500-Bed Detention Facility in Lower Manhattan

Draft Environmental Impact Statement

The City of New York
Department of Correction

April 1982

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Proposed Construction of a 500-Bed
Detention Facility Adjacent to the Existing
Borough House of Detention and Criminal Courts
Building in Lower Manhattan

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I. DESCRIPTION OF THE PROJECT

PURPOSE AND NEED

To provide replacement space for the House of Detention for Men on Rikers Island, which the City has pledged to close in five years, and in response to judicial mandates for improvements in the City's correctional system, the Department of Correction (DOC) is undertaking an urgent program to expand its detention facility capacity in Manhattan. Specifically, the Department proposes to construct a new 500-bed Lower Manhattan Detention Facility, more than doubling the borough's available detention capacity after the existing Manhattan facility is reopened early next year following an extensive renovation.

As in the existing facility, known familiarly as the "Tombs"*, the proposed new facility will house detainees awaiting or undergoing trial in one of the City's Criminal or Supreme Courts in the area, as well as a small cadre of sentenced inmates assigned to provide facility sanitation. The new facility is planned to accommodate exclusively Manhattan detainees.

The new facility was originally proposed in the comprehensive plan for the overall Rikers Island Correctional Facilities Replacement Project and in the Department's 1980 five year capital development plan entitled Jails for the 80s. The purposes, needs, and goals for the Replacement Project, as well as for the Department of Correction in general, correspond to those for the proposed new detention facility. They include the following:

1. To provide a secure, safe, and humane environment for those in custody;

2. To assure ready access by detainees to the courts, legal counsel, families, and other support services by locating the Rikers Island replacement facilities at convenient sites in the boroughs;

3. To operate the DOC in an efficient, cost-effective manner by introducing innovative management and programmatic policies in the new facilities;

4. To design and construct new facilities which will accommodate the projected population categories for each borough with adequate, appropriate, flexible and well-equipped space;

5. To make maximum use of the older existing borough facilities by coordinating the functions served by the new and existing facilities in each borough; and

*The Criminal Courts Building and Prison are called the "Tombs" after its two- generation ancestor which was located across the street. (White, Norval, and Elliot Willensky, AIA Guide to New York City, New York Collier Books, 1978.)

6. To improve the level and quality of correctional services in response to Federal District Court orders, consent decrees, and the implementation of N.Y.C. Board of Correction minimum standards promulgated in 1977. (New York City Department of Correction, Generic EIS, 1980. See references in IV. UNDERLYING STUDIES, REPORTS AND OTHER DATA SOURCES for full citation.)

LOCATION

The site for the new facility is on Centre Street in the heart of the Civic Center area of Lower Manhattan between Chamber and Canal Streets (see Figure 1). It is located in the block directly to the north of the existing detention facility, the Tombs, and is referred to as the "White Street site" (It has also been known as the Firestone site after an earlier owner.) The site was selected for the new Lower Manhattan facility because of its advantageous location adjacent to the existing facility and Criminal Courts Building, and its other positive features relative to other sites considered before its selection. The DOC has no plans for new facilities at other sites in the Lower Manhattan area.

Site Selection

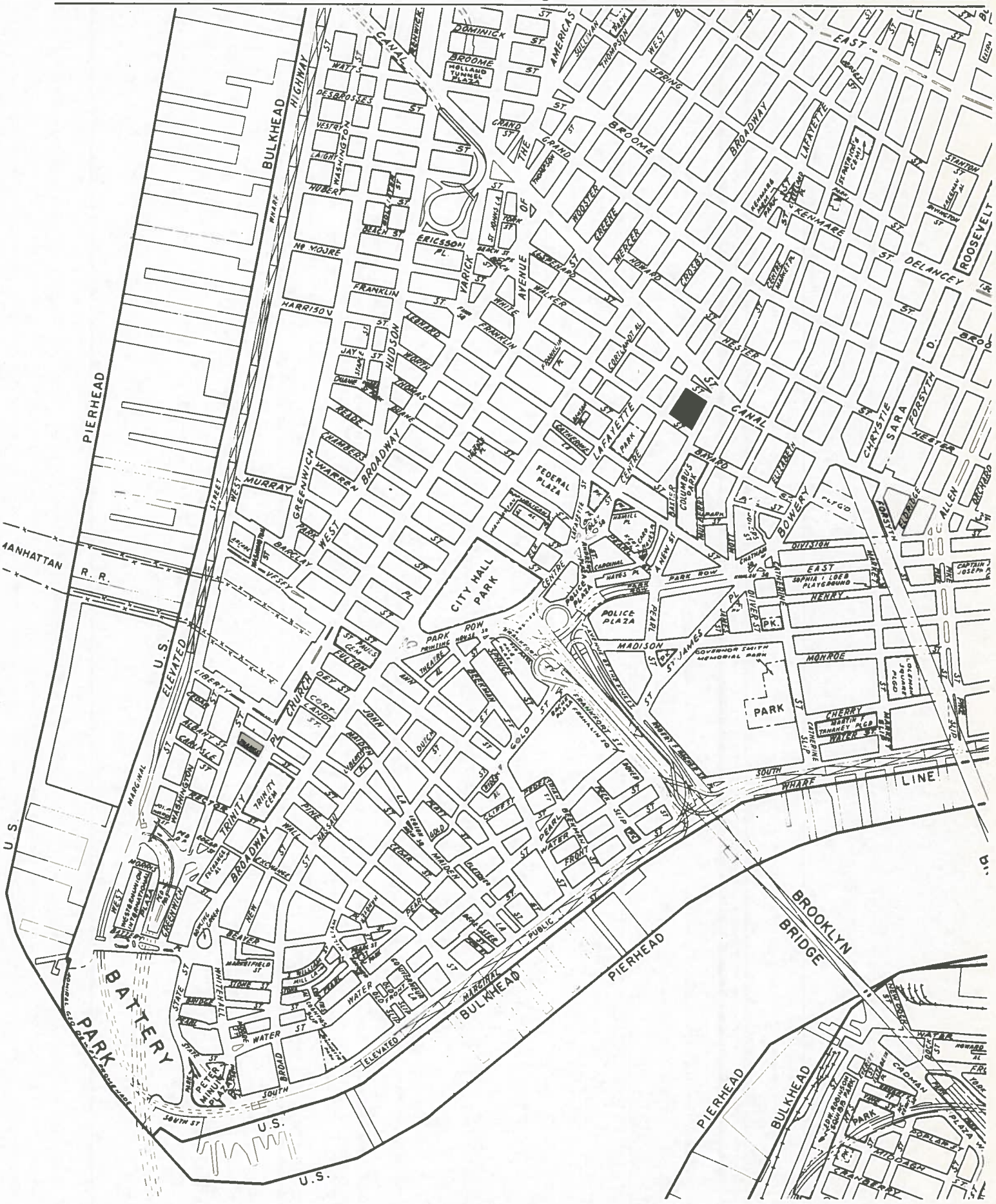
Selection of the White Street site for the new Lower Manhattan facility was part of the comprehensive planning process for new facilities city-wide contained in the Rikers Island Correctional Facilities Replacement Project. The process included the establishment of suitable site selection criteria by the DOC, and identification and review of a slate of candidate sites. The DOC's site selection criteria specified that a site:

- should be adjacent to, or as close as possible to, the courts to minimize costly transportation;
- should not be immediately adjacent to residential uses and, therefore, preferably should be in Community Board #1;
- should minimize the need for demolition and extensive site preparation;
- should be convenient to public transportation; and
- should be as close as possible to the existing borough institution (the Tombs), so as to share central support services, connecting corridors to courts, parking, etc., as may be appropriate.

In addition to these criteria, another critical consideration was site size --any site was required to have at least 250,000 square feet of gross buildable area to provide for the required architectural program.

A total of eleven sites in Lower Manhattan, including the White Street site, were studied by the DOC in conjunction with an interagency task force, consisting of Criminal Justice Coordinator's Office, the Office of Management and Budget, the Department of General Services, the Department of City Planning, the Board of Correction, and the Law Department.

Figure 1 **Location in Lower Manhattan**



The sites initially considered were as follows:

1. White Street/Baxter Street/Walker Street/Centre Street (White Street Site);

2. State Office Building at 80 Centre Street;

3. 300 Broadway - Block Bounded by Broadway/Duane/Elk/Reade Streets;

4. 346 Broadway - Block Bounded by Broadway/Leonard/Lafayette Streets and Catherine Lane;

5. Washington Street Urban Renewal Area: Sites 1A & 1B (Hubert/Greenwich/North Moore/Park Row);

6. Washington Street Urban Renewal Area: Sites 5A, 5B & 6 (Reade/Greenwich/Barclay/West Streets);

7. King/Hudson/Greenwich/Houston Streets;

8. Old Gouverneur Hospital at Water and Montgomery Streets;

9 Parking Lots at Chambers and Greenwich Streets;

10. Lafayette Park (opposite 111 Centre Street) and bed of Leonard Street between Centre and Lafayette Streets; and

11. Canal/Wooster/Grand Streets and West Broadway.

The White Street site was selected from among these candidates as the location for the proposed detention facility because of the superior operational and locational characteristics associated with the site. The reasons for rejection of the other sites are summarized below:

Site 2. At a desireable location but considered to be unobtaineable, as it is owned by New York State and there are plans to relocate additional state agencies into the building over the next couple of years.

Site 3. Rejected by the task force because of opportunity cost. The City has high-yield plans for development of a future municipal office facility at this site.

Site 4. Rejected because of lot configuration constraints, available gross footage (inadequate), and because of Department of General Services advice that the cost to the city for replacement leased space for current city agency occupants would exceed $1.7 million per year.

Site 5. Rejected as being more distant from the courts than most of the other sites under consideration, because of its location immediately adjacent to residential development, and because the Borough Prsident, OED and HPD are considering the site for commercial development.

Site 6. No longer available.

Site 7. Rejected because it is the most distant from the courts of all the sites under consideration, would involve condemnation of church-owned property, is within one block of a public school, and was considered likely to involve a high degree of public opposition for the above reasons.

Site 8. No longer available.

Site 9. Rejected due to requiring condemnation of several small separately-owned parcels, because it would require a zoning change, and because the site is too small for a functional building of the size required.

Site 10. Rejected because of the difficulties in demapping the public park, and because of underground mechanical equipment which would further constrict the small available area. Location was also regarded as inappropriate from an urban design point of view, creating intolerable density in the area bounded by Worth/Centre/White/Lafayette Streets.

Site 11. Rejected because a zoning change could be required and the site is located in an historical district and contains several buildings which may be considered for landmark status. Given the other alternatives, this site was also relatively distant from the courts and the existing detention facility.

The complete results of the study, including the selection of the White Street site, were documented in the Facilities Replacement Project report.

Site Description

The White Street site occupies the entire block across White Street from the Tombs (Lots, 1, 10, 23, 24 and 26 of Block 198). and is bounded on the west, north and east by Centre, Walker and Baxter Streets (see Figure 2). Directly to the east across Baxter Street is the central area of the Chinatown community, and to the north beyond Walker and Canal Streets is Little Italy. The site lies within the jurisdiction of Community Board #1 but is located near the boundaries of Community Boards #2 and #3. Figure 3 shows two views of the site and its neighborhood context.

The White Street site is privately owned and contains approximately 52,200 square feet. However, the area which can be built upon is somewhat smaller due to a subway easement running beneath the northwest corner of the block.

Figure 2 **Site Location**

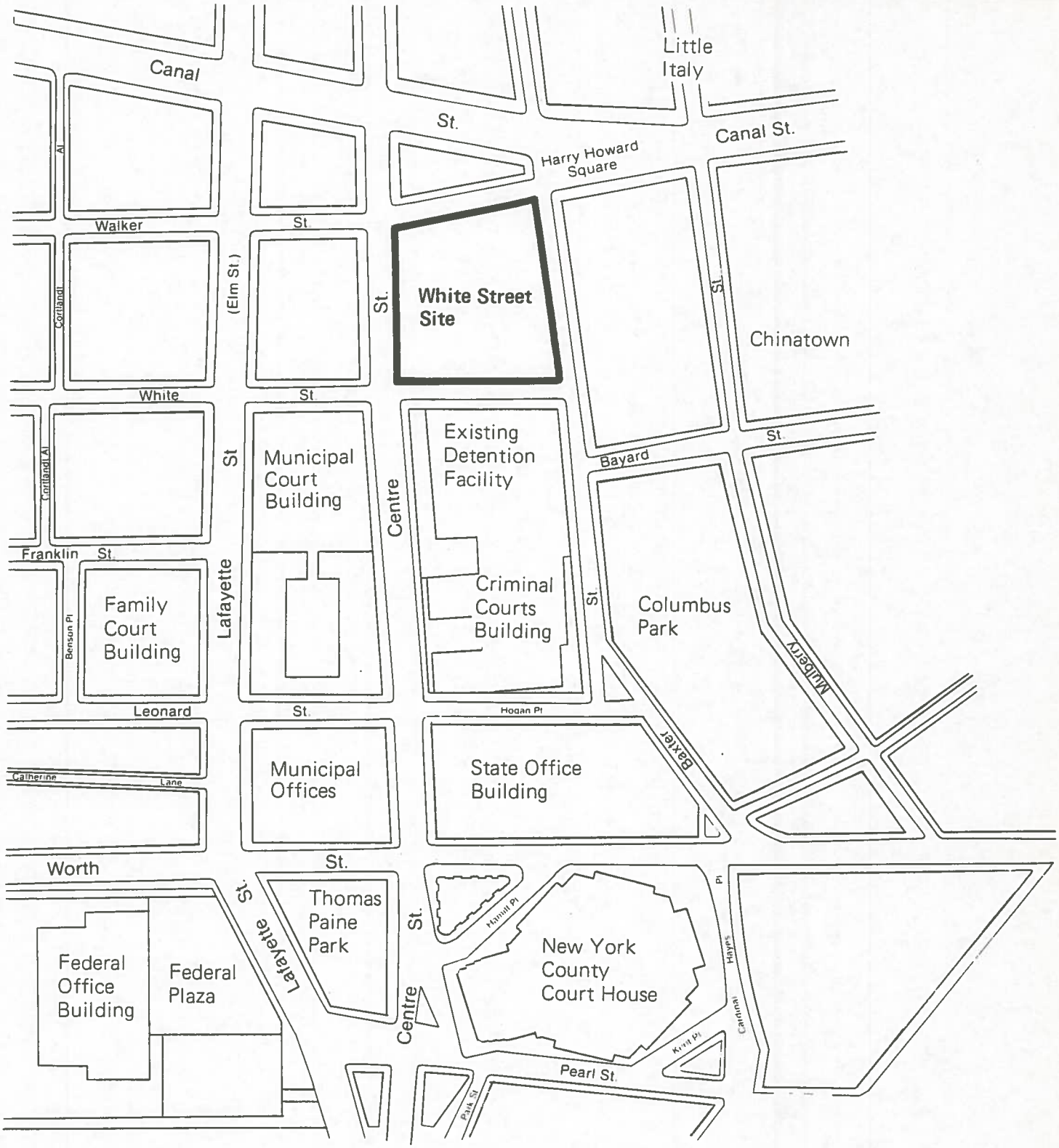


Figure 3 **White Street Site**

View from the corner of White and Baxter Streets

View from Walker Street

The site is presently vacant and has recently been cleared by its current owner, the China Plaza Company, for a proposed high-rise development. The developer has obtained a demolition and excavation permit and has done a portion of the excavation. A building permit application was submitted for a fifty-two story luxury apartment building on the site (with 476 residential units from the third floor up, commercial/retail space of approximately 71,000 gross square feet on the ground, cellar, and second floors, and parking space for 96 cars), but has since been withdrawn by the developer who reportedly is now considering development of two 30 story towers with residential and commercial uses.* The estimated cost of the original project ranged from $35,000,000 (NYC Department of Buildings, New Building Application) to $70,000,000 (Wang, John, New York Times, September 20, 1982). If the detention facility is not built on this site, it is reasonably certain that the China Plaza Company will proceed with a development project of its own.

The City would acquire the site for the proposed facility through condemnation.

DESIGN AND OPERATIONS

Overall Concept

The proposed Lower Manhattan Detention Facility and other new and remodeled detention and correctional facilities in New York City are very different from the jails of a decade ago. Legal mandates and Department of Correction standards have brought about numerous improvements to the physical design and operations of correctional facilities. Taking these concepts and regulations into account, preliminary design studies were produced for the proposed facility at the site as part of the Correctional Facilities Replacement Project.

The proposed detention facility will house a maximum of 500 detainees awaiting or undergoing trial in one of the City's Criminal or Supreme Courts. The preliminary programmatic studies have established a standard of 500 gross-square-feet per prisoner to accommodate housing and other living activities, visiting, and institutional support services. Based on that area standard, the new facility will contain approximately 250,000 square-feet in gross area.

*Meeting of the Civic Center Committee, Community Board #1, March 1, 1982.

The facility will be organized according to the concept of correctional unit management, which means that the housing units will be divided into small (24-48 person) decentralized units. This improves classification and security management, and provides for a more constructive social environment within the facility. This concept, which is extensively employed within the Federal Bureau of Prisons and many progressive state and local systems, avoids large concentrations of prisoners and minimizes the possibility of disturbances.

Each detainee will have his own separate cell, and each cell will have an inoperable security glass window which will provide an unobstructed view to the outside. The windows will be inoperable to prevent conversations between detainees and people outside the building. In addition to housing the detainees, activities will include intake processing, institutional support services, educational services, a library, and recreation.

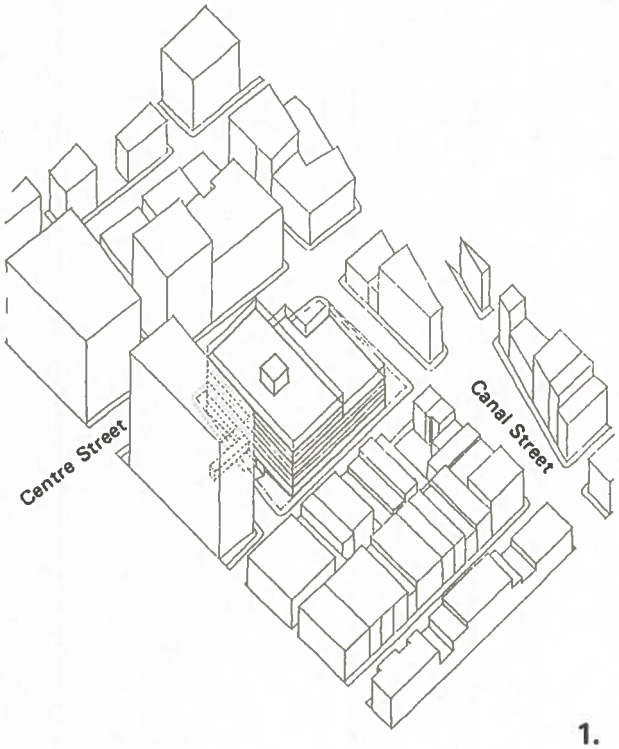
There will be two types of entry to the proposed facility, one for pedestrians and one for vehicles. Vehicular entry will be through a "sally port", a double-gate type of arrangement which provides secure passage into and out of the building. All vehicles, from DOC buses carrying prisoners to sanitation trucks removing garbage, will enter and exit through the same secure gate. Pedestrian entry for staff and visitors will be via a similar type of secure portal. Inside the facility there will be two visitor waiting areas, including an area for children and vending machines. The waiting areas are expected to eliminate the problem of visitors loitering outside the building. However, if waiting visitors overflow onto the street, the Department of Correction keeping within its legal mandates will be able to avoid large congregations of visitors by rearranging visiting hours.

