



Arthur Avenue, the Bronx

STRATEGIES

WALKABILITY



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INTRODUCTION

SYNOPSIS

The relative walkability of a community plays a critical role in underpinning the success of Transit-Oriented Development. A welcoming, walkable, pedestrian environment utilizes many tools along its streetscape, which, in the aggregate, increase safety and activity amongst its users, and ultimately works to establish a sense of 'place' within the larger community. Its importance was recently highlighted in New York City's latest addition to its Active Design series: *Shaping the Sidewalk Experience*, which provides a framework for thinking about sidewalks as well as tools to inform sidewalk design.¹ In his recent book, *Walkable City*, Jeff Speck states that "a walk has to satisfy four main conditions: it must be useful, safe, comfortable and interesting. Each of these qualities is essential and none alone is sufficient."² An aesthetically appealing commercial corridor is not going to succeed if there is no reason to go there or no way to get there, and an extremely useful corridor will not be memorable for repeat visits if it not interesting.

Many successful neighborhoods, such as Greenwich Village or the Belmont neighborhood in the Bronx, have bolstered and preserved their pedestrian amenities, retail and service establishments and community assets to the extent that their name becomes synonymous with, and evocative of, a unique, pleasurable walking and strolling experience. The quality of this experience in turn reinforces the use of mass transit to and from the neighborhood, as the abundance of amenities within the neighborhood reduces the need for trips outside, and necessity of a vehicle. The appeal and desirability of these neighborhoods also serves as a continuing catalyst for renewed private investment and development.

This section discusses the barriers to walkability currently faced by many Bronx neighborhoods, and discusses the components which are often found in the City's most walkable streets. When these components are comprehensively applied to major corridors, in a unique and compelling manner, they can facilitate a more walkable, more sustainable community which marries its transit assets into the pedestrian fabric.

FIGURE 1 | East side of Amsterdam Avenue between 107th and 108th Streets in Manhattan. This highly walkable street contains active retail along the ground floor, street trees, continuous street wall, contextual buildings that also have varying articulation and nuances.



BACKGROUND

Given the robust transit network within New York City, this relationship between transit and the pedestrian environment is more pronounced than most other American cities. The walkability of the streets in a community is often a deciding factor in how users choose to get to their destination. If neighborhood amenities like grocery stores, convenience stores and other retail and service establishments do not exist within a walkable radius, or are in areas perceived to be unsafe, then a resident will likely drive to another neighborhood. If the route to a subway or mass-transit station from home or a place of employment is not populated with convenient amenities, like places for coffee and newspapers, or is perceived as unsafe, it may prompt commuters to change their mode of transit to vehicular, or avoid a particular mode of transit. Not only is this walkability critical to promoting neighborhood sustainability (by reducing emissions resulting from vehicular trips) but it is also vital to promoting and sustaining local economic development. Streets with large amounts of pedestrian activity feel safer and vibrant, promoting more pedestrian activity and stimulating local businesses. The inverse can occur on sterile and desolate corridors.

Many Bronx neighborhoods blossomed and flourished on the basis of their transit connectivity. Subways, commuter rails and trolley cars crisscrossed the borough, and a wide variety of neighborhood and civic amenities within walking distance made many Bronx neighborhoods stately, middle-class enclaves for upwardly mobile immigrants. A complicated history of neighborhood decline in conjunction

with transit disinvestment has made walking around some neighborhoods difficult. At the same time development patterns around commuter rail lines have created isolated areas around some stations which are disconnected from traditional pedestrian pathways. This has created gaps in streetscape amenities, vacant lots, and land uses with unwelcoming building frontages which ultimately create an environment that is unfriendly for pedestrians and discourages ridership.

This study provides an opportunity to re-examine these neighborhoods and address walkability gaps. Through this study we have identified key pedestrian routes in each community, those which commuters utilize for transfers between modes of transit as well as day-to-day activities. Issues and opportunities related to the pedestrian environment were identified along these routes, and upon analysis, a pattern emerged that many neighborhoods suffered from the same deficiencies and lack of pedestrian infrastructure. This section identifies best practices for addressing some of these issues in order to reestablish walkable corridors, which reconnect neighborhoods, employment centers, and civic amenities to the mass-transit options they were built upon. Together they are intended to promote ridership, safety, increased pedestrian activity and create a more walkable and complete community.

Figure 3 shows images of contrasting streets blocks. The block along 161st in the Melrose neighborhood lacks a continuous street wall, has inactive ground floor uses, surface parking abuts the pedestrian realm; it lacks amenities, and has drastically varying building scale. The image along Amsterdam Avenue and similarly along 149th Street in the Bronx, con-



CASE STUDY | Enhanced Commercial Districts

In order to facilitate the development and preservation of quality streetscapes, the Department of City Planning has devised a zoning tool called an Enhanced Commercial District (EC District). This special district can be mapped anywhere within the city, and the discrete tools that it offers can be customized to meet the specific needs of a given commercial corridor.

The first EC District was established on Fourth Avenue in Brooklyn in 2011. Since the neighborhood was rezoned in 2005 as part of the South Park Slope contextual rezoning, Fourth Avenue has been evolving from automotive and commercial uses to a more mixed use thoroughfare with residential and retail establishments. However, since this is an emerging corridor, the ground floors of many new developments have been built to be primarily occupied by public parking garages, resulting in mostly blank walls against the sidewalk. This was especially troubling since modifying a parking garage is not a simple task like renovating a retail interior to another use.

Guided by the community, the Department of City Planning created an EC District to require future developments provide a minimum percentage of the ground floor be occupied by more active retail uses, and requiring all parking to be beyond 30 feet of the street wall. Pedestrian impediments such as curb cuts for parking must be located on side streets, and minimum levels of ground floor level transparency are required. A similar EC District was established for

an emerging retail corridor along Broadway in Bedford-Stuyvesant, where sections of it were paired with a special elevated rail district to accommodate the needs of lots adjacent to the elevated rail line. In combination, these rules will ensure that as the corridors continue to emerge, quality retail space is provided to serve the needs of the growing population.

In the Upper West Side in Manhattan, the city devised two distinct EC Districts in 2012 to address community concerns about changes to the retail landscape and character of the neighborhood. The Upper West Side, a highly dense residential area with limited commercial space, requires retail diversity to serve the needs of its large population. In order to address the unique conditions of the particular commercial avenues, the modifications to Amsterdam and Columbus differed from those on Broadway. The EC District along Amsterdam and Columbus Avenues addressed concerns about large frontages that have opened along the commercial avenues. Here, regulations which establish maximum frontage widths and minimum number of stores per block will help to ensure that the diverse array of storefronts is maintained in this area. Along Broadway, the commercial stores are of a regional character, and restrictions are specifically targeted to stem the proliferation of banks along the corridor. Both corridors utilize minimum levels of ground floor level transparency. These rules will ensure future growth mimics the rich urban fabric which has evolved in these neighborhoods.



FIGURE 2 | Fourth Avenue, Brooklyn; the first EC District was established here in 2011.



FIGURE 3 | Street blocks in the Melrose neighborhood, Bronx. (Top) 161st Street and Concourse Village East. Surface parking abuts the pedestrian realm, creating a break in the street wall. (Bottom) Arthur Avenue, Belmont. This successful retail corridor has a diversity of ground floor uses, street trees, continuous street wall, and contextual buildings.

tains active retail along the ground floor, street trees, continuous street wall, contextual building that also have varying articulation and nuances. The contrasting images illustrate how a block with an unsuccessful streetscape, in the case of 161st street, can serve as a barrier to pedestrian activity. The Melrose section of this report further details how integral this is to a thriving retail corridor.

STRATEGIES: COMPONENTS OF WALKABLE STREETS

Walkable streets begin with the sidewalk and how a pedestrian experiences the street. Sidewalks are integral places on every street, in every community. We use this place for transport, for shopping, and for socializing. Creating a pleasurable sidewalk experience, you also increase staying power, the qualities that persuade people to stay and enjoy a place. The sidewalk is also a critical juncture between the street

and the built environment, and typically serves as the threshold between private development and the public right of way. It is the portal to connect to transit, to retail and service establishments, to places of employment and to recreational amenities. The sidewalk has incredible potential in a community as both a social and economic engine.

What follows are a list of components identified by both practitioners and by community members which should be integrated into major corridors to facilitate greater walkability within the neighborhood and to mass transit resources.

INTEGRATED MASS-TRANSIT

Ideally, mass-transit stations are well-integrated into walkable, vibrant corridors. Irrespective of the type of transit, riders benefit from the convenience of having retail establishments at their disposal, and most people feel safer waiting for service in well-lit, well-populated places. Fronting on or having visibility from a major corridor benefits the transit by encouraging riders.

Traditionally, many Metro-North stations had prominent stations along major corridors, as currently can be found at the Fordham station along Fordham Road. As the Bronx progressed from a suburban

borough into an extension of urban Manhattan, the relevance of Metro-North waned for decades as the northern extension of the subway system made them somewhat redundant. The relatively expensive inbound ticket price, considering the relatively low-income population, furthered station decline and capital improvements were rarely warranted.

However, the outbound price of Metro-North ticketing is considerably less expensive and since jobs have steadily moved to the suburbs, a new reverse commuting trend in the Bronx has begun to emerge since 1990 to the extent that the Bronx constitutes the largest reverse-commute pattern on any commuter rail line in America.³ This increase of service warrants re-examining and improving station conditions, especially where old stations have been removed and entrances relegated to secondary streets.

BUILDING STREET WALL

Building façades not only have the challenge of being attractive and well-designed at the building scale, but should also work to be relatively harmonious with other buildings on the block. Attention should be paid to how much a building entrance is setback from the street, how high it rises, and what is the overall height of buildings. Ideally, a series



FIGURE 4 | Bus stop near the Fordham Metro-North Station. Easing transfers between different modes helps create a more comprehensive public transit system, and, in turn, supports the growing reverse-commute pattern in the Bronx.

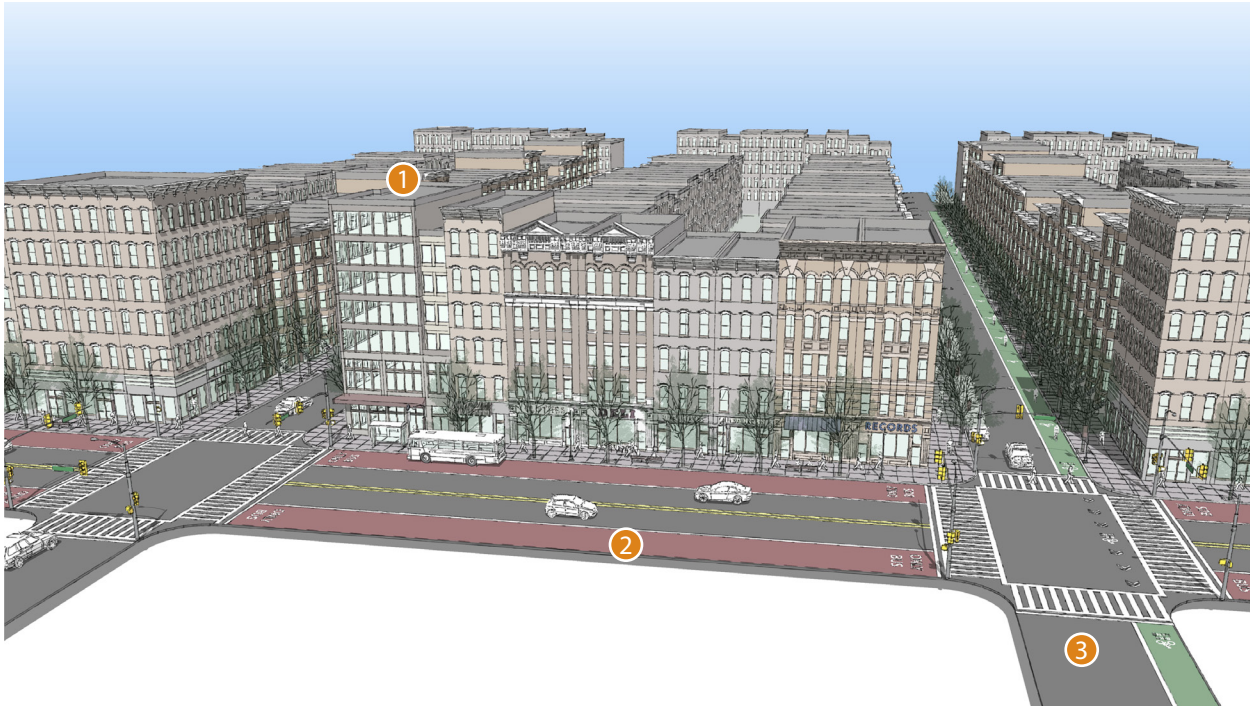


FIGURE 5 | Attributes of successful pedestrian streets.

