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Urban Development Alternatives for the Hudson Rail Yards



Regional Plan Association (RPA) is an independent regional planning organization that improves the quality of life and the economic competitiveness of the 31-county New York-New Jersey-Connecticut region through research, planning, and advocacy. Since 1922, RPA has been shaping transportation systems, protecting open spaces, and promoting better community design for the region's continued growth. We anticipate the challenges the region will face in the years to come, and we mobilize the region's civic, business, and government sectors to take action.

RPA's current work is aimed largely at implementing the ideas put forth in the Third Regional Plan, with efforts focused in five project areas: community design, open space, transportation, workforce and the economy, and housing. For more information about Regional Plan Association, please visit our website, www.rpa.org.

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This Regional Plan Association report describes a series of alternative development plans for the proposed New York Sports and Convention Center site on the Hudson Yards. The report concludes that a mixed-use development on the site is viable for private developers and would better connect the waterfront to the district, promote urban development throughout the area and provide a significantly larger rate of return on public infrastructure investments.

Immense progress has been made over the past two years in advancing plans for revitalizing the underutilized Far West Side of Midtown Manhattan. In an area of Midtown that has long been eyed by urban visionaries, there is now broad consensus that the neighborhood should and will be redeveloped. While they may differ on the specifics, the majority of observers, from local community groups to Mayor Bloomberg's administration, believe that dense development is needed to accommodate the westward growth of the Midtown business district.

Still, as debate heats up over these ambitious plans, it is increasingly clear that a two-track review process has emerged. On the one hand, the plans have been the subject of countless forums, hearings, news stories, editorials, demonstrations and advertising campaigns. The zoning changes are subject to the City's strict Uniform Land Use Review Procedure (ULURP), with its six-month period of review and scrutiny by community boards, Manhattan Borough President, City Planning Commission and the City Council. State legislation is necessary to approve the northern expansion of the Javits Center. On the other hand, the most contentious and controversial aspects of the proposal – the financing plan and the proposed Jets football stadium – are subject to almost no legislative oversight, resulting in a very limited number of public officials with any authority to affect the outcome.

With regard to the stadium proposal, there has been extensive debate on the pros and cons of the facility. However, there has been far less discussion of the City's underlying assumption that the public's choice is between a stadium and the exposed rail yard that exists on the site today. In opposing construction of the stadium in a July 2004 position paper, Regional Plan Association (RPA) contended that a mixed-use development on the stadium site would better

serve the overall goals for revitalizing the Far West Side. Specifically, the report concluded that an alternative development would better connect the district to the waterfront, spur development throughout the area and provide at least as much economic return for New York City, New York State and the Metropolitan Transportation Authority (MTA).

Since the release of that report, RPA has more closely examined the possibilities, costs and benefits of a mixed-use alternative. RPA consulted with planners, developers, architects, designers and engineers to assess the viability of a series of alternative mixed-use developments on the stadium site and the adjacent Eastern Rail Yard. This effort tested the assumption that public investment in a platform over the Yards could create multiple development opportunities. The results confirmed that mixed-use development on the Hudson Yards is not only viable for private developers but will provide a greater public return on investment than the proposed stadium/convention center. Using the City's assumptions for development revenues elsewhere in the district, the mixed-use alternative generates greater revenues for the City, State and MTA than estimates for the New York Sports and Convention Center (NYSCC). Further, a series of design alternatives revealed that a mixed-use development would add significant value to the overall district, catalyzing development by providing superior open spaces, waterfront access and pedestrian-friendly activities.

These basic conclusions were reached by formulating a development program and testing its market viability, producing a series of urban design alternatives, and calculating the public return on investment. These analyses are summarized below:

Development Program and Feasibility

A density of FAR 9 was selected for the entire site (Eastern and Western Yards) based on a combination of urban design considerations, engineering feasibility and market demand. While other plans have proposed greater densities, which may be achievable, the RPA analysis concluded that the plan would be most likely to achieve the desired scale, open space and waterfront access at this density.

The mix of uses was projected as approximately 75% residential and 25% commercial

with one cultural facility. The Western Yards, with its breathtaking riverfront views, would be entirely residential, while the Eastern Yards would be half commercial and half residential. The build-out of the site is estimated at 500,000 square feet a year of residential space, with building construction beginning in 2007, and 500,000 square feet per year of office space,

12th Avenue. The analysis shows that a rental building that is 80% market rate apartments and 20% affordable units can generate a reasonable rate of return while paying the \$7 psf ground lease payment assumed in the City's financial plan for the Hudson Yards, and taking advantage of tax exempt financing.



Renderings of the Three Alternative Designs Organized around 34th, 33rd, and 32nd streets

beginning in 2014. These projections were determined through an analysis of the market for condominiums, rental residential buildings and office space, briefly described below:

Condominiums

The strength of the condo market and the premium waterfront location make this a logical development option for the site. While the City-assumed market land value of \$100 per square foot (psf) of FAR was used in this analysis, current market conditions suggest that condo development could support an even higher value, with the MTA or another public agency commanding as much as \$170 psf.

Rental Apartments

Current market conditions suggest developer interest in building luxury apartments with waterfront views, such as Silverstein Properties' One River Place at 42nd Street and

Commercial Office Development

The current office market is unlikely to support the development of commercial space on the Hudson Yards until the current stock of vacant space and new construction elsewhere in Manhattan have been absorbed. RPA's phasing assumes office construction in the Eastern Yards beginning in 2014.

Design Alternatives

Based on the development program described above, three design alternatives were prepared to illustrate how the mixed-use alternative would better achieve the project's objectives and add to the city landscape. All of the design concepts were generated by a set of shared design principles that would encourage redevelopment of the surrounding district:

- Activate streets and public spaces
- Create a human-scale pedestrian experience

- Create a variety of public spaces
- Provide a link to the water, both visually and physically

All three of the design concepts include major public open spaces that connect to the Hudson River Park, in two cases bridging over the West Side Highway. Beyond these shared features, each of the three alternatives exhibited unique features, starting with the primary east-west connection that defines it, be it 32nd, 33rd or 34th Street:

32nd Street Alternative

This design alternative is organized around the 32nd Street east-west axis and capitalizes on the idea of linking the series of large civic buildings extending from Madison Square Garden through the Moynihan Station to new development on 10th Avenue.

33rd Street Alternative

The second design alternative focuses on the 33rd Street corridor, connecting Herald Square to the waterfront, culminating in a linear park that crosses the highway and engages the Hudson River Park.

34th Street Alternative

The final alternative makes use of 34th Street's stature as a "signature street." Unlike the other alternatives, the park space crosses the West Side Highway at grade. A signature building creates a visual terminus to the new park and a "bookend" to the Empire State Building.

Each alternative would achieve many of the stadium's objectives with added benefits:

- Both options cover the exposed rail yards by 2009.
- Mixed-use development would restore a street system and allow access to neighboring streets and the waterfront. The stadium would only add an impediment to movement and access, for both pedestrians and autos.
- Traffic conditions would be far less severe with residential rather than stadium and convention uses.
- The scale and variety of buildings and public spaces would enhance the pedestrian experience in and around the Hudson Yards.
- Mixed-use would provide a more effective terminus to the 32nd-34th Street corridor, encouraging westward movement of Midtown.

Public Return on Investment

The central question in determining the use of this prime publicly owned site is what type of development provides the greatest public benefit and can best serve as a catalyst for the rest of the district. Since the uses on the Eastern Yards do not differ greatly from those proposed by the City, this study compares the public return for the Western Yards, measuring the mixed-use development against the stadium proposal.

The analysis determined that the mixed-use program would provide net revenue of \$510 million (present value in 2003 dollars), compared to only \$74 million for the stadium. The gap was due to decreased infrastructure costs – the mixed-use alternative assumes public investment in the deck over the Yards but does not require the \$225 million stadium roof – and new revenues from development fees and property taxes on the Western Yards. It is important to note that while income and sales tax revenues are included for the stadium, they are not included for the mixed-use alternative. Were these significant revenues to be calculated and included, the gap favoring the mixed-use alternative would be even greater.

