
TIOGA MARINE TERMINAL MASTER PLAN



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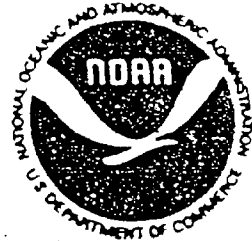
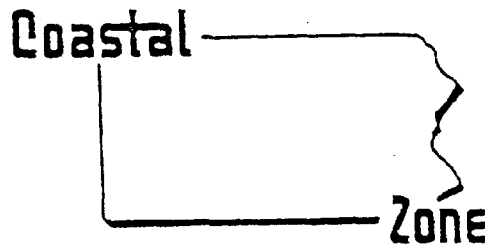
Pennsylvania Coastal Zone Management Program

The Tioga Marine Terminal Master Plan

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EXECUTIVE SUMMARY

Philadelphia Regional Port Authority (PRPA) was established in 1990 as an independent State Authority of the Commonwealth of Pennsylvania. PRPA owns several marine terminals in the Philadelphia area, one of which is the 97 acre Tioga Marine Terminal located on North Delaware Ave. in the vicinity of Venango Street. At present, Tioga Marine Terminal is leased to three (3) independent operators. The primary cargo handled at Tioga Marine Terminal is containerized cargo, fruit and bulk liquids. One of PRPA's goals is to retain and increase the quantity of cargo handled at Tioga Marine Terminal. Based upon current and project cargo volumes, PRPA is presently reviewing a five (5) year Capital Improvement Program for Tioga Marine Terminal.

PRPA has had several reports prepared reflecting the capacity and facilities planning of Tioga Marine Terminal. Through these reports, PRPA has been apprised of several issues which must be addressed in order that Tioga Marine Terminal remain competitive in the port industry. As a result, PRPA has deemed it necessary to invest in several Capital Improvement Projects aimed at improving efficiency and capacity. PRPA is now interested in obtaining an in depth Capital Improvement Master Plan. Urban Engineers, Inc. (Urban) was retained by PRPA to develop this Capital Improvement Master Plan Study. The scope of Urban's services included an in depth review of the needs related to continued operation of the Terminal by two scenarios. The first being multiple lessees as presently exists, and the second being a single operator terminal. A third item of interest which was discovered during the course of development of the Tioga Capital Improvements Master Plan is that of the partial closure of Delaware Avenue in the vicinity of Tioga Marine Terminal.

Before Urban could start the development of the Tioga Master Plan, a better understanding of Terminal operations was required. PRPA made available to Urban three (3) previously prepared capacity and facilities planning reports as well as Terminal activity reports also for the Tioga Marine Terminal. In addition, Urban performed interviews with the various stakeholders to ascertain their comments regarding the existing operations, perceived efficiency problems, and possible improvements. Interviews were conducted with persons within PRPA, all three lessees (Crowley American Transport, Inc., Tioga Fruit Terminal, Inc., and General American Transport, Inc.), one stevedoring company and a PRPA security consultant. A detailed traffic analysis was performed of the truck traffic both on the Terminal and on Delaware Avenue. Urban visited similar terminals on the east coast to observe the effects of the recent capital improvements made at these terminals. Urban provided an environmental analysis and a Preliminary Area Reconnaissance (PAR) report for two adjacent properties to Tioga Marine Terminal and Pier 179 and the Northern Lagoon. Urban also performed title searches on several adjacent properties to determine the feasibility of PRPA expanding Tioga Marine Terminal's acreage.

After all of the above mentioned data was obtained, Urban began their conceptual planning stage of Capital Improvement Master Plan Project. Items such as market forecasts, terminal utilization and the terminal capacities were all taken into account. As a means to evaluate the feasibility and impacts of the various capital improvements, Urban developed a number of

conceptual plans. After evaluating the merits of each of those conceptual plans, combinations of the capital improvement schemes were assembled in an attempt to arrive at the two requested operational plans, including the conceptual plan for the closure of Delaware Avenue.

In summary, Urban has suggested that PRPA pursue the capital improvements as suggested in our Two Operator Terminal scenario (refer to *Exhibit 2*). This scheme includes the following features:

1. Acquisition of the former railroad right-of-way for the entire distance of Crowley's terminal. This will allow expansion of the terminal to the Delaware Avenue right-of-way and increase the container yard size by 1.5 acres.
2. In order to allow maximum efficiency, the terminal's paving is in need of repair. The terminal's pavement should be restriped to increase efficient traffic circulation and increase the yard's capacity.
3. Construction of a new 40,000 square foot Container Freight Station at the northeast corner of the container terminal. Including maneuvering space, Crowley will lose approximately 1.5 acres.
4. Expansion of the maintenance and repair shop to include four (4) additional bays. The acquisition of the railroad track will allow the shop expansion to occur westward so that the driving isle is not affected. The container terminal would lose approximately 0.25 acres of the 1.5 acres gained from the relocation of the fence along the Conrail right-of-way. The expansion of the maintenance and repair shop will include moving the present operations from the existing carpenter shop to the maintenance and repair shop.
5. Due to the lighting levels that presently exist and the fact that many existing light standards/poles will have to be relocated/replaced because of suggested capital improvements, the existing terminal lighting should be replaced.
6. The addition of a third container crane would allow for an increase in berth utilization and productivity. It also would allow the two existing cranes to be retrofitted one at a time without affecting the container operation.
7. Demolition of the carpenter's shop, since both Crowley and DRS would like to move the DRS repair shop to the north end. DRS currently utilizes the carpenter shop, and must move their equipment from one end of the terminal to the other. Tioga Fruit would gain approximately 0.6 acres, but more importantly, the bottle neck between the existing Container Freight Station and the carpenter shop would no longer exist.

Tioga Fruit Terminal will have the final decision regarding the demolition of this facility. The present carpenter shop operations will be relocated to the expanded maintenance and repair shop identified above.

8. Relocate Tioga Fruit's employee parking to the west side of Delaware Avenue at Venango Street. Relocate Crowley's employee parking to the west side of Delaware Avenue near Wheatsheaf Lane. Tioga Fruit would gain approximately 1.4 acres of additional laydown space and Crowley would gain approximately 1.1 acres of additional laydown space.
9. Tioga III should be converted into a refrigerated transit shed to provide year round capabilities.
10. Due to the lighting improvements recommended above and increased electrical requirements for Tioga III, electrical upgrades are recommended. These upgrades should include a second PECO Energy service to be installed to the Tioga II building, and the manual transfer switch at Tioga I should be replaced with an automatic transfer switch.
11. Construction of a four lane gatehouse in the same location as Tioga Fruit's present guard house. This gate would accommodate the large volumes of both fruit and in-transit moves. Tioga Fruit would lose approximately 1.0 acre of laydown space.
12. Construction of both a new eight-lane gatehouse canopy and a new four-lane roadability facility for Crowley in the northwest corner of the container terminal. Crowley would lose approximately 2.8 acres. The new gatehouse location will provide more queuing space for Crowley.