Most detainee trips between the facility and the courts can be said to be "invisible"; that is, detainees will be taken to and from their court visits in a secure weatherproof tunnel and/or bridge. Detainee arrivals at the facility will likewise be invisible. Intake will be through the existing facility, the Tombs, and new detainees will be taken via a secure bridge or tunnel to the new facility.

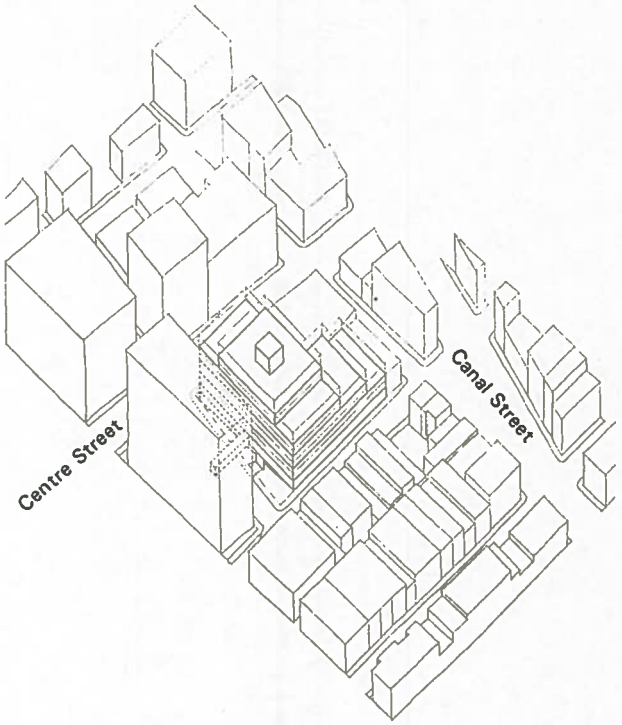
The expected staff for the 500-bed facility is 305 uniformed employees and 39 civilians, almost all of whom will be current Department of Correction employees. A small parking area for twelve to fifteen cars will be provided within the facility for senior Department of Correction officers and staff.

The facility design can best be described from three prototypical designs prepared for the White Street site by the Department of Correction in 1980 (Department of Correction, Planning and Facility Guidelines, April 1980). Figure 4 schematically illustrates those designs in the context of the surrounding buildings. The prototype designs are for a 400-bed facility, while the proposed facility is planned to house up to 500 detainees. However, with this increase in size, the bulk is still considerably less than that permitted "as of right" by the existing zoning for the site. Due to the size of the site in relation to the facility, excess space could be available for other development (such as joint development of community or recreational facilities). However, no specific proposals have been prepared or are assumed to be a part of this project.

Figure 4 **White Street Schematic Designs**



1.



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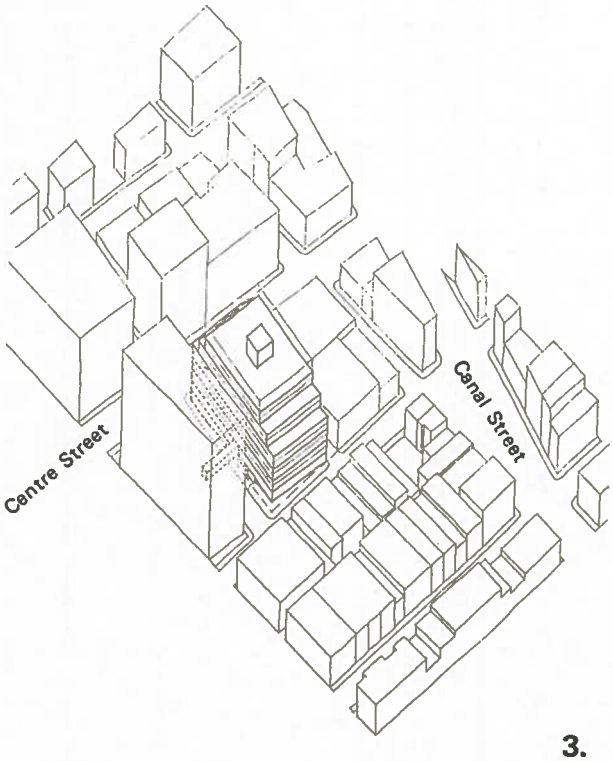


3.

1. Cost Efficient Scheme
2. Operationally Efficient Scheme
3. Urban Design Scheme

Department of Correction
NYC Borough Replacement Facilities:
Planning and Facility Guidelines
April 1980
The Ehrenkrantz Group

In each of the prototypical designs, the pedestrian entry is off Centre Street and the vehicular sally port opens on White Street opposite the Tombs. Inmate transfer to criminal courts would be via a bridge over White Street, connecting to a corridor provided for this purpose on the second level of the renovated Tombs. Also included in each of the prototypical designs are roof top recreational areas which would be provided for the detainees.

These roof top areas will be enclosed to obscure views to and from surrounding roofs and windows.

The appearance of the building facade would not be that which traditionally comes to mind as prison architecture. A good example of modern correctional facility facade aesthetics is provided by the Metropolitan Correctional Center, the federal detention facility located nearby at 150 Park Row (see Figure 5).

CONSTRUCTION ACTIVITIES

Construction of the proposed detention facility at is expected to begin in 1983 and to last approximately three years. Construction would begin with excavation, pile driving, and other foundation work since the site is already cleared. A structure of steel or reinforced concrete would then be erected, and work would begin on the exterior skin (masonry units and security glass windows) and the interior walls and finishes of the building. Other work would include utilities, installation of equipment and furnishings, and exterior landscaping.

While details of the construction are still tentative, since the proposed facility is not yet designed, the activities are expected to be those typically associated with construction of a 10-12 story office or institutional building. In addition to the on-site work, major activities will include materials delivery and the carting away of excavated and construction waste materials. At the peak of construction, there will be approximately 25 truck deliveries per day (from 7 AM to 3 PM). Vehicle loading and unloading is expected to be conducted on-site.

Foundation work (excavation, pile driving, forming and concrete work) should take approximately 6-10 months, structural work (involving derricks and cranes and possibly on-site unloading of forms and concrete or structural steel) should take approximately 6-10 months thereafter, and the remainder of the on-site work (finishing, installation of mechanical and electrical equipment, site landscaping, etc.) will be completed within the remainder of the three year construction period. No blasting is anticipated and only minimal rock drilling. Most likely, some utility connections in the surrounding streets will be required. Materials delivery and storage will occur predominantly on the White and Centre Street sides. At the peak of construction, approximately 300 workers will be on-site.

Figure 5 **Metropolitan Correctional Center**

View from Police Plaza

View from the North

II. PROJECT ENVIRONMENT AND IMPACTS

SUMMARY OF IMPACTS

The following is a summary of the probable environmental impacts resulting from construction and operation of the proposed detention facility at the White Street site.

Community and Land Use

There will be some short-term noticeable noise impacts on the Chinatown community during the first few months of construction. Traffic and air quality impacts due to construction are expected to be negligible and, therefore, will have little impact on the community.

Since the proposed site is within an area surrounded by courts and other government buildings where detention facilities have been a traditional land use, direct negative impacts on the nearby neighborhood are expected to be less than would otherwise be the case. However, the community is very concerned over several issues: in particular, the perceived negative image of a new jail in the area; the potential for visitor loitering; and use of the land for a purpose other than housing that is needed by the community. The Department of Correction is committed to working to mitigate the first two of these issues.

Traffic and Transportation

Construction of a new 500-bed detention facility at the site will have a negligible impact on transportation services in the project area. Although the project area does exhibit a congested transportation system, due to the nature of the proposed facility, the project is expected to generate relatively light levels of traffic and to have a peak traffic period which will not coincide with the regular rush hours. The project is forecast to generate 11 vehicle trips during the peak 8-hour average and 5 trips during the peak hour. In addition, by centralizing Manhattan's inmate population near the courts, the project is expected to substantially reduce the number of inmate-related bus trips to and from lower Manhattan.

Air Quality

Construction of the detention facility will have an insignificant short-term effect on air quality. The results of air quality modeling for operating conditions at the site show only a slight impact.

Noise

There will be some noticeable noise impacts during construction, particularly in the first few months. The most significant short-term impacts would result from the driving of foundation piles . However, operation of the detention facility is not expected to have any significant impact on community noise levels.

Economics

The total estimated cost of the project is $71,380,000 in actual time-of-expenditure dollars. Construction expenditures will modestly benefit the construction industry directly. Indirectly, they will benefit related sectors of the city and state economies. Construction of the facility at the site will preclude an alternative use of the space The maximum "opportunity cost" would be to forgo a commercial high-rise development at the site.

Operating expenditures will have no net fiscal impact to the City because the proposed facility is a replacement project rather than an addition to the DOC system. A small positive impact on the local area economy will result as the direct and induced effect of operating the facility.

Utilities and Solid Waste

Because the proposed site for the detention facility is located in a highly developed well-serviced urban area, neither the construction nor the operation of a 500-hundred bed facility is expected to have significant impacts on the utility systems or on the disposal of solid waste.

Visual Quality

Impacts on the visual quality of the neighborhood due to construction will be short-term and limited to the site itself. The facility will be designed to blend with the existing visual fabric. Its bulk and visual impact will be much less than that of the existing adjacent detention facility, or an allowable (as of right) commercial development project at the site.

COMMUNITY AND LAND USE

Existing Environment

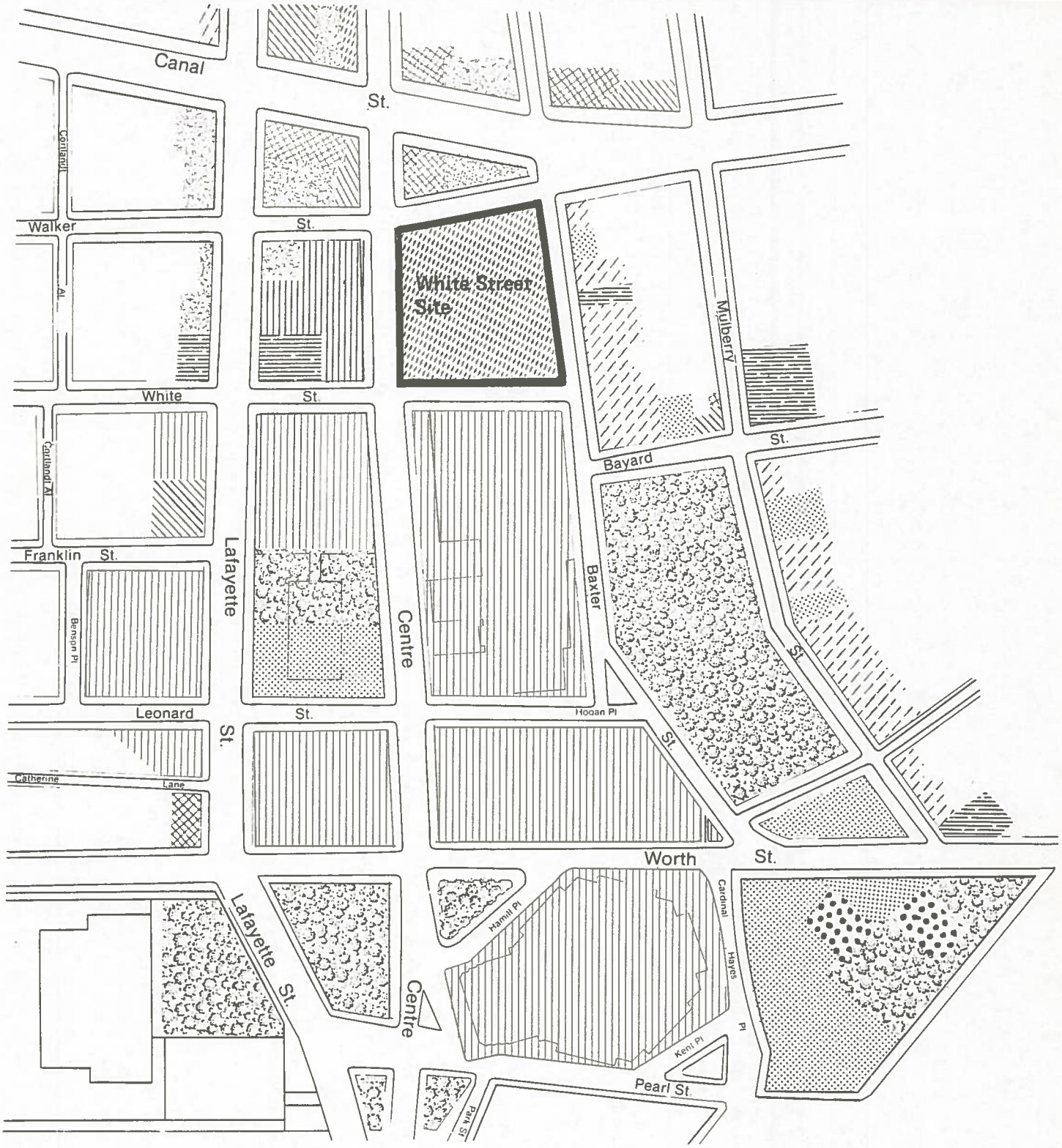
Study Area

The site of the proposed facility is located in the Civic Center Area which is the northeast corner of Community Planning District #1. This District includes the Wall Street/City Hall hub of financial and governmental activities in Manhattan (see Figure 6). The immediate study area comprises sections of the Civic Center area, Chinatown, and a very small portion of Little Italy, and overlaps into Community Planning Districts #2 and #3. The potential area of influence of the proposed site was the major criterion for defining the study area boundaries. To the east this boundary extends half a block beyond Baxter and Mulberry Streets to include the nearest residential buildings facing the site. The following sections summarize the area's major socioeconomic features.

Land Use

Located at the juncture of several overlapping communities, the study area is characterized by four major land use patterns as shown on Figure 6: 1) the government/civic district which straddles Centre Street and extends

Figure 6 **Land Use**



Legend:

- Residential
- Mixed Residential
- Community Facilities
- Government Facilities
- Retail
- Office
- Loft
- Park/Open Space
- Parking
- Vacant

from Canal Street to south of Foley Square just outside the study area to City Hall Park where government office buildings and court buildings predominate; 2) light industrial activity related to the garment trade, particularly garment factories, and offices on Canal, Lafayette, and White Streets; 3) ground floor commercial activity ranging from shops selling jewelry, martial arts supplies, groceries, to Chinese and Italian restaurants, to Chinese herbal medicine shops; and 4) residential uses, mostly located above the ground floor retail shops in Chinatown and Little Italy. In the southeast corner of the study area is Chatham Towers, a high-rise middle-income cooperative. This two-tower complex, built in 1965, breaks up the densely populated low rise neighborhood to the north and east. Located within view of the White Street site is Columbus Park, the study area's major recreational open space. Several parking facilities are scattered throughout the study area, the largest ones located in the vicinity of Pearl and Worth Streets.

Zoning

Figure 7 illustrates the study area's existing zoning. With the exception of the northernmost section west of Baxter Street, the area is zoned for commercial uses. Zones C6-1 and C6-2 permit mixed commercial and residential uses, while Zone C6-4 provides for medium bulk office buildings. These three zoning categories are exempted from parking requirements; however, parking is allowed subject to other regulatory approvals.

The special Lower Manhattan Mixed Use District encompasses a 62-block area south of Canal Street and was superimposed on the existing M1-5 manufacturing zone. The special district zoning permits the conversion of certain older manufacturing buildings to work/living spaces for artists; the combination thus allowing light industry and retail uses to coexist with limited residential use. The same residential/light manufacturing mix is permitted in the M1-5B district north of Canal Street.

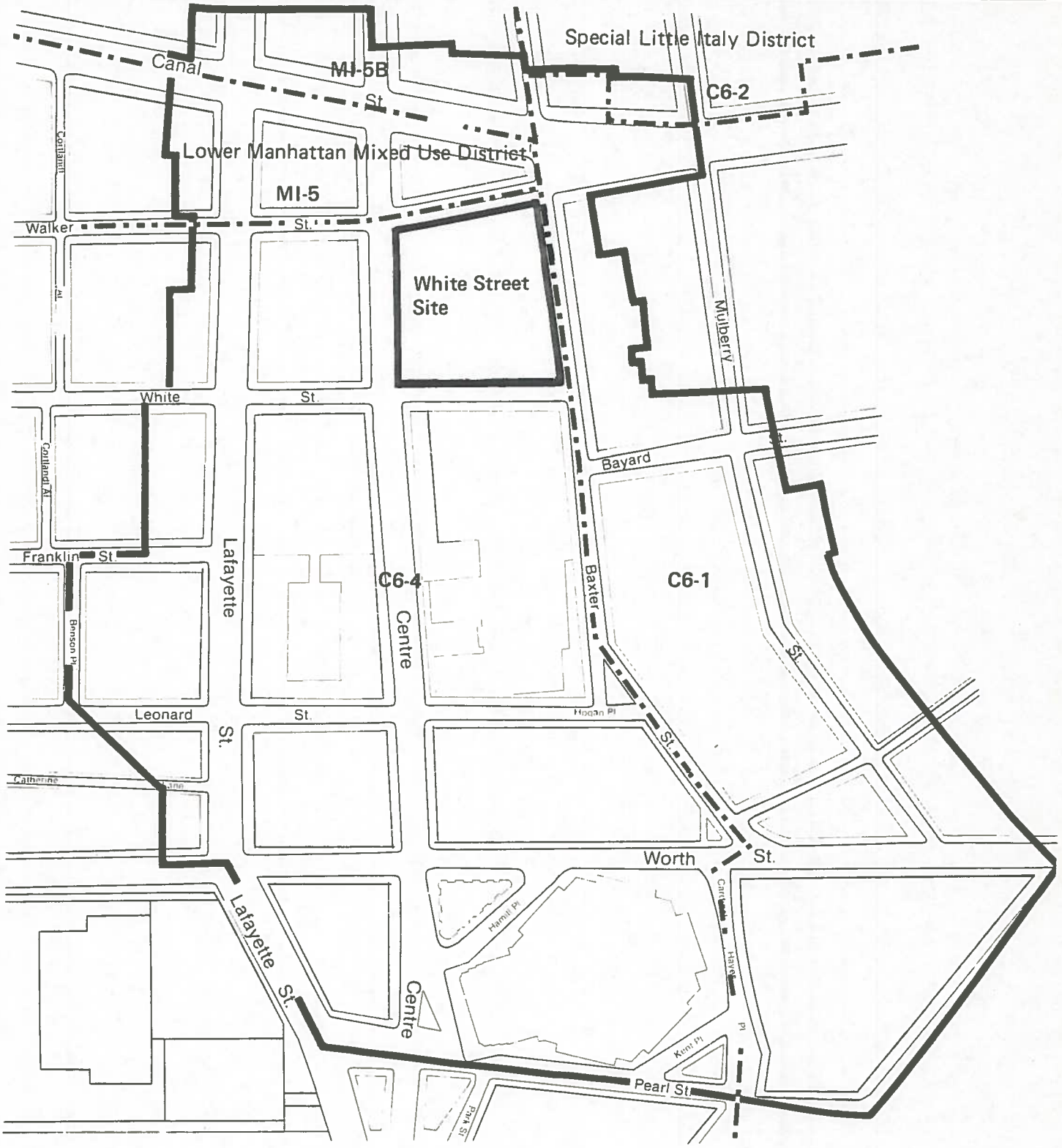
A small section of the Little Italy Special District, established to preserve the character of that community, lies in the northeastern corner of the study area.