While the employment and income tax impacts of the NYSCC and the alternative residential uses proposed here are more difficult to compare, the mixed-use alternative provides an important benefit that the stadium does not – housing for a growing city workforce. One of the competitive challenges of New York City and the metropolitan area is the lack of high quality housing for a wide range of incomes. The addition of 6,000 units of new housing would enhance the city's ability to attract and retain the global workforce that drives its economy. By contrast, stadia and convention centers are notoriously speculative ventures when it comes to improving the local economy, and estimates for the jobs and income that would be created by the NYSCC vary widely.

The City/State plans for remaking the Far West Side are perhaps the most ambitious that New York City has seen in a generation. Given the complexity of these plans and their implications for the regional economy, Regional Plan Association began an analysis of proposals for the area in July 2003. What followed was an intense program of research, analysis and public discussion that included five reports, a large-scale public forum at the 2004 Regional Assembly and, in the pages that follow, an alternative proposal for the Rail Yards.

RPA strongly supports redevelopment of the Far West Side with the density and mixed-use character proposed by the City and State of New York. This underutilized area represents the region's best opportunity to create a new 24/7 district in the region's central core that can grow with an evolving 21st Century economy. This vision emanates from development principles that have guided RPA throughout its history and from RPA's economic priorities for the future. These principles and priorities lead RPA to oppose construction of the New York Sports and Convention Center and support a phased strategy that implements much of the City/State plan on a revised timetable. Most successful redevelopment plans are altered and revised several times before implementation, and this plan must be flexible enough to incorporate changes if it is to succeed. These conclusions are described more fully in a series of research reports available at www.rpa.org.

Most specifically, RPA identified the stadium as a flawed aspect of the plan that required further study. RPA's position paper called for the "design of a mixed-use alternative for the Western Rail Yards site that will draw residents, visitors and office workers to the Hudson River waterfront." In spite of a number of alternative proposals for the site, stadium proponents continued to insist that the stadium was the only alternative to the open rail yard. Because the Yards have never been developed, it was argued, the viability of other types of private development was dubious. Yet market conditions for waterfront housing have rarely been as favorable as now, and the City and State have never offered the same level of public subsidy they have offered to the Jets. It became clear that research was needed to determine whether other options were both feasible and desirable, even within the context of the City's overall design for the district.

To that end, over the summer of 2004 RPA began to consult with a variety of development professionals. A consensus soon emerged that the current housing market could support residential buildings over the Yards, and that the long-term appeal of this waterfront site could easily support a phased program of intense mixed-use development. There was a void in the public debate that could only be filled with a series of alternative proposals for the stadium site that fit within the context of the overall proposal, as opposed to starting from scratch as some other alternatives had. It was also determined that from an urban design and engineering standpoint it only made sense to look at both the Eastern and Western Rail Yards together.

As a result, RPA proceeded to articulate and test alternatives that could achieve a number of objectives:

- Help meet the density and zoning proposed by the City for the remainder of the Far West Side district;
- Create scale and uses on the site that are compatible with plans for the rest of the district;
- Create affordable housing that is consistent with goals for the district;
- Maximize visual and pedestrian access to the waterfront;
- Encourage pedestrian traffic and attract office and residential tenants to the area; and
- Generate a reasonable rate of return for private developers and significant revenue for the City, State and MTA, as owner of the rail yards.

This process included defining a baseline development program for the site, assessing the market feasibility of the baseline and alternative programs, estimating the public return on investment and developing sensitivity tests for the major assumptions. The centerpiece of this process was a two-day design workshop to brainstorm concrete ideas for development on the Rail Yards. A team of professional urban designers, developers and planners produced the three development concepts that are described at length in the following pages.

The Hudson Yards are owned by the Metropolitan Transportation Authority (MTA) but their use is regulated by the State. The Yards cannot be developed for any purpose without infrastructure investments to provide buildable space over the tracks. How much value the Yards can create is dependent on the behavior of residential and commercial real estate markets, how the site is designed and developed, the phasing of development, and the pace of improvements to the entire district, such as the extension of the Number 7 subway. As described below, the historic and recent value of real estate in New York, particularly on the waterfront, suggests a great potential for this site to provide a reliable and lucrative revenue stream to its public owner for an indefinite period of time.

The ideal density and uses for the Hudson Yards are a function of urban design considerations, engineering feasibility and market demand. For a project this large and complex, the program would need to emerge from a master planning process with input from potential developers, community residents and other stakeholders. In all likelihood, it would also undergo revisions as the market evolves between project inception and completion. With these considerations in mind, RPA developed a baseline development program to meet the objectives defined in the previous section.

Although the development of the Western Yards (west of 11th Avenue) is the most contentious issue, the program outlined below is for the Eastern and Western Yards combined. From both a design and development perspective, it is difficult to consider an alternative use for the Western Yards without re-examining the assumptions for the Eastern Yards.

The density and use mix were determined by examining past and current plans for the Yards, analogous development projects (such as Battery Park City and Riverside South) and current market conditions, and by consulting with developers, architects and engineers familiar with the issues posed by the site. Based on this information, the following program elements were selected:

- A density of FAR 9 was selected for the baseline scenario, yielding a total of 10.8 million square feet of commercial and residential space. Other plans, such as the

1988 MTA plan and the Hell's Kitchen Neighborhood Association (HKNA) plan, have proposed a build-out at FAR 10, and some developers have suggested FAR 12. While development at these densities is possible, and could be chosen to maximize the value of the site itself, several of the urban designers consulted felt that the scheme would be more likely to achieve the scale, open space and waterfront access objectives at densities of FAR 8 or 9. FAR 9 was also chosen because the City calls for a similar density on the Eastern Rail Yards.

- Uses were assumed to be approximately 75% residential and 25% commercial, with one cultural facility. The Western Rail Yards, with its waterfront views, would be entirely residential, while the Eastern Yards would be half commercial and half residential. It was also assumed that the residential development would be a mix of condominium and rental. Other mixes of uses are also plausible, including the City's assumption that the Eastern Rail Yards would be entirely commercial, as well as a scenario that would be entirely residential. To the extent possible, the master plan should provide flexibility to respond to changes in market demand that are in keeping with the goals for the project.
- The program assumes that a platform completely covering the yards would need to be constructed before building construction could take place, and at a cost similar to the amount assumed by the City.
- The build-out of the site was estimated at 500,000 square feet per year of residential with construction beginning in 2007 and 500,000 square feet per year of office beginning in 2014. Although current residential demand indicates that a faster build-out is possible, this rate is more consistent with historic patterns. Riverside South has added an average of 453,000 square feet per year while Battery Park City, over a much longer period, built out at about 360,000 square feet annually.

Table 1
Program and Site Details
(in Square Feet)

	Developed Floor Area		
	Ground Area (sq. ft.)	City/State Plan (sq. ft.)	Alternative Mixed-Use Plan (sq. ft.)
Eastern Rail Yards (ERY)	570,000	5,100,000	4,900,000
Western Rail Yards (WRY)	630,000	NYS CC	5,900,000
Total On-site	1,200,000	5,100,000	10,800,000
Floor Area Transferred Off-site	N/A	5,700,000	5,700,000
Total Floor Area	1,200,000	10,800,000	16,500,000

- The phasing makes no assumption for when the Number 7 would be extended to 11th Avenue, except to assume that the office development would not occur until the subway line is extended. Although improved subway access would substantially enhance housing values as well, it is not a necessary condition for residential development. In the last decade, many successful residential buildings have risen

in a number of waterfront locations in spite of poor subway access.

current strength of the housing market, and particularly of condominiums, would support residential development on the Yards now. Over the build-out period, the market for all of these uses will shift, and presumably create stronger conditions for office development at a different point in the business cycle.

Condominiums

The current strength of the condominium market and the potential for developers to obtain premium prices for waterfront views makes this a logical development option. The recent interest in signature waterfront condominiums

by notable architects, such as the Santiago Calatrava building proposed near the South Street Seaport and the completed Richard Meier buildings in the Far West Village, also presents a compelling example of developer confidence in how much people are willing to pay for waterfront views and premium design. However, the most analogous comparison for a mixed use development program at the Hudson Yards are places like Riverside South and

Small footprint “point towers” insure access to light and air even in a densely built environment.



