SECTION 2: LINDEN YARDS

LINDEN YARDS

SITE DESCRIPTION:

The Linden Yards site occupies approximately 23 acres in the Bassett Creek Valley (BCV) area immediately west of downtown Minneapolis, located between Highway 394 and the Cedar Lake Bike Trail to the south, and the Burlington Northern Rail lines to the north (see Figure 3 – West Linden Yards/East Linden Yards). The site is named for its adjacency Linden Avenue, as many other City of Minneapolis Public Works (PW) facilities take the name of adjacent streets. The property was also referred to as Linden or Lindale Yard when it was occupied by the Burlington Northern Rail Road. Linden Yards serves as a central construction materials storage yard for various Department of PW Maintenance and Construction Divisions. The site is also used for concrete crushing operations, street sweeper drop off, and construction soil backfill stockpile operations. In addition, large areas of the site are underutilized but used seasonally as PW operations require (see Attachment D – Linden Yards Inventory Report).

Construction Materials Storage:

The materials storage functions at Linden Yards makes up approximately 13 acres of the entire site (see Attachment D – Linden Yards Inventory Report). Linden Yards is used by the PW Divisions of Transportation, Maintenance & Repair (TM&R, including the Street, Paving, and Bridge service lines), Surface Water & Sewers (including the Sewer Maintenance & Construction service lines), and Traffic and Parking Services (Traffic Maintenance service line). The construction storage areas are segregated by division and in general are storage sites for equipment and excess, damaged, obsolete, or unused construction materials (such as pipe, manhole sections, manhole castings, grates & covers, light poles, trenching materials, street furniture, etc.). Although segregated by PW Division the construction storage areas are scattered across the site and intermixed with the various operational spaces in a generally unorganized and inefficient manner.

Concrete Crushing:

The Concrete Crushing Operation (managed by TM&R) occupies approximately seven (7) acres within the Linden Yards area. Throughout the year, concrete rubble from the demolition of City streets and other City infrastructure projects is delivered to the site and maintained in stockpiles. As material volume and stockpile size limitations require, the rubble is crushed into usable aggregate by a private vendor and stored on site until the following construction season. The actual Concrete Crushing activity is currently contracted out to an outside vendor. This operation requires space for storage of large volumes of materials (both rubble and crushed concrete), and also space to accommodate large truck traffic volumes. The site also regularly has heavy equipment on site, moving material around and loading trucks.

Materials Storage Function:

Surface Waters and Sewers Department also maintains a 3.0 acre space for the stockpiling of construction aggregate materials for backfilling purposes. This is an ongoing construction operation, with backfill material stockpiled for use on a variety of construction projects around the City. Of special note: the backfill stockpiles are used throughout the year, including the winter months for emergency purposes, consequently the stockpile is maintained at its present size to prevent freezing and maintain accessibility. The operational areas of Linden Yards (crushing, street sweeper, backfill stockpiles) are fairly well organized and the space used efficiently.

Street Sweeping Function:

Street and Sewer Maintenance operates a small area (0.5 acres) for the stockpiling of street sweepings and vacuum truck wastes. The sweeping activities take place seasonally in the Spring and Fall. These spaces provide temporary stockpiling space until the materials can be hauled away and disposed of properly.

The overall site was zoned I2 and is part of a larger industrial area bordering the freeway system on the west side of downtown Minneapolis. The current Zoning of the site is OR3, and any of the Public Works functions can be considered non-conforming. Appraisals and engineering reports done as part of the original 2001 Operational Analysis (see Attachment A) and environmental investigations completed in 2008 (by Braun Intertec) indicate that soils and groundwater in the area are contaminated and of poor geotechnical quality.

WHY THE CURRENT SITE?