The proposed facility would be allowed "as of right" under the existing zoning for the site. The site for the detention facility is zoned C6-4 (medium bulk office buildings), which allows residential development equivalent to R-10 in terms of floor area ratio (proportion of building gross floor area to lot size), or the higher density R-12 with a bonus for on-site open space (such as an outdoor plaza).

Community and Government Facilities

As shown on Figure 8, the study area contains a number of community and government facilities, two of which occupy buildings designated as historic landmarks (see description below). The community facilities largely serve the surrounding Chinatown residents while the government facilities, municipal offices and courthouses serve and employ people from all over the metropolitan area.

Figure 7 **Zoning**



Legend:

- Zoning District Boundary
- Study Area Boundary

Figure 8 Community and Government Facilities

Community Facilities

1. McCauley Water Street Mission
2. Downtown Community TV Center (formerly Fire House Engine Co. 31)**
3. Chinatown Health Clinic
4. Community Center (formerly P.S. 23)
5. True Light Lutheran Church

Government Facilities

1. City of New York Department of Finance, Bureau of Taxation
2. Municipal Offices
3. Municipal Offices
4. Municipal Court Building
5. Prison Building
6. Criminal Court Building
7. Family Court/Probation Department Headquarters
8. Municipal Offices
9. Municipal Offices
10. New York State Office Building
11. New York County Courthouse*
12. Federal Office Building

Note: ** — National Register of Historic Places

* — City Landmark

Community Facilities. Public School 23, at the corner of Mulberry and Bayard Streets, is no longer an educational institution. It has been proposed for conversion to a multi-use community center. In its present unrenovated condition, it houses several community groups, including the Chinatown Senior Citizens Coalition Center Association, the United East-West Chinese American Youth Association, and the Chinatown Manpower Project.

The McCauley Water Street Mission on Lafayette Street provides temporary shelter to indigent men, and directly across the street at 87 Lafayette is the landmark Fire House Engine Company 31 which now houses a community video center and a social club.

The Chinatown Health Clinic at 87 Baxter Street, serves mainly Chinese clients residing in as well as outside Chinatown.

At the southeastern corner of the study area is the True Light Lutheran Church whose membership draws largely from the greater Chinatown community to the east. The church also provides after school Chinese language classes for children.

The nearest police and fire stations are located outside the study area as are schools, hospitals, and public libraries.

Government Facilities. In the western portion of the study area, government facilities abound, including the City's Bureau of Taxation, the Tombs, the Criminal Courts building at 100 Centre Street, and the New York County Court House at Foley Square.

Several small public parks and oepn spaces dot the Civic Center area, including Thomas Paine Park, Court House Park, and the open space serving municipal offices to the east of Lafayette Street. Columbus Park, over three acres in size and the largest recreational space in the study area, has traditionally been a buffer between the governmental offices and the Chinatown community.

Historic Landmarks. There are two designated landmarks in the study area: Fire House Engine Co. 31 on Lafayette Street, listed on the National Register of Historic Places; and the New York County Court House at Foley Square. The 1895 Fire House, commissioned by the city from LeBrun and Sons, is of the early French Renaissance style of Frances I, and succeeds in "...imparting an unusual aura to a utilitarian structure." (Landmarks Preservation Commission of New York, 1974) The New York County Court House (New York State Supreme Court) was built in 1927 and features an impressive Roman Corinthian portico, one hundred feet wide and three columns deep. Fire House Engine Co. 31 is located one block west of the White Street site, and the New York County Courthouse is to the south across Worth Street.

Demographic Characteristics and Housing

Population. Only a small portion of the study area, the western edge of the central core of Chinatown, contains significant numbers of residences. This area and its population are, however, an important consideration in terms of potential impacts. The Chinese community has been increasing rapidly in recent years. It is expanding primarily to the north and east and somewhat

to the west of Chinatown. The Civic Center area has traditionally blocked expansion to the south and west.

To describe the community, population information was derived from the 1980 Census where available, as well as from 1975 estimates compiled by the Department of City Planning and the 1970 Census. However, as with other low-income ethnic neighborhoods in New York City, Chinatown has been consistently under-counted by the U.S. Census.

The study area comprises portions of two census tracts. Divided by Centre Street, the two tracts have distinctly different characteristics. Census Tract 31, west of Centre Street, is not nearly as populous as Tract 29 to the east. Old Chinatown which comprises ten irregularly shaped blocks, is an area of much greater density. Most of the population is clustered in the three blocks immediately north and to the east of Columbus Park.

From 1970 to 1980, Census Tract 31 to the west reported an increase in population from 100 to 299 residents, while Tract 29 to the east experienced a population drop from 9,412 to 6,016. The significant population loss there can be attributed to the transfer of the Tombs population to renovate the building which housed 1,327 people in 1970 (detention facilities are counted in the Census), as well as to the clearing of residential areas in the southern part of the tract in the past decade for non-residential development projects (e.g., Police Plaza).

The 1980 population in the eastern portion of the study area was approximately 82 percent Asian and 17 percent white, while the population in the western section approached 100 percent white. Further east in Census Tract 29, the Chinese portion of the population approaches 100 percent.

Census data at the block level substantiates the mixed residential land use of the area immediately east of Baxter Street. Blocks lying partially within the study area south of Canal Street and east of Baxter Street had a population of 7,209 in 1980. The population in the study area west of Baxter Street and south of Canal Street, on the other hand, was just under 100 persons.

Household size in 1970 ranged from 2.83 persons per household in Tract 31 to 2.92 in Tract 29. Tract 29, where Old Chinatown is situated, is characterized by relatively smaller and older households without children when compared with the Chinatown periphery. In 1970, 30.8 percent of the households in Tract 29 and 25.9 percent of the households in Tract 31 had incomes below the official poverty level whereas the comparable figure for New York City was 13.1 percent.

Housing. Most of the housing in the study area is rental units. In 1970, 91.1 percent of the housing units were renter-occupied. In Tract 31, all of the units were renter-occupied.

Housing in Tract 29 is typified by old multi-family walk-up structures. Of the 140 residential lots, over 98 percent are multi-family and of these, only 3.6 percent have elevators. Almost 80 percent of the housing stock is Old Law Tenements, built before 1901 and 7 percent are New Law Tenements,

constructed between 1901 and 1929. By contrast housing in Tract 31 is mostly converted manufacturing/office spaces.

Local Economic Activities

Along Canal and Baxter Streets a retail and service area is found, and along Lafayette, White, and Canal Streets, a manufacturing zone. The retail and service area, which comprises restaurants, grocery stores, gift and curio shops, and jewelry stores, largely Chinese-owned and -staffed, serve both the population within Chinatown as well as Chinese and non-Chinese shoppers and visitors from the metropolitan New York region and elsewhere.

The manufacturing section comprises mostly garment manufacturing firms which employ mostly Chinese workers, many residing in Chinatown. The manufacturing loft and warehouse properties in recent years have been experiencing two significant trends: 1) an expansion in the number of garment factories, which are Chinese-owned and -staffed (in spite of the overall decline of manufacturing activity in Manhattan); and 2) an increasing demand for conversions of loft buildings to residential and office spaces.

Plans and Proposals

The Chinatown Street Revitalization Plan of 1976, and the Manhattan Bridge Area Study, prepared in 1979, remain the most recent plans presented by the Department of Planning affecting the study area as well as greater Chinatown. The Chinatown Street Revitalization Plan emerged as part of the City's Bicentennial efforts, and was primarily directed at improving pedestrian and vehicular circulation in the Chinatown core area (Old Chinatown). The plan called for:

- Improving vehicular traffic by rechanneling traffic and improving signalization;
- Replacing metered parking with 15-minute standing time;
- Resurfacing roads and sidewalks;
- Providing street furniture and outdoor sculpture;
- Removing street vendors from storefronts and establishing a vendor's market in the triangular space formed by the fork at Canal and White Streets;
- Constructing a parking garage with municipal rates, perhaps at the White Street site;
- Providing zoning incentives which would maximize development potential of the White Street site to include a parking garage, along with possibly a multi-use complex that would incorporate commercial space, a hotel or luxury apartments; and
- Developing a program for solid waste management, including use of subsurface compactors.

The Manhattan Bridge Area Study, which grew out of the Street Revitalization Plan, attempted to probe deeper into an understanding of the dynamics of Chinatown as a community experiencing explosive growth. The study recommended two "action projects" to be implemented immediately as well as other longer range proposals. The study proposed that immediate consideration be given to: 1) recycling Public School 23 at the corner of Mulberry and Bayard Street, into possibly a multi-use community center and/or housing; and 2) implementing the Chinatown street revitalization plan that had been further refined since the Street Revitalization Plan prepared in 1976.

The Manhattan Bridge Area Study further made the following recommendations:

- Zoning changes, including the consideration of a special district to preserve the physical scale in Old Chinatown and its adjacent areas; establishing guidelines for key sites where new development can occur;

- Infrastructure improvements, including the funding of the Columbus Park renovation;

- Housing, both rehabilitation and new construction to accommodate Chinatown's existing and new population; and

- Improvements to enhance the economic base, including establishment of a program to alleviate traffic problems and garbage disposal problems; creation of pedestrian amenities; and provision of parking spaces within new developments.

The Manhattan Bridge Area Study provided the framework for the establishment of the Special Manhattan Bridge District, a highly controversial issue. The zoning change from C8-4 to C6-1 and R7-2 would permit construction of larger, residential buildings having either community space, low-income housing or renovation of existing apartments in the area around Henry and Madison Streets, which is further to the east of the study area. This change responded to the higher residential nature of the neighborhood and its urgent need for middle-income housing. Current investigation of alleged tenant harassment is delaying progress on the project.

There are other development plans in the study area. The White Street site is presently owned by a recently-formed partnership, China Plaza Company, whose partners include a Chinese shipping magnate, C.Y. Chen, and a New York-based real estate developer, David Feinberg, of Feinberg Realty & Construction. The partnership plans to construct a high-rise commercial project on this site. The northwest corner of Canal and Centre Streets is vacant and awaits the construction of a Chinese-owned bank, the Golden Pacific National Bank, one of the many Chinese-owned banks proliferating within the Chinatown community in recent years.

The Little Italy Special District Study, prepared in 1976 by the Urban Design Group of the Department of City Planning, provided the rationale for the subsequent creation of the special zoning district to preserve the character of Little Italy -- the community delineated as north of Canal Street, between Mulberry Street and the Bowery, and south of Bleecker Street.

Impacts

During Construction

Impacts during construction of the proposed detention facility are expected to be temporary and not significantly disruptive to the social and community environment. Noise, fugitive dust and dirt are expected from the pile driving, cranes and use of other equipment at the site, and sidewalk and street traffic flow will most likely be disrupted in a minor way in much the same manner as it currently is around the Tombs.

The most sensitive areas in the immediate vicinity of the site are the ground level commercial and upper floor residential uses on Baxter Street, across from the site. Since truck loading and unloading is to be done on White and Centre Streets, potential adverse impacts on Baxter Street activity will be avoided. Although Columbus Park is in the vicinity of the site and is a heavily used public open space, impacts on it due to constructon are not expected. Construction activity also is not expected to have any impact on historic landmarks in the study area. Fire Engine Co. 31 is not in the immediate vicinity, and the New York County Court House is located two blocks away from the site.

Since the site has already been cleared for a development project, demolition and displacement are not issues there. Construction is likely to temporarily disrupt activity on the streets and sidewalks adjacent to the project in only a minor way.

If the detention facility is not built at the White Street site, construction of the proposed China Plaza development is likely to take place so that construction will occur in any case.

During Operations

Since the site of the proposed project is adjacent to other government facilities and because detention facilities have been a traditional land use in the area, direct negative impacts on the nearby community are expected to be less significant than would otherwise be the case. These direct impacts include the perceived negative image of a detention facility and the use of the White Street site for anything other than housing. Security within the facility or during detainee transfer to the courts is not expected to be a problem. DOC operational procedures are designed to eliminate security problems. Further, no significant community interface problems are evident at other detention facilities in the city.

Some indirect impacts from changes in traffic, air quality, and noise are expected, but not to a noticeable or significant degree (see II. TRAFFIC AND TRANSPORTATION, AIR QUALITY and NOISE). The location of the detention facility is not expected to affect the operations or the accessibility of the various community facilities in the study area, including the local social service, religious, and health care facilities.

Community Concerns and Mitigating Measures. As part of the impact assessment for this analysis, community organizations were contacted regarding their

concerns about the proposed detention facility and the proposed site. (See VI. UNDERLYING STUDIES, REPORTS, AND OTHER DATA SOURCES for a listing of the meetings and contacts.) The community's concerns, which are discussed below, are focused on potential impacts during operation. Many of the concerns of the residents are addressed by specific DOC operating procedures and plans for the proposed facility. These measures which are designed to eliminate or mitigate the potential negative impacts are also discussed below.

One of the considerations most often expressed by the community leaders is the negative public image of a jail in the neighborhood. However, the existing Tombs has been in the neighborhood, on White Street, since 1939; and according to some community leaders it apparently has not been adversely obtrusive. Also, the architectural design of the proposed facility can be an asset to its image. The proposed facility will be designed in a manner similar to the nearby Metropolitan Correctional Center which does not have the appearance of a prison and effectively blends in with the residential and government structures surrounding it (see Figure 5).

Chinatown representatives have also indicated that the construction of a facility at the White Street site would exacerbate current space and housing shortages in the community. It is argued that this site is apparently a prime location for new residential and commercial development and should not be used for other purposes. As the only large undeveloped parcel in the area, its use for a detention facility is seen as a limitation on future development options for much needed housing and/or commercial space. However, if the detention facility is not built on this site, it seems likely that the development project proposed by the China Plaza Company will be built, and that it will contain market-rate apartments or condominiums. This type of housing is unlikely to solve the current housing crisis in Chinatown. Also some community leaders indicated that the main thrust of the current Chinatown expansion is to the north and east, not directly west.

There is disagreement over the effect of a detention facility on the desirability and price of real estate in the area. Some community leaders have indicated that the negative image of a jail would lower real estate values. Others have cited the dearth of large developable parcels in or near the Chinatown core as reason that the prices would be driven higher faster. Rising real estate prices could force some smaller and more marginal retail businesses to relocate elsewhere.

Other Chinatown representatives have suggested that the needs of both the community and the City could be met through the creation of a multi-use facility at the White Street site, that is, by combining the detention center with new commercial and recreational uses, or even housing for the community on the same site. The DOC has indicated that it is willing to consider these suggestions and proposals to the extent that they are desired by the community and feasible in terms of security and DOC operations.

Some members of Community Board #1 and the Chinatown representatives have expressed concern about the possibility of visitors loitering in parks and along sidewalks in the community. The design of the detention facility will include ample visitor waiting areas, and these are expected to eliminate the problem of visitors loitering outside the facility. If waiting visitors

linger on the street, the Department of Correction will consider rearranging visiting hours to avoid large numbers of visitors waiting outside the facility. The additional visitors and employees would be likely, however, to support the retail establishments and abundant restaurants in the area.

Compatability with existing plans and proposals. Both the Chinatown Street Revitalization Plan and the Manhattan Bridge Area Study, prepared by the Department of City Planning with community input, mention the White Street site as having tremendous development potential for some type of mixed parking and commercial, and/or housing complex providing for Chinatown's growth. The construction of a detention facility at this site would not allow realization of this potential. On the other hand, location of a detention facility at the site would implement the City's plan for expanding and upgrading City detention facilities and would meet the objectives of centralizing detention-related activities in Lower Manhattan.

TRAFFIC AND TRANSPORTATION

Introduction

The general area surrounding the site of the proposed detention facility is characterized by a congested transportation network with an irregular (non-grid) street system and narrow sidewalks. The area exhibits intense vehicular and pedestrian activity from a multitude of users -- residents, workers, tourists -- and places heavy demands on its system of streets, sidewalks and public transportation.

The evaluation of traffic and transportation-related impacts superimposed on this existing transportation network both the traffic impacts associated with nearby development projected to occur before 1986, as well as the travel patterns expected to result from implementation of the project itself. Accordingly, existing conditions were inventoried before project-related traffic was assigned to the street network, and future changes expected to be implemented by the time the facility opens were also assessed. The only future development assumed was reopening of the Tombs. To be conservative, it was assumed that without the proposed detention facility, the site would not be developed with an alternative use by 1986, but would remain as it is today --a vacant lot. This picture of 1986 traffic before the detention facility opens represented the future no-build (without the project) condition. An evaluation of the site fully developed as of right with a residential building was also completed, however, for comparison purposes. This scenario is referred to as the comparison no-build alternative.

The transportation-related impacts of the project were then overlaid on the 1986 no-build condition. This 1986 build (with the project) condition added the trip making characteristics of the various users of the proposed facility, including inmates, employees and visitors, to the no-build condition.

The analysis of the 1986 build traffic conditions indicates that the proposed detention facility will have a negligible impact on traffic and transportation services in the project area. Due to the nature of the facility, trip making to and from the site will not be intense, and the peak traffic

periods of the project will occur at times of the day which do not coincide with the general rush hours. In addition, by centralizing Manhattan's inmate population (now largely housed on Rikers Island) in one location, the project is expected to substantially reduce the number of inmate-related bus trips to and from the courts in Lower Manhattan.

Existing Conditions

Surface Network

To assess the traffic and transportation impacts associated with the proposed detention facility, a transportation study area was defined to encompass those streets expected to be used most intensively for project-related travel. This area is bounded by Canal Street on the north, Mulberry Street on the east, Pearl Street on the south, and Lafayette Street on the west. (Figure 9) The project's impacts on the surrounding street network diminish rapidly with distance from the proposed facility, as vehicles generated by it disperse beyond the study area.

As is common in much of Lower Manhattan, the streets within the study area do not follow a grid pattern. The nearest through-traffic route in the east-west direction is Canal Street, which extends from the Holland Tunnel to the Manhattan Bridge. This street provides motorists with at least two through lanes in the study area. Centre Street and Lafayette Street represent through routes in the north and southbound directions, respectively. The remaining streets within the impact area have one-way directions and are local collector routes. (Hamill Place, Kent Place, and Cardinal Hayes Place were excluded from the analysis because these streets are generally used for preferential, court-related parking and, as such, prevent through-traffic movements.)

