OFFICE

Village of Ossining

Parking Structure Feasibility Study

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This report provides an overview of the feasibility of constructing a parking structure within Ossining's Central Business District (CBD). The possibility of developing a parking structure has been considered for some time. Recently, the Village Board reviewed several parking structure concepts, which once again stirred the consideration of the idea. This report builds upon these concepts and provides a preliminary analysis of the feasibility of advancing the idea to the next level.

A. Parking in the Central Business District – Existing Conditions

Parking in Ossining's CBD takes place within municipal parking lots, private parking lots and within individual on-street parking spaces. In total, nearly 1,000 parking spaces can be found in the CBD. Approximately 1/5 of these spaces are privately controlled, while the remainder are controlled by the Village.

1. Municipal Parking Lots

The eleven (11) existing municipal parking lots located within the CBD currently support 400 off-street parking spaces.

Occupancy rates at the lots vary somewhat, but in general; virtually all of the municipal parking lots are heavily utilized.

2. Private Parking Lots

The four major private parking lots located in the CBD contain 189 parking spaces. These spaces are heavily utilized and occupancy rates are high, particularly during normal business hours. Occupancy rates in these lots decrease notably during off-peak periods.

3. On-Street Parking

Nearly 400 on-street parking spaces are located throughout the CBD. These spaces are generally heavily utilized; however, occupancy rates vary significantly. Spaces within the core of the CDB are occupied nearly continuously, and turnover rates are generally high. Spaces in the outlying areas have somewhat lower occupancy rates, and turnover occurs less frequently. Even through most of these outlying spaces are limited to short term parking, they are often used for longer-term parking. Metro North commuters have been observed using these outlying on-street parking spaces for long-term parking.

Table 1 and Figures 1 & 2 provide an overview of the CBD parking inventory.

TABLE 1
CBD PARKING SPACE INVENTORY

Location	# Spaces
Municipal Lots	
Municipal Building Lot	43
North Highland Avenue Lot	9
Croton Avenue Lot	17
Eastern Avenue Lot	10
Village Center Lot	81
Market Square Lot	23
Broadway Lot	47
Brandreth Street Lot	61
Community Center Lot	40
State Street Lot	38
St. Pauls Place Lot	31
Subtotal Municipal Lots	***400***
Private Parking Lots	
Croton Avenue	17
Church Street	82
Main Street/State Street	40

State Street	50
Subtotal Private Lots	***189***
On-Street Parking	
Eastern Avenue	51
Ellis Place	36
Highland Avenue	11
Brandreth Street	13
Main Street	91
Church Street	6
Central Avenue	52
Maple Place	37
Spring Street	53
St. Pauls Place	18
Brace Street	19
Academy Place	11
Subtotal On-Street Parking	***398***
Total Available Parking in CBD	***987***

B. Parking Demand

It can be generally concluded that all of the Central Business District's nearly 1,000 parking spaces are heavily used, and a high demand exists for safe and convenient parking. Some notable patterns emerge from close observation of the CBD's current parking characteristics:

- On-street parking spaces, located in close proximity to popular points of destination, are the preferred parking spaces. The primary exception to this is the Village Center Municipal Parking Lot, which is centrally located and close to many primary destinations. These factors make this lot as desirable as the on-street parking spaces.

- While on-street parking spaces are generally preferred for short term parking, many of these spaces are regularly occupied for long-term periods, often in violation of the applicable parking restrictions.

- Pedestrians tend to avoid crossing Route 9 when possible. Therefore, parking facilities on the east side of Route 9 will not functionally meet the needs of those on the west side, and visa versa.

- The farther west parking spaces are located, the less desirable they become to serve the CBD, and the more desirable they become to host Metro North commuter parking. This is due in some measure, to the steep topography rising up from the river.

- Outlying parking lots often host a larger amount of multi-day parkers.

- Convenience was noted as the primary reason for selecting a parking space. However, security and safety are considered nearly as important, and at certain times, such as in the evenings, may be the overriding reason for selecting a parking space.

- Uneven enforcement of existing parking regulations encourages individuals to risk "beating the odds." Occasional parking violation fines are considered acceptable expenses when compared to the convenience obtained by illegally parking.

C. CBD Build-Out Analysis

When considering parking in the CBD, it is important to first establish what the parking will be used for. Parking in the CBD directly correlates to the nature and extent of the land uses in the area. A bustling and thriving business district will require more parking than would a blighted and deteriorated one that is dominated by vacant stores. The first step in properly planning for parking in the CBD is to accurately estimate how much development the district can support, and then calculate the corresponding amount of parking that would be required.

A "build-out analysis" is a planning tool used to estimate the maximum amount of development that might occur in a given area under existing zoning and land use controls.

The boundary of the CBD corresponds to the B-3 zoning district boundary. The B-3 zone establishes a number of specific zoning controls; most notably it permits 100% coverage and a Floor Area Ratio (F.A.R.) of 1.5. These zoning controls are the primary factors used in the build-out calculation.

The first step in estimating the CBD's potential build-out is to calculate the area of each lot that might be developed (or redeveloped). For the purposes of this study, the area of lots in the CBD were obtained from tax assessment records and individual lot measurements. Using these methods, the areas of all privately owned parcels were obtained.

Public property, such as the municipal parking lots, the Municipal Building, the Recreation Center, Police and Fire stations, were excluded from the build-out calculation. It was assumed that the potential of these properties being sold for the purpose of private development is very low. All other property, including quasi-public uses, such as churches, were included in the build-out calculation, as it is possible that these uses could potentially be redeveloped.

In total, 831,230 square feet or slightly over 19 acres of land could be built upon within the CBD.

The build-out formula estimates full development based on the size of the parcels, regardless of the size or presence of existing buildings or uses. The build-out analysis is clearly a "worst-case", full development projection. Applying the existing B-3 zoning controls to the available buidable area within the CBD, 1,246,845 square feet of development can be accommodated within the CBD.

Estimating build-out is a useful exercise when evaluating the CBD's parking situation because it provides an understanding of how much parking would ultimately have to be provided if the CBD were developed to its fullest.

The B-3 zone permits a range uses, and many of these uses have different off-street parking requirements. However, a common off-street parking requirement applies to three of the most common uses form in the CBD; retail, service and office. The requirement for these uses is 1 space for every 250 square feet of gross floor area. Applying this ratio, it can be calculated that full build-out or 1,246,845 square feet of commercial space, would require 4,987 off-street parking spaces.

It should be noted that full build-out rarely occurs. Planning for a parking need of 5,000 spaces at this time, is premature. However, it is critically important to proactively plan for the future, with a clear understanding of what might be necessary if all of the various circumstances that would support full build-out were to fall into place.

D. Parking Garage Location

When evaluating sites for the possible construction of a parking structure, a number of factors must be considered. A viable site must be:

- *Consumer Friendly* – The structure must accommodate patrons in a logical and easy-to-understand manner. It needs to be in close proximity to the primary uses in the CBD, it must be easy to get to and from, and easy to navigate and park within.

- *Good Neighbor* – The parking structure must fit well within the surrounding environment. The facility should compliment existing land uses and not detract from other uses in the neighborhood. It should be compatible with the existing infrastructure of the Village, and it should have negligible adverse impact on local traffic conditions.

- *Operationally Efficient* – A good site will be of a size that permits the construction of a facility with good parking efficiency. Parking spaces sizes and aisles widths should be comply with the applicable requirements established in the zoning ordinance. Minimal spaces should be lost to oversized aisles and non-parking areas. Ingress and egress should be logical and efficient.

- *Ease of Implementation* – It is desirable to select a site that will not be difficult to secure for the project, is not environmentally constrained, or legally restricted in some way.

Several sites have been explored over the years as potential sites for a parking structure, including all of the municipal parking lots, as well as a number of privately owned parcels.

A consensus exists that the Brandreth Street lot is the most appropriate location for consideration of a parking structure. This is so for a number of reasons:

- The parcel is centrally located within the CBD.

- The site is inconspicuously situated behind Main Street, so it will not disrupt the existing streetscape.

- The existing at grade parking lot is built on multiple levels, offering the opportunity to set the parking structure into the slope and reduce construction costs.

- The size and shape of the site affords the opportunity to maximize vehicle capacity.

- The site is located adjacent to the Aqueduct walkway. Connection to the existing pedestrian circulation system will prove practical.

- The site has two-way ingress and ingress on Brandreth Street

- The Village already owns the site.

Brandreth Street Parking Lot

If a new parking structure were constructed at he Brandreth Street site, preliminary design plans indicate that a 4 level structure could be developed supporting approximately 335 parking spaces.

E. Access and Trip Generation

Two factors must be carefully evaluated when considering the feasibility of constructing a parking structure. The first relates to the ability to safely and conveniently access the structure. The second relates to the amount of traffic drawn to the structure.

1. Access

The existing Brandreth Street municipal parking lot fronts onto, and has direct access on Brandreth Street. The roadway pavement width is variable, but is adequate to provide for two-way traffic flow past the site.

The location of the curb cut servicing the parking structure is an important design consideration. If the curb cut were located too close to the Main Street intersection, then vehicle conflicts at the site entrance would invariably back-up into the Main Street intersection. As this is the central intersection in the CBD, situations that might create gridlock should be avoided. Generally, no curb cuts should be located less than 50' from the intersection, and ideally should be 75' to 100' away. This separation affords an adequate on-street vehicle queue (if necessary) that would not impact the Main Street intersection.

The design of the site ingress and egress should take into account the site's proximity to a major intersection and should include an on-site entrance driveway apron. This feature would allow a vehicle to pull into the site (pulling the vehicle fully off Brandreth Street) before encountering a traffic access point, such as a gate or fair collection device. This design feature will

further assure that vehicles ingress and egressing the parking structure will not disrupt the traffic flow on Brandreth Street or the Main Street intersection.

It is important that the access to the garage be clearly identified. Proper signage, both at the driveway and at the Main Street intersection, is critical, as are well placed pavement markings and site lighting. All instructional signage, such as rates and restrictions, should be designed to be read on-site and not from Brandreth Street.

B. Traffic Generation

The parking structure being considered is not a land use destination. The parking structure itself will not generate traffic. The ultimate destinations of individuals utilizing the site are, for the most part, the businesses, residences and other facilities in the CBD. New traffic will be generated by the new uses that are now able to locate within the CBD due to the presence of adequate parking.

As noted previously, if fully developed and built-out the CBD could accommodate over 1.2 million square feet of commercial activity. This level of business activity would generate a considerable volume of traffic.

A new parking structure would have the potential to redirect and reallocate existing (and also future) parking. For example, currently, individuals looking for parking spaces in the Brandreth Street area have 61 spaces in the municipal parking lot and 13 on-street parking spaces, to choose from. Based upon this finite supply of parking spaces (74 spaces), traffic volumes and intersection levels-of-service can be easily calculated. The traffic volumes are simply a function of the number of available parking spaces, the applicable parking regulation (3 hour parking, etc.) and the actual occupancy rates.

