improved transit access, and employment expansion associated with the increase in sales among 42nd Street commercial establishments. The analysis of LRT impacts on occupancy increases suggests 5,400 additional workers would be housed in the available space. Assuming 73 percent are New York City residents and 85 percent are New York State residents[10], at average wage and tax rates[11] the revenue yield on personal income earned in newly leased offices and expanded commercial businesses would be $9.7 million for New York City and $19.0 million for New York State, for a combined annual impact of $28.7 million. It should be noted, however, that an unknown portion of newly housed workers may represent jobholders that were relocated from worksites elsewhere in New York City and State.

By 2020, office properties in the Study Area are expected to have experienced at least a 30 percent turnover of existing to new leases as well as increased occupancy of overly vacant space, resulting in higher rent collections estimated at $194.6 million annually. Where rents exceed $250,000 annually an effective 3.9 percent (3.9%) Commercial Rent Tax is applied, yielding a collective liability of $6.8 million for selected office properties in the Study Area.

In addition, as a consequence of improved accessibility, a turnover in leases and increased occupancy at higher rental rates, the office properties in the Study Area will generate higher corporate earnings for real estate owners as well as net new corporate income from the increase in office occupants. Moreover, the commercial businesses on 42nd Street that expect to increase sales in response to a survey on the benefits of LRT service, may also reflect a commensurate gain in corporate earnings. New York City and

[9] The United Nations, Ford Foundation and other non-profit office buildings are included in this inventory and may make payments in lieu of taxes (PILOTs).
[10] Based on 2000 Census Transportation Planning Package (CTPP) reported shares of New York City and New York State residents working in Manhattan of total Manhattan workers.
[11] Tax filing status as single, married filing joint return, and head of household affects the tax rate, standard deduction and number of dependents. For simplicity sake, it was assumed that tax filing status divided into thirds and single filers had no dependents, married filing joint return had one dependent, and head of households had two dependents, yielding an average 3.4 percent (3.43%) of wages as taxable in New York City and 5.7 percent (5.73%) as taxable in New York State.

New York State impose a corporate franchise tax on earned income for the privilege of doing business, employing capital, owning or leasing property, or maintaining an office in New York City. The tax is primarily based on the federal taxable income concept of "entire net income" allocated to the portion earned in New York. For hotels and other commercial businesses on 42nd Street that expect increased sales, their net gain in sales of $23.4 million is estimated to generate a combined business tax liability of one half million dollars. Given the lack of financial data on newly leasing commercial entities, a conservative assumption of eight percent (8%) of average small business earnings is adopted, or $108 million net income, while for real estate owners the net return is assumed to equal fifteen percent (15%) of increased real estate revenues. Against these gains, the City and State corporation tax rates are applied. The New York City corporation tax rate of 8.85 percent (8.85%) would yield $12.4 million, while the corresponding New York State tax rate of 7.1 percent (7.1%) would yield $10.0 million, for a combined $22.4 million of corporate franchise tax revenue generated annually on the increased rental and other corporate income in the Study Area attributable to LRT access.

ix. Cost Benefit Relationship

The annual value of direct net benefits of the proposed LRT system for 42nd Street is estimated to be $986.6 million, comprised of economic and fiscal benefits less economic costs for all monetized and consumer surplus benefits accruing to individuals, businesses and state and local government as Table 9.1 shows.[12] This compares to an urpdated estimate of the capital cost of three LRT system options, prepared by Halcrow and Langen. From the least costly self powered system requiring minimal utility work ($570 million) to the most costly self-powered system requiring extensive utility work ($807 million)[13], the annual debt service would amount to $36.7 to $52.0 million on a 30-year repayment basis.[14]

The LRT's annual operating cost of $8.0 million is not included in the cost benefit relationship because it is estimated to be $82,000 less than the operating cost of the bus service that it will replace and fares of the LRT will be pooled with other MTA fares.

This benefit analysis shows that the anticipated direct net benefits will cover the entire investment in the first stabilized year of operation (2020). Financed over 30 years, the cost-benefit ratio would range from 26.9:1 to 19.0:1.

In the near future, as the following section shows, further property development will enhance the net economic and fiscal benefit advantage while financing costs of the capital investment will remain unchanged. Given these advantages, the financing plan for developing the LRT system will be based solely on property tax revenues, and not include other tax benefits. This report concludes with a discussion of alternative property tax financing options.

[12] The one-time increase in property asset values is represented as an annual increase in property taxes.
[13] Costs of this alternative may be lessened by use of an ultralight track bed that would allow sewer manholes to be adjusted only slightly. This solution, possible because the LRT route is straight and will be traversed at low speeds, has been adopted in Houston and Portland. In New York it would offer a possibility of avoiding the expensive diversion of utilities.
[14] Entire principal financed on 30 year basis, monthly compounded at 5%.

Table 9. 1 Comparison of Annual Direct Net Benefits to Annual LRT System Costs

Annual Cost-Benefit Component	Value of Direct Benefits or Costs
Economic Benefit:	
Travel time savings	+ 692.9 million
Office rent & occupancy increases	+ $194.6 million
Accident reduction savings	+ $1.4 million
Fiscal Benefit:	
New York City tax revenue increase	+ $181.1 million
New York State tax revenue increase	+ $29.9 million
Less:	
Economic Costs:	
Increased cost of traffic diversion	- $112.9 million
Increased cost of deliveries	- $0.4 million
Equals:	
Net Economic & Fiscal Benefit	+ $986.6 million

Source: Urbanomics, based in part on Halcrow/Langan

x. Future Development

Over the next decade, a considerable amount of property development is anticipated for the Study Area, exclusive of Hudson Yards, consisting of new office, hotel, retail and residential construction. The following maps identify the location of seven (7) new office towers, twenty-seven (27) more hotels and twenty-nine (29) new residential buildings. Much of this development will occur at the outer edges of the Study Area and thus significantly benefit from the proposed LRT.

Prominent among these, the new UN office building planned for the southeast corner of 42nd street and First Avenue is expected to start construction in 2017. It should contain offices for some 2,700 UN employees on the upper floors. While it will not directly generate taxes for the City or State, with its location right on 42nd Street, it could open up excellent possibilities for a grand and transit-friendly, tourist-welcoming public entrance. This could in turn stimulate the tourism industry and bolster both the UN and New York's honorable position as the UN's chosen host city.

South of the UN expansion site, the property owned by Solow and destined for residential uses has not yet undergone development. However, the vacant property will significantly increase in land value as a consequence of LRT service. While the Study Area for this economic analysis only extends as far south as 37th Street on the East Side, the LRT is envisioned to terminate at the 35th Street ferry dock. Additional gains from existing and projected development south and west of this terminus have not been included in this analysis.

Adjacent to the Study Area, nine (9) office and mixed use/ residential high rises will be constructed in the Hudson Yards by Related, Brookfield, Eliot Spitzer and other developers. Only one Study Area office development overlaps the Hudson Yards but a significant share of the hotel and residential construction lies within the Hudson Yards financing district. Although some of the newly identified construction is already underway, or has recently

been completed, it is included in the inventory of future development because it is not reflected in the 2015 *PLUTO* file of existing land uses or in the estimate of FY2015-16 tax revenues.

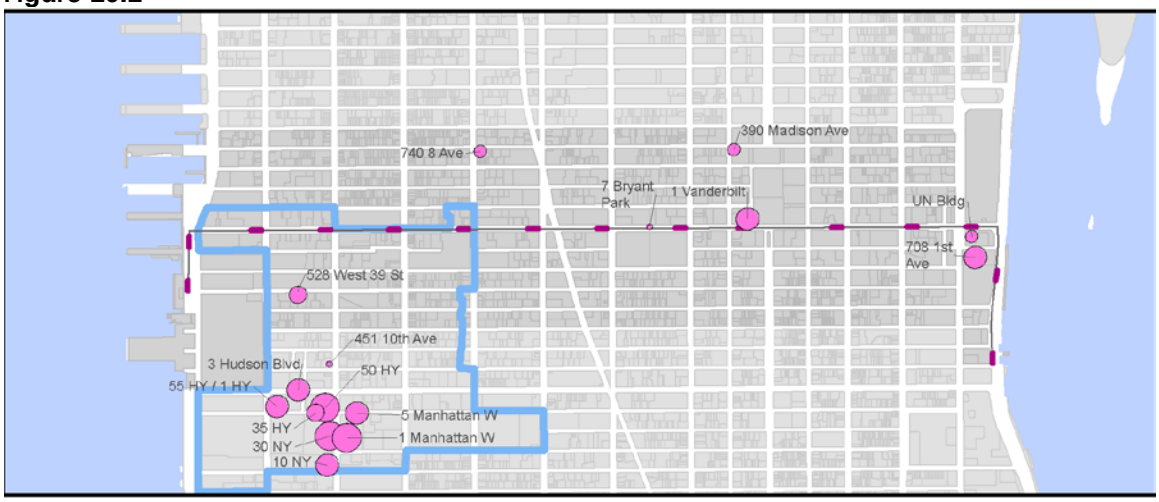
Collectively, new development in the Study Area will deliver 22 million square feet of new space and nearly one billion ($) of property tax revenue, while construction in the Hudson Yards outside of the Study Area can be expected to yield at least another 15.5 million square feet by 2025. As Table 10.1 shows by land use for the Study Area, the residential sector is the major generator of developable space and new tax revenues, while a limited number of office buildings will outrank more numerous hotels in contributing to the property tax base. Yet combined as one area, new office and mixed use buildings will dominate development in Midtown.

Table 10.1. Future Development in the Study Area by Land Use, Estimated Market Value and Property Tax Liability, 2015-2025

Study Area					
Uses:	***Parcels***	***Building GSF (000)***	***Lot Area (in 000 GSF)***	***Market Value (in 2016 $ M)***	***Property Tax Liability (in 2016 $ M)****
Total	**64**	**22,152**	**1,356.3**	**$18,957.7**	**$960.3**
Office	7	7,323	222.3	$6,821.5	$287.5
Retail	1	30	5.0	$15.0	$0.7
Hotel	29	2,240	259.3	$3,050.9	$146.3
Residential	27	12,559	869.7	$9,070.3	$525.8
In Hudson Yards Outside of Study Area					
Uses:	***Parcels***	***Building GSF (000)***	***Lot Area (in 000 GSF)***	***Market Value (2016 $ M)***	***Potential Tax Revenue (2016 $ M)***
Office & Mixed Use	9	15,494	na	na	na

Note (*): Assumes only United Nations Development is tax exempt. Without a knowledge of whether other properties may receive full or partial tax exemptions, the estimates may overstate the revenue potential.
Source: Urbanomics

Figure 10.1



Office Projects in the Pipeline in Relation to LRT Platforms

Office GSF Approved or Under Construction

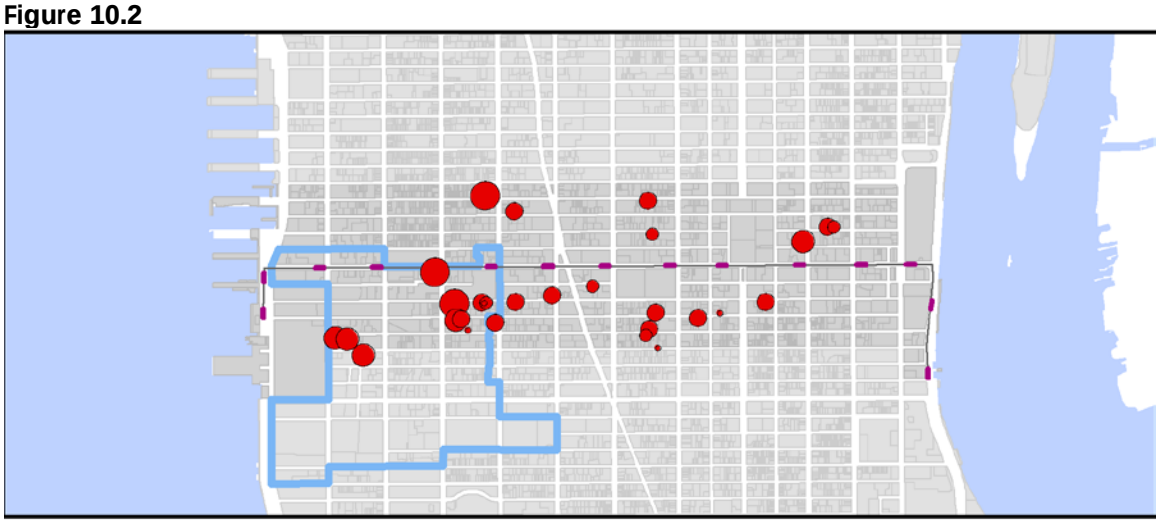
- Less than 500K
- 500K - 1M
- 1.1M - 1.5M
- 1.6M - 2.0M
- 2.1M - 2.6M

- LRT Station Platforms
- LRT Alignment
- Hudson Yards Financing District
- Study Area
- Remainder of Manhattan