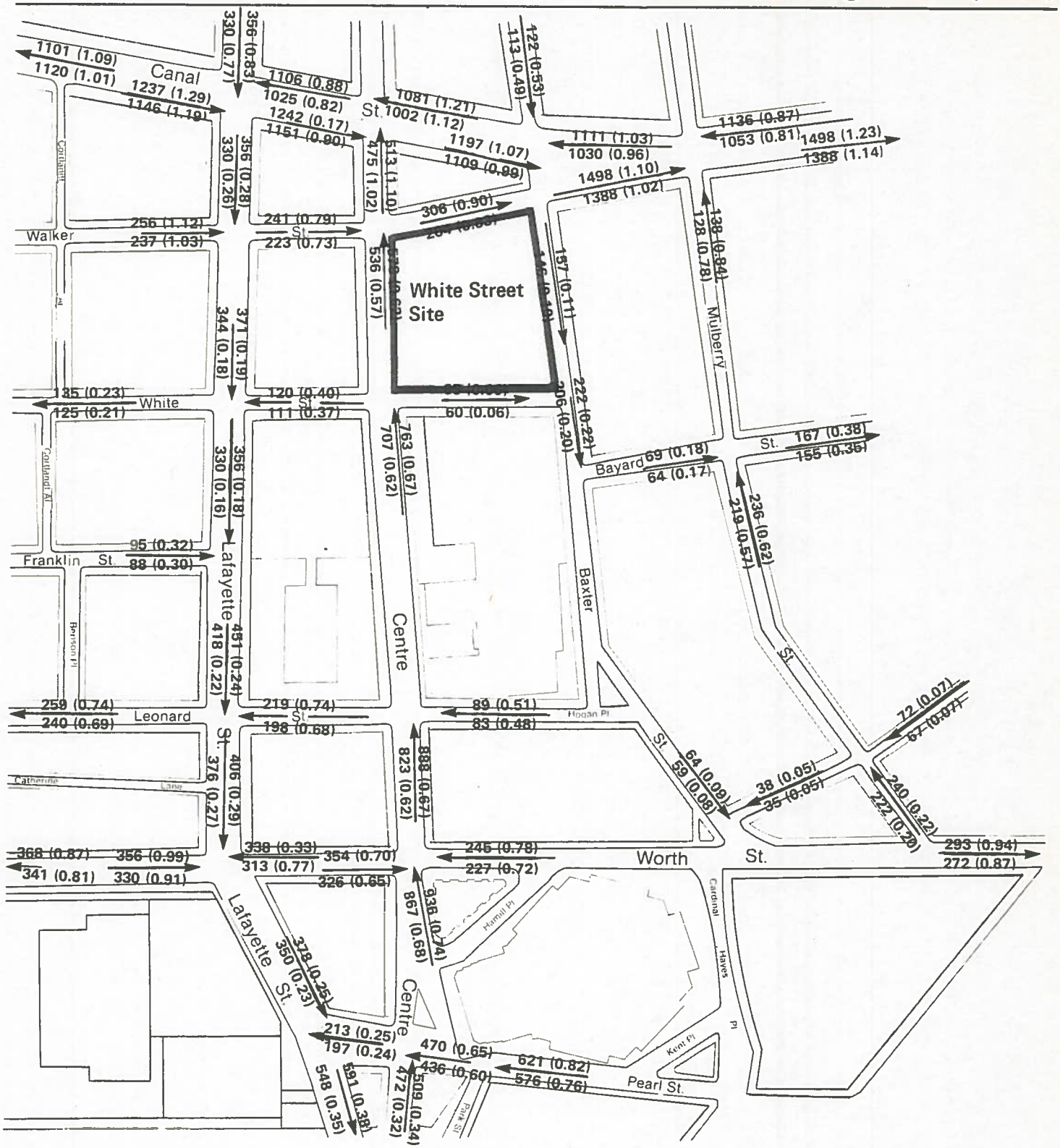
Traffic

To determine existing traffic conditions, the most recently recorded traffic counts for the area were obtained from the New York City Department of Transportation, Bureau of Traffic Operations (DOT). In addition, traffic signal information (i.e., cycle lengths and phase timings), intersection turning movements, and the number of moving lanes for each street segment were obtained via field inventory.

After examining the DOT traffic count data in the area, 9-10 AM and 9 AM - 5 PM were identified as the daily peak one-hour and peak eight-hour traffic flow periods, respectively.

The most heavily travelled route in the east-west direction is Canal Street, which has volumes ranging between 1,050 and 1,150 vehicles per hour (VPH) westbound, and between 1,200 and 1,500 VPH eastbound (see Figure 9). Another major east-west route in the area is Worth Street, which carries 200-370 VPH westbound and 300-370 VPH eastbound. Of the north-south routes in the area, Centre Street, a northbound route, carries between 500 and 950 VPH, while southbound Lafayette Street handles between 350 and 450 VPH.

Figure 9 **Existing Traffic (1982)**



AM Peak Volume in Vehicles Per Hour (Volume to Capacity Ratios)

8-hour Average Volume in Vehicles Per Hour (Volume to Capacity Ratios)

The capacity of the streets to accommodate vehicular traffic is the other significant element in evaluating traffic conditions. The ratio of volume to capacity (V/C ratio) provides a measure of the efficiency and stability of traffic flow conditions, while differences between volumes and capacities indicates available capacity to accommodate additional vehicular trips in the future. Intersection capacities were calculated based on field-survey data including the number of effective moving lanes of traffic (i.e., excluding parking lanes or other regular obstructions such as recurrent double parking), traffic signal timings, and posted speeds. The methodology used for computing the capacities was based on the 1965 Highway Capacity Manual. That document represents the current standard source for calculating street capacities.

The comparison of volumes and capacities can be described by reference to traffic levels of service (LOS) ranging from A to F. Traffic at higher levels of service (A, B, C) represents a relatively low utilization of available capacity, while D, E, and F reflect increasing use of street space. The levels of service can also be depicted mathematically by dividing volumes by capacities (V/C ratio as shown below).

Level of Service	A	B	C	D	E	F
V/C Ratio between	0.00	0.60	0.70	0.80	0.90	1.00
and	0.59	0.69	0.79	0.89	0.99	1.00+

Generally speaking, LOS 'D' represents a minimum acceptable level of service for peak conditions in an urban area. LOS 'D' may be characterized as approaching unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Drivers have little freedom to maneuver, and comfort and convenience are poor, but conditions can be tolerated for short periods of time. Level of service 'E' represents even lower operating speeds than LOS 'D', with volumes at or near street capacity. Flow is unstable, and there may be stoppages of momentary duration. Level of service 'F' describes forced flow operations at low speeds resulting from queues of vehicles backing up from a constriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time. In the extreme, both speeds and volume can drop to zero.

As shown in Figure 9, each of the aforementioned streets has segments that either approach unstable flow or exceed capacity limits (i.e., V/C ratios equal to or greater than 0.80). Restrictions to traffic flow experienced by these segments can be attributed to various constraining factors. Canal Street is the only route in Lower Manhattan that traverses the island river-to-river and, as such, is attractive to the bulk of truck traffic traveling through this section of the borough. As a result, levels of traffic operation are severely constrained by the presence of truck traffic. This is evidenced by V/C ratios exceeding 1.00 (capacity) at seven of the ten intersections along Canal Street within the study area.

Canal Street has traffic flow priority in that a greater proportion of its intersection's green time is allotted to these major through vehicular movements. The north/south routes are, therefore, given less time for vehicular progression across Canal Street. The Centre Street approach to Canal Street exceeds capacity limits due to this low allotted northbound green time.

Restraints to Worth Street traffic flow can be attributed to a significant amount of turning movement which reduces the street's capacity.

Public Transportation

The study area is well served by public transportation (see Figure 10). A subway station, the Canal Street Station, is located within a very short walking distance of the site. This station has an entrance at Canal and Centre Streets. Further to the south is the Chambers Street/Brooklyn Bridge Station with an entrance at Foley Square.

The Canal Street Station is one of the largest station complexes in the entire subway system, and is served by the BMT Broadway, the BMT Nassau Street and the IRT Lexington Avenue lines. The Chambers Street/Brooklyn Bridge Station is served by the BMT Nassau Street and the IRT Lexington Avenue lines.

Both stations have moderately heavy turnstile registrations with recent weekday totals of 27,400 at the Canal Street Station and 33,000 at the Chambers Street/Brooklyn Bridge Station.

The project area is also served by a number of bus routes. As shown in Figure 10, local buses which pass near the project site are the M1, M15, M22, and B15.

Parking

Table 1 lists the commercially available off-street parking facilities in the study area. This inventory of garages and lots was derived from a field survey of the area on a typical weekday. As shown in the table, there are approximately 642 licensed off-street parking spaces in the study area.

Table 1 also contains occupancy rates for some of the parking facilities at noon on a typical weekday. These rates, which range from 60 to 100 percent and average 84 percent, are estimates of the managers surveyed, either in the facilities themselves or in administrative head offices. Based upon the information in the table, it can be estimated that during the midday period about 16 percent of the parking spaces (103 spaces) are available in licensed off-street parking facilities in the study area.

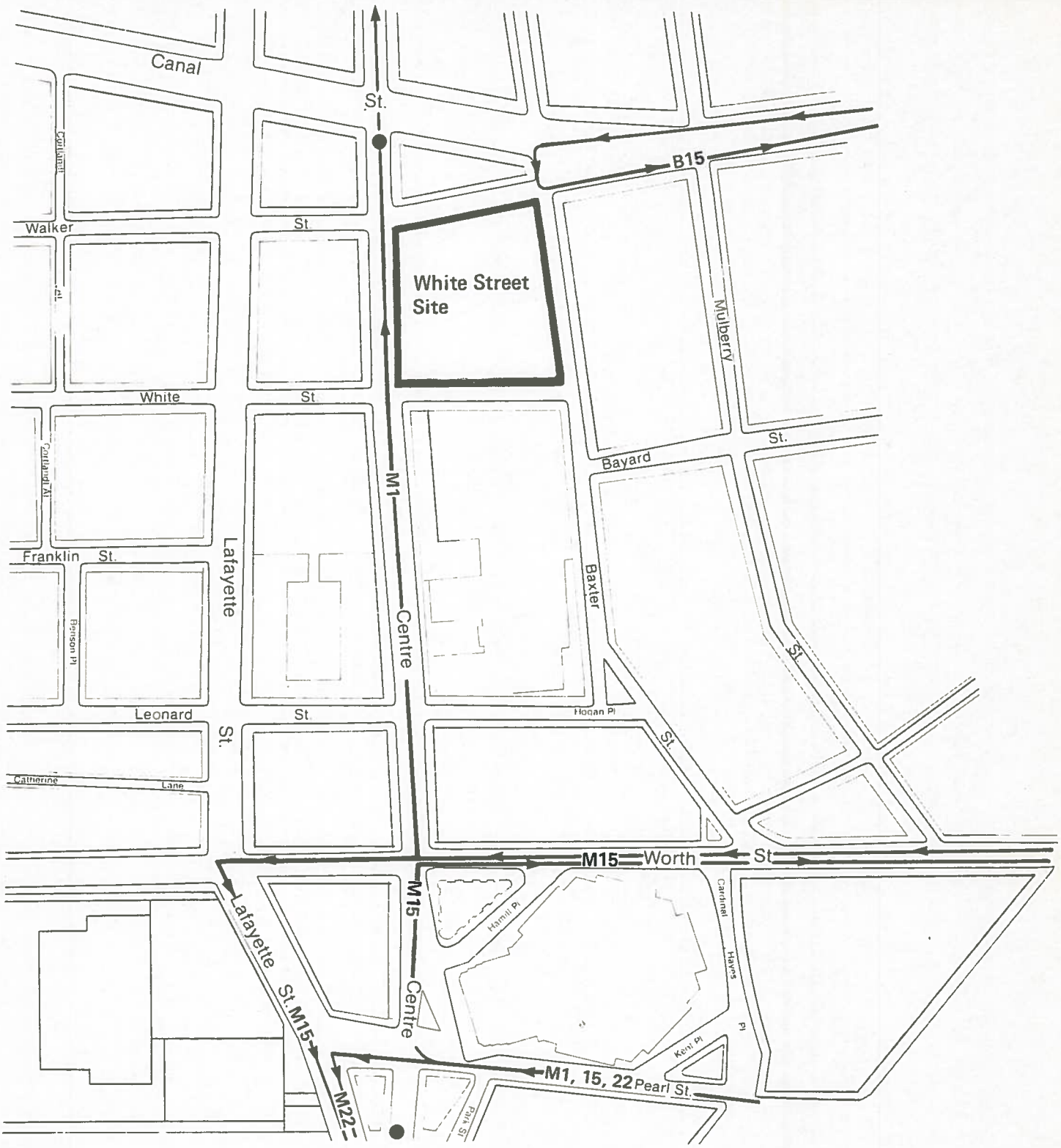
Although utilization rates vary on a daily basis, the estimates of the parking facility managers are considered to realistically reflect the existing parking conditions in this area. There is a shortfall of parking in Lower Manhattan, in general, and the relatively small number of spaces available in the 12 facilities surveyed confirms the limited available supply.

Impacts

Methodology and Analysis

Assessing the impacts of the new detention facility on vehicular traffic and on available capacity on the streets surrounding the project site required a six step analysis. These steps are:

Figure 10 **Public Transportation Facilities**



Legend:

- ● Subway Station
- → Bus Route

Table 1

OFF-STREET PARKING FACILITIES
IN THE PROJECT AREA

	Name	Location	License#	Mid-Day Capacity	Utilization
1.	AU-RO Parking Corp.	83 Walker Street	368316	17	N.A.
2.	AU-RO Parking Corp.	84-86 White Street	367638	42	N.A.
3.	S.L.L. Franklin Street Parking Lot, Inc.	48-52 Franklin Street	734556	40	60%
4.	Maj. Parking Inc.	108 Leonard Street	469340	125	N.A.
5.	Chao & Luu Corp.	95 Baxter Street	429100	28	70%
6.	Margaret E. Pescatore	98-100 Bayard Street	765883	12	100%
7.	Margaret E. Pescatore	62-64 Mulberry Street	427693	35	86%
8.	Rice Bowl Realty Corp.	52 Mulberry Street	367099	12	N.A.
9.	Edison 9th Ave. Corp.	169 Worth Street	368858	86	N.A.
10.	Court Parking System, Inc.	180 Park Row	368910	130	75%
11.	Municipal Parking	Leonard Street	-	45	100%
12.	Carl Duboff Inc.	472 Pearl Street	428335	70	100%

Source: Parsons Brinckerhoff field survey, 1/19/82.

- Trip generation -- estimation of new person trips expected to come to and from the detention facility.

- Temporal distribution -- estimation of the percentage of new trips attributable to the project that will take place during the one- and eight-hour peak periods.

- Modal split -- estimation of the percentage of person-trips to be made by auto, taxi, and other modes for project-related travel; and the conversion of person-trips into vehicle trips according to assumed vehicle occupancy rates.

- Truck traffic -- estimation of new truck trips generated by the project.

- Modification of existing traffic -- addition of new traffic that is expected from other development in the project area.

- Traffic impact assessment -- evaluation of the effects on existing traffic conditions of incremental auto, taxi, and truck trips associated with the project during the one- and eight-hour peak periods.

Each step is summarized in the sections below.

Trip Generation. The estimation of new person trips to and from the proposed detention facility was based on previously established trip making patterns exhibited at other correctional facilities in New York City. Trips to this type of facility are made by Department of Correction uniformed and civilian employees, inmates, and visitors. As would be expected, the magnitude and circulation of traffic associated with a detention or correctional facility follows highly regulated and predictable routines.

The expected staff for the 500-bed facility is 305 uniformed employees and 39 civilians. The assumed trip generation rate for employees is two trips per employee, which produces 688 trips per day (305 x 2 + 39 x 2 = 688). This rate is based on the fact that uniformed employees take their meals at the facility and generally remain on the premises throughout their shifts, making only an arrival and departure vehicular trip at the beginning and end of each work shift.

It is assumed that inmate trips will not affect traffic on the local streets. This is because inmate trips will be primarily to and from the Criminal Courts Building. Under the anticipated facility design, these movements will be mostly "invisible" trips, i.e., they will be made in secure areas through a pedestrian bridge, and will not use the existing the sidewalk or roadway network, although some van movements to 60 and 111 Centre Street will be required.

The weekday trip rate for visitors is assumed to be .31 visitors per inmate. This rate is based on an average figure (New York City Department of Correction, May 1980). Assuming the facility is fully occupied, this rate translates into 155 visitors per day, or 310 visitor trips in order to account for the arrival and departure of each visitor (500 x 31 x 2 = 310).

This rate, which includes personal visitors and attorneys, should be considered conservative. The Brooklyn House of Detention, which is an 815-bed facility, typically has 150 personal visitors on a weekday, and between 10 and 15 attorney visits. (Attorney-inmate meetings generally take place at the court building). This translates into a rate of .20 visitors per inmate, which is significantly lower than the .31 rate used in this analysis.

Temporal Distribution. For environmental purposes, it is necessary to focus on travel characteristics during two periods -- the daily peak one-hour and the peak eight-hour average. (The peak eight-hour average is the sum of the traffic in each hour of the peak eight-hour period divided by eight.) These periods represent worst-case conditions -- when the combination of base and incremental traffic will be highest but not necessarily when traffic to or from the project will be heaviest. In the case of the detention facility, due to the scheduling of work shifts and hours of visitation, the peak hour generates relatively little traffic and the majority of the facility traffic occurs outside of the peak eight-hour period. As noted above, an analysis of the traffic data for the study area indicated that these peak periods would occur during 9 - 10 AM (for one-hour) and between 9 AM and 5 PM (for eight-hour average).

Uniformed employees work three eight-hour shifts commencing at 7 AM, 3 PM, and 11 PM, while civilians work a 9 AM-5 PM shift. It is reported that 40 percent of the uniformed employees would work the day shift, 35 percent will be on duty during the evening shift, and 25 percent will be on the night shift (New York City Department of Correction, April 1980). The morning shift of uniformed employees will have arrived for work before 9 AM and will thus produce no trips during the peak hour. During the peak eight-hour average, an estimated 29 trips would be generated as the morning shift departs and evening shift arrives for work (122 + 106 = 228 ÷ 8 = 28.5). For civilians it was assumed that 25 percent of the trips are made during the peak hour and 50 percent during the peak eight-hour average for results of 20 and 5 trips, respectively.

Personal visitors will be permitted from noon to 8:30 PM on weekdays and attorney visits from 8 AM to 8 PM. It was assumed that five percent of the visitor trips will be made during the peak hour and 60 percent during the peak eight hours for totals of 15 and 23 trips, respectively. These estimates are based on established visitation patterns at other facilities where evenings have the busiest visiting hours.

Modal Split. Modal split estimates for the uniformed employees were based on reported figures. It was assumed that 10 percent of the daytime employees and 100 percent of the evening and night shift employees would come by automobile. Multiplying the 10 percent factor by the number of trips for daytime employees, and the other employees' trips by 100 percent, results in 390 person-trips by auto for uniformed employees and 8 for civilian employees. For visitors it was assumed that 20 percent arrive by auto, which results in 62 person-trips per day. These modal split estimates should be regarded as conservative. There is limited parking available in Lower Manhattan during the work day and the detention facility will not house on-site parking facilities for employees. Consequently, it is likely that the percent of trips made by auto will be even lower than those used in this analysis.

The assumed vehicular occupancy rate (expressed as persons per vehicle) was 2 for visitors and uniformed employees, and 1.65 for civilian employees. These modal split and vehicle occupancy factors were applied to the incremental person-trips associated with the project for the peak-hour and peak eight-hour average, yielding the results shown below.

Vehicle Trips Between	Employees	Visitors
9 AM - 10 AM	1	2
9 AM - 5 PM average	8	2

Truck Traffic. The project is also expected to generate a minor amount of additional truck traffic. The estimated volume of truck traffic was based on activity rates at other correctional facilities of comparable size. On this basis, it was estimated that the facility will generate approximately five truck trips per day. It was assumed that all of these trips would be made during the peak eight-hour period and that one truck trip would be made during the peak hour.

For purposes of assessing traffic impacts, trucks are translated into passenger car equivalents (PCEs) by multiplying the total number of trucks by two. The projected truck traffic associated with the project is thus equivalent to 10 PCEs, and the peak-hour figure and eight-hour average are 2 and 1, respectively.