- ① A well-defined street wall abutting the sidewalk edge; scale of new development should blend with existing context
- ② Streets can safely accommodate multiple modes of transit (buses, bikes, etc.) safely; limit curb cuts
- ③ Short blockfronts with well-defined crosswalks

of prominent facades will line up along the street, forming in the aggregate, a street wall. A well-defined street wall which abuts the sidewalk edge will form an uninterrupted and protected pedestrian zone. It can set up a visual corridor that allows the pedestrian to see what is next. The scale of new development should blend with the existing context of the existing area. Minimum and maximum building heights should be included to create this feel. The exception to this is institutional buildings, like houses of worship, museums and schools, which typically, and purposefully, exceed the size and scale of other surrounding buildings to announce their importance.

This is not to say that all non-institutional buildings should be the same, but quite the opposite. Monotonously monolithic developments with regimented heights and façade treatment spanning the entire block can produce bland, and uninspiring blockfronts. Minimum and maximum street wall height, with 2-3 stories of difference, can create subtle variations in height, adding interest and variety to intrigue the pedestrian. Permitted recesses and dormers allow for articulation on the façade which adds a subtle, but noticeable, undulation to the block-

front, pulling the pedestrian down the block. Subtle variations at routine intervals are another street wall element that make many New York City blocks so walkable. The traditional New York City block originally subdivided into several lots which were sized around 20-foot wide with a depth of 100 feet. This facilitated the fastidious development of brownstones at the time, one after the other, block after block. Subtle variations exist between each building, and over time, renovations, additions, and enlargements have made these organic changes even more pronounced. In the aggregate, this balance between consistency and variety makes a tremendous walking experience as slight variations in heights, articulation, transparency, materials, plantings and colorations at 20-30 foot intervals all combine to keep the pedestrian engaged.

In many of our study areas the street wall has been interrupted by vacant parcels and erratic and inconsistent development. Buildings built after the 1960s were often setback far from the street and tower over the existing buildings. In the early part of the twentieth century, the Swiss architect, Le Corbusier espoused a new form of urbanism which radically departed from its past and would be defined by



FIGURE 6 | Attributes of successful pedestrian streets.

- 1 Street trees at regular intervals, with adequate tree pits
- 2 Street lamps at regular intervals, including crosswalks; ensures safety
- 3 Ground floor level has appropriate balance of transparency and articulations, with signage well incorporated into the façade
- 4 Way-finding signage is clearly visible
- 5 Variety of ground floor uses with multiple stores per block
- 6 Bus shelter, seating, and other street furniture where appropriate
- 7 An adequate clear paths on the sidewalk assures ample room for pedestrians

large towers placed in sprawling parklands. The theory became so popular that in 1961, when New York City rewrote its Zoning Resolution, its bulk regulations encouraged the ‘tower in the park’ sort of development through ‘height factor zoning’. The practicality of incorporating this type of built form into an existing fabric had undesirable consequences, distancing activity from the street, and much of the development of the 1960s and 1970s severed much of the pre-existing fabric by encouraging buildings which ignored the existing location and heights of all the surrounding buildings.

Realizing the drawbacks of ‘height factor zoning’, in the 1980s the Department of City Planning estab-

lished the ‘Quality Housing Program’. This program works in conjunction with the mapping of ‘contextual zoning districts’ and either incentivizes or requires positive street wall elements, including stringent street wall location rules which often require new buildings to line up with existing buildings, allowances for recesses and dormers to add articulation and variety, minimum and maximum street wall heights before setback and overall building heights. Contextual districts which require these elements have been mapped in areas where appropriate over the last twelve years to re-engage the built fabric of New York with the public realm.