N

0 1,000 2,000 4,000 Feet

Figure 10.2



Hotel Projects in the Pipeline in Relation to LRT Platforms

Rooms Under Construction

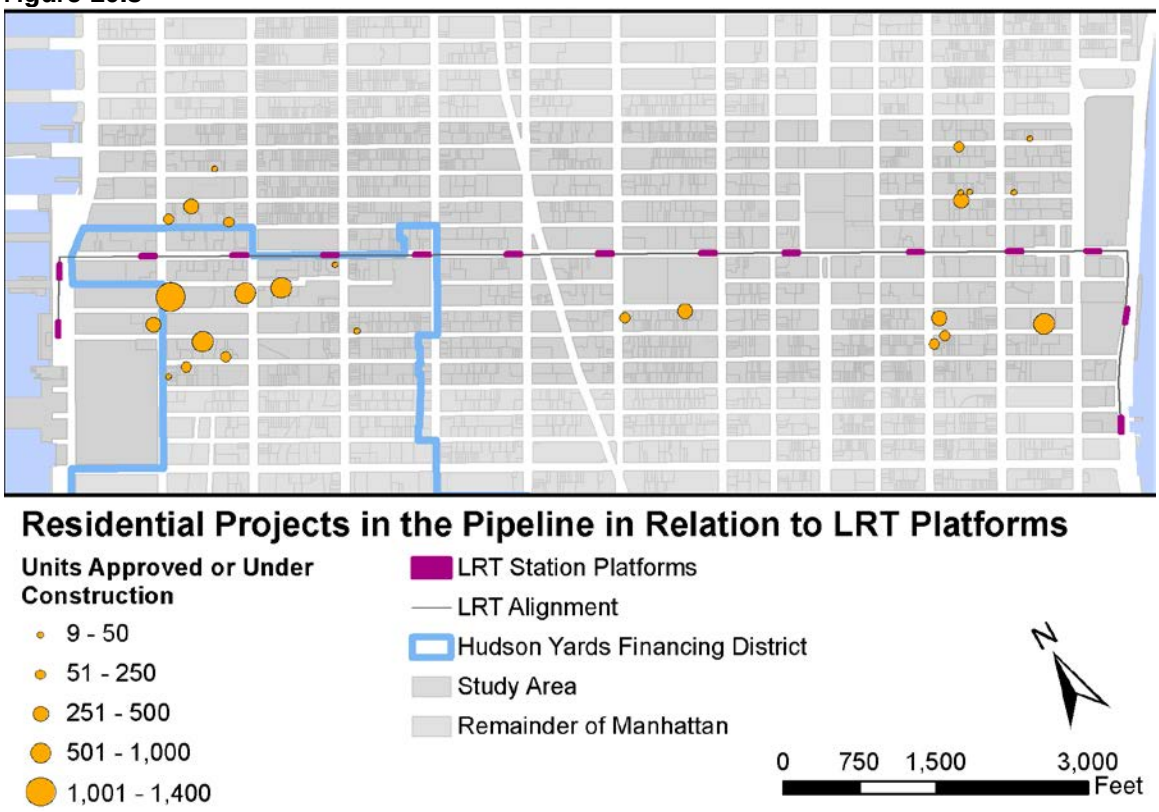
- 60 - 100
- 101 - 150
- 151 - 300
- 301 - 450
- 451 - 641

- LRT Station Platforms
- LRT Alignment
- Hudson Yards Financing District
- Study Area
- Remainder of Manhattan

N

0 1,200 2,400 4,800 Feet

Figure 10.3



Much of the new development in the Study Area will benefit from LRT access. As Table 10.2 shows, the net increase in market value would be greatest for residential development by 2025, with a potential gain of $7.5 billion, while new office development would increase in value by $0.5 billion and other commercial uses by less than $100 million. Assuming no full or partial tax exemptions on new development, this collective enhancement in real estate value would be liable for $455 million annually in property taxes at existing rates. However, as the prior maps have shown, significant shares of proposed development lie within the boundaries of the Hudson Yards Financing District (HYFD).

Table 10.2. Market Value Increase and Annual Tax Liability of Future Development in the Study Area as a Benefit of LRT Access, 2015-2025

Development in Study Area	*Study Area*		*Study Area Outside of HYFD*	
	Value Increase with LRT Access (in 2016 $ M)	*Benefit Tax Liability (in 2016 $ M)*	*Value Increase with LRT Access (in 2016 $ M)*	*Benefit Tax Liability (in 2016 $ M)*
Office	$517.7	$17.0	$506.6	$16.5
Retail	$0.6	$0.0	$0.6	$0.0
Hotel	$64.2	$3.1	$0.0	$0.0
Residential	$7,491.9	$434.3	$4,744.5	$275.1
Total	**$8,074.4**	**$454.5**	**$5,251.7**	**$291.6**

Source: Urbanomics, based upon value capture equations applied to proposed uses

The Hudson Yards Financing Corporation was established by New York City to manage project revenues and expenditures for the HYFD, a project area of 45 square blocks bounded roughly by 42nd Street, 9th Avenue, 31st Street and 12th Avenue. Revenue bonds issued by the Corporation have funded the extension of the #7 Line and a system of area parks and open space including the construction of a boulevard. While the City initially covered interest on the bonds, the revenue to cover the principal is derived from payments on new developments in the District. The payments are in lieu of real property taxes (PILOTs) and mortgage recording taxes (PILMRTs), on the sale of TDRs (transfer of development rights), and on density bonuses pursuant to the zoning resolution (development fees). In order to encourage new development and achieve these revenues the City has established a Uniform Tax Exemption Policy (UTEPs) that exempts property owners or greatly discounts property taxes in the HYFD for a period of up to 20 years. Given these tax provisions, real estate value increases cannot be captured on new or existing development in the Study Area portion that overlaps the HYFD.

As Table 10.2 shows, the property value increase from LRT access for that portion of the Study Area that lies outside of the HYFD amounted to $5.25 billion in 2016 dollars. Taxed at the FY2015-16 rate by building class, the recurring annual tax liability of this benefit was $292 million in constant 2016 dollars.

xi. Financing Plan

A financing plan for the proposed LRT system of **vision42** is based solely upon the property tax benefit of LRT access and on an evaluation of two alternative collection methods: tax increment financing (TIF) and a transportation improvement district (TID). The analysis relies upon current estimates of the improvement in existing property values associated with transit access improvements, and the redevelopment potential of specific sites within the proposed 42nd Street benefit district. The benefit district is defined as the area traversed by 42nd Street in Midtown Manhattan, river-to-river, encompassing five blocks north and south.

The plan examines the principal source of revenue to finance these costs by either imposing a direct charge on property owners in the defined improvement district, or by dedicating incremental taxes generated from increased property values in the benefit district. It shows that either revenue source will cover debt service on bonds to be issued by a special purpose development corporation, and presumably, guaranteed by the New York City Transitional Finance Authority, as follows:

- ***Tax Increment Financing (TIF) Option:*** Revenues generated by current tax rates on increased property values of existing development in the proposed **vision42** improvement district (exclusive of properties in the Hudson Yards district) that benefit from LRT access would yield $133.5 million in annual revenues in Fiscal Year 2015-16 dollars. This levy would assume LRT service was in operation.
- ***Transit Improvement District (TID) Option:*** Revenues generated by a 4 percent flat surcharge, or 6 to 1 percent graduated surcharge on existing property tax liability of selected land uses in the proposed **vision42** improvement district (exclusive of properties in the Hudson Yards district) would yield $63.5 to $55.3 million in annual revenues in Fiscal Year 2015-16 dollars. This levy could be applied before LRT service was in operation.
- Neither option assumes future recurring revenues from new development.

These recurring revenue sources compare to an annual debt service charge of $36.7 million to $52.0 million, depending upon LRT system option, assuming a conservative 5 percent long term bond rate and a 30-year term of financing. Given ample revenue resources that reflect the value of existing property, as well as transparency and accountability of assessing levies based on current property tax liability, the TID option is preferred for construction of the LRT system. However, a TIF option would generate more revenues when the system is in operation. In a 2020 build year, either option would produce more than ample resources given the extent of proposed development. Under those circumstances, flat or graduated TID rates could be lowered or the TIF benefit tax liability could be assessed below the statutory rate.

Other revenue sources – notably, the business and personal income as well as the sales and use tax revenues – could be dedicated to financing other public needs, such as affordable housing. Collectively, New York City is estimated to receive some $138.2 million from this revenue enhancement on an annual recurring basis as a consequence of improved transit access.

Table 11.1. Summary of Tax Increment Financing (TIF) from Taxes on Property Value Increase with LRT Access in FY2015-2016 Dollars

Land Use		Attributed Benefit in FY2015-2016 $000,000				
		Full Value of Property in Study Area	*Property Taxes*	*Study Area Benefit with LRT Access*	*Benefit Tax Liability*	*Benefit Tax Liability (excluding parcels in Hudson Yards)*
Commercial:		***$34,998.1***	***$1,317.4***	***$2,165.8***	***$56.6***	***$53.8***
Office		$32,864.2	$1,238.6	$2,079.3	$53.3	$50.6
Retail		$1,631.8	$59.9	$5.3	$0.3	$0.2
Vacant		$502.1	$18.9	$81.2	$3.0	$3.0
Residential:		***$8,484.1***	***$339.4***	***$2,317.0***	***$93.9***	***$79.7***
123 Family		$359.5	$8.0	$26.5	$0.9	$0.3
Walkup Condo		$7.4	$0.4	$1.3	$0.1	$0.1
Walkup Rental		$1,053.2	$60.0	$548.8	$31.7	$27.4
Walkup Co-op		$99.7	$4.4	$51.9	$2.3	$2.1
Elevator Condo		$191.0	$9.7	$29.2	$1.3	$1.3
MXBldg Elevator Condo		$2,321.9	$94.9	$450.7	$21.6	$18.3
Elevator Rental		$3,151.6	$98.7	$1,029.6	$28.1	$22.2
Elevator Co-op		$917.3	$52.3	$138.9	$7.9	$7.9
Cond-op		$202.7	$0.6	$39.4	$0.1	$0.0
Apartment Hotel		$177.5	$10.3	$0.7	$0.0	$0.0
Residential Loft		$2.4	$0.1	$0.01	$0.0	$0.0
Grand Total*		***$43,482.2***	***$1,656.8***	***$4,482.8***	***$150.5***	***$133.5***

Source: Urbanomics

Table 11.2. Summary of Tax Increment Financing (TIF) in Study Area Outside of Hudson Yards by Distance from 42nd Street, in FY2015-16 Dollars

Land Use		Benefit Tax Liability at Current Tax Rates in FY2015-16 $000,000						
		FY2015-16 Tax from LRT Benefit	*On 42nd Street*	*1 Block North or South*	*2 Blocks North or South*	*3 Blocks North or South*	*4 Blocks North or South*	*5 Blocks North or South*
Commercial:		***$53.85***	***$9.84***	***$2.73***	***$17.23***	***$19.83***	***$9.35***	***-$5.13***
Office		$50.64	$9.82	$2.39	$16.63	$17.94	$9.36	-$5.50
Retail		$0.20	$0.02	$0.16	$0.14	$0.06	-$0.08	-$0.10
Vacant		$3.01	$0.00	$0.18	$0.46	$1.83	$0.07	$0.47
Residential:		***$79.67***	***$14.01***	***$4.59***	***$15.97***	***$10.87***	***$16.33***	***$17.90***
123 Family		$0.34	$0.00	$0.07	$0.12	$0.08	$0.07	$0.00
Walkup Condo		$0.10	$0.00	$0.05	$0.05	$0.00	$0.00	$0.00
Walkup Rental		$27.40	$2.06	$0.27	$6.74	$6.33	$8.05	$3.95
Walkup Co-op		$2.13	$0.00	$0.09	$0.40	$0.21	$0.53	$0.90
Elevator Condo		$1.25	$0.99	$0.00	$0.00	$0.08	$0.00	$0.18
MXBldg Elevator Condo		$18.34	$0.00	$0.25	$3.24	$0.99	$0.97	$12.89
Elevator Rental		$22.17	$8.05	$1.06	$4.32	$2.36	$6.52	-$0.14
Elevator Co-op		$7.92	$2.91	$2.80	$1.10	$0.80	$0.19	$0.12
Cond-op		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Apartment Hotel		$0.02	$0.00	$0.00	$0.00	$0.02	$0.00	$0.00
Residential Loft		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Grand Total*		***$133.52***	***$23.85***	***$7.32***	***$33.20***	***$30.70***	***$25.68***	***$12.77***

Source: Urbanomics

Table 11.3. Summary of Transit Improvement District (TID) Finances in Study Area Outside of Hudson Yards in FY2015-16 Dollars