Modification of Existing Traffic. In order to assess future traffic conditions, it is necessary to add the incremental traffic that will result from any new development in the study area, before the design year. Thus, a picture of the study area in a future year is developed on which the traffic generated by the proposed correctional facility can be added to present a description of traffic conditions resulting from implementation of the project.

Land Uses Under Alternative Development Scenario for Proposed Detention Facility

	Existing	1986 No-Build	1986 Build White St. Site	1986 Comparison No-Build
Tombs	under renovation	reopened	reopened	reopened
White St. Site	vacant	vacant	500-bed detention facility	Maximum as of right commercial development

The existing Tombs, for which renovation is already underway, will be reopened by 1986. Thus the reopened facility is assumed for all 1986 alternatives. In the 1986 no-build, the White Street site is assumed to remain vacant -- neither the 500-bed detention facility nor the proposed as of right commercial development are considered to be built. This assumption results in the most

conservative estimate of impacts of the project on trafic and transportation. Under the 1986 build White Street site alternative, the proposed 500-bed detention facility is assumbed to be built. If the White Street Site is used for the proposed detention facility, it is assumed that the proposed maximum as of right commercial development project would not be built.

In order to compare the effects of alternative uses of the White Street site, a 1986 comparison no-build was also analyzed. This condition assumes that instead of building the detention facility on the White Street site, a maximum as of right commercial development will be built. For purposes of the analysis, the commercial development was assumed to be a 52-story residential tower corresponding to a design scheme submitted by the developer to the Department of Buildings.

The travel-related characteristics associated with each of these components are described below.

Tombs - Related Traffic. The renovated Tombs will be a 426 bed facility, with a projected staff of 244 uniformed personnel and 31 civilians. The operational characteristics associated with the Tombs will be similar to those expected for the proposed facility, so the same parameters were used in estimating its expected traffic.

The Tombs, when operational, is expected to generate 550 employee trips, 264 visitor trips and 5 truck trips on an average weekday. This will result in 193 vehicle trips, with an eight-hour total of 71, and a peak-hour total of 4 vehicle trips.

While the reopening of the Tombs will generate an increment of new local traffic, it will also result in a reduction in the current number of inmate-related bus trips in the project area. Currently, there is an inmate population housed on Rikers Island, which is transported back and forth to the New York County Court House in Lower Manhattan. With the reopening of the Tombs, many of these inmates will be housed in the vicinity of the courts and will no longer need to be transported by bus. It is estimated by transportation officials on Rikers Island that when the Tombs reopens the number of daily bus trips made from Rikers Island to the courts in Lower Manhattan will be reduced by 14, with reductions for the eight-hour and peak-hour of 7 and 3 bus trips, respectively.

Residential Development-Related Traffic. The alternative private development evaluated at the White Street site is a 52-story tower including an estimated 71,203 gross square feet (gsf) of commercial space and 426 apartments with 1,221 residents.* Assuming trip generation rates of 4.75 trips per resident and 205 trips per 1,000 gsf of retail space (Pushkarev and Zupan, 1975), this project would generate 20,397 trips per day. Separate

*Based on the initial application for a building permit filed by the current owner of the site.

temporal distributions for residential and retail trips were also obtained (Puskarev and Zupan, 1975). This data indicated that during 9-10 AM, 6.5 percent of the residence-related person-trips and 1 percent of the retail-related person-trips would occur, while during the eight-hour period from 9 AM-5 PM, 42.2 percent of residence trips and 79.5 percent of the retail trips would take place. Applying a residential modal split of 8.2 percent auto and 14.8 percent taxi, and respective average home-based vehicle occupancy rates of 1.54 and 1.4 persons per auto and taxi, yields an estimate of 922 vehicle trips per day, with 60 trips during the peak hour and 389 trips during the peak eight hour period For commercial trips, modal splits of 2.3 percent for auto and 1.4 percent for taxi were applied with respective vehicle occupancy rates (shopping-related) of 1.88 and 1.4. This calculation yielded an estimate of 325 retail-related vehicular trips per day, with a peak hour of 3 trips and a peak eight-hour total of 258 trips.

Truck trip general rates and temporal distributions (Levinson, 1978) yield estimates of 72 residence-related and 25 retail-related deliveries per day. The peak-hour estimate is 11 truck trips and the peak eight-hour figure is 75 truck trips.

Total Additional Traffic. Total incremental traffic associated with anticipated development in the project area and with the proposed detention facility are shown in Table 2. The project is estimated to produce an additional 241 PCEs on an average weekday, 5 PCEs during the 9-10 AM peak hour, and 11 PCEs on the average for each hour of the 9 AM-5 PM peak eight hours. Under the comparison no-build, the residential tower would generate an estimated 1,441 additional PCEs on an average weekday, 85 PCEs during the AM peak hour, and 99 during the 8-hour average. In other words, the residential use at the White Street site would generate significantly larger traffic volumes than would the proposed detention facility at the same location.

Traffic Impact Assessment

Future 1986 No-Build Conditions. As noted above, under the 1986 no-build scenario, no new detention facility would be constructed and the White Street site would remain vacant. However, the Tombs would be reopened, and existing 1982 base traffic was assumed to grow by 0.5 percent annually.

Under this scenario, approximately 14 additional one-way vehicle trips associated with these sites were estimated to occur during the AM peak-hour (see Figure 11). The majority of these incremental trips, up to 9, are attributable to overall traffic growth. The 5 other additional trips will originate from the renovated Tombs.

Future 1986 Build Traffic Conditions - White Street Site. This alternative comprises the combined effects of the reopening of the Tombs, implementation of the detention facility on the White Street Site, and continued operation of other surrounding land uses.

Table 2

Forecast of Additional Traffic in the Study Area

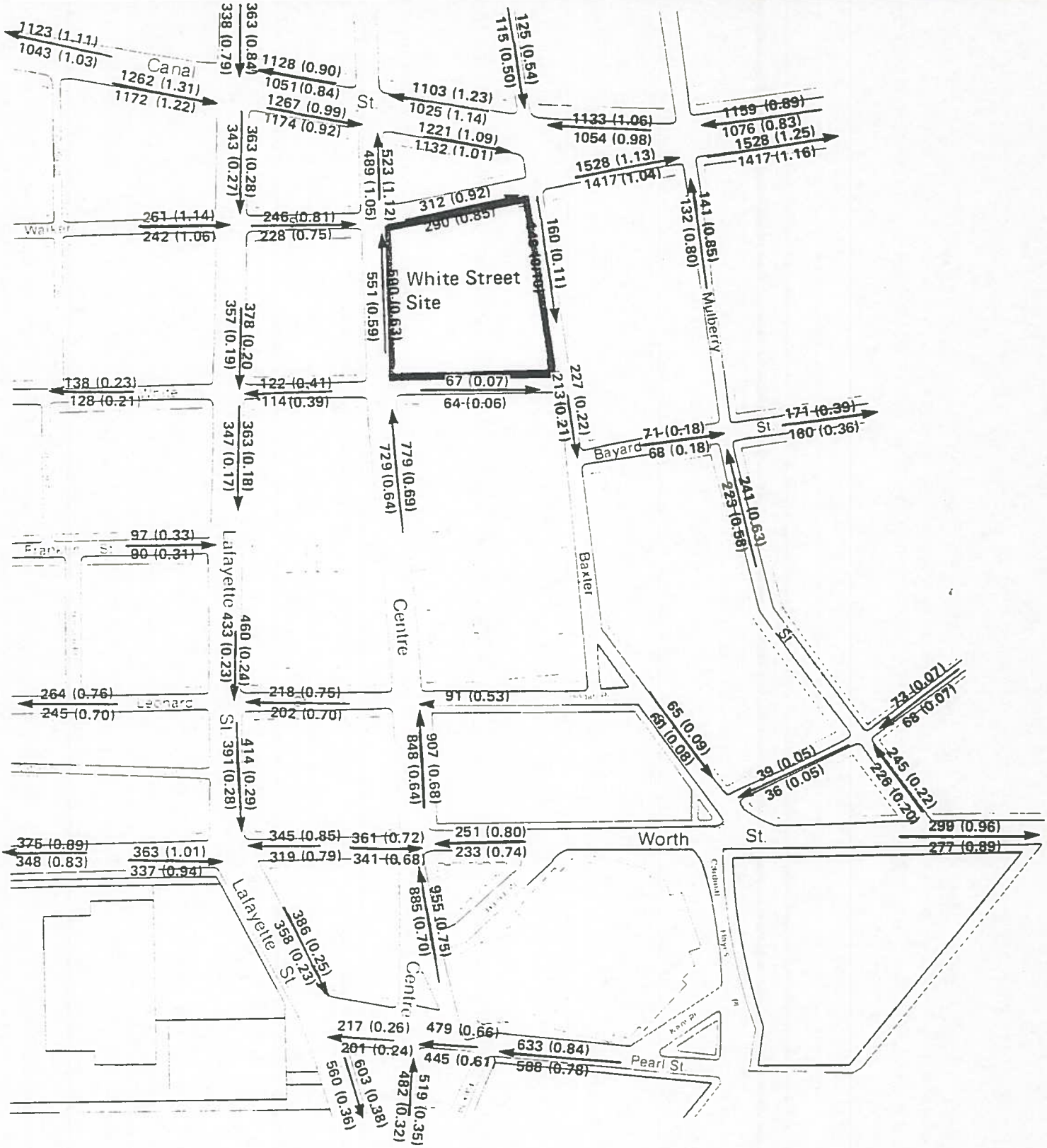
	Detention Facility	Tombs	White St.[1] Resid. Bldg.
One-Way Person Trips			
24-Hour Total	998	814	20,397
Peak 8-Hour Average (9 AM-5 PM)	57	46	1,756
Peak Hour (9-10 AM)	35	29	523
Vehicular Trips			
24-Hour Total	231	188	1,247
Peak 8-Hour Average	10	8	81
Peak Hour	3	3	63
Truck Trips[2]			
24-Hour Total	10	10	194
Peak 8-Hour Average (9 AM-5 PM)	1	1	18
Peak Hour (9-10 AM)	2	2	22
Total Vehicle Trips[2]			
24-Hour Total	241	198	1,441
Peak 8-Hour Average (9 AM-5 PM)	11	9	99
Peak Hour (9-10 AM)	5	5	85

NOTES

1. Development occurs only if White Street Site is not used for project. This condition is analyzed under the comparison no-build alternative.

2. Presented in PCEs.

Figure 11 **Future No-Build Traffic (1986)**



AM Peak Volume in Vehicles Per Hour (Volume-to-Capacity Ratios)

8-hour Average Volume in Vehicles Per Hour (Volume-to-Capacity Ratios)

Approximately 3 additional one-way vehicle trips associated with the detention facility, as located on White Street, were estimated for this scenario. (It should be noted that changes in levels of traffic operations are primarily due to natural traffic growth during the four-year period leading up to 1986 rather than the incremental traffic generated by the facility.)

Worth Street is expected to experience modifications in level of service (LOS) at two intersections: on the westbound approach to Lafayette Street ('E' reducing to 'F') and the eastbound approach to Centre Street ('C' reducing to 'D') (see Figure 12). Canal Street is projected to have its westbound approach to Lafayette Street undergo an LOS change ('D' reducing to 'E'). No other major travel routes in the area would be adversely affected by the addition of site-generated and/or natural growth traffic.

Future 1986 Comparison No-Build Traffic Conditions. Under this alternative the Tombs is projected to reopen and the White Street site is assumed to house a 52-story apartment tower. Under this scenario, approximately 75 additional one-way vehicle trips associated with these sites were estimated to occur during the AM peak hour (see Figure 13). The majority of these incremental trips will originate from the apartment complex. By occupying a marginal amount of available street capacity, the projected incremental traffic would cause a new breakdown condition in vehicular flow at one intersection -- the Worth Street approach to Lafayette Street. The additional traffic will also intensify existing traffic flow at other congested locations (see Figure 13).

Worth Street, for example, will experience a change in the level of service at three of the six intersection approaches within the study area. The eastbound and westbound approaches to Centre Street will decline from 'C' to 'D', while the eastbound approach to Lafayette Street is projected to drop from 'E' to 'F'. Canal Street has two eastbound approaches, to Mulberry and Lafayette Streets, that would undergo an LOS change ('D' to 'E' in each case). Canal Street is projected to experience capacity conditions (LOS 'E' or 'F') at each of the ten intersection approaches within the study area. The Centre Street midblock pedestrian crossing directly in front of the Tombs site, which is signal controlled, would experience LOS 'E' conditions in traffic flow; previously under 1982 conditions, this approach operated at LOS 'D'.

Comparison of Alternatives. Table 3 provides a summary of the changes in traffic levels of service on the street segments in the study area under the various alternatives analyzed. This information is also contained in Figures 9, 11, 12, and 13.

As can be seen from Table 3, the 1986 comparison no-build conditions would result in the heaviest traffic activity among all the alternatives and the highest V/C ratios overall. This is because under the comparison no-build condition the proposed 52-story apartment/retail tower would generate significantly higher traffic volumes than would the detention facility.

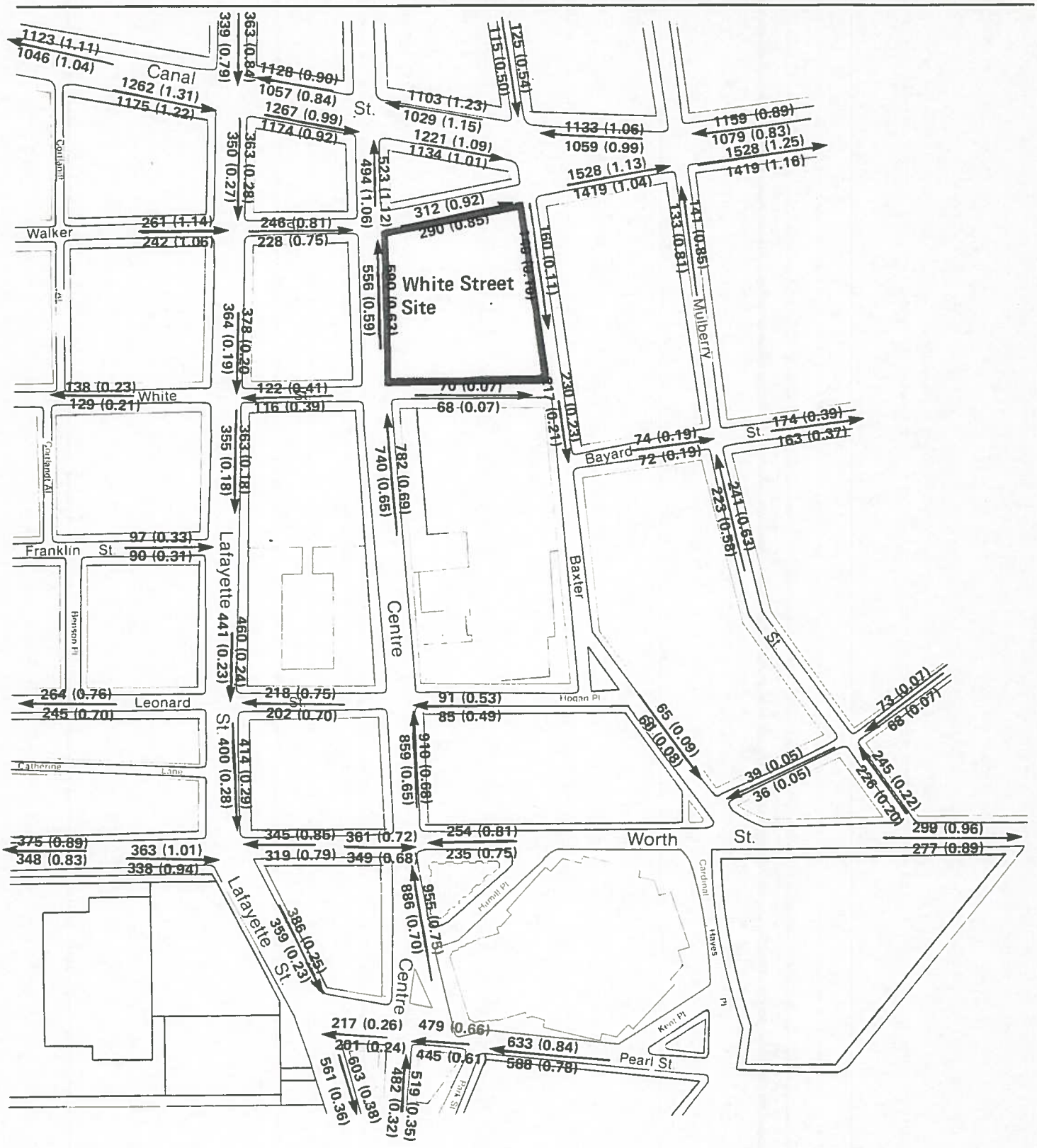
The White Street Site alternative would generate a marginally greater volume of traffic than the no-build alternative. This effect is due primarily to the low trip generation influence of the detention facility.

TABLE 3
SUMMARY COMPARISON OF TRAFFIC CONDITIONS BY ALTERNATIVES

Location	Capacity	1982: Existing		1986: No-Build		1986: White St.		1986: Comparison No-Build	
		Volume (PCE's)	V/C	Volume (PCE's)	V/C	Volume (PCE's)	V/C	Volume (PCE's)	V/C
Canal St. (from Mott St. to Mulberry St.)	1,563	1,362	0.87	1,389	0.89	1,389	0.89	1,414	0.91
Canal St. (from Mulberry St. to Baxter St.)	1,287	1,332	1.03	1,359	1.06	1,359	1.06	1,392	1.08
Canal St. (from Baxter St. to Centre St.)	1,074	1,296	1.21	1,322	1.23	1,322	1.23	1,356	1.26
Canal St. (from Centre St. to Lafayette St.)	1,503	1,326	0.88	1,353	0.90	1,353	0.90	1,409	0.94
Canal St. (from Lafayette St. to Broadway)	1,210	1,320	1.09	1,346	1.11	1,346	1.11	1,379	1.14
Canal St. (from Broadway to Lafayette St.)	1,151	1,483	1.29	1,513	1.31	1,513	1.31	1,546	1.34
Canal St. (from Lafayette St. to Centre St.)	1,529	1,489	0.97	1,519	0.99	1,519	0.99	1,519	0.99
Canal St. (from Centre St. to Baxter St.)	1,348	1,435	1.07	1,464	1.09	1,464	1.09	1,464	1.09
Canal St. (from Baxter St. to Mulberry St.)	1,629	1,796	1.10	1,832	1.13	1,832	1.13	1,855	1.14
Canal St. (from Mulberry St. to Mott St.)	1,462	1,796	1.23	1,832	1.25	1,832	1.25	1,855	1.27
Walker St. (from Broadway to Lafayette St.)	324	362	1.12	369	1.14	369	1.14	339	1.14
Walker St. (from Lafayette St. to Centre St.)	432	341	0.79	348	0.81	348	0.81	348	0.81
Walker St. (from Centre St. to Baxter St.)	481*	433	0.90	442	0.92	442	0.92	468	0.97
White St. (from Centre St. to Baxter St.)	1,047*	67	0.06	69	0.07	72	0.07	92	0.09
White St. (from Centre St. to Lafayette St.)	310	124	0.40	127	0.41	127	0.41	136	0.44
White St. (from Lafayette St. to Broadway)	619	139	023	142	0.23	142	0.23	146	0.24
Franklin St. (from Broadway to Lafayette St.)	304	98	0.32	100	0.33	100	0.33	100	0.33
Hogan Place (from Baxter St. to Centre St.)	179	92	0.51	94	0.53	94	0.53	99	0.55
Leonard St. (from Centre St. to Lafayette St.)	299	220	0.74	224	0.75	224	0.75	230	0.77
Leonard St. (from Lafayette St. to Broadway)	360	267	0.74	272	0.76	272	0.76	274	0.76
Worth St. (from Broadway to Lafayette St.)	383	378	0.99	386	1.01	386	1.01	392	1.02
Worth St. (from Lafayette St. to Centre St.)	535	376	0.70	384	0.72	384	0.72	446	0.83
Worth St. (from Centre St. to Park Row)	331	311	0.94	317	0.96	317	0.96	317	0.96
Worth St. (from Park Row to Centre St.)	333	260	0.78	266	0.80	270	0.81	273	0.82
Worth St. (from Centre St. to Lafayette St.)	431	359	0.83	366	0.85	366	0.85	366	0.85
Worth St. (from Lafayette St. to Broadway)	447	390	0.87	398	0.89	398	0.89	398	0.89
Lafayette St. (from Howard St. to Canal St.)	455	376	0.83	384	0.84	384	0.84	390	0.86
Lafayette St. (from Canal St. to Walker St.)	1,350	376	0.28	384	0.28	384	0.28	440	0.33
Lafayette St. (from Walker St. to White St.)	2,042	392	0.19	400	0.20	400	0.20	455	0.22
Lafayette St. (from White St. to Franklin St.)	2,127	376	0.18	384	0.18	384	0.18	446	0.21
Lafayette St. (from Franklin St. to Leonard St.)	2,020	477	0.24	487	0.24	487	0.24	548	0.27
Lafayette St. (from Leonard St. to Worth St.)	1,495	429	0.29	438	0.29	438	0.29	503	0.34
Lafayette St. (from Worth St. to Pearl St.)	1,613	399	0.25	407	0.25	407	0.25	417	0.26
Lafayette St. (from Pearl St. to Duane St.)	1,660	624	0.38	637	0.38	637	0.38	647	0.39
Centre St. (from Duane St. to Pearl St.)	1,579	538	0.34	549	0.35	549	0.35	558	0.35
Centre St. (from Pearl St. to Worth St.)	1,338	989	0.74	1,009	0.75	1,009	0.75	1,019	0.76
Centre St. (from Worth St. to Leonard St.)	1,408	938	0.67	958	0.68	961	0.68	1,036	0.74
Centre St. (Midblock pedestrian crossing between White and Leonard Sts.)	959	806	0.84	823	0.86	826	0.86	901	0.94
Centre St. (from Leonard St. to White St.)	1,199	806	0.67	823	0.69	826	0.69	901	0.75
Centre St. (from White St. to Walker St.)	988	611	0.62	623	0.63	623	0.63	668	0.68
Centre St. (from Walker St. to Canal St.)	493	542	1.10	553	1.12	553	1.12	577	1.17
Baxter St. (from Hester St. to Canal St.)	237	126	0.53	129	0.54	129	0.54	129	0.54
Baxter St. (from Walker St. to White St.)	1,474*	162	0.11	165	0.11	165	0.11	165	0.11
Baxter St. (from White St. to Bayard St.)	1,047	229	0.22	234	0.22	237	0.23	257	0.25
Baxter St. (from Hogan Place to Worth St.)	764*	66	0.09	67	0.09	67	0.09	67	0.09
Mulberry St. (from Worth St. to Park St.)	1,150*	247	0.22	252	0.22	252	0.22	252	0.22
Mulberry St. (from Park St. to Bayard St.)	394	243	0.62	248	0.63	248	0.63	248	0.63
Mulberry St. (from Bayard St. to Canal St.)	170	142	0.84	145	0.85	145	0.85	156	0.92
Bayard St. (from Baxter St. to Mulberry St.)	399	71	0.18	73	0.18	76	0.19	91	0.23
Bayard St. (from Mulberry St. to Mott St.)	454	172	0.38	176	0.39	179	0.39	183	0.40
Park St. (from Mott St. to Mulberry St.)	1,047*	74	0.07	75	0.07	75	0.07	75	0.07
Park St. (from Mulberry St. to Worth St.)	785*	39	0.05	40	0.05	40	0.05	40	0.05
Pearl St. (from Park Row to Park St.)	799	659	0.82	672	0.84	672	0.84	672	0.84
Pearl St. (from Park St. to Centre St.)	772	499	0.65	509	0.66	509	0.66	509	0.66
Pearl St. (from Centre St. to Lafayette St.)	887	226	0.25	231	0.26	231	0.26	231	0.26

* No signal at this intersection; therefore, this approach capacity is calculated under unrestricted conditions.
PCE = Passenger car equivalent.
V/C = Volume-to-capacity ratio.

Figure 12 **Future Build Traffic: White Street Site (1986)**



AM Peak Volume in Vehicles Per Hour (Volume to Capacity Ratios)

8-hour Average Volume in Vehicles Per Hour (Volume to Capacity Ratios)

Figure 13 **Future Comparison No-Build Traffic (1986)**

AM Peak Volume in Vehicles Per Hour (Volume to Capacity Ratios)

8-hour Average Volume in Vehicles Per Hour (Volume to Capacity Ratios)

Transit Impact Assessment

The incremental demand from the project for bus and subway trips will not have a significant impact on transit services in the project area. The demand will be relatively small -- fewer than 500 trips per day -- and would not coincide with the rush hours when the transit system experiences its greatest level of congestion.

Parking Impact Assessment

Although there is only limited off-street parking available in the area it is likely that the demand for parking generated by the project can be absorbed by the existing supply. Based on the limited survey of parking lots in the area, it appears there are approximately 100 spots available during the midday. At slightly greater distances, north of Canal Street, there is a limited amount of additional parking. The midday demand will be less than 25 spaces, and approximately 79 percent of the parking demand from the project will be for employee parking during the evening and night shifts when the utilization rates are much lower than during the midday.

Construction Impact Assessment

Construction of the proposed detention facility would have short-term effects on local traffic conditions. Disruption of traffic should be minimal, however, and care will be taken to maintain existing traffic lanes.

On-site construction activities are expected to last approximately 36 months. The average number of workers on the site during this period would be approximately 80. During the peak constructon period approximately 300 workers are expected to be on the site.

It is anticipated that the employees will work a normal construction shift of 7 a.m. to 4 p.m. The lack of relatively inexpensive parking is expected to affect the number of workers driving to the site. Information from the Tombs renovation site indicates that between 5 and 10 percent of the construction workers arrive by private automobile. Because ride-sharing is common among construction workers, the average vehicle occupancy rate for these workers is estimated at three persons per car. Assuming 10 percent of the workers arrive by car, 3 automobiles would be used by commuting workers. During the peak construction period, approximately 10 automobiles would be used. The impact of this traffic, which is very slight to begin with, would be mitigated by the comparatively early hours of arrival and departure of construction workers, thus not coinciding with peak traffic periods.

The construction activities are expected to generate additional truck traffic -- an average 5 trucks per day. The peak period for truck traffic would also be approximately 5 trucks per day.

There is a possibility of temporary off-site traffic disruption related to the connection and placement of utilities. When utilities are relocated or extended to the property, the usual New York City construction practices would be followed which involve the shortest possible closing of lanes while care is taken to maintain regular traffic flow.

AIR QUALITY

Existing Environment

Air Pollutants

Seven air pollutants have been identified by the United States Environmental Protection Agency (EPA) as being of concern nationwide: carbon monoxide, hydrocarbons, nitrogen oxides, photochemical oxidants, lead, particulate matter, and sulfur oxides. In Manhattan, ambient concentrations of carbon monoxide, hydrocarbons, photochemical oxidants, and lead are predominantly influenced by motor vehicle activity, while emissions of nitrogen oxides, particulate matter, and sulfur oxides are associated with various stationary sources of emissions.

Of primary importance to implementation of the proposed facility are those pollutants that can be traced principally to motor vehicles: carbon monoxide, hydrocarbons, photochemical oxidants, and lead. National Ambient Air Quality Standards for these pollutants are summarized in Table 4.

Carbon monoxide is a site-specific pollutant and warrants microscale analysis. Hydrocarbons are reactive pollutants whose impacts usually occur over a wide area and are examined on an areawide basis. Similarly, photochemical oxidants, resulting from complex reactions between hydrocarbons and nitrogen oxides in the presence of sunlight, are examined on an areawide basis by assessing changes in the orginating hydrocarbon compounds.

The lead used in gasoline anti-knock additives constitutes a major source of lead emissions to the atmosphere. Lead emission will decrease as older vehicles are replaced by new catalyst-equipped vehicles, which are restricted to the use of unleaded gasoline. Ambient lead concentrations will decrease in the future whether or not the detention facility is constructed, bringing lead levels below National Ambient Air Quality Standards. Consequently, a detailed assessment of changes in ambient concentrations of lead is not included in this analysis.

TABLE 4

NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Primary Average Time	Secondary Standard (ppm)*	Standard (ppm)**
Carbon Monoxide	8 hours	9	9
	1 hour	35	35
Hydrocarbons***	3 hours (6 to 9 a.m.)	0.24	0.24
Ozone	1 hour	0.12	0.12
Lead	Calendar Quarter	1.5****	1.5****

NOTES: *Primary Standard: The level of air quality necessary, with an adequate margin of safety, to protect the public health.

**Secondary Standard: The level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

***Used as a guide in devising implementation plans to achieve ozone standards.

****Micrograms per cubic meter.

SOURCE: 40 CFR Part 50, "National Primary and Secondary Ambient Air Quality Standards," 36FR22384, November 25, 1971, as amended.

Meteorology

The concentration of air pollutants is directly affected by the meteorological characteristics of the region in which the pollutants are emitted. The ventilation and dispersion characteristics of the atmosphere at any given location are dependent both on the large, or macroscale, climatic characteristics of the region, as well as on microclimatic effects due to local topography, presence of vegetation or water bodies, and nature and extent of disturbance by man.

The New York metropolitan area exhibits relatively good ventilation characteristics due to the relatively high average wind speeds and the absence of topographic barriers to impede wind flow. Though wind direction shows significant annual variation, prevailing winds are westerly. On a microscale level, wind direction varies depending on the characteristics of the earth's surface, including the presence of buildings and other structures. These structures can create wind turbulence, as well as the spiraling and channelization of wind within "street canyons" (a section of street confined on both sides by abutting multistory structures).

Ground-based temperature inversions (a condition of the atmosphere where surface air is cooler than the air above it, resulting in the inability of ground-level pollutants to rise and mix in the atmosphere) occur diurnally, normally in the early morning and late evening hours. These short-term inversions do not generally occur during peak traffic hours.

Long-term inversions for the New York metropolitan region are far less frequent. Based on temperature data from the National Climatic Center, for example, low level (less than 500 meter) inversions lasting longer than two days with wind speeds less than four meters per second occurred in the New York area only once -- for a total of two days -- within a five-year time span. Generally, the formation of even short-term inversions is impeded in Manhattan due to the increased air turbulence caused by the relative roughness of the surface of the urban landscape, and by increased vertical mixing due to urban "heat island" effects.

Prediction Sites

Five sites were selected for detailed study on the streets adjacent to and elsewhere in the general vicinity of the project site. These sites represent the locations where the greatest air quality impacts and maximum changes in the carbon monoxide concentrations would be expected. The prediction site locations were selected on the basis of the expected travel patterns of vehicles traveling to and from the detention facility, and as control or comparison checks for the analysis at the facility. Prediction locations are shown on Figure 14.

Other locations, including sites in the vicinity of such sensitive community facilities as schools, parks, religious institutions, and health care facilities, would experience lesser impacts in pollutant levels than those at the prediction sites.

Existing Ambient Air Quality

Existing air quality in the vicinity of the proposed facility was estimated on the basis of available ambient air quality data monitored at several locations in Manhattan by the New York State Department of Environmental Conservation (DEC), and, for carbon monoxide, on the basis of microscale air quality modeling at the five prediction sites using the prediction methodology described in this assessment.

Available 1980 ambient air quality data for Manhattan for the pollutants of interest are summarized in Tables 5 and 6. 1980 is the latest full calendar year for which ambient air quality data is currently available from the DEC. When compared to the applicable National and State Ambient Air Quality Standards (NAAQS), these data indicate that there were violations of the eight-hour NAAQS for carbon monoxide (CO) at street-level monitoring stations. CO levels recorded at roof top monitoring locations were considerably below street-level concentrations. Second highest one- and eight-hour CO concentrations (the NAAQS for CO are based on the second highest one- and eight-hour CO concentrations recorded during a year) for the two roof-top monitoring stations in Manhattan were 7.6 ppm and 8.1 ppm, and 5.0 ppm and 5.6 ppm, respectively, well below the NAAQS of 35.0 and 9.0 ppm.

Almost 200 violations of the NAAQS for photochemical oxidants (ozone) were recorded at the six ozone monitoring stations in New York City during 1980. Violations of the NAAQS for ozone are pervasive through most of the eastern seaboard from Virginia to Maine, and the violations recorded in Manhattan are not indicative of any circumstances unusual to New York City.

Results of the microscale CO modeling analysis are summarized in Table 9 (p. 45). Violations of the eight-hour NAAQS for CO were predicted at two locations. There was one predicted violation of the one-hour NAAQS for CO at prediction site 1. These predictions are consistent with available monitoring data, in that violations of the eight-hour NAAQS are far more common than violations of the one-hour NAAQS in Manhattan. Maximum concentrations were found at prediction locations 1 and 3 (see Figure 14). This is due to the relatively high ratio of traffic volumes to street capacity found on Centre Street.

TABLE 5

Ozone Concentrations Recorded at New York State Department of Environmental Conservation Monitoring Stations in New York During 1980

Monitoring Location	One-Hour Average (ppm)*			
	NAAQS 0.12	Number of Observations 0.12	Max.	2nd High
Mabel Dean		19	0.155	0.154
Sheepshead		44	0.184	0.173
PS-321		24	0.148	0.146
Queens College		51	0.174	0.164
Woolsey PO		37	0.188	0.163
Susan Wagner		20	0.174	0.152

*parts per million

Source: New York State Department of Environmental Conservation. New York State Air Quality Report. Continuous and Manual Air Monitoring Systems. Annual 1980 DAR-81-1.

TABLE 6

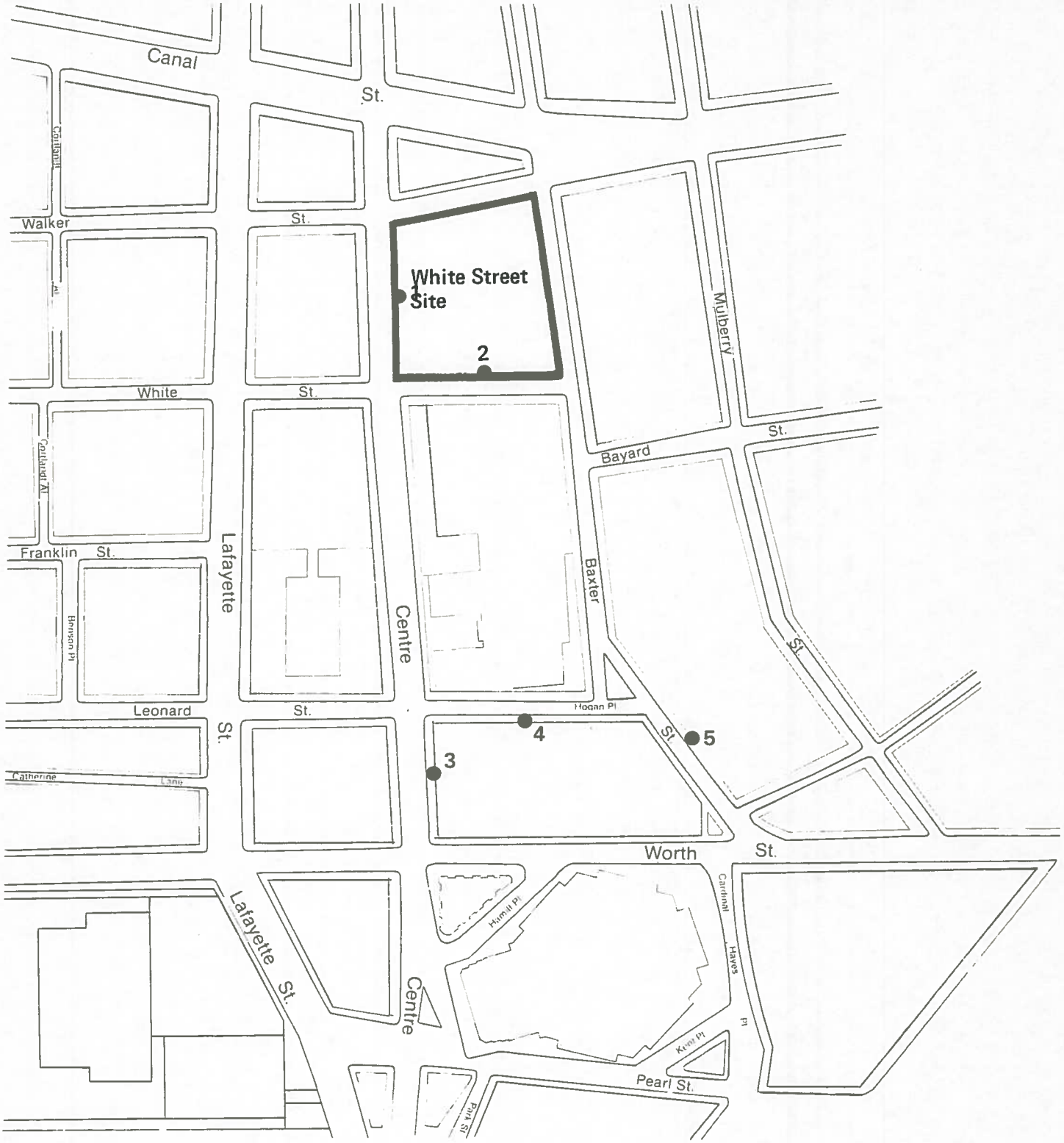
CARBON MONOXIDE CONCENTRATIONS RECORDED AT NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION MONITORING STATIONS IN MANHATTAN DURING 1980

Monitoring Location	One-Hour Average (PPM)				Eight-Hour Average (PPM)			
	NAAQS	Number of Observations >35.0	Max.	2nd High	NAAQS	Number of Observations >9.0	Max.	2nd High
	35				9			
Mabel Dean*		0	7.9	7.6		0	5.4	5.0
Central Park*		0	8.6	8.1		0	5.6	5.6
45th Street**		0	30.9	24.6		637	15.4	14.9
Canal Street**		0	28.0	20.7		130	14.0	13.0

* Rooftop Monitoring Stations
** Street level "traffic" site

Source: New York State Department of Environmental Conservation. New York State Air Quality Report. Continuous and Manual Air Monitoring Systems. Annual 1980 DAR-81-1.

Figure 14 **Air Quality Prediction Sites**



Impacts

During Construction

Increases in ambient concentrations of particulate matter from construction activities are difficult to estimate precisely due to inaccuracy in determining actual total emissions, and the wide range in size of the particulates emitted. Since a large proportion of the fugitive dust generated by construction activity is of a relatively large particle size, much of the fugitive dust is expected to settle to the ground within a short distance from the construction site and not significantly affect nearby facilities. Dust control measures, such as watering of affected areas and the use of dust covers for trucks, can reduce increases in ambient concentrations of particulate matter due to construction to minimal levels.