Market feasibility begins with an examination of current market conditions for condominium, rental apartment and commercial office buildings. As discussed below, the

Battery Park City, where both condominium and rental apartments have fetched high prices. Both projects are master-planned, waterfront communities with generous park space that



Townhouse-scale development at the bases of the towers creates an animated, pedestrian scale experience even at the edges of the smaller parks and narrower streets.

are challenged by long walks to mass transit. These precedents support the argument that people would be willing to settle on this

currently uninhabited frontier, given the proper investment in a well-executed master plan, waterfront access and well-designed parks and open space.

The strength of the residential market, particularly for condos, is one area where the public sector can attempt to maximize its revenue on the Eastern and Western Yards. While the City-assumed development right price of \$100 psf was used in this analysis, market research suggests that condo development could support an even higher land price. Appendix C assumes a condo sale price of \$851 psf, based on the average 2003 condo sale price in Midtown West, according to the 2003 Corcoran Market Report. At this price and the assumed development costs, the MTA or City could command as much as \$170 psf for development rights, with the developer earning a 50% return over costs before taxes.

At these values, condo development could also support 10 to 20 percent as affordable units and still justify the City's projected development fees and a reasonable rate of private return.

Rental Apartments

While Manhattan's rental market has not demonstrated the same explosive growth in value as condominiums and co-ops in recent years, the consistently high demand for rental property in Manhattan and limited supply makes rental apartment development an attractive investment for developers and a low-risk long-term tenant of the Yards. Current market conditions and some initial activity in the far west midtown area suggest developer interest in building luxury high-amenity apartments with waterfront views. Silverstein Properties' One River Place, a 41-story luxury

apartment building at 12th Avenue and 42nd Street, provides a potentially analogous example, particularly for its far westerly location. The building is currently operating at 95% occupancy, with available apartments renting in the \$49 -54 psf range.¹

Developers are also likely to take advantage of the 80/20 program, to avail themselves of City, State, and Federal programs providing tax-exempt bond financing, 421-a real estate tax exemption and Federal low income housing tax credits. A pro forma of a sample 80/20 rental building is provided in Appendix D and E, which assumes an average \$46 psf rent on market-rate units and \$11 psf on "affordable" units, and construction costs and operating expenses provided by developers of comparable west midtown buildings. Appendix E demonstrates that an 80/20 rental building can easily generate a reasonable positive cash flow while paying the \$7 psf ground lease payment the City assumes in its finance plan for the Hudson Yards.

From the City/State perspective, encouraging the development of both rental and owner-occupied apartments on the Hudson Yards provides the best insurance against

possible fluctuations in the residential market. Moreover, while early revenues can be gained from the sale of development rights for condominium development, a ground lease arrangement, for which rental properties are better suited, guarantees the City/State a long term cash flow, and eventually a greater amount of revenue.

Commercial Office Development

The current office market, while improving, is unlikely to support the development of commercial space on the Hudson Yards in the near future. However, once the current stock of vacant space and new construction elsewhere in Manhattan have been absorbed, developers may look to the Yards and other sites in the Far West Side as the next area for expansion. RPA's phasing assumes office development in the

Eastern Yards beginning in 2014, around the time the City's plan assumes the first office towers on the site. Even so, the master

plan for the Hudson Yards should remain flexible, and if office space is still not viable well into the development period, then different uses should be considered on those parcels. Similarly, if the housing market weakens and the demand for office space surpasses the need for residential development, then the master plan could be revised to accommodate greater amounts of commercial space.

A landscaped area with level changes creates a transition between the most public spaces and the more private entrances to residential buildings.



Three conceptual designs were prepared for the program described above. As such, all are “variations on a theme”. They all demonstrate the physical and spatial capacity of the rail yards to accommodate significant mixed-use development – roughly 2.5 million square feet of commercial development, 8.3 million square feet of residential development, a major cultural or institutional use of some kind, and significant amounts of open space.

From an urban design perspective, each of the alternatives is based on the same fundamental premise: the district should be organized around an armature of streets and public spaces extending east and west, linking the CBD to the Far West Side’s most compelling asset – the waterfront. Each of the studies organizes the east-west framework differently along one of three corridors – 34th Street, 33rd Street and 32nd Street.

No one of these concepts is intended to be complete or definitive in and of itself. Rather, collectively they demonstrate that there are a huge variety of ways to link the district to the water and to resolve connections to other features in the area. This is only possible because a mixed-use development, organized around a finely grained network of streets and blocks, is the most flexible urban form. A street and block network enables pedestrian and vehicular connections to and across the rail yards.

For the purposes of this exercise, all of these concept plans for the rail yards are nested into the City’s proposal, largely unchanged, for the rest of the district. The City’s basic concept of a high density development zone along a new “10 1/2 Avenue” is accepted although its configuration is changed somewhat: its splayed form, part of the city’s emphasis on a north-south procession to the Olympic Plaza, is here a more orthogonal and less figural space. Each of the three concept proposals engages this new north-south avenue by creating a special public space at the intersection of the north-south avenue with the east-west axis of the plans. The importance of this intersection suggests that this is a favored location for a civic or institutional use of some kind. In subsequent studies, the strong north-south orientation of this development zone might be re-thought because it competes with the goal of linking to the western edge of the city, even if several of these cross streets end at 11th Avenue and the re-designed edge of the Javits Center.

The perspective renderings do not represent a commitment to a particular style. Rather, they are meant to suggest that a street and block system would accommodate a highly animated built environment. The flexibility inherent in a street and block network anticipates that within the framework created by design guidelines, buildings can be very different as they are completed over time. Each conceptual design is shaped by a set of shared design principles, which are described below.

Shared Design Principles

Activate the streets and public spaces

Each of the buildings can accommodate ground floor uses including entrance lobbies and retail spaces that open out onto the streets and parks. Even more important than the parks and plazas, the streets are the public spaces that are most essential to the life of the district and they must be thought of as public spaces first, and means of conveyance second. As public spaces they become animated by direct interaction with activities in the buildings, i.e. the entrances where residents and workers come and go, and where restaurants and cafés spill out onto the sidewalk. Equally important are the quiet streets animated only by the stoops, windows and architecture of the residential buildings.

Create a human-scale pedestrian experience

The buildings have set backs and other changes in massing that create comfortable spaces with ample access to light and air. While the ground floors of the buildings will have the greatest impact on the pedestrian experience, sense of scale is very much impacted by the visual cues that take place far above the street.



For this reason, importance is placed not only on the animation of the building surfaces at the ground level, but on how large any building wall can be before there is some significant setback or other change in plane.

In addition to the high activity of the parks and commercial streets, the district should create quiet and intimate neighborhood-scale streets.

Create a variety of public spaces

A fine grain scale can create a variety of public spaces from large open parks to intimate “pedestrian pockets”. By accommodating a broad range of building types and block sizes, these



A wide variety of public spaces provides the setting for community life.

proposals create the kinds of public spaces that become the settings for an equally broad range of activities that are part of the life of the community. This includes places for

active and passive recreation, festivals and farmers markets, and simply quiet and intimate places for social interaction.

Link to the water

The overall orientation of the master plan reinforces east-west movement from the CBD to the water. Extension of the public spaces across the highway is a priority. The one positive consequence of having to build a deck over the yards is that any new public space can be extended over the highway. Visual access to the water, however, is as important. By breaking up the massing of the buildings and, especially, by creating new public spaces with an east-west orientation, views to the river from apartments and offices are maximized.

Challenges

These conceptual designs must address several obstacles that are common to all of the past and current proposals for the Hudson Yards. The most difficult is the limitations on site access created by changes in elevation around the edges of the site. This undermines one of the great advantages of the new street and block network – the connections from the interior of the two “super blocks” to the side streets. Because of the change in grade, several of the interior streets will have to dead-end on the platforms or become pedestrian-only connections.

Another challenge is to soften the edges of the parking structures which could wind up along the 34th and 31st Street frontages. The actual railroad tracks are bounded to the north by 33rd Street and, to the south, by an alignment that is just south of what would be the edge of 31st Street if it were extended west into the site. This means that lower level building entrances and some retail can be at grade along the 34th and 30th Street edges of the platform. The western edge of the platforms over the yards is also problematic because it is up against the West Side Highway and there is very little space at street level between the highway and the ends of the tracks. In two of the concepts, the public spaces over the yards bridge the highway before ramping down, north and south to Hudson River Park. In one of the proposals, the ramping down takes

place on the east side of the highway by cantilevering over the space of the sidewalk.