Land Use	Attributed Benefit in FY2015-2016 $000,000				
	Full Value of Property in Study Area	***Study Area Benefit with LRT Access***	***At Current Tax Liability***	***At Decreasing Rates of Tax Increment***	***At 4% Value Capture***
Commercial:	***$34,998.1***	***$2,165.8***	***$1,298.4***	***$46.7***	***$51.9***
Office	$32,864.2	$2,079.3	$1,229.3	$44.6	$49.2
Retail	$1,631.8	$5.3	$55.5	$1.7	$2.2
Vacant	$502.1	$81.2	$13.6	$0.4	$0.5
Residential:	***$8,484.1***	***$2,317.0***	***$287.4***	***$8.6***	***$11.6***
123 Family	$359.5	$26.5	$6.4	$0.2	$0.3
Walkup Condo	$7.4	$1.3	$0.2	$0.0	$0.0
Walkup Rental	$1,053.2	$548.8	$54.0	$1.5	$2.2
Walkup Co-op	$99.7	$51.9	$4.1	$0.1	$0.2
Elevator Condo	$191.0	$29.2	$9.7	$0.5	$0.4
MXBldg Elevator Condo	$2,321.9	$450.7	$83.2	$1.9	$3.3
Elevator Rental	$3,151.6	$1,029.6	$74.9	$2.5	$3.0
Elevator Co-op	$917.3	$138.9	$51.0	$1.8	$2.0
Cond-op	$202.7	$39.4	$0.0	$0.0	$0.0
Apartment Hotel	$177.5	$0.7	$3.8	$0.1	$0.2
Residential Loft	$2.4	$0.01	$0.1	$0.0	$0.0
Grand Total*	***$43,482.2***	***$4,482.8***	***$1,585.8***	***$55.3***	***$63.5***

Source: Urbanomics

Table 11.4. Summary of Transit Improvement District (TID) Finances in Study Area Outside of Hudson Yards from Decreasing Rates of Tax Levy on Existing Tax Liability in FY2015-16

Land Use		Tax Increment Levied at Decreasing Rate in FY2015-16 $000,000						
		FY2015-16 Tax Increment	*On 42nd Street @ 6% of Tax Liability*	*1 Block North or South @ 5% of Tax Liability*	*2 Blocks North or South @ 4% of Tax Liability*	*3 Blocks North or South @ 3% of Tax Liability*	*4 Blocks North or South @ 2% of Tax Liability*	*5 Blocks North or South @ 1% of Tax Liability*
Commercial:		***$46.72***	***$10.31***	***$9.94***	***$12.16***	***$8.66***	***$4.60***	***$1.05***
Office		$44.64	$10.02	$9.78	$11.72	$7.89	$4.24	$0.99
Retail		$1.68	$0.29	$0.08	$0.29	$0.66	$0.33	$0.03
Vacant		$0.40	$0.00	$0.08	$0.15	$0.11	$0.03	$0.03
Residential:		***$8.57***	***$1.73***	***$0.84***	***$2.29***	***$1.76***	***$1.40***	***$0.55***
123 Family		$0.18	$0.00	$0.03	$0.06	$0.04	$0.05	$0.00
Walkup Condo		$0.01	$0.00	$0.00	$0.01	$0.00	$0.00	$0.00
Walkup Rental		$1.47	$0.22	$0.07	$0.36	$0.36	$0.37	$0.09
Walkup Co-op		$0.09	$0.00	$0.01	$0.03	$0.01	$0.02	$0.02
Elevator Condo		$0.46	$0.38	$0.00	$0.00	$0.07	$0.00	$0.01
MXBldg Elevator Condo		$1.92	$0.00	$0.11	$0.68	$0.52	$0.29	$0.32
Elevator Rental		$2.54	$0.65	$0.16	$0.77	$0.50	$0.43	$0.03
Elevator Co-op		$1.82	$0.48	$0.46	$0.38	$0.20	$0.24	$0.06
Cond-op		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Apartment Hotel		$0.08	$0.00	$0.00	$0.00	$0.06	$0.00	$0.02
Residential Loft		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Grand Total*		***$55.29***	***$12.04***	***$10.78***	***$14.45***	***$10.42***	***$6.00***	***$1.60***

Source: Urbanomics

The Similarity to Hudson Yards Financing

The Hudson Yards Infrastructure Corporation (HYIC) was created in 2005 by the City of New York to finance property acquisition and infrastructure work in the Hudson Yards Financing District, a 45 square block area bounded by Seventh and Eighth Avenues on the east, West 43rd Street on the north, Eleventh and Twelfth Avenues on the west, and West 29th and 30th Streets on the south. Pursuant to development of the Hudson Yards, extension of the No. 7 subway line and creation of a new park-lined boulevard were included in the financing plan. The plan called for value capture financing -- one of few such examples ever employed in New York City that was designed to use expected taxes and fees from new development to back bonds issued to pay for land acquisition and infrastructure improvements. To do so, the HYIC was authorized to issue up to $3 billion in bonds in the project's early stages, with offerings made of $2 billion in 2007 and $1 billion in 2012 upon approval by the City Council.

The past decade shows that revenues collected by HYIC have fallen far short of expectations, resulting in a growing net deficit since FY2010. Table 11.5 shows, as of June 30, 2016, the Corporation was in a cumulative deficit position of $2.6 billion with annual revenues less than expenses in every year of the current decade except FY2015. Tax Equivalency Payments (TEP), equivalent to normal property taxes levied on hotel, residential and small commercial buildings that have been built or substantially renovated in the financing area since 2005, are the most consistent source of revenue, appropriated from the City budget by the City Council in the amount of $232 million since FY2011. Payments in Lieu of Taxes (PILOT and PILOMRT) have only recently come on line as, to qualify, eligible projects must be located in specific areas of the Hudson Yards and be at least one million square feet, with 75 percent of usable space in Class A office or commercial usage. As of FY2016, discounted property tax and mortgage recording revenues of $56 million have been received in PILOT payments from a few office buildings.

Recognizing that in early stages of development, project revenues would not be sufficient to cover the interest payments on bonds issued, the City committed to make up the difference with annual Interest Support Payments (ISP). Since FY2011, these payments have amounted to $188.2 million with the exception of a payment not made for FY2016. Although the HYIC has utilized efficient and cost-effective borrowing methods, market conditions have declined since the financial crisis and the unused portions of the bond issues have generated lesser investment income at lower interest rates. Over the current decade, investment income has amounted to less than $10 million. Although the major portion of HYIC revenues was intended to come from payments in lieu of taxes and mortgage recording fees that have secured the bonds issues, the sale of development rights in excess of permissible zoning density have currently become the leading source of revenue. As the following table shows, over the past six fiscal years, the Density Improvement Bonus (DIB) has generated $260.5 million by selling air rights primarily to developers of new office buildings.

Nonetheless, the long term outlook for full funding of the No. 7 subway extension, the park-lined boulevard and other infrastructure improvements by value capture of the tax revenue potential of the Hudson Yards build-out is positive. With zoned capacity for roughly 26 million square feet of new office space, 20,000 residential units with almost 5,000 affordable, 2 million square feet of retail and 3 million square feet of hotel space, the re-envisioned rail yards area are projected to have been transformed into a vibrant, transit-oriented mixed-use district that will command high rents or sales values and generate commensurate property taxes within a decade or two.

Although both are reliant upon a value capture strategy, the financing of Hudson Yards has limited similarity to the financing plan of ***vision42*** in that a major infrastructure investment is much less for the LRT system and the financing district is already developed with high density properties that

pay significant property taxes. For the LRT, a surcharge on existing tax revenues or the capture of incremental property tax value does not require the creation of a corporate entity, such as HYIC. Rather the operational approach is similar to financing the Business Improvement District, wherein as part of the budget process, the City administration requests the City Council to appropriate the sum of property tax surcharges or tax increase payments to the entity operating a light rail system. Moreover, because new development need not be incentivized by discounting property taxes, PILOT agreements are not required with NYC IDA (Industrial Development Agency) participation.

If developed by the City of New York, the initial capital investment would likely be eligible for financing by a bond issue of the New York City Transitional Finance Authority, a public benefit corporation established to fund a portion of the City's capital program. The analysis of this report has shown that either a surcharge on existing property taxes or a capture of incremental value in property taxes attributable to provision of the LRT service in the financing district would be more than adequate to cover annual debt service over the long term at prevailing rates of interest. Given this security, Interest Support Payments (ISP) from the City of New York would not be required and the proposed system would be self-financing with value capture revenues.

Table 11.5. Annual Revenues and Expenses of the Hudson Yards Infrastructure Corporation (In 000s), 2011-2016

	Fiscal Year ending on June 30th of:					
	2011	2012	2013	2014	2015	2016
REVENUES						
District Improvement Bonus (DIB)	$4,635	$2,951	$3,261	$10,827	$193,652	$45,183
Tax Equivalency Payment (TEP)	$25,937	$27,679	$32,647	$38,553	$48,563	$58,656
Grant from The City of New York	$0	$155,595	$0	$0	$0	$0
PILOMRT	$0	$0	$11,097	$13,873	$0	$22,496
PILOT	$0	$0	$0	$0	$4,036	$4,969
Interest Support Payment (ISP)	$42,667	$79,347	$0	$38,130	$28,047	$0
Other Revenue	$0	$0	$3,075	$2,206	$4,681	$29
Investment Income	$2,629	$1,375	$1,819	$1,159	$898	$2,005
Total revenues	$75,868	$266,947	$51,899	$104,748	$279,877	$133,338
EXPENSES						
Project - subway extension	$275,609	$316,439	$325,414	$175,228	$107,412	$38,600
Project - land acquisition	$69,269	($39,787)	$18,884	$91,136	($9,956)	$16,335
Project - transfer to HYDC	$3,198	$3,026	$1,980	$2,233	$1,343	$1,097
Bond Interest	$88,223	$122,624	$140,393	$140,393	$129,359	$142,425
Arbitrage rebate	($1,419)	($5,111)	$0	$0	$0	$0
Cost of bond issuance	$748	$7,053	$0	$0	$0	$0
General and administrative	$837	$695	$458	$435	$514	$503
Total expenses	$436,465	$404,939	$487,129	$409,425	$228,672	$198,960
CHANGE IN NET POSITION	($360,597)	($137,992)	($435,230)	($304,677)	$51,205	($65,622)
NET DEFICIT - Beginning of year	($1,329,113)	($1,687,139)	($1,851,297)	($2,286,527)	($2,591,204)	($2,539,999)
NET DEFICIT -- End of year	($1,687,139)	($1,851,297)	($2,286,527)	($2,591,204)	($2,539,999)	($2,605,621)

Note: FY2012 was restated at the beginning of net position by ($26,166).
Source: Hudson Yards Infrastructure Corporation

Appendix A:
Retail, Hotel, Theatre and Open Space Fieldwork Report

Retail and Restaurants

A census of ground floor retail establishments and restaurants for the entire length of 42nd Street was performed during the week of June 29th, 2015. Shown in Table A.1, the street survey identified 131 active retail establishments, encompassing 69 food establishments and 62 purveyors of goods and services. The survey also counted 18 arts and entertainment establishments, 9 providers of travel and accommodation, 3 fitness and sport centers, 3 amusement and gaming establishments, and 19 vacant properties.

Since the previous survey in 2012 (See Table A.1), the number of commercial businesses increased by 3.1 percent (+5 establishments) while just two retail businesses were added (+1.6%). The number of food establishments increased by six from 63 to 69 businesses while goods and services shops dropped from 66 to 62 businesses. A sharp drop in vacancies occurred (-36.7% or -11) as newly constructed buildings in 2012 found long-term tenants. By establishment type, 42nd Street experienced a loss of four out of six electronics and appliances businesses located there in 2012, as well as single losses of health and personal product retailers and office supply and stationary retailers. Despite these losses, the corridor added six food and beverage businesses, two travel and accommodations establishments (hotels) and single arts and entertainment establishments, book and newsprint shops, and miscellaneous retailers.

From 2006 to 2015, 42nd Street gained13 ground floor commercial businesses. Losses occurred among the following establishment types: electronics and appliances (-5); arts and entertainment (-2); and office supplies and stationary (-1) whiles gains were made among food and beverage stores (+14); health and personal products (+3); amusement and games businesses (+1); clothing and accessories shops (+1); fitness and sports businesses (+1); and travel and accommodation (+1). While the gains and losses of businesses by type was somewhat different from 2006 to 2012 and 2012 to 2015, both the continuous expansion of food and beverage establishments was significant. Additionally, the increased scarcity of appliance and electronics shops was a sign that online retailers of big ticket items may be negatively impacting sales in one of the nation's most profitable retail corridors.