Gaseous hydrocarbon and nitrogen oxide emissions from the private vehicles of construction workers, from construction equipment at the site, and from traffic in the vicinity of the site will have little impact on local air quality. The very small localized increases in hydrocarbon and nitrogen oxide emissions caused by these sources during the construction process will be insignificant when compared to total regional burdens of these pollutants and would be expected to have little effect on regionwide concentrations of ozone.

Small increases in ambient concentrations of CO during construction of the facility can be expected in the vicinity of the site, due to decreased vehicle speeds in the vicinity of the construction site, emissions from the private vehicles of construction workers, and from construction vehicles at the site. Since CO emissions increase with decreases in vehicle speed, disruptions in existing traffic due to construction should be minimized. This will be accomplished, wherever feasible, by maintaining the existing number of lanes of through traffic. Emissions from construction vehicles will not be a major source of carbon monoxide since most construction equipment is diesel-powered and emits relatively low amounts of carbon monoxide.

Air quality impacts during construction of the proposed detention facility can be limited by applying a number of mitigating measures.

Fugitive dust emissions can be minimized by:

- The use, where possible, of water or other suitable chemicals for control of dust in excavation and construction operations; and

- The covering, at all times when in motion, of open-bodied trucks transporting materials likely to give rise to airborne dust.

Localized increases in mobile source emissions can be minimized by incorporating into construction contract documents the following traffic maintenance procedures:

- Performance of construction requiring temporary street closings during off-peak hours;

- Maintenance of the existing number of available traffic lanes; and

- Prohibition on the idling of delivery trucks or other equipment during periods when they are being unloaded or not in active use.

During Operation

Microscale Carbon Monoxide Analysis. Carbon monoxide concentrations at the detention facility site were estimated using a modeling approach widely applied for evaluating the air quality impacts of projects in New York City. This approach was coupled with a series of "worst-case" assumptions related to meteorology, traffic and pollutant background levels, resulting in a highly conservative estimate of expected carbon monoxide concentrations and air quality impacts due to the project. This approach is described in the following sections.

Prediction Methodology. Maximum one- and eight-hour carbon monoxide concentrations were determined using a computerized version of the EPA-developed indirect source review procedures (Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9 (Revised): Evaluating Indirect Sources, Publication No. EPA-450/4-78-001, Research Triangle Park, North Carolina) in conjunction with the EPA developed HIWAY-2 dispersion model (User's Guide for HIWAY-2, a Highway Air Pollution Model, Publication No. EPA-600/8-80-018, Research Triangle Park, North Carolina), the shallow street canyon portion of the SRI APRAC-1A dispersion model (User's Manual for the APRAC-1A Urban Diffusion Model Computer Program, Publication No. EPA-650/3-73-001, Research Traingle Park, North Carolina) and a "deep canyon" model developed by staff of the New York City Department of Environmental Protection Division of Air Resources (DAR).

Using the EPA indirect source methodology, carbon monoxide concentrations at a prediction location are assumed to be the result of emissions from a combination of free-flowing traffic along nearby roadways or streets, and queuing traffic at nearby intersections or on nearby roadways. Vehicular emissions are based upon the updated (December 1977) Modal Emissions Model (Kunselman 1974) and adjusted using factors derived from the EPA-developed Mobile Source Emissions Model, (MOBILE-2 User's Guide to MOBILE-2: Mobile Source Emissions Model, Publication EPA-460/3-81-006, Ann Arbor, Michigan). After determining vehicular emissions, concentrations were calculated using the HIWAY-2, SRI APRAC-1A, or deep canyon models.

Both the HIWAY-2 and SRI APRAC 1A models are approved EPA state-of-the-art dispersion models which have been widely used for evaluating CO concentrations due to mobile sources. The HIWAY-2 model is a Gaussian diffusion model developed by EPA for predicting carbon monoxide concentrations along roadway segments in open terrain. Gaussian models assume that the dispersion of pollutants downwind of a pollution source follow a Gaussian (or "normal") distribution. In making estimates of pollutant concentrations for an at-grade roadway or city street, emissions are considered to be equivalent to a series of finite line sources. Each lane of traffic is modeled as though it were a straight, continuous finite line source with a uniform emission rate. Carbon monoxide concentrations downwind are found by numerical integration along the line source of a simple Gaussian point-source plume. For this analysis, the HIWAY-2 model was used to predict localized concentrations of CO at prediction sites that were located in relatively open terrain (not within street canyons).

The SRI APRAC-1A model is a semi-empirical model, specifically developed to calculate pollutant concentrations at sites within urban areas, including shallow street canyons (canyons where the aspect ratio, i.e., the ratio of average building height to street width, is less than about 2:1). The SRI APRAC-1A model calculates pollutant concentrations within an urban street canyon for winds either leeward, windward, or parallel to the street axis. Except for prediction locations of unusual cross-sectional geometries, maximum predicted concentrations at ground level are usually found assuming a leeward wind. For this analysis, the SRI APRAC-1A model was used to predict localized concentrations of CO at prediction sites within shallow street canyons.

No generally accepted diffusion model currently exists for determining street level concentrations of pollutants emitted from vehicular sources within deep street canyons (street canyons with an aspect ratio of greater than approximately 2:1). Dr. John Sontowski, while on the staff of DAR, developed a computer model, however, for estimating pollutant concentrations within deep street canyons which yields results in general agreement with street-level CO concentrations monitored in Manhattan. Dr. Sontowski's model is applicable to street canyons sufficiently long to establish stable pollutant concentrations (canyons longer than about 500 meters). The DAR has recently issued guidance for modifying the results of the Sontowski model to assess street level pollutant concentrations within deep canyons of lengths less than 500 meters. For this analysis the Sontowski deep canyon model, modified for use in shortened canyons, was applied to estimate the change in CO concentrations at prediction sites due to formation of street canyons with aspect ratios greater than 2:1. Table 7 indicates the aspect ratio at each prediction location for each alternative.

Meteorological Conditions. The transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. Wind direction, wind speed and stability were chosen to maximize pollutant concentrations at each of the prediction sites. In applying the HIWAY-2 model, maximum concentrations are normally found when the wind is assumed to blow approximately parallel to the street adjacent to the site. In applying the APRAC-1A model, maximum concentrations are normally found when the wind is assumed to blow approximately perpendicular. The Sontowski deep canyon model does not require specification of wind direction. At each receptor location, the wind angle which maximized the pollutant concentration was used in the analysis regardless of frequency of occurence.

Following the recommendations contained in the EPA indirect source procedures, carbon monoxide prediction computations were performed using a wind speed of 1 meter/second, stability class D, and assuming a meteorological persistence factor of 0.7 for the eight-hour computations. A 30° F ambient temperature was assumed for all computations.

Table 7

ASPECT RATIO AT AIR QUALITY PREDICTION LOCATIONS

Prediction Site		Aspect Ratio*			
Number**	Location	Existing	No Build	Build White St.	Comparison No-Build
1	Centre St. between Walker and White	.24	.24	1.66	4.98
2	White St. between Centre and Baxter	.36	.36	3.30	8.17
3	Centre St. between Leonard and Worth	1.59	1.59	1.59	1.59
4	Hogan St. between Centre and Baxter	3.17	3.17	3.17	3.17
5	Baxter St. between Hogan and Worth	N/A	N/A	N/A	N/A

*Ratio of average building height to street width.

**Refers to Figure 14.

Analysis Year. CO concentrations were estimated for 1982 baseline conditions, and for the no build, build, and comparison no-build alternatives for 1986, the year when the facility is scheduled to open. In later years, carbon monoxide concentrations are expected to decrease due to federally mandated vehicular emission control requirements along with vehicle turnover.

Vehicle Emissions Data. As described previously, the methodology detailed in the EPA indirect source procedures was used to estimate pollutant emissions. Using this methodology, emission estimates were made for four classes of motor vehicles: light-duty, gasoline-powered vehicles (automobiles); light-duty, gasoline-powered trucks; heavy-duty, gasoline-powered vehicles; and, heavy-duty, diesel-powered vehicles.

For automobiles and light-duty, gasoline-powered trucks, the emission estimates accounted for three possible vehicle operating conditions: cold-vehicle operation; hot-start operation; and, hot-stable operation. Vehicle operating conditions used in the emission calculations were estimated based upon material supplied by the Tri-State Regional Planning Association for Manhattan, and from data supplied by the DAR. (New York City Department of Environmental Protection, August 1981.) The table below summarizes the conditions used in the analysis.

LIGHT DUTY VEHICLE OPERATING CONDITIONS

	1 - Hour	8 - Hour
% Cold (Non Cat.)	18.6	5.7
% Cold (Cat.)	20.8	9.2
% Hot (Cat.)	2.1	3.6

Vehicle operating conditions for the vehicles generated by the proposed facility were assumed to be identical to the operating conditions of vehicles in the no-build alternatives.

Emission estimates were based on implementation of the New York State auto inspection and maintenance (I&M) program which began in January 1982. The New York I&M program requires annual inspections of automobiles and light trucks to determine if carbon monoxide and hydrocarbon emissions from the vehicles' exhaust systems are below strict emission standards. Vehicles failing the emissions test must undergo maintenance and pass a re-test in order to be registered in New York State. No credits have been taken for the fact that the taxi inspection and maintenance program began in late 1977.

Heavy-duty vehicle emission estimates reflect local engine displacement and vehicle loading characteristics. No credits were taken for reduced truck emissions which will be achieved if the heavy-duty gasoline truck retrofit program, included in New York State Air Quality Implementation Plan for the New York City metropolitan area, is implemented. Light-duty truck emissions were based on an assumed 50-50 split between trucks weighing less than 6,000 pounds, and trucks weighing 6,000 to 8,500 pounds.

Traffic Data. Traffic data for the air quality analysis were derived from traffic counts and other information developed as part of the traffic analysis for this assessment. For the air quality analysis, the peak one-hour and eight-hour time periods were 9-10 AM and 9 AM - 5 PM periods, respectively. These were the time periods when predicted concentrations could be expected to be greatest and when the project would be expected to have the maximum impact based on anticipated increases of traffic on local streets.

Background Concentrations. Background concentrations are those pollutant concentrations not directly accounted for through the modeling analysis (the modeling analysis directly accounts for vehicular-generated emissions on the streets immediately adjacent to the receptor locations). Background concentrations must be added to the modeling results to obtain total pollutant concentrations at a prediction site.

Carbon monoxide background concentrations used in this analysis for the one and eight-hour predictions are presented in Table 8. These background values were obtained based on the highest one-hour and eight-hour carbon monoxide concentrations measured in 1980 at the Battery Park City site in conjunction with the Environmental Impact Statement for that project (Battery Park City Authority, Draft Environmental Impact Statement, Battery Park City, May 1981) adjusted to reflect the reduced vehicular emissions expected in the analysis year. The concentrations recorded at the Battery Park City site are in excellent agreement with CO concentrations recorded at DEC monitoring stations in Manhattan (Table 6), and are the best CO background estimates available for lower Manhattan

Results. Table 9 shows the maximum predicted one-hour and eight-hour concentrations of carbon monoxide at the five prediction sites for the no-build, the White Street build, and the comparison no-build alternatives. Traffic and site geometries in this analysis were based on the expected generalized growth in traffic in the study area, and on site geometries with and without construction of the residential building. Results are based on peak one and eight-hour traffic estimates developed as part of the traffic and transportation studies for this assessment, the worst case meteorological conditions described previously, and implementation of the New York State Department of Environmental Conservation vehicle inspection and maintenance program. It is assumed that the Tombs will be reopened in both the build alternative and the no-build alternatives.

In all cases, predicted one-hour and eight-hour carbon monoxide concentrations in 1986 were below those concentrations predicted at the identical prediction sites in 1982. This is due to the combined effects of the replacement of older vehicles with relatively clean vehicles (vehicle turnover), and the implementation of the New York State auto inspection and maintenance program.

At all sites, predicted CO concentrations associated with the build alternative were equal to or less than predicted CO concentrations for the comparison no-build alternative. This is due to the traffic generated by the

Table 8

Background CO Concentrations

Year	NYC Downtown Emission Inventory CO tons/day	Background CO 1 hr. ppm	Background CO 8 hr. ppm
1982	21.18	5.7	3.8
1986	12.07	3.3	2.2

Maximum Recorded CO Concentrations (ppm)

1-hr.	8-hr.
7.6	5.1

Based on: 1980 CO Emission Inventory
28.25 tons/day

Source: Battery Park City Authority. Draft Environmental Impact Statement. May, 1981.

Table 9
MAXIMUM ONE- AND EIGHT-HOUR CARBON MONOXIDE CONCENTRATIONS
(ppm)*

Predictions Applying HIWAY-2	Baseline 1982		No-Build 1986		White St. Site 1986		Comparison No-Build 1986	
Receptor	1-hr.	8-hr.	1-hr.	8-hr.	1-hr.	8-hr.	1-hr.	8-hr.
1	39.0	17.4	22.2	10.0	22.2	10.1	24.6	10.7
2	7.6	4.1	4.4	2.3	4.5	2.4	4.4	2.4
3	22.0	10.9	12.5	6.5	13.3	7.6	12.5	6.8
4	17.0	7.2	9.7	4.3	10.3	5.0	9.7	4.5
5	10.3	4.3	5.8	2.5	5.9	2.5	5.9	2.5
Predictions pplying SRI APRAC-1A								
Receptor								
1	16.3	13.7	9.1	7.9	9.3	8.0	9.1	7.9
2	6.4	4.0	3.7	2.3	3.9	2.4	3.7	2.3
3	15.8	11.7	8.8	6.8	9.1	7.1	8.8	6.9
4	10.5	7.7	5.9	4.6	6.1	4.8	5.9	4.6
5	NA**							

Note * All concentrations include background.

** SRI Model not applicable. No street canyon at this location.

land uses incorporated in the comparison no-build alternative. These assumed uses at the White Street site are a 52 story high rise development, which includes 476 dwelling units and three floors of commercial space. The traffic generated by the build alternative will be significantly less than the traffic associated with the uses incorporated in the comparison no-build alternative.

Predicted CO concentrations for the build alternative showed a maximum increase of 0.3 ppm at receptor location 3, when compared with the no-build alternative. At one prediction location, Centre Street between Walker and White, CO concentrations predicted using the HIWAY-2 model were greater than the eight-hour NAAQS for CO for the no-build, comparison no-build, and the build case, though lowest for the build alternative (10.1 ppm). These concentrations include the effect of emissions from traffic using Centre Street immediately adjacent to the prediction locations, as well as the effect of emissions from traffic using Centre Street north of the prediction location and from traffic using Canal Street. Approximately 75 percent of the total concentrations (without background) predicted at prediction location 1 were from traffic on Centre Street immediately adjacent to or on the blocks north of the prediction site. The remaining contributions, about 25 percent (approximately 2.5 ppm) were from traffic along Canal Street. These predictions were completed without regard to the presence of structures along Canal Street which could effectively block dispersion of a portion of the Canal Street emissions from entering Centre Street. If the effect of these structures was taken into consideration, pollutant concentrations at prediction location 1 would approach or probably meet the eight-hour ambient air quality standard of 9.0 ppm.

Table 10 summarizes the results of the analysis using the Sontowski deep canyon model. These results indicate that deep canyon formation only occurs at receptor site 2 in the build case. This results in a predicted increase in CO concentration of 0.1 ppm.

Regional Analysis. Regional pollutant burdens of carbon monoxide, hydrocarbons, and nitrogen oxides were estimated for the baseline conditions in 1982, and for the build year 1986. The results are presented below:

REGIONAL BURDEN FOR MANHATTAN IN 1982 and 1986
(tons per day)

Pollutants	Base Year (1982)	Build Year (1986)
Hydrocarbons	39.35	21.42
Carbon Monoxide	487.35	293.68
Nitrogen Oxides	25.73	21.64

As indicated by the figures in the table above, implementation of the New York State I&M program and replacement of older vehicles with newer vehicles will result in a 40 percent decrease in pollutant burdens in 1986 from base year conditions. The amounts of carbon monoxide, hydrocarbon, and nitrogen oxides emissions generated due to the minimal traffic associated with the detention facility, respresent an insignificant change in emissions when viewed in a regional context. Based on this analysis it is concluded that there will be very small regional impact of the above pollutants and photochemical oxidants due to the operation of the detention facility.

TABLE 10

EFFECTS OF PROPOSED PROJECT ON CARBON MONOXIDE CONCENTRATIONS DUE TO DEEP CANYON EFFECTS

Receptor	CO
1	0.0
2	0.1
3	0.0
4	0.0
5	0.0

Consistency of the Project with the New York State Air Quality Implementation Plan for the New York City Metropolitan Area. The proposed detention facility has been evaluated on the basis of applicable control strategies contained in the New York State Air Quality Implementation Plan (SIP) for the New York City Metropolitan Area. All control strategies are intended to assure that the National Ambient Air Quality Standards are attained as soon as practicable.

Results of this evaluating indicate that the proposed facility is consistent with all control strategies contained in the SIP for the New York City Metropolitan Area. Construction and operation of the detention facility will neither cause or exacerbate violations of the National Ambient Air Quality Standards, and will not violate the de minimus air quality increments established by the DAR for assessing the impact of proposed development in New York City.

NOISE

Introduction

Noise Descriptors

A number of factors affect sound as it is perceived by the human ear. These include the actual level of the sound (or noise), the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels during exposure. Levels of noise are measured in units called decibels. Since the human ear cannot perceive all pitches or frequencies equally well, these measures are adjusted or weighted to correspond to human hearing. This adjusted unit is known as the A-weighted decibel, or dBA. Table 11 illustrates noise levels from typical fluctuating and nonfluctuating noise sources, based on the A-weighted decibel measure of noise.

Since dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over extended periods are needed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it has been a steady, unchanging sound. For this condition, a descriptor called the equivalent sound level, L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, $L_{eq(1)}$, or 24 hours, $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound.

Alternatively, it is often useful to account for the difference in response of people in residential areas to noises that occur during sleeping hours as compared to waking hours. One method of accounting for the difference between daytime and nighttime exposure is to apply a weighting factor to the nighttime noise. A descriptor, the day-night noise level, L_{dn}, defined as the A-weighted average sound level in decibels during a 24-hour period with a 10 dB weighting applied to nighttime sound levels, is a widely used indicator for such evaluations. L_{dn} has been proposed by the United States Environmental Protection Agency (EPA) and other organizations as one of the most appropriate criteria for estimating the degree of nuisance or annoyance that increased noise levels will cause in residential neighborhoods.

For purposes of this project, the maximum one-hour equivalent sound level ($L_{eq(1)}$), the 24-hour equivalent sound level ($L_{eq(24)}$), and the day-night noise level (L_{dn}) have been selected as the noise descriptors to be used in the noise impact evaluation. Maximum one-hour equivalent sound levels were used to provide an indication of highest expected sound levels during operation of the proposed development. The $L_{eq(24)}$ and L_{dn} sound levels permit a comparison with federal and local noise standards, and indicate the extent to which changes in noise levels resulting from the project will affect local residents.

Noise Analysis Methodology

The dominant source of noise in the study area, as in most urban areas, is vehicular traffic. The traffic noise level at a given location depends on several factors, the most important of which are the site geometry of the

TABLE 11

Typical Noise Levels

dBA L10	Fluctuating Noises	dBA	Non-Fluctuating Noises (a)
120	Rock Band	120	
110		110	Jet Aircraft at 1000 feet
100	Inside Subway Train - New York City	100	Full Throttle Diesel Truck at 20 feet
90		90	Full Throttle Diesel Truck at 50 feet
	Noise Urban Daytime		Freeway Diesel Truck at 50 feet, 60 mph
80	Shouting at 3 feet	80	Medium Truck at 20 feet, 30 mph
			Food Blender at 3 feet
70	Exterior FHWA* Design Noise Level	70	Auto at 20 feet, 30 mph
	Normal Speech at 3 feet		Dishwasher at 3 feet
60	Quiet Urban Daytime	60	Auto at 20 feet, 15 mph
	Interior FHWA Design Noise Level		Air conditioner (indoors) at 5 feet
50	Quiet urban Nighttime	50	Dishwasher (next room)
40		40	Refrigerator at 3 feet
	Quiet Rural Nighttime		
30		30	Quiet Rural Bedroom at Night
			Concert Hall Background
20		20	
			Broadcasting Studio
10		10	
			Threshold of Hearing
0		0	

(a) Moving source noise levels are for closest points of approach.

*U .S. Federal Highway Administration.

receptor location and the traffic flow past the site. The FHWA Level 2 Highway Traffic Noise Prediction Model, which relates traffic and site geometry information to resultant sound levels, was selected for use in the noise analysis to estimate both present and future noise levels. The model was selected based on a review of several alternative prediction models including the TSC Model as modified for the West Side Highway Project, and the NCHRP 117/144 Model.

In all cases, it was concluded that the FHWA Level 2 Model would yield higher predicted noise values for typical Manhattan traffic conditions than the other models examined. In addition, prediction results obtained using the FHWA Level 2 Model would be consistent with noise levels measured as part of several recent studies in Manhattan, including noise studies for the Broadway Plaza, Garment Center, City on 42nd Street, Post Office Vehicle Maintenance Facility, West Side Highway Project, and the New York City Exposition and Convention Center. Noise levels predicted by the model include the effect of sound reverberation and reflectance due to the presence of structures and noise barriers.

This model provides a conservative estimate of traffic-generated noise because of two other reasons:

(1) It overpredicts noise associated with traffic slower than 30 miles per hour (mph). Since vehicle speeds on traffic links in the project impact area are less than 30 mph, predicted noise levels due to operation of the project are conservative upper limits to actual values;

(2) The model makes no provision or allowance for expected future vehicle noise reductions due to implementation of the noise emission limitations required by the Federal Noise Control Act of 1972. Noise emission standards required by that act have either been promulgated or proposed for a wide variety of vehicle classifications.

The combined effect of these noise emission limitations could cause a significant decrease in community noise levels from vehicular sources within the next several years. Future noise levels are therefore expected to be below most of the values predicted in this analysis.

Existing Environment

Five locations within the study area were selected for the noise impact analysis (see Figure 15 and Table 12). Two were adjacent to the White Street site, and three were located elsewhere at typical locations in the study area. These are locations where the maximum facility-related traffic increases were predicted to occur, and are therefore sites where the maximum noise impacts of the project are likely to occur.

Current noise levels due to vehicular traffic were calculated for each of these locations. In addition, typical existing noise levels were determined by short-term monitoring at three of the sites using a calibrated

Figure 15 **Noise Monitoring and Prediction Sites**

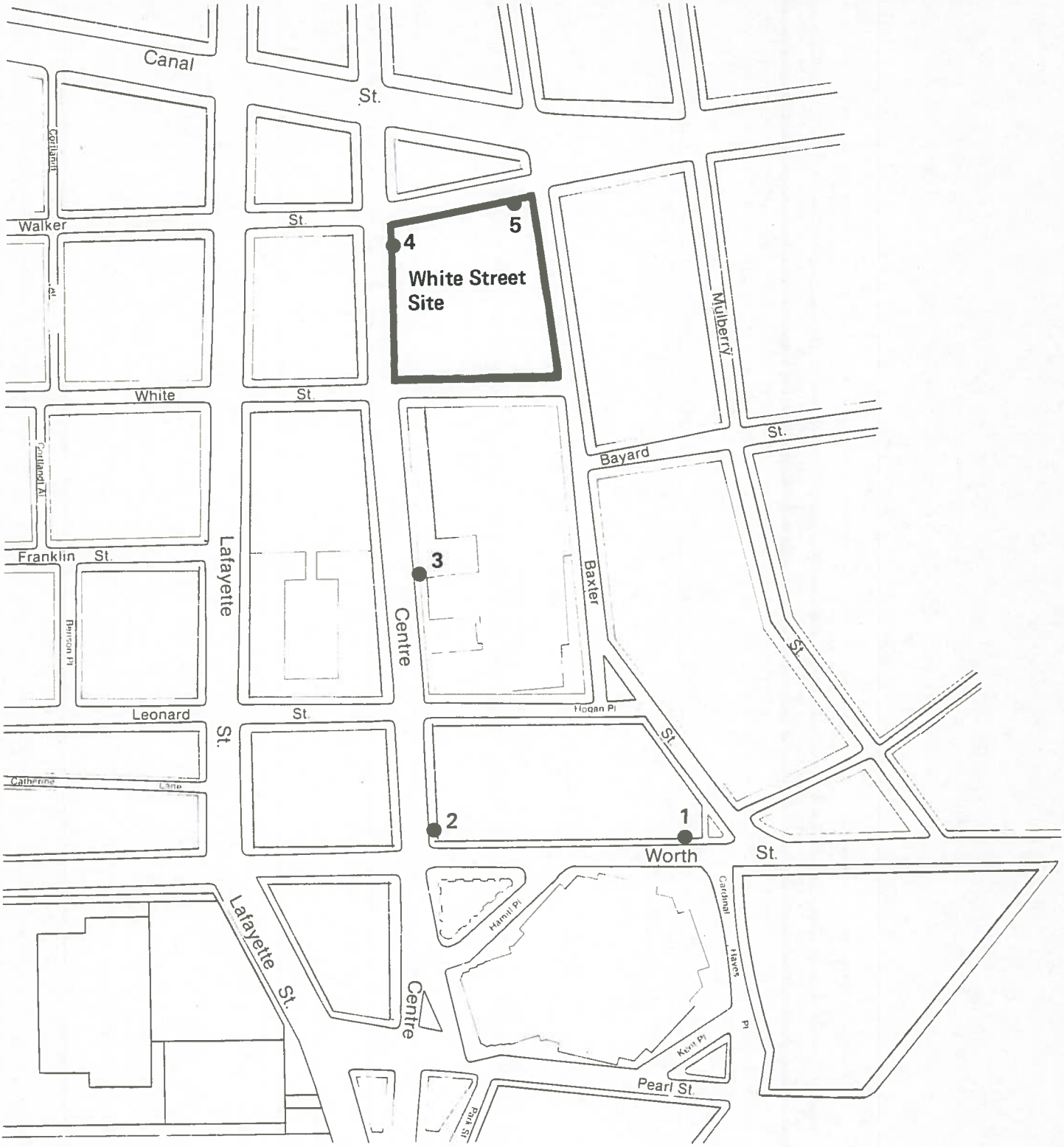


TABLE 12

EXISTING NOISE LEVELS
(dBA)

	Site	Time Period	$L_{eq(1)}$ Observed	$L_{eq(1)}$ Calculated	$L_{eq(24)}$	L_{dn}
1.	Worth St. near Baxter State Office Building	12:05-1:05 P.M.	73	71	68.5	71.2
2.	Centre St. near Worth State Office Building				70.6	73.7
3.	Centre St. Criminal Courts Building	9:40-10:40 A.M.	72	71	68.2	71.3
4.	Centre St. near Walker White St. Site				68.7	73.2
5.	Walker St. near Baxter White St. Site	10:50-11:50 A.M.	76	77	75.4	80.4

Note: All measurements taken on January 7, 1982

Metrosonics dB 306 sound level meter. Observed and calculated existing noise levels are shown in Table 12. Model predictions at the sites where field measurements were taken were in good agreement with monitored levels.

24-hour equivalent noise levels were between 68.2 and 70.6 dBA, except for the location at the northwest corner of the White Street site where the calculated $L_{eq(24)}$ was 75.4 dBA. Noise levels at this location are strongly affected by the high volume of heavy truck traffic on Canal Street.

Impacts

During Construction

Impacts on community noise levels during construction include noise from construction equipment, and noise from construction vehicles and delivery vehicles traveling to and from the construction site.

Typical noise emission levels for construction equipment are summarized in Table 13. For the proposed facility, the construction period is expected to extend approximately three years, with the greatest noise impacts concentrated in the first few months of the period.

At the White Street site, by far the most noise intensive activity during construction would be the driving of foundation piles. Instantaneous (impact) noise levels from pile driving operations are typically over 100 dBA at fifty feet from the pile driving activity. Pile driving noise by its very nature is intrusive. This operation will be noisy and will be so perceived. It is expected that pile driving operations will be limited to one eight-hour daytime shift and noise levels during the nighttime hours will not be affected.

Increases in noise levels due to the operation of delivery trucks and other construction vehicles will be far less significant. Construction activities should not cause a noticeable increase in the existing high levels of heavy truck traffic on Canal and Walker Streets.

Construction noise is regulated by the New York City Noise Code and by EPA noise emission standards. These local and federal requirements mandate that certain classifications of construction equipment and motor vehicles meet specified noise emission standards; that, except under exceptional circumstances, construction activities be limited to weekdays between the hours of 7AM and 6PM; and that construction material be handled and transported in such a manner as not to create unnecessary noise. These regulations will be carefully followed. In addition, the use of "quieter" construction equipment and procedures will be explored and, where feasible, low noise emission level equipment and operational procedures will be utilized. Compliance with noise control measures will be accomplished by including them in the contract documents as material specifications, by directives to the construction contractor, and by careful supervision of noise-generating activities throughout the construction process.

Table 13

TYPICAL NOISE EMISSION LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment Item	Noise Level at 50 ft. (dBA)
Air Compressor	81
Asphalt Spreader (paver)	89
Asphalt Truck	88
Backhoe	85
Bulldozer	87
Compactor	80
Concrete Plant	83*
Concrete Spreader	89
Concrete Mixer	85
Concrete Vibrator	76
Crane (derrick)	88
Delivery Truck	88
Diamond Saw	90*
Dredge	88
Dump Truck	88
Front End Loader	84
Gas-driven Vibro-compactor	76
Hoist	76
Jackhammer (Paving Breaker)	88
Line Drill	98
Motor Crane	83
Pile Driver/Extractor	101
Pump	76
Roller	80
Shovel	82
Truck	88
Tug	85*
Vibratory Pile Driver/Extractor	89*

Source: Patterson, W.N., R.A. Ely, and S.M. Swanson, "Regulation of Construction Activity Noise", Bolt Beranek and Newman, Inc., Report 2887, for the Environmental Protection Agency, Washington, D.C., November 1974, except for (*) items.

During Operations

The principal effect of operation of the detention facility on community noise levels will be the noise generated by vehicular traffic traveling to and from the facility. The relatively low noise levels generated by non-transportation sources, such as roof-mounted ventilation fans and cooling equipment, would be masked by transportation noise and consequently have been excluded from this analysis.

Traffic conditions in 1986 for the "no-build" alternatives and for development of the project site were predicted as described in the section on traffic and transportation impacts. The FHWA Level 2 Highway Traffic Noise Prediction Model was then used to calculate the predicted future noise levels shown in Table 14.

Predicted future noise levels at all locations are equal to or slightly greater than present levels. There are no significant differences at any location between noise levels predicted for the no-build and build alternatives.

HUD Noise Standards

The United States Department of Housing and Urban Development (HUD) has adopted environmental standards, criteria, and guidelines for determining acceptable noise levels in federally-assisted projects. HUD has proposed mitigating measures to ensure that activities they assist will achieve the goal of a suitable living environment. Though these standards and criteria are directly applicable only to HUD-assisted programs, they do represent reasonable goals for any project. However, security features must take precedence at detention and correctional facilities.

The table below summarizes HUD site acceptability standards based on external noise levels. These standards reflect an EPA goal that interior noise levels should not exceed a day-night average sound level of 45 decibels. This goal is not a mandated standard and does not account for cost or feasibility.

HUD Site Acceptability Standards

	Outdoor Ldn (dBA)
Acceptable	Not exceeding 65
Normally Unacceptable	65 to 75
Unacceptable	Above 75

Source: Title 24, Code of Federal Regulations, Part 51.103(c), Exterior Standards

TABLE 14

Predicted Future Noise Levels
(dBA)

	Prediction Site	Noise Descriptor	No-Build	Comparison No-Build	White St. Site
1.	Worth St. near Baxter	$L_{eq(24)}$	68.5	68.5	68.5
		L_{dn}	71.2	71.2	71.2
		$L_{eq(1)max}$	71	71	71
2.	Centre St. near Worth	$L_{eq(24)}$	70.7	70.9	70.7
		L_{dn}	74.1	74.2	74.1
		$L_{eq(1)max}$	73	73	73
3.	Centre St. Criminal Court Bldg.	$L_{eq(24)}$	68.6	68.8	68.6
		L_{dn}	72.0	72.1	72.0
		$L_{eq(1)max}$	71	71	71
4.	Centre St. near Walker	$L_{eq(24)}$	71.9	72.1	71.9
		L_{dn}	75.4	75.6	75.4
		$L_{eq(1)max}$	74	75	74
5.	Walker St. near Baxter	$L_{eq(24)}$	78.9	79.1	78.9
		L_{dn}	82.6	82.7	82.6
		$L_{eq(1)max}$	81	81	81

HUD encourages noise attenuation features in new construction or in alterations of existing structures. The HUD mandated or recommended design mitigation measures include well-sealed double-glazed windows, forced air ventilation systems (permits windows to remain closed in summer) and acoustic shielding and insulation. The detention facility will have well-sealed inoperable security glass windows; and it will have a forced air ventilation system. Other accoustic shielding and insulation will be provided as possible given security considerations.

Generally, HUD approval for projects in a Normally Unacceptable noise zone require a minimum of 5 decibels additional sound attenuation for buildings having noise-sensitive uses, if the day-night average sound level is greater than 65 decibels but does not exceed 70 decibels, or a minimum of 10 decibels of additional sound attenuation, if the day-night average sound level is greater than 70 decibels but does not exceed 75 decibels.

The predicted 1986 noise levels shown in Table 14 indicate that the White Street site is in the "unacceptable" range. For a masonry structure with sealed windows and forced-air ventilation, interior noise levels will be about 25 dBA below exterior levels. Double-glazing provides an additional 10 dBA in noise attenuation. These measures should reduce interior noise levels to acceptable levels (less than the EPA-suggested interior noise level goal of 45 dBA).

ECONOMICS

The area of the proposed facility is located at the convergence of several of the City's functional economic regions. The area falls within the government/civic district, which extends north from City Hall through a series of public sector facilities dedicated to the functioning of the city, state, and federal governments. North of the site and across Canal Street is Little Italy, with numerous retail shops, restaurants, and small factories; to the northeast is the Lower East Side, where Jewish and other immigrants mostly from Europe filled the narrow sidewalks and streets 75 to 110 years ago; and directly east of the site and expanding northward and eastward is Chinatown.

Existing Conditions

The principal economic sectors or concentrations of economic activity in the area surrounding the site are:

- Public sector activities associated with the operation of city, state, and federal governments, including public agency offices, government office buildings, and criminal justice activities;
- Restaurants, retail stores, and services which primarily cater to customers who are not local residents, including workers from the public sector and visitors attracted to the vicinity from other parts of the metropolitan area;
- Light manufacturing and warehousing, particularly garment related industry, operating primarily in loft buildings;
- Local retail and service activities which cater primarily to the needs of local residents, and activities associated with the provision of residential space, mostly located above ground floor retail shops.

The evolving economic condition of the general area has been affected in recent years by two trends: a growing Chinese population concentrated in, though emerging from, Chinatown; and a decline in the importance of some former economic uses in the area, particularly manufacturing. New York City's and Manhattan's relative share of the total U.S. Chinese population has been rising sharply since 1965, after declining in the previous two decades. Since 1965, when the laws affecting Chinese immigration were liberalized, the city's Chinese population is estimated to have tripled, with a majority of this ethnic group concentrated in the general area of Lower Manhattan to the east of and surrounding the site. In recent years, it has been estimated that New York City has accounted for approximately 17 percent of the country's total Chinese population -- a proportion that is an all time high (NYC Department of City Planning, MBAS, 1979).

The explosive growth due in part to immigration has lead to an expansion of the economic sphere of influence of Chinatown. The initial Chinese settlement in Manhattan was within the area today defined as Old Chinatown. While Chinatown's exact boundaries continue to change, the site proposed for the detention facility adjoins on the east the area of Old Chinatown. Bounded by Canal street on the north, Bowery on the east, Worth Street on the south, and

Baxter Street on the west, in recent times the number of people living in this area is reported to have continued to increase (NYC Department of City Planning, MBAS, 1979). At the same time, the Chinese population, like other New York immigrant groups, has increasingly moved from the area of its major early settlement. This has taken the form of dispersal from Old Chinatown to its surrounding area in the general Manhattan Bridge region, and a concurrent outward movement to other areas.

Concurrent with the burgeoning growth in Chinatown is a city-wide trend of reduced manufacturing activity -- the sector which has traditionally been an important employer of immigrants. In fact, the economic problems of recent Chinese immigrants to New York have been itensified by the decline of the City's manufacturing base. Manufacturing in 1981 was down 13,000 jobs, continuing its long-term decline. This decline in manufacturing has taken place against a trend of increasing overall employment in the city. New York City's total employment during the first 10 months of 1981 was up 23,000 jobs according to the U.S. Bureau of Labor statistics, rising above the 3.3 million mark for the first time since 1974. In the last four years, the City's job total has risen by 135,000, compared with declines totaling 600,000 in the previous eight years. However, the 1981 increase in employment in the City, as has been the case throughout New York's recovery, was spurred by increases in the service sector and in finance, insurance, and real estate rather than in manufacturing.

These broader trends are operating on the local economy of the study area. The nine occupied blocks of Old Chinatown contain predominantly five-story turn-of-the-century tenements with commercial activities on the lower levels. Chinatown restaurants and retail establishments are situated not only at street level, but also in the cellars, basements and upper floors. Old Chinatown contains approximately 500 restaurants and retail stores, as well as more than 2,300 dwelling units housing roughly 10,000 people (NYC Department of City Planning, MBAS, 1979).

The retail trade and service sectors are of great importance not only in Old Chinatown, but increasingly throughout the area. In recent years, retail establishments owned and operated by Chinese have begun to appear with increasing frequency in adjacent areas. In addition, Chinese employers and employees have increasingly moved into other sectors. With increased numbers of Chinese families living above other uses in adjacent areas, and increased numbers of Chinese-operated retail as well as manufacturing and other establishments in adjacent areas, the economic importance of Lower Manhattan's Chinese community has expanded beyond traditional Chinatown, moving into available space in the civic/governmental area surrounding the site.

Impacts

During Construction

The project is being funded as New York City Capital Project C-109. The estimated total cost is $71,380,000 in actual, time-of-expenditure dollars, assuming an escalation factor during the construction period of 1 percent per month. (The approximate development cost in 1982 dollars is $51,290,000.)* Construction at the White Street site would be expected to begin in 1983 and last 3 years, with peak construction employment of approximately 300.