FIGURE 7 | Pop-up cafe on Pearl Street in downtown Manhattan.
Source: © NYC Department of Transportation

GROUND FLOOR USES

The built environment and the pedestrian realm are necessarily connected. The type of use that occupies the ground floor of a building defines the user and activity generated. Elements like the type of use of ground floor stores, width, signage, the number of stores per block, and transparency -- the ease a pedestrian has to view into a store -- are critical in facilitating a successful pedestrian experience.

The quality of the pedestrian experience is greatly enhanced through an array of active ground floor uses and the efficiency in which sidewalks can connect users to their destinations. Just as a variety of buildings makes a block interesting, a multitude of ground floor establishments engages a given passerby. These places could be special destinations like museums and movie theaters, or routine shopping trips to retail and services, like grocery stores, and laundromats. The more retail and service uses that are located within the community itself, the more efficiently and effectively community members can shop within their neighborhood. This in turn can produce a virtuous cycle where a successful corridor begins to attract new retailers and shoppers from outside the community.

To ensure that retail corridors are filled with vibrant, active uses, the amount of street wall frontage allocated to uses which generate minimal amounts of

foot-traffic should be limited. These less active uses might include residential lobbies, certain community facility uses, and the front office of banks.

Signage and awnings along retail corridors can clearly communicate the individual identity and purpose of a business and at the same time project a consistent theme which conveys the neighborhood identity. This should be stated without obscuring windows or covering architectural elements of the building. While DCP regulates elements of signage, local Business Improvement Districts can work with business owners to set guidelines to create a cohesive experience as well as offer incentives to assist with compliance.

Healthy streetscapes foster vibrant, active streets which in turn attract other, sometimes larger, retailers, including larger department stores and national chains. Many community members have negative reactions to big-box development, thinking of suburban strip malls with large open parking lots. This is a valid concern, as some poorly designed larger storefronts can take away from walkability block after block with long, blank street walls. However, there are several cases of large retail stores adapting to urban markets and promoting healthy commercial strips by becoming destinations unto themselves and function as micro-economic engines that bring more potential customers into a neighborhood.



FIGURE 8 | Pervious pavers can be used to connect street tree pits in areas with heavy pedestrian traffic. (Left) Grand Concourse north of 161st Street, Bronx. (Right) Decorative tree guards add visual interest and protect street trees.

Examples of this success can be seen in the Bronx at the River Plaza and Bronx Terminal developments, as well as along Fordham Road, where large retail developments are often located on the second floor and basement. In order to maximize the potential value these stores add to a neighborhood and minimize the potential negative effects, additional controls can be established. An increased commercial floor area ratio (FAR) may encourage these stores to be located on second stories, allowing for an array of retail sizes to be retained on the ground floor. Lower parking requirements and screening requirements can minimize concerns over traffic congestion and strip malls. Finally, in small-scaled neighborhoods with a well-established variety of retail sizes, maximum store widths can protect this neighborhood character by shepherding large portions of these stores to the second floor, the basement, or behind other retail uses to minimize their impact.

The transparency of store fronts and show windows serve to engage with pedestrians and provide them with a sense of safety and security. Furthering the feeling offered by these uses is the glow at night from open stores spilling out into the sidewalk, a large improvement when compared to shuttered stores or blank walls. Urbanist Jane Jacobs noted this correlation between ground floor activity and vitality, and how this activity could passively reduce crime simply by having more ‘eyes on the street.’ Such design measures have been shown to significantly deter crime.⁴

Any potential frontage restrictions in the Bronx should be carefully calibrated to the specific needs of a community, and the relative health and vitality of their retail corridors. For example, any restriction on banks in certain emerging Bronx neighborhoods may be inappropriate as they suffer from a dearth of financial services institutions. Offices should be discouraged from the ground floor as the limited hours and limited foot traffic they generate does not enhance the vitality of the commercial thoroughfare. Parking garages and their entrances should front on side streets and be located behind retail frontages whenever possible.

The Department of City Planning, recognizing the importance of all these elements, has incorporated several elements into neighborhood rezonings. Since no solution should be ‘one size fits all,’ a variety of zoning tools have been used throughout the city, tailoring solutions on a block-by-block basis, depending on the relative health and stability of the neighborhood.

CLEAR PATH

Sidewalks should maintain a clear path with adequate room for pedestrians. Wide sidewalks with well defined amenity strips can provide a buffer and reinforces the pathway for pedestrians.

Amenity strips could utilize a separate material, such as permeable pavers, to differentiate themselves from a clear path. Permeable pavers have the added

benefit of absorbing and filtering storm water prior to going into a catch basin.

Oftentimes, retail uses spill out into the sidewalk. Grocery stores often place produce onto sidewalks to attract customers and restaurants often provide sidewalk cafes to offer fresh air and sunlight to patrons. These contribute to the general ambiance of a successful sidewalk and should be encouraged where there is ample room. The Department of City Planning establishes streets where sidewalk cafes are permitted in commercial districts and has established a minimum clear path requirement of eight feet to ensure there is not a conflict between the functionality of the sidewalk and the wait staff and patrons of the restaurant. The Department of Consumer Affairs issues permits for cafes which meet these locational and clear path requirements. Sidewalk cafes often bring vibrancy and life to streets and unenclosed cafés should be permitted and encouraged where there is ample sidewalk room.

Conversely, inappropriate uses along commercial corridors can spill out across the pathway, adding little value to the pedestrian experience. In close proximity to several station areas, for example, automobile sales and repair shops have vehicles, tires and vehicle components spilling into if not blocking the public right of way. Not only does this limit the

functionality of the sidewalk, but it detracts from the potential vibrancy of the streetscape.

STREET TREES

Throughout our community outreach process, community members consistently identified streetscape components that they liked and felt benefited the community and those that did not. Amongst the features that are most desired on sidewalks are street trees. Street trees provide countless benefits for residents, pedestrian passersby, and the city as a whole. Street trees provide shade in the hot summer months to not only those on the street, but nearby residential units. This makes the sidewalk a more attractive place for pedestrians, and lowers energy costs for nearby residents. (New York City estimates that all urban trees combined result in a total energy-cost savings of \$3.41 per resident).⁵ Street trees also benefit a city's infrastructure. They divert gallons of rainwater that otherwise would mix with raw sewage and flow into our waterways.

Street trees also immensely improve the aesthetics of a particular street by softening the hardscape of urban neighborhoods. The positive effects of trees, including their value to surrounding real estate, has been understood for centuries.



FIGURE 9 | Privately Owned Public Space (POPS) Plaza, 6th Avenue Manhattan.

Source: © NYC Department of Transportation



FIGURE 10 | DOT traffic-calming measures have helped improve the pedestrian experience, as shown here at the Hub in the Bronx (Left). At the West Side Highway and Warren Street in Lower Manhattan. (Right)

Source: © NYC Department of Transportation

Adequate tree pits are required to ensure that trees will mature properly and to prevent the sidewalk from uplifting. Decorative pavers or tree pit guards can be coordinated by BID's and contribute to consistent design. Detailed standards can be found in the NYC Department of Parks and Recreation's 2013 *Tree Planting Standards*.⁶ It is important that once trees are planted, that the tree pits are maintained. Oftentimes in Bronx neighborhoods, trash and debris can collect within them, which defeats the purpose of the amenity providing aesthetic enjoyment. Several BIDs maintain their communities tree pits, and often plant them with flowers or ground cover to deter litter.

New developments and enlargements to existing buildings are required to provide street trees in 25-foot intervals along their street frontage pursuant to the NYC Zoning Resolution. As developments and renovations occur in station areas, new street trees will follow. Other areas may be eligible for the Million Trees NYC initiative, which allows residents to request a street tree for their block or property. In both situations, street trees are maintained by the Department of Parks and Recreation, unless planted on private property or adopted through Million Trees NYC. To request a street tree, call 311 or visit: <http://www.nycgovparks.org/trees/street-tree-planting/request>

