

4.1.3.13. During early 1992, the New Orleans District continued studying the economic feasibility of constructing various alternatives including the North of Claiborne alternative. The North of Claiborne Avenue site was determined to be a technically feasible alternative. In mid-1992 the New Orleans District produced a second "mini-report" documenting the costs, benefits, and major impacts of the various IHNC alternatives. The report included analysis of 200-foot east plans, a 200-foot west plan, an in-situ plan, and several plans for North of Claiborne Avenue. The plans investigated are listed as follows:

- ▶ A new lock, 200 feet east of the existing lock, constructed with conventional methods. Mid-level replacement bridges at St. Claude and Claiborne Avenues are also included as plan components.
- ▶ A new lock, 200 feet east of the existing lock. The steel shell of the lock would be prefabricated off-site and floated into place in sections. Mid-level replacement bridges at St. Claude and Claiborne Avenues are also included as plan components.
- ▶ A new lock, 200 feet west of the existing lock, constructed with conventional methods. Mid-level replacement bridges at St. Claude and Claiborne Avenues are included as plan components.
- ▶ In-situ replacement of existing lock, with a mid-level replacement bridge at St. Claude Avenue. The existing Claiborne Avenue bridge would be compatible with this lock alignment and would not need replacement.
- ▶ A new lock, located within the IHNC, north of Claiborne Avenue. The shell of the lock would be prefabricated off-site and floated into place in sections. A mid-level bridge would be constructed at St. Claude Avenue but the Claiborne Avenue bridge would not be replaced.
- ▶ A new lock, located within the IHNC, north of Claiborne Avenue. The shell of the lock would be prefabricated off-site and floated into place in sections. A low-level bridge would be constructed at St. Claude Avenue but the Claiborne Avenue bridge would not be replaced.
- ▶ A new lock, located within the IHNC, north of Claiborne Avenue. The shell of the lock would be prefabricated off-site and floated into place in sections. A low-level bridge would be constructed at St. Claude Avenue and a new mid-level bridge would be constructed at Claiborne Avenue.
- ▶ A new lock, located within the IHNC, north of Claiborne Avenue. The lock would be built using conventional construction methods. A new low-level bridge at St. Claude Avenue and a new mid-level bridge at Claiborne Avenue are part of this plan.

4.1.3.14. The four sites for a new lock included in the above plans represent the full range of technically feasible and rational locations for lock replacement at the IHNC site. A 200-foot east plan was determined to produce the highest apparent net benefits of the plans studied but, of the \$46 million apparent difference in net benefits between the best 200-foot east plan and the best North of Claiborne Avenue plan, \$31 million are attributable to costs sustained by navigation interests from the difference in IHNC closure durations of the two

plans. An additional \$71 million of the difference between the two plans results from vehicular transportation benefits foregone in the North of Claiborne Avenue Plan. The vehicular benefits attributable to the 200-foot east plan are derived from the extensive bridge replacements that are part of that plan -- replacements that produce significant socioeconomic impacts. The actual construction costs are lower for the North of Claiborne alternative.

4.1.3.15. During preparation of the second "mini-report", representatives of the Port of New Orleans and local elected officials met with the representatives of the New Orleans District to discuss the planning process. At the meeting held on March 20, 1992, the Port and elected officials agreed that only the North of Claiborne Avenue alternative would be implementable and refused to support a 200-foot east plan because of intolerable and unmitigable neighborhood impacts. The significant adverse impacts that were expected from most of the lock replacement plans at the IHNC, together with steadfast opposition to all but the North of Claiborne Avenue site by local residents and elected officials, led the New Orleans District to conclude in the second "mini-report" that the only site where a new lock could possibly be built at the IHNC was within the existing channel, North of Claiborne Avenue. The other site locations were determined to not be implementable because of significant, adverse socioeconomic project impacts that galvanized the local community and locally elected officials against them. Additional rationale for this conclusion is detailed in the Plan Formulation Section of the Main Report.

4.1.4. Phased Construction Plan

4.1.4.1. At the request of the Inland Waterway Users Board, a variation of the North of Claiborne Avenue lock replacement plan, called the phased construction plan, was investigated in considerable detail. In this plan, a new mid-level, St. Claude Avenue bridge would be constructed as early as possible but construction of a new lock would be delayed until a later date. The intention is to reduce vessel traffic congestion at the existing lock as soon as possible with a relatively low-cost effort and delay the expenditure of the considerable funds necessary for lock replacement. In order to allow for lock construction at a future date, the new bridge at St. Claude Avenue would have to provide sufficient horizontal clearance for vessels to use the existing lock and for vessels to use a temporary bypass channel during demolition of the existing lock. For this plan, at least a 300-foot horizontal clearance would be necessary. The most appropriate type of bridge would be a mid-level, vertical lift-span. This type of bridge has high towers and could be considered more objectionable than a double bascule bridge from an aesthetic perspective.

4.1.4.2. Of significantly more importance than the type of bridge, is the height of the bridge necessary for the phased construction plan. A low-level bridge is a component of the non-phased construction plan whereas the phased plan requires a mid-level bridge. This is an important consideration because of the number pedestrians and bicyclists that cross the existing low-level bridge. A mid-level bridge would seriously limit use by pedestrians and bicyclists. Also, a mid-level bridge would have significantly more impacts

on the local community since touch-down points and access ramps would extend farther into the adjacent neighborhoods and could require elevated access ramps. A mid-level bridge is required for the phased construction plan because a low-level bridge would not solve the problem of bridge interference with the existing lock.

4.1.4.3. A variety of lock sizes was investigated for the phased construction plan and for the conventional construