vision42

A Comparison of Relative Benefits of a Proposed River-to-River Auto-free Light Rail Boulevard on 42nd Street with a New 10th Avenue #7 Subway Station

Prepared by

Urbanomics, Inc.

May 23, 2012

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

Phase V Technical Studies—
A Comparison of Relative Benefits of a Proposed River-to-River Auto-free Light Rail Boulevard on 42nd Street with a New 10th Avenue #7 Subway Station

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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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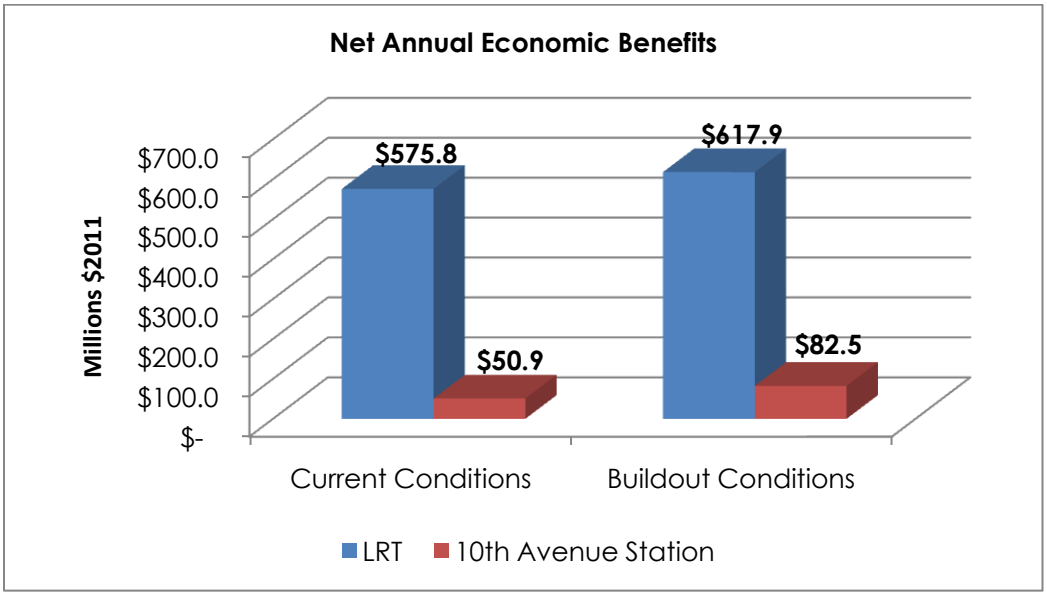
Executive Summary

In terms of economic benefit, the proposed **vision42** light rail (LRT) outperforms the proposed 10th Avenue Station of the #7 subway line extension (10th Avenue station) in many ways, both under existing conditions and given a 2030 buildout. Economic and fiscal impacts of the LRT and 10th Avenue Station are summarized and, where directly comparable, charted below.

Annual Impacts

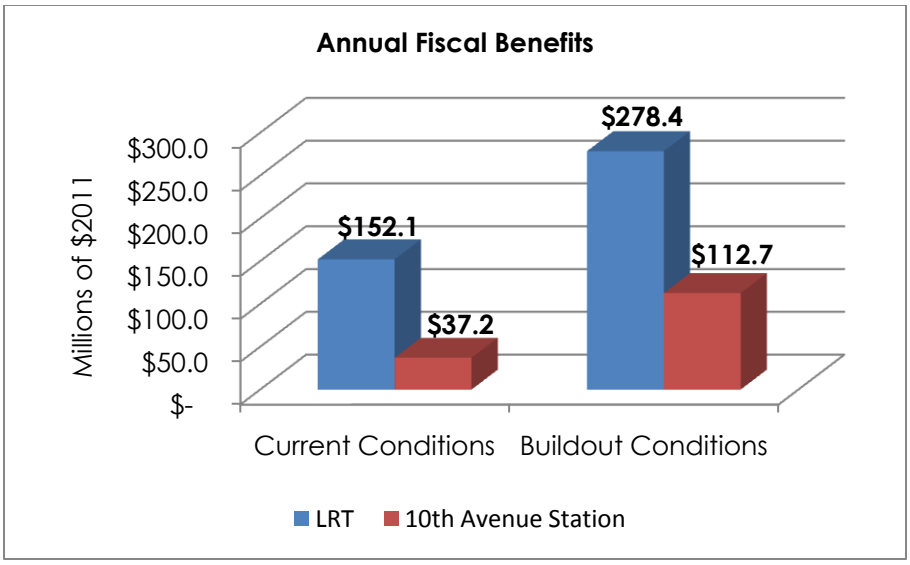
Net Annual Economic Benefits:



Under existing conditions, the annual economic benefits of the LRT are 11 times greater than those of the 10th Avenue Station at $575.8 million to $50.9 million. At full buildout in 2030, the LRT will generate $617.9 million in economic benefit each year compared to $82.5 million from the 10th Avenue Station.

Net Annual Fiscal Benefits

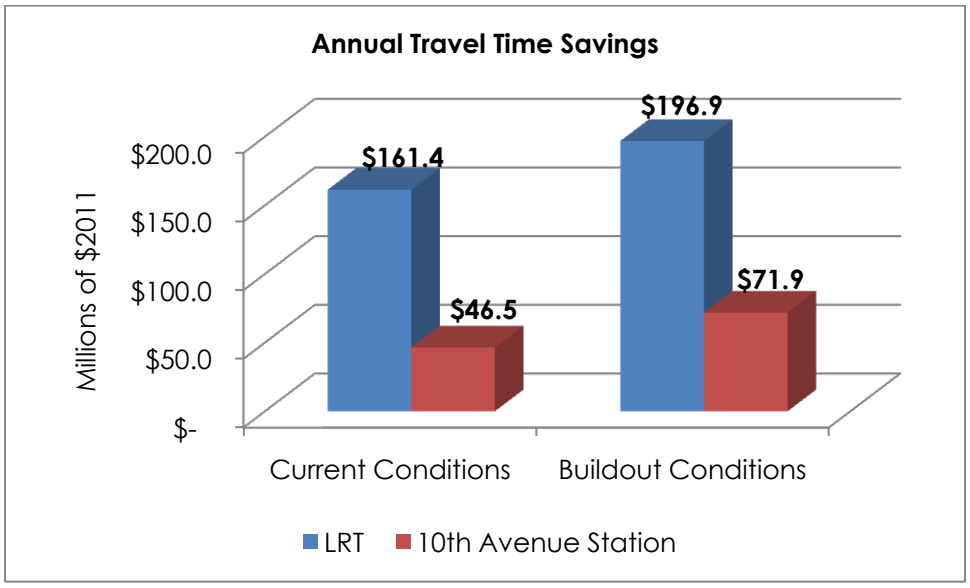
Under existing conditions, the **vision42** LRT would provide additional annual tax revenues of $152.1 million, compared to $37.2 million spurred by the 10th Avenue Station. By the buildout year of 2030, the LRT would be generating $278.4 million in tax revenues each year or more than twice the $112.7 million created by the 10th Avenue Station.



- Of these, property Tax increases attributed to proximity to the LRT total $250 million compared to $112.7 million due to proximity to the 10th Avenue Station.

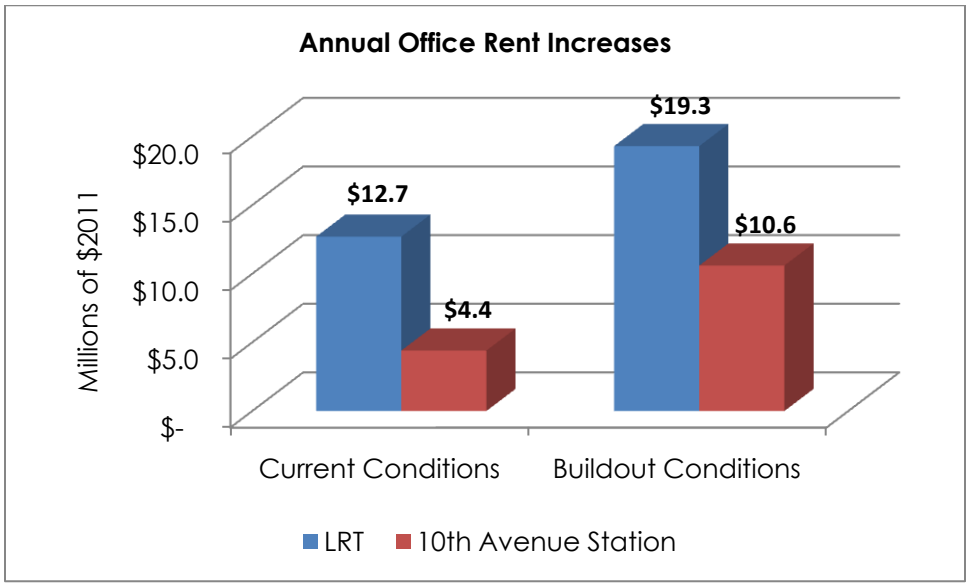
Detail of Annual Economic and Fiscal Impacts

- **Travel Time Savings:** Because of the extent of the river-to-river line, the LRT would create $176.9 million in travel time savings *each year*, compared to $46.5 million from the 10th Avenue Station for existing travelers in the corridor. By 2030, the annual benefits due to LRT proximity is expect to grow to $196.8 million, while the benefits due to the 10th Avenue Station will be only one third of that, at $71.9 million. Travel time savings to residential parcels, which would be modest compared to non-residential parcels, were not



estimated due to the complexity of analysis, but would certainly favor the LRT over the 10th Avenue Station.

- **Increased Rents:** Under current conditions, the LRT will produce annual office rent increases of $12.7 million compared to $4.4 million for the 10th Avenue Station. In the buildout year, rent increases can be counted at $19.3 million for the LRT and $10.6 million for the 10th Avenue Station.



- **Retail Sales:** Annual retail sales gains resulting from the introduction of LRT service and pedestrianization of 42nd Street are expected to be $455 million, yielding $27.0 million in sales taxes. Impacts of the 10th Avenue Station have not been estimated.

- **Hotel Occupancy:** The **vision42** LRT will result in a 2% increase in occupancy, yielding $8.8 million a year in additional revenues and $1.3 million in sales and hotel occupancy taxes. Impacts of the 10th Avenue Station have not been estimated.

- **Theater Sales:** The **vision42** LRT will spur a 2% increase in patronage, yielding $25.7 million a year in additional ticket revenues. Impacts of the 10th Avenue Station have not been estimated.

- **Operating expenditures:** The LRT would yield a net benefit, or decrease in expenditures, of $0.1 million each year over the existing operating costs of the M42 Bus service. The 10th Avenue Station will increase operating expenditures for New York City Transit.

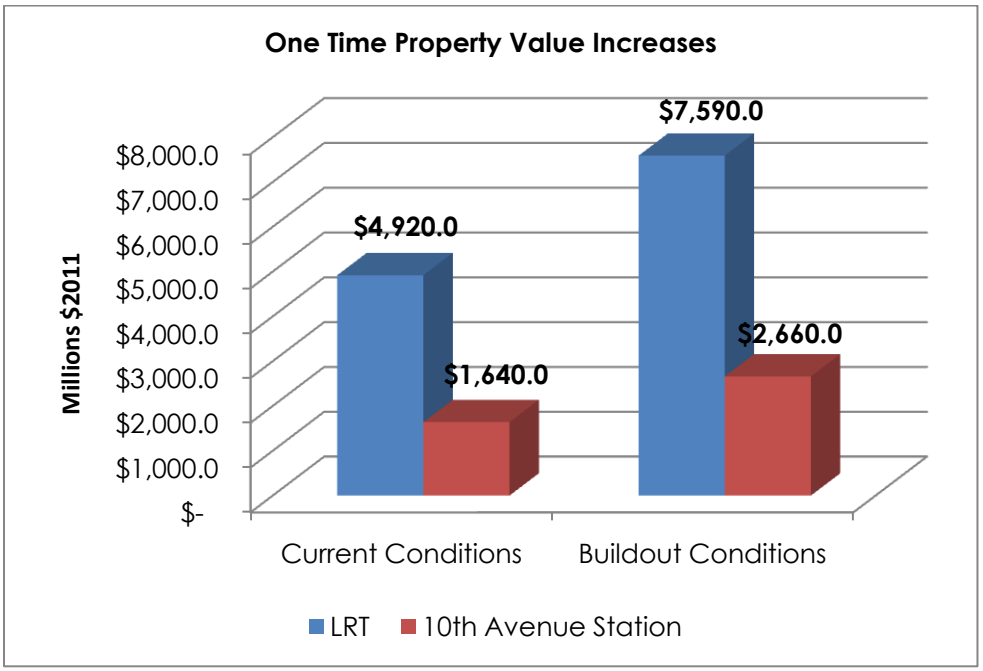
- **Accidents:** Eliminating traffic on 42nd Street will reduce the number of accidents in the corridor. The monetary value of fewer accidents is $1.3 million per year. The 10th Avenue Station has no similar benefit.

- **Traffic Diversions and Delivery Delays:** Traffic disruption and the subsequent delivery delays caused by the pedestrianization of 42nd Street will cost $89.2 million each year. The 10th Avenue Station has no similar disbenefit.

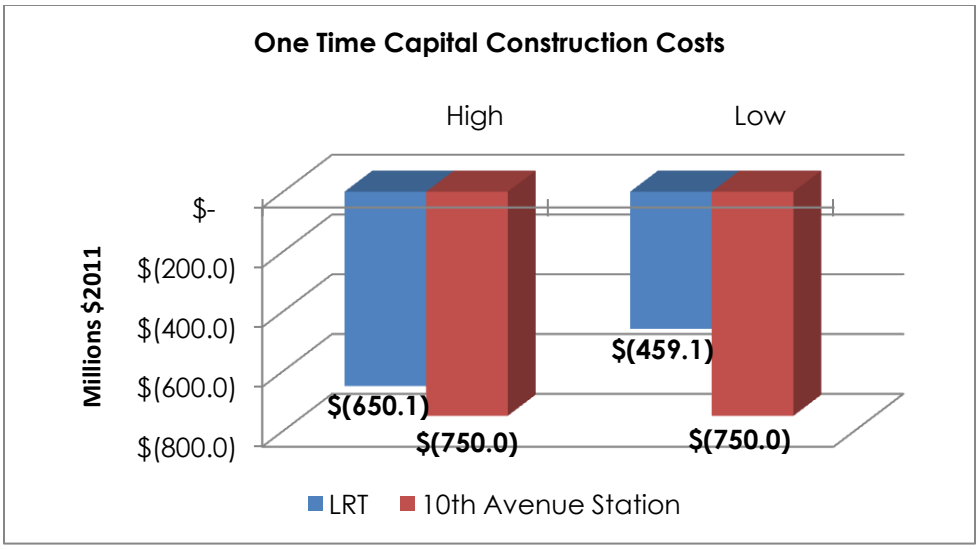
<u>One Time Impacts</u>

Net One Time Impacts: The net one-time benefits of the LRT ranges from $6,795.0 million to $6,986.0 million compared to the one-time benefits of the 10th Avenue station, estimated at $1,910.0 million. This is based on:

- **Property Value Increases:** By 2030 with future buildout, proximity to the LRT would increase property values by a net $7,590.0 million, compared to $2,660.0 million from proximity to the 10th Avenue Station. Under existing conditions, the incremental gain due to the LRT would be $4,920.0 million in property value increases compared to the 10th Avenue Station's $1,640.0 million.



- **Capital Costs:** Depending on type of system and utility relocation requirements, the LRT is estimated to cost between $459.1 million and $650.1 million for more than 2.5 miles of track and 16 platforms in a landscaped pedestrian street. Even at its most costly, the **vision42** LRT would still cost less than the most recent back-of-the-envelope estimates of the 10th Avenue Station construction at $750.0 million.



- **Retail Sales Loss:** During construction of the LRT, it is expected that 42nd Street merchants will lose an aggregate $145.2 million in sales due to obstruction. The 10th Avenue Station has no similar disbenefit.

Forward

This study compares the benefits of a proposed new intermediate station at 10th Avenue on the #7 subway extension to Hudson Yards with **vision42 -** a 16-stop river-to-river light rail line in an auto-free boulevard on 42nd Street, an initiative proposed by the Institute for Rational Urban Mobility, Inc. (IRUM), a NYC-based non-profit.

NYC's plan for the one-mile extension of the #7 Subway Line from its current terminal at Times Square, together with a rezoning initiative permitting a much higher level of development in the Hudson Yards district, was approved in 2004. The subway was to be extended to a new station at 34th Street and 11th Avenue that would have served an Olympics 2012 stadium, to be constructed over the LIRR West Side Yards. One intermediate station was to have been built at 10th Avenue and 41st Street.

Much has changed since then. The stadium did not gain needed state approval and NYC was not selected for the Olympics. In 2007, as construction costs for the subway extension increased, the 10th Avenue station was eliminated from the plan. Civic and business groups have long called for restoration of this station which would serve a densely developed area of the city. MTA officials informally estimate that the station would now cost $750 million to construct, although no detailed studies have been made available. The **vision42** proposal would cost somewhat less, between $459.1 million to $650.1 million, based on detailed studies done by IRUM's engineering consultants.

This study makes a one-on-one comparison of the 10th Avenue station with the full 16-stop light rail line. Study resources were not available to compare benefits if both projects were completed concurrently. The comparison was made for "existing" commercial and residential development currently in place, and for a future year, 2030, when full "buildout" of development now permitted by rezoning of the Hudson Yard district and the ConEd site in East Midtown is likely to have occurred. The appendix summarizes travel time savings resulting from the 10th Avenue station, developed by MTA in environmental studies completed in 2004, which are generally consistent with the findings in this report.

I. 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. **vision42** could be a prototype for a whole network of landscaped, pedestrian/light rail streets throughout the city. It is sponsored by the Institute for Rational Urban Mobility, Inc., a New York-based not-for-profit corporation.

Purpose of Study

This report is both an update of previous work prepared for **vision42** and a comparison of the relative economic benefits of a Proposed River-to-River Auto-free Light Rail Boulevard on 42nd Street with a new 10th Avenue Station on the #7 Subway.

This effort focused on an update of existing conditions, given shifting commercial conditions in the study area corridor running river-to-river from 37th Street to 47th Street, as well as a comparison of the transportation and economic benefits of the **vision42** proposal versus the added 10th Avenue station of the #7 extension. The **vision42** analysis methodology was updated and applied to each investment (the **vision42** proposed light rail and the 10th Avenue station) individually, to determine travel time savings, real property value increases, property occupancy and rental increases, retail spending, and fiscal net benefits that would be anticipated to arise within the tributary area.

Data for analysis were drawn from the previous **vision42** research and modeling, the *#7 Subway Extension, 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 New York City Department of City Planning *Primary Land Use Tax Lot Output (PLUTO)* database and other sources.

The existing conditions year of analysis is 2011 and the future year 2030. All monetized benefits are expressed in 2011 constant dollars.

Prior Findings for LRT

Four 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 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.

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.

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 condo 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.

II. The Benefits of Travel Time Savings

The Model in Brief

The Travel Time Savings Model was developed for the purpose of estimating 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 faster 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 2011 dollar terms based on the weighted value of time for various categories of riders. The number of trips is not 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.

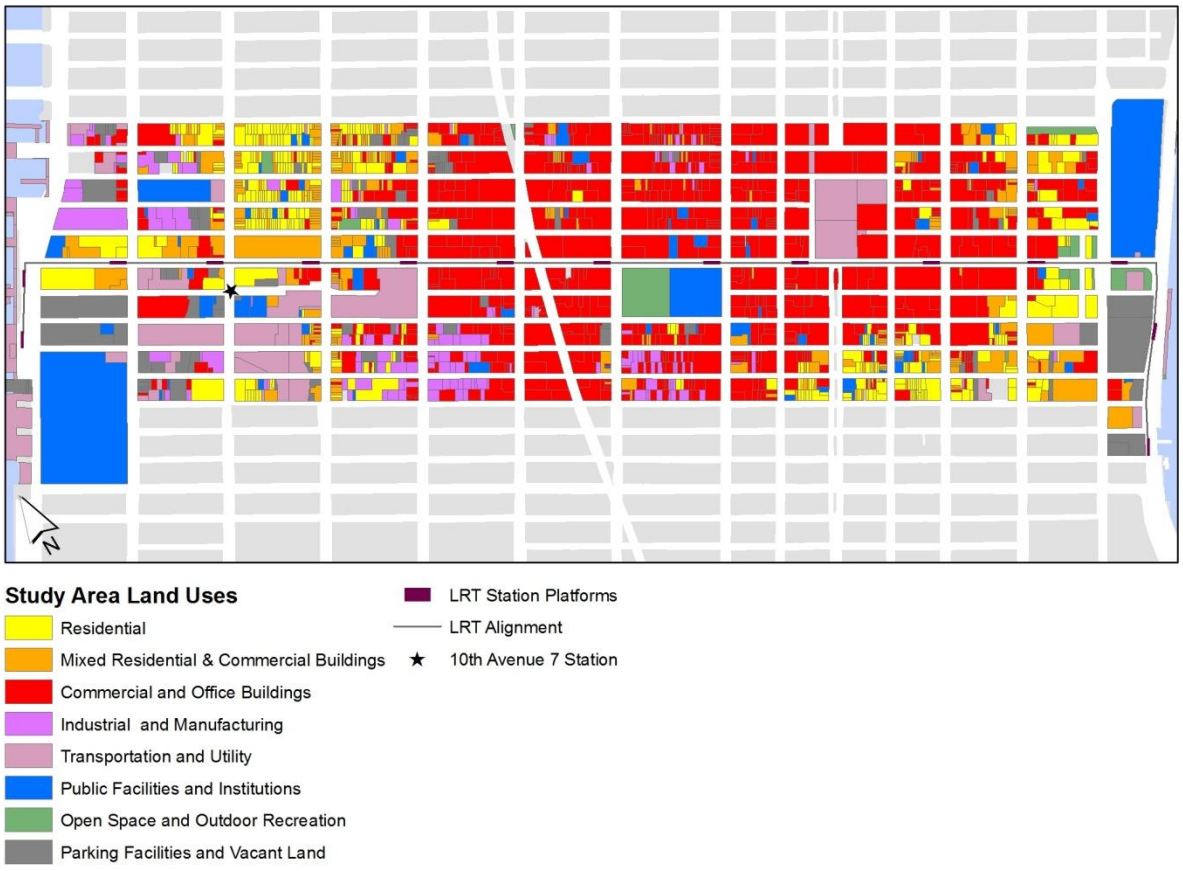
It should be noted that the ONLY criteria influencing choice of transportation modeled was time savings.

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.

Updates

The seven (7) years between the initial Cost-Benefit Study and the present have seen extensive changes in real estate in the study area, especially on the west side. New residential and hotel properties, as well as the shift from manufacturing to service uses have changed both trip types and wage rates in the study area.

Figure 2.1



Extensive fieldwork was done to determine whether buildings listed in the *PLUTO* with a recent construction date are completed. In addition, the *PLUTO* data for new buildings located on multiple parcels were examined to correct for those instances where total building floorspace was attributed to each component parcel.

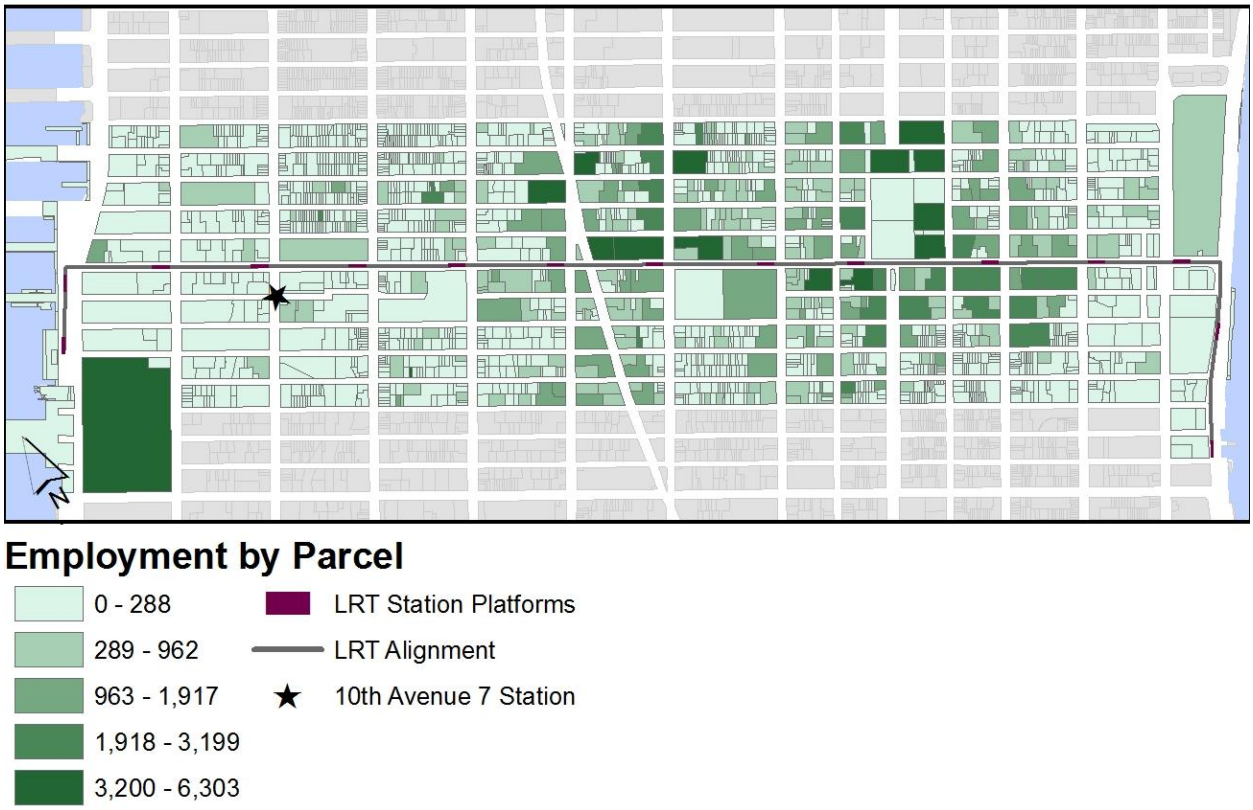
Work Trips

The models were updated to reflect 2011 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 New York State Department of Labor's 2011 *Quarterly Census of Employment and Wages* (*QCEW*) data at the zip code level to each parcel to determine the number of workers by type to be input into the worktrip models of travel time savings.

The map below shows 2010 employment distribution by parcel.

Figure 2.2



The 2000 and 1990 *Census Transportation Planning Package* (*CTPP*) origin/destination and modal split data utilized in the 2005 model were updated using the most recent data available. Worker origin/destination data for 2009 were drawn from the *Longitudinal Employer-Household Dynamics* (*LEHD*), a program within the U.S. Census Bureau through which federal and state administrative data on employers and employees are combined with core Census Bureau censuses and surveys while protecting the confidentiality of people and firms that provide the data. Modal split proportions by residential origin were drawn from the 2000 *CTPP* and applied to the 2009 *LEHD*. The resulting mode matrix was applied to the normalized *QCEW* employment.

Non-Work Trip Generation

As previously mentioned, there has been significant change in the corridor in the recent past, especially as concerns hotel, theater and retail development. Extensive fieldwork was performed to establish existing conditions for these trip generating uses. These changes are summarized in Chapter 4 and described in detail in Appendix B.

Distance from Parcel to Transit

In addition, a number of parcels have been assigned new Borough Block and Lot (BBL) designations as lots have been divided, aggregated or changed use. Due to the changes to both nominal and physical parcel definitions, the distances from parcel boundary to nearest existing subway entrance, nearest proposed LRT platform entrance and the site of the 10th Avenue Station of the #7 Extension were measured using CommunityViz™ spatial analysis software.

Transit segment travel times were revisited for time distance between stops within the corridor and all subway entrances are located as shown in the previous modeling effort.

Existing Travel in Study Area

There are 400,000 persons working within the study area and 36,000 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 and ten schools of higher education—these latter are described in detail in Chapter 4. Each of these uses generate trips—work, school, shopping, theatre. On any given day, within the study area there are roughly:

- 790,000 work trips
- 150,000 office visits
- 17,000 shopping trips
- 25,000 theatre trips
- 20,000 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 or the 10th Avenue Station of the #7 extension, given the completion of either option. 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.[1] 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 2030 buildout year conditions are altered based solely upon the floorspace and employment reflective of the completion of the following office properties.

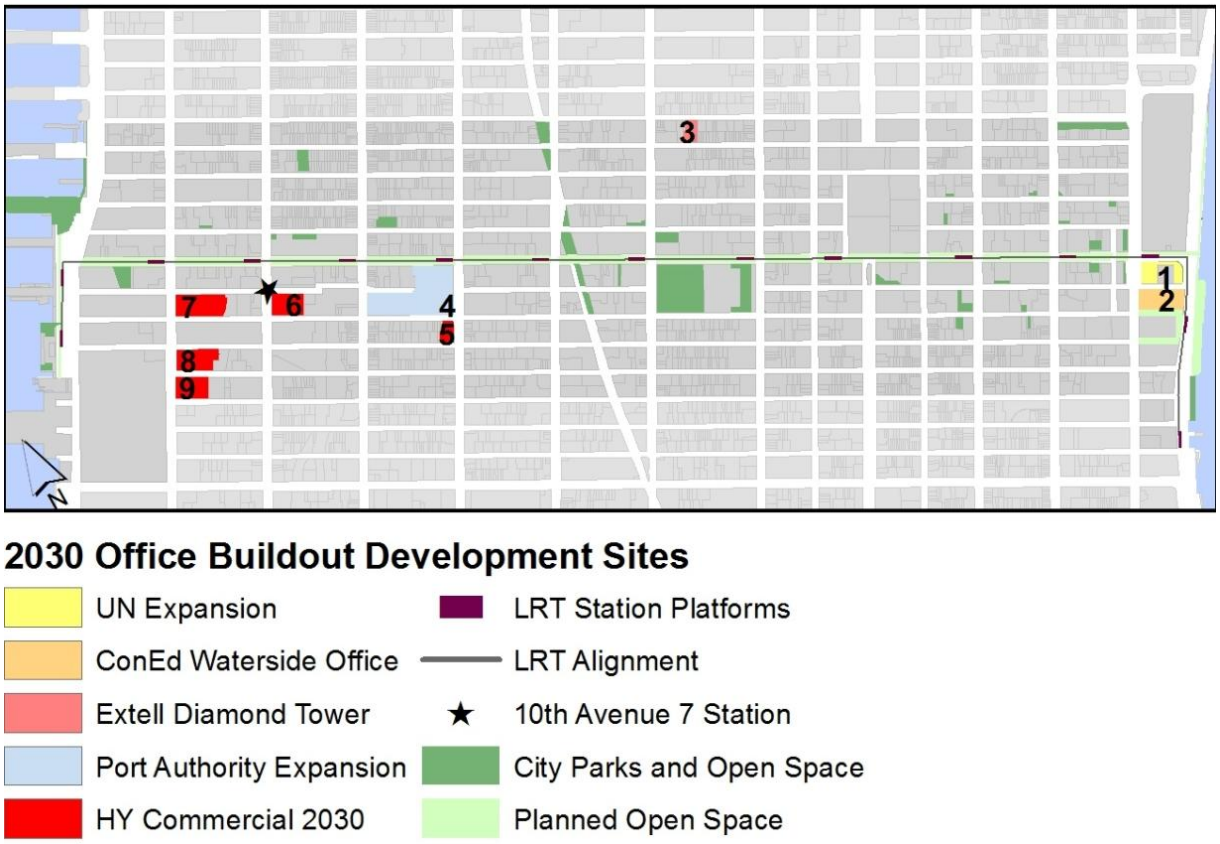
1. United Nations Expansion: 750,000 square feet, 3,000 jobs
2. Solow Building on Con Edison Site: 1,000,000 square feet, 5,000 jobs
3. Extell Diamond Tower: 792,574 square feet, 3,963 jobs
4. Vornado Building on Port Authority Bus Terminal: 1,300,000 square feet, 5,200 jobs
5. Hudson Yards Site 36: 578,590 square feet, 2,314 jobs
6. Hudson Yards Site 20: 1,196,874 square feet, 4,784 jobs
7. Hudson Yards Site 46: 1,925,675 square feet, 7,703 jobs
8. Hudson Yards Site 12: 1,651,550 square feet, 6,606 jobs
9. Hudson Yards Site 10: 1,520,151 square feet, 6,081 jobs

While there will undoubtedly be other commercial and residential development within the study area in the next 18 years, these projects are planned and the 40,688 jobs and 15,258 office visits they represent are the most significant driver of future travel time savings.

Figure 2.3, on the following page, shows the locations of each of the planned buildings.

[1] 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.

Figure 2.3



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. The model and therefore the map did not include trips generated by residential parcels. There are already substantial numbers of residential buildings in the corridor, and more are planned, such as the very large ConEd site on the East River, which will be served by the LRT.

A Comparison: The Value of Travel Time Savings in Current Dollars:

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 existence 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 compared. The 2005 model was prepared for a "buildout year" of 2010, which assumed the completion of the majority of projects still in the pipeline for the current "buildout year" of 2030. The results of the 2005 model were in 2003$, and have been adjusted for inflation to 2011$ to be in keeping with the current year model run. A comparison of

the annualized[2] economic benefits of LRT travel time savings between the 2005 and current (2012) runs are shown in Table 2.1 below in total and by beneficiary group.

Table 2.1 Annualized Travel Time Savings Benefits of LRT Travel Time Savings 2005 Report vs. 2012 Report

	2005 Report		2012 Report	
Beneficiary	**2010 (Buildout Value in millions 2003$)**	**2010 (Buildout Value in millions 2011$)**	**Existing Conditions (millions 2011$)**	**2030 Buildout (millions 2011$)**
Total	$152.0	$185.8	$165.4	$196.9
Workers	$108.5	$132.7	$115.0	$132.9
Office Visitors	$23.7	$29.0	$13.1	$15.1
Shoppers on 42nd Street[3]	$18.7	$22.9	$32.9	$44.3
Theatergoers	$0.9	$1.0	$3.3	$3.4
University Students	$0.2	$0.2	$1.1	$1.1

Source: Urbanomics

Once adjusted for inflation, the total annualized travel time savings assuming a full 2010 buildout would be $185.8 million, halfway between the travel time savings value of the existing conditions and the 2030 buildout year. Travel time savings to residential parcels, which would be modest compared to non-residential parcels, were not estimated, due to the complexity of the analysis, but would certainly favor the LRT over the 10th Avenue Station.

LRT vs. Existing Subway System, excluding 10th Avenue #7 Station

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 3,350,684 hours, having a monetary value of $165.4 million. The greatest share of this, 1,913,717 hours, or $115 million, would benefit study area workers. Shoppers are the next greatest beneficiaries in the area with an annual savings of 1,009,189 hours and $32.9 million. These are followed by Office Visitors, at $13.1 million, accruing from 138,567 hours of time savings; theatergoers with $3.3 million in savings based upon 105,678 saved hours of travel, and university students, with 183,533 hours of saved travel time, but only $1.1 million in monetary benefit.

[2] 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.

[3] Interviews with store owners and managers determined that the pedestrianization of 42nd Street as part of the **vision42** plan would be the driver of increased shopping trips; therefore shopping trips and subsequent travel time savings were identified only for the directly affected retail floorspace on 42nd Street.

Table 2.2. Existing Conditions: Annualized Travel Time Savings Benefits of LRT

	Travel Time Savings (Hours)	Travel Time Savings (millions 2011$)
Total	3,350,684	$165.4
Workers (2 trips per day, 250 days per year)	1,913,717	$115.0
Office Visitors (250 days per year)	138,567	$13.1
Shoppers (312 Days per Year)	1,009,189	$32.9
Theatergoers	105,678	$3.3
University Students (250 days per year)	183,533	$1.1

Source: Urbanomics

As shown in Table 2.3, under buildout conditions, the total annualized travel time savings is 4,168,909 hours or $196.9 million. The distribution of value to the beneficiaries remains much the same, but with worker trip savings increasing to $132,9 million per year, or 2,345,358 hours and office visitor benefits increasing to $15.1 million for 169,821 hours of travel time savings each year. Based on the estimates of increased numbers 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 1,362,405 hours with a value of $44.4 million and a 107,792 hours of time savings for theater goers with a value of $3.4 million each year.

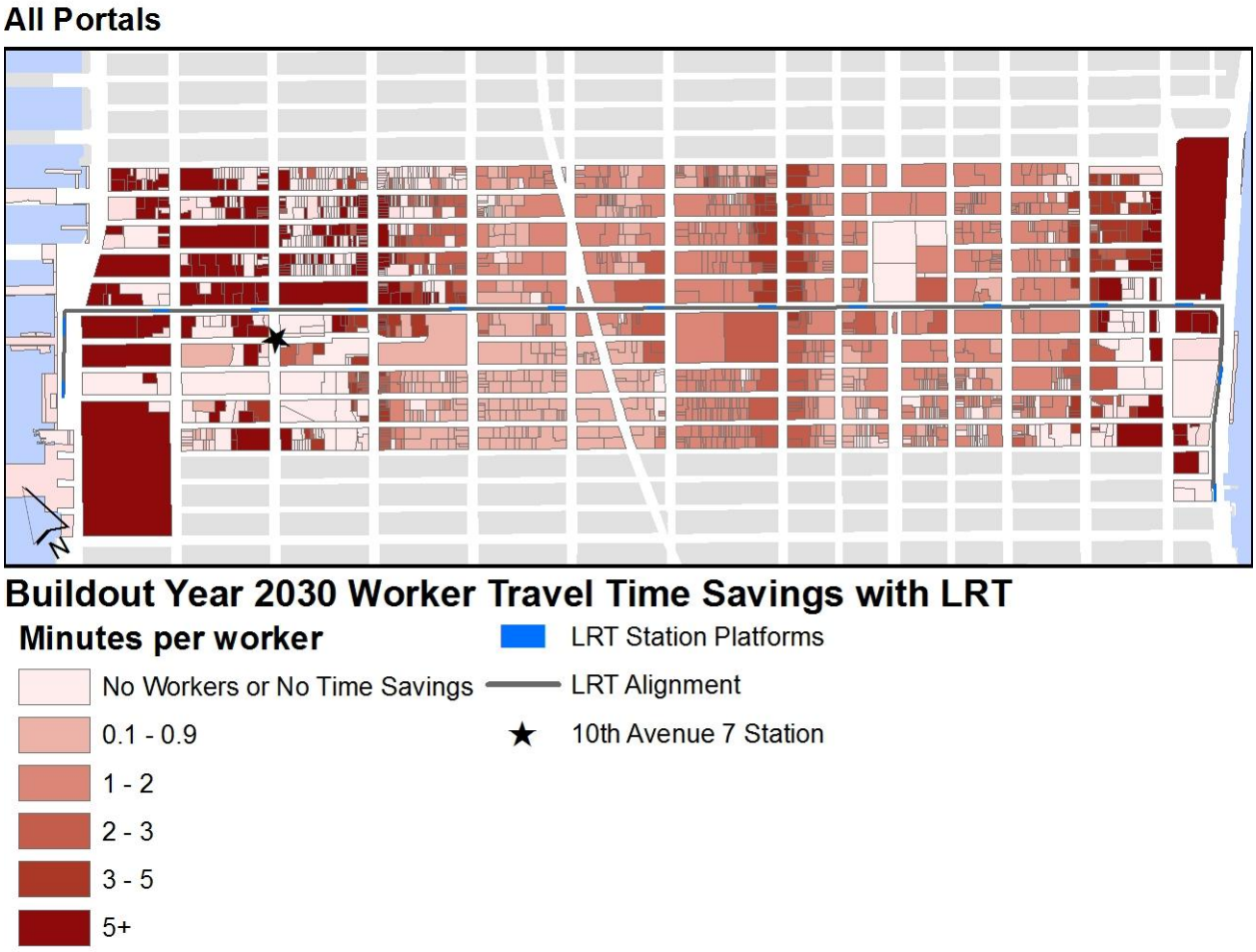
Table 2.3. Buildout Conditions: Annualized Travel Time Savings Benefits of LRT

	Travel Time Savings (Hours)	Travel Time Savings (millions 2011$)
Total	4,168,909	$196.9
Workers (2 trips per day, 250 days per year)	2,345,358	$132.9
Office Visitors (250 days per year)	169,821	$15.1
Shoppers (312 Days per Year)	1,362,405	$44.4
Theatergoers	107,792	$3.4
University Students (250 days per year)	183,533	$1.1

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. The map in Figure 2.4 shows the average daily travel time savings per worker (under buildout conditions) by the parcel of work regardless of portal of entry into the study area corridor.

Figure 2.4



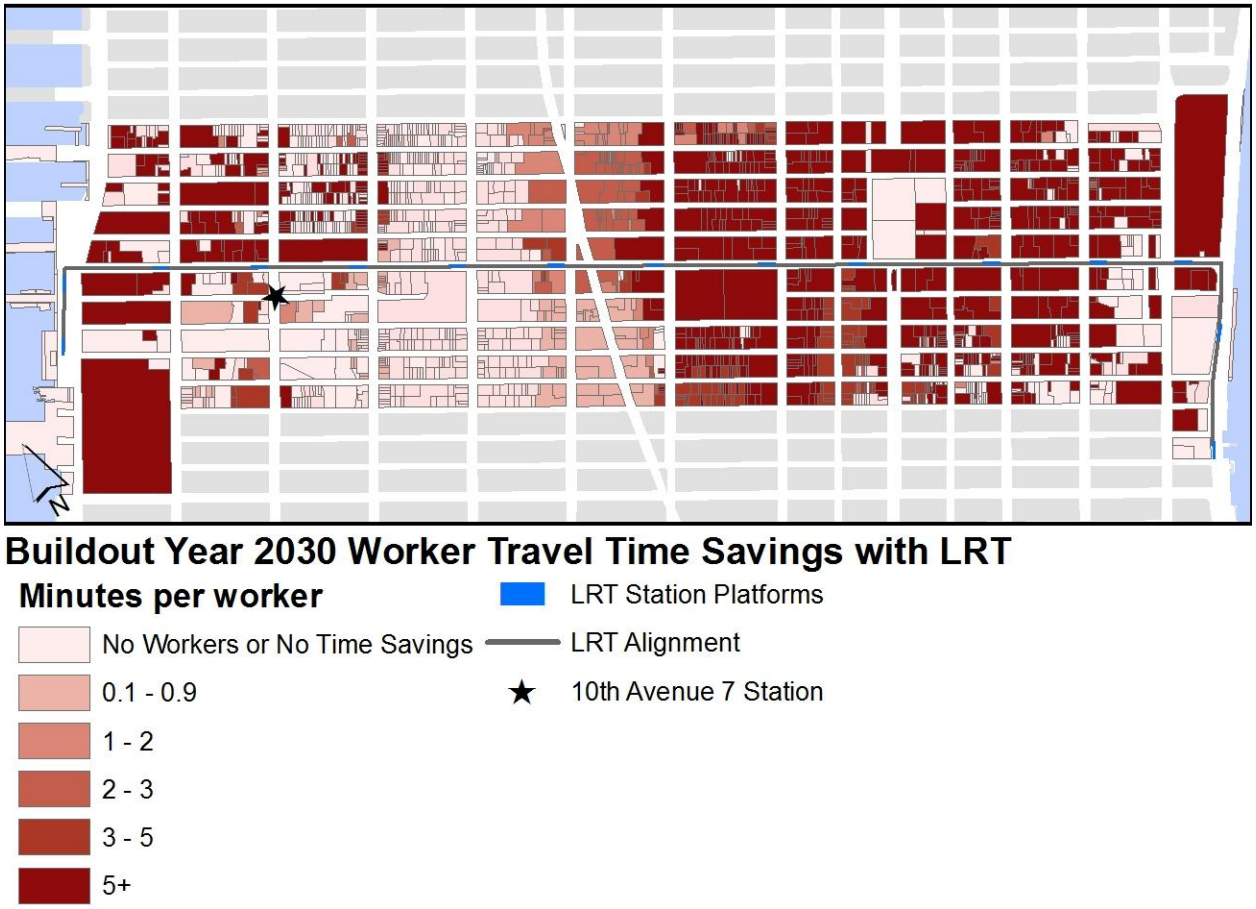
As shown, the individuals working on the far eastern and western edges of the study area accrue the greatest benefit, with daily travel time savings per person of up to 29 minutes, totaling 120 hours each year.