Table A.1. Commercial Establishment Characteristics by Type, 2006-2015

	Establishments			Establishment Change, 2006-2012		Establishment Change, 2012-2015	
Establishment Type	**2006**	**2012**	**2015**	**Number**	**Percent**	**Number**	**Percent**
Amusement and Games	2	3	3	+1	+50.0%	0	0.0%
Arts and Entertainment	20	17	18	-3	-15.0%	+1	+5.9%
Book and Newsprint	2	1	2	-1	-50.0%	+1	+100.0%
Clothing and Accessories	31	32	32	+1	+3.2%	0	0.0%
Electronics and Appliances	7	6	2	-1	-14.3%	-4	-66.7%
Food and Beverages	55	63	69	+8	+14.5%	+6	+9.5%
Health and Personal Products	10	14	13	+4	+40.0%	-1	-7.1%
Miscellaneous	12	11	12	-1	-8.3%	+1	+9.1%
Office Supplies and Stationary	2	2	1	0	0.0%	-1	-50.0%
Fitness and Sports	2	3	3	+1	+50.0%	0	0.0%
Travel and Accommodations	8	7	9	-1	-12.5%	+2	+28.6%
Occupied Commercial Establishments	**151**	**159**	**164**	**+8**	**+5.3%**	**+5**	**+3.1%**
Vacant Storefronts	25	30	19	+5	+20.0%	-11	-36.7%
Total Retailers	**119**	**129**	**131**	**+10**	**+8.4%**	**+2**	**+1.6%**
Food Establishments	55	63	69	+8	+14.5%	6	+9.5%
Goods and Services	64	66	62	+2	+3.1%	-4	-6.1%

Source: Urbanomics

Table A.2 and Figures B.1 to B.3 illustrate the general trends among retailers as related to changes in storefront services and vacancies over the period from 2006 to 2012 and 2012 to 2015. Compared with the last survey in 2012, there were 27 new retailers (18.1%) in 2015 operating out of spaces that underwent new construction or were previously non-retail compared with 31 (23.3%)of such retailers identified as new from 2006 to 2012. Surveys in both 2012 and 2015 identified a similar share of retailers that underwent no change in retail use (73.7% in 2012 and 73.2% in 2015) and an equal number of retailers that been replaced by non-retail commercial uses (2 in both surveys). Previously occupied retailers but now vacant storefronts increased from just 2 in 2012 to 11 in 2015, in part due to planned demolitions for new developments such as 1 Vanderbilt.

Table A.2. Retailer Trends, 2006-2015

	2006-2012		2012-2015	
Land Use Trend	**Storefronts**	**Percent Share**	**Storefronts**	**Percent Share**
New retailer	31	23.3%	27	18.1%
No change in retail use	98	73.7%	109	73.2%
Replaced by non-retail commercial use	2	1.5%	2	1.3%
New vacancy	2	1.5%	11	7.4%
Total	**133**	**100.0%**	**149**	**100.0%**

Source: Urbanomics

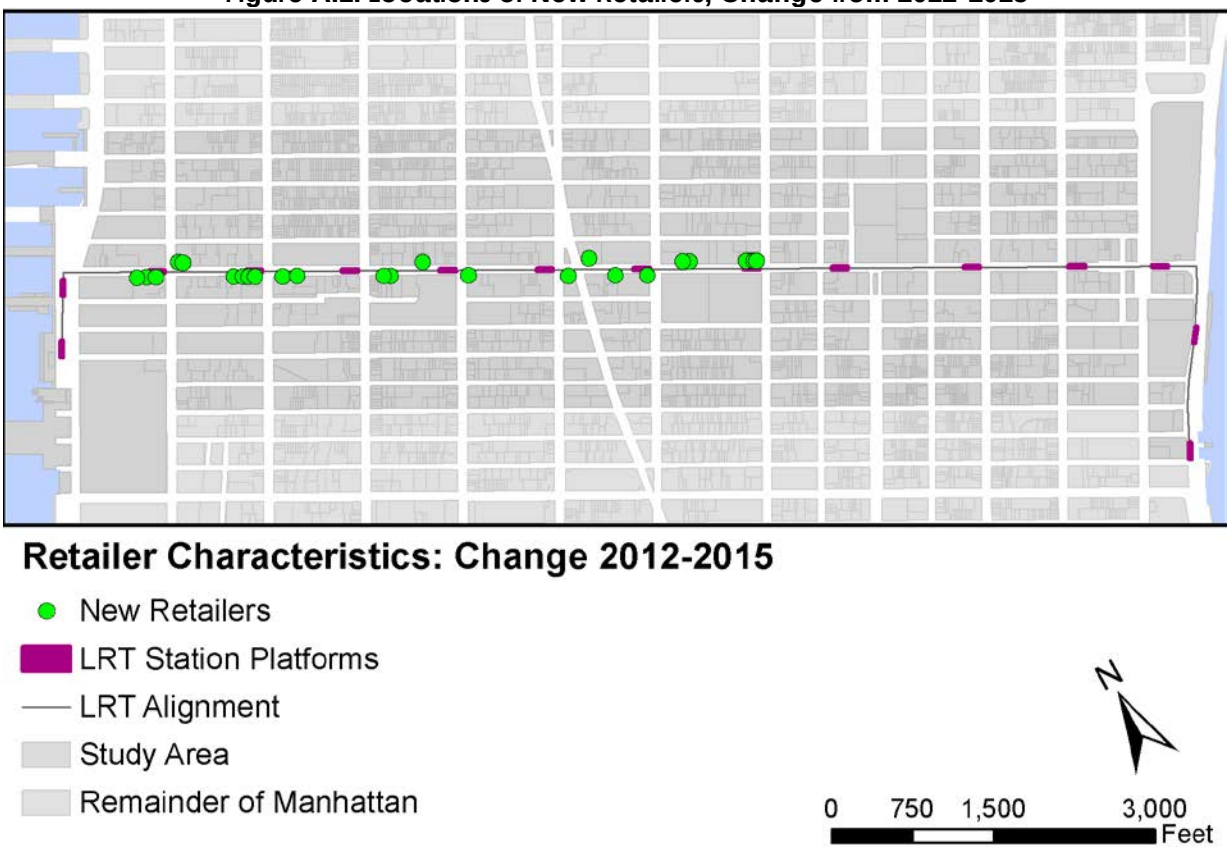
The number of retail vacancies rose up from 25 in 2006 to 30 in 2012, falling down to 19 in 2015 as new construction projects along the corridor were somewhat less common in 2015 than earlier years. Shown in Table A.3, the number of occupied previously vacant storefronts increased from 10 in 2012 to 23 in 2015 while vacant storefronts fell from 13 to 3. Vacant storefronts in previously occupied retail spaces edged down from 13 to 11 spaces while over the same period the number of continuously vacant storefronts increased by a single space from 4 to 5. Figure A.5 illustrates the trend in vacancies from 2012 to 2015, showing a concentration of continuously vacant storefront on the West Side and vacant storefront with prior retail uses, typically short-term vacancies clustered on the East Side.

Table A.3. Retail Vacancy Trends, 2006-2015

Land Use Trend	2006-2012		2012-2015	
	Storefronts	Percent Share	Storefronts	Percent Share
No longer vacant storefronts	10	25.0%	23	54.8%
Vacant storefront in new building	13	32.5%	3	7.1%
Vacant storefronts with prior retail use	13	32.5%	11	26.2%
Continuously vacant storefronts	4	10.0%	5	11.9%
Total	**40**	**100.0%**	**42**	**100.0%**

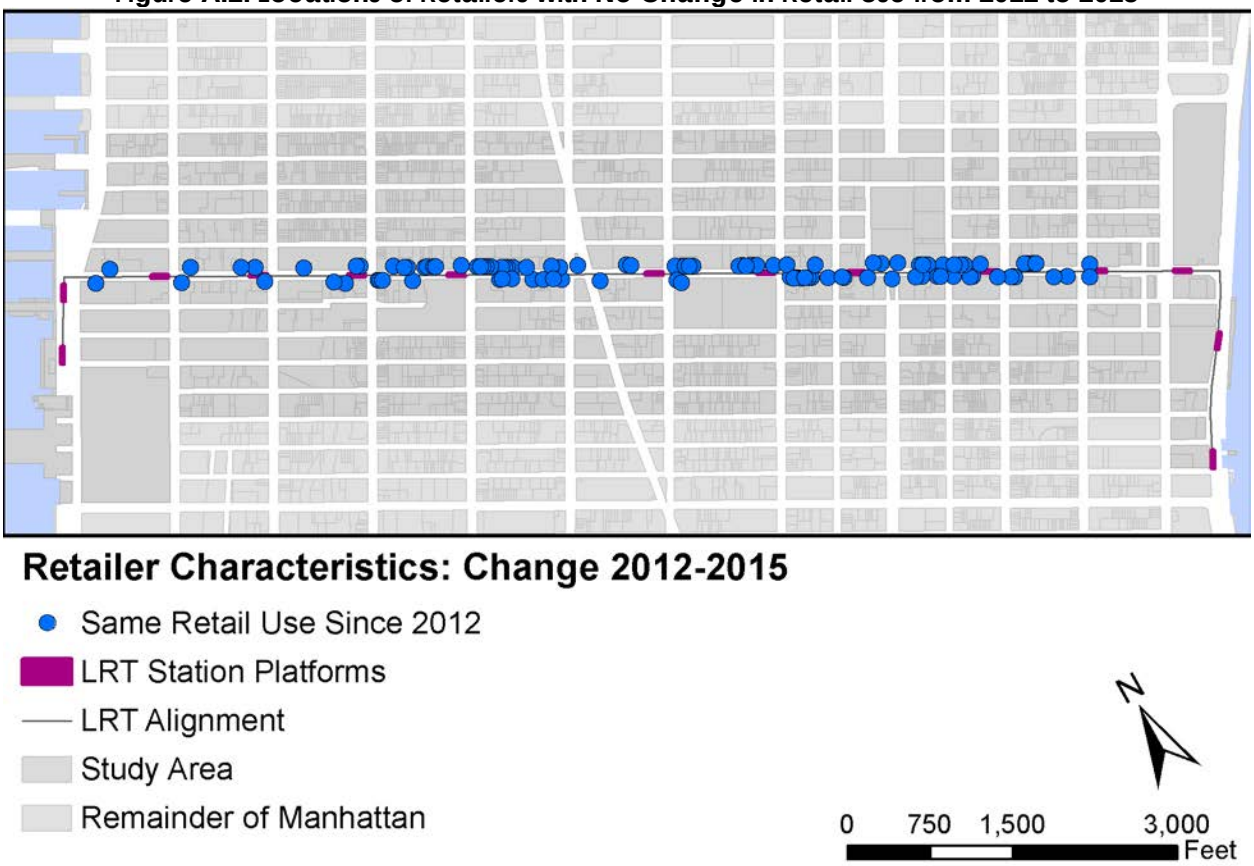
Source: Urbanomics

Figure A.1. Locations of New Retailers, Change from 2012-2015



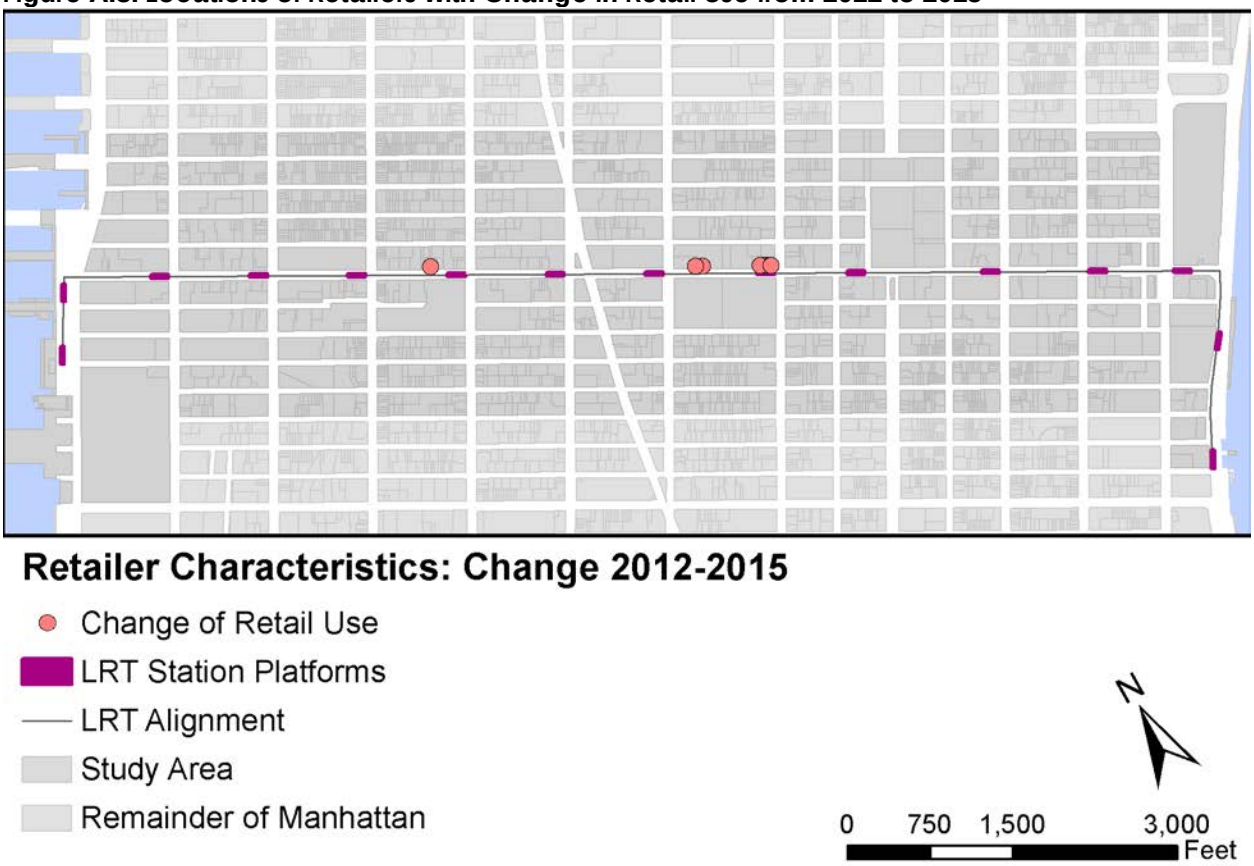
Source: Urbanomics

Figure A.2. Locations of Retailers with No Change in Retail Use from 2012 to 2015