If more parking spaces are provided, or importantly, if more convenient and secure parking spaces are provided, then the number of vehicles moving along Brandreth Street will proportionally increase.

Traffic studies conducted in the CBD over the past seven years indicate that the Brandreth Street/Main Street intersection functions adequately. Table 2 presents various intersection levels-of-service[1].

TABLE 2
BRANDRETH STREET/MAIN STREET INTERSECTION LEVELS OF SERVICE

Year	Time Period	LOS
1995	AM	D
	PM	C
1999	AM	D
	PM	C
	Saturday Peak	C
2001	AM	C
	PM	C
	Saturday Peak	D
With Harbor Square Project	AM	C
	PM	D
	Saturday Peak	C

LOS "C" translates into a 15 – 25 second delay. LOS "D" is a 25 – 40 second delay. As a general rule, central business districts and downtown areas where intersections operate at LOS "C" and "D" are considered clearly acceptable, as would a LOS "E" in certain situations. A slightly degraded LOS, a "D" for example, suggests that the CBD or downtown is bustling and vibrant, without being choked by traffic. It represents an optimum balance.

[1] The level-of-service (LOS) of an intersection is the amount of delay experienced by a vehicle. A LOS of "A" represents a delay of 5 seconds or less. A LOS of "F" represents a delay of over a minute.

An understanding of existing traffic volumes offers an indication of how accessible the site of the proposed parking structure will be. Table 3 presents traffic volumes along Brandreth Street, at the existing driveway location.

TABLE 3
TRAFFIC VOLUMES
AT SITE ACCESS ON BRANDRETH STREET

Year	Time Period	Volume
1995	AM	38
	PM	87
1999	AM	64
	PM	91
	Saturday Peak	69
2001	AM	67
	PM	95
	Saturday Peak	72
With Harbor Square Project	AM	69
	PM	95
	Saturday Peak	72

During the heaviest traveled period in the afternoon peak hour, 95 vehicles would pass the site access point. This volume translates into less than 2 vehicles per minute. This volume would allow for safe site ingress and egress.

If the parking structure were constructed, 274 new parking spaces would become available (the 61 existing spaces would remain). Even if a majority of the vehicle trips associated with these spaces were to occur during the peak hours, the LOS and traffic volumes would not deteriorate appreciably.

F. Parking Structure Cost

Construction Costs

Many variables combine to influence the actual cost of constructing a parking structure. At this preliminary stage, without engineered site plans, it is impossible to

assign a specific cost to the project. However, several financial assumptions can be brought forward. These generalized figures are based on experiences with similar projects in the region, including the Harbor Square project, as well as an overall understanding of the Brandreth Street site:

Construction Costs

- $13,000 - $18,000/Space
- $40.00 - $60.00/Square foot

The character of the Brandreth Street property appears to uniquely lend itself to the construction of a tiered parking structure. A preliminary review of existing elevations confirms this assumption. However, if extensive rock removal, or other site work is required, the cost of construction will correspondingly escalate. Additionally, these figures do not include the cost of demolishing the existing parking lot, architectural and engineering fees, construction and engineering management and legal and financing costs.

Operating Costs

In addition to the cost of constructing the parking structure, the Village must take into account operating and maintenance (O&M) costs. Typical O&M expenses include utilities, custodial services, landscape maintenance, administration and management, repairs, and other related items. O&M costs vary considerably between municipalities. Variables include the type of parking structure, the type of parking revenue collection system, the nature of a maintenance reserve, and insurance costs. The following estimate is based on experience with similar facilities:

O&M Costs

- $400 - $500/Space/Year

G. Financing the Parking Structure

The following discussion presents various options that might be considered to finance a parking structure. If and when the Village Board determines to proceed with the development of a parking structure, a financial advisor specializing in municipal parking financing should be consulted to evaluate each option and to recommend the most appropriate financing tool and technique. The following options are typically considered:

- Parking revenue bonds
- Parking assessment district bonds
- Tax increment financing
- In-lieu parking fees
- Grants
- Public/private partnerships
- Valet parking leasing/franchising program

Each of these options is discussed in greater detail below:

1. Parking Revenue Bonds

Revenue collected from new and/or existing parking facilities can be used to support the issuance of bonds. While this approach may appear at face value to be the most traditional and viable option available to the Village, it is important to note some limitations. First, revenue from a new parking structure is typically not sufficient to cover both the operating costs and the annual debt service for the bond payments. In addition, because there are certain risks associated with depending on the revenues from parking as the sole backing for a bond issue, it is typical for bond underwriters to require that the revenue from the parking exceed the debt service by 50 percent or more. As a result, in order to use parking revenue as a source for funding a parking structure or other major improvement, additional sources of dedicated revenue needs to be developed that can be exclusively devoted to servicing the bond

debt. An example of such a revenue source might be parking meter revenue collected elsewhere in the CBD.

2. Parking Assessment District Bonds

New York State Law empowers municipalities to create special districts for the funding of parking improvements. This can be done through the formation of a Parking Authority or a local business improvement district (BID). The City of White Plains Parking Authority (created in 1947), is one of the oldest Parking Authorities in New York State, and is a useful example of that system. A Parking Authority not only has the power to issue bonds, but can also acquire land. In the White Plains example, the City actually acquires property and issues bonds, and the Parking Authority leases the land and reimburses the City for bond debt service.

BID's are used in the County for many purposes, including the provision of parking. A BID is a mechanism where the property owners within the district boundary agree to assess themselves through property taxes to fund the desired parking improvements.