BENCHES

Strategically-spaced, weatherproof benches were also noted by community members as desirable

sidewalk amenities. When benches are made of the right materials and placed in the right places, they can greatly enhance a space. People are much more likely to stay and enjoy the day, and increased faces on the street promote community and deter crime. This is also an important amenity for physically impaired or elderly people as it allows for breaks in walking. Benches located along busy retail corridors serve as a resting place for patrons, and along transit stops they serve as auxiliary waiting areas for riders, greatly increasing their appeal. The NYC Department of Transportation's CityBench program installs attractive and durable benches around the city, particularly at bus stops, retail corridors, and in areas with high concentrations of senior citizens. The goal is to have more than 1,000 additional benches across the city by 2015.⁷ To request a CityBench in your neighborhood visit: <http://www.nyc.gov/html/dot/html/pedestrians/citybench.shtml>

PUBLIC SPACES

Public spaces that include public and private plazas, seating and outdoor cafes can provide respites for users and serve attractions to the area they are in. When located along a pedestrian corridor they can double as a meeting place, waiting area, and promote local businesses. At key intersections these spaces can serve as an entranceway to or connection between communities, which can help to define it as a place. As identified in this study across much of the Bronx successful public plazas are lacking, although additional sites have been identified. NYC DOT's pla-

za and street seats programs provide opportunities for businesses and community organizations to activate spaces along pedestrian pathways.

PARKING & CURB CUTS

As the name suggests, curb cuts are gaps in the continuity of the curb to allow for vehicular driveways. The very nature of these allow for automobiles to drive onto the curb, defeating the purpose of the sidewalk as a pedestrian refuge and creating dangerous conflicts between drivers and pedestrians. Vehicles attempting to egress a parking facility often lurch out into the sidewalk to establish if they may safely merge into traffic, prompting hazardous conditions for pedestrians. This ingress of merging vehicles into traffic flow can also exacerbate traffic congestion on major arterials.

Since most curb cuts access parking spaces or loading docks required by the Department of City Planning typical solutions on major streets involve a combination of prohibiting curb cuts on major avenues and commercial streets and pursuing zoning districts along commercial corridors which have lower parking requirements, especially in areas well served by mass transit, as it will increase a property's ability to waive out of the requirement. Where parking is provided, it should ideally be enclosed and located beyond other uses. Entrances and exits to the parking facility should be located on side streets with fewer pedestrians and potential mode conflicts.

STREET LAMPS

Getting people to stay on the streets during the daytime can be a difficult task in itself, let alone at night. Well-lit sidewalks and public spaces are integral in bringing more people to enjoy sidewalks and the places they connect with-- be they recreational, entertainment or shopping related. Well-lit, active spaces are not conducive to crime, so pro-actively creating active, bright, bustling sidewalks is one method that vulnerable communities can take to reduce crime. When people aren't afraid to travel at night, the image and safety of a community dramatically improves.

Not only is lighting important, but the typology itself and any associated community-specific banners is important in establishing and reinforcing community assets and pride. The New York City Department of Transportation utilizes a variety of street lamps to respond to differing needs and communities. For example, highways and major arterial roads typically

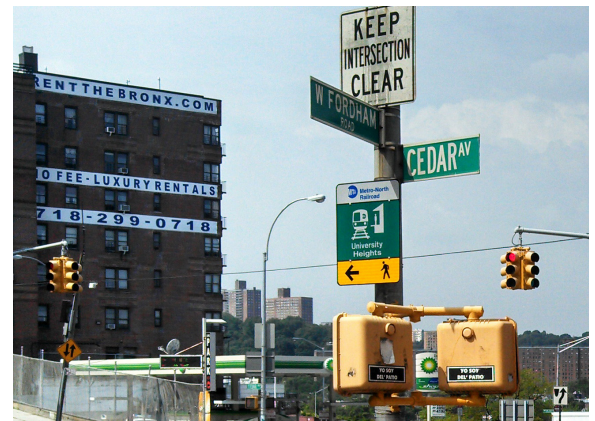


FIGURE 11 | (Top) NYC DOT neighborhood signage at Worth and Mulberry Streets in Manhattan, installed in 2013. (Bottom) Metro-North sign in the University Heights neighborhood in the Bronx.