As mentioned previously, travel time savings per worker per parcel vary based upon the portal of entry into the study area. On the following pages, the travel time savings per worker at the parcel level based upon portal of entry are mapped. 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.

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

Figure 2.5

Portal 6: Port Authority



As shown in Figure 2.5, 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 and a share of #7 trains. As seen in Figure 2.6 below, the greatest time savings benefits accrue to those workers on the East River or west of 8th Avenue.

Figure 2.6

Portal 7: Times Square

Buildout Year 2030 Worker Travel Time Savings with LRT

Minutes per worker

- No Workers or No Time Savings
- 0.1 - 0.9
- 1 - 2
- 2 - 3
- 3 - 5
- 5+

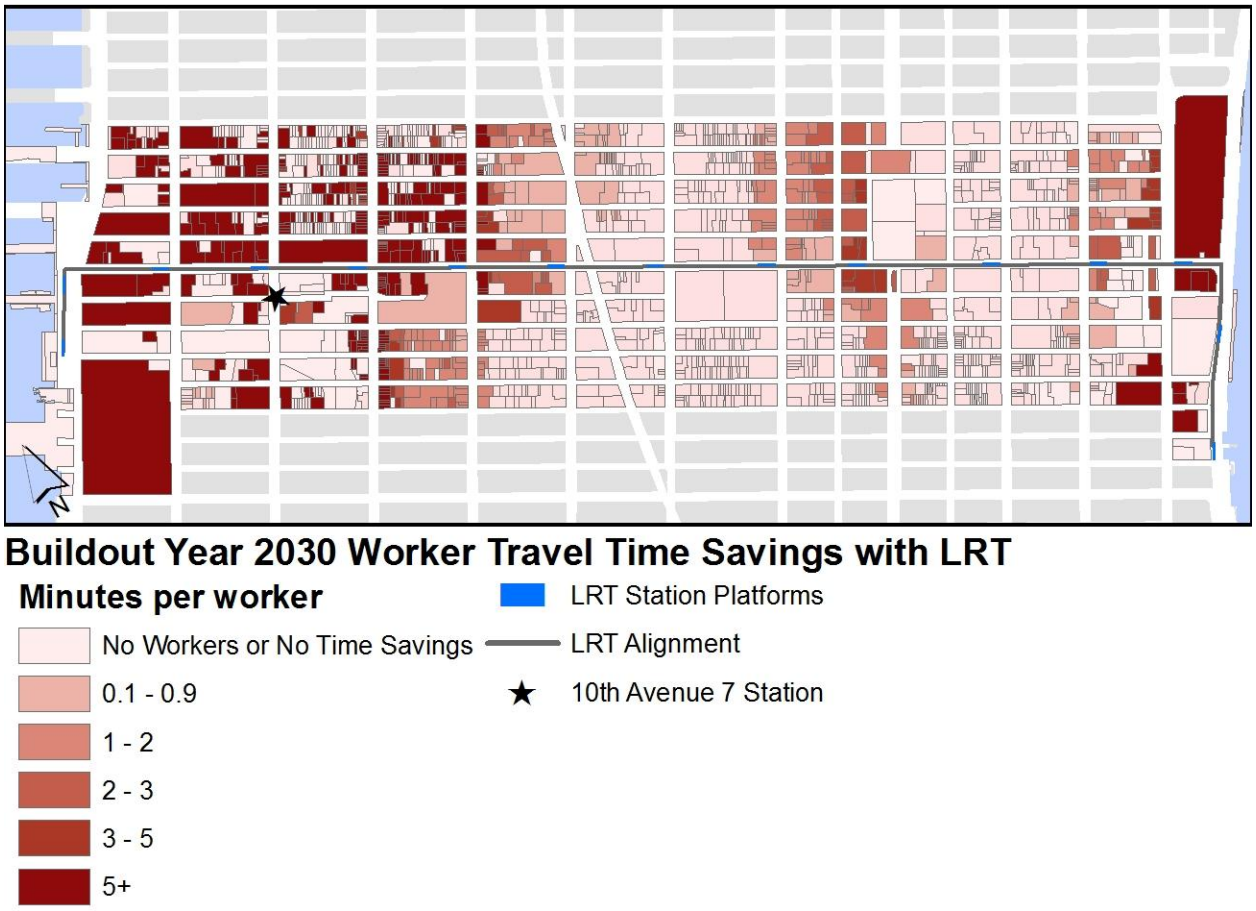
- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

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 amenability of the mode.

Located on 42nd Street and 6th Avenue, the Bryant Park portal includes B and D 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 2.7

Portal 8: Bryant Park

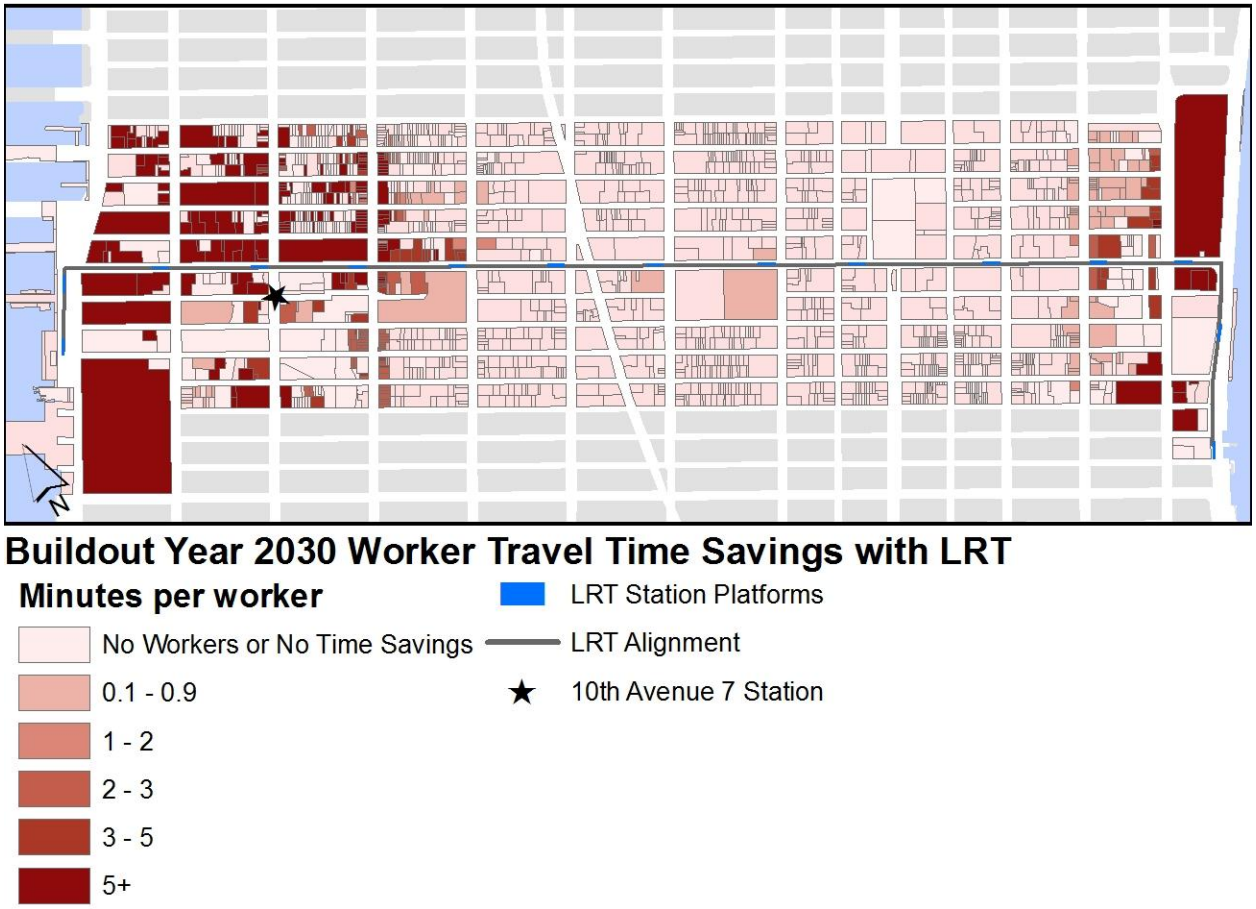


As was the case with Times Square entrants, the areas receiving the least travel time savings benefits are those limited areas served by the #7 train.

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 2.8

Portal 10: Grand Central

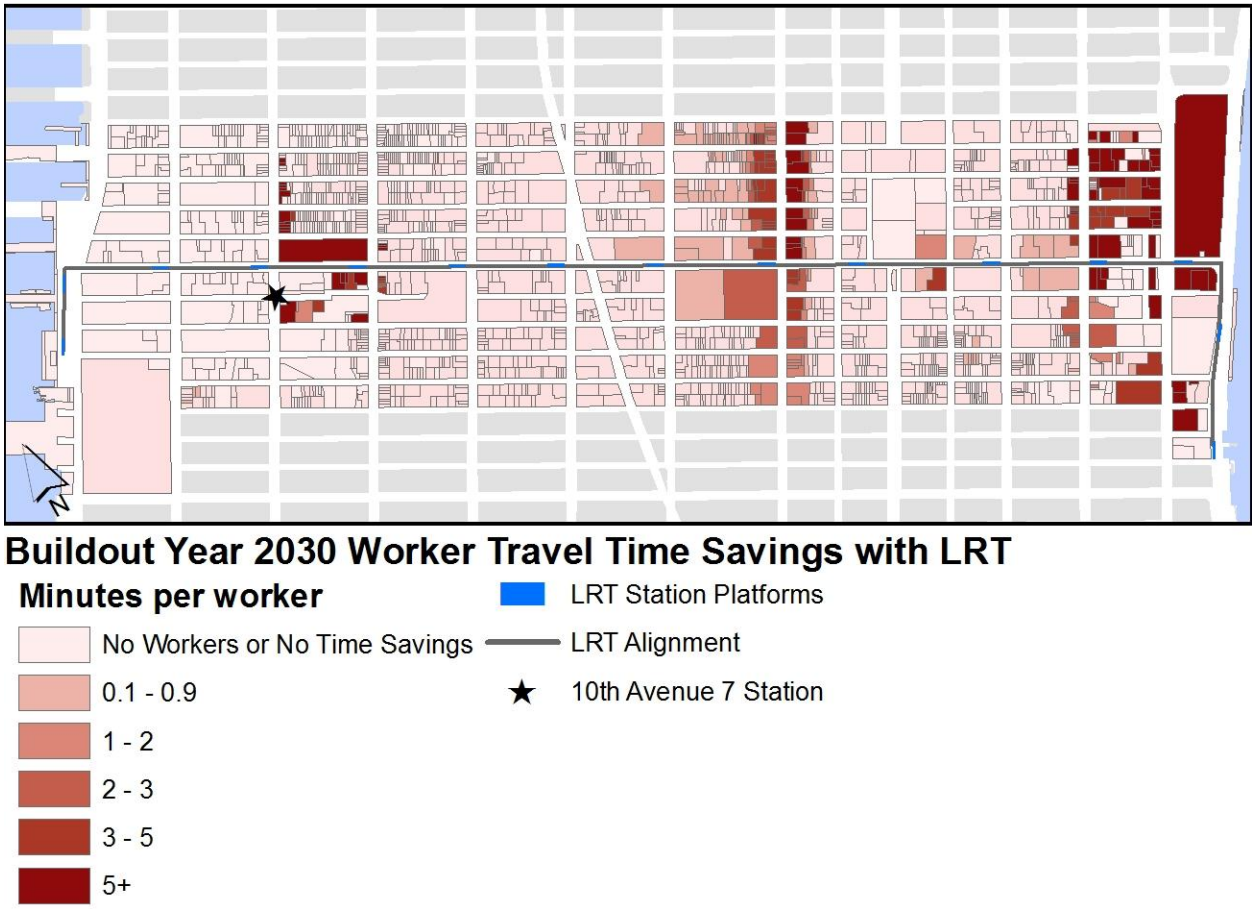


The greatest benefit to Grand Central travelers entering is to those working east of 2nd Avenue and west of 8th Avenue.

Figure 2.9 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 2.9

Portal 16: Penn Station



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.

10th Ave Station in System vs Existing Subway System, excluding the vision42 LRT

Parameters were entered into the pre-existing model to reflect the travel time savings that would accrue to those parcels that are closer to the location of the proposed 10th Avenue Station of the #7 extension than to any other existing subway entrance. These parcels numbered only 297 of the 1883 parcels in the study area. There are currently 7,065 workers who would benefit from the Station. In the buildout year, that number would grow to only 18,755.

The results of the travel time saving benefits accruing to the same beneficiary group using the same origin-destination and modal split assumptions follow. In addition, BFJ Planning prepared a

gravity model-based travel time savings estimate, based upon the ridership projections found in the *No. 7 Subway Extension - Hudson Yards Rezoning and Development Program, FGEIS*. The results of this analysis may be found in Appendix A.

Under existing conditions, assuming the 10th Avenue Station of the #7 line extension were built, study area travelers could expect to accrue 1,130,473 hours of travel time savings per year valued at $46.5 million. As with the LRT run of the model, workers receive the largest share of monetary benefit, with $25.1 million in annual value from 484,925 hours of time savings. Shoppers save the most hours of travel each year at 594,058, but have a reduced value of $18.7million. Office visitors gain $1.9 million in value from 19,800 hours of time savings; theatergoers save 25,360 hours per year valued at $0.8 million; while students save 6,330 hours per year, valued at $0.04 million.

Table 2.4 Existing Conditions:
Annualized Travel Time Savings Benefits of 10th Avenue Station

	Travel Time Savings (Hours)	Travel Time Savings (millions of 2011$)
Total	1,130,473	$46.5
Workers (2 trips per day, 250 days per year)	484,925	$25.1
Office Visitors (250 days per year)	19,800	$1.9
Shoppers (312 Days per Year)	594,058	$18.7
Theatergoers	25,360	$0.8
University Students (250 days per year)	6,330	$0.04

Source: Urbanomics

Under 2030 buildout year conditions, travel time savings accruing to users of the 10th Avenue Station almost double to $71.0 million for 1,648,716 hours of time savings. This strong growth is due to proximity of the station site to the planned Hudson Yards developments. Growth is entirely in the worker and office visitor time savings at $48.8 million and $3.6 million each. See Table 2.5.

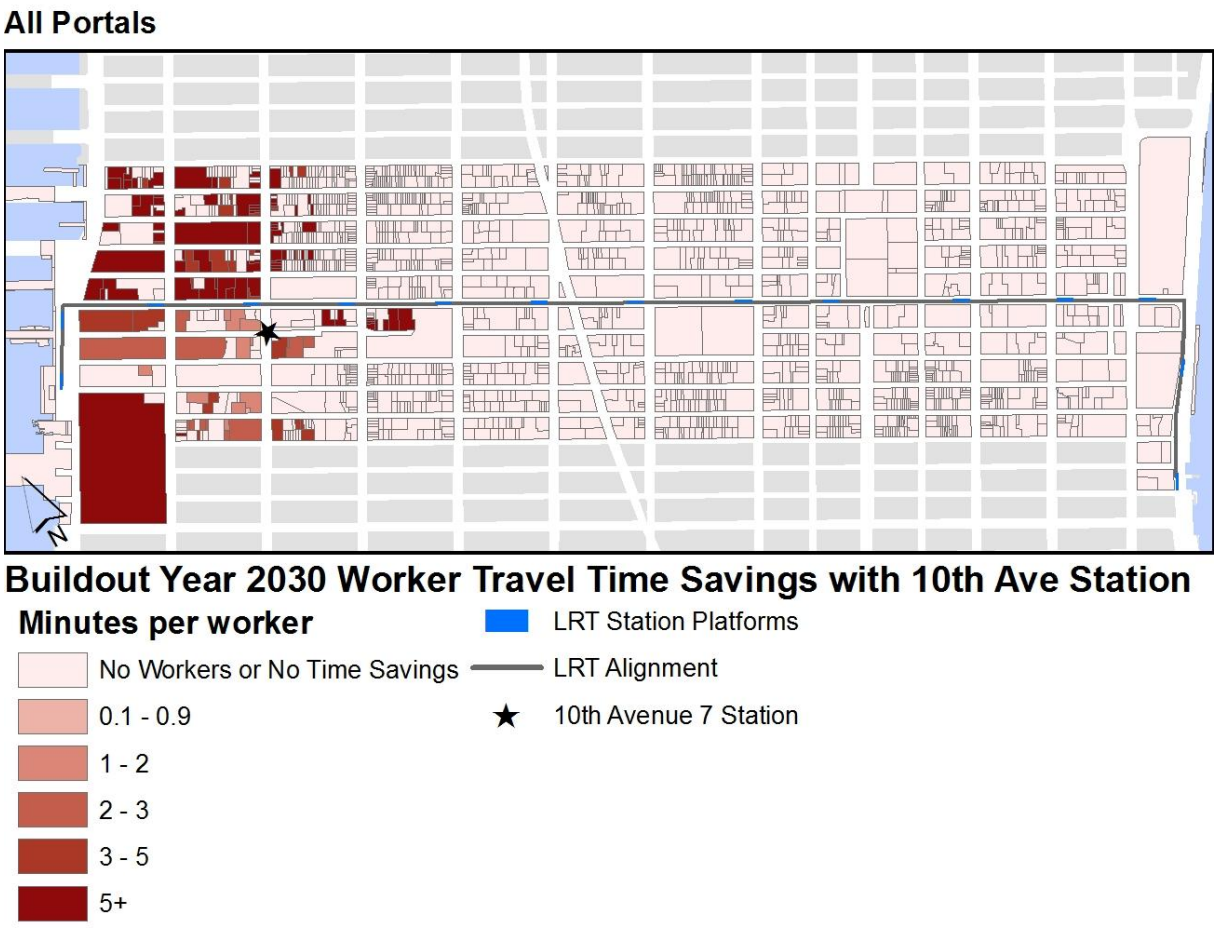
Table 2.5 Buildout Conditions:
Annualized Travel Time Savings Benefits of 10th Avenue Station

	Travel Time Savings (Hours)	Travel Time Savings (millions of 2011$)
Total	1,648,716	$71.9
Workers (2 trips per day, 250 days per year)	982,837	$48.8
Office Visitors (250 days per year)	40,130	$3.6
Shoppers (312 Days per Year)	594,058	$18.7
Theatergoers	25,360	$0.8
University Students (250 days per year)	6,330	$0.04

Source: Urbanomics

Figure 2.10 shows the average travel time savings benefits that would accrue to study area workers from using the 10th Avenue Station of the #7 extension. As shown, the only benefits accrue to those workers west of 10th Avenue.

Figure 2.10



Comparison of Travel Time Savings Benefits of vision42 LRT versus 10th Avenue Station

With existing development, the **vision42** LRT would provide total travel time savings 3.36 times greater than those provided by the 10th Avenue Station (3.7 million hours vs. 1.1 million hours); but benefits 3.8 times greater in monetary terms ($176.9 million vs $46.5 million). The differentials in value vary by beneficiary because of the differences in value of travel time as discussed earlier.

Table 2.6 Existing Conditions:
Comparison of the Travel Time Savings Benefits of LRT versus the 10th Avenue Station

	Travel Time Savings (Hours)		Travel Time Savings (millions 2011$)	
	LRT	10Av7	LRT	10Av7
Total	3,350,684	1,130,473	$165.4	$46.5
Workers (2 trips per day, 250 days per year)	1,913,717	484,925	$115.0	$25.1
Office Visitors (250 days per year)	138,567	19,800	$13.1	$1.9
Shoppers (312 Days per Year)	1,009,189	594,058	$32.9	$18.7
Theatergoers	105,678	25,360	$3.3	$0.8
University Students (250 days per year)	183,533	6,330	$1.1	$0.04

Source: Urbanomics

In the 2030 Buildout year the margin lessens, while the LRT continues to lead by a wide margin in terms of travel time savings, as shown in Table 2.7.

Table 2.7. Buildout Conditions:
Comparison of the Travel Time Savings Benefits of LRT versus the 10th Avenue Station

	Travel Time Savings (Hours)		Travel Time Savings (millions 2011 Dollars)	
	LRT	10Av7	LRT	10Av7
Total	4,168,909	1,648,716	$196.9	$71.9
Workers (2 trips per day, 250 days per year)	2,345,358	982,837	$132.9	$48.8
Office Visitors (250 days per year)	169,821	40,130	$15.1	$3.6
Shoppers (312 Days per Year)	1,362,405	594,058	$44.4	$18.7
Theatergoers	107,792	25,360	$3.4	$0.8
University Students (250 days per year)	183,533	6,330	$1.1	$0.04

Source: Urbanomics

While the annual monetary value of travel time savings for the LRT increases by 11 percent to $196.8 million under buildout conditions, the value of travel time savings from the 10th Avenue Station increases by 54 percent to $71.9 million. Even with full buildout, the time savings gained with the 10th Avenue Station are only one-third of the time savings gained the the LRT. The LRT

produces widespread gains over the whole corridor, far offsetting the gains produced by the 10th Avenue Station.

III. The Benefits of Property Value Enhancements

The Model in Brief

In 1993, results of a multiyear study on the relationship between land value and rail transit access in the New York Metropolitan Area were presented by Regional Plan Association to the Federal Transit Administration in a report entitled, *Transit Access and Land Value*.[4] Two economic models were developed during the course of this study, one of which, the *New York Station Area model* (*NYSTA*), was calibrated on the relationship between parcel-specific land values and the distance to public transit stations in New York City. This model, and updated values of the independent variables used to explain the portion of land value attributable to transit access, formed the basis for estimating the difference in property value of any given Study Area parcel when serviced by the proposed LRT system versus the existing transit system.

