

Ninth Avenue Bicycle Path and Complete Street

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Since July 2006, the New York City Department of Transportation has been aggressively building out the on-street bicycle network in a 3-year, 200-mile expansion program to improve the safety, convenience and attractiveness of cycling. The aim is to make bicycling a viable choice for all New Yorkers. This unprecedented network expansion has provided a unique opportunity to develop new and robust bicycle lane design treatments and to advance the profession of bicycle and pedestrian friendly street design.

One of the most innovative projects undertaken to date is the Ninth Avenue Bicycle Path and Complete Street project. The project created what we believe is the first urban on-street parking- and signal-protected bicycle facility in the United States. It is located on a wide avenue in Manhattan that had previously been a motor vehicle dominated thoroughfare. In fall 2007, NYCDOT implemented the completely redesigned avenue with a bicycle path between the parking lane and sidewalk (see Figure 1).

The project is a “complete street” design on Ninth Avenue in Manhattan, located within the most dense, active and mixed-use central business district in the country. The primary goal of the project was to create a street that would accommodate all users, not simply motorists.

Major project elements included shortening the pedestrian crossing distance of this 70 foot-wide avenue and protecting the bicycle path from vehicular incursion, which has been an ongoing problem with traditional on-street bicycle lanes in Manhattan. These incursions mean traditional bike lanes in these contexts do not succeed in the goal of encouraging cycling as a utilitarian mode of transportation. To make the improvements quickly, the project was executed with operational measures under the purview of NYCDOT rather than initiating a costly and time consuming capital reconstruction project which would need to be effectuated by NYC’s Department of Design and Construction. The bicycle path in the project is separated from moving vehicles by an eight-foot buffer and a parking lane, and from turning vehicles by discrete signal phases. At intersections, there are pedestrian refuge islands and turn bays where needed. The project uses pavement markings, signs, traffic signals and raised concrete islands to create a unique, safe and enjoyable street (see Figure 2).

We are delighted that the ITE’s Transportation Planning Council has chosen this project for its 2008 Best Program award. The rest of this paper outlines the details of the project in accordance with the award’s criteria: originality, quality, significance, comprehensiveness and transferability.