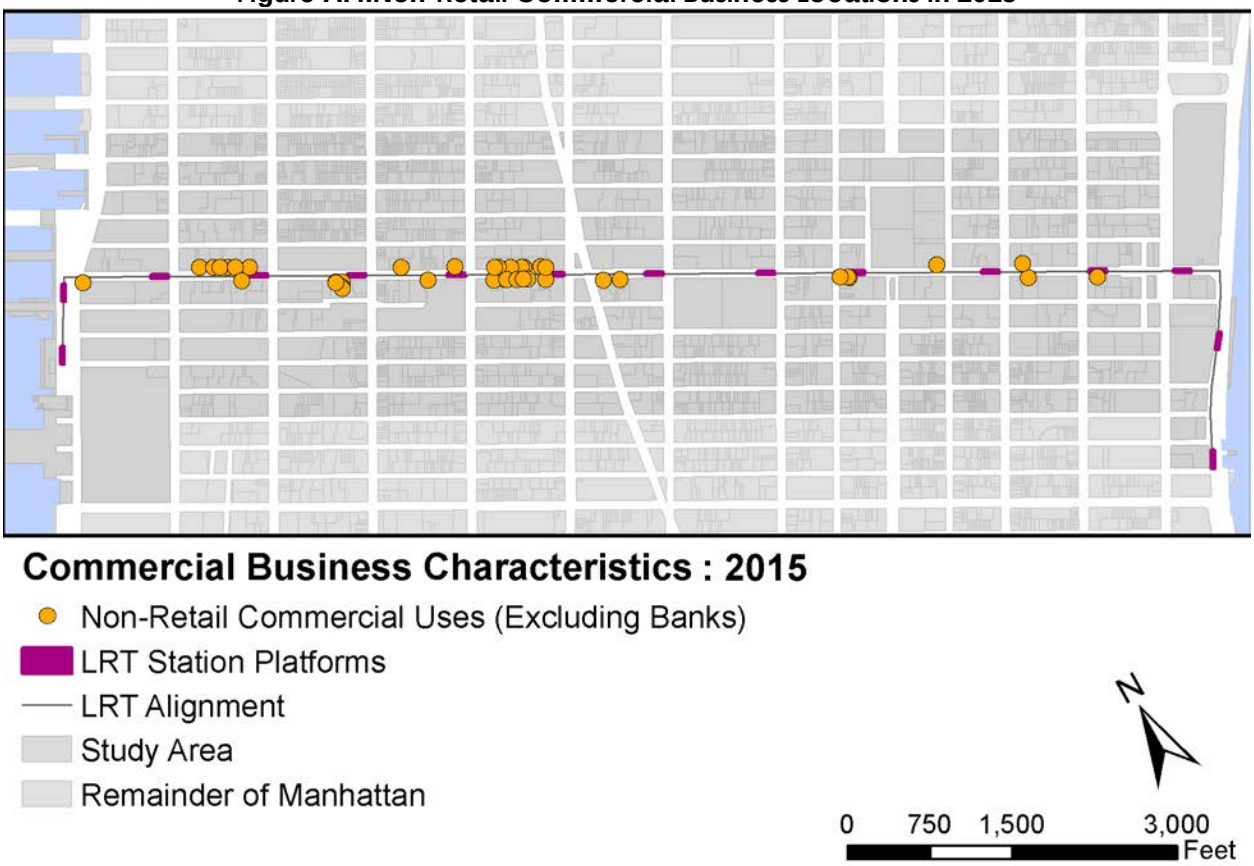
Source: Urbanomics

Figure A.3. Locations of Retailers with Change in Retail Use from 2012 to 2015



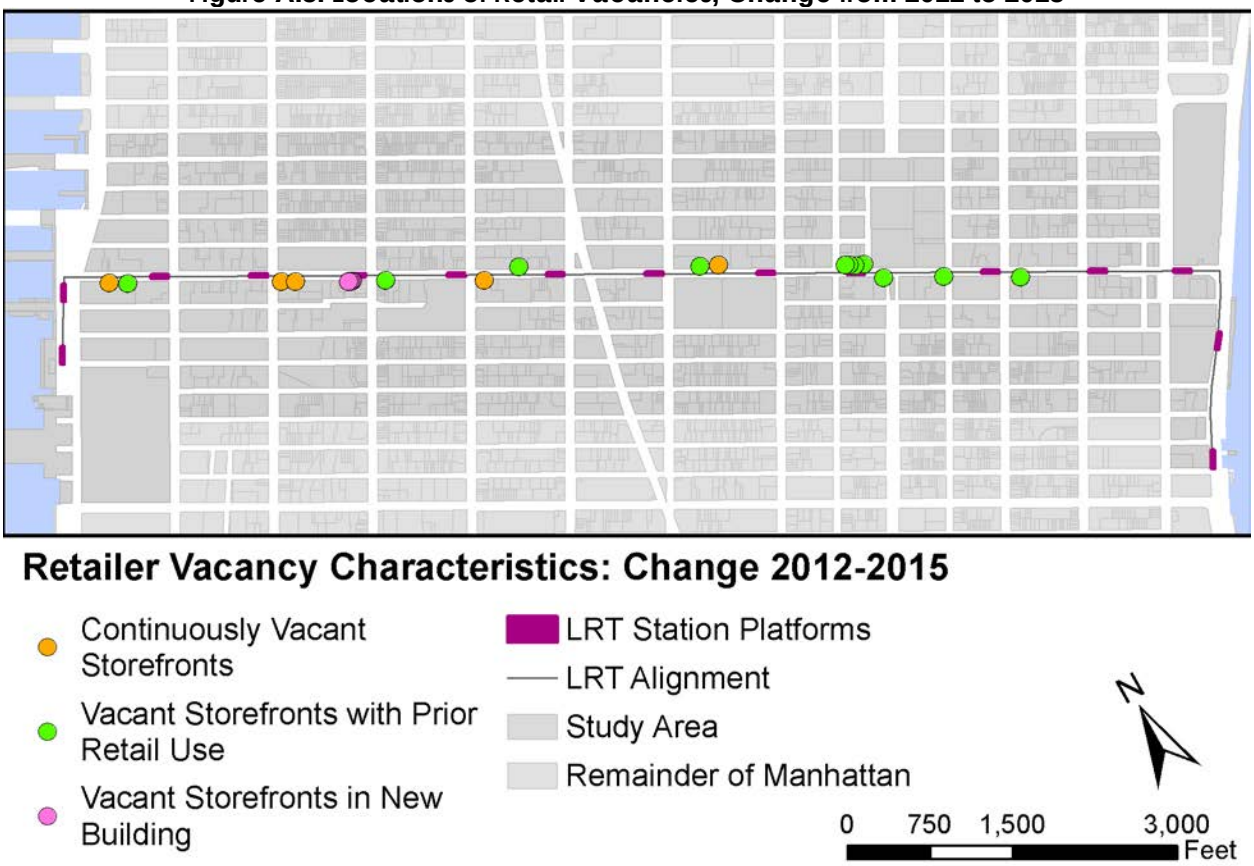
Source: Urbanomics

Figure A.4.Non-Retail Commercial Business Locations in 2015



Source: Urbanomics

Figure A.5. Locations of Retail Vacancies, Change from 2012 to 2015



Source: Urbanomics

Retail Rents

The study area encompasses two distinct retail markets, (Times Square and Fifth Avenue (42nd to 49th Streets)). Generally, asking rents for ground floor retail spaces have increased with pedestrian traffic. While the Times Square MTA Station saw annual subway ridership rise from 55 million riders in 2006 up to 66 million in 2015, daily pedestrian traffic in the area declined over the near-term with a drop of 0.9 percent from 90,750 pedestrians in June 2015 to 90,000 pedestrians in June 2016 at 42nd Street between 7th and 8th avenue on both north and south sides. Both retail rents and occupancy rates have generally dropped in the study area, perhaps a sign that prices have recently peaked as pedestrian traffic and sales have leveled off.

Based on retail real estate tracking reports from Cushman & Wakefield, asking rents in Times Square dropped by 8.5 percent over the prior year from $2,489 PSF in Q1 2015 to $2,294 PSF in Q1 2016. Over the long-term average asking retails rents have far outpaced inflation in the area, having increased from $350 PSF in 2006 to $1,052 PSF in 2011 and $2,294 PSF in 2016. On the 5th Avenue corridor from 42nd to 49th street, average asking rents were $1,234 PSF in Q1 2016, a drop of 0.3 percent over the prior year and just under half the price per square foot rate of retail properties in Times Square.

The Real Estate Board of New York also reported a slight drop in retail rents in the Times Square area (Broadway & 7th Ave: 42nd – 47th St) with average asking rents falling from $2,413 in Spring 2015 to $2,363 in Spring 2016. In contrast to the findings of Cushman & Wakefield, the Real Estate Board reported growing asking rents along the Fifth Ave: 42nd – 49th St corridor with annual gains of 14 percent from Spring 2015 to 2016 ($1,200 to $1,368). Over the same period, the Real Estate Board found the median asking rent to be unchanged, a sign that large retail leases may be increasing in value PSF while smaller locations may experience lesser growth PSF. The change in the range of asking rents further supports this notion, whereby asking rents on the Fifth Ave: 42nd – 49th St corridor increased from a range of $575-$1,500 in Spring 2015 to $1,000-$2,500 the following year while the range of rents along the Times Square remained unchanged ($2,000-$3,000).

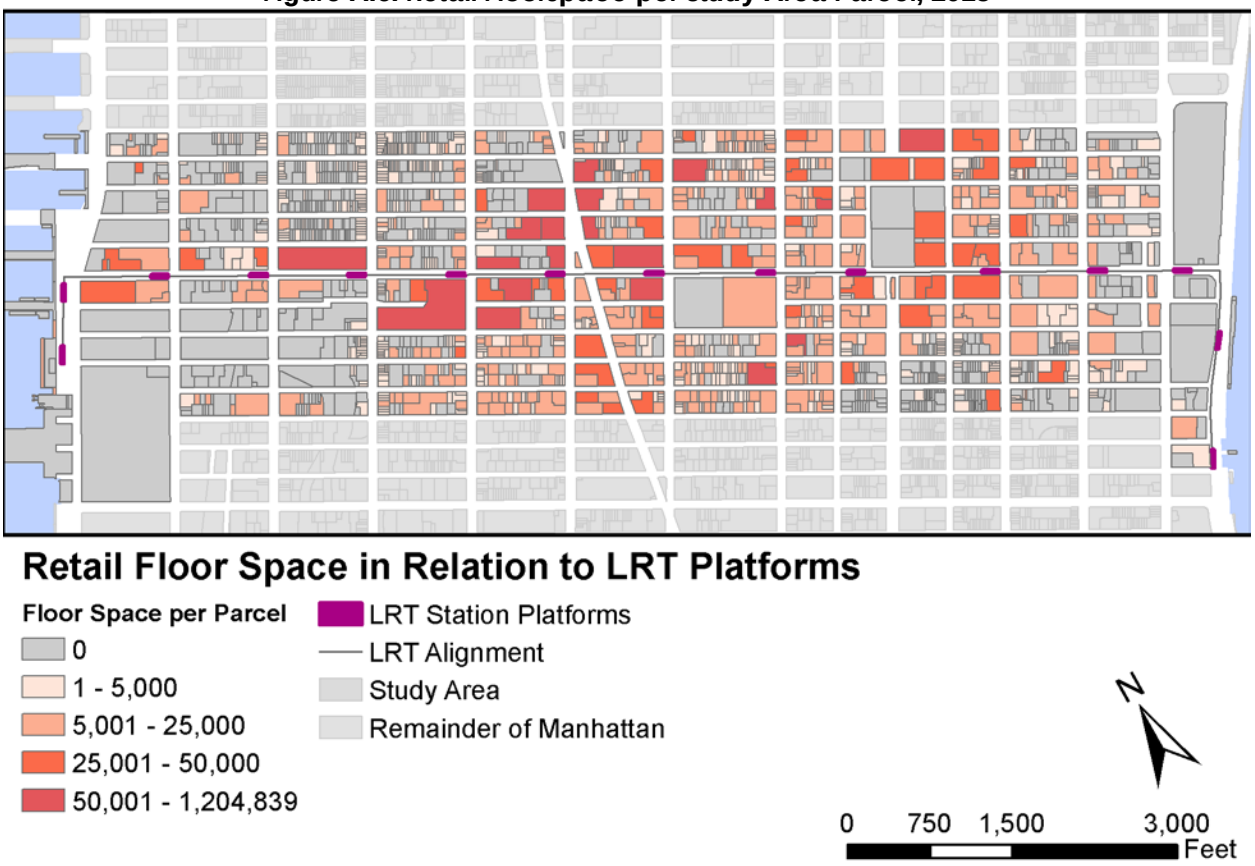
From 2005 to 2015 (See Table A.4), the Study Area added 243,000 square feet of retail space (+4.2%) in the blocks from 5th to 8th Avenue, where the largest concentration of retail space is located, while the blocks between 1st and 5th Avenue lost 27,600 square feet (-1.0%) and the blocks from 8th to 12th Avenue added 127,900 square feet (+10.0%).