Urban recommends the Two Operator Terminal scheme, and has prepared an estimated cost summary for the twelve (12) capital improvements which were suggested. It is estimated that the total capital cost to PRPA to perform these capital improvements will be approximately \$ 14,500,000. The benefits to Tioga Marine Terminal will far outweigh the capital expenditure.

I. INTRODUCTION

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A. BACKGROUND

The Philadelphia Regional Port Authority (PRPA) was established in 1990 as an independent State Authority of the Commonwealth of Pennsylvania. One of the Authorities' goals is to retain and increase the quantity of cargo handled at their port facilities.

One of the major marine terminals in the Philadelphia area is the 97 acre, Tioga Marine Terminal located on Delaware Avenue in the vicinity of Venango Street in Philadelphia. At present, the Terminal is owned by PRPA and leased to three (3) independent operators. The primary cargos handled at Tioga Marine Terminal are containerized cargo, fruit and bulk liquids. While there are three lessees at Tioga Marine Terminal, the Terminal is basically divided into two distinct operations. The third lessee is a bulk liquid transporter which utilizes two berths on site to dock ships and unload chemicals to their facility on the west side of Delaware Avenue. For more details regarding the existing condition of Tioga Marine Terminal, refer to *Exhibit 1* in Section VI this report.

B. PURPOSE OF MASTER PLAN

In 1992, both the container terminal and fruit terminal experienced increased cargo volumes compared to previous years. The container terminal handled 48,304 TEU's (twenty foot equivalent units) and approximately 1,550 metric tons of general cargo¹. The fruit facility handled over 17.3 million cases of fruit and exported 12,000 metric tons of new and used automobiles². The bulk liquid storage and distribution operation in 1993 handled 853,454 Metric Tons of liquids³. Based on current and projected cargo volumes, PRPA is presently reviewing a five year capital improvement program for Tioga Marine Terminal.

PRPA has had several reports prepared reflecting the capacity and facilities planning of Tioga Marine Terminal. Through these reports, PRPA has been apprised of several issues which must be addressed in order that Tioga Marine Terminal remain competitive in the port industry. With the expectation of significant increases in the total volume of cargo handled over the next few

¹ PRPA, Tioga Marine Terminal Activity Report, Quarterly Report (4th Quarter 1992), Tioga Container Terminal.

² PRPA, Tioga Marine Terminal Activity Report, Quarterly Report (4th Quarter, 1992), Tioga Fruit Terminal.

³ Shay, Al (GATX), Interview, March 22, 1994.

years, PRPA has deemed it necessary to invest in several capital improvement projects aimed at improving efficiency and capacity. PRPA is now interested in obtaining an in-depth Capital Improvement Master Plan which should include, at a minimum, detailed development plans for a new terminal layout. Thus, PRPA has provided general guidelines of issues which must be addressed under this Capital Improvement Master Plan. These issues are addressed in more detail in Section I.D.

PRPA retained Urban Engineers, Inc. (Urban) in February 1994 to undertake this Capital Improvement Master Plan Study. The scope of services included the in-depth review of the needs related to continued operation of the Terminal by the following two scenarios:

1. Multiple lessees as presently exists
2. A single operator Terminal

For both scenarios, the Capital Improvement Master Plan addresses those modifications which must be performed to alleviate issues which PRPA has determined to be existing problems. In addition, it shall prepare the Terminal for any changes in the shipping industry within the identified time frame of five (5) years. A third item of interest which was not identified in the original Scope of Work was that of the partial closure of Delaware Avenue for the entire length of Tioga Marine Terminal. Pertinent issues related to these scenarios are addressed in more detail in Section IV.

C. PLANNING ASSUMPTIONS AND ISSUES

As mentioned before, PRPA has made available to Urban three (3) previously prepared capacity and facilities planning reports as well as Terminal activity reports, all for the Tioga Marine Terminal. It is understood that with the exception of a traffic analysis study, Urban will be utilizing the information from the PRPA as a basis for this Master Plan.

There are certain issues that must be considered when evaluating the potential operational and physical changes to a Terminal. They are the following:

- Whether or not the physical infrastructure properly supports the current operation.
- Whether or not a different operating scenario would make better use of the existing infrastructure.
- What improvements to the infrastructure are required to increase the efficiency of cargo handling.

- What improvements to the infrastructure are required to accommodate expected changes in the global shipping industry.

In an effort to obtain answers to the above questions, Urban performed a series of informational interviews and site visits to similar, competing marine terminals. Through the interviewing process, Urban obtained a list of items or concerns which either PRPA or one of the Terminal operators felt should be addressed as part of the Tioga Master Plan. Urban visited marine terminals in Baltimore, North Jersey, South Jersey and the Philadelphia area in an effort to determine what would make Tioga Marine Terminal more efficient.

D. MASTER PLAN COMPONENTS

With the aid of the previously prepared reports (refer to Section IIA - Provided Data), PRPA developed a list of possible capital improvements for which they would expect to be included in a Tioga Capital Improvement Master Plan. That list was presented as part of the Request For Proposal and included the following components:

- Two terminal layouts:
 - Terminal layout reflecting a single operator
 - Terminal layout reflecting current multiple operators
- Cost estimates, schematic design and location of the following suggested capital improvements:
 - Crane rehabilitations
 - Container Freight Station of about 40,000 s.f.
 - Demolition of Pier 179
 - Addition of refrigeration to Tioga III building
 - New gate complex
 - Maintenance shop expansion
 - Reefer outlets
- Identification of Environmental problems at the facility.
- Cost and analysis of filling in the finger Pier 179 and the lagoon areas.
- Traffic study to determine location and design of new container terminal gatehouse.
- Determine the condition and feasibility of acquiring the property north of the Terminal boundary.

II. DATA COLLECTION

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In an effort to achieve a better understanding of the Scope of Work as well as the Terminal operations, preliminary steps were taken to obtain background information available and conduct necessary interviews with interested parties. Listed below is a brief recap of the information and comments obtained.

A. PROVIDED DATA

The PRPA offered the use of several existing Tioga Marine Terminal related reports which were either performed on their behalf or performed by PRPA themselves. Those reports include the following:

- Martin O'Connell Associates, Market Based Facilities Plan for the Port of Philadelphia, November, 1992
- Booz, Allen and Hamilton, Inc., Strategic Business Plan for the Philadelphia Port Corporation, October, 1988
- Container Transport Technology, Philadelphia Container Terminals Capacity Analysis, May, 1987
- Philadelphia Regional Port Authority, Tioga Marine Terminal Activity Reports, January 1992 through September 1993

B. INTERVIEWS

In addition to the PRPA provided reports, Urban deemed it necessary to conduct one on one interviews with the various stake holders to ascertain their comments to the existing operations, perceived efficiency problems, and possible improvements. Interviews were conducted with persons within the PRPA as well as personnel from all 3 lessees, their stevedores, and a PRPA security consultant. Listed below is a brief summary of the conclusions reached as a result of these interviews:

Crowley American Transport, Inc.