Figure 1

Ninth Avenue Bicycle Path and Complete Street- Before and After Pictures

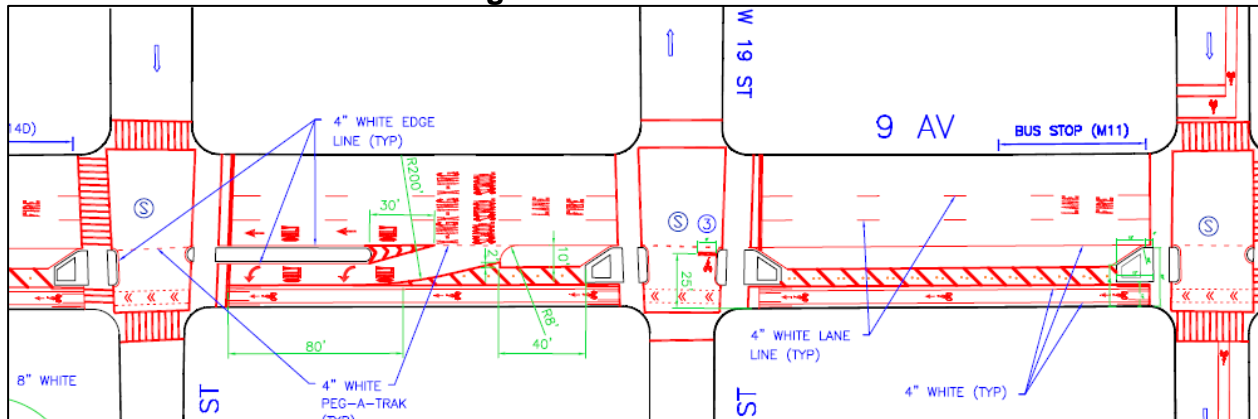


Originality

In preparation for the project, the project team reviewed studies and design treatments from abroad, as well as our own work with bicycle facilities in New York City. However, we found no design that met our project goals and therefore developed an entirely new design for the project. Traditional bicycle lanes are located between the parking lane and travel lane of a roadway, where they are subject to violation by motor vehicles, but where visibility between motorists and cyclists is good. European cycle tracks are typically raised and therefore costly and difficult to build quickly. In order to move the bicycle lane between the parking lane and sidewalk, original design treatments were developed to address the inherent loss of visibility and turning conflicts this type of configuration would create.

Since the street grid of Manhattan consists of mostly one-way streets, there are only turning conflicts at every other intersection. At intersections where turns cross over the bicycle lane, we designed left turn bays directly adjacent to the bicycle lane with protected left turn phases to completely separate the conflicting through cyclist and left-turning motorist movements. Bicycle signal lenses are employed to regulate movement on the bicycle path (see Figure 3).

Figure 2
Ninth Avenue Pavement Marking Plan – Section of 20th Street to 18th Street