In its initial econometric formulation, *NYSTA* used multivariate regression analysis to explain land value relationships around 506 transit and commuter rail stations in the five boroughs of New York City. By doing so, it coupled a broad consideration of physical, transport, and socioeconomic variables with a fine grain geographic scale. Relationships were computed at the parcel level by distance from a station or a line; not by broad zonal averages. *NYSTA* solved for changes in market values based upon the reported sales of roughly one hundred thousand parcels, while transit inputs to the model were calibrated on actual operating characteristics of the system. The econometric approach was cross-sectional, rather than time-dimensional, providing the policy analyst with a 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 the multivariate regression equations to estimate land price functions by property type. The property types tested included: vacant land, family residential structures, walk-up and elevator apartment structures, office buildings and retail stores. While the choice of dependent variable in such an analysis was clear – i.e., the unit price of land -- the choice of independent variables necessitated a process of stepwise regression or incremental analysis of all possible explanatory factors. Given the magnitude of data assembled for *NYSTA*, the model was stratified by property type or land use, estimating separate equations for vacant land, residential buildings, offices and other commercial properties. For each such use, some 60 parcel-specific, neighborhood, and access-related factors were tested for their potential significance as independent variables in explaining parcel land value. Only high-rise residential uses failed to reveal an increase in unit land values as transit access improved.

[4] Anas and Armstrong, 1993.

Updates

In 2004, *NYSTA* was applied to all residential, commercial and vacant land properties within the ten block, river-to-river study area of **vision42**. All independent variables were updated with current values, including walking distance between each study area parcel and the nearest transit station, and the reported market value of each property type was acquired from the New York City Department of Finance. In 2011, a similar process was undertaken for vacant land, office and other commercial properties, assigning 2010 or 2011 values to independent variables , while the unit value of land was derived from the *2011 PLUTO File* of the New York City Department of City Planning on a parcel-specific basis. A separate econometric analysis of high-rise residential properties was undertaken, based upon New York City Department of Finance *2010 Rolling Property Sales*, as reported in *The Value of Transit Access to Residential Properties of Manhattan.*

The Current *NYSTA* Application

For the Study Area's nonresidential properties, current values were required of model variables on a parcel-specific or neighborhood basis for purposes of applying the *NYSTA* equations. Inclusion of each of the variables listed improves the R-squared of the equations. The number of parcels for which data was separately acquired is noted in the parentheses ( ):

- Vacant Land Parcels (***59 existing & 58 future vacant parcels***)
    - Land value per square feet of land area
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Airline distance to water in meters
    - Walking distance to nearest park in meters
    - Percent of households in Community District below poverty level
    - Employment of work places in Zip Code Area
    - Miles to Midtown Manhattan central business district (CBD)[5]
    - Transit minutes to Downtown CBD
    - Crime rate of Police Precinct for rape

- Office Building Parcels (***435 existing & 444 future office buildings***)
    - Land value per square feet of land area
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Percent of households in Community District below poverty level
    - Airline distance to water in meters
    - Employment of work places in Zip Code Area

[5] The CBD is defined as the area between 34th Street and 59th Street in Midtown Manhattan. The NYSTA model is calibrated for New York City as a whole; therefore, some variables that are integral to the equations may not seem relevant to our midtown study area, but they must be included.

- Retail Store Parcels (***161 existing & future commercial buildings with retail***)
    - Land value per square feet of land area
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Employment of work places in Zip Code Area
    - Percent of households in Community District below poverty level

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

- Land value per square feet of land area – New York City Department of City Planning *PLUTO* 11.V.1, Fiscal Year 2011. For each tax parcel, the portion of reported Market Value was assigned to Land Value based upon the share of Assessed Value Land in Assessed Value Total, and divided by the reported square footage.
- Walking distance in meters to subway station or LRT stop – ESRI *ArcGIS* calibration of distance from center of parcel to nearest existing or proposed #7 subway entrance and proposed LRT stop by tax parcel, using digitized parcel coordinates and MTA subway GIS layer.
- Airline distance to water in meters – measured by parcel to nearest river on ESRI *ArcGIS* software
- Walking distance to nearest park in meters – measured by parcel to nearest park on ESRI *ArcGIS* software
- Miles to Midtown Manhattan CBD – assumed to be zero (42nd & Fifth)
- Employment of work places in Zip Code area – New York State Department of Labor 2010 Qtr IV ES-202 employment data for zip zones
- Percent of households in Community District below poverty level – *2010 Census of Population*
- 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, 2010 data

NYSTA Model equations by land use, showing the intercept and coefficient values, are contained in the *Transit Access and Land Value* report. For each parcel of a given land use, the coefficients of the NYSTA equations were applied to the current values of all independent variables. The first application was based upon the difference in land value between walking distance to the nearest existing subway station and the proposed LRT stop, while the second application was based upon the difference in land value between walking distance to the nearest existing subway station and the enhanced subway system with the 10th Avenue #7 subway station. These equally structured applications thus allowed for a direct comparison between any LRT travel time savings advantages over the existing transit system and any expanded subway system advantages (without the LRT) over the existing system.

For each application, a value for the dependent variable was generated, explaining the incremental or decremental portion of land value attributable to the LRT or an added 10th Avenue station, over the existing subway access. The difference in either application was thus taken to represent the increase in property value attributable to either the LRT or the 10th Avenue station.

Modeling Future Office Conditions

Between 2012 and 2030, nine office building proposals, each with identifiable developers and existing sites, will likely be developed in the Study Area. This conclusion reflects the assumption that other pending office development proposed for the rest of Manhattan, which amounts to roughly 30 million square feet, will also likely precede given the on-going recovery of the economy and the expansion of office activity. Collectively, this proposed development and the completion of the World Trade Center office construction would result in less than three million square feet built each year or some 10,000 office jobs added annually, without the loss or vacancy of existing space.

As Table 3.1 shows, the designed scale of future Study Area office development amounts to 10.7 million aggregate square feet of floorspace and $5.6 billion of market value in current dollars. Market values of the improvements have been based on either reported values (Excell, United Nations) or the assumed development costs of $500 per square foot (except Vornado, which is expected to cost more because it is to be built over an operating bus terminal). Land values have been based on existing land assessments, although given the proposed developments, land values are likely to rise significantly. Five of the proposed developments have locations in the Hudson Yards, for which all or a portion of their taxable value may be liable for tax increment financing to pay for the #7 subway extension.

Table 3.1. Future Office Development in the Study Area (millions 2011$)

Office Development	Expected Completion	Square Feet	Market Value	Taxable Status
Extell Diamond Tower 55 W. 46th Street	2012	792,574	$386.9	taxable
United Nations Building 41st & First Avenue	2015	750,000	$500.0	exempt
Solow on Con Edison Site 40th & First Avenue	2020	1,000,000	$553.2	taxable
Vornado atop PABT 42nd & Eighth Avenue	2020	1,300,000	$668.6	taxable
Related in Hudson Yards Site 46	2025	1,925,675	$980.6	taxable*
Related in Hudson Yards Site 12	2025	1,651,550	$837.9	taxable*
Related in Hudson Yards Site 20	2025	1,196,874	$614.1	taxable*
Related in Hudson Yards Site 36	2030	578,590	$309.6	taxable*
Related in Hudson Yards Site 10	2030	1,520,151	$773.2	taxable*

(*) all or a portion liable for tax increment financing
Source: Urbanomics

The *NYSTA* model was applied to 444 future office buildings, assuming the nine proposed developments and the 435 existing office properties. Appropriate values were assigned to independent variables of the future office properties in a manner consistent with current conditions.

The Related Use of Office Property Data for Impacts on Rents and Occupancy

In a related use of the database and the property value results compiled for 435 existing office properties in the Study Area, a method was devised to estimate the impact of improved property value on increasing office asking rents and occupancy over the forecast period. This was performed for both applications. Based upon the real property data services of Cushman & Wakefield, the following information was attributed to office parcels in the Study Area, as of 2011:

- Rentable building area
- Square feet available, separately on direct and sublease basis
- Total vacancy rate
- Percent leased
- Typical floor plate
- Rent per square foot

Based upon leasing characteristics of office buildings, it was assumed that thirty percent (30%) of building space would turn over for occupancy between 2011 and 2015. 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 empirical evidence. New rents were applied to both turnover space and newly leased space for a measure of increased office rental income.

The Residential Property Model

A separate, but related analysis was conducted of single-family, walk-up and high-rise residential properties in the Study Area. NYSTA model equations calibrated on a citywide database of elevator apartments did not show a strong positive relationship between residential land value and transit access. However, since these relationships were modeled in the 1990s, considerable changes have occurred in residential property types and their locations in New York City. Given the current availability of property sales data from the New York City Department of Finance, a database was acquired of some 6,200 residential sales in Manhattan of condominium units, cooperative and rental apartment buildings over a 12-month period ending in 2010.

Similar to the NYSTA model, property values (determined by recent sales) per square foot of residential development were the dependent variable, and the independent variables were determined by a stepwise regression analysis of 35 potential factors. The output of econometric modeling was evaluated by several tests of statistical significance applied to each explanatory variable, including the t-Statistic and Probability, the R-squared, and the Durbin-Watson statistic.

By type of residential property, the following dependent and independent variables produced statistically reliable equations of the relationship between property value and transit access:

- 123 Family Homes
    - Price per Gross Square Foot
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Median household income in Public Use Microdata Area
    - Crime rate of Police Precinct for all crimes

- Walk-up Rental
    - Price per Gross Square Foot
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Median household income in Public Use Microdata Area, 2006-2008
    - Average travel time of workers in Public Use Microdata Area, 2006-2008

- Walk-up Condominium
    - Price per Gross Square Foot
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Average travel time of workers in Public Use Microdata Area, 2006-2008
    - Year built
    - Number of establishments in zip code area, 2008
    - Mean value of owner-occupied units in Public Use Microdata Area, 2006-2008
    - 3-year average weekday ridership of nearest station, 2007-2009

- Elevator Rental
    - Price per Gross Square Foot
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Mean value of owner-occupied units in Public Use Microdata Area, 2006-2008
    - Burglary crimes reported in precinct, 2009
    - Year built

- Elevator Condominium
    - Price
    - Walking distance in meters to:
        - Nearest subway station
        - LRT stop
        - Proposed 10th Avenue #7 station
    - Unit gross square feet
    - Year built

- Average weekday ridership of nearest station, 2009
- Robbery crimes reported in precinct, 2009

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

- Price, Price per Gross Square Feet, and Unit Gross Square Feet – New York City Department of Finance, Rolling Property Sales File, June 30, 2010, and New York City Department of City Planning *PLUTO* 11.V.1, Fiscal Year 2011. For each property, by tax block and lot identifier, the reported sales was matched with the reported unit or building square footage.
- Walking distance in meters to subway station or LRT stop – ESRI *ArcGIS* calibration of distance from center of parcel to nearest existing or proposed #7 subway entrance and proposed LRT stop by tax parcel, using digitized parcel coordinates and MTA subway GIS layer.
- Median household income – US Bureau of the Census, 2006-2008 American Community Survey, *Public Use Microdata Sample* File.
- Mean value of owner-occupied units -- US Bureau of the Census, 2006-2008 American Community Survey, *Public Use Microdata Sample* File.
- Year Built -- US Bureau of the Census, 2006-2008 American Community Survey, *Public Use Microdata Sample* File.
- Average travel time of workers -- US Bureau of the Census, 2006-2008 American Community Survey, *Public Use Microdata Sample* File.
- Crime rates: Total, Burglary, Robbery – 2009 New York City Police Department Crime Reports by Precinct
- Number of establishments – US Bureau of the Census, County Business Patterns, 2008
- Weekday ridership of nearest station – MTA, December & Full Year 2009 Subway Ridership Report

Residential model equations by property type, showing the intercept and coefficient values, are contained in the 2010 powerpoint entitled *The Value of Rail Transit Access to Residential Properties of Manhattan*. As the powerpoint will show, R-squared test results were greatest for the Elevator-Condominium property equation which explained 55 percent of residential unit prices. Based upon these results, the best-fit model was applied to 345 high-rise condo sales in the Study Area between July 1, 2009 and June 30, 2010, and subsequently to all high-rise residential properties in the Study Area under existing and future conditions. It was assumed that recently built rental high-rises would be valued in a similar manner because they were initially developed as condominiums, while the values of high-rise cooperatives, which tend to be older, were marked down consistent with reported sales differences between condos and co-ops.

Modeling Future Residential Conditions

Between 2012 and 2030, two significant areas of the Study Area will likely undergo residential development: the Con Edison site on First Avenue, and selected sites within the Hudson Yards between 37th and 41st Streets. Collectively, some 7,500 new residential units can be expected, comprising 4.8 million square feet of space in new condominium dwellings. In current dollars, given their size and locational differences, the units are predicted to have values of nearly $1,400 per square foot for the smaller Hudson Yards condos and $1,700 per square foot for the larger Con Edison units.

Table 3.2. Future Residential Development in the Study Area

Residential Development	Expected Completion	Square Feet	Units & Ave Unit Price (millions 2011$)	Taxable Status
Solow on Con Edison Site			2,939 units	
40th & First Avenue	2020	2,166,980	$1.25	taxable
Related in Hudson Yards			4,555 units	
Selected Sites	2030	2,619,692	$0.79	taxable*

(*) all or a portion liable for tax increment financing
Source: Urbanomics

Under future conditions, the best-fit residential equation was applied to some 29,000 future residential units, assuming the 7,500 Con Edison and Hudson Yards developments and the 21,500 existing residential units. Appropriate values were assigned to independent variables of the future residential properties in a manner consistent with current conditions.

Table 3.3. Office Rent Increase under Normal Occupancy(millions 2011$)

	With LRT Service	With 10th Avenue Station
Current Conditions	$12.7	$4.4
Buildout Conditions	$19.3	$10.6

A Comparison: The Value of One-Time Property Impact in Current Dollars

Under Existing Conditions:

With the provision of LRT service, the aggregate benefit of an asset increase in property values for nearly 600 commercial structures, some 21,500 residential apartments, and 59 vacant parcels in the Study Area is estimated at $4.92 billion in constant 2011 dollars under existing conditions. As Table 2.4 shows, with provision of a 10th Avenue station of the #7 subway line, but without LRT service, the comparable values are considerably less, or $1.04 billion in constant 2011 dollars. In relative terms, the LRT service is expected to generate a 9.3 percent increase in property values, while the 10th Avenue Station will create only a two percent rise. Value enhancements for all property types are greater under the LRT option, than the 10th Avenue station option, and for office buildings – where the benefit is greatest -- the LRT option triggers more than a tenfold increase in property values over the 10th Avenue station. Only the rental residential value increases are roughly comparable, as the new apartment buildings within easy walking distance of the 10th Avenue station would realize significant economic benefits.

Table 3.4. The Comparative Economic and Fiscal Benefits of Property Value Increases Under Existing Conditions, in millions$

With LRT Service:			
Property Type	**Increase in Property Asset Value in 2011**	**% Increase in Property Values**	**Property Tax Net Increase in 2011**
Total Commercial	**$3,138.61**	**10.91%**	**$45.52**
Office Buildings	$3,047.45	11.59%	$42.79
Commercial Bldgs with Retail	$11.13	0.52%	$0.52
Vacant Properties	$80.03	25.27%	$2.22
Total Residential	**$1,782.59**	**7.34%**	**$78.15**
Condominiums Units	$898.59	9.72%	$30.96
Cooperative Units	$403.97	9.54%	$18.38
Rental Apartments	$480.03	4.44%	$28.80
Grand Total	**$4,921.20**	**9.28%**	**$123.67**
With 10th Avenue Station of #7 Line but without LRT Service:			
Property Type	**Increase in Property Asset Value in 2011**	**% Increase in Property Values**	**Property Tax Net Increase in 2011**
Total Commercial	**$312.14**	**1.09%**	**$7.82**
Office Buildings	$283.07	1.08%	$7.19
Commercial Bldgs with Retail	$5.68	0.26%	$0.27
Vacant Properties	$23.39	7.39%	$0.37
Total Residential	**$729.78**	**3.01%**	**$29.42**
Condominiums Units	$319.13	3.45%	$4.82
Cooperative Units	$5.18	0.12%	$0.23
Rental Apartments	$405.47	3.75%	$24.36
Grand Total	**$1,041.92**	**1.97%**	**$37.24**

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 eight years of annual benefits in travel time savings for the LRT option. Although massive in dollar terms, this gain represents a fraction of the aggregate value of property in the Study Area. For example with the LRT option, the 435 office properties estimated to realize a $3.0 billion increase in asset value are currently worth $26.3 billion, for a 11.6 percent gain, while 161 commercial buildings with retail and 59 vacant parcels -- predicted to rise by $11.1 and $80 million -- are currently worth $2.1 billion and $300 million respectively in market value. For more than 21,500 residential units, whose aggregate market value is currently quite comparable to office buildings in the Study Area at $24.3 billion, the LRT benefits of $1.8 billion would represent a 7.3 percent increase in property values. Compared to

the empirical measures of property value increases taken around new LRT stations in the nation, these predicted gains are within the range of relative responses.

From a fiscal impact perspective, at current property tax rates of taxable assessed value, the LRT option would capture $123.7 million in property taxes on the property value gains of commercial and residential properties. By comparison, the 10th Avenue station of the #7 subway would likely attract $37.2 million, largely as a result of property value increases in new residential developments within walking distance of the station.

Under Future Conditions:

By 2030, with the provision of LRT service, the aggregate benefits of an asset increase in property values for some 650 commercial structures, fully 29,000 residential apartments, and 58 vacant parcels in the Study Area is estimated at $7.59 billion in constant 2011 dollars for an increase of 54 percent over existing conditions. As Table 2.5 shows, with provision of a 10th Avenue station of the #7 subway line, but without LRT service, the comparable values continue to be considerably less, or $2.66 billion in constant 2011 dollars, although the rate of growth is greater at 155 percent. This is so because the development of office buildings in the Hudson Yards will benefit substantially from access to the 10th Avenue station of the #7 subway, a benefit which will also be conveyed by the LRT.

In relative terms under future conditions, the LRT service is expected to generate an 11.5 percent increase in property values across the Study Area while the 10th Avenue Station will advance property values by a four percent rise. Value enhancements for all property types will continue to be greater under the LRT option, and the incremental gains of any property type over their existing conditions will also favor the LRT service. Whereas property value benefits increase by $2.7 billion in constant dollars as a result of the LRT in the future, they rise by $1.6 billion with the 10th Avenue station, despite the heavy concentration of new development on the West Side.

Table 3.5. The Comparative Economic and Fiscal Benefits of Property Value Increases Under Future Conditions in Millions$

With LRT Service:			
Property Type	**Increase in Property Asset Value in 2011**	**% Increase in Property Values**	**Property Tax Net Increase in 2011**
Total Commercial	**$5,037.01**	**14.70%**	**$128.48**
Office Buildings	$4,951.20	15.52%	$125.99
Commercial Bldgs with Retail	$11.13	0.52%	$0.52
Vacant Properties	$74.68	28.34%	$1.97
Total Residential	**$2,554.39**	**8.09%**	**$121.58**
Condominiums Units	$1,670.39	10.13%	$74.39
Cooperative Units	$403.97	9.54%	$18.38
Rental Apartments	$480.03	4.44%	$28.80
Grand Total	**$7,591.40**	**11.53%**	**$250.06**
With 10th Avenue Station of #7 Line but without LRT Service:			
Property Type	**Increase in Property Asset Value in 2011**	**% Increase in Property Values**	**Property Tax Net Increase in 2011**
Total Commercial	**$1,630.67**	**4.75%**	**$69.01**
Office Buildings	$1,601.59	5.02%	$68.37
Commercial Bldgs with Retail	$5.68	0.26%	$0.27
Vacant Properties	$23.39	8.88%	$0.37
Total Residential	**$1,027.21**	**3.25%**	**$43.73**
Condominiums Units	$616.57	3.75%	$19.13
Cooperative Units	$5.18	0.12%	$0.23
Rental Apartments	$405.47	3.75%	$24.36
Grand Total	**$2,657.88**	**4.03%**	**$112.74**

Source: Urbanomics

A Comparison: The Value of Annual Property Income in Current Dollars

Unlike the benefits of increases in the asset value of property attributable to transit access, which are one-time occurrences, the benefits of increases in the income value of property is recurrent. For 435 existing office properties and 444 future office developments, a method of estimating annual impacts on office rents and occupancy was applied, as previously described.

Assuming normal occupancy of 94 percent, under existing conditions the improvement in property values associated with LRT access can be expected to produce a $12.7 million increase in annual rents among 435 office buildings, while comparable conditions associated

with the 10th Avenue station will generate only a $4.4 million increase in office rents. Under future conditions, the disparity in benefits will persist, as the annual increase in office rents will rise to $19.3 million under the LRT option and to $10.6 million under the 10th Avenue station option.

IV. Other Benefits: Retail, Hotel, Theater

This section summarizes the benefits accruing due to increased retail shopping, hotel occupancy and theater attendance due to the **vision42** LRT. A full discussion of the fieldwork performed and updates to the data may be found in Appendix B. The modeling of economic benefits was updated to reflect these changes in floorspace, rooms and seats.

Similar benefits of the 10th Avenue Station were not able to be estimated.

Retail and Restaurants

A census of ground floor retail establishments and restaurants for the entire length of 42nd Street was performed during the mid-week of January 9, 2012. The street survey identified 129 active retail establishments, encompassing 63 food establishments and 66 purveyors of goods and services. In addition, the survey counted 17 arts and entertainment establishments, seven travel and accommodation providers, three fitness and sport centers, three amusement and gaming establishments, and 30 vacant properties.

Compared to survey findings in 2006, the total number of retail storefronts grew by 5.3 percent over the last five years, from 151 to 159. The number of active retailers increased from 151 to 159, with a growth rate of 8.4 percent. The number of food establishments grew by eight businesses (14.5%) and the number of purveyors of goods and services expanded by two businesses (3.1%). Arts and entertainment establishments decreased by three businesses (-15.0%), while the number of amusement and gaming establishments grew from two to three businesses. Additionally, the number of vacant retail units increased by five parcels (20.0%).

As seen in Table 4.1, although 28 new active retailers opened up along 42nd Street, high business turnover resulted in 18 closures. Despite changes in ownership, the total number of active retailers grew by ten establishments during the five year period to a total of 129 establishments. Among all active retailers, 98 establishments saw no change in services, although some saw change in ownership or location. Three active retailers changed the type of retail services offered and two active retailers were converted to commercial banks.