Crowley American Transport, Inc. (Crowley) is a containerized operation which operates the northern most 50 acres of Tioga Marine Terminal (refer to *Exhibit I in Section VI* of this report). Crowley subsidizes their operation by providing stevedore services for outside shipping lines as well as In-Transit moves. In-Transit moves is a service where containers that have been delivered to a port other than that which its bill of lading requires, are transported to their intended

port. The International Longshoreman's Association (ILA) rules require that any such container be transported to the Port of Intent before being shipped to its final destination. Crowley also provides services for break bulk however, this entails only approximately 1% of their business⁴.

Crowley's operation utilizes two berths, two 90,000 lb. Kocks container cranes, an 8 lane gatehouse for incoming and outgoing traffic, refrigerated container receptacles, a four bay combination maintenance/repair shop and roadability shop, a maintenance and repair shop for yard equipment, and a 37,785 s.f. container freight station. The container freight station is where containers whose contents are for more than one consignee are stripped or stuffed. Crowley utilizes the stevedoring services of Delaware River Stevedoring Company (DRS). Below is a summary of the major issues raised by Crowley:

Container Freight Station -

The present container freight station has significant disadvantages, the first of which is location. Referring to *Exhibit 1*, entitled "The Existing Condition of Tioga Marine Terminal", it is apparent that while Crowley operates the northern half of the Terminal, the incoming truckers are required to traverse the Tioga Fruit Terminal to access the container freight station. This results in conflicts with Tioga Fruit. Secondly, the structural design of the building includes interior ramps which reduce capacity, reduce the traffic flow inside of the building, and also creates a safety concern when these ramps are wet. Due to bonding and security issues, Crowley notes that the container freight station cannot be relocated to the west side of Delaware Avenue. Desirable features for a new container freight station would include cross-dock operation as well as rail access at the northern end of the Terminal.

Vehicle Queuing -

Terminal security requires that truckers first get approval to enter the gatehouse area and while doing so they park their vehicles on Delaware Avenue. Once approved, they are allowed to enter the Terminal. Upon leaving the Terminal, the same information is required, and as a result, a queue on the inside of the Terminal, between the gatehouse and security gate, occurs. Crowley believes that the 8 lanes at the existing gatehouse are adequate for the forecasted cargo volumes. In addition,

⁴ PRPA, Tioga Marine Terminal Activity Report, Quarterly Report (4th Quarter, 1992), Tioga Container Terminal.

queuing of vehicles on Delaware Avenue was noted as an operational decision by Crowley.

· Refrigerated Container Plugs -

A total of 80 new reefer plugs were recently constructed which are being used by Crowley. This alleviates the need for Crowley to traverse and utilize the 40 Reefer plugs located at the north end the Tioga Fruit Terminal.

· Expansion of the Maintenance and Repair Shop -

Crowley suggested that the maintenance and repair shop be expanded to meet the adequate requirement for mandatory roadability inspection of trucks. In addition, a better facility for repair of yard vehicles is desirable since Crowley would like to bring their stevedore's (Delaware River Stevedores) maintenance shop from the south side of the Terminal to the northern half.

· Railroad Access -

Crowley noted a need for modified rail access to their terminal. At present, Crowley is the only tenant who utilizes the existing Conrail lines through the Tioga Marine Terminal. Unfortunately, the only rail access to the Terminal comes from the south end of the Terminal requiring that all Conrail trains traverse through the Tioga Fruit Terminal's operation. On occasion, tractor trailers are parked on the railroad lines delaying the delivery and/or pick-up of rail cars. Crowley currently dispatchs 200 rail cars per month.

· K-1 Container Crane Boom Modification -

Crowley noted that the boom on crane K-1 cannot reach to the outer most thirteenth container on the larger ships servicing the Terminal. This is not an operational problem at this time. Repairs to the crane rails were identified as a necessity. A third crane was not viewed as a requirement provided that the existing 2 cranes are kept in good repair and that down time is kept to a minimum.

· Gatehouse -

A gatehouse, which would combine both Crowley's and Tioga Fruit's use, was not desirable according to Crowley.

Terminal Lighting -

Crowley noted that the Terminal lighting requires improvement.

Tioga Fruit Terminal, Inc.

Tioga Fruit Terminal, Inc. (Tioga Fruit) primarily handles Chilean fruit on the southern 47 acres of Tioga Marine Terminal (refer to *Exhibit 1* in *Section VI*). Tioga Fruit is a subsidiary of the shipping line CSAV based in Chile, South America. They have operated at the Tioga Marine Terminal since 1987. Tioga Fruit utilizes the stevedoring services of Independent Pier Company (IPC).

Tioga Fruit handles a large volume of fruit between the months of November and May. In order to supplement their business during the off season, Tioga Fruit handles other commodities. Ever since the closure of Northern Metals in 1993, another increasingly significant component of Tioga Fruit's operation has become In-Transit moves. They also export new and used automobiles as well as entertaining passenger cruise ships and general break bulk cargo. These back-haul and other cargo amounted to approximately 10% of Tioga Fruit Terminal's annual business in 1992⁵.

Tioga Fruit's operation includes 2 non-refrigerated warehouses totaling 400,000 s.f., a 90,000 s.f. cold storage warehouse, refrigerated container receptacles, 3 berths and available parking space for In-Transit moves. The following is a summary of the issues raised by Tioga Fruit:

Forecasted Cargo Volumes -

Tioga Fruit does not anticipate any significant changes in their forecasted cargo volumes (fruit, break bulk, automobiles, passengers, In-Transit moves).

Vehicle Queuing -

Queuing has become a great concern for Tioga Fruit. They noted that congestion due to the combination of fruit trucks and In-Transit moves results in long back-ups outside of their own gate. Also, conflicts occur between the excessively long queues from Crowley's gatehouse.

⁵ PRPA, Tioga Marine Terminal Activity Report, Quarterly Report (4th Quarter, 1992), Tioga Fruit Terminal.

· Automobiles -

Because Tioga Fruit has agreed to store automobiles undercover for one of their major customers, they are using the Tioga III building for this purpose. An undetermined amount of additional covered area for car storage was identified as being desirable.

· Refrigeration Tioga III-

It was suggested that Tioga III be upgraded to a refrigerated warehouse to handle the overflow of fruit during the peak fruit season.

· Terminal Conflicts -

Tioga Fruit indicated that conflicts exist between their operation and Crowley's operation due to the location of the Container Freight Station. Tioga Fruit also pointed out that the rail access to Crowley's Terminal traverses through Tioga Fruit's operation and hampers it.

· Gatehouse -

The suggestion of a combined gatehouse with Crowley was viewed as a problem due to the differing nature of Tioga Fruit's operation from Crowley's container operation.

General American Transportation, Inc.

General American Transportation, Inc. (GATX) is a world wide bulk liquid storage and handling company who operates a storage facility near Tioga Marine Terminal (refer to *Exhibit I* in *Section VI*). GATX currently leases the south berths adjacent to finger Pier 179 and a berth along the marginal wharf east of the Tioga II building. From these two points, a series of pipe lines connect Tioga Marine Terminal to GATX's tank farm facility immediately across Delaware Avenue. Consequently, GATX's operation affects the activities of the Terminal in a minimal manner.

While GATX has a total storage capacity of 1.2 million barrels of liquids at their facility, in 1993 they posted a throughput of 854,000 metric tons or over 4 million barrels of bulk liquids⁶. Approximately 90% of their annual throughput is importation while the remaining 10% is export. The following is a summary of those issues raised by GATX:

⁶ Trovato, Carl (PRPA), Telephone Conversation, August 4, 1994.

Access to Berthing Area -

GATX noted that access to their berthing area is at times cumbersome since they are required to enter the site through Tioga Fruit's security gate. GATX proposed the construction of a separate gate for their use only.

Filling of Pier 179 -

The filling in of Pier 179 was noted as being undesirable especially in light of the fact that GATX has recently invested in the construction of a pipe bridge across Delaware Avenue connecting the existing on-site piping to their tank facility.

Reconstruction of Pier 179 -

GATX recommended that the finger Pier 179 either be reconstructed or be completely removed to facilitate easier berthing of their ships. They noted that if the pier was to be reconstructed they could potentially accommodate two large tanker ships at a time. GATX has disclosed plans to expand their tank facility sometime in the future.

Delaware River Stevedores, Inc.

Delaware River Stevedores, Inc. (DRS) performs the stevedoring services at the container terminal on behalf of Crowley. DRS owns and operates all of their on-site yard equipment including fork lifts, top picks, and yard horses. DRS generally concurred with those comments which Crowley entered during their interviews, but also raised several other issues:

Gatehouse -

Regardless of whether the Terminal is a one operator terminal or two operator terminal, DRS notes that separate gates for the two operations (fruit and containers) is typical.

Stacking of Containers -

DRS has purchased a top pick which is capable of stacking containers four (4) high. Crowley/DRS' present operation is a wheeled operation or one which places all full containers on chassis. Empty containers are either stored on chassis or stacked depending on the shipping line and availability of chassis.

Philadelphia Regional Port Authority

The PRPA interviews were conducted with personnel from the Operations, Real Estate and Strategic Planning Departments. The Operations interviews confirmed policy issues relating to Tioga Marine Terminal, day to day operational issues and furnished background information on the existing infrastructure. The Strategic Planning Department provided all of the necessary data related to the throughput of the three operators for the past several years and the anticipated cargo volumes during the 5 year time frame of the Master Plan. During the course of the tenant interviews, the PRPA was informed of the issues raised by the various other stakeholders. The PRPA raised the following concerns which should be addressed:

Vehicle Queuing -

The queuing of trucks appears to be the worst in the early morning prior to the terminal opening and during lunch time. This truck traffic parked on Delaware Avenue is primarily a safety concern.

In-Transit Moves -

PRPA raised the possibility of routing of all of the Tioga Fruit In-Transit moves through Crowley's gate in lieu of constructing a new gate facility at the south end of the Terminal (as requested by Tioga Fruit). This could alleviate the duplication of effort and provide more trucks to the existing gate facility. Gate capacity is of concern.

Partial Closure of Delaware Avenue -

The full or partial closure of Delaware Avenue would present opportunity to, among other things, expand the Terminal and isolate the public traffic from the Terminal traffic.

Container Crane Situation -

PRPA believes the two container cranes are in very good working condition. They discussed the possibility of adding another container crane to Tioga Marine Terminal to accommodate the anticipated future increase in container volumes.

· Container Freight Station -

PRPA and Crowley both determined that the size of a new Container Freight Station could be reduced from 100,000 s.f. to 40,000 s.f. without restricting the operation.

· Finger Pier and the North Lagoon -

PRPA requested that Urban investigate the possibility of filling in finger Pier 179 or the lagoon located at the north end of the marginal wharf as a possible way to increase the Terminal capacity.

· Refrigeration of Tioga III -

PRPA agreed with Tioga Fruit that the refrigeration of the Tioga III Building would open the door to new opportunities at the Fruit Terminal. The refrigeration of the 98,500 s.f. building would increase the marketability of the Terminal.

· Additional Terminal Acreage -

PRPA agrees that the limiting factor at Tioga Marine Terminal is its size. Additional Terminal acreage would provide many opportunities to better enhance the existing Terminal operations, as well as any future operations.

C. TRAFFIC ANALYSIS

This section summarizes the data collection and analysis performed by Urban on the existing vehicle traffic and queuing at Tioga Marine Terminal. The information developed provides a baseline for evaluating the impact of the various proposed improvements included in the Master Plan.

Traffic and queuing counts were manually performed during the week of March 28, 1994. During this week a total of five ships arrived, three container ships and two fruit ships. During the fruit season (November to May) the truck activity is at its busiest, therefore this week was considered to be a good representative basis for evaluating capacity and traffic conflict issues. The counts were conducted at the following on-site and off-site locations:

- Delaware Ave. in front of Crowley's terminal entrance
- Delaware Ave. in front of Tioga Fruit's terminal entrance

- On-site between Crowley's gatehouse and security gate
- On-site at Tioga Fruit's Trailer Interchange Receipt gate

Patterns which were observed indicated heavy volumes of traffic the day of a ship arrival at the fruit terminal and slowly tapering off over the next two days. At the container terminal, it was observed that the most active days are the day before and the day after a ship arrival. The temporal distribution of traffic varied by the day and by the Terminal activity.

The results of the Traffic Study are as follows:

- 25% of all trucks entering/exiting the container terminal were bobtails (i.e. no trailer)
- 19% of the trucks entering/exiting the fruit terminal were bobtails and 1% were auto carriers.
- 75% of all truck traffic on the fruit terminal utilized the Trailer Interchange Receipt (TIR) booth. In other words, approximately 400 of the 526 trucks on that particular day were In-Transit moves and the remaining 126 trucks were for either fruit, autos, or break bulk.

For more information regarding the above mentioned traffic data refer to Urban Engineers, Inc. Summary of Existing Traffic Conditions at Tioga Marine Terminal in the Appendices⁷.

D. SITE VISITS TO SIMILAR TERMINALS

With the knowledge that competing marine terminals have made significant capital expenditures within the past twelve years in order to upgrade their physical plant, Urban deemed it worthwhile to visit some of these terminals. The ports of New York have invested approximately \$797 million since 1982 and the ports in Baltimore have invested approximately \$424 million in the same time span⁸. During each site visit, Urban would meet with the head of the Operations Department for that facility, at which time inquiry was made about the basic operation of the terminal, capacity, general cargos, future

⁷ Urban Engineers, Inc. Summary of Existing Traffic Condition at Tioga Marine Terminal, April 14, 1994.

⁸ Booz, Allen and Hamilton, Inc., Strategic Business Plan for the Philadelphia Port Corporation, October 1988, Page I-6.

improvements, etc. Upon completion of the interview, an informational tour of the facility was conducted.

The following terminals were visited:

- Sealand Service, Inc., Elizabeth, N.J.

Aside from the 250 acre, 6 Berth Terminal itself, a point of interest is the 150,000 s.f. Central Examination Station (CES). This is where U.S Customs performs their inspection of 80 - 100 containers per day.

- Seagirt Marine Terminal, Baltimore, MD.

The 275 acre terminal is an "open terminal" operation where the current five (5) shipping lines all share the same berths, cranes, warehouse, etc. Seagirt's state of the art gatehouse complex and double trolley gantry cranes were of great interest.