Table A.4. Study Area Retail Floorspace Block Summaries, 2006 to 2015

	Retail Floorspace			2005-2011		2011-2015	
	2005	2011	2015	AB Change	% Change	AB Change	% Change
1-2nd	308,183	297,632	238,676	-10,551	-3.4%	-58,956	-19.8%
2-3rd	506,163	481,992	446,297	-24,171	-4.8%	-35,695	-7.4%
3-Lexington	553,572	546,049	525,433	-7,523	-1.4%	-20,616	-3.8%
Lexington-Madison	629,856	642,129	770,537	+12,273	+1.9%	+128,408	+20.0%
Madison to 5th	1,006,149	963,077	994,343	-43,072	-4.3%	+31,266	+3.2%
5-6th	2,855,478	2,768,895	2,868,218	-86,583	-3.0%	+99,323	+3.6%
6-7th	1,978,618	1,252,836	1,402,912	-725,782	-36.7%	+150,076	+12.0%
7-8th	925,482	1,308,299	1,731,696	+382,817	+41.4%	+423,397	+32.4%
8-9th	625,443	561,122	638,998	-64,321	-10.3%	+77,876	+13.9%
9-10th	261,358	295,774	299,853	+34,416	+13.2%	+4,079	+1.4%
10-11th	319,494	200,217	254,687	-119,277	-37.3%	+54,470	+27.2%
11-12th	74,078	132,307	214,771	+58,229	+78.6%	+82,464	+62.3%
Total	**9,969,796**	**9,318,022**	**10,171,650**	**-651,774**	**-6.5%**	**+853,628**	**+9.2%**

Source: Urbanomics, NYC *PLUTO* 15v1

Figure A.6. Retail Floorspace per Study Area Parcel, 2015



Source: Urbanomics, NYC *PLUTO* 15v1

Increased Retail Sales

LRT

The Phase Two Economic Study[15] included extensive interviews with and surveys of retail and restaurant owners and managers on 42nd Street.[16] The total average daily retail sales of 42nd Street merchants in 2007 were $3,218,376, yielding average daily sales of $0.43 per square foot. Increased for inflation to 2016, this yields a total average daily sales of $0.50 per square foot. Applying this to current retail and restaurant floorspace on 42nd Street, it may be estimated that the current average daily sales are $4,230,000 or $1.3 billion per year in 2016.[17]

Surveyed merchants estimated that their sales would increase by 35% due to the increase in foot traffic caused by the pedestrianization of 42nd Street. Applied to current annual sales, this increase would yield an additional $455 million each year in retail sales. Assuming one third of these are for clothing and footwear of less than $110, the taxable additional sales ($304.85 million) will also yield fiscal benefits of $27.0 million in sales taxes, made up of $13.7 million to New York City, $12.2 million to New York State and $1.1 million to the MTA.

Theatres

Along 42nd Street, there are 13 theatres with a total 25 stages and 7,648 seats (See Table A.5). The largest of the theatres, the Lyric (1,874), New Amsterdam (1,700), Signature (775), and American Airlines (740), are classified as "Broadway" theatres based upon house sizes of at least 500 seats. The remaining nine theatres include 15 Off-Broadway houses with between 99 and 499 seats, and four Off-Off Broadway houses with less than 99 seats. The Off-Broadway houses include the New Victory (499), Stage 42 (499), the Duke on 42nd Street (200), the Pearl (160) and Laurie Beechman (100). The Manhattan Repertory Theatre (40) is the only Off-Off Broadway house with a single stage. Additionally, there are four theatre complexes with Off-Broadway and Off-Off Broadway stages. Those include Theatre Row with six stages (639), Playwrights Horizons with two stages (326) and the Signature Theatre with four stages (775).

[15] Available at: http://vision42.org/wp-content/uploads/2015/05/E_4_vision42retail_061115.pdf

[16] Throughout May 2016, Urbanomics contacted d retail store owners and managers to participate in an updated retail survey. Of 121 potential unique respondents identified 13 potential respondents refused to participate and just one store manager completed the online survey.

[17] This estimate was corroborated using ESRI Business Analyst for retail sales on 42nd Street for 2016 at $0.9 billion.

Table A.5. 42nd Street Theatres by Number of Stages and Seats

Establishment	2011		2015	
	Stages	Seats	Stages	Seats
Lyric Theatre	1	1,813	1	1,874
New Amsterdam Theatre	1	1,747	1	1,700
Signature Theatre	3	684	4	775
American Airlines Theatre	1	740	1	740
Theatre Row	6	639	6	639
New Victory Theatre	1	499	1	499
Playwright Horizons	2	326	2	326
Duke on 42nd Street	1	199	1	200
Stage 42	1	499	1	499
Pearl Theatre	0	0	1	160
Laurie Beechman Theatre	1	100	1	100
Castillo Theatre	0	0	1	90
Manhattan Repertory Theatre	1	40	4	46
Times Square Arts Center	5	850	0	0
Total	**24**	**8,136**	**25**	**7,648**

Source: Urbanomics

42nd Street has increased its seating capacity from 6,738 seats in 2006 to 8,136 in 2011 to 7,648 in 2015 (See Table A.6), a long-term gain of 910 seats or 13.5 percent. The drop in capacity from 2011 to 2015 can be attributed to the closure of the Times Square Arts Center (750 seats), while the corridor added capacity from the opening of the Pearl (160 seats) and the Castillo (90 seats). Over the period from 2011 to 2015, Off-Broadway theatres lost a substantial number of seats (-523 or -14.6%), while Broadway and Off-Off Broadway theatres added 14 seats and 21 seats, respectively.

Table A.6. 42nd Street Seating Capacity Change, 2006-2015

	42nd Street Theatres			Seating Capacity Change, 2006-2011		Seating Capacity Change, 2011-2015	
Theatre Type	**2006**	**2011**	**2015**	**Number**	**Percent**	**Number**	**Percent**
Broadway	4,200	4,300	4,314	+100	+2.4%	+14	+0.3%
Off-Broadway	2,221	3,578	3,055	+1,357	+61.1%	-523	-14.6%
Off-Off-Broadway	217	258	279	+41	+18.9%	+21	+8.1%
Total	**6,638**	**8,136**	**7,648**	**+1,498**	**+22.6%**	**-488**	**-6.0%**

Source: Urbanomics

Within the study area, there are 51 Theatres with a total of 71 stages and 38,479 seats (See Table A.7). Among them, 25 are Broadway theatres (31,568 seats). There are also 29 Off-Broadway stages (6,193 seats) and 19 Off-Off Broadway stages (718 seats).

From 2006 to 2015, seating capacity expanded from 36,310 seats in 2006, 38,578 seats in 2011 to 38,479 seats in 2015 with a four year loss of 1,152 seats (-3.0%) and a nine-year gain of 2,169 seats (+6.0%). Since 2011, the study area lost 66 Broadway seats due to renovations. It should be noted that the long-closed Hudson Theatre on 44th street will reopen later in 2016, adding 950 seats to the study area, the first new Broadway theatre since Henry Miller's Theatre was demolished, rebuilt and opened in 2010 as the Stephen Sondheim Theatre. The study area added 318 Off-Broadway seats with the opening of the Diamond Horseshoe (240 seats) and Pearl Theatre (160 seats).

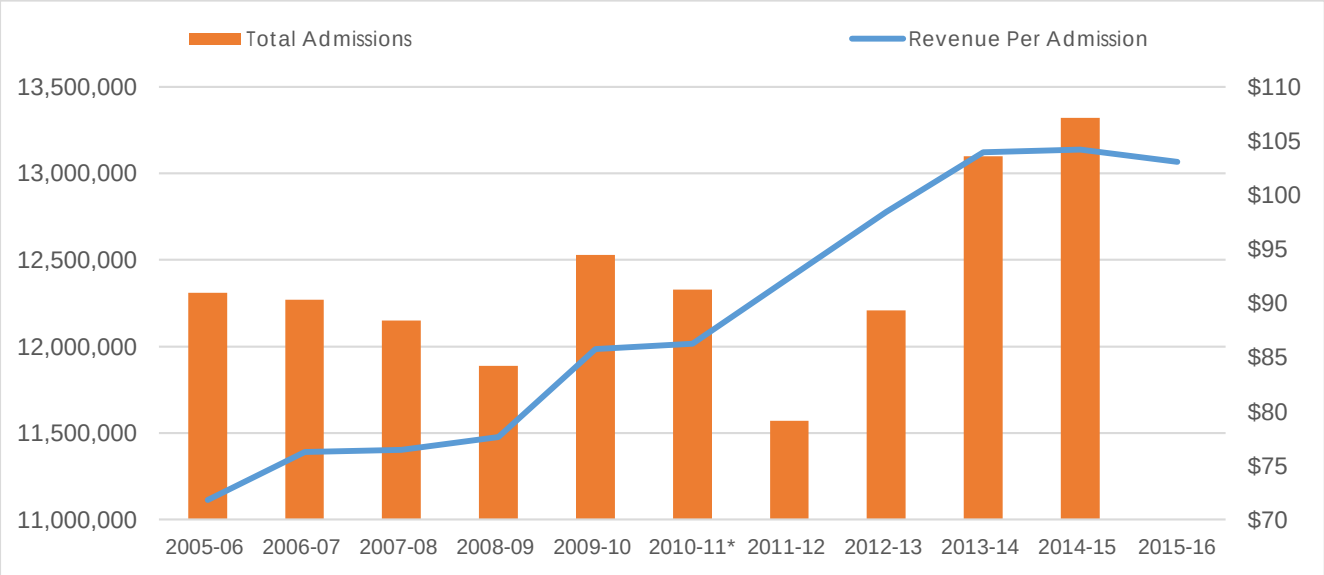
Despite the opening of two Off-Off Broadway theatres, the Joria Studios Mainstage Theatre (70 seats) and the Playroom Theatre (62 seats), the area lost 351seats at Off-Off Broadway venues as the Times Square Arts Center, the Tank and Roy Arias Studios all closed.

Table A.7. Study Area Theatre Seating Capacity, 2006 to 2015

	Seating Capacity			Seating Capacity Change, 2006-2011		Seating Capacity Change, 2011-2015	
Theatre Type	**2006**	**2011**	**2015**	**Number**	**Percent**	**Number**	**Percent**
Broadway	30,523	31,634	31,568	+1,111	+3.6%	-66	-0.2%
Off-Broadway	5,048	5,875	6,193	+827	+16.4%	+318	+5.4%
Off-Off-Broadway	739	1,069	718	+330	+44.7%	-351	-32.8%
Total	**36,310**	**38,578**	**38,479**	**+2,268**	**+6.2%**	**-1,152**	**-3.0%**

Source: Urbanomics

Figure A.7. Broadway Gross Ticket Revenue per Admission and Total Admissions, 2005/06-2015/16



Notes: Beginning with the 2009-10 season, Broadway League "Gross" revenues represent gross and "Attendance" represents total attendance. For seasons prior, these numbers represent net gross and paid attendance, respectively. (*) To account for variances in the calendar year, a 53rd week is added to the season every seven years.
Source: The Broadway League

Since the 2005-06 theatre season, annual admissions levels at Broadway theatres have expanded from 12.0 to 13.3 million visitors (See Figure A.9), with an increase in admissions of 1,320,000 (+11.0%) between 2005-06 and 2015-16 seasons. In that time span, average revenue per ticket sales climbed up from $71.83 to $103.08 (+43.5%).