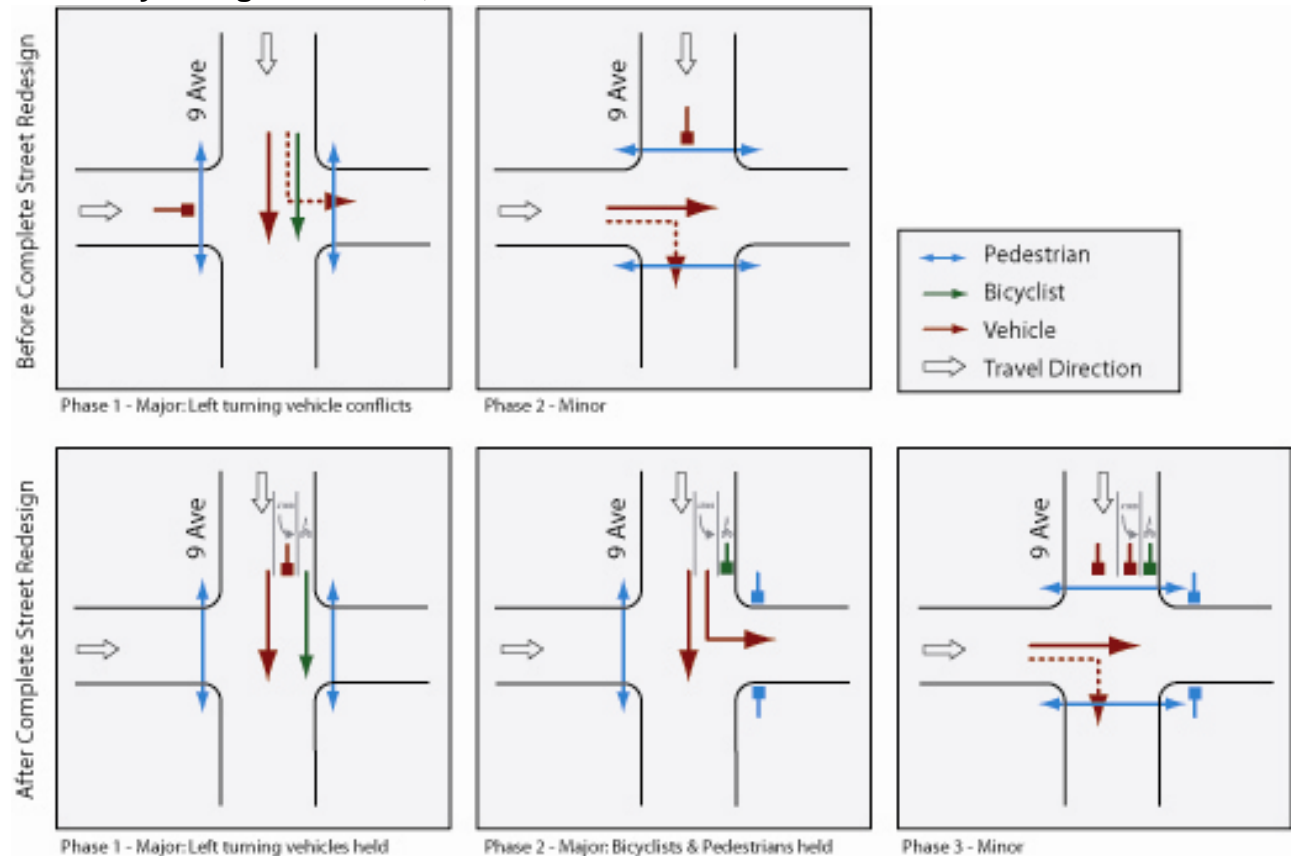


Quality

The *Ninth Avenue Complete Street* project achieves remarkable quality, not only in terms of traffic, bicycle and pedestrian operations, but also in terms of improvements to the streetscape, especially for a non-capital project. The national design guidance (MUTCD and AASHTO) highlight the design challenges inherent in this type of design, including visibility and turning conflicts between motorists and bicyclists. By engaging planners, designers and engineers from various divisions of NYCDOT for each element of the design, we were able to produce a design that would work not only on paper, but also operate well in the field.

The project creates a street that works for all of the users of the street, while responding to the limitations of existing bicycle facility design. In addition to creating a highly safe and enjoyable cycling environment, the project dramatically improved conditions for pedestrians, by narrowing the effective crossing distance of Ninth Avenue by almost 30 feet. Dedicated commercial loading space was also created for businesses on Ninth Avenue utilizing state-of-the-art multi-space parking meters. The aesthetic quality of the avenue is improved by planter beds within the pedestrian refuge islands. These have been landscaped with trees and shrubs by the City's Parks and Recreation Department (see Figure 4). The project was achieved without creating significant additional traffic congestion – before the project Ninth Avenue had four unassigned traffic lanes; the project created three through traffic lanes and dedicated left turn bays.

Figure 3
Summary of Signal Phases, Before and After



Significance

To protect bicycle lanes from incursion by motor vehicles, the New York City cycling community, led by advocates and bicycle commuters, has appealed to the NYCDOT to develop physically separated on-street bicycle facilities, often citing examples in northern and western European cities. The lack of a design for such a facility that could withstand the rigors of New York City's streets has been an obstacle to implementing a physically separated bicycle lane in New York. However, the design piloted on Ninth Avenue has proven highly effective at addressing the problem of vehicular incursions while effectively mitigating the visibility and turning conflict problems (see Figure 5).

In 2007, Mayor Bloomberg released a long-range plan called *PlaNYC – A Greener, Greater New York*, which outlines initiatives to improve New York's sustainability. Promoting cycling by creating safe and comfortable cycling facilities is a key part of this plan. The new bicycle path on Ninth Avenue will be used as a model for future expansion of the bicycle network in Manhattan and is a major step in shifting the