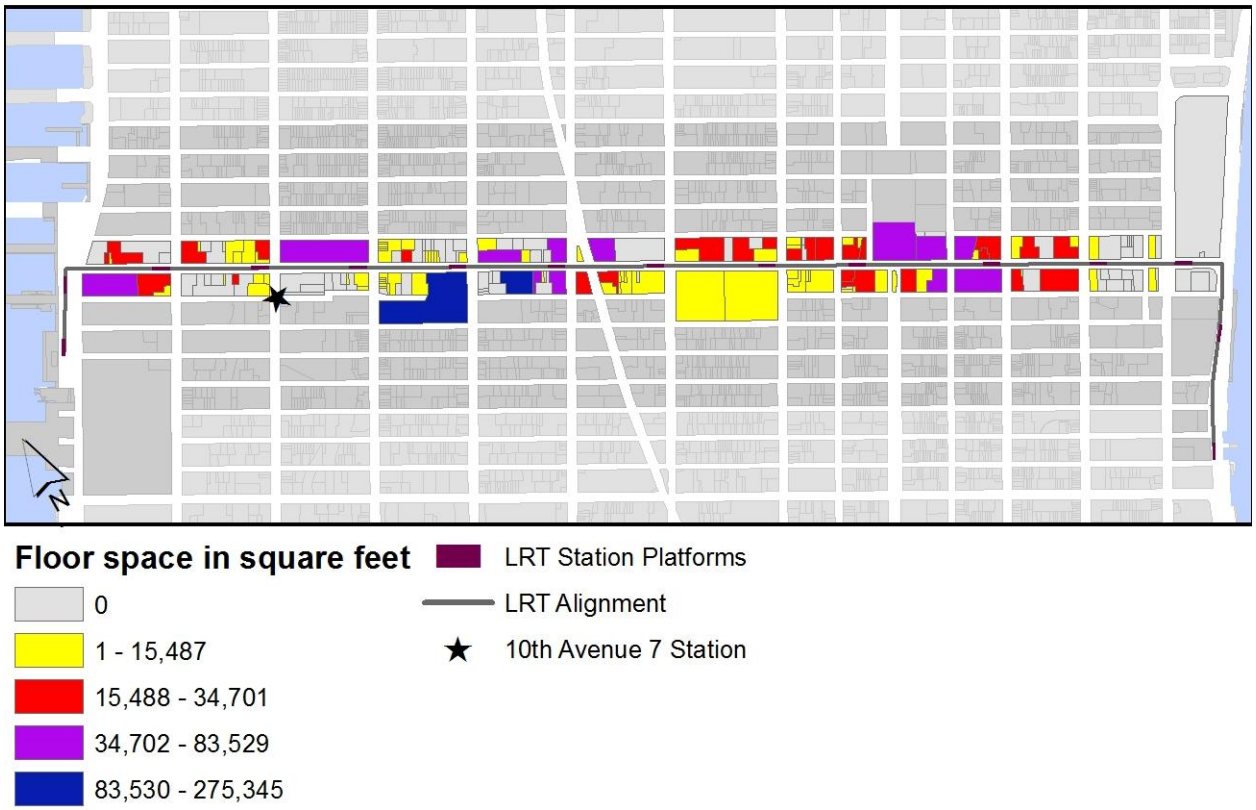
Table 4.1. Active Retailer Trends, 2006-2011

Land Use Trend	Storefronts	Percent
new establishments	28	21.1%
no change in retail use	98	73.7%
change in retail use	3	2.3%
replaced by non-retail commercial establishment	2	1.5%
vacant in 2012	2	1.5%
Total	**133**	**100.0%**

Figure 4.1 shows the distribution of retail floorspace along 42nd Street.

Figure 4.1

Retail Floor Space, 2011



Retail Rents

The study area encompasses four distinct retail markets, (Midtown West, Midtown East, Times Square, and Grand Central). Generally, asking rents for ground floor retail spaces increase with pedestrian traffic. Based on retail real estate tracking reports from Cushman & Wakefield, asking rents in Times Square continued to climb in 2011, a result of high pedestrian traffic and the large but relatively few retail properties available. In that area, average asking retail rents increased from $350-$400 per square foot in 2006 to $1,052 per square foot in 2011(253%). The highest rents in the study area are located on Broadway where the space currently occupied by TGI Friday's is asking for $2,200 per square foot. In areas with lower pedestrian traffic such as 5th Avenue, average asking retail rents increased from $300 per square foot in 2006 to $888 in 2011 (220%). Recent trends indicate that rents along 5th Avenue are growing at a faster rate than in Times Square. Between 2010 and 2011, retail rents increased by 65 percent along 5th Avenue between 42nd Street and 49th Street, while in Times Square, rents increased by 40 percent.

Based on retail tracking reports from CBRE, a commercial real estate services firm, smaller retailers along 42nd Street paid considerably lower rents. Retailers such as Rize and Sunglass Hut

paid between $220 and $265 per square foot for locations near Grand Central while Aldo paid $727 per square foot for a Times Square location. These trends indicate that if retailers are capable of paying higher rents in the study area, they are also generating higher growth in sales. Should the LRT produce the expected rise in pedestrian traffic, retailers should generate higher sales, and retail rents will continue to grow in the future.

Increased Retail Sales due to the LRT

LRT

The Phase Two Economic Study (http://www.vision42.org/about/documents/vision42retail_061115.pdf) included extensive interviews with and surveys of retail and restaurant owners and managers on 42nd Street. 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 2011, this yields a total average daily sales of $0.47 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 2011.[6]

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 a fiscal benefit 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.

10th Avenue Station

The impact of the 10th Avenue Station, if any, on 42nd Street retailers has not been determined.

[6] This estimate was corroborated using ESRI Business Analyst for retail sales on 42nd Street for 2010 at $1.1 billion.

Theaters

Along 42nd street, there are 12 theaters with a total of 24 stages and 8,136 seats. The largest of the theaters, Foxwoods (1,813), New Amsterdam (1,747), and American Airlines (740), are classified as "Broadway" theaters based upon house sizes of at least 500 seats. The remaining nine theaters include 17 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), Little Shubert (499), the Duke on 42nd Street (199), and Laurie Beechman (100). The Manhattan Repertory Theatre (40) is the only Off-Off Broadway house with a single stage. Additionally, there are four theater complexes with Off-Broadway and Off-Off Broadway stages. Those include Theater Row with six stages (639), Playwrights Horizons with two stages (326), the Signature Theater with three stages (684), and the Times Square Arts Center with five stages (850) as seen in Table 4.2.

Table 4.2. 42nd Street Theaters by Number of Stages and Seats

Establishment	Stages	Seats
American Airlines	1	740
Duke on 42nd Street	1	199
Foxwoods	1	1,813
Laurie Beechman	1	100
Little Shubert	1	499
Manhattan Reperatory Theater	1	40
New Amsterdam	1	1,747
New Victory	1	499
Playwrights Horizons	2	326
Signature Theater	3	684
Theater Row	6	639
Times Square Arts Center	5	850
Total	**24**	**8,136**

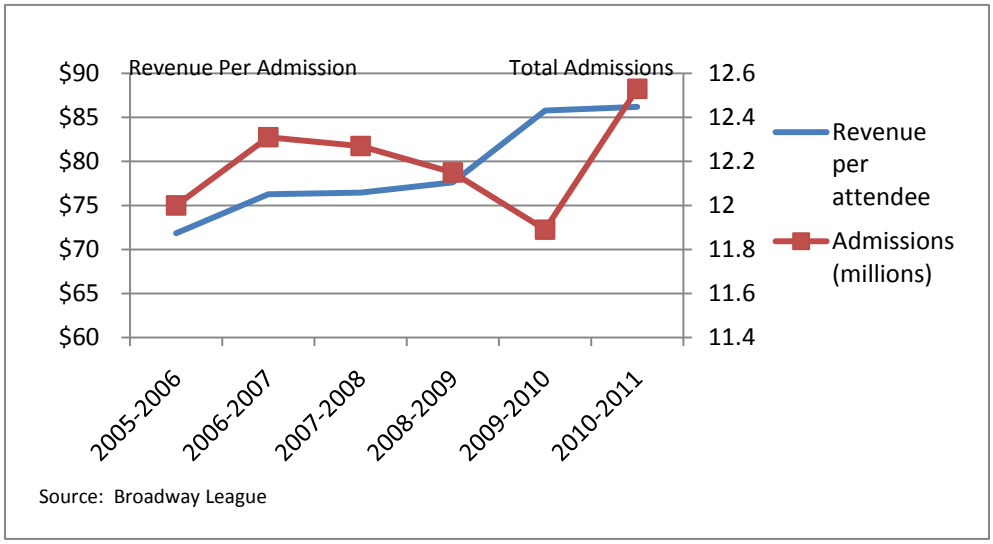
Compared with survey data collected in 2006, 42nd Street increased seating availability by 18.4 percent (1,498) in all theater categories. Off-Broadway theaters added the largest number of seats (1,357), while Broadway and Off-Off Broadway theaters added 100 seats and 41 seats, respectively. The increase in Off-Broadway theaters can be attributed to the Signature Theater Company's 2011 opening of the Signature Center with three stages and 684 seats, as well as the opening of the Times Square Arts Center with four stages and 785 seats as seen in Table 4.3 on the following page.

Table 4.3. 42nd Street Seating Capacity Change, 2006-2011

Theater Type	42nd Street Theaters 2006	2011	Seating Capacity Change, 2006-2011 Number	Percent
Broadway	4,200	4,300	100	2%
Off-Broadway	2,221	3,578	1,357	61%
Off-Off-Broadway	217	258	41	19%
Total	**6,638**	**8,136**	**1,498**	**18.4%**

Within the study area, there are 48 theaters with a total of 72 stages and 38,578 seats. Of those, there are 25 Broadway theaters with 31,634 seats, 28 Off-Broadway stages with 5,875 seats, and 19 Off-Off Broadway stages with 1,069 seats. Compared with survey data collected in 2006, seating capacity in the study area increased by 2,268 seats (6.2%) with the addition of 1,111 Broadway seats, 827 Off-Broadway seats, and 330 Off-Off-Broadway seats. The increase in Broadway seats is partially attributed to the opening of the Stephen Sondheim Theater in 2010 with 1,055 seats, while the opening of the Tank and Roy Arias Studios added an additional 336 Off-Off Broadway seats.

Figure 4.2. Broadway Gross Ticket Revenue per Admission and Total Admissions, 2005-2011[7]

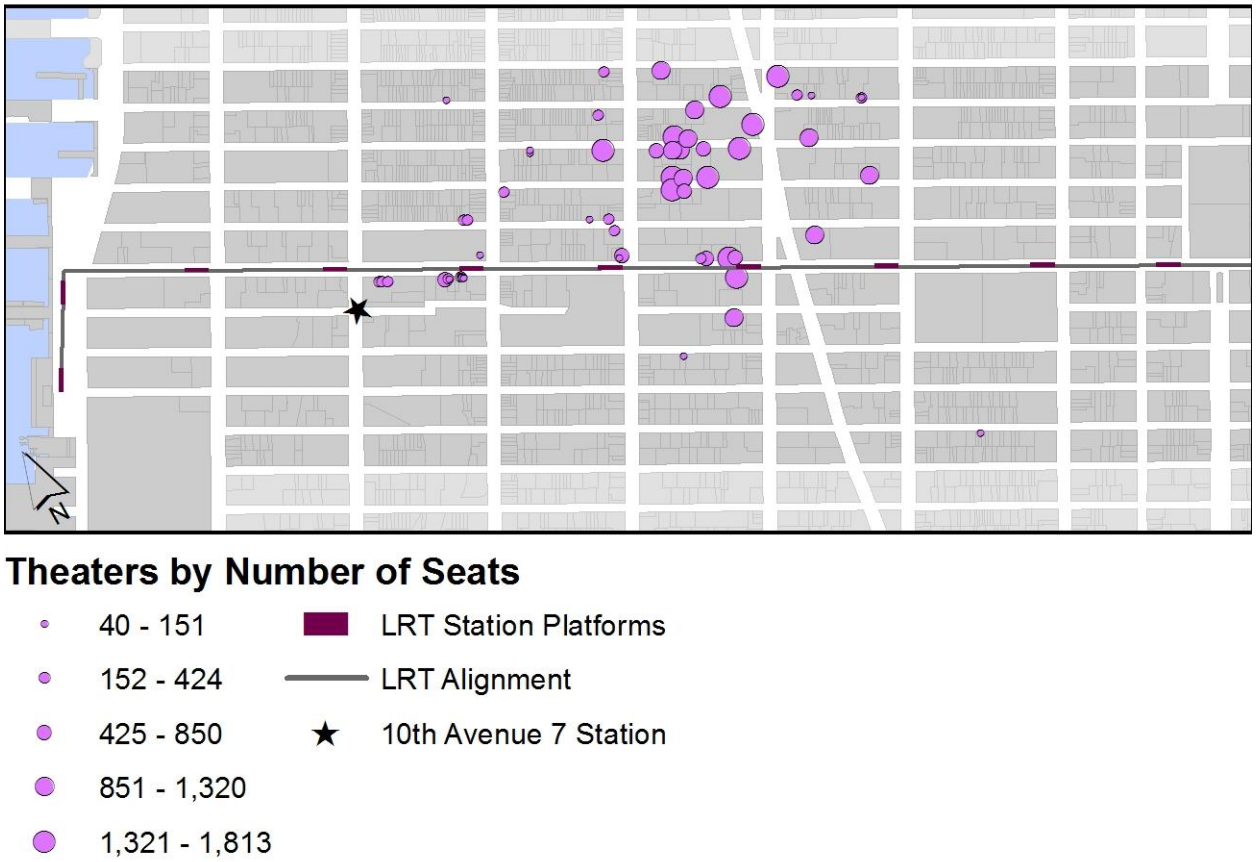


Since the 2005-06 theater season, annual admissions levels at Broadway theaters have fluctuated between 11.9 and 12.5 million visitors, with an increase in admissions of 530,000 (4.4%) between 2005-06 and 2010-11 seasons. In that time span, total revenue per ticket sales has grown steadily from an average of $72 dollars to $86 dollars (19.4%).

[7] Beginning with the 2009-10 season, Broadway League revenue per attendee represent total revenues and "Attendance" represents total attendance. For seasons prior, these numbers represent net revenues and paid attendance, respectively.

Figure 4.3 shows the distribution of theaters in the study area by size of house.

Figure 4.3



Increased Theater Revenues due to the LRT

LRT

The Phase Two Economic Study determined through interviews with theater 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 $25.7 million in additional theater revenues each year.

10th Avenue Station

The impact of the 10th Avenue Station on study area theaters has not been estimated.

Hotels

On 42nd Street

Along 42nd Street, there are seven hotels with street level entrances. These hotels include 4,536 rooms with guest room capacities per hotel ranging from 160 to 1,311 rooms. Three of the hotels, the Grand Hyatt (1,311 rooms), Hilton - Manhattan East (300 rooms), and the New York Helmsley (773 rooms) are located east of 5th Avenue. The average size of these hotels is 795 rooms. West of 5th Avenue, there are four smaller hotels with an average of 538 rooms. These hotels include Yotel New York (669 rooms), the Hilton - Times Square (460 rooms), Travel Inn (160 rooms) as well as the Westin - Times Square (863 rooms), whose primary motor vehicular entrance is on 43rd street. Since 2006, 42nd Street has increased its hotel room capacity by 15.3 percent (603 rooms) with gains attributed to the 2011 opening of Yotel New York.

Table 4.4. 42nd Street Hotels by Number of Rooms, 2011

Establishment		Rooms
Grand Hyatt New York		1,311
Helmsley Hotel		773
Hilton Manhattan East		300
Hilton Times Square		460
Travel Inn		160
Westin New York - At Times Square		863
Yotel New York		669
Total Rooms	2006	3,933
	2012	4,536
Hotel Capacity Change, 2006-2012	Number	603
	Percentage	15.3%

Study Area

In the study area as a whole, there are 81 hotels with a capacity of 22,771 rooms. The total number of rooms per hotel varied from 1,949 rooms at the New York Marriot Marquis to 22 rooms at the French Quarters Guest Apartments, with an average size of 245. Between 2006 and 2011, the number of hotel rooms increased by 5,817 rooms (34.3%), a result of several hotel openings south of 42nd street between 12th and 7th avenues. Hotels in the study area located beyond 42nd street increased room capacity at a higher rate (39.7%) than along 42nd street with the addition of 20 new hotels and 5,164 rooms.

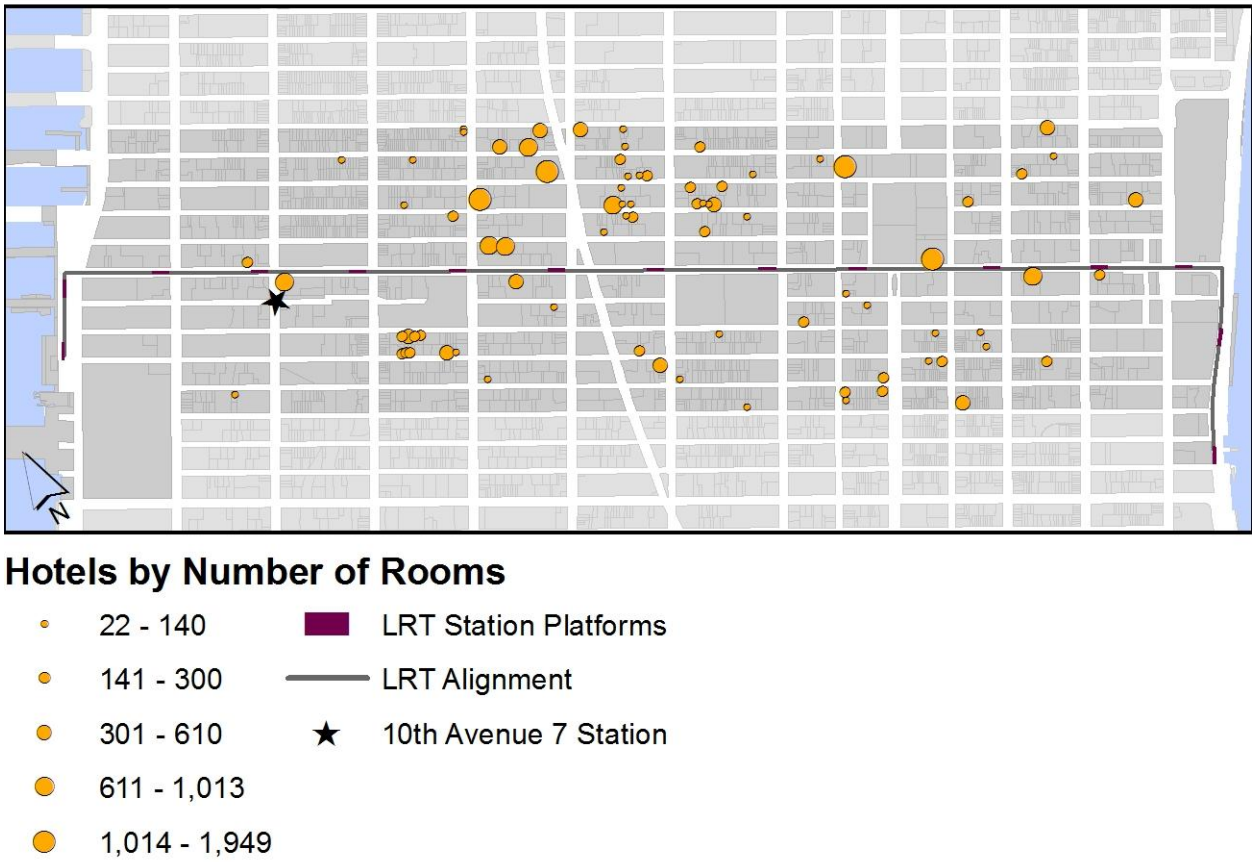
Table 4.5. New Hotels Constructed since 2006: 37th Street to 47th Street

New Hotels Constructed Since 2006					
Establishment				**Rooms**	**Neighborhood**
Americana Inn				54	Grand Central
Cassa Hotel				166	Grand Central
Fairfield Inn - Fifth Avenue				92	Grand Central
Gotham Hotel				66	Grand Central
Candlewood Suites - Times Square				188	Midtown West
Comfort Inn - Theatre District				70	Midtown West
Comfort Inn - Times Square South				78	Midtown West
Distrikt Hotel				155	Midtown West
Econo Lodge - Times Square				50	Midtown West
Element - Times Square West				411	Midtown West
Fairfield Inn - Times Square				244	Midtown West
Four Points By Sheraton - Times Square				244	Midtown West
Hampton Inn - Times Square South				184	Midtown West
Holiday Inn Express - Times Square				210	Midtown West
Intercontinental Hotel				242	Midtown West
Staybridge Suites - Times Square				310	Midtown West
Yotel New York				669	Midtown West
Residence Inn by Marriott - Times Square				357	Penn Plaza
AKA - Times Square				105	Times Square
Chatwal Hotel				83	Times Square
Hotel Mela				230	Times Square
Millennium Premier Hotel				125	Times Square
Sanctuary Hotel				111	Times Square
Hotel Capacity Change, 2006-2012				Hotel Capacity Change Attributed To	
2006	2012	Number	Percentage	New construction	renovation/expansion
16,954	22,771	5,817	34.3%	4,444	1,373

Note: Several hotels were not counted in the 2006 survey and may have been under renovation or closed for various reasons during that time. Those hotels in question include Hotel Edison (900), Millennium Broadway (625), New York Inn (35), French Quarters Guest Apartments (22), and the Alex Hotel (203).

Figure 4.4 shows the location of all hotels in the study area by size.

Figure 4.4.