3.Tax Increment Financing

The most common form of tax increment financing is the formation of a redevelopment or urban renewal area. The redevelopment mechanism was designed to financially assist portions of cities with blight and depressed economic conditions. When an urban renewal area is formed, the incremental property taxes generated within the area from the date of formation accrue directly back to the area and can be used to fund infrastructure improvements such as parking.

3. In-Lieu Parking Fees

A number of communities provide a system where property owners in downtown commercial districts have the option to pay a fee "in-lieu" of

providing the amount of off-street parking required by code. The amount of the fee is often set at a value that is estimated to represent actual cost of developing a new parking space in the downtown area. The fee can be a one-time payment or an annual lease payment. In-lieu fee programs are typically established for a specific area, such as a CBD, Urban Renewal Area, a BID etc. as opposed to throughout the entire community. One problem with many in-lieu fee programs is that the amount of money generated tends to be insufficient to fund a complete new parking facility. In-lieu fees work best when they are used in combination with other funding mechanisms to fund parking improvements.

4. Grants

Historically there have been various federal and state funding programs, which could fund downtown parking improvements. Ossining's share of the Westchester Urban County Consortium annual award is substantial, and the use of Community Development Block Grant monies represents a viable option. Other sources of funding, such as the TEA-21 (Transportation Equity Act) can also support the development of a parking facility, or related improvements.

5. Public/Private Partnerships

Sometimes a special circumstance exists where a private developer or property owner and the Village would mutually benefit from a partnership approach. An example would be a developer who wishes to invest in an area, but does not own the appropriate property. The Village could provide the developer with the land in exchange for the developer constructing a parking structure including an agreed number of public parking spaces in excess of the code requirements for the project. The reverse could also occur, for example, a developer who has land could be given special development rights or payment to provide public parking as part of the project. This concept has been explored in conjunction with the "We Can Do It" site.

6. Valet Parking Leasing/Franchising Program

A unique and innovative approach involves the possibility of selling or leasing the right to operate valet parking in municipal parking lots. The opportunity may exist for the Village to enter into an agreement with private companies to lease valet parking spaces and/or to operate a "Valet Parking Franchise." Under the lease arrangement the Village would lease spaces at a rate equivalent to the rate of occupying a metered parking space for a full day. Under the Valet Parking Franchise arrangement the Village would solicit competitive bids from companies that could operate valet services for a specified area. The qualified high bidder would be awarded a contract to operate a Valet Parking Franchise for the specified area. In return the Village would earn revenue from the licensing of the franchise and/or the franchisee's operations. Revenues from this program could be used to help support the construction and/or operation of new parking facilities.

H. Parking Structure Maintenance

As described above, the capital cost of a new parking structure can be significant. However, construction and development costs are only a portion of the overall picture. Maintenance costs are a significant expense that must be factored into any evaluation of the feasibility of a proposed parking facility.

A cost must be assigned for routine maintenance activities such as custodial services, landscaping, administration and management, repairs, utilities, insurance and other related items. Additionally, a maintenance budget must include funds to maintain the revenue collection system, and a reserve must be established for major maintenance and repairs.

Proper design and construction will minimize excessive maintenance costs. The primary cause for the deterioration of parking structures is usually corrosion of the reinforcing steel due to the action of de-icing salts carried into the garage by vehicles.

According to the Institute for Research in Construction, this type of deterioration can become evident in as little as five years. Nationwide, it is estimated that parking garage repair costs are in the range of billions of dollars annually.

Corrosion can be reduced or even eliminated be several methods:

1. **Retarding the Electrochemical Process**

Coating the steel with an electrical-insulating material that will retard the electrochemical process can prevent corrosion. Epoxy coatings, while expensive, have been successfully used for this purpose.

2. **Exclusion of Reactants:**

Corrosion of steel in a parking structure can be avoided by preventing water, oxygen and most importantly, chlorides from entering the concrete. Several measures can be taken, either singly or in combination, to minimize the presence of these chemicals:

- **Design** - If water is prevented from accumulating within the structure, undesirable chemical reactions will be avoided. A well designed internal drainage system that incorporated adequate slopes, drain locations and the provision of expansion joints is essential.

- **Concrete** – Assuring that the concrete used in the structure is of high quality is important. Concrete should have a low permeability, low porosity, high strength and low slump. Good compaction is necessary, and the concrete should be cured slowly.

- **Cover** – Reinforcing steel should be covered at the top, as well as on the bottom by a sufficient thickness of concrete.

- **Membranes** - A good quality waterproofing membrane, properly installed on the concrete surface, will extend the life of a parking structure significantly. Waterproof membranes come in many varieties, including plastic, elastomeric based, such as epoxy, polyurethane, rubberized asphalt, coal tar, chlorinated rubber, neoprene, etc.

- **Overlays** – A second concrete course, without a membrane, can also be used to protect the reinforcing steel. In addition to reducing permeability, this method also stiffens the structure and lessens the probability of cracking due to flexing.

- **Sealers** – To reduce permeability, the application of a sealer has often been recommended as a simple method to increase the durability of reinforced concrete. Linseed oil is an example of a sealer.

3. Cathodic Protection

Utilizing steel coated with zinc (galvanized steel) is another method to minimize corrosion. In the corrosion process, the steel will become the cathode and the zinc the anode. This process is frequently used in pipelines, containers and ships, bridge decks and more recently parking structures.

4. Corrosion Inhibitors

Certain chemicals are known to minimize or completely stop the corrosion process. Calcium nitrate, added to the concrete, can serve this purpose. This is a recent advance, and its long-term results are unknown.