From 2006 to 2015, the Study Area lost 46 seats (-0.2%) in the blocks from 7th to 8th Avenue where the largest number of seating capacity is concentrated while the neighboring blocks on 6th to 7th Avenue and 8th to 9th Avenue added 699 (+14.7%) and 486 seats (+18.0%) respectively (See Table A.8). Increasingly, theatre capacity is expanding on the Far West Side with blocks between 9th and

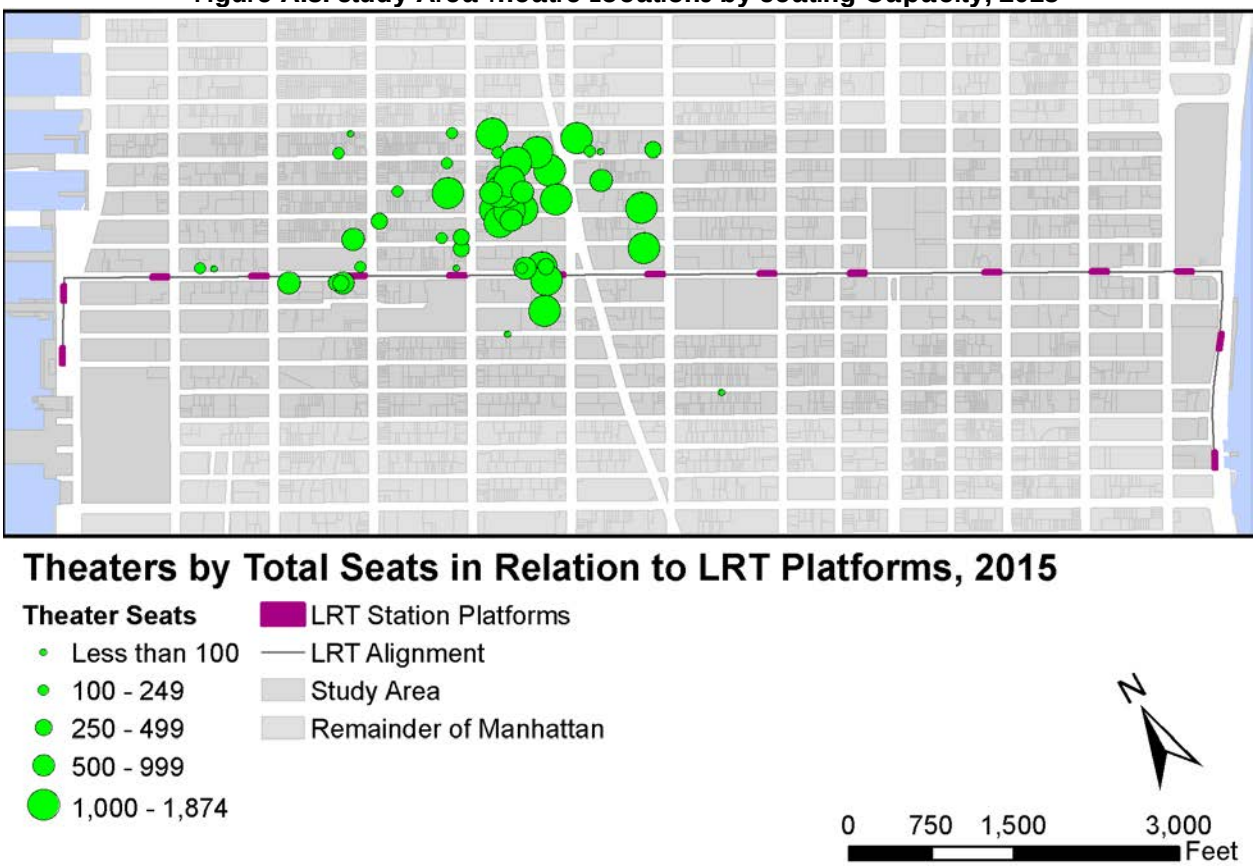
10th Avenue adding 954 seats (+44.1%) and blocks bounded by 10th to 11th Avenue adding 90 seats (+56.3%). Beyond the traditional confines of the Theatre District east of 6th Avenue, the Study Area lost 60 seats between 5th and 6th Avenue and 74 seats between 2nd and 3rd Avenue.

Table A.8. Study Area Theatre Seating Capacity Block Summaries, 2006 to 2015

	Theatre Seats			Change, 2006-2011		Change, 2011-	
	2006	**2011**	**2015**	**Absolute**	**Percent**	**Absolute**	**Percent**
1-2nd	0	0	0	0	0.0%	0	0.0%
2-3rd	74	0	0	-74	-100.0%	0	0.0%
3-Lexington	0	0	0	0	0.0%	0	0.0%
Lexington-Madison	0	0	0	0	0.0%	0	0.0%
Madison to 5th	0	0	0	0	0.0%	0	0.0%
5-6th	0	60	0	+60	N/A	-60	-100.0%
6-7th	4,770	5,542	5,469	+772	+16.2%	-73	-1.3%
7-8th	26,441	26,154	26,395	-287	-1.1%	+241	+0.9%
8-9th	2,702	3,874	3,188	+1,172	+43.4%	-686	-17.7%
9-10th	2,163	2,947	3,117	+784	+36.2%	+170	+5.8%
10-11th	160	0	250	-160	-100.0%	+250	N/A
11-12th	0	0	0	0	0.0%	0	0.0%
Total	**36,310**	**38,577**	**38,419**	**+2,267**	**+6.2%**	**-158**	**-0.4%**

Source: Urbanomics

Figure A.8. Study Area Theatre Locations by Seating Capacity, 2015



Source: Urbanomics

Increased Theatre Sales

LRT

The Phase Two Economic Study determined through interviews with theatre managers, that the increased tourism caused by the LRT would increase ticket sales by some 299,000 annually. At current average sales rates, these will total $30.8 million in additional theatre revenues each year.

Hotels

On 42nd Street

There are ten hotels along the 42nd Street corridor with street level entrances and guest room capacity of 5,261 rooms, up from 3,933 rooms in 2006 and 4,536 rooms in 2011 (See Table A.9). These hotels range in size from 105 to 1,306 rooms with an average capacity of 526 rooms. Three hotels, OUT NYC (104 rooms), Travel Inn (160 rooms) and Yotel New York (669 rooms) are clustered near 10th Avenue. Another four hotels are located near Times Square: Westin New York at Times Square (873 rooms), Hilton Times Square (460 rooms), Hilton Garden Inn New York Times Square Central (282 rooms) and Knickerbocker Hotel (330 rooms). East of Madison Avenue, there are three hotels including the Grant Hyatt New York (1,306 rooms), Westin New York Grand Central (776 rooms) and Hilton Manhattan East (300 rooms). Hotel construction has been active in recent years

with the addition of the Out NYC in 2012, Hilton Garden Inn New York Times Square Central in 2014, and reopening of the Knickerbocker Hotel in 2015.

Table A.9. 42nd Street Hotels by Number of Rooms, 2015

Establishment			Rooms
Grand Hyatt New York			1,306
Westin New York Times Square			873
Westin New York Grand Central			776
Yotel New York			669
Hilton - Times Square			460
Knickerbocker Hotel			330
Hilton - Manhattan East			300
Hilton Garden Inn New York/Times Square Central			282
Travel Inn			160
The OUT NYC			105
Total Rooms		**2006**	3,933
		2011	4,536
		2015	5,261
Hotel Capacity Change	**2006-2011**	**Number**	+603
		Percentage	+15.3%
	2011-2015	**Number**	+725
		Percentage	+16.0%

Source: Urbanomics

Study Area

Within the Study Area there are 98 hotels with a capacity of 27,279 rooms (See Table A.10). As tourism has soared in Manhattan, hotel construction has rapidly expanded throughout the borough, though largely concentrated in Midtown and especially around Times Square. Since 2006, the Study Area added 10,325 rooms, a gain of 60.9 percent while over the last four years 4,508 rooms were added (+19.8%). Hotels range in size from 1,949 rooms at the New York Marriot Marquis to 22 rooms at the French Quarters Guest Apartments, with an average size of 526 rooms. New hotels constructed since 2011 have been smaller than past years with an average size of 240 rooms. Additionally, hotels in the Study Area increased room capacity at a slightly higher rate (+19.8%) than along 42nd street (+16.0%).

Table A.10. New Hotels Constructed since 2011: 37th Street to 47th Street

Establishment	Rooms	Neighborhood
Holiday Inn NY Times Square South	288	Times Square South
Riu Plaza Times Square	641	West Side
Cambria Hotel & Suites NY Times Square	196	Grand Central
The Renwick	173	Grand Central
Hampton Inn Manhattan/Times Square Central	300	Times Square South
Archer Hotel	180	Times Square South
The William	33	Murray Hill
Hyatt Times Square	487	West Side
Hilton Garden Inn NY/Times Square Central	282	Times Square South
Courtyard by Marriott /Times Square West	224	Times Square South
SpringHill Suites by Marriott	173	Murray Hill
Refinery Hotel NY	197	Times Square South
POD 39	367	Grand Central
The OUT NYC	105	Times Square South
Cassa Hotel & Residences	86	Times Square South
Knickerbocker Hotel	330	Times Square South
Hampton Inn Manhattan/United Nations	143	Grand Central

Hotel Capacity			Change, 2006-2011		Change, 2011-2015	
2006	2011	2015	Absolute	Percent	Absolute	Percent
16,954	22,771	27,279	+5,817	+34.3%	+4,508	+19.8%

Source: Urbanomics

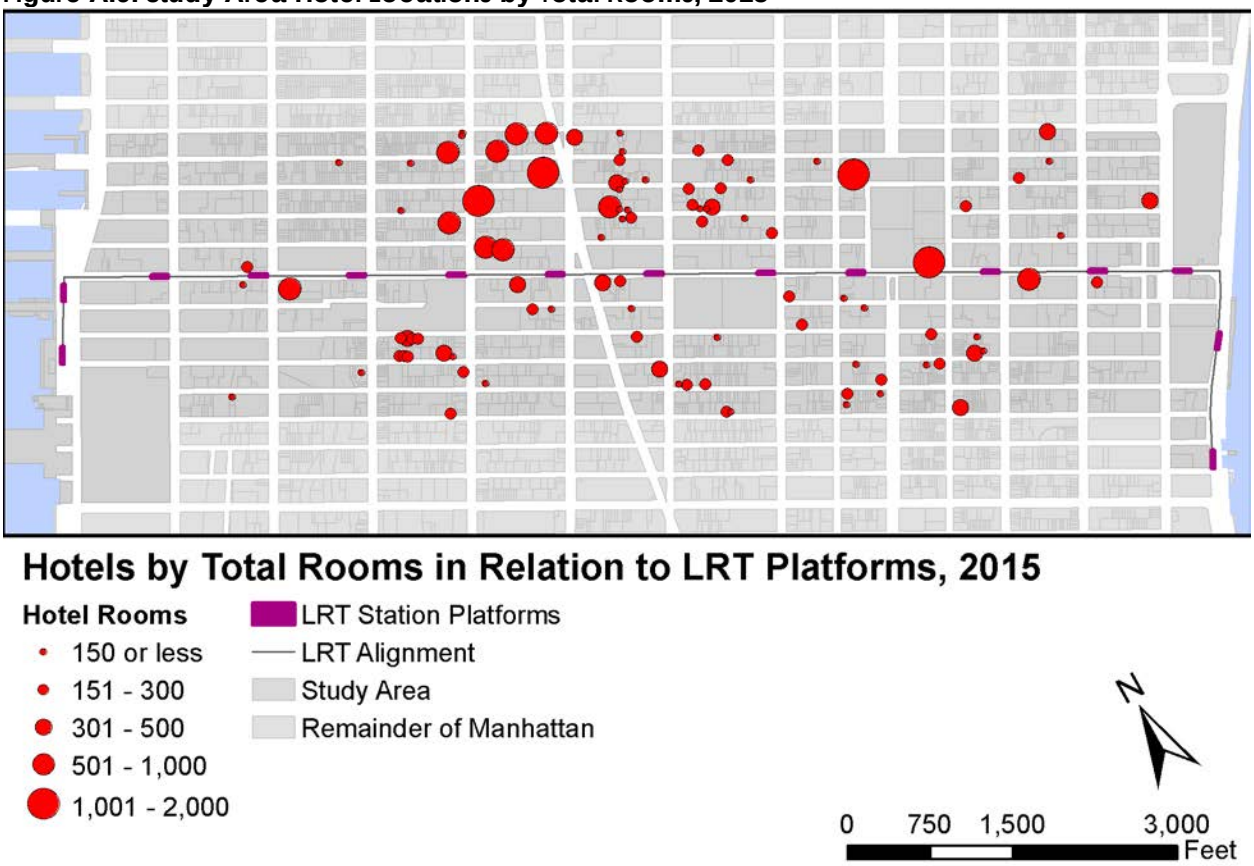
From 2006 to 2015, the Study Area added 1,225 rooms (+19.0%) in the blocks from 7th to 8th Avenue, where the largest number of hotel rooms are concentrated, while the neighboring blocks on 6th to 7th Avenue and 8th to 9th Avenue added 2,521 (+145.7%) and 3,878 rooms (+4,261.5%) respectively (See Table A.10). On the Far West Side, from 9th Avenue to 11th Avenue, 860 rooms were added (+324.5%) and east of 6th Avenue, 1,841 rooms were gained (+21.9%). As Times Square continues to be a major destination for tourism, developers continue to build new hotels within close proximity to 8th and 9th Avenues and increasingly surrounding Bryant Park.