Occupancy Rates

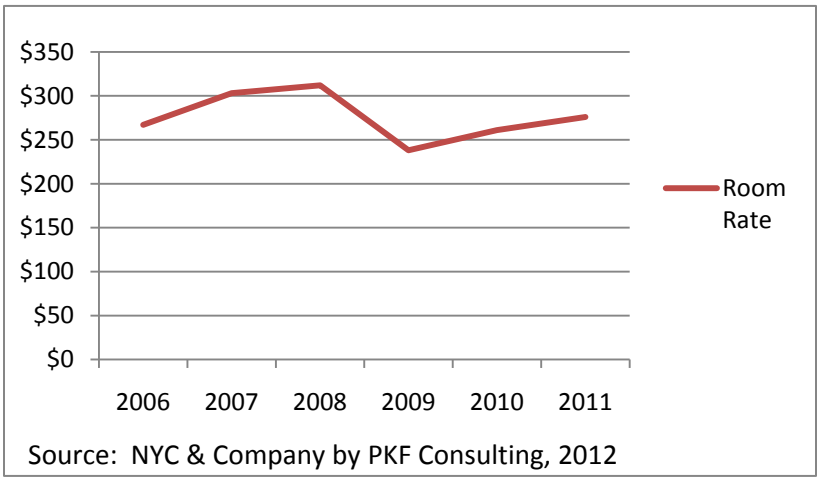
In the years from 2006 until 2008, average annual occupancy levels throughout Manhattan steadily climbed to near record levels at 86.0 percent; however by the end of 2008, occupancy levels dropped by nearly 5.0 percent. Since the official end of the recession in June 2009, Manhattan hotel occupancy rates have aggressively climbed near 2006 levels. Over the 5-year period between 2006 and 2011, occupancy rates declined by one percent from 84 percent in 2006 to 83 percent in 2011. Hotels in Times Square slightly outperformed Manhattan hotels overall, while Midtown East and Uptown hotels lagged behind. According to Smith Travel Research, the average annual occupancy rate of medium- to large-scale hotels in Times Square decreased by 0.7 percentage points from 84.8 percent in 2006 to 84.1 percent in 2011. Comparatively, in Midtown East and Uptown, the occupancy rate declined by 2.3 percent, from 84.2 percent to 81.9 percent.

Figure 4.5. Long-Term Occupancy Levels in Manhattan – 12-Month Moving Average

Source: HVS, STR Global, and National Bureau of Economic Research

Over the last five years, average hotel room rates in New York City rose and declined in pace with the recession, increasing by 3.4 percent from $267 to $276 between 2006 and 2011. During the two year period between 2006 and 2008, average room costs increased by 31 percent from $267 dollars to $312 dollars per day. By 2009, hotel room rates had fallen by 23 percent. According to Price Waterhouse and Coopers & Lybrand, hotel room rates in Midtown East, at $296 per room, were among the highest in Manhattan, increasing 6.6 percent from 2010 to 2011. In Midtown West and Midtown South, 2011 hotel room rates were slightly lower than New York City as a whole, at $267 and $214, respectively.

Figure 4.6. Average Daily Room Rate New York City, 2006-2011



Increased Hotel Occupancy due to the LRT

LRT

There are currently 4,536 hotel rooms located in hotels on 42nd Street, applying the average occupancy rate (84%) and room rate ($267 per night), it is estimated that 42nd Street hotels have $1.0 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 $24,222 in revenues per day, or $8.8 million per year.

Hotel sales are taxable under New York City (4.5%) and New York State (4.0%) sales taxes as well as New York City Hotel Room Occupancy Tax ($2 per room per night + 5.875%). The total fiscal benefits of increased occupancy is projected to be $1.3 million: $396,000 in New York City sales tax, $352,000 in New York State sales tax and $583,000 in New York City Hotel Occupancy tax.

10th Avenue Station

The impacts of the 10th Avenue Station on 42nd Street hoteliers have not been estimated.

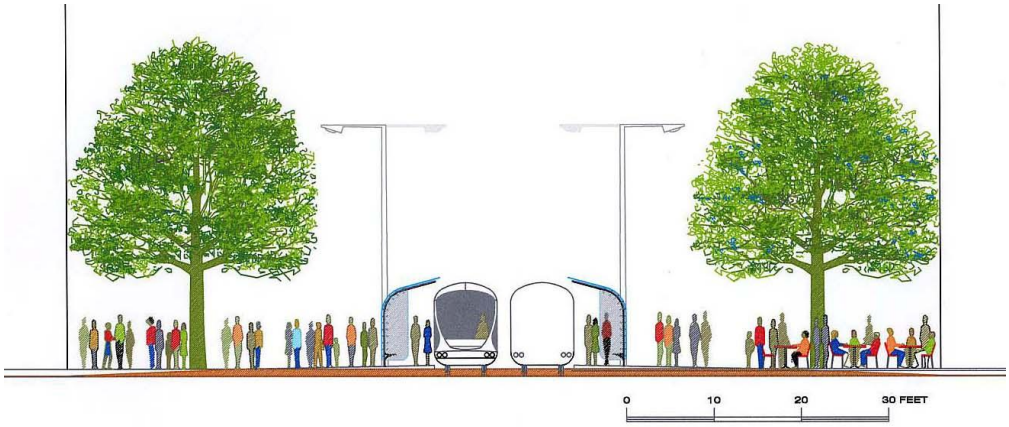
Parks and Open Space

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.

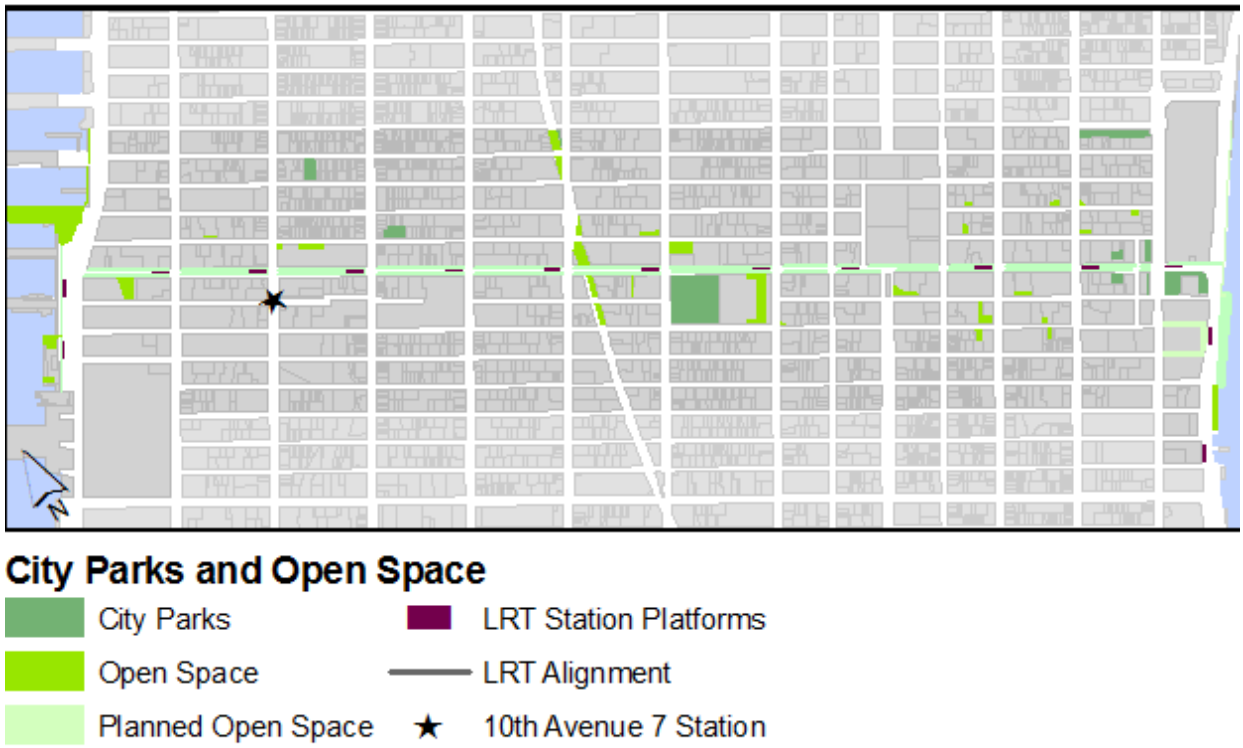
DOT's conversion of roadway sections into pedestrian malls along Broadway in Times Square and Herald Square are exemplary success stories of the benefits of urban place making for pedestrians. According to DOT's Green Light for Midtown Report, increased sidewalk area and pedestrian space has improved 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 4.7 below.

Figure 4.7: 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 4.8.

Figure 4.8



V. LRT & 10th Avenue Station Costs

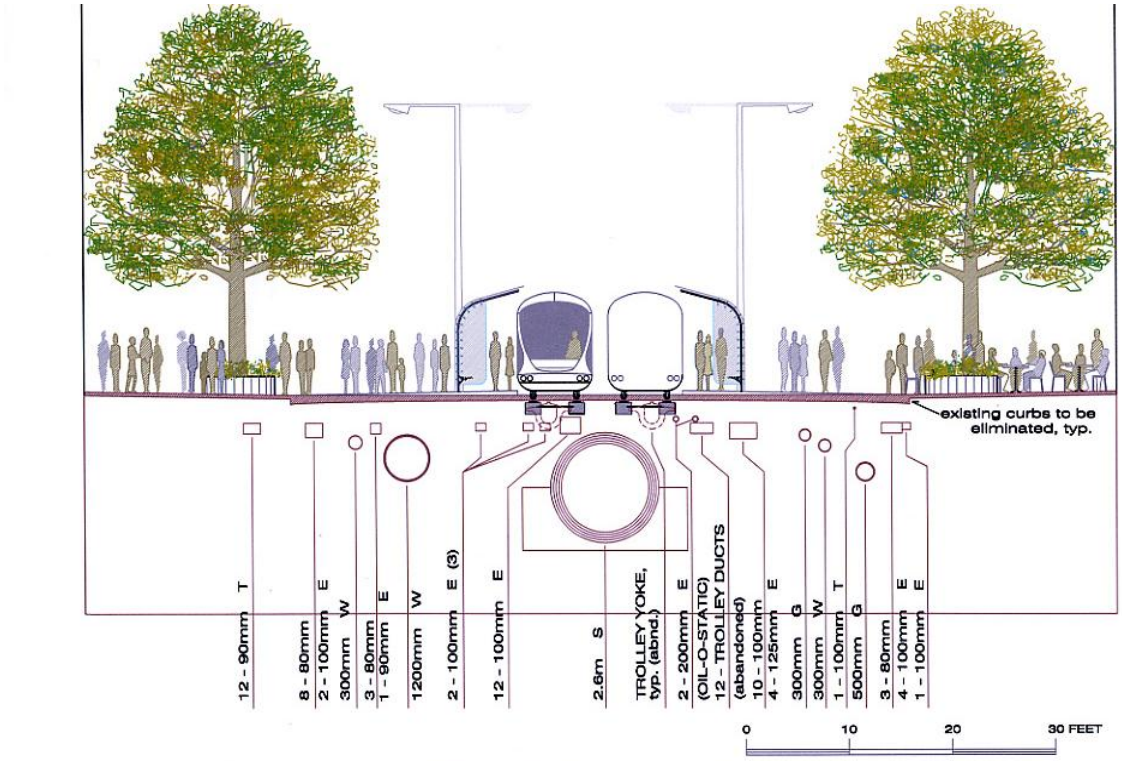
Construction Costs

Initial construction costs and the required financing are the greatest hurdle for any infrastructure improvement. However, each improvement is an investment with an economic return and should be thought of as such. In this section we will examine the costs of the **vision42** light rail and the 10th Avenue Station.

LRT Option Costs

Construction cost estimates for the 16-stop, 2.5-mile river-to-river light rail were prepared by Halcrow, LLC for **vision42** in Technical Study 3: *Construction and Cost Estimates* in 2005, and updated to 2007$ in the *Updated Cost Estimate* memorandum found on the **vision42** website http://www.vision42.org/about/studies.php#cost. As described in more detail in these memoranda, the estimates include system construction, landscaping and utility replacement. The construction costs of the LRT depend upon the type of light rail system and the utility replacement requirements as determined by Con Ed. Utility replacement or modification is the largest share of any of these options, because, as seen in the following image, the 42nd Street is a conduit for many different utilities.

Figure 5.1



VISION42 - CROSS SECTION THROUGH UTILITIES AT 10TH AVENUE

Three construction scenarios were estimated:

- conventional catenary system power supply, requiring full utility replacement
- self-propelled vehicles using fuel cell technology or nickel cadmium batteries, requiring full utility replacement
- self-propelled vehicles with beams (instead of a continuous slab) supporting the rails, to limit the diversion of the sewer mains and some of the other utilities

Updates

The estimates for each system type have been recalculated to 2011 dollars using ENR's Construction Cost Index (CCI) for New York City on an annual basis from 2008 to 2011. Described in terms of percent change over prior year, the CCI has ranged from high of 4.53% in 2008 to a low of -0.46% in 2009; with the index rebounding in 2010 and 2011 with rates of 3.53% and 3.63% respectively.

Current Cost Estimates

As seen in Table 5.1, estimated construction costs range from $459.1 million for the self-powered light rail with minimum utility work, to $650.1 million for the self-powered LRT with full utility replacement. In each case, utility relocation is the greatest share of the work, ranging from $240 million for the minimal relocation required $406 million for full replacement.

Table 5.1-Estimate of Capital Costs for Alternative LRT Options (Millions 2011$)*[8]

Component	catenary system, full utility replacement	self-powered LRT, full utility replacement	self-powered LRT, min. utility work
Utility Relocation	$406.3	$406.4	$240.3
All Other Work	$228.3	$243.7	$218.8
Net Capital Costs	$634.6	$650.1	$459.1

Source: Halcrow, Updated to 2011$ by Urbanomics using ENR CCI

Regardless of chosen system, the construction may be phased in such a way that there is minimal disruption of street access.

10th Avenue Station Costs

There are currently no formal estimates of construction costs for the 10th Avenue Station of the Number 7 Line extension because no immediate plans for construction are underway. However, informal conversations with MTA have indicated that the station would likely cost $750 million.

[8] 2007 Halcrow Construction cost estimate updated to 2011$ using ENR CCI on an annual basis.

Other considerations on construction of the 10th Avenue Station include the fact that, while the track is being laid, the construction of the station once the service on the extension has begun will necessitate interruptions to service.

Retail Sales Lost During Construction

LRT

The Phase Two Economic Study (http://www.vision42.org/about/documents/vision42retail_061115.pdf), included extensive interviews with and surveys of retail and restaurant owners and managers on 42nd Street. Based upon their understanding of the construction process, they expected sales losses during the six month period of LRT construction on a street segment basis. Although sidewalks will be open and bus service available, they reported expected losses ranging from under 10 to 25 percent or more over the period due to the disruption.

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 2011, this yields a total average daily sales of $0.47 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 2011.[9]

An average estimate of loss at 22 percent of daily store sales over the 6-month construction period would represent a one-time $145.2 million aggregate sales loss for all stores across 42nd Street under current conditions.

10th Avenue Station

There are no expected retail sales losses to be sustained due to the 10th Avenue Station construction.

Annual Operating Expenses

LRT Operating Expenses

The annual operating expenses of the LRT are estimated to be slightly lower than existing M42 bus service, which will be displaced. This difference yields a net benefit of $0.1 million per year (in 2011$) for a system with three times the capacity of the existing bus service.

10th Avenue Station Operating Expenses

While a new station will result in a modest increase in operating costs for lighting, ventilation and maintenance, no estimate is available.

[9] This estimate was corroborated using ESRI Business Analyst for retail sales on 42nd Street for 2010 at $1.1 billion.

Annual Traffic Diversion and Delivery Costs

LRT

The construction of the LRT and the pedestrianization of 42nd Street will have costs in terms of extended delivery times and traffic diversions.

As a consequence of the closure of 42nd Street to auto and truck traffic, approximately 150 hand freight entrances will experience average delivery time increases of 3:44 minutes per an average of four daily deliveries, as estimated by Sam Schwartz, LLC, traffic engineers. Originally estimated at an annual cost of $253,300 in 2007, the current cost of delivery delays adjusted for inflation is $274,797 per year.

Table 5.2-Estimate of Diversion and Delivery Costs for the LRT Options (Millions 2011$)*[10]

Increased Costs of Traffic Diversion*	$88.9
Increased Costs of Deliveries*	$0.3
Total Costs	$89.2

Source: Urbanomics and Sam Schwartz, LLC. Updated to 2011$ CPI

10th Avenue Station

There are no expected traffic diversions or delivery costs to be incurred by the 10th Avenue Station.

Accident Reduction

Most accidents on 42nd Street are caused by vehicles during turns onto or off of the street. Based upon the original Economic Study prepared by Urbanomics for **vision42**, it was estimated that $1 million is expended annually on health care costs for pedestrians injured in motor vehicle accidents on 42nd Street. Updated for inflation, that cost increases to $1.3 million.

The construction of the LRT and the subsequent pedestrianization of 42nd street would eliminate the primary cause of vehicular accidents and save some $1.3 million each year.

10th Avenue Station

With construction of the 10th Avenue Station there are no expected reductions in number of accidents caused by turning on to or off of the street.

[10] 2007 Halcrow Construction cost estimate updated to 2011$ using ENR CCI on an annual basis.

VI. A Cost-Benefit Comparison of Investment in vision42 vs. 10th Avenue Station

This chapter summarizes and compares all of the costs and benefits enumerated in the preceding chapters.

Non-Recurring Impacts

As seen in Table 6.1, the benefits of the LRT investment, regardless of cost, exceed the benefits of the 10th Avenue Station by 6 to 1 for those events that occur only once.

Table 6.1: Comparison of Non-Recurring Costs and Benefits (Millions 2011$)

	LRT				10th Avenue Station	
	Catenary	**Self-Propelled Slab**	**Self-Propelled Rail**			
Net	**$6,175.6**	**$6,144.6**	**$6,526.6**		**Net**	**$1,160.0**
Capital Costs	($634.6)	($650.1)	($459.1)		Capital Costs	($750.0)
Utility Relocation	*($406.3)*	*($406.4)*	*($240.3)*			
All Other Work	*($228.3)*	*($243.7)*	*($218.8)*			
Property Value Increases*	$7,590.0	$7,590.0	$7,590.0		Property Value Increases*	$2,660.0
Retail Loss due to Construction	($145.2)	($145.2)	($145.2)		Retail Loss due to Construction	$0.0

*Under 2030 full buildout. (Under existing conditions, that is, with no further development, the LRT property value increase would be $4.92 Billion and the 10th Avenue Station, $1.04 Billion.)

Annual Impacts

Table 6.2, below, provides a side-by-side comparison of the annually recurring economic and fiscal costs and benefits of the two proposed infrastructure investments under both existing conditions and in the Buildout Year.

Table 6.2-Comparison of Annual Costs and Benefits (Millions 2011$)

	LRT			10th Avenue Station	
	Existing	**Buildout**		**Existing**	**Buildout**
Net Annual Impacts	**$575.8**	**$617.9**		**$50.9**	**$82.5**
Travel Time Savings	$165.5	$196.9		$46.5	$71.9
Office Rent and Occupancy	$12.7	$19.3		$4.4	$10.6
Accident Reductions	$1.3	$1.3		$0.0	$0.0
Operational Savings	$0.1	$0.1		$0.0	$0.0
Increased Business Revenues	$489.5	$489.5		$0.0	$0.0
Retail	$455.0	$455.0		$0.0	$0.0
Hotel	$8.8	$8.8		$0.0	$0.0
Theaters	$25.7	$25.7		$0.0	$0.0
Traffic Diversion	($88.9)	($88.9)		$0.0	$0.0
Delivery Costs	($0.3)	($0.3)		$0.0	$0.0
Annual Fiscal Benefits	***$152.2***	***$278.5***		***$37.2***	***$112.7***
NYC Property Taxes	$123.7	$250.1		$37.2	$112.7
Other NYC Taxes	$14.7	$14.7		$0.0	$0.0
Sales (including sales Tax on hotels)	$14.1	$14.1		$0.0	$0.0
Hotel Occupancy Tax	$0.6	$0.6		$0.0	$0.0
NYS Sales Tax	$12.6	$12.6		$0.0	$0.0
MTA Taxes	$1.1	$1.1		$0.0	$0.0

Economic Benefits

Under existing conditions, the annual economic benefits of the LRT are ten times greater than those of the 10th Avenue Station at $575.8.3 million to $50.9 million. At full buildout in 2030, the LRT will generate $617.9 million in economic benefits each year compared to $82.5 million from the 10th Avenue Station.

Fiscal Benefits

Under existing conditions, the **vision42** LRT would provide additional annual tax revenues of $152.1million compared to $37.2 million attributable to the 10th Avenue Station.

By the buildout year of 2030, the LRT would be generating $278.5 million in tax revenues each year—more than twice the $112.7 million attributable to the 10th Avenue Station.

Appendix A:
10th Avenue Station Travel Time Savings (Gravity Method)

Travel time savings for the 10th Avenue Station were calculated by figuring out the difference in travel time for passengers with and without the proposed station. This was done for passengers traveling to as well as those leaving from 10th Avenue in the peak AM hour. Subway Line haul data (based on the MTA's Regional Transit Forecasting Model (RTFM) results) were provided in the *Hudson Yards FEIS* for 2025 AM peak hour passengers boarding the #7 subway. Passengers from all stations in Queens were consolidated as their origin is not relevant for this study. These data are summarized below.

Table A.1

User Population					
ORIGINS of #7 Line Passengers Getting OFF at 10th Ave Station in AM Peak Hour					
Exit Location	**42nd & 10th**	**41st & 10th**	**40th & Blvd**	**Total**	**Percent**
Queens	2,450	2,672	2,252	7373	63%
Grand Central	455	496	418	1,370	12%
5th Ave	201	219	184	604	5%
Times Sq.	781	852	718	2,352	20%
Total Passengers:	3,887	4,239	3,573	11,699	100%
DESTINATIONS of #7 Line Passengers Getting ON at 10th Ave Station in AM Peak Hour					
Exit Location	**42nd & 10th**	**41st & 10th**	**40th & Blvd**	**Total**	**Percent**
Queens	565	238	26	829	49%
Grand Central	395	167	18	580	34%
5th Ave	116	49	5	171	10%
Times Sq.	79	33	4	116	7%
Total Passengers:	1155	487	53	1,696	100%

Source: No. 7 Subway Extension - Hudson Yards Rezoning and Development Program, FGEIS: Appendix S.4

The FEIS provides data for three different entrances near 42nd Street and 10th Avenue. In order to estimate travel time, a catchment area was created for each of the three entrances (aerial photo A-4). This catchment, or watershed, area is affected by the distance pedestrians are likely to walk (.25 mi) as well as the proximity to other nearby stations, including the Times Square Station and the future 34th Street and 11th Avenue Station. A point at the center of each catchment denotes its center of gravity, the average place in that catchment area people would be traveling from/to.