The need to deck over the yards creates significant engineering challenges, although these are in no way beyond current building practice elsewhere in the city, including the Riverside South development over the Amtrak right-of way.

For the logistical purpose of staging construction with minimum interference of the rail operation, it is likely that a pre-cast deck capable of supporting roads and public spaces would be built all at once over the full extent of both yards. This has the advantage of making it possible to build the public realm which will create value for the development sites. It has the disadvantage of forcing an upfront commitment to a reasonably specific master plan, so that the heavier structure below the deck can be put in place before the deck is closed.

Also, the structure must ultimately find its way to spaces between the tracks. It is inevitable that many columns, especially in the residential buildings, will have to be transferred from their tower locations (driven by optimizing the apartment layouts) to the footing locations between the tracks. Because the structural transfers cannot take place below the completed deck, most of these will have to take place in the high ceilings of the ground floor. The higher ground floor ceiling, however, is suitable for the lobbies of buildings and the retail and community facility spaces that would likely be at the ground floor. The cost of the additional structural components is factored into the development pro formas included in the appendices of this paper.

Three conceptual plans, each shaped by the common design principles above, are presented next. They are distinguished by three different assumptions about how the primary east-west connection is made.



Lively commercial corridors will link Midtown to the waterfront.

Plan Drawing

Structures

Alternative A: 32nd Street



Alternative B: 33rd Street

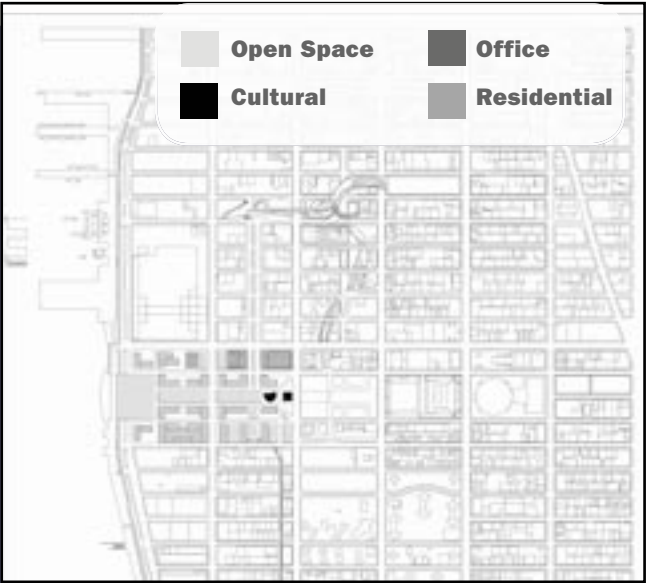


Alternative C: 34th Street



Open Space Strategy

Land Use



A 32nd Street
Alternative

This plan is organized around the 32nd Street east-west axis, a strategy exploited by several proposals that have been made over the years. This plan capitalizes on the idea of linking the series of large civic buildings on the “super blocks” that extend along 32nd Street from 7th Avenue to the Yards, including the future Moynihan Station (formerly the Farley Post Office building), Madison Square Garden/Penn Station and potential new development east of 10th Avenue. In this alternative, the series of interior and exterior spaces is extended across the east and west rail yards as a wide linear

park lined on both sides by residential buildings. At the western end of the yards, this linear park opens out onto a large park that extends over the West Side Highway and engages the Hudson River Park. Because the Hudson River Park is quite narrow here, the connection to the park is made by a set of cascading stairs to the north and south. In response to the overall symmetry of the 32nd Street axis, the public spaces in this variation are treated as formal symmetrical parks. The office buildings are arrayed along the 34th Street corridor from 10th Avenue to 11th Avenue.



B 33rd Street Alternative

This plan is organized around the 33rd Street east-west axis. This is a significant corridor that almost competes with 34th Street in importance because it passes by the northern entrances to Madison Square Garden/Penn Station and the Penn Plaza office buildings. It will also pass by the north side entrance of the new Moynihan Station when it is completed, terminating in the middle of Herald Square. As in the 32nd Street concept plan, the east-west axis leads to a linear park space that joins the two rail yard superblocs and, in a similar way, the linear park ends in a major public space which crosses the highway and engages the Hudson River Park. In this proposal however, the linear park is offset from the 33rd Street alignment, creating a more dynamic public space that terminates the 32nd Street

axis as well. This also results in different sized blocks on the north and south sides of the linear park creating opportunities for a wide variety of building types and configurations. The three office buildings on the eastern yards have different orientations in response to the orientation of the corridors that connect to the public space.

Unlike the public spaces in the 32nd Street proposal, here the linear park and the large park at the western edge of the yards are asymmetrical with different kinds of spaces north and south. The connection to the Hudson River Park is asymmetrical as well, opening up to the north and the termination of 34th Street.



C 34th Street Alternative

This plan is organized around the 34th Street connection corridor. The rationale for this is obvious: 34th Street is one of the “signature cross streets”, like 42nd Street or 14th Street, although none of the major civic structures in the “superblock corridor” actually front onto it. Still, it is an important, wide cross street that has a strong identity. Future growth along this corridor is likely, and it has the strongest connection to Herald Square. Also, of the three east-west corridors studied in these options, it is the only one that currently extends to the water at grade.

This proposal illustrates a different strategy for terminating the east-west link and reaching Hudson River Park. Here, 34th Street opens up onto a wide park the width of the block between 33rd and 34th streets and extending from the intersection with the City’s proposed 10½ Avenue to the West Side Highway, thereby joining both the 34th and 33rd Street corridors. The

park would be both sloped and terraced as it moves from the higher elevation of 11th Avenue to the water, providing a variety of different kinds of park spaces from which to view the river. The at-grade crossing of the West Side Highway would be a wide, heavily landscaped space and would favor pedestrians over automobiles.

The residential buildings between 30th and 33rd Streets are organized along the perimeter of a new public park. A similar space over the Eastern Yards terminates 10½ Avenue and provides a setting for the civic or institutional building.

In this alternative, the office buildings sit along 10th Avenue. A signature building on the block framed by 33rd Street, 34th Street, 10th Avenue and the City’s proposed 10½ Avenue creates a visual terminus to the new park, a kind of “bookend” to the Empire State Building at the eastern end of 34th Street corridor.



Impact on the Surrounding District

In looking at the particular circumstances of the Far West Side, it is clear that mixed-use development provides several advantages over a stadium on the Western Rail Yards. The advantages cited for the NYSCC are that it will immediately remove an impediment to development by covering the exposed rail yards, generate visits to an underutilized area through numerous sports and convention events, and includes the creation of public spaces and “animated edges” of retail, cultural and entertainment uses. However, a mixed-use development on the Hudson Yards would do far more to create the type of quality street life that would attract office workers and residents.

- Both uses would cover the “hole in the ground” in the same period of time. In the case of residential or mixed-use development, undeveloped portions of the site could be landscaped until development occurs.
- As opposed to a large, monolithic structure impeding both visual and pedestrian access through the site, a mixed-use alternative would restore a street system that would allow entry through the site to neighboring streets and to the waterfront. It would also provide the scale and variety of both building types and public spaces that would enhance, rather than detract from, the pedestrian experience.
- By any calculation, traffic conditions would be far better with housing rather than stadium and convention uses. Whenever events are held at the facility, traffic congestion would be intense even under the assumptions in the EIS. Housing would also help alleviate some of the in-commutation to jobs in the district.
- On the majority of days when events are not scheduled, pedestrian traffic would depend on the retail and cultural uses around the stadium. However, these are not likely to generate significant street life on their own, and many could also be programmed into a mixed-use development.

- As described in the Design Alternatives, a mixed-use development would also be much more effective as the termination of the east-west corridor along 32nd-34th Streets, providing more impetus to the westward movement of Midtown along this corridor.