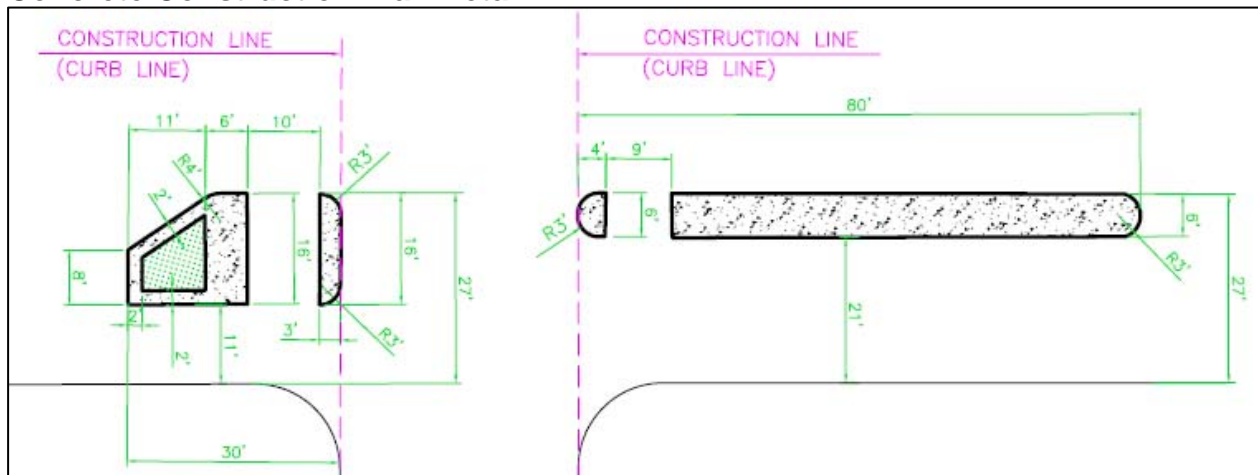
view of cycling from that of an extreme sport to a viable means of transportation. The support of the Mayor and DOT Commissioner Janette Sadik-Khan ensured that this complex, multi-divisional, multi-agency project was executed in a timely fashion.

Comprehensiveness

The design and implementation process for the Ninth Avenue Complete Street was extremely comprehensive. Careful consideration was given to the accommodation of all street users including cyclists, pedestrians, motorists, bus riders, delivery persons and emergency response personnel. The project makes key improvements for each user group. Intensive design meetings were held with specialists from various units throughout the NYCDOT, including the Pedestrian Projects Group, the Bicycle Program, Signals, Parking, Citywide Concrete and Manhattan Borough Engineering. The design needed to take into account the methods NYC uses to keep streets clean. Specifically, the pedestrian refuge islands were designed to leave an opening of 11' from the curb to allow curbside cleaning by the mechanical sweepers of the City's Department of Sanitation.

Throughout the planning, design and assessment process, NYCDOT has had an open dialogue with stakeholders and community representatives. NYCDOT first met with the Transportation Committee of the local Community Board to present the project concept. Their feedback was instrumental in deciding whether to prohibit turns or to remove parking and create left turn bays to reduce the turning conflicts with cyclists. Parking regulations were modified several times after project installation to meet needs of the residents, business owners and the small percentage of customers that arrive by vehicle. The Community Board approved a proposal to create parking spaces for taxi drivers that visit one of the businesses for relief and meals.

Figure 4
Concrete Construction Plan Detail



Transferability

While the *Ninth Avenue Complete Street* project is finely tuned to the unique needs of its location and users, the underlying design of a parking- and signal-protected bicycle path could be utilized in a variety of circumstances. NYCDOT is currently planning the extension of the southbound Ninth Avenue bicycle path and construction of a complementary path on the northbound Eighth Avenue. In addition, NYCDOT is planning to experiment with a simplified design for narrow streets that will not employ the same signal operations as the Ninth Avenue project.

Traffic conditions on Manhattan avenues approach the intensity limits for cycling. However, that the design employed in the *Ninth Avenue Complete Street* project has created a safe and pleasant cycling environment despite the harsh conditions. The success of the design in one of the most demanding traffic environments in the country bodes well for its transferability to other locales. Our experience with the project has reinforced our belief that effective designs must be coupled with a context-sensitive approach and a flexibility to address local conditions.

Conclusion

The innovative design developed here has created a safe, comfortable and unique street that will be the foundation for the future expansion of our bicycle network in heavily trafficked areas of our City. By making cyclists both safe and comfortable, this project will make cycling a legitimate transportation choice for more New Yorkers. Hopefully, this groundbreaking design is one that can be utilized by other jurisdictions to promote cycling while providing safe streets for all users.

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