The costs and success rate of the various techniques described above vary widely. And while difficult to quantify, the significance of this expense must be realized and taken into consideration early, so that costly repairs are not required down the road.

I. Parking Control Equipment

The following is a brief description of some of the most widely used parking control alternatives.

1. Mechanical Parking Meters

The very first parking meter was installed in Okalahoma City on July 16, 1935. Since that time the basic parking meter has not changed substantially, and is still the method of choice to control street parking in North America. The cost of a double meter is in the $750.00 range.

2. Electronic Parking Meters - Coin Only Acceptance

This equipment is a refinement of the mechanical parking meter. The clock mechanism is replaced by an electronic timing device, and in most units the coin discrimination device is replaced by an electronic coin sensor. These units provide positive auditing and do not require the customer to turn a handle to activate the meter. The cost of a double electronic meter is $900.00 - $1,000.00.

3. Electronic Parking Meter - Smart Card Acceptance

This equipment is similar to the above with the addition of a proprietary smart card reader. This equipment is relatively new and is designed to accept a prepaid debit card. There are no meters that have been designed to accept a credit card or common debit card, yet. The cost of a double smart card meter is estimated to be $1,000.00 - $1,200.00.

4. Pay and Display Equipment - Coin Only Acceptance

Pay and display equipment is used extensively on private property for the control of self-park lots. Typically one unit can control up to one hundred parking spaces with a walking distance of two to three hundred feet (from vehicle and back). On street, one unit could typically serve 10 spaces with the same walking distances. The cost/unit for a unit that can be used on the street ranges from $5,000.00 to $10,000.00.

5. Pay and Display Equipment - Credit Card Acceptance

This equipment is a refinement of the above equipment that will accept credit cards. This type of control equipment was pioneered in Vancouver, and is now relatively common in use in other parts of Canada and the U.S. The cost per unit ranges from $6,000.00 to $15,000.00.

6. Pay Station

A pay station is similar to the pay and display system described above, however, the customer does not have to return to their vehicle to display a ticket as the equipment is designed to identify payment for a marked space. All street spaces would have to be individually identified and numbered and it would be difficult to achieve this on street. The cost per unit ranges from $10,000.00 to $18,000.00.

Street parking control equipment must be able to stand up to very rigorous treatment. Equipment on the street is exposed to the elements and often to very rugged use or misuse. Experience with mechanical parking meters has shown that the average lifespan is 20 plus years with an average of two service calls per year.

Recent advances in electronic meters have made them durable and reliable enough to meet street use standards. Recent experience indicates roughly two services calls per year for every 10 meters. This is less than half the service requirement for mechanical meters.

Pay and display equipment requires higher maintenance and generally has a 10-year lifespan. Paper stock must be renewed on a regular basis and the equipment, like parking meters, is subject to tampering and jams. However, when pay and display equipment is out of order it affects multiple spaces rather than just a single space.

The equipment described above is some of the most widely used. Newer technologies are becoming available constantly, such as in-vehicle meters (where parkers prepay to

use a small electronic meter displayed in the vehicle when it is parked), and automatic vehicle identification (a system similar to EZ-Pass where the equipment automatically records vehicles entering and leaving a parking area and then bills for usage).

Several additional factors are important to consider when evaluating parking control equipment:

1. Customer Convenience

There are three main factors to consider for public convenience. These are:

- Ease of operation and understanding
- Range of payment options
- Walking distance to make payment.

Ease of Operation

Mechanical parking meters are easily recognized and understood by the public due to their long history of use on streets throughout North America. Electronic meters have a straight coin drop and do not require the public to operate the equipment. Pay and display equipment is common in off-street parking lots where it has public acceptance. Public acceptance of pay and display on streets is not known. If pay and display were used on the street it would require additional signing for legal purposes and to educate the public about the equipment.

Payment Options

Mechanical parking meters are limited to the acceptance of coins (generally quarters). Credit card and debit card technologies have been slow to come to meters. Pay and display equipment can accept credit cards

Walking Distances

Parking meters that are located at each parking space provide a high level of convenience for the public. The walking distances associated with pay

and display equipment located at a central location, is dependant on the number of meters served by each machine. To maintain an average walking distance of 120 feet, 6 units would be required to serve the 4 sides of a typical city block. This walking distance could be a significant inconvenience to the public, particularly for anyone with a disability. In a community like Ossining where topography is a factor, even shorter walking distances may be inconvenient.

Enforcement

Enforcement must be adequate to ensure that any option works well. The degree and ease of enforcement is an important factor that affects the overall economics of the parking operation. Mechanical parking meters are the easiest to enforce because of the unobstructed visibility of the violation window. Pay and display equipment requires that a coupon be displayed within the vehicle. This is more difficult for enforcement staff to identify, as every vehicle dash must be checked, reducing enforcement efficiency. The coupons can fall off dashboards or be positioned incorrectly.

Aesthetics

Parking meters located at the curb are a highly visible element of the streetscape. It is often argued that parking meters clutter the streetscape, and project an image that is unfriendly to those visiting the business district.

If meters are utilized, twin meters, which require half the number of meter posts as a single meter, help to minimize the aesthetic impact. However, even with twin meters, there are still five times the number of support posts needed than for pay and display equipment.

Pay and display equipment, while requiring fewer mounting posts, requires added street signing, and is a larger piece of equipment that would take up a greater amount of street space, similar to a newspaper-vending box.

J. Pricing Parking

One of the benefits of the development of a parking structure, is that the facility can generate revenues from parking to cover some portion of the operating costs of the structure as well as the costs of the debt service and debt service coverage requirement on the bonds that would be issued to finance the development of the structure. As noted previously, this revenue rarely is sufficient to cover these costs fully.

Properly pricing the newly created parking is critical to the overall success of the parking structure. Parking Pricing is the tool of assigning appropriate costs to parking resources. Parking Pricing represents a significant change from current practices. Most vehicle parking in the U.S. is provided free or significantly subsidized. According to the USDOT's Bureau of Transportation Statistic's *National Personal Transportation Survey*, Of the 95% of U.S. employees who commute by automobile, only 5% pay full parking costs and 9% pay a subsidized rate, and parking is unpriced at more than 98% of non-commute trip destinations. When parking *is* priced, there are often substantial discounts for long-term leases and sometimes there is no hourly or daily rental option, leaving motorists with little financial incentive to use alternative modes.

Parking Pricing can provide significant revenue. Parking facilities represent 5-15% of the annualized cost of a typical building, so charging motorists directly for using parking rather than incorporating parking facility costs into building rents and mortgages could increase property revenues or reduce building rental charges by nearly this amount (additional revenues minus any costs associated with collecting fees). Although a 10% increase in building rents may seem modest, this is equivalent

to normal return on investments, indicating that recovering parking costs directly from users could double profits on typical building investments. Similarly, charging for public-owned parking facilities can provide significant revenue to governments. Some estimates suggest that charging market-rate prices for curb parking could yield more revenue than total property taxes in many neighborhoods.

Given a choice, motorists usually prefer unpriced parking. But unpriced parking is not really free; consumers ultimately bear parking costs through higher taxes and retail prices, and reduced wages and benefits. The choice is actually between paying for parking *directly* or *indirectly*. Paying directly for parking is more equitable and efficient.

Much of the resistance to Parking Pricing reflects the inconvenience of current payment methods, and obstacles to using alternatives. Parking Pricing can become more accepted if:

- Better pricing methods are used that make pricing more convenient and fair.
- Transportation and parking management strategies are used to improve user choices.
- Marketing to provide better information on parking prices and availability, and transportation alternatives.

Table 4 provides a summary of pricing choices

TABLE 4
Summary of Parking Pricing Methods

TYPE	DESCRIPTION	EQUIPMENT COSTS	OPERATING COSTS	USER CONVENIENCE	PRICE ADJUSTABILITY
Pass	Parkers purchase and display a pass. Common for leased parking.	Very low	Medium	Medium	Poor to medium.
Single-Space Meters	Parkers prepay a mechanical or electronic meter located at each	High	High	Low to medium.	Mechanical meters: poor; electronic meters: good.

	space.				
Pay Box	Parkers prepay into a box with a slot for each space.	Low	Medium	Low	Poor to medium.
Pay-And-Display Meters	Parkers prepay a meter, which prints a ticket that is displayed in their vehicle window.	Medium	Medium	Medium	Mechanical meters: poor; electronic meters: good.
Electronic Pay-Per-Space	Parkers prepay an electronic meter.	Medium	Medium	Medium	Very good.
In-Vehicle Meter	Parkers prepay to use a small electronic meter displayed in the vehicle when it is parked, that counts down minutes.	Medium	Low	High	Moderate
Attendant	Parkers pay an attendant when entering or leaving a parking space.	High	High	High	Good
Automated Controlled Access System	Parkers pay a machine when entering or leaving a parking space.	High	Moderate	Moderate	Good
Valet	Parkers pay an attendant who parks their car.	Low	High	High	Good
Automatic Vehicle Identification	System automatically records vehicles entering and leaving a parking area and can bill for use.	High	Medium	High	Good

For the purpose of estimating revenues that might be received from a new parking structure in the Village of Ossining, fees of $0.50 per hour for short-term parking and $65 per month for employee parking were assumed. Spaces designated for employee parking would generate $65 per month or $780 per year. However, it is common practice to oversell permits for these spaces by 10 percent or more. Assuming 10

percent oversell would yield revenue of approximately $860 per year per space for employee parking.

For short term parking, the characteristics of the CBD and the uses surrounding the Brandredth Street site suggest that the average duration is about 2.7 hours and that a typical spaces turns over 2.6 times per day. This is based on recent observations and comparisons with similar facilities elsewhere.

A fifty cents per hour fee suggests that a short-term space could generate $3.50 per day or about $1,277.5 per year, assuming 365 days of operation.

Depending upon the design of the parking structure, and the number of spaces provided, a simple arithmetic calculation can provide total revenues.

For the purpose of accuracy, the analysis should assumed a ramp-up period of five years in which time the percent utilization of public spaces is assumed to incrementally increase as the public becomes accustomed to the location of the structure. A typical rate assumes that 55 percent of the available public parking spaces will be utilized in the first year of operation. This value is expected to increase by 10 percent per year, until practical capacity of 85 percent is achieved by the fourth year of operation.

K. Cost/Benefit

A simple comparison of the parking structure development costs setforth in Section G above and the anticipated revenues described in Section J can provide a preliminary cost benefit analysis.

TABLE 5
COST REVENUE ANALYSIS[2]

Description	# Spaces	Bond Issue	Annual Operating Costs	Annual Revenue	Net revenue	Annual Debt Service	Net Surplus/Deficiency
4 level parking structure at Brendreth Street Lot	335	$6,874,200	$167,500	$372,017	$204,517	$687,420	-$482,903

This analysis suggests that the revenue from the parking structure alone would not be sufficient to cover both the operating costs of the structure as well as the annual debt service for the bond payments. This is a common situation, and one that the Village must be aware of when considering the development of a parking structure. Additional revenues will be necessary.