The question of timing is also an important consideration. For good or ill, the full effects of the stadium will be felt quicker than the effects of mixed-use development. The mixed-use alternatives described here would have immediate benefits in terms of waterfront access and public spaces, and many of the residential buildings can be developed relatively quickly. However, if speed of development in the district’s commercial core is a primary goal, then the stadium proposal, with all of its risks, would complete the development of the Western Yards by 2009. However, the primary purpose of the district is to provide room for Midtown’s expansion over 30 or more years. A mixed-use development on the western edge of the district is more consistent with this goal. At a minimum, it provides 28 additional acres of land for residential or commercial development. It also provides a waterfront location that can develop at the same time that commercial and residential development moves progressively westward from 7th and 8th Avenues, and that can evolve with the needs of the market and the district.

While the perspective of the private developer is critical to determining project feasibility and value, the central question is what use will provide the greatest public benefit. This is not simply a matter of computing the highest rate of return from improvements on the site itself. Other issues include the impact of development on the rest of the Far West Side and on the economy of New York City and the metropolitan region. There are also the issues of weighing short-term versus long-term benefits, how costs and benefits are distributed among different constituents, and the environmental impacts of development.

For the Hudson Yards, three benefit categories are most important—the fiscal return on investment to New York City, New York State and the MTA, the jobs and income that are created, and the degree to which new activities on the Yards stimulate redevelopment in the rest of the district. For all three, residential and commercial development would be far more likely to produce greater benefits for the residents of the city and the region than the proposed stadium.

The advantages for stimulating development in the surrounding area are described in the previous section. The analysis below focuses solely on the Western Rail Yards, specifically a comparison of the economic benefits that would be produced by the residential uses proposed in all three of the RPA design schemes and those estimated for the New York Sports and Convention Center (NYSCC), which would be the only structure on the site in the City/State plan. Although the uses proposed for the Eastern Yards also differ from the City's plan, they would produce only modest differences in revenue and are less critical than the fundamental difference between a sports facility and residential development over the Western Yards.

Fiscal Benefits

The MTA, the City and the State all have a financial interest in the development of the Hudson Yards. As owner of the Yards and the development rights over them, the MTA would receive any fees or rents from new development or the sale of air rights. The City or State could receive property taxes or payments in lieu of taxes (PILOTS) from new structures and would also gain from income, sales and

other taxes generated from any resulting new economic activity. However, all the revenues would support public services, either public transit or any of the activities funded by general city or state taxes. Comparing the total fiscal benefits of different uses requires accounting for all of these potential revenues.

Table 2 compares the net revenue that would be generated between 2005 and 2035 from the NYSCC and the Western Yards portion of the mixed use program analyzed by RPA. Revenues for the NYSCC use the most optimistic annual revenues estimated by the New York City Independent Budget Office (IBO). For the Mixed Use Alternative, revenues were computed on an annual, building-by-building basis for one of the urban design schemes (Alternative B) generated from the development program. Since all three conceptual design alternatives share the same use and density assumptions, revenues would vary only slightly among the three schemes.

Both gross and net revenues show the present value of the annual revenue streams. Revenues from the NYSCC are assumed to reach their maximum level within a few years after construction, while revenues from the mixed-use alternative build up gradually as the site develops. By taking both the amount and timing of revenue into account, net present value provides a way of comparing both on an equal basis.

Both alternatives show positive net revenue after the infrastructure costs are subtracted (the deck for both, and the roof in addition for the stadium proposal). However, the RPA alternative yields \$510

Table 2
Revenue Comparison for New York Sports and Convention Center and RPA Alternative, 2005-2035 (Present value millions of 2003\$)

	NYSCC	Mixed Use
Development Fees and Rents	NA*	\$475 million
Property Taxes/PILOTS	0	423
Income, Sales and Other Taxes	674	NA**
Gross Revenue	674	898
Infrastructure Costs	(600)	(388)
Net Revenue	74	510

* Rent payments from Jets to MTA are under negotiation

** The residential development for the Western Yards would also yield significant income and sales tax revenue, but are not calculated here.

million, \$436 million more than the \$74 million estimated for the NYSCC. About half of the difference results from higher gross revenues. In other words, the development fees, rents and property taxes generated by the residential buildings more than exceed the income and sales taxes generated by the NYSCC. The other half of the difference results from the lower infrastructure costs of the residential alternative.

This analysis excludes two sources of revenue that could change the results. It does not include the value of any rent payments that are currently being negotiated between the Jets and the MTA. It also does not account for the increase in income and sales taxes that would be generated by residents of new housing on the site. Including these would raise the value of the residential development substantially. However, estimating their value is difficult, not only because it involves assumptions of income, deductions and consumption by these households, but also because it requires an assumption of how many of the households would represent a net addition to New York City's population. However, using a set of assumptions outlined in Appendix A, each household could produce \$16,500 per year in state and city income and sales taxes. At the assumed build-out rate, this represents a net present value of \$960 million. Even if we assume that only half of this is a net gain to the City and State, it would add \$480 million to the value of the mixed-use alternative.

Assumptions

To the extent possible, this analysis uses the same assumptions as those applied by the City in its financial plan for the infrastructure improvements for the Hudson Yards district.² All of the following assumptions for development on the Western Yards are identical to those assumed by the City for development in other parts of the district:

- Construction of the deck and initial buildings is projected for 2005-2009, with the first buildings ready for tenants in mid-2009, the same point that the NYSCC is projected to be completed;
- Development rights are valued at \$100 psf of floor area;
- Where ground lease payments are used as an alternative to sale of development rights, annual lease payments are projected at 7% of the current year development cost;
- Platform reimbursement fees of \$10 psf of floor area are applied to each building;
- Average property taxes per square foot escalate at the same rate as in the City's financial plan;
- An inflation rate of 2.5% per year is used to determine nominal revenues; and
- A discount rate of 6% is used to calculate net present value.

An annual comparison of nominal values can be found in Appendix B. Assumptions for the line items in Table 2 are as follows:

Development fees and rents

The \$475 million from residential development results from a combination of sale of development rights and ground lease payments. It assumes that rights will be sold outright for 2.5 million square feet of condominiums but that rental buildings (3.5 million square feet) will negotiate ground leases. The Jets are also likely to pay the MTA an annual rent, but this amount is being negotiated with the parties reportedly far apart on compensation. Therefore, no assumption for rent payment is included.

Property Taxes/PILOTS

It is assumed that most rental buildings will avail themselves of eligible tax abatements, yielding similar tax collections as the City is assuming for other parts of the district. Therefore, residential property taxes are estimated by applying an average tax per square foot calculated from the revenue streams and residential build-out assumptions in the City's plan.³ As with the City's financial plan, revenues start small and escalate as tax abatements under the 421-a affordable housing program phase out.

Income, Sales and Other Taxes⁴

The New York Jets and the Hudson Yards Draft Generic Environmental Impact Statement

(EIS) assume a total of \$72.5 million per year from these sources to New York City and State combined. However, the RPA analysis uses the most optimistic estimate from the New York City Independent Budget Office (IBO), a total of \$54.5 million per year.⁵ Academic studies have shown that economic impact studies conducted by proponents of stadiums and convention centers invariably overestimate the public benefits, and IBO appears to have made more reasonable assumptions.⁶ A sensitivity test using the Jets assumptions is shown below, but the result still yields less revenue than the residential alternative.

As described above, the residential development would also generate income and sales taxes from the earnings and purchases of resident households, but a complete analysis is beyond the scope of this study. Even a conservative assumption would result in a significant addition to the revenues from the residential alternative.

Infrastructure Costs

The \$388 million infrastructure cost assumed for the residential alternative in the Western Yards was reached using the same psf platform and tower foundation costs assumed by the City for the Eastern Yards. Engineers consulted for this paper determined this to be a conservative assumption. The City/State plan includes an additional \$225 million for the stadium roof. It should also be noted that both renderings by the Jets and two

of the three design alternatives in this report indicate an open space extension over the West Side highway. The cost of this, which some have estimated at \$50 million, is not included in this analysis nor in the City/State cost estimates for the stadium.

Beyond 2035

Both the City's financial projections and the above analysis only estimate revenues through 2035, the period assumed for the build-out of the Far West Side and the 30-year payment of debt service on the infrastructure investments. However, some mention is needed of the probable payback beyond this period. In all likelihood, the revenues from residential developments on the site will continue to grow as tax abatements on the later phases of development expire. Also, both residential and commercial buildings have a much longer useful life than football stadia, estimated currently at approximately 30 years. Thus, a complete net present value comparison over the full useful life of both developments would likely show an even wider advantage for mixed use development on the site.