FIGURE 12 | Step Streets at 232nd Street and Broadway incorporate design and landscape to add to a unique pedestrian environment.

use cobra head lamps. These work well for vehicular environments but would seem cold and impersonal on quiet pedestrian streets. Many historic districts and BID's utilize unique lampposts that can be adorned with banners or planters to emphasize a common theme. Pedestrian scale lighting can be used to supplement street lighting along key pathways, bikeways, plazas and parks.

PEDESTRIAN CROSSINGS

Well-marked and signed crossings enable pedestrians to feel comfortable en route to their destination. Routes between transit points and key community amenities should aim to minimize crossings. Where crossings are required at key points a number of measures can be implemented to make a more comfortable crossing:

- **Curb extensions** or bulbouts are extensions of the curb line to shorten pedestrian crossing are an effective tool in reducing speed, lessening the

crossing distance, and sheltering/reinforcing the parking lane. Typically these would be found in commercial corridors or difficult crossings such as on East Tremont Avenue.

- **Textured or painted crossings** can significantly reduce speed and indicate a safe crossing zone for users. While speed tables or humps can be more effective in reducing speed, along busier routes textured crosswalks can be less prohibitive and have a similar effect.
- **Walk timers** assure pedestrians of their crossing and encourage safe crossing.
- **Pedestrian routes**, as seen on Fordham Road and the Grand Concourse around our study areas, often coincide with wide streets or boulevards. Generally high volume roads dominated by cars can be intimidating for pedestrians. **Landscaped medians** can slow traffic by creating a boulevard effect and gaining the drivers attention. **Pedestrian refuges** allow for cross-

ing large intersections without having to run all the way across. As shown in Figure 10, additions such as bollards can reinforce the safety of the refuges.

- **Guidelines** for these and many other streetscape amenities can be found in the NYC DOT *Street Design Manual*.⁸ NYC DOT has several safer streets programs including Neighborhood Slow Zones and Safe Routes to Transit which focus on implementing safer pedestrian crossings in areas of need. Their Rapid Response Toolkit offers light infrastructure solutions such as pavement markings, signal timing, new signage, painted and/or textured surfaces, and flexible delineators as lower cost pedestrian solutions.

WAYFINDING SIGNAGE

The lack of pedestrian scale signage is an issue that was identified around many of our station areas. When a neighborhood offers convenient signage including distances or travel times, visitors are much more likely to explore that neighborhood knowing they can quickly and safely return to where they started. Signage which directs transit users to connections can down commute times and encourage multi modal transit. Neighborhood signage reinforces a sense of place and promotes community amenities. DOT's neighborhood signage program, piloted in 2013, is well served for communities that attract regional users. The Fordham station area would be an ideal candidate for this program as it could denote several world-class institutions like the Bronx Zoo, the New York Botanical Gardens, as well as regional destinations like Little Italy and the Fordham Shopping District.

STEP STREETS

Step streets are a unique feature that can enhance the pedestrian experience in Bronx neighborhoods. They create a distinctive identity and, by nature of being pedestrian only, provide unique urban design opportunities. Step streets can be utilized to provide pedestrian access in areas where steep grades can create longer pedestrian routes along the traditional pedestrian pathway.

It is unlikely that new step streets will be built due to ADA compliance concerns and cost, however the Bronx currently has 63 stepstreets. The majority of these features fall under the responsibility of NYC DOT and occasionally DPR, however the surrounding community must play a part in their upkeep as

well. Step streets that are underutilized or perceived as unsafe can turn into loitering areas and collect trash. It is important they are well lit, maintained and tied into the pedestrian fabric. Where appropriate, retail uses should abut steps and landscaping or public art should be incorporated.

CONCLUSION

While each of our study areas possesses strong assets and transit amenities, they are often disconnected and underutilized, which provides an opportunity to increase usage and improve connections. Changes in land use and commute patterns have created gaps in pedestrian infrastructure creating disconnected pedestrian pathways that result in overall diminished walkability. Pedestrian pathways need to be reevaluated to adapt to these changes. As evidenced in this section, the concept of a walkable community is a combination of multi-disciplinary elements that include land use, streetscape, transportation and community amenities. There are components of these strategies that could enhance the pedestrian environment of each station area; however, we have identified priority areas as examples to show how these can be applied to create more walkable and complete communities that maximize transit assets.

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