The City benefits from the location of Linden Yards for a number of reasons. The site was originally purchased to consolidate multiple storage functions into one centralized site. The City of Minneapolis purchased the property from the Burlington Northern Rail Road in 1991, as rail transit changed and the yard was un-needed property. The City of Minneapolis purchased the property for approximately $1,100,000. The site was purchased at an economical price and with minor improvements, provided adequate operational site for several PW functions and fulfilled storage needs. The centralized location allows for quick access for storage and transfer of equipment and materials throughout the construction season, and the site is adjacent to established truck routes and can accommodate large volumes of heavy truck traffic. The site is also used for overflow impounding storage in times of snow emergencies, due to its close proximity to the Impound Lot, immediately to the north.

Visual Blight:

Managing visual blight will be a major consideration in relocating any of the Linden Yards storage and operational functions. The Crushing Operation consists of large piles of concrete and asphalt materials and large scale crushing equipment. The Construction Materials Storage

functions accommodates a large range of construction materials, equipment, job site trailers, light poles, and a variety of other items (see Attachment D – Linden Yards Inventory Report). The site is also used to store street sweeping piles, vacuum truck wastes, and backfill stockpiles. Along with the visual impact of these functions, the daily access by truck traffic in and out of the site and the Crushing Operations create noise and dust. Heavy equipment may also be running long hours on the site, general noise from equipment and back-up alarms, and other similar noises will be a concern that will need to be addressed for considering possible relocation sites.

Environmental Concerns:

Given the past industrial uses of Linden Yards (as a rail yard), the close proximity to the existing Burlington Northern rail lines, and the overall heavy industrial use of the surrounding area, environmental issues related to the BCV should be considered in any redevelopment scenario. Linden Yards has been the focus of several environmental studies and is currently being analyzed further to determine the implications that soil and groundwater contamination may have on future development. A Phase II Environmental Site Assessment was completed in November of 2008 (by Braun Intertec). A total of eleven (11) soil borings were taken and five (5) monitoring wells installed, which indicate that the site has both soil and ground water contamination. In addition, geotechnical analysis of the site indicates the presence of poor quality fill (varying from 10' to 40' in depth) over the top of large areas of swampy organic deposits. These conditions are considered undesirable for geotechnical and structural reasons requiring complex footing systems for the potential construction of buildings, bridges, and roadways.

Consequently, because of the visual blight of the overall heavy industrial nature of the BCV area, the central location, the ease of accessibility, the existing soil and ground water contamination,

the poor structural make-up of the soils and the adjacency to the Burlington Northern Railroad, the current Linden Yards operation is a compatible use of the existing site.

Economics of Crushing Operations:

During the construction season concrete rubble from the demolition of City streets and other City infrastructure projects is stockpiled at the Crushing Operation site. During the winter months the rubble is crushed into usable aggregate by a private vendor and stored on site until the following construction season. The Crushing Operation also accepts small volumes of waste asphalt for recycling. The overall operation requires space for storage of large volumes of materials (both rubble and crushed product), and also space to accommodate large truck traffic volumes and heavy equipment operation. The current Cushing Operation also benefits from an economy of scale, in that larger volumes of materials can be stockpiled. This results in Larger volumes of materials crushed per occurrence, providing the City with a lower cost to crush and recycle materials.

Due to the close proximity to the Impound Lot, during the winter months, the Crushing Operation site is also used as an overflow Snow Emergency Contingency Lot typically providing space for 200 to 400 vehicles. The proximity of this operation to the Rail Way, Highway, and the Impound Lot also provides some buffering or the activities.

In addition to the physical advantages of the current site for Crushing Operations, cost comparison analysis for the production of crushed concrete material indicates that there is benefit to the City for managing a Crushing Operation in Minneapolis (see Table 4 – Crusher Cost Comparison). Since 2001, the Crushing Operation has averaged over 70,000 tons of material per year. Comparing the actual cost of production for this volume of material against the cost of

purchasing an equivalent volume from a private source, the City realizes a savings of over $600,000 per year. This comparison is based on current purchase prices for a similar material thru a potential partnership with a private facility in Bloomington (one of the closest facilities for production).

PW CRUSHER COSTS COMPARISON MODEL

	MINNEAPOLIS LOCATION		BLOOMINGTON, MN	
ONE-WAY DISTANCE (MI) =	3		14	
ONE WAY TRAVEL TIME (HOURS) =	0.07		0.31	
ROUND TRIP TRAVEL TIME (HOURS) =	0.13		0.62	

VEHICLE	AVERAGE MPH	COST/HOUR	COST/MILE	TOTAL TRAVEL DISTANCE	TRAVEL COST (ROUND TRIP)	TOTAL TRAVEL DISTANCE	TRAVEL COST (ROUND TRIP)
Tandem Truck & Driver	45	$93.11	$ 2.07	6	$ 12.41	28	$ 57.94
			COSTS PER TRIP =	6	$ 12.41	28	$ 57.94

	VOLUME (TONS)	VOLUME (TONS)
TRUCKING TO ACQUIRE CRUSHED MATERIAL		
ANNUAL TONNAGE=	70,400.00	70,400.00
TONS PER TRUCK=	12.00	12.00
TRIPS PER YEAR=	5,866.67	5,866.67
% REDUCTION FOR DUAL HAULING=	25%	25%
NET TRIPS PER YEAR=	4,400.00	4,400.00
ANNUAL TRUCKING COSTS =	$ 54,624.53	$ 254,914.49
PRODUCTION OF CRUSHED MATERIAL	VOLUME (TONS)	VOLUME (TONS)
ANNUAL TONNAGE=	70,400.00	70,400.00
(Estimated cost, may vary due to market conditions) MATERIAL COST PER TON=	$ 4.50	$ 7.50
ANNUAL MATERIAL PURCHASE COSTS =	$ 316,800.00	$ 528,000.00
ANNUAL MATERIAL PRODUCTION COSTS =	$ 371,424.53	$ 782,914.49
TRUCKING TO DELIVER CONCRETE RUBBLE	VOLUME (TONS)	VOLUME (TONS)
ANNUAL TONNAGE=	70,400.00	70,400.00
TONS PER TRUCK=	12.00	12.00
TRIPS PER YEAR=	5,866.67	5,866.67
% REDUCTION FOR DUAL HAULING=	25%	25%
NET TRIPS PER YEAR=	4,400.00	4,400.00
ANNUAL TRUCKING COSTS =	$ 54,624.53	$ 254,914.49
ANNUAL MATERIAL PRODUCTION & DISPOSAL COSTS =	$ 426,049.07	$ 1,037,828.98
ANNUAL COST INCREASE TO BUY MATERIAL vs. PRODUCE =	$	611,779.91

Table 4 – Crusher Cost Comparison

BEST PRACTICES

The City has considered "Best Practice Improvements" that could be considered for implementation in the various Linden Yards functions located in the BCV area. The main goals of implementation of Best Practice Improvements are to: improve efficiency, reduce costs, and to maintain or improve service levels. These include:

1. Managed Inventory (Post-Stores Management). Currently the Construction Material Storage areas are segregated by Public Works Division, scattered across the site, and intermixed with the various operational spaces in a generally unorganized and inefficient manner (see Attachment D – Linden Yards Inventory). A formal system of inventory management does not exist for the stored materials, which results in large volumes of

usable construction materials sitting idle for long periods of time, and equally large volumes of damaged or obsolete materials taking up valuable storage space. Post-Stores Management would consist of a formal system of inventory for construction materials brought to the site. Usable materials would be documented at delivery and then stored appropriately. The inventory would then be made available to supplement materials required on future projects. Unusable, damaged, or obsolete materials would be evaluated at delivery and recycled or disposed of properly, and in a timely manner.

Implementing a system of Post-Stores Management would result in the re-use of viable construction materials and the proper disposition of waste materials. Consequently, the City would realize savings in construction materials costs and benefit from a significantly reduced footprint for a Construction Materials Storage area.

2. Temporary or Seasonal Operations. Generally, the various operations located at Linden Yards are of a seasonal nature, with peak activity occurring during the April to November construction season. In addition, City construction projects vary by type, size, and location from year to year. Given that minimal site improvements are necessary for the storage of construction materials, and allowing for pre-planning based on the established PW Five-Year Capital Improvement Plan, temporary storage sites in strategic locations could be acquired (by lease or other agreement) to accommodate storage needs. The "nomadic" ability of these types of sites will reduce acquisition and long term site maintenance costs. This idea would reduce relocation costs and areas considerably in comparison to relocating to dedicated space for each function. Further cost reductions can be realized when temporary site acquisitions are coupled with the previously described system of Post-Stores Management. The would mean materials would be

ordered, delivered to the yard, and used in a reasonable manner of time, as to not occupy lot space for to long.

RELOCATION OPTIONS

The Linden Yards materials storage and operational functions could be considered for relocation and/or reorganization to accommodate the BCV plans. However, numerous considerations should be evaluated as part of any relocation plan. These considerations include an examination of the existing site and its advantages, the programming requirements that need to be satisfied at a new location, and the impact on operations and operational costs associated with a new location. Another major decision will be if the City continues to continue Concrete Crushing to too contract out the operation as a whole.

Program Requirements and Considerations:

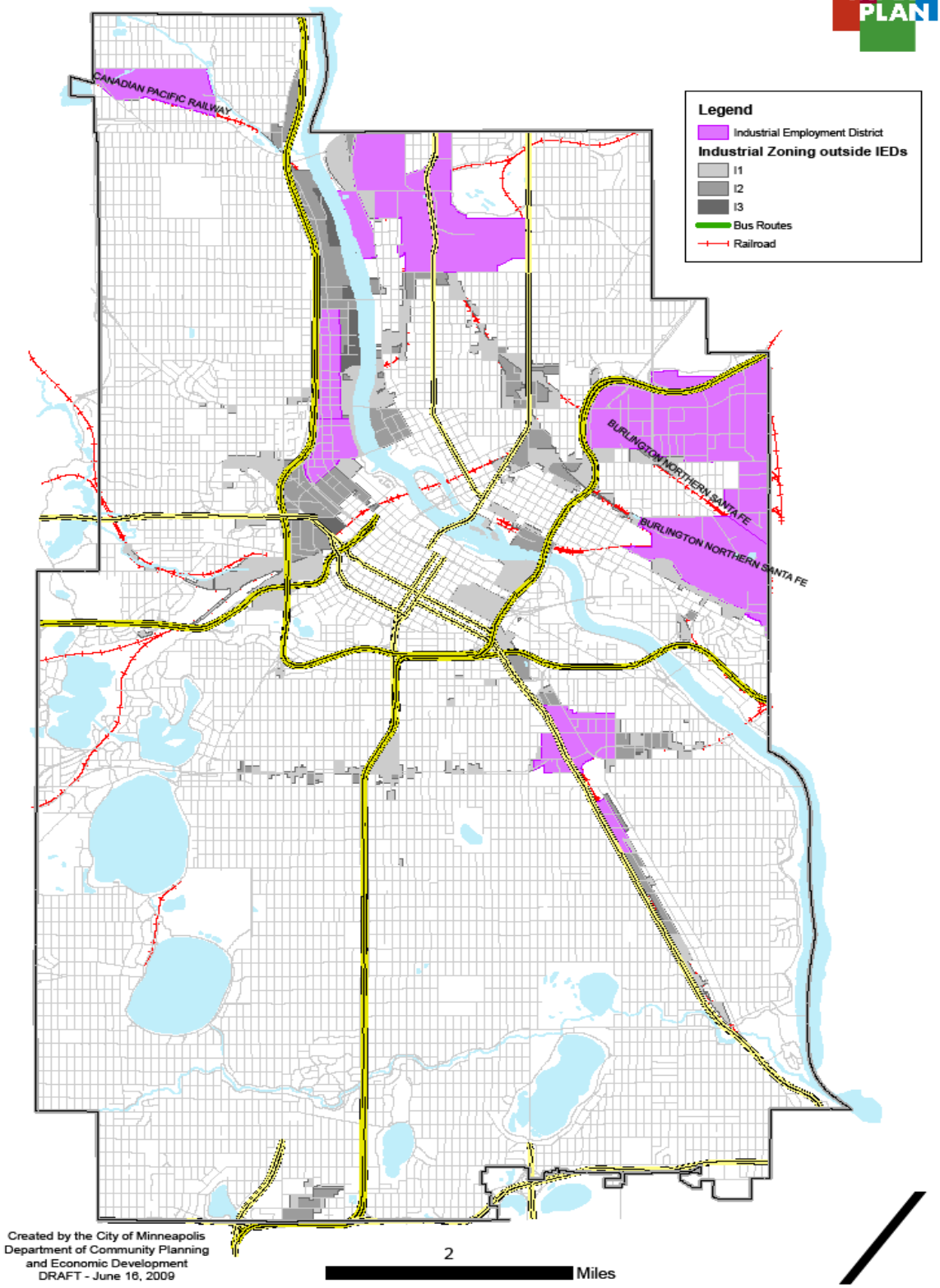
As stated herein, operationally the location of the existing Linden Yards is desirable because of its centralized location, ease of access for heavy trucks, and adjacency to designated truck routes (see Attachment F – Designated Truck Routes). Specifically, other program requirements and considerations that impact location include the following:

1. Industrial Zoning (I2 and I3). Although the entire site is currently zoned I2, Crushing Operations are actually required to be zoned I3. Stockpiling operations require I2 zoning, while the majority of Construction Materials Storage can be accommodated on property zoned I2. Industrial Zoned land that meets the Zoning requirements for these functions is somewhat limited (see Location Influences for Bassett Creek PW Facilities below). Current zoning requirements also include provisions for landscaping, screening, and storm-water management.

2. In a proposed relocation, zoning requirements may also include provisions for additional on-site interior staff spaces (office and restrooms), paved yard surfaces, securely fenced perimeters, and various site utilities. Utilities, primarily water and power accessibility is important as dust control measures will be required to operate a crusher on any site.

3. The spatial program requirements for the various Construction Materials Storage areas, and the Crushing and Stockpiling Operations, can be broken down in detail (see Attachment E – Linden Yards Program Requirements).

Location Influences for the Bassett Creek PW Facilities



Options:

After an evaluation of the existing site, its advantages and deficiencies, understanding the necessity for the various operations, and taking in to account programming requirements; a number of reorganization and relocation options were developed. These options were developed centering on the existing site, splitting functions between different locations, and best practice improvements to reduce the overall site acreage requirements. The functions currently occupy just short of 23 acres, and with space saving measures accounted for, the operations could be consolidated to approximately a 15 acre site. The Public Works operations Due to current lack of available single sites with in Minneapolis, relocation of the City of Minneapolis operations, currently located at Linden Yards, will require the acquisition of multiple sites.

Option #1 – Single Site (Clean-up and Reorganize):

Because the Construction Materials Storage areas are generally considered unorganized and used inefficiently. This option would, in effect, consist of a general house cleaning; disposing of the unnecessary, obsolete, and damaged materials that are currently being stored in each of the areas across the site. Through strategic space planning and implementation of the best practice improvement of Post-Stores Management, construction materials could be organized and consolidated within a reduced footprint on a new single site.

Because Construction Materials Storage areas require very little site improvement for use (fencing and minimal utilities), require I1 zoning, and could move as necessary

depending on the changing locations of Public Works projects during the construction season. However if Crushing operations were to be relocated to the same site, I3 Zoning will be required.

Option #2 – Multiple Sites (Clean-up, Reorganize, and Move):

Option #2 consists of splitting the Construction Materials Storage operation regionally to locations in both North and South Minneapolis. This concept would require the acquisition of two sites that meet the previously defined program requirements. The relocation from a single centralized location to strategically located regional sites would alleviate the concern for increased travel distance costs. The viability of these split sites could be further enhanced by providing seasonal operations storage space for street sweepings, vacuum truck wastes, and backfill stockpiles. These sites could be simple yard space Zoned I1 and would also require minimal site improvements. Two smaller sites are more readily available and would be easier to acquire than a large single site. The sites would accommodate seasonal construction activities and materials storage of various types. These facilities could be relocated to new sites as necessity demands, and could be sited on underutilized properties (rail yards and unimproved right-of-way) to reduce acquisition costs. Crushing operations would require a third site due to the more intense industrial nature of the function.