Site Value

These results are intended to compare the relative benefits of the two alternatives, and the assumptions and methodology were chosen to facilitate an apples-to-apples comparison. For this reason, they should not be used to imply

Table 3

Gross revenue comparison for Western Yards at different values and densities (Present value in millions of 2003\$)

	FAR 8	FAR 10	FAR 12
At \$100 per square foot			
Development Fees and Rents	\$437 million	546	656
Property Taxes	383	478	574
Total	820	1,024	1,230
At \$125 per square foot			
Development Fees and Rents	546	683	820
Property Taxes	383	478	574
Total	929	1,161	1,394
At \$150 per square foot			
Development Fees and Rents	656	819	984
Property Taxes	383	478	574
Total	1,039	1,297	1,558

Assumes build-out of 500,000 sf/year

Table 4
Revenue Comparison of different scenarios
(Net present value Millions of 2003 \$)

	NYSCC IBO Baseline	Mixed Use Baseline	NYSCC IBO Low Est.	NYSCC Jets Estimate	Mixed Use Slow Build-Out	Mixed Use High Value & Density
Development Fees and Rents	NA*	475	NA*	NA*	357	712
Property Taxes/PILOTS	0	423	-	-	280	470
Income, Sales and Other Taxes	674	NA**	551	1,040	NA**	NA**
Gross Revenue	674	898	551	1,040	637	1,182
Infrastructure Costs	(600)	(388)	(600)	(600)	(388)	(388)
Net Revenue	74	510	(49)	440	249	794

* Rent payments from Jets to MTA are under negotiation
** The residential development for the Western Yards would also yield significant income and sales tax revenue, but are not calculated here.

a value for the site. That process requires an actual appraisal of the site that is beyond the scope of this analysis.

However, for this development scenario and value assumptions, the value of development rights and property taxes for the Western Rail Yards would total nearly \$900 million and still leave more than \$500 million net after infrastructure costs. (Value for both the Eastern and Western Yards would be more than double this, taking into account both on-site development on the Eastern Yards and the transferred development rights assumed in the City/State plan). This value could be captured by the MTA and the State, which has regulatory authority over the site, in a number of ways. For example, a development authority, similar to the Battery Park City Authority, could be created to issue state revenue bonds for the infrastructure and collect development fees, rents and PILOTS (payments in lieu of taxes) for the expected property tax revenue.

Changes in assumptions could also alter the value of the site. For example, a market analysis could determine the value is substantially greater than \$100 psf based on the current market for condominiums and luxury apart-

ments. It could also value the site at some of the higher densities that have been proposed. The program used for the design alternative deliberately used a low FAR to maximize the advantages of scale and open space to encourage development in the rest of the district. A different strategy could try to maximize the value of the site itself. Table 3 shows the value of development rights and property taxes at different densities and values. These indicate a range of values from \$800 million to \$1.6 billion. For development rights alone, the values range from over \$400 million to nearly \$1 billion. Similarly, in the High Density, High Value scenario in the sensitivity tests below, the value at \$125 psf and FAR 10 increases the gross value of the development rights and property taxes to nearly \$1.2 billion, leaving nearly \$800 million after infrastructure costs.

Sensitivity Analysis

Any estimates of return for long-term investments of this nature, whether for residential and commercial development or for sports and convention facilities, can vary widely with changes in the underlying assumptions. To

test the sensitivity of this analysis, the net present value of three alternative scenarios were calculated. These tested plausible differences in the amount, pace and value of development, as well as revenue projected from the New York Sports and Convention Center. The results are shown in Table 4.

The IBO Low Estimate shows the net revenue assuming \$44.5 million per year in annual revenues for the NYSCC, as opposed to \$54.5 million in the baseline comparison. The result shows revenues fall slightly short of investments.

The Jets Estimate shows net revenue assuming \$72.5 million annually for the NYSCC. This raises net revenue substantially to \$440 million, but is still less than the \$510 million estimated for the baseline residential alternative.

The Slow Build-Out scenario assumes that weaker market conditions will delay opening of the first buildings until 2009, and that the site will build out at 350,000 square feet per year rather than 500,000. This lowers the net revenue to \$249 million, still higher than the NYSCC baseline estimate.

The High Value, High Density scenario assumes that the site is built out at FAR 10 rather than FAR 9, and that continued strength in the housing market results in development rights valued at \$125 psf rather than \$100. The combination raises the net revenue to \$794 million.

A table showing the annual revenue streams for these scenarios is included in Appendix B.

Job and Income Benefits

The economic impacts of the NYSCC and



A landscaped area with level changes creates a transition between the most public spaces and the more private entrances to residential buildings.

the alternative residential uses proposed here are difficult to compare. The sports and convention center will generate jobs and income directly through the spending of visitors to the facility on goods and services. By contrast, housing creates value from the spending of new residents and from the labor that they provide to businesses in the city and the region. Estimating the jobs and income that would be created by the new residents is a complex undertaking that is beyond the scope of this study. However, one of the leading competitive challenges of New York City and the metropolitan area is the lack of high quality housing for a wide range of incomes.⁷ The addition of 6,000 units of new housing in Manhattan would enhance the city's ability to attract and retain the global workforce that drives its economy.

As described above, stadia and convention centers are notoriously speculative ventures when it comes to improving the local economy. For the NYSCC, most of the economic impact depends on convention uses and mega-events, and there is a wide range of predictions for how many events the facility will attract, how many new out-of-town visitors these events would attract, and how much they would spend. The projected number of jobs that the NYSCC would create range from an IBO estimate of 3,600 to a total of 7,000 estimated by the Jets. From a regional standpoint, the gain would be even less since all of the stadium benefits and some of the convention benefits are merely the result of shifting activities from one part of the region to the other.

Conclusion

The Hudson Yards represent a development opportunity with enormous potential and are a key to redeveloping the Far West Side. Determining the best use of this site involves weighing three criteria—whether it provides a reasonable rate of return to private developers, how well it stimulates redevelopment on the Far West Side, and how much the public receives in return for its investments. By these criteria, mixed-use development is clearly preferable to stadium or convention center uses. Residential development of the Yards is both feasible and profitable now, and commercial demand is likely to develop at a later date. The advantages of mixed-use development over the stadium in terms of scale, variety, public spaces, waterfront access and traffic make it a clearly superior choice for animating the district. With lower infrastructure costs and higher revenues, it also provides the greatest return on investment and provides the best long-term revenue streams for transit, city and state services.

Endnotes**Development Program and Feasibility**

1 One River Place Rental Office, November 2004.

Public Return on Investment

2 The primary source documents for these assumptions are “*Request for Proposals: Financing of Hudson Yards Project by the Hudson Yards Corporation*,” December 2003, and the Hudson Yards Rezoning and Development Program Draft Generic Environmental Impact Statement.

3 Because residential tax abatements will apply to most of the residential development, the tax return starts small and escalates as abatements phase out. An annual rate was calculated by dividing the 2005-2020 revenue stream in Appendix 2 of the “Request for Proposals: Financing of Hudson Yards Project by the Hudson Yards Corporation” by the amount of cumulative residential development assumed by the City (600,000 sf per year). This schedule was applied to the additional residential development assumed in the mixed use proposal, matching the first year rate in the City/Plan (2005) to the first year of residential development in the Mixed Use Program (2009).

4 Most revenues in this line are from income or sales taxes, but they also include small amounts from other taxes and fees, such as hotel taxes, not included elsewhere.

5 New York City Independent Budget Office, *West Side Stadium: Touchdown for the City?*, July 1, 2004.

6 Regional Plan Association, *Fulfilling the Promise of Manhattan’s Far West Side*, pp. 28-29, July 2004.

7 See *Out of Balance: The Housing Crisis from a Regional Perspective*, Regional Plan Association and the Citizen’s Housing and Planning Council, April 2004.

The Western Rail Yards would include 2,473 condominium units and 3,461 rental units. Ten percent of the condominiums and 20% of the rental units would be income targeted, or “affordable” housing. All households are assumed to be families of three; for tax purposes, they are assumed to be married couples with one dependent.