Passenger Route Choice

In order to calculate time savings, BFJ calculated the time it would take passengers traveling to/from Queens, Grand Central Station, 5th Avenue and Times Square in the peak AM hour. All of the various elements of the trip (i.e., transit time, waiting for train or bus, walk, leaving station.) were taken into consideration[11]. The travel time for each segment of the trip is detailed in the table at the end of this report. Some assumptions were made including the #7 train transit time between Times Square and 10th Avenue (2 minutes) and the time it takes to exit the 10th Avenue Station (4 minutes due to the depth of the station). A summary of the route choices is below.

Route Choice of People Traveling TO 10th Avenue Station:

Passengers from Queens would come via the #7 train. Without the 10th Ave Station, they would travel on the #7 to the Times Square Station, exit and walk to their destination. With the 10th Ave Station, they would travel on the #7 train to 10th Avenue, exit and walk to their destination.

Passengers from Grand Central Station would primarily be transferring from another subway or train. Without the 10th Ave Station, they would take the #7 train to Times Square, exit and walk to their destination. With the 10th Ave Station, they would travel on the #7 train to 10th Avenue, exit and walk to their destination.

Passengers from 5th Avenue would approach from the street, in most cases transferring from a bus on 5th Avenue. Without the 10th Ave Station they would board the M42 bus, disembark near their destination on the West Side and walk. With the 10th Ave station, they would enter the subway station, board the #7 train to 10th Ave, exit and walk to their destination.

Passengers from Times Square would be transferring from another subway line. Without the 10th Ave Station, they would exit Times Square Station and walk to their destination. With the 10th Ave Station, they would transfer to the #7 train to the 10th Ave Station, exit and walk to their destination.

Route Choice of People Traveling FROM 10th Avenue Station:

Passengers going to Queens and Grand Central, without the 10th Avenue Station would walk to and enter the Times Square Station, and board the #7 train. With the station, they would walk to and enter the 10th Avenue Station, and board the #7 train.

Passengers going to 5th Avenue, without the 10th Avenue Station would walk to 42nd Street near their origin and board the M42 bus (to 5th Avenue) exit and walk to their destination. With the 10th Avenue Station, they would enter the 10th Ave Station, board the #7 train, exit at 5th Avenue and walk to their destination.

Passengers going to Times Square, without the 10th Avenue Station would walk to and enter the Times Square Station. With the 10th Avenue Station, they would walk to and enter the 10th Avenue Station, board the #7 train and get off at Times Square.

[11] Source for transit, transfer and wait times: vision42 (Table 14: Transit Model Assumptions: Link Travel Times)

Results

Based on the methodology above, AM peak hour and full day (AM peak hour x 7) travel time savings were calculated for passengers heading to/from the three catchment areas. Walk/wait and vehicle time savings were calculated sepaately. The results are summarized below and provided in detail in the tables attached to this report.

Table A.2

Travel Time Savings for #7 Line Passengers (in hours):				
Getting OFF at 10th Ave Station in AM Peak Hour (westbound)				
Origin Subway Entrance	**42nd & 10th**	**41st & 10th**	**40th & Blvd**	**Total**
# of People	3,887	4,239	3,573	**11,699**
Walk/Wait Time Savings	718	616	954	**2,288**
Vehicle Time Savings	-83	-102	-77	**-262**
AM Peak Hour Time Savings	635	514	878	**2,026**
Getting ON at 10th Ave Station in AM Peak Hour (eastbound)				
Origin Subway Entrance	**42nd & 10th**	**41st & 10th**	**40th & Blvd**	**Total**
# of People	1,155	487	53	**1,696**
Walk/Wait Time Savings	203	67	14	**284**
Vehicle Time Savings	-12	-7	-1	**-19**
AM Peak Hour Time Savings	192	60	13	**265**
Total Travel Time Savings with 10th Avenue Station (eastbound and westbound)				
Origin Subway Entrance	**42nd & 10th**	**41st & 10th**	**40th & Blvd**	**Total**
# of People	5,042	4,726	3,626	**13,394**
AM Peak Hour				
Walk/Wait Time Savings	922	683	968	**2,573**
Vehicle Time Savings	-95	-109	-77	**-281**
Total	827	574	891	**2,291**
Weekday				
Walk/Wait Time Savings	6,454	4,781	6,776	**18,011**
Vehicle Time Savings	-665	-763	-539	**-1,967**
Total	5,787	4,017	6,235	**16,039**

Appendix B:
Retail, Hotel, Theater 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 mid-week of January 9, 2012. The street survey identified 129 active retail establishments, encompassing 63 food establishments and 66 purveyors of goods and services. In addition, the survey counted 17 arts and entertainment establishments, seven travel and accommodation providers, three fitness and sport centers, three amusement and gaming establishments, and 30 vacant properties.

Compared to survey findings in 2006, the total number of retail storefronts grew by 5.3 percent over the last five years, from 151 to 159. The number of active retailers increased from 151 to 159, with a growth rate of 8.4 percent. The number of food establishments grew by eight businesses (14.5%) and the number of purveyors of goods and services expanded by two businesses (3.1%). Arts and entertainment establishments decreased by three businesses (-15.0%), while the number of amusement and gaming establishments grew from two to three businesses. Additionally, the number of vacant retail units increased by five parcels (20.0%).

Table B.1. Commercial Establishment Characteristics by Type, 2006-2012

	Establishments		Establishment Change, 2006-2012	
Establishment Type	2006	2012	Number	Percent
Amusement and Games	2	3	1	50.0%
Arts and Entertainment	20	17	-3	-15.0%
Book and Newsprint	2	1	-1	-50.0%
Clothing and Accessories	31	32	1	3.2%
Electronics and Appliances	7	6	-1	-14.3%
Food and Beverages	55	63	8	14.5%
Health and Personal Products	10	14	4	40.0%
Miscellaneous	12	11	-1	-8.3%
Office Supplies and Stationary	2	2	0	0.0%
Fitness and Sports	2	3	1	50.0%
Travel and Accommodations	8	7	-1	-12.5%
Total Storefronts with Tenants	**151**	**159**	**8**	**5.3%**
Vacant Storefronts	25	30	5	20.0%
Total Active Retailers	**119**	**129**	**10**	**8.4%**
Food Establishments	55	63	8	14.5%
Goods and Services	64	66	2	3.1%

Although 28 new active retailers opened up along 42nd Street, high business turnover resulted in 18 closures. Despite changes in ownership, the total number of active retailers grew by ten establishments during the five year period to a total of 129 establishments. Among all active retailers, 98 establishments saw no change in services, although some saw change in ownership or location. Three active retailers changed the type of retail services offered and two active retailers were converted to commercial banks.

Table B.2. Active Retailer Trends, 2006-2011

Land Use Trend	Storefronts	Percent
new establishments	28	21.1%
no change in retail use	98	73.7%
change in retail use	3	2.3%
replaced by non-retail commercial establishment	2	1.5%
vacant in 2012	2	1.5%
Total	**133**	**100.0%**

The number of retail vacancies rose by 20.0 percent from 25 storefronts in 2006 to 30 storefronts in 2012. New construction projects created numerous storefronts over the last five years, including 13 new storefronts that were vacant at the time of surveying in 2012. Not counting for new vacant storefronts, there were 17 vacant storefronts along 42nd Street. Four of those storefronts were vacant at the time of surveying in both 2006 and 2012.

Table B.3. Retail Vacancy Trends, 2006-2011

Land Use Trend	Storefronts	Percent
no longer vacant storefronts	10	25.0%
vacant new storefronts	13	32.5%
vacant storefronts with prior retail use	13	32.5%
vacant storefronts in 2006 and 2011	4	10.0%
Total	**40**	**100.0%**

Figure B-1

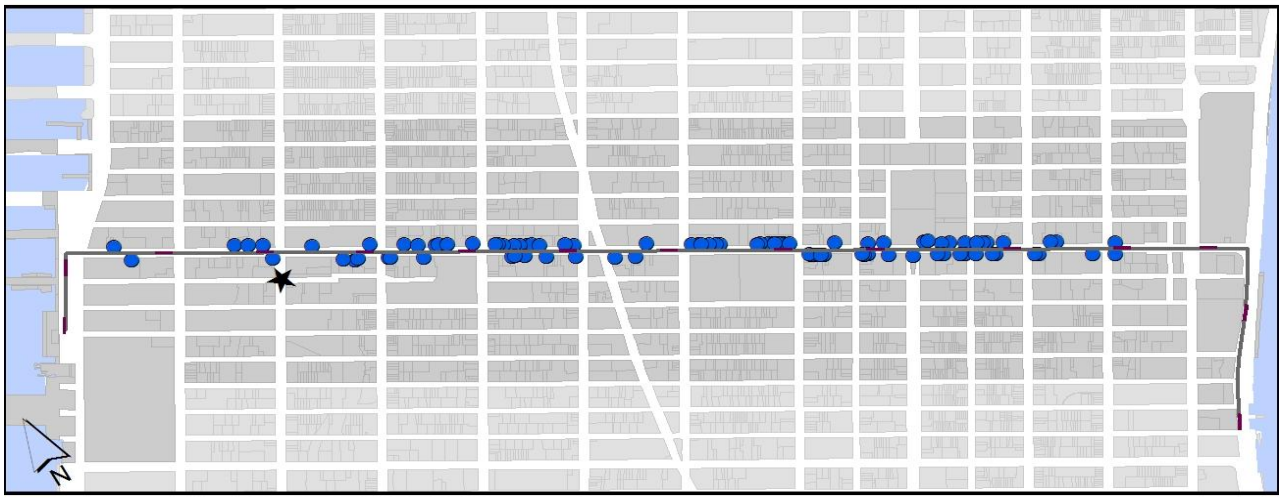
New Physical Space

Active Retailer Characteristics

- New Physical Space
- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

Figure B-2

Same Retail Use Since 2006



Active Retailer Characteristics

- Same Retail Use Since 2006
- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

Figure B-3

Change of Retail Use

Active Retailer Characteristics

- Change of Use
- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

Figure B-4

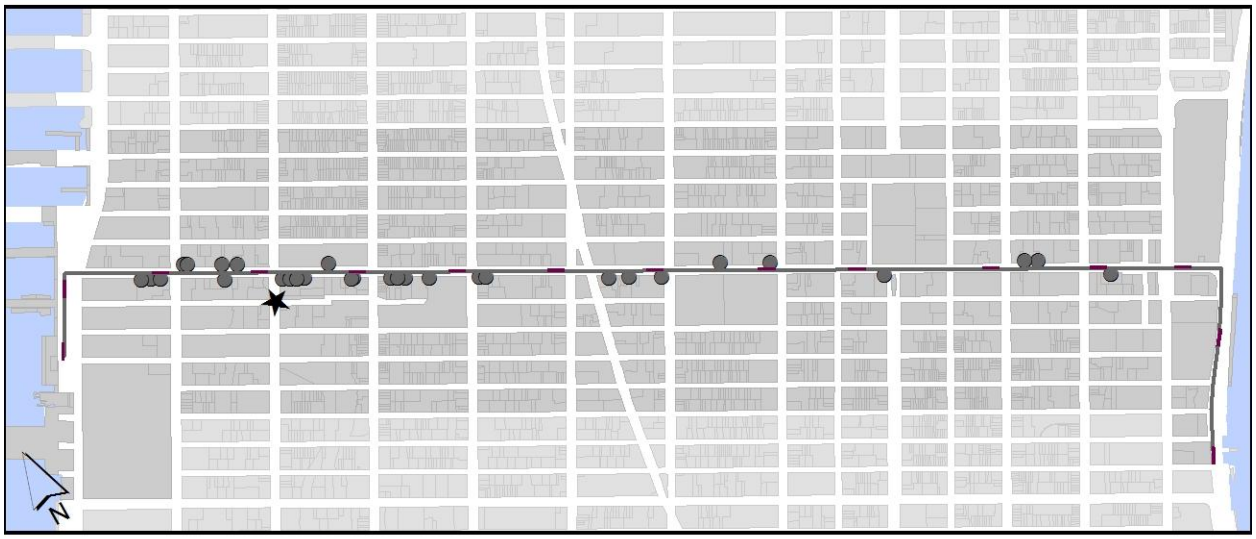
Other Commerical Establishments

Active Retailer Characteristics

- Other Commercial Establishments
- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

Figure B-5

Vacancies



Active Retailer Characteristics

- Vacant
- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

Figure B-6

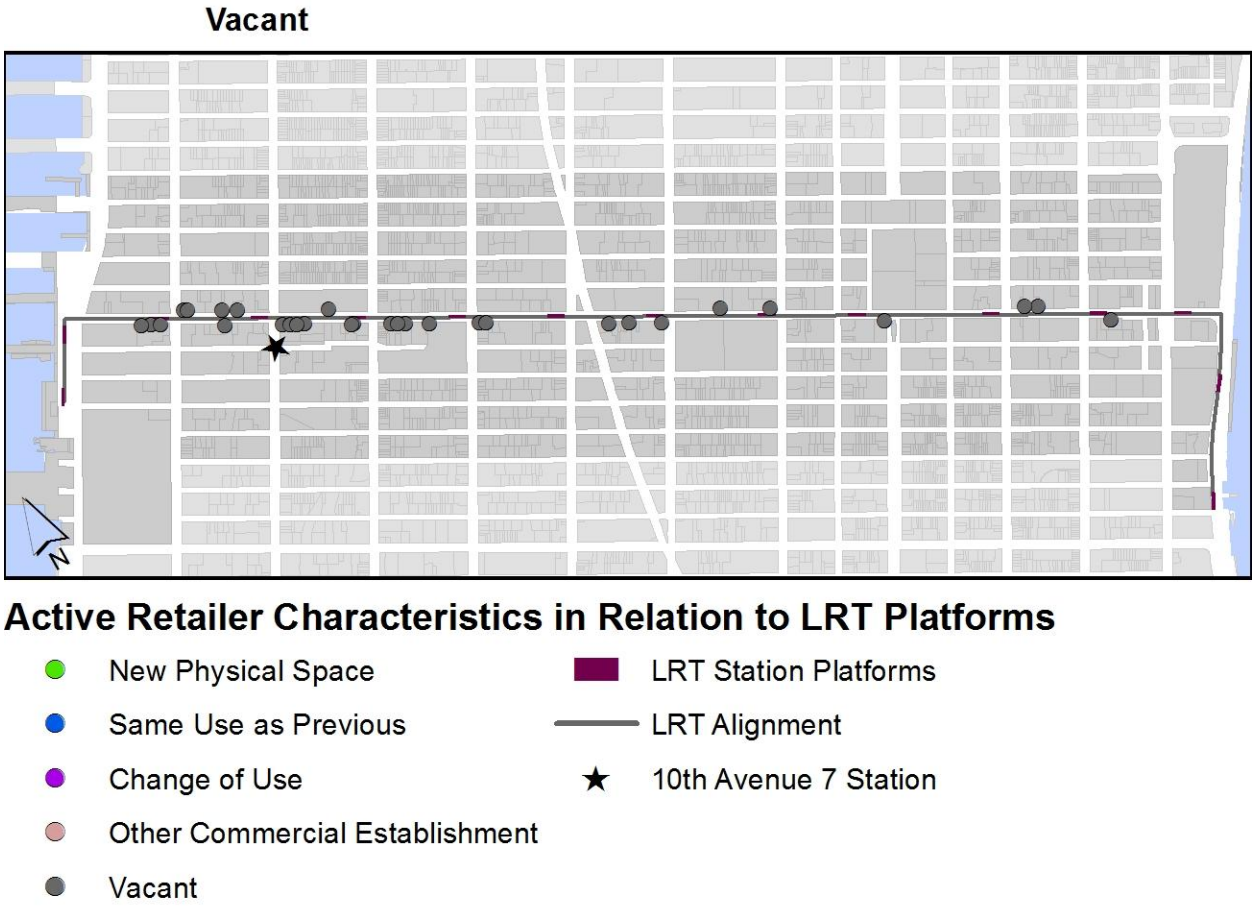
Change of Retail Use

Other Commercial Establishment

Active Retailer Characteristics in Relation to LRT Platforms

- New Physical Space
- Same Use as Previous
- Change of Use
- Other Commercial Establishment
- Vacant
- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

Figure B-7



Retail Rents

The study area encompasses four distinct retail markets, (Midtown West, Midtown East, Times Square, and Grand Central). Generally, asking rents for ground floor retail spaces increase with pedestrian traffic. Based on retail real estate tracking reports from Cushman & Wakefield, asking rents in Times Square continued to climb in 2011, a result of high pedestrian traffic and the large but relatively few retail properties available. In that area, average asking retail rents increased from $350-$400 per square foot in 2006 to $1,052 per square foot in 2011(253%). The highest rents in the study area are located on Broadway where the space currently occupied by TGI Friday's is asking for $2,200 per square foot. In areas with lower pedestrian traffic such as 5th Avenue, average asking retail rents increased from $300 per square foot in 2006 to $888 in 2011 (220%). Recent trends indicate that rents along 5th Avenue are growing at a faster rate than in Times Square. Between 2010 and 2011, retail rents increased by 65 percent along 5th Avenue between 42nd Street and 49th Street, while in Times Square, rents increased by 40 percent.

Based on retail tracking reports from CBRE, a commercial real estate services firm, smaller retailers along 42nd Street paid considerably lower rents. Retailers such as Rize and Sunglass Hut

paid between $220 and $265 per square foot for locations near Grand Central while Aldo paid $727 per square foot for a Times Square location. These trends indicate that if retailers are capable of paying higher rents in the study area, they are also generating higher growth in sales. Should the LRT produce the expected rise in pedestrian traffic, retailers should generate higher sales, and retail rents will continue to grow in the future.

Figure B-8

Retail Floor Space, 2006

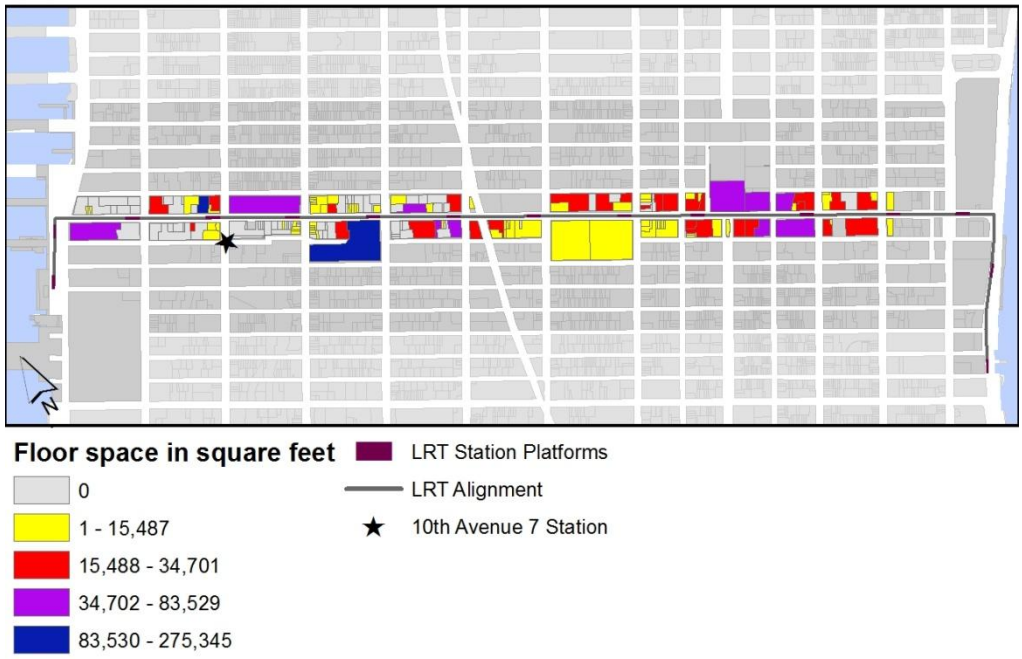
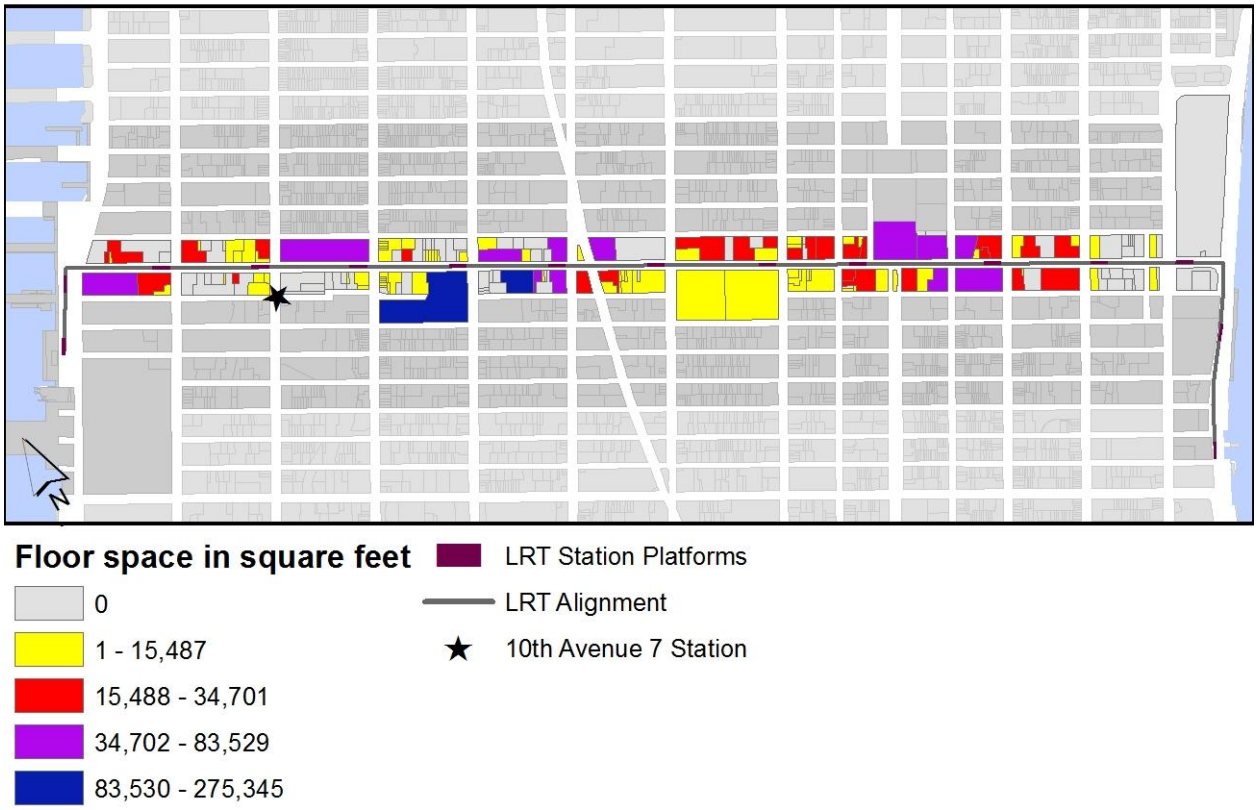


Figure B-9

Retail Floor Space, 2011



Increased Retail Sales

LRT

The Phase Two Economic Study (http://www.vision42.org/about/documents/vision42retail_061115.pdf) included extensive interviews with and surveys of retail and restaurant owners and managers on 42nd Street. 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 2011, this yields a total average daily sales of $0.47 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 2011.[12]

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

[12] This estimate was corroborated using ESRI Business Analyst for retail sales on 42nd Street for 2010 at $1.1 billion.

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.

10th Avenue Station

The 10th Avenue Station is not expected to have a significant impact on 42nd Street retailers.

Theaters

Along 42nd street, there are 12 theaters with a total 24 stages and 8,136 seats. The largest of the theaters, Foxwoods (1,813), New Amsterdam (1,747), and American Airlines (740), are classified as "Broadway" theaters based upon house sizes of at least 500 seats. The remaining nine theaters include 17 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), Little Shubert (499), the Duke on 42nd Street (199), and Laurie Beechman (100). The Manhattan Repertory Theatre (40) is the only Off-Off Broadway house with a single stage. Additionally, there are four theater complexes with Off-Broadway and Off-Off Broadway stages. Those include Theater Row with six stages (639), Playwrights Horizons with two stages (326), the Signature Theater with three stages (684), and the Times Square Arts Center with five stages (850). Compared with survey data collected in 2006, 42nd Street increased seating availability by 18.4 percent (1,498) in all theater categories. Off-Broadway theaters added the largest number of seats (1,357), while Broadway and Off-Off Broadway theaters added 100 seats and 41 seats, respectively. The increase in Off-Broadway theaters can be attributed to the Signature Theater Company's 2011 opening of the Signature Center with three stages and 684 seats, as well as the opening of the Times Square Arts Center with four stages and 785 seats.

Table B.4. 42nd Street Theaters by Number of Stages and Seats

Establishment	Stages	Seats
American Airlines	1	740
Duke on 42nd Street	1	199
Foxwoods	1	1,813
Laurie Beechman	1	100
Little Shubert	1	499
Manhattan Reperatory Theater	1	40
New Amsterdam	1	1,747
New Victory	1	499
Playwrights Horizons	2	326
Signature Theater	3	684
Theater Row	6	639
Times Square Arts Center	5	850
Total	**24**	**8,136**

Table B.5. 42nd Street Seating Capacity Change, 2006-2011

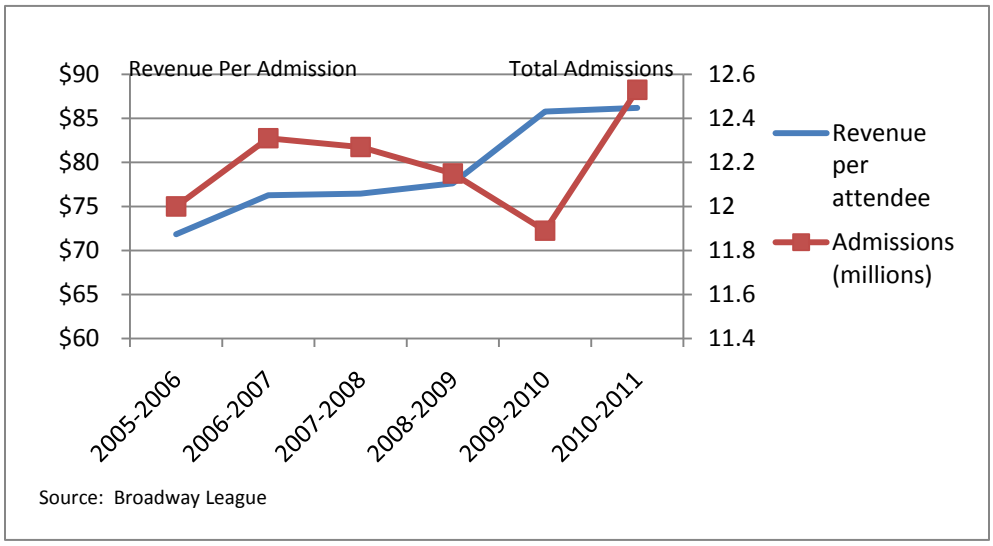
Theater Type	42nd Street Theaters 2006	42nd Street Theaters 2011	Seating Capacity Change, 2006-2011 Number	Seating Capacity Change, 2006-2011 Percent
Broadway	4,200	4,300	100	2%
Off-Broadway	2,221	3,578	1,357	61%
Off-Off-Broadway	217	258	41	19%
Total	**6,638**	**8,136**	**1,498**	**18.4%**

Within the study area, there are 48 theaters with a total of 72 stages and 38,578 seats. Of those, there are 25 Broadway theaters with 31,634 seats, 28 Off-Broadway stages with 5,875 seats, and 19 Off-Off Broadway stages with 1,069 seats. Compared with survey data collected in 2006, seating capacity in the study area increased by 2,268 seats (6.2%) with the addition of 1,111 Broadway seats, 827 Off-Broadway seats, and 330 Off-Off-Broadway seats. The increase in Broadway seats is partially attributed to the opening of the Stephen Sondheim Theater in 2010 with 1,055 seats, while the opening of the Tank and Roy Arias Studios added an additional 336 Off-Off Broadway seats.

Table B.6. Study Area Theater Seating Capacity, 2006 to 2011

Theater Type	Seating Capacity 2006	Seating Capacity 2011	Seating Capacity Change, 2006-2011 Number	Seating Capacity Change, 2006-2011 Percent	Stages 2006	Stages 2011	Total Stages Change, 2006-2011 Number	Total Stages Change, 2006-2011 Percent
Broadway	30,523	31,634	1,111	4%	24	25	1	4%
Off-Broadway	5,048	5,875	827	16%	22	28	6	27%
Off-Off-Broadway	739	1,069	330	45%	14	19	5	36%
Total	**36,310**	**38,577**	**2,268**	**6%**	**60**	**72**	**12**	**20%**

Figure B.10. Broadway Gross Ticket Revenue per Admission and Total Admissions, 2005-2011



Since the 2005-06 theater season, annual admissions levels at Broadway theaters have fluctuated between 11.9 and 12.5 million visitors, with an increase in admissions of 530,000 (4.4%) between 2005-06 and 2010-11 seasons. In that time span, total revenue per ticket sales has grown steadily from an average of $72 dollars to $86 dollars (19.4%).

Note: Beginning with the 2009-10 season, Broadway League "Gross" revenues represent gross gross and "Attendance" represents total attendance. For seasons prior, these numbers represent net gross and paid attendance, respectively.

Tax Block	Street Segment	Segment Number	2006		2011-12		Change	
			Theaters	Seats	Theaters	Seats	Theaters	Seats
1335	1-2nd North side	*1*	0	0	0	0	0	0
1316	2-3rd North side	*2*	1	74	0	0	-1	-74
1297	3-Lexington North side	*3*	0	0	0	0	0	0
1280 and half 1277	Lexington-Madison North side	*4*	0	0	0	0	0	0
half 1277	Madison to 5th North side	*5*	0	0	0	0	0	0
1258	5-6th North side	*6*	0	0	0	0	0	0
995	6-7th North side	*7*	8	4,770	8	5,542	0	772
1014	7-8th North side	*8*	24	23,451	20	23,164	-4	-287
1033	8-9th North side	*9*	11	2,702	11	3,874	0	1,172
1052	9-10th North side	*10*	3	699	4	799	1	100
1071	10-11th North side	*11*	1	160	0	0	-1	-160
1090	11-12th North side	*12*	0	0	0	0	0	0
1334	1-2nd South side	*13*	0	0	0	0	0	0
1315	2-3rd South side	*14*	0	0	0	0	0	0
1296 (half)	3-Lexington South side	*15*	0	0	0	0	0	0
1296 (half) and 1276 half	Lexington-Madison South side	*16*	0	0	0	0	0	0
1276 half	Madison to 5th South side	*17*	0	0	0	0	0	0
1257	5-6th South side	*18*	0	0	1	60	1	60
994	6-7th South side	*19*	0	0	0	0	0	0
1013	7-8th South side	*20*	3	2,990	3	2,990	0	0
1032	8-9th South side	*21*	0	0	0	0	0	0
1051	9-10th South side	*22*	9	1,464	12	2,148	3	684
1070	10-11th South side	*23*	0	0	0	0	0	0
1089	11-12th South side	*24*	0	0	0	0	0	0
	Total		**60**	**36,310**	**59**	**38,577**	**-1**	**2,267**

Figure B-11

Theaters by Number of Seats

- 40 - 151
- 152 - 424
- 425 - 850
- 851 - 1,320
- 1,321 - 1,813

- LRT Station Platforms
- LRT Alignment
- ★ 10th Avenue 7 Station

Increased Theater Sales

LRT

The Phase Two Economic Study determined through interviews with theater 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 $25.7 million in additional theater revenues each year.

10th Avenue Station

The impact of the 10th Avenue Station on study area theaters has not been estimated.

Hotels

On 42nd Street

Along 42nd Street, there are seven hotels with street level entrances. These hotels include 4,536 rooms with guest room capacities per hotel ranging from 160 to 1,311 rooms. Three of the hotels, the Grand Hyatt (1,311 rooms), Hilton - Manhattan East (300 rooms), and the New York Helmsley (773 rooms) are located east of 5th Avenue. The average size of these hotels is 795 rooms. West of 5th Avenue, there are four smaller hotels with an average of 538 rooms. These hotels include Yotel New York (669 rooms), the Hilton - Times Square (460 rooms), Travel Inn (160 rooms) as well as the Westin - Times Square (863 rooms), whose primary motor vehicular entrance is on 43rd street. Since 2006, 42nd Street has increased its hotel room capacity by 15.3 percent (603 rooms) with gains attributed to the 2011 opening of Yotel New York.

Table B.7. 42nd Street Hotels by Number of Rooms, 2011

Establishment		Rooms
Grand Hyatt New York		1,311
Helmsley Hotel		773
Hilton Manhattan East		300
Hilton Times Square		460
Travel Inn		160
Westin New York - At Times Square		863
Yotel New York		669
Total Rooms	2006	3,933
	2012	4,536
Hotel Capacity Change, 2006-2012	Number	603
	Percentage	15.3%

Study Area

In the study area as a whole, there are 81 hotels with a capacity of 22,771 rooms. The total number of rooms per hotel varied from 1,949 rooms at the New York Marriot Marquis to 22 rooms at the French Quarters Guest Apartments, with an average size of 245. Between 2006 and 2011, the number of hotel rooms increased by 5,817 rooms (34.3%), a result of several hotel openings south of 42nd street between 12th and 7th avenues. Hotels in the study area located beyond 42nd street increased room capacity at a higher rate (39.7%) than along 42nd street with the addition of 20 new hotels and 5,164 rooms.

Table B.8. New Hotels Constructed since 2006: 37th Street to 47th Street

New Hotels Constructed Since 2006					
Establishment				**Rooms**	**Neighborhood**
Americana Inn				54	Grand Central
Cassa Hotel				166	Grand Central
Fairfield Inn - Fifth Avenue				92	Grand Central
Gotham Hotel				66	Grand Central
Candlewood Suites - Times Square				188	Midtown West
Comfort Inn - Theatre District				70	Midtown West
Comfort Inn - Times Square South				78	Midtown West
Distrikt Hotel				155	Midtown West
Econo Lodge - Times Square				50	Midtown West
Element - Times Square West				411	Midtown West
Fairfield Inn - Times Square				244	Midtown West
Four Points By Sheraton - Times Square				244	Midtown West
Hampton Inn - Times Square South				184	Midtown West
Holiday Inn Express - Times Square				210	Midtown West
Intercontinental Hotel				242	Midtown West
Staybridge Suites - Times Square				310	Midtown West
Yotel New York				669	Midtown West
Residence Inn by Marriott - Times Square				357	Penn Plaza
AKA - Times Square				105	Times Square
Chatwal Hotel				83	Times Square
Hotel Mela				230	Times Square
Millennium Premier Hotel				125	Times Square
Sanctuary Hotel				111	Times Square
Hotel Capacity Change, 2006-2012				Hotel Capacity Change Attributed To	
2006	2012	Number	Percentage	New construction	renovation/expansion
16,954	22,771	5,817	34.3%	4,444	1,373

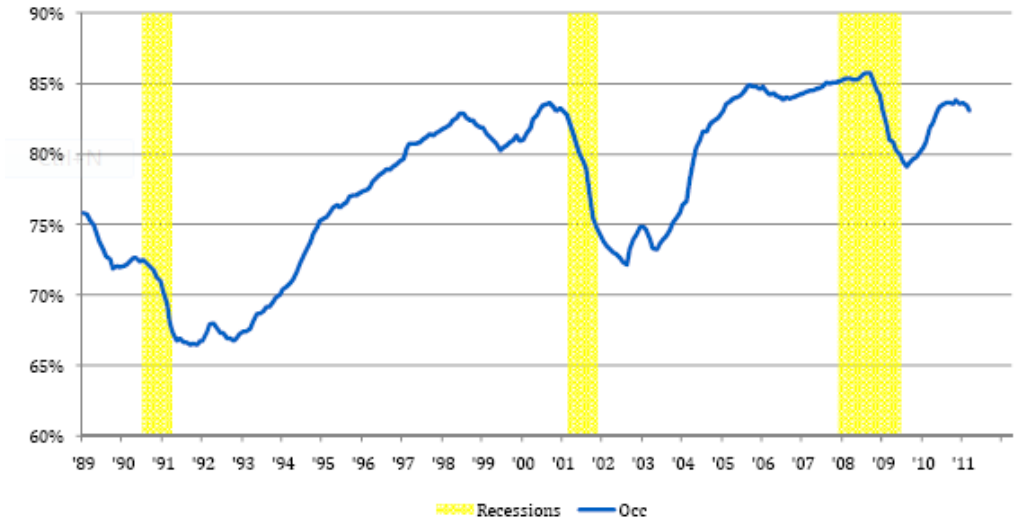
Note: Several hotels were not counted in the 2006 survey and may have been under renovation or closed for various reasons during that time. Those hotels in question include Hotel Edison (900), Millennium Broadway (625), New York Inn (35), French Quarters Guest Apartments (22), and the Alex Hotel (203).

Occupancy Rates

In the years from 2006 until 2008, average annual occupancy levels throughout Manhattan steadily climbed to near record levels at 86.0 percent; however by the end of 2008, occupancy levels dropped by nearly 5.0 percent. Since the official end of the recession in June 2009,

Manhattan hotel occupancy rates have aggressively climbed near 2006 levels. Over the 5-year period between 2006 and 2011, occupancy rates declined by one percent from 84 percent in 2006 to 83 percent in 2011. Hotels in Times Square slightly outperformed Manhattan hotels overall, while Midtown East and Uptown hotels lagged behind. According to Smith Travel Research, the average annual occupancy rate of medium- to large-scale hotels in Times Square decreased by 0.7 percentage points from 84.8 percent in 2006 to 84.1 percent in 2011. Comparatively, in Midtown East and Uptown, the occupancy rate declined by 2.3 percent, from 84.2 percent to 81.9 percent.

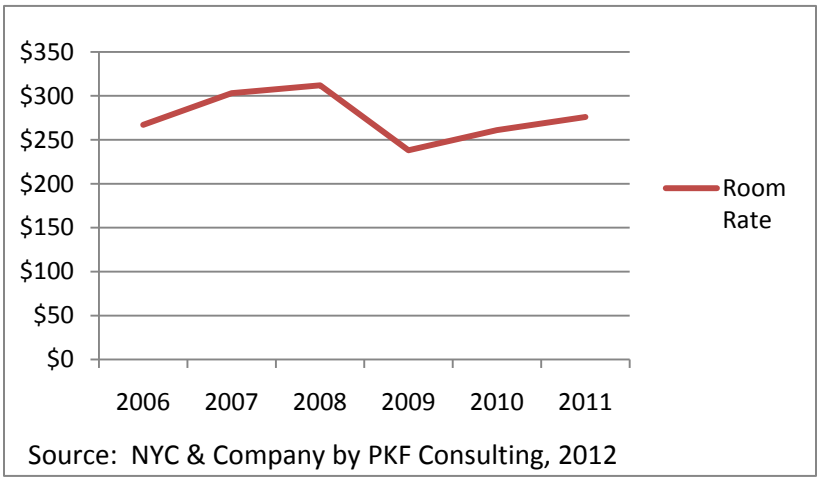
Figure B.12. Long-Term Occupancy Levels in Manhattan – 12-Month Moving Average



Source: HVS, STR Global, and National Bureau of Economic Research

Over the last five years, average hotel room rates in New York City rose and declined in pace with the recession, increasing by 3.4 percent from $267 to $276 between 2006 and 2011. During the two year period between 2006 and 2008, average room costs increased by 31 percent from $267 dollars to $312 dollars per day. By 2009, hotel room rates had fallen by 23 percent. According to Price Waterhouse and Coopers & Lybrand, hotel room rates in Midtown East, at $296 per room, were among the highest in Manhattan, increasing 6.6 percent from 2010 to 2011. In Midtown West and Midtown South, 2011 hotel room rates were slightly lower than New York City as a whole, at $267 and $214, respectively.

Figure B.13. Average Daily Room Rate New York City, 2006-2011



Increased Hotel Occupancy

LRT

There are currently 4,536 hotel rooms located in hotels on 42nd Street, applying the average occupancy rate (84%) and room rate ($267 per night), it is estimated that 42nd Street hotels have $1.0 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 $24,222 in revenues per day, or $8.8 million per year.

Hotel sales are taxable under New York City (4.5%) and New York State (4.0%) sales taxes as well as New York City Hotel Room Occupancy Tax ($2 per room per night + 5.875%). The total fiscal benefit of increased occupancy is projected to be $1.3 million: $396,000 in New York City sales tax, $352,000 in New York State sales tax and $583,000 in New York City Hotel Occupancy tax.

10th Avenue Station

The impacts of the 10th Avenue Station on 42nd Street hoteliers has not been estimated.

Table B.9. Block Summaries of Hotel Establishments

Tax Block	Street Segment	Segment Number	2006	2012	Change
1335	1-2nd North side	*1*	1	1	0
1316	2-3rd North side	*2*	2	3	1
1297	3-Lexington North side	*3*	1	1	0
1280 and half 1277	Lexington-Madison North side	*4*	2	2	0
half 1277	Madison to 5th North side	*5*	0	1	1
1258	5-6th North side	*6*	10	10	0
995	6-7th North side	*7*	9	14	5
1014	7-8th North side	*8*	6	7	1
1033	8-9th North side	*9*	1	5	4
1052	9-10th North side	*10*	1	1	0
1071	10-11th North side	*11*	1	1	0
1090	11-12th North side	*12*	0	0	0
1334	1-2nd South side	*13*	1	1	0
1315	2-3rd South side	*14*	2	2	0
1296 (half)	3-Lexington South side	*15*	3	3	0
1296 (half) and 1276 half	Lexington-Madison South side	*16*	9	9	0
1276 half	Madison to 5th South side	*17*	1	1	0
1257	5-6th South side	*18*	1	3	2
994	6-7th South side	*19*	1	2	1
1013	7-8th South side	*20*	3	3	0
1032	8-9th South side	*21*	1	9	8
1051	9-10th South side	*22*	0	1	1
1070	10-11th South side	*23*	1	1	0
1089	11-12th South side	*24*	0	0	0
	Total		**57**	**81**	**24**

Figure B-14

Hotels Constructed After 2006

Hotels by Number of Rooms

- 22 - 140
- 141 - 300
- 301 - 610
- 611 - 1,013
- 1,014 - 1,949

LRT Station Platforms

LRT Alignment

10th Avenue 7 Station

Figure B-15

Hotels Constructed in 2006 or Earlier

Parks and Open Space

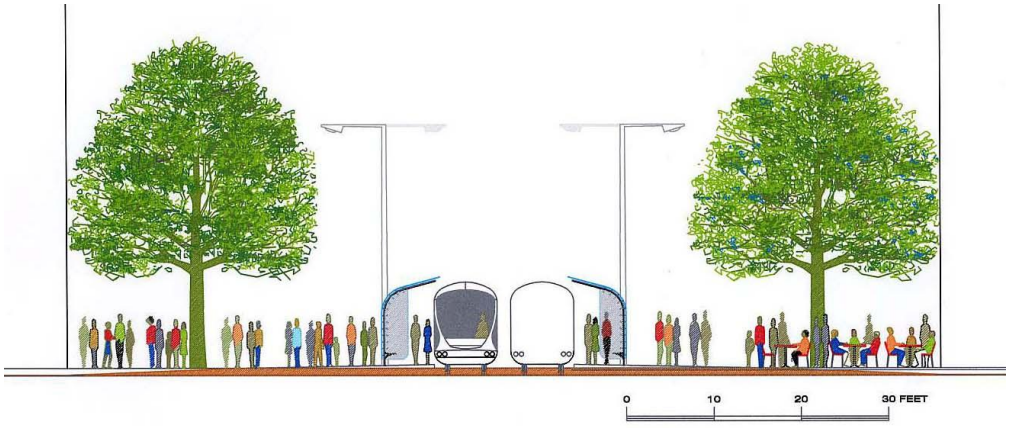
In recent years, the availability of open space and city parks has been on the rise. Conversion of Pier 84 (2006) along Hudson River Park and DOT's closure of Broadway (2009) between 42nd and 47th Street to vehicle traffic has increased the pedestrianization of Midtown Manhattan to the benefit of visitors, 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.

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 B.16: 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 B.17.

Figure B-17