L. Summary

Safe, accessible and convenient parking is critical to the ultimate success of Ossining's CBD. Over the years, the Village has debated the advisability of constructing a parking structure to meet the parking needs of the area. Several recent proposals have served as a catalyst to rekindle the parking structure discussion. This feasibility study was prepared to provide an overview of some of the important issues that must be considered when seriously evaluating the feasibility of such a plan. In summary, the following key issues have been identified:

- ✓ The existing CBD parking inventory consists of nearly 1,000 parking spaces (400 in municipal lots, 189 in private lots and 398 on-street)

[2] The analysis assumed that 40 percent of the parking spaces would be used for employee parking (134) and the remaining 201 spaces would be used for short-term parking. The high end of the cost per space range ($18,000) was used to provide a conservative estimate. The cost of parking control equipment was estimated to be $1,000/space. Architectural and engineering fees, legal and financing costs were calculated to be 8% of the total project cost. Annual O&M costs of $500/space was utilized

- ✓ The majority of the CBD's parking spaces are heavily utilized and support high occupancy rates.

- ✓ Existing patterns of parking space use and enforcement are a major cause of the districts parking problems.

- ✓ If development activity were to increase, the gap between available and required parking will widen. Fully built-out, the CBD could support over 1.2 million square feet of commercial space, requiring the provision of nearly 5,000 parking spaces.

- ✓ The Brandreth Street municipal parking lot is the most logical site for a municipal parking structure.

- ✓ Conceptual designs indicate that a 4 story, 335 space parking structure could be developed on the Brandreth Street lot.

- ✓ Revenues derived from the parking structure itself will be inadequate to cover the operating costs and bond debt service for the structure. Additional revenues will be necessary.

- ✓ A number of additional revenue sources are available to the Village, including assessment district revenues, TIF revenues, in-lieu parking fees, grants, private partnership funds, franchise revenue, capital funds, and meter revenues from elsewhere in the CBD.

- ✓ Maintenance costs must be carefully considered as an unavoidable project cost.

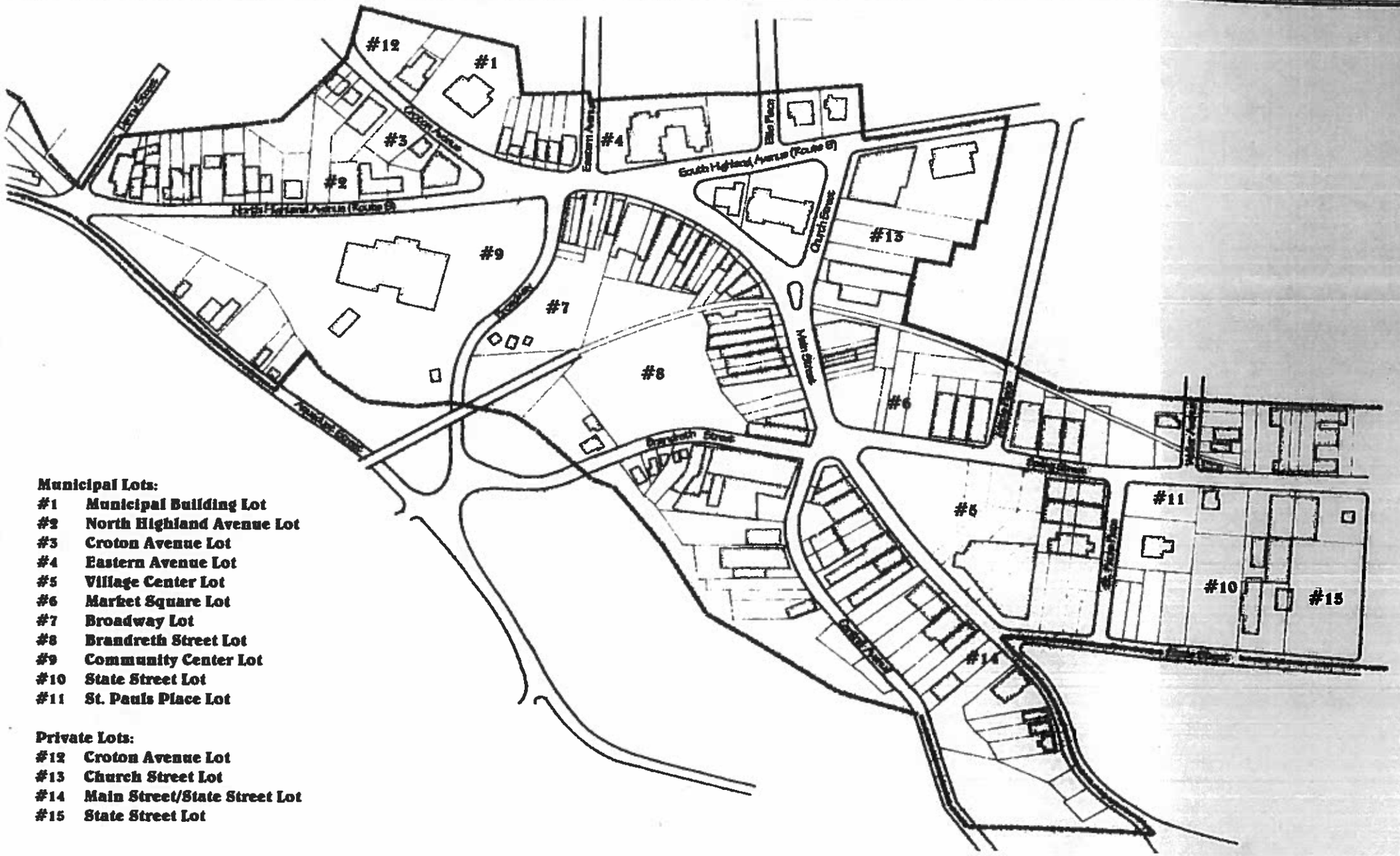
- ✓ A wide range of parking control equipment is available, which can be utilized to collect revenue in the structure and elsewhere in the CBD.