It is assumed that households living in market rate condominiums earn \$170,000, market rate renters earn \$138,000, and income targeted households earn \$47,000. These are based on the assumption that households will spend 30% of their income on housing costs, where owned units are bought with 30-year mortgages at 6% interest. Selling and rental prices of the units are based on prices per square foot to developers at a reasonable rate of return, specifically 52% for condominium developments and 9.33% for rental developments.

For comparison, the average household income in 2000 according to the US Census was, in Battery Park City, \$149,000 for owners and \$148,000 for renters; in Riverside South it was \$162,000 for owners and \$85,000 for renters; in all of Manhattan, it was \$173,000 for owners and \$66,000 for renters. This income data is based on geography and averages all households regardless of size or amount paid in housing costs.

To estimate income tax, it is assumed that all households are married couples filing jointly with one dependent. Those owning market rate condominium units also deduct \$30,000, which estimates the yearly interest paid on mortgages plus \$3,000 to \$5,000 in other deductions. Those owning income-targeted units deduct \$11,000, which estimates yearly interest paid on their smaller mortgages. Those households renting market rate units are assumed to deduct \$5,000, and those renting income-targeted units have no deduction other than the \$1,000 dependent deduction. This brings the estimated New York State and City income taxes paid per household to the following amounts:

NY State Income Tax paid per year per household

	Owners	Renters
Market Rate Households	\$ 7728	\$ 7248
Income Targeted Households	\$ 823	\$ 1419

NY City Income Tax paid per year per household

	Owners	Renters
Market Rate Households	\$ 4326	\$ 4071
Income Targeted Households	\$ 584	\$ 963

Sales tax is based on this formula: sales tax rate of 8.6% * (after tax income) - (housing + food expenses). It is assumed that households earning \$170,000 will spend \$9,600 on food per year, those earning \$138,000 will spend \$9,100, and those earning \$47,000 will spend \$6,500. These amounts are based on data from the Bureau of Labor Statistics Consumer Expenditure Survey, which shows that in the US in 2001 those households earning in the upper quintile spent \$9,100 on food per year, and those earning \$40,000 to \$49,999 spent approximately \$6,000. Estimates were rounded up and increased by 5% to reflect higher prices in Manhattan. Given these assumptions, the sales tax collected per household per year is as follows:

Sales Tax Collected per year per household

	Owners	Renters
Market Rate Households	\$ 8,367	\$ 6,156
Income Targeted Households	\$ 2,129	\$ 2,046

Annual Revenues for Western Yards Alternatives

	City/State Plan			Mixed Use Alternative					
	NYSCC Revenues IBO Best Case	NYSCC Revenues IBO Low Scenario	NYSCC Revenues Jets	Baseline		Weak Market		High Value & Density	
				WRY Onsite Land Value	Residential Property Taxes	WRY Onsite Land Value	Residential Property Taxes	WRY Onsite Land Value	Residential Property Taxes
NPV (2003\$)	658,411,292	\$ 537,601,881	\$1,040,391,197	\$474,704,008	\$423,156,728	\$357,368,168	\$280,228,250	\$711,705,739	\$470,174,143
2003	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-
2008	-	-	-	500,000	449,462	-	-	500,000	499,403
2009	27,250,000	22,250,000	42,038,886	66,461,074	1,137,176	-	-	90,265,101	1,263,529
2010	54,500,000	44,500,000	86,179,717	86,662,706	2,057,495	500,000	449,462	117,706,448	2,286,105
2011	55,862,500	45,612,500	88,334,210	76,647,655	3,211,213	500,000	1,137,176	105,849,648	3,568,014
2012	57,259,063	46,752,813	90,542,565	113,079,040	4,355,207	13,237,750	1,381,138	156,974,613	4,839,119
2013	58,690,539	47,921,633	92,806,129	9,389,559	6,169,694	78,132,858	2,356,447	15,649,265	6,855,216
2014	60,157,803	49,119,674	95,126,283	11,124,298	7,619,433	97,226,085	5,626,366	17,540,496	8,466,037
2015	61,661,748	50,347,665	97,504,440	12,364,905	9,489,445	9,864,905	3,919,870	18,941,509	10,543,827
2016	63,203,291	51,606,357	99,942,051	22,444,926	10,447,254	80,545,389	5,182,453	32,867,884	11,608,060
2017	64,783,374	52,896,516	102,440,602	30,781,830	12,758,688	55,743,847	6,208,437	45,615,081	14,176,320
2018	66,402,958	54,218,929	105,001,617	53,481,498	14,466,358	84,622,999	7,713,465	78,783,551	16,073,731
2019	68,063,032	55,574,402	107,626,657	41,050,048	16,105,916	10,889,009	8,809,150	62,250,165	17,895,462
2020	69,764,608	56,963,762	110,317,324	41,416,674	21,821,095	12,161,235	9,863,231	65,422,327	24,245,661
2021	71,508,723	58,387,856	113,075,257	40,476,893	24,969,276	12,940,266	11,468,204	65,966,592	27,743,640
2022	73,296,441	59,847,553	115,902,138	38,730,732	32,618,025	19,338,599	16,676,433	64,551,221	36,242,250
2023	75,128,852	61,343,741	118,799,692	39,699,001	37,867,608	22,410,092	20,292,336	66,165,001	42,075,120
2024	77,007,073	62,877,335	121,769,684	40,691,476	47,332,882	31,096,587	27,894,475	67,819,126	52,592,091
2025	78,932,250	64,449,268	124,813,926	41,708,763	57,324,547	33,259,486	34,854,008	69,514,604	63,693,941
2026	80,905,556	66,060,500	127,934,274	42,751,482	68,531,811	41,042,740	44,942,199	71,252,469	76,146,456
2027	82,928,195	67,712,013	131,132,631	43,820,269	82,768,634	76,621,544	56,095,896	73,033,781	91,965,149
2028	85,001,400	69,404,813	134,410,947	44,915,775	102,375,617	50,352,994	67,062,953	74,859,626	113,750,686
2029	87,126,435	71,139,933	137,771,221	46,038,670	122,815,818	49,317,164	80,994,635	76,731,116	136,462,020
2030	89,304,596	72,918,432	141,215,501	47,189,637	143,653,245	47,189,637	100,181,377	78,649,394	159,614,716
2031	91,537,211	74,741,392	144,745,889	48,369,377	169,008,183	48,369,377	120,183,478	80,615,629	187,786,870
2032	93,825,641	76,609,927	148,364,536	49,578,612	192,460,087	49,578,612	140,574,291	82,631,020	213,844,542
2033	96,171,282	78,525,175	152,073,649	50,818,077	223,575,008	50,818,077	165,385,791	84,696,795	248,416,675
2034	98,575,564	80,488,305	155,875,491	52,088,529	249,994,436	52,088,529	188,335,046	86,814,215	277,771,596
2035	101,039,953	82,500,512	159,772,378	53,390,742	284,599,395	53,390,742	218,783,073	88,984,571	316,221,550
Total (Nominal)	1,989,888,088	1,624,771,007	3,145,517,698	1,245,672,248	1,949,983,006	1,081,238,521	1,346,371,392	1,940,651,252	2,166,647,784

Appendix

C

Sample Condo Building

Building Description

Gross Building Area (sf)	468,750
Net Residential sf	375,000
Total housing units	375

Development Costs (\$)

Land Cost		
Development Rights Purchase	\$170/sf	79,687,500
Soft Costs		
A&E	\$6/sf	2,812,500
Legal		550,000
Developers Fee	3.00%	5,840,325
Financing Construction Period (Net)	\$16,000/unit	6,000,000
Other Soft Costs	\$14,000/unit	5,250,000
Soft Cost Contingency	5.00%	730,625
Total - Soft Costs	\$45/sf	21,183,450
Hard Costs		
Construction Contingency	5.00%	4,500,000
Construction Costs	\$192/sf	90,000,000
Platform Cost Improvements (Fee To City)	\$10/sf	4,687,500
Structural Premium For Building On Platform	\$85/sf	1,190,000
Total - Hard Costs	\$214/sf	100,377,500
Total - Construction Costs Excl. Land Cost	\$259/sf	121,560,950