Table A.11. Study Area Hotel Room Capacity Block Summaries, 2006 to 2015

	Hotel Rooms			Change, 2006-2011		Change, 2011-2015	
	2006	2011	2015	Absolute	Percent	Absolute	Percent
1-2nd	727	738	739	+11	+1.5%	+1	+0.1%
2-3rd	1,427	1,625	1,573	+198	+13.9%	-52	-3.2%
3-Lexington	599	655	1,024	+56	+9.3%	+369	+56.3%
Lexington-Madison	3,689	3,655	3,727	-34	-0.9%	+72	+2.0%
Madison to 5th	185	251	432	+66	+35.7%	+181	+72.1%
5-6th	1,783	2,001	2,756	+218	+12.2%	+755	+37.7%
6-7th	1,730	3,054	4,251	+1,324	+76.5%	+1,197	+39.2%
7-8th	6,458	7,365	7,683	+907	+14.0%	+318	+4.3%
8-9th	91	2,493	3,969	+2,402	+2,639.6%	+1,476	+59.2%
9-10th	22	691	777	+669	+3,040.9%	+86	+12.4%
10-11th	243	243	348	0	0.0%	+105	+43.2%
11-12th	0	0	0	0	0.0%	0	0.0%
Total	**16,954**	**22,771**	**27,279**	**+5,817**	**+34.3%**	**+4,508**	**+19.8%**

Source: Urbanomics

Figure A.9. Study Area Hotel Locations by Total Rooms, 2015



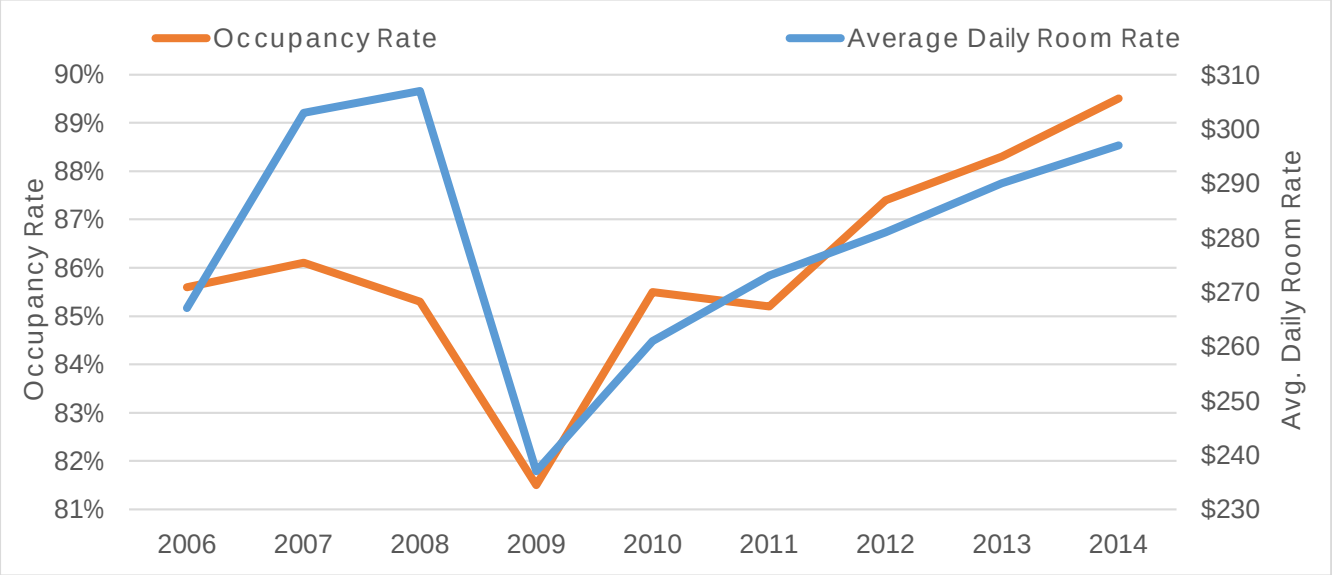
Source: Urbanomics

Occupancy & Average Daily Room Rates

Following a sharp drop in occupancy rates following the 2007-2009 US Recession, hotel occupancy rates sharply recovered according to PKF Consulting, the official marketing organization for New York City, passing the 2007 peak of 86.1 percent in 2012 and reaching a record high of 89.5 percent, a gain of 4.9 percentage points over the 2006-2014 period and 4.3 percentage point gain over the short-term from 2011 to 2014 (See Figure A.12).

Historically hotels in Times Square have slightly outperformed Manhattan hotels overall. According to somewhat more conservative market data prepared by PricewaterhouseCoopers LLP, Midtown West hotel occupancy rates outpaced Manhattan as a whole over the period from Q1 2011 to Q1 2016, increasing from 73.8 percent to 81.2 percent (+7.4 percentage points) versus a gain of 6.6 percentage points from 72.0 to 78.6 percent in Manhattan. In Midtown East, the gain in occupancy rates was slightly less than that of the borough as a whole, increasing by 5.2 percentage points from 72.6 percent to 77.8 percent in 2016, ending with an occupancy rate 0.8 percentage points lower than the Manhattan rate.

Figure A.10. New York City Occupancy and Average Hotel Daily Room Rates, 2006-2014



Source: PKF Consulting

From 2006 to 2014, average daily hotel room rates in New York City rose and declined in pace with the economy, increasing by 11.2 percent from $267 to $297 between 2006 and 2014. Between 2006 and 2011, average room costs increased by 2.2 percent from $267 dollars to $273 dollars per day while from 2011 to 2014, average room costs jumped in value by 8.8 percent, rising from $273 to $297. According to PricewaterhouseCoopers LLP, average daily room rates in Midtown fell by 0.5 percent from Q1 2011 to Q1 2016 from $205.50 to $204.50 per night while Manhattan saw the reverse trend, a gain from $213.40 to $214.60 (+0.5%) per night. In Midtown East, average daily room rates edged up by just 0.1 percent, from $234.60 to $234.90.

Increased Hotel Occupancy

There are currently 5,261 hotel rooms located in hotels on 42nd Street, applying the average New York City occupancy rate (89.50%) and room rate ($297 per night), it is estimated that 42nd Street hotels have $1.4 million in sales each day. The Phase Two Economic Study interviews with hoteliers provided an estimate that with the increased tourism due to the LRT, occupancy would increase by 2%. This would yield an additional $31,250 in revenues per day, or $11.4 million per year.

Parks and Open Space

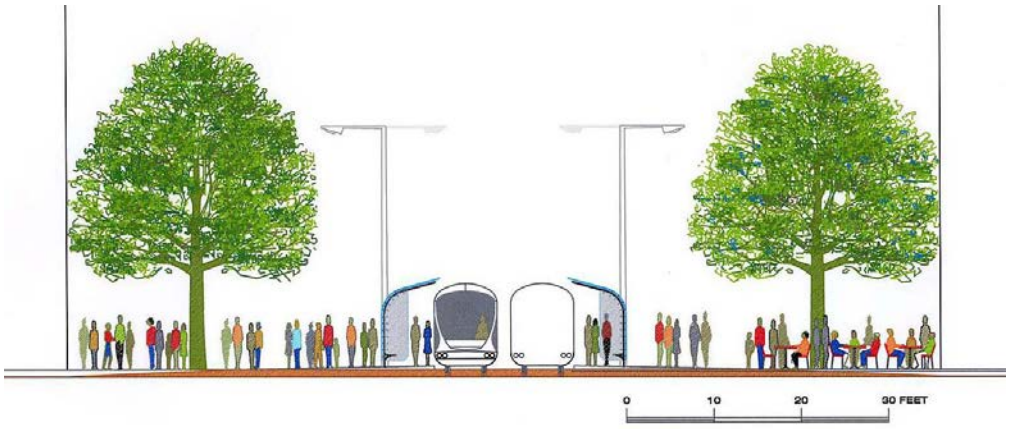
In recent years, the availability of open space and city parks has been on the rise. Conversion of Pier 84 (2006) along Hudson River Park and DOT's closure of Broadway (2009) between 42nd and 47th Street to vehicle traffic has increased the pedestrianization of Midtown Manhattan to the benefit of visitors, shoppers, and area workers alike. Under a 2011 agreement between the City of New York and the United Nations, 42nd Street is likely to become increasingly accessed by pedestrians due to an expansion of the Manhattan Greenway along the East River waterfront, a plan that will require the Parks Department to turn over the Robert Moses Playground on East 41st Street to the United Nations, in exchange for waterfront access to the Eastside Greenway and construction of a new Robert Moses Playground located near the existing site by the year 2020.

In addition to ten city parks, the study area is home to a large number of privately-owned open space areas. Although many of these open space areas lack adequate accommodations for

socialization or eating, they do offer benefits to the pedestrian experience through improved circulation and seating for a brief stop. There are approximately 20 neighborhood open space areas that effectively draw residents from the immediate area for eating, socializing and resting purposes. Pier 84, near 42nd Street, acts as the only destination-type privately-owned open space area with opportunities for cultural programming, socialization, and eating. Since 2011, 4,400 square feet of open space has been added to the Study Area including 1,867 square feet at 120 West 45th Street, 1,061 square feet at 25 West 37th Street and 1,500 square feet at 7 Bryant Park,

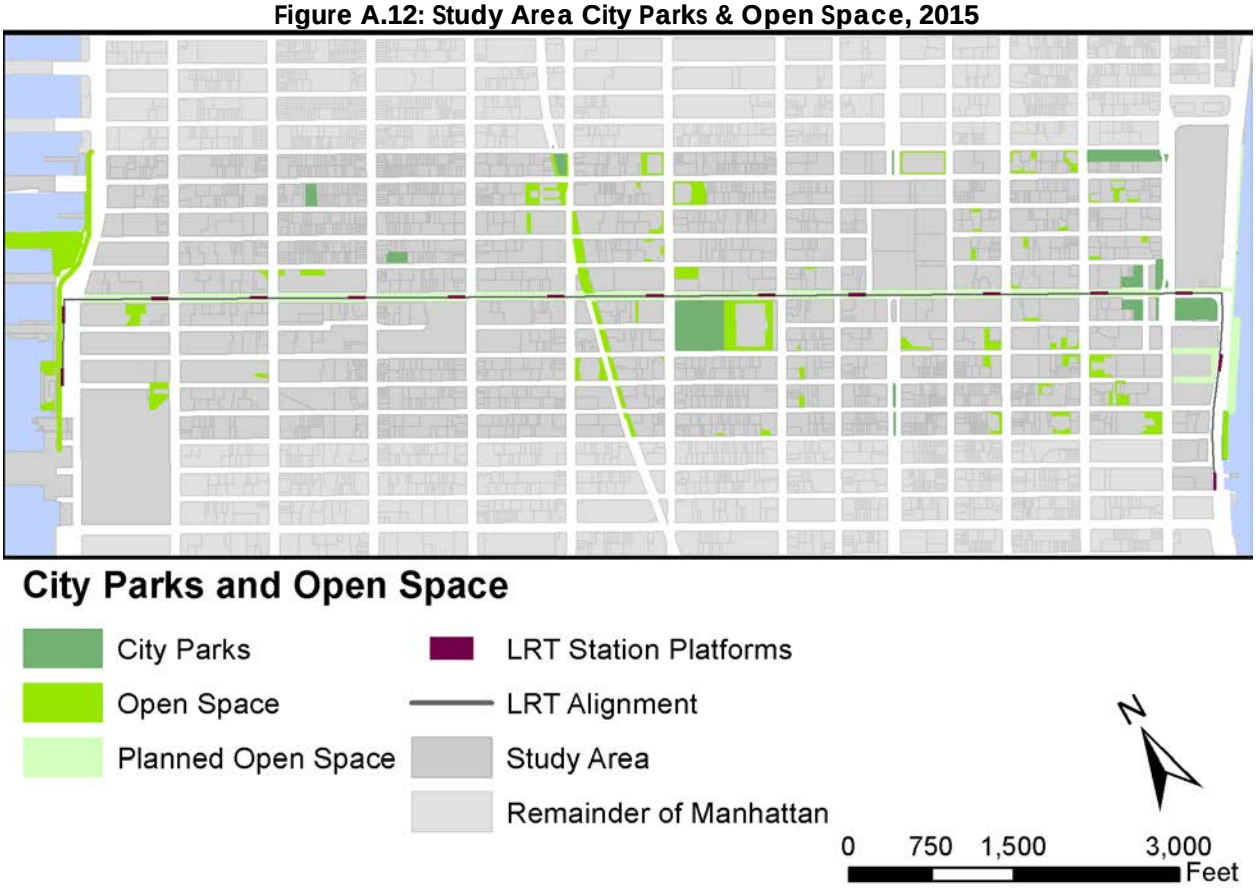
DOT's conversion of roadway sections into pedestrian malls along Broadway in Times Square and Herald Square are exemplary success stories of the benefits of urban place making for pedestrians. According to DOT's Green Light for Midtown Report, increased sidewalk area and pedestrian space has improved pedestrian capacity, safety and increasing foot traffic. In Times Square, pedestrian volume increased by 11 percent while pedestrian injuries declined by 40 percent. Additionally, 80 percent fewer pedestrians are walking in roadways on 7th avenue between 46th and 47th Streets. According to survey data, these changes have had a positive impact on pedestrian behavior. Among New Yorkers, 42 percent reported shopping in Times Square more frequently and 26 percent of Times Square employees reported that they increasingly left their offices for lunch. Earlier studies for 42nd Street indicated that making the street car-free will increase pedestrian space by 35 percent as shown in the Figure below.

Figure A.11: Cross Section of 42nd Street with vision42 LRT



While not having a quantifiable monetary value under this scope of work, the pedestrianization and landscaping of 42nd Street will contribute to the long term goal of increasing open space in New York City as discussed in PlaNYC2020 and would serve as a connector to other open spaces in the study area, as shown in Figure A.14.

Figure A.12: Study Area City Parks & Open Space, 2015



Source: Urbanomics, NYC *PLUTO* 15v1, NYC City Owned and Leased Properties 11/2014