- Dundalk Marine Terminal, Baltimore, MD.

This 570 acre, 13 Berth Terminal currently handles 150,000 containers per year along with large volumes of automobiles, break bulk and project cargos. As many as 50 shipping lines operate at this terminal.

- Del Monte Fresh Produce Terminal, Camden, N.J.

This terminal has a very consistent flow of fruit. One ship arrives on Monday, 52 weeks a year. They handle Costa Rican fruits such as pineapples, bananas, various melons, coconuts and sweet corn in the 35,000 s.f. refrigerated warehouse.

- Penn Terminal, Eddystone, PA

This multi cargo terminal is owned and operated by the same company and they stay busy due to the competitive labor provided by the Boilermakers Union.

E. ENVIRONMENTAL ANALYSIS

Trash Incinerator Site

A Preliminary Area Reconnaissance (PAR)⁹ was conducted at the site of the former City of Philadelphia trash incinerator located adjacent to the northern property line of Tioga Marine Terminal. This study was presented to PRPA in a separate report and its salient points are summarized here. More information regarding this matter can be found in the complete report in the appendices. The goal of the Preliminary Area Reconnaissance was to determine the potential presence of hazardous or other environmentally sensitive waste at the trash incinerator site which might affect its viability of expanding Tioga Marine Terminal onto its site. The work was based on a site reconnaissance, historical files, document reviews, and the use of Environmental Risk Imaging and Information Services. No intrusive methods (i.e. sampling, drilling, etc.) were used to prepare the Preliminary Area Reconnaissance report.

The site contains an incinerator building, Philadelphia Water Department Sludge Line, office building, several small buildings, and a settling basin for storm water runoff. The major structures were constructed in 1956. Approximately 60% of the site is covered with either asphalt or concrete paving.

Based on the Preliminary Area Reconnaissance, the following areas of concern were determined:

- Numerous stains from former use of the property observed at the site indicate potential contamination.
- Former coal stockpiles located on the Tioga Marine Terminal and the Philadelphia Electric Company properties may have potential to contaminate surficial soils along the property lines.
- Water runoff is depositing sediment in the settling basin.
- The incinerator building, with an emphasis on asbestos containing materials (general building materials, heat insulation).
- The contents of several aboveground storage tanks and drums are unknown.

⁹ Urban Engineers, Inc., Preliminary Area Reconnaissance Report, September 15, 1994.

- Groundwater quality should be checked due to storage tanks, collection bins, sludge pipes, etc.
- Dredge spoils from the Delaware River and fill material may be on the premises.

Prior to PRPA making a decision to proceed with any development on this site, it is recommended that additional investigations be undertaken to further characterize the site. Groundwater monitoring is also recommended. Urban approximates that the cost of the investigation, sampling and report would be \$40,000 to \$60,000 and take up to 6 months to complete.

Conrail Right-Of-Way

At this time, there are two abandoned railroad tracks running parallel to Delaware Avenue. They start at Tioga Street and run north between the property line of the Terminal and Delaware Avenue. By definition, the railroad ties and ballast from these tracks would be considered residual waste. The potential also exists for hazardous materials to be present along the right-of-way due to the nature of the materials previously hauled along the rail lines.

Prior to the PRPA making a decision to proceed with the acquisition of this property, it is recommended that samples of the ballast material and surface soil be taken at periodic intervals along the rail line. These samples should be analyzed to classify the materials as either residual or hazardous waste. Urban approximates that the cost of the sampling and characterization would be \$15,000 to \$20,000 and take up to 2 months to complete.

Pier 179 and Northern Lagoon

One of the required items included within the Scope of Work for the Master Plan project was to provide an analysis and cost of filling in the two berths adjacent to finger Pier 179 and also the lagoon area located north east of the container terminal. In addressing the possibility of filling in wetlands along the Delaware River, Urban researched the required steps which would be encountered if this option was pursued. Meetings were held with the Urban Waterfront Action Group and the U.S. Army Corps of Engineers. Both entities reached similar conclusions.

It would be very difficult to receive authorization to fill in either piers 179 (north or south) and it would be even more difficult to fill in the lagoon area. They cited recent cases along the Delaware River where the Fish and Wildlife Service in conjunction with the U.S. Environmental Protection Agency had expressed several reservations regarding "negative" impacts to shallow water

habitat and to migratory fish patterns. These agencies have held up projects in close proximity to Tioga Marine Terminal which proposed less than two (2) acres of fill because field surveys indicated the presence of over 26 different species of fish and other wildlife would be affected. The proposed filling in of Piers 179 north and south involves approximately 9 acres and the lagoon involves approximately 16.5 acres.

As a minimum, the filling in of Pier 179 and the lagoon would require the following:

- A complete bio-habitat survey
- Identification of subsurface habitat
- Identification of depths of habitat material
- Identification of nesting and spawning areas
- Address shading impacts

The following are the regulatory reviews that are required to fill in the Pier # 179 and the Northern Lagoon:

Regulatory Agency Reviews:

1. Delaware Valley Regional Planning Commission
Urban Waterfront Action Group (UWAG)
2. Delaware River Basin Commission
3. City of Philadelphia
 - a. Zoning Permit
 - b. Use Registration
4. U.S. Army Corps of Engineers 404 permit with PADER
5. U.S. Coast Guard
6. Commonwealth of Pennsylvania Department of Environmental Resources (PADER) Water Obstruction and Encroachment Permit Joint Chapter 105 Wetlands Coastal Zone Management Consistency Review

7. PA Historical and Museum Commission (PHMC) Review

8. PA Department of Community Affairs

The time frame to complete permitting and start filling the area is as follows:

1. Presentation to UWAG - meets once a month 60 days
2. Preparation of Wildlife Survey and fisheries 12 to 18 months
3. Submission of Joint Applications and Wildlife Reports
 - a. Corps of Engineers
 - b. PADER
 - c. PHMC
 - d. City Water Department
4. Review of Applications for completeness 30 days
5. Technical Review of Applications 90 days
6. Preparation of Response to Questions
Document Revisions 30 to 60 days
7. Review of Questions and Answers 30 to 60 days
8. Preparation of Public Notice, Announcements,
Public Hearing, Public Comment Period 60 days
9. Preparation of Response to Public Questions
and Hearing Comments 30 to 60 days
10. Receipt of Preliminary Approvals
(Above mentioned items 1 through 9) **23 to 32 months**

If approval is achieved:

11. Preparation of Design Documents 6 to 12 months
12. Regulatory Review of Construction Documents 60 to 90 days
13. Public Bidding 60 to 90 days
- TOTAL 33 to 50 months**

The above mentioned approval process would be expected to take 23 to 32 months to be completed. If the results of in-depth study permits filling in, the area would then be classified. Based upon the classification, a mitigation site in the same geographical watershed area would have to be constructed in order to duplicate the lost habitats. Depending on the classification, the mitigation could be from a 1:1 ratio all the way up to a 4:1 ratio. The availability of shallow water habit areas around Philadelphia, Pennsylvania is limited.