Total Development Cost 201,248,450

Sales Revenue (\$)

Condo Sales		
For Sale Proceeds	\$851/sf	319,125,000
Selling Commissions	4.0%	(12,765,000)
Gross Revenue		306,360,000
Net Revenue		105,111,550

Net Revenue/ Total Development Cost 52%

Appendix

D

Sample 80/20 Rental Building

Building Description

Market Rate Housing Units	326
Affordable Housing Units	71
Total Housing Units	397
Market Rentable sf	325,606
Affordable Rentable sf	71,475
Retail sf	3,836
Total Rentable sf	397,081
Gross Building Area (sf)	468,750

Development Costs (\$)

Land Cost		
Ground Lease Construction Period (2 Yrs)*	\$500,000/yr	\$1,000,000
Total - Land Cost		1,000,000
Soft Costs		
A&E	\$5/sf	2,343,750
Legal	\$1,333/unit	529,441
Developers Fee	3.00%	3,394,050
Construction Period Financing (Net)	\$16,000/unit	6,353,296
Marketing And Advertising	\$3/sf	1,401,563
Other Soft Costs	\$14,000/unit	5,559,134
Soft Cost Contingency	5.00%	809,359
80/20 Financing Fees	\$20/sf	9,375,000
Total - Soft Cost	\$63/sf	29,765,593
Hard Costs		
Construction Contingency 5.00%		4,289,063
Construction Costs	\$183/sf	85,781,250
Structural Premium For Building On Platform	\$85/sf	1,190,000
Platform Cost Improvements*	\$10/sf	4,687,500
Total - Hard Costs	\$205/sf	95,947,813
Total Development Cost	\$270/sf	126,713,405

Unit Assumptions

	Market	Affordable†
Year 1 Average Annual Rent psf	\$46	\$11
Vacancy	4.0%	1.0%
Annual Rent Growth	3.0%	3.0%

Financing Assumptions

30-Year Tax Exempt Bonds	\$126,713,405
Interest Rate: Low Floater**	3.50%
Principal payment***	0.65%
Remarketing Fee	0.08%
Issuer's Fee	0.15%
Trustee Fee	0.01%
Credit Enhancement Fee	1.00%
"All-in" Rate	5.39%

Real Estate Tax Assumptions

421-a Tax Exemption	% Exemption
Years 1-12	100%
13-14	80%
15-16	60%
17-18	40%
19-20	20%

* Assumptions For Ground Lease Payments And Platform Reimbursement Fee Are Based On The City's Finance Plan for the Hudson Yards of December 2003.
 **10 Year Bond Market Association Index Average
 *** Based on 30 Year Mortgage at 9% imputed interest rate
 †NYC HDC 80/20 Guidelines: 20% of Units must be occupied by families earning no more than 50% of area median income

Sample 80/20 Rental Building (cont.)

Projected Cash Flow for Years 1 through 10 (\$ unless noted)

	\$ per net sf	\$ per unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
Revenue	Revenue Market Units	\$46.0	\$46,000	\$14,977,895	15,427,232	15,890,049	16,366,751	16,857,753	17,363,486	17,884,390	18,420,922	18,973,550	19,542,756
	Market Vacancy	-1.8	-1,840	(599,116)	(617,089)	(635,602)	(654,670)	(674,310)	(694,539)	(715,376)	(736,837)	(758,942)	(781,710)
	Revenue Affordable Units	12.0	12,000	857,695	883,426	909,929	937,226	965,343	994,304	1,024,133	1,054,857	1,086,502	1,119,097
	Affordable Vacancy	-1	-120	(8,577)	(8,834)	(9,099)	(9,372)	(9,653)	(9,943)	(10,241)	(10,549)	(10,865)	(11,191)
	Net Rental Revenue	38.3	38,350	15,227,898	15,684,734	16,155,276	16,639,935	17,139,133	17,653,307	18,182,906	18,728,393	19,290,245	19,868,952
	Other Revenue Sources												
Retail Income	35.0		134,260	138,288	142,436	146,710	151,111	155,644	160,313	165,123	170,077	175,179	
Other Income	.3	252	100,000	103,000	106,090	109,273	112,551	115,927	119,405	122,987	126,677	130,477	
Total Other Revenue	.6	590	234,260	241,288	248,526	255,982	263,662	271,572	279,719	288,110	296,754	305,656	
Effective Gross Revenues	38.9	38,940	15,462,158	15,926,022	16,403,803	16,895,917	17,402,795	17,924,878	18,462,625	19,016,503	19,586,999	20,174,608	
Expenses	Building Payroll	-2.9	-2,896	(1,150,000)	(1,184,500)	(1,220,035)	(1,256,636)	(1,294,335)	(1,333,165)	(1,373,160)	(1,414,355)	(1,456,786)	(1,500,489)
	Marketing	-.4	-428	(170,000)	(175,100)	(180,353)	(185,764)	(191,336)	(197,077)	(202,989)	(209,079)	(215,351)	(221,811)
	Maintenance	-.3	-290	(115,000)	(118,450)	(122,004)	(125,664)	(129,434)	(133,317)	(137,316)	(141,435)	(145,679)	(150,049)
	Grounds	-1	-94	(37,500)	(38,625)	(39,784)	(40,977)	(42,207)	(43,473)	(44,777)	(46,120)	(47,504)	(48,929)
	Redecoration	-.2	-229	(91,000)	(93,730)	(96,542)	(99,438)	(102,421)	(105,494)	(108,659)	(111,919)	(115,276)	(118,734)
	Professional Fees	-1	-63	(25,000)	(25,750)	(26,523)	(27,318)	(28,138)	(28,982)	(29,851)	(30,747)	(31,669)	(32,619)
	Utilities	-1.0	-1,039	(412,500)	(424,875)	(437,621)	(450,750)	(464,272)	(478,201)	(492,547)	(507,323)	(522,543)	(538,219)
	Management Fee	-1.1	-1,071	(425,209)	(437,966)	(451,105)	(464,638)	(478,577)	(492,934)	(507,722)	(522,954)	(538,642)	(554,802)
	Insurance	-.8	756	(300,000)	(309,000)	(318,270)	(327,818)	(337,653)	(347,782)	(358,216)	(368,962)	(380,031)	(391,432)
	Real Estate Taxes	-.9	-909	(360,938)	(360,938)	(360,938)	(360,938)	(360,938)	(360,938)	(360,938)	(360,938)	(360,938)	(360,938)
	Total Operating Expenses	-7.8	7,775	(3,087,147)	(3,168,933)	(3,253,173)	(3,339,940)	(3,429,310)	(3,521,361)	(3,616,174)	(3,713,831)	(3,814,418)	(3,918,022)
Ground Lease Payment	-8.3	-8,263	(3,281,250)	(3,363,281)	(3,447,363)	(3,533,547)	(3,621,886)	(3,712,433)	(3,805,244)	(3,900,375)	(3,997,885)	(4,097,832)	
Net Operating Income	22.9	22,902	9,093,761	9,393,808	9,703,267	10,022,430	10,351,598	10,691,084	11,041,207	11,402,297	11,774,696	12,158,755	
Tax Exempt Bond Financing													
Debt Service	-5.39%		(6,829,853)	(6,829,853)	(6,829,853)	(6,829,853)	(6,829,853)	(6,829,853)	(6,829,853)	(6,829,853)	(6,829,853)	(6,829,853)	
Cash Flow After Debt Service			2,263,908	2,563,955	2,873,414	3,192,577	3,521,746	3,861,231	4,211,354	4,572,445	4,944,844	5,328,902	

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Regional Plan Association (RPA) is an independent regional planning organization that improves the quality of life and the economic competitiveness of the 31-county New York-New Jersey-Connecticut region through research, planning, and advocacy. Since 1922, RPA has been shaping transportation systems, protecting open spaces, and promoting better community design for the region's continued growth. We anticipate the challenges the region will face in the years to come,

and we mobilize the region's civic, business, and government sectors to take action.

RPA's current work is aimed largely at implementing the ideas put forth in the Third Regional Plan, with efforts focused in five project areas: community design, open space, transportation, workforce and the economy, and housing. For more information about Regional Plan Association, please visit our website, www.rpa.org.

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