- ✓ Pricing parking must be given careful consideration so that an equitable balance can be achieved.

- ✓ Total costs to develop the Brandreth street structure are estimated to be in the 6.8 million range.

- ✓ Such a project might generate $204,517 in net revenue and would require a debt service of $687,420, leaving an annual deficit of approximately $482,903.

Should the Board wish to advance the concept of developing a parking structure on the Brandreth Street site, the next steps would involve commissioning preliminary structural engineering plans, as well as developing a financing plan.



Municipal Lots:

#1	Municipal Building Lot
#2	North Highland Avenue Lot
#3	Croton Avenue Lot
#4	Eastern Avenue Lot
#5	Village Center Lot
#6	Market Square Lot
#7	Broadway Lot
#8	Brandreth Street Lot
#9	Community Center Lot
#10	State Street Lot
#11	St. Pauls Place Lot

Private Lots:

#12	Croton Avenue Lot
#13	Church Street Lot
#14	Main Street/State Street Lot
#15	State Street Lot

Date: June 2003

Scale: N.T.S.

Prepared By: CHAZEN ENGINEERING

Village of Ossining
CBD Parking Lot Location Map

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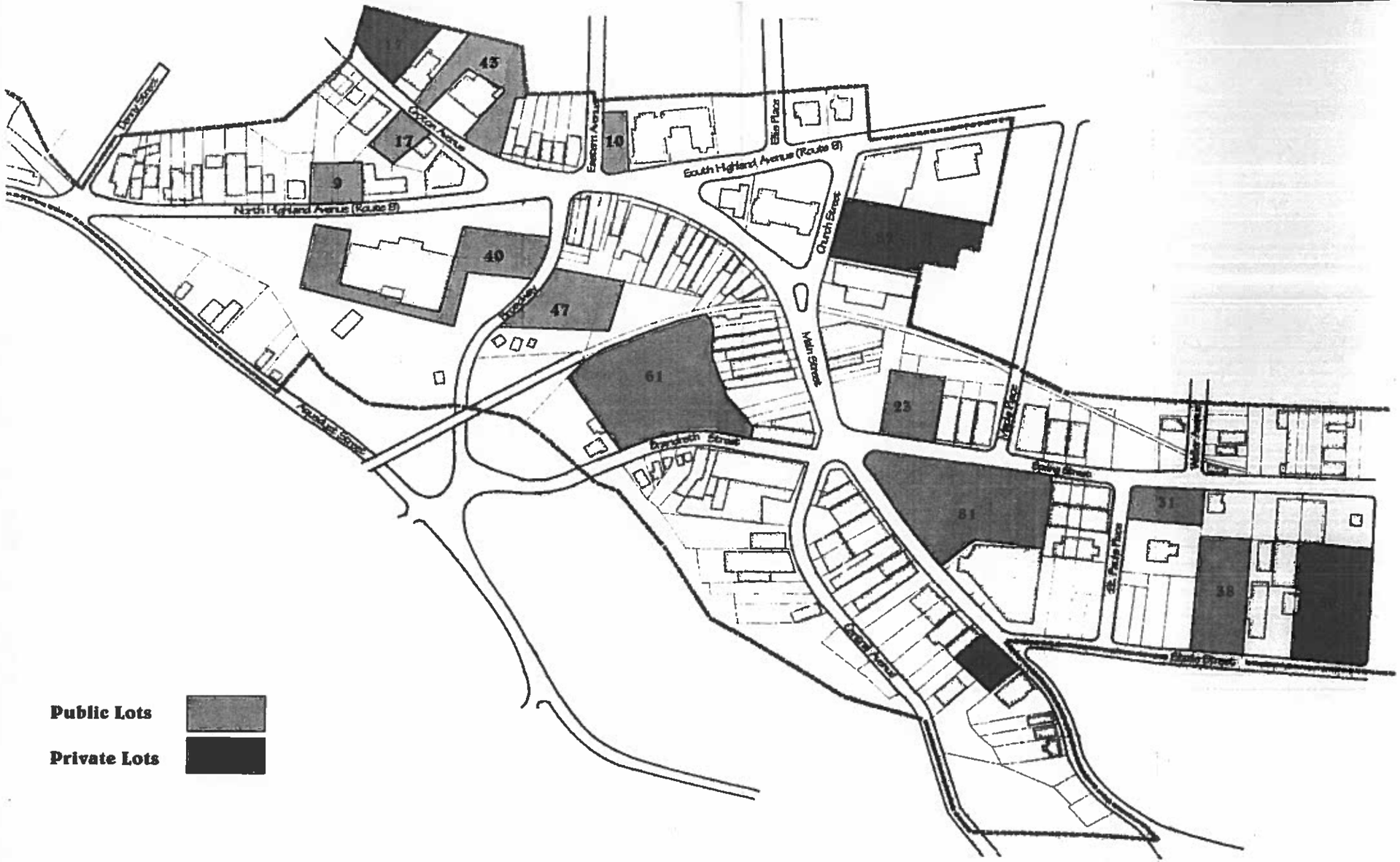

Date: June 2003

Scale: N.T.S.

Prepared By: CHA/BH CONSULTING

Village of Ossining
CBD Parking Inventory

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