Based upon a classification requiring a mitigation ratio of 1 to 1.5 acres, Urban approximates that the cost to fill in Pier 179 (9 acres) and build a new bulkhead and cell system would be \$ 21,875,100.00 and the cost to fill in the northern lagoon (16.5 acres) would be \$ 33,982,000.00. The time frame to obtain permits, receive approval, design, and bid the construction will range from 33 to 50 months.

F. PROPERTY ACQUISITIONS

During the course of the Master Planning process, it was discovered that one of the limiting factors of the container throughput at Tioga Marine Terminal was not the capacity of the cranes, berths or gates, but the capacity of the yard itself. A previously prepared report stated that in 1986 Tioga Marine Terminal had the following maximum container capacities¹⁰:

Berth Capacity = 52,000 containers/year
Crane Capacity = 126,000 containers/year
Gate Capacity = 86,000 containers/year
Yard Capacity = 60,000 containers/year¹¹

Since 1986, few if any changes have been made to the infrastructure at Tioga Marine Terminal which would lead us to believe that the theoretical yard capacity of the Terminal would remain the same. Aside from making changes in the operational techniques (reduce container dwell times, change to a grounded operation, stacking containers four high, etc.) the only other way to increase yard capacity is to expand the yard acreage.

Many of the recommended capital improvements will require the acquisition of several off-site properties. Prior to Urban suggesting that a certain parcel of

¹⁰ Container Transport Technology, Philadelphia Container Terminals Capacity Analysis, May 1987, Page 27 (Table 3).

¹¹ Matin O'Connell Associates, Market Based Facilities Plan for the Port of Philadelphia, November, 1992, (Pages I-13 and III-5).

land be purchased, research was performed to determine the feasibility of the PRPA purchasing the land. The City of Philadelphia Tax Assessors Office and Department of Records were both visited and title searches were performed for the various properties.

The following information was recovered:

- Location: City of Philadelphia's Northeast Incinerator
Owner: City of Philadelphia Department of Public Property
Present Use: The east half of the property is the incinerator and it has been abandoned since 1972. The western half is still is being used by the Streets Department.

- Location: West of Delaware Ave. and South of Wheatsheaf Lane
Owner: City of Philadelphia Department of Public Property
Lessee: Philadelphia Water Department
Present Use: Vacant field

- Location: South of Venango St. between Delaware Ave. and Carbon St.
Owner: City of Philadelphia Department of Public Property
Lessee: Philadelphia Gas Works
Present Use : Vacant field and trailer storage

- Location: Railroad between Delaware Ave. and the Terminal property line
Owner: A branch of the Penn Central Kensington and Tacony Branch. The owner is Conrail.
Present Use : Abandoned line

**III. CONCEPTUAL
PLANNING CONCERNS**

III. CONCEPTUAL PLANNING CONCERNS

A. MARKET FORECAST

As part of the PRPA provided data, Urban received copies of a market based facilities plan, and a strategic business plan and capacity analysis, all addressing Tioga Marine Terminal. This Capital Improvement Master Plan does not attempt to duplicate those studies, but rather utilize certain information from them as a basis for the master planning process. These are the market forecasts which Urban used during the study:

- It is anticipated that the activity on the container terminal at Tioga will increase from its present volume of 48,000 container per year to 80,000 per year within the next decade.
- It is anticipated that the activity in the fruit industry will remain the same.
- Activity in other cargo markets such as automobiles, break bulk, passengers, etc. are incidental to this study. These cargos are supplemental since Tioga Marine Terminal is considered to be a container and fruit terminal.

The conclusion reached as a result of the provided market forecasts is that the Tioga Master Plan should address ways to increase capacity and to increase the ability to efficiently handle the current and projected volume of cargo.

B. TERMINAL UTILIZATION

The Tioga Marine Terminal is currently operated as if it were two separate terminals handling two distinctly different cargos. There are occasions when there is joint utilization of the Terminal's facilities such as the use of a crane or the reefer plugs, but this is on an infrequent basis. As outlined in the project scope of work, Urban was required to provide a terminal layout including suggested capital improvements for both a single operator terminal and the present situation of a dual operator terminal. It should be noted that there are advantages and disadvantages to both.

Single Operator -

- Internal coordination between containers and fruit is better. This reduces conflicts (i.e. railroad delays).

- Allows the elimination of redundant facilities such as maintenance shops, roads, and reefers.
- Allows greater flexibility in berthing arrangements.
- Security is the responsibility of one organization.

Dual Operator -

- Accommodates smaller, specialized tenants who handle either fruit or containers.
- Allows for flexibility to have a multi-use terminal.
- Less capital expenditures since it is present situation.
- Diversification allows greater intensity of each operation.

C. ELEMENTS OF CONTAINER CAPACITY

For the time frame of this study, both fruit and containers will be the main cargo handled at Tioga Terminal. The recommended capital improvements discussed later in this report attempt to enhance the current operations in a manner which is consistent with PRPA's policies, but also provide flexibility should conditions change. Obviously, suggested capital improvements which support both a single and a dual operator terminal are advantageous. As was documented via the previously prepared reports, the Terminal operations can have a profound impact on the calculated capacity of a terminal's throughput. Thus, approval of capital improvements to accommodate increased throughput should be closely evaluated against possible changes in operational procedures used by the tenant(s).

There are four key elements which affect the overall capacity of the container terminal. First is the berth capacity, the second is the crane capacity, the third is the yard capacity and fourth is the gate capacity. In addressing the desire to achieve a throughput of 80,000 containers per year, the present operating policies have been assumed to continue, however where operational changes would impact capacity, these issues will be discussed.

Berth Capacity -

Berth capacity for the container terminal is a function of the length of the marginal wharf, the number of cranes, the crane production rate, and the occupancy of the individual berths. Based on the size of the present Panamax container ships (650' to 750' in length) calling at Tioga, the 1400 lf. berth of the

container terminal can effectively be considered a two (2) berth terminal. Based on typical crane production rates, a range of berth capacities is between 40,000 and 70,000 containers per year (previous reports show 52,000)¹². The PRPA has identified that the growth in the container volume is expected to occur with an increase in the containers per ship. This will effectively increase the allowable berth occupancy by reducing the ship maneuvering time in relation to the time spent actually unloading and loading.

Berth Utilization and Crane Capacity -

The theoretical crane capacity of 126,000 containers per year is well in excess of both the berth and yard capacity¹³. A third crane would help to increase berth utilization by allowing either three cranes to operate on one ship (instead of two at present) or if two ships were at dock, two cranes could work the heavier activity ship while the third crane could be working the second ship. In addition, a third crane would increase berth productivity by providing a spare should down time occur. It would also allow for the retrofit of the two existing cranes (one at a time), while still providing two container cranes for Crowley's use.

As a result, an expensive crane rail turntable would be required to be constructed to connect the diverging crane rail tracks. In addition, the projected length of time required to obtain approval of the environmental aspect (referred to in "Environmental Analysis" Chapter II, Section E) is enough to negate the idea of berth expansion. Another feasible alternative would be the installation of a dolphin in the north lagoon area to accommodate the berthing of two 750 lf. ships at once. Since this may not be required until the later stages of this 5 year study period, Urban's recommendation would be to have a berth occupancy study performed to justify the need for the third crane.

Yard Capacity -

It has been documented that the Tioga container yard capacity is approximately 60,000 containers per year¹⁴. Yard capacity is highly dependant upon operational policy. In order to achieve 80,000 containers per year without increasing the acreage of the yard, steps could be taken to decrease the dwell time, or the period of time which a container is left on the Terminal, for both import and export containers. Instead of stacking empty containers three high,

¹² Philadelphia Container Terminals Capacity Analysis, Page 27.

¹³ Philadelphia Container Terminals Capacity Analysis, Pages 27 and 37.

¹⁴ Market Based Facilities Plan for the Port of Philadelphia, (Pages I-13 and III-5).

they could be stacked four high, use a grounded operation in lieu of a chassis operation, or possibly address the Terminal striping layout to increase the number of container slots.

Another item of concern is the relocation of the container freight station to the container terminal. A minimum of 120 container parking slots stand to be lost due to the construction of the building or as many as 170 parking slots.

Gate Capacity -

The container terminal currently processes in excess of 40,000 containers per year through four lanes of the existing eight lane gatehouse. The documented gate capacity is 86,000 containers per year through the existing gatehouse¹⁵. Therefore, it is not a requirement to expand the existing gatehouse, but rather to determine if it could be relocated to a more advantageous location. Automatic Vehicle Identification is an applicable new technology which could possibly benefit the gatehouse. Since the responsibility for this lies with Crowley to initiate, refer to the appendices for more information.

¹⁵ Philadelphia Container Terminals Capacity Analysis, Page 27.

**IV. RECOMMENDED
CAPITAL IMPROVEMENTS**

IV. RECOMMENDED CAPITAL IMPROVEMENTS

As a means to evaluate feasibility and impacts of the various possible schemes, Urban developed a number of conceptual plans. Addressed in these conceptual plans were all of the major issues including the Container Freight Station relocation, additional parking lots and the gatehouse, as well as revisions to rail access and the filling in of Pier 179. After evaluating the merits of each of those various schemes, combinations of schemes were assembled in an attempt to arrive at two viable terminal plans. The following section discusses the issues related to these two schemes which Urban is recommending for consideration.

A. TWO OPERATOR TERMINAL - THE RECOMMENDED SCHEME

Refer to *Exhibit 2* in *Section VI* entitled "Two Operator Scheme" which reflects Tioga Marine Terminal being utilized by two operators as is the present case. This scheme includes the following features:

1. Acquisition of the former railroad right-of-way for the entire distance of Crowley's terminal. This will allow expansion of the terminal to the Delaware Avenue right-of-way and increase the container yard size by 1.5 acres.
2. In order to allow maximum efficiency, the terminal's paving is in need of repair. The terminal's pavement should be restriped to increase efficient traffic circulation and increase the yard's capacity.
3. Construction of a new 40,000 square foot Container Freight Station at the northeast corner of the container terminal. Including maneuvering space, Crowley will lose approximately 1.5 acres.
4. Expansion of the maintenance and repair shop to include four (4) additional bays. The acquisition of the railroad track will allow the shop expansion to occur westward so that the driving isle is not affected. The container terminal would lose approximately 0.25 acres of the 1.5 acres gained from the relocation of the fence along the Conrail right-of-way. The expansion of the maintenance and repair shop will include moving the present operations from the existing carpenter shop to the maintenance and repair shop.
5. Due to the lighting levels that presently exist and the fact that many existing light standards/poles will have to be relocated/replaced because of suggested capital improvements, the existing terminal lighting should be replaced.

6. The addition of a third container crane would allow for an increase in berth utilization and productivity. It also would allow the two existing cranes to be retrofitted one at a time without affecting the container operation.
7. Demolition of the carpenter's shop, since both Crowley and DRS would like to move the DRS repair shop to the north end. DRS currently utilizes the carpenter shop, and must move their equipment from one end of the terminal to the other. Tioga Fruit would gain approximately 0.6 acres, but more importantly, the bottle neck between the existing Container Freight Station and the carpenter shop would no longer exist. Tioga Fruit Terminal will have the final decision regarding the demolition of this facility. The present carpenter shop operations will be relocated to the expanded maintenance and repair shop identified above.
8. Relocate Tioga Fruit's employee parking to the west side of Delaware Avenue at Venango Street. Relocate Crowley's employee parking to the west side of Delaware Avenue near Wheatsheaf Lane. Tioga Fruit would gain approximately 1.4 acres of additional laydown space and Crowley would gain approximately 1.1 acres of additional laydown space.
9. Tioga III should be converted into a refrigerated transit shed to provide year round capabilities.
10. Due to the lighting improvements recommended above and increased electrical requirements for Tioga III, electrical upgrades are recommended. These upgrades should include a second PECO Energy service to be installed to the Tioga II building, and the manual transfer switch at Tioga I should be replaced with an automatic transfer switch.
11. Construction of a four lane gatehouse in the same location as Tioga Fruit's present guard house. This gate would accommodate the large volumes of both fruit and in-transit moves. Tioga Fruit would lose approximately 1.0 acre of laydown space.
12. Construction of both a new eight-lane gatehouse canopy and a new four-lane roadability facility for Crowley in the northwest corner of the container terminal. Crowley would lose approximately 2.8 acres. The new gatehouse location will provide more queuing space for Crowley.

B. SINGLE OPERATOR TERMINAL

Although this is not the present situation nor a current priority, it would be prudent to investigate this scenario should the circumstances become such that a one-operator facility becomes viable (refer to *Exhibit 3* in *Section VI* entitled "One Operator Scheme"). This option includes the following features:

1. Acquisition of the railroad right-of-way for the entire distance of the container operation. This will allow expansion of the terminal to the Delaware Avenue right-of-way and increase the yard size by 1.5 acres.
2. In order to allow maximum terminal efficiency, the terminal's paving is in need of repair. The terminal's pavement should be restriped to increase efficient traffic circulation and increase the yard's capacity.
3. Construction of a new 40,000 square foot Container Freight Station at the far northeast corner of the container terminal. A separate access road will be constructed, thereby eliminating the need for freight consignees to enter the Terminal for pickup or delivery. Including maneuvering space, the terminal would stand to lose approximately 3 acres.
4. Expansion of the maintenance and repair shop to include four additional bays. The acquisition of the railroad track will allow the shop expansion to occur westward, so that the driving isle is not affected. The terminal would lose approximately 0.25 acres of the 1.5 acres gained from the relocation of the fence along the Conrail right-of-way. The expansion of the maintenance and repair shop will include moving the present operations from the existing carpenter shop to the maintenance and repair shop.
5. Due to the lighting levels that presently exist and the fact that many existing light standards/poles will have to be relocated/replaced because of suggested capital improvements, the existing terminal lighting should be replaced.
6. The addition of a third container crane would allow for an increase in berth utilization and productivity. It also would allow the two existing cranes to be retrofitted one at a time without affecting the container operation.
7. Demolition of the carpenter's shop can be performed as a result of the expansion of the maintenance and repair shop at the north end of the terminal. The terminal would gain approximately 0.6 acres, but more

important is the fact that the bottle neck between the existing Container Freight Station and the carpenter shop would be eliminated.