Crushing Operations:

Crushing Operations will be the most difficult function to relocate because of the requirement for I3 Zoning and adjacency to established truck routes (see Attachment F – Designated Truck Routes). Ideally, Crushing Operations should continue to be centrally located in order to minimize trucking costs to and from project sites. Because of the I3 Zoning requirements, relocation of the Crushing Operations should be considered a permanent relocation. Strategic planning would allow for some reduction in space for the current Crushing Operation at the existing site or a new location that provides a more efficient layout. However, this would require detailed analysis of the current operation in order to identify efficiencies and excess space use and then reduce the required footprint of the operation. Concrete Crushing Operations are a valuable asset to the City of Minneapolis, and the decision to stay in the Business of Crushing or to contract with and outside vendor will ultimately need to be made before Linden Yards is vacated.

Option #2A - Crusher Relocation

Relocation of the Crushing Operations to a site that meets the aforementioned program requirements (specifically I3 Zoning and truck routes) is a challenging task. Properties zoned I3 within the City are limited and generally located along rail corridors in far Northeast or far South Minneapolis. In almost all cases the acquisition of a suitable I3 zoned site would require the relocation of an existing private business, resulting in increased acquisition costs. And as stated previously, the inability to find a centralized location will result in increased Crushing Operations costs.

Option #2B - Private Outsourcing

The Crushing Operation not only provides an economically valuable construction product but also supports the City's sustainability goals by promoting recycling of construction materials on a very large scale (over 70,000 tons per year). However, the City could make the business decision to "get out of the concrete and asphalt recycling business" and choose to bear the costs associated with purchasing crushed product (see Table 4 – Crusher Cost Comparison Model).

In this case, the City would develop a business relationship (thru the Public Bid process) with outside vendors to facilitate the disposal and crushing of concrete and asphalt rubble and then procure the recycled materials for use on City construction projects. The relationship would require that a suitable vendor accept the projected annual volumes of deposal material and provide the recycled product in a timely and cost effective manner. In comparison with the centralized location of the existing Crushing Operation, the cost of trucking materials to and from a private facility will vary greatly from Project to Project, impacting overall costs significantly. Consequently, this business decision will result in increased demolition disposal and purchased material costs for all construction projects.

Option #2C – Crushing Partnerships

The Option of partnering Crushing Operations with other government agencies such as Hennepin County, Mn/DOT or the City of St. Paul could be considered, private partnerships also should be further researched as well.

Option #3 - Dual Use:

This Option considers the seasonal aspects of Construction Materials Storage, the various stockpiling and backfill operations, and Crushing Operations in order to take advantage of a single combined site that is utilized differently at different times of the year. For instance: a relocated Crushing Operations site could be utilized at times for street sweeping storage or backfill stockpiles. In order to maintain a cost effective and efficient Crushing Operation a more intense system of management would be required, including the crushing of materials more frequently with limited ability to store large volumes of materials. However, this remains a viable option, given the acquisition of a suitable site.

SUMMARY

After review of the functions performed by the Public Works Department, Division of Transportation and Repair (includes Street, Paving, and Bridge service lines), Surface Water & Sewer Division (includes Maintenance and Construction service line), and the Traffic and Parking Services Division, in the Linden Yards area, this report was compiled. It was

determined that these operations can be moved to a single new site or multiple new sites. Theses sites must be zoned correctly to accommodate City Operational activities. Operational cost will likely change due to relocation, the most notable example being the approximately $600,000 difference to crush concrete at a site outside of the City of Minneapolis in comparison with Crushing inside of the City limits. Some of the increased operational costs may be offset with property tax income in the BCV area. The City may also recognize additional cost savings due to further implementation of "Managed Inventory Concepts."

West Linden Yards / East Linden Yards

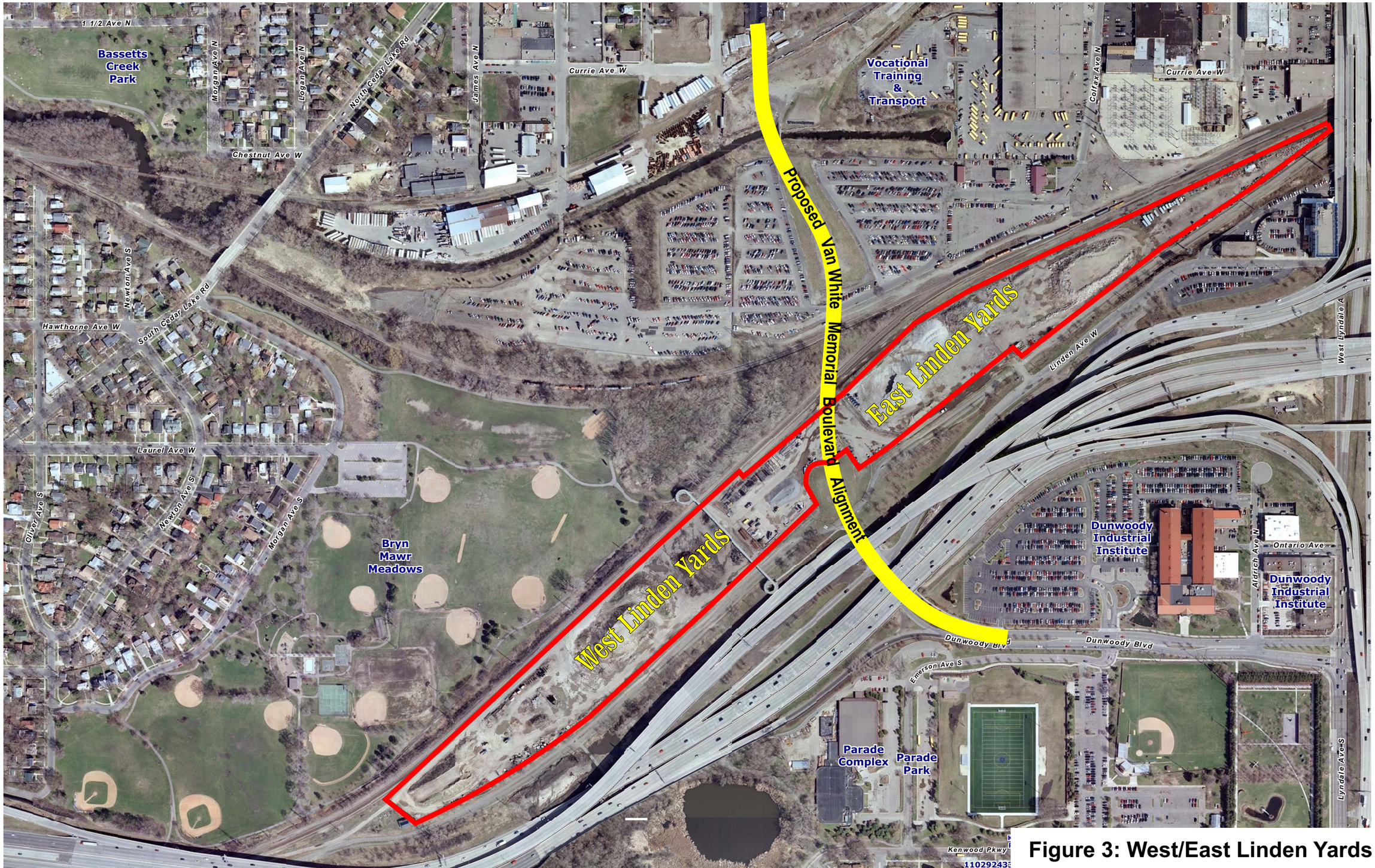


Figure 3: West/East Linden Yards

GeoMaster version 32r at 2009-08-07 13:54