8. Relocation of both the break bulk and container terminal employee parking to the west side of Delaware Avenue. The terminal would gain approximately 2.5 acres of laydown space as a result.
9. Tioga III should be converted into a refrigerated transit shed to provide year round capabilities.
10. Due to the lighting improvements recommended above and increased electrical requirements for Tioga III, electrical upgrades are recommended. These upgrades should include a second PECO Energy service to be installed to the Tioga II building, and the manual transfer switch at Tioga I should be replaced with an automatic transfer switch.
11. Construction of a four lane gatehouse in the same location as the break bulk terminal's present guard house. This gate would accommodate the large volumes of fruit, break bulk and in-transit moves. The terminal would lose approximately 1.0 acre of laydown space.
12. Construction of both a new eight-lane gatehouse canopy at the north end of the terminal and a new four-lane roadability facility. The terminal would lose approximately 2.8 acres. The new gatehouse location will provide more queuing space for the container operation than exists at present.

C. CLOSURE OF DELAWARE AVENUE

During the course of the Tioga Capital Improvements Master Plan, it became apparent to both the PRPA and Urban Engineers that another possible opportunity to improve site access and circulation is to obtain a full or partial closure of Delaware Avenue. Despite being beyond the scope of work for this endeavor, Urban has reviewed and identified several points of interest. (Refer to *Exhibit 4* entitled "Delaware Avenue Closure Concept" in Section VI for more information reflecting the public traffic being separated from the Terminal traffic and away from the Terminal's activities.) Please note that no investigative work was performed confirming the feasibility of the plan. This option includes the following points:

1. For both the partial and complete closure of Delaware Avenue, the public vehicular traffic would be diverted west onto Carbon Street, currently an active railroad bed. The PRPA would be required to acquire certain properties, all of which are believed to be owned by the City of

Philadelphia. In doing so, additional acreage would be obtained which could be used to increase both the container and break bulk terminals.

2. The gatehouse location is shown schematically. Based upon the Terminal utilization (i.e. one or two operators, In-Transits using the container gate, etc.) the gatehouse could properly be oriented, sized and designed.
3. Traffic signals would have to be designed to permit the railroad's access to their line.
4. The potential exists for a greater length of queuing area which would help eliminate the closeness of the public traffic to the queuing terminal traffic. Also, conflicts between the break bulk and the container terminal could be lessened.
5. Employee parking could be relocated westward, thereby allowing more laydown space closer to the water's edge.
6. A possible obstacle may be the pipe bridge above Carbon Street, between Venango Street and Castor Avenue.

V. CAPITAL COST ESTIMATES

**ESTIMATED COST SUMMARY
RECOMMENDED FOR CAPITAL IMPROVEMENTS
DUAL OPERATOR TERMINAL**

ITEM NO.	IMPROVEMENT/TASK	AMOUNT
1	Purchase and Cleanup Conrail Railroad track along Delaware Ave.	\$ 100,000.00
2	Pavement Repairs and Striping	\$ 400,000.00
3	Addition of Container Freight Station Building (40,000 s.f.)	\$ 1,633,835.00
4	Maintenance and Repair Shop Expansion (6,000 s.f.)	\$ 250,000.00
5	Terminal Lightning and Electrical upgrades including Automatic Transfer Switches	\$ 1,900,000.00
6	New Container Crane	\$ 5,500,000.00
7	Demolition of Carpenter Shop	\$ 15,000.00
8	Parking Relocation Across Delaware Ave.	\$ 250,000.00
9	Adding Refrigeration to Tioga III Building	\$ 2,697,758.00
10	Upgrade power distribution and add second PECO service	\$ 600,000.00
11	Construction of four-lane gatehouse for Tioga Fruit	\$ 381,530.00
12	New Gate and Roadability Complex for Container Area (without office building)	\$ 763,060.00
TOTAL		\$ 14,491,183.00

* All prices except for item No.6 (Third Crane) were obtained from 1994 MEANS Construction Cost Data or historical data for similar projects Urban has designed.

**ESTIMATED COST SUMMARY
RECOMMENDED FOR CAPITAL IMPROVEMENTS
SINGLE OPERATOR TERMINAL**

ITEM NO.	IMPROVEMENT/TASK	AMOUNT
1	Purchase and Cleanup Conrail Railroad track along Delaware Ave.	\$ 100,000.00
2	Pavement Repairs and Striping	\$ 400,000.00
3	Addition of Container Freight Station Building (40,000 s.f.)	\$ 1,715,835.00
4	Maintenance and Repair Shop Expansion (6,000 s.f.)	\$ 250,000.00
5	Terminal Lightning and Electrical upgrades including Automatic Transfer Switches	\$ 2,500,000.00
6	New Container Crane	\$ 5,500,000.00
7	Demolition of Carpenter Shop	\$ 15,000.00
8	Parking Relocation Across Delaware Ave.	\$ 250,000.00
9	Adding Refrigeration to Tioga III Building	\$ 2,697,758.00
10	Upgrade power distribution, and add second PECO service	\$ 600,000.00
11	Construction of four-lane gatehouse for Tioga Fruit	\$ 381,530.00
12	New Gate and Roadability Complex for Container Area (without office building)	\$ 763,060.00
TOTAL		\$ 15,173,183.00

* All prices except for item No.6 (Third Crane) were obtained from 1994 MEANS Construction Cost Data or historical data for similar projects Urban has designed.

**ESTIMATED COST SUMMARY FOR
ITEMS REQUESTED BY PRPA, BUT
NOT INCLUDED AS PART OF RECOMMENDATION**

ITEM NO.	ITEM/TASK	AMOUNT
1	Demolition of Pier 179	\$ 4,843,100.00
2	Filling of Adjacent Sides of Pier 179	\$ 21,875,100.00
3	Filling of North Lagoon	\$ 33,981,820.00

VI. EXHIBITS

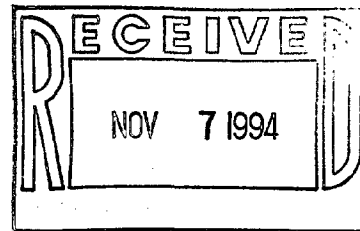


COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

P.O. Box 8555
Harrisburg, PA 17105-8555
November 1, 1994

717-787-2529

Bureau of Land and Water Conservation



Neil K. Christerson, Program Specialist
Coastal Programs Division - OCRM
SSMC4 Room 11209 (N/ORM 3)
1305 East-West Highway
Silver Spring, MD 20910

RE: DER File No. CZ1:A(93)

Dear Neil:

Enclosed with this letter are two copies of the final plan for the Tioga Marine Terminal Master Plan (CZ1:93PS.02). This project was completed with funds provided by a financial assistance award in the Coastal Zone Management Program for the Fiscal Year 1993.

Sincerely,

Robert S. Edwards
Environmental Planner II
Division of Coastal Programs

Enclosure

NOAA COASTAL SERVICES CTR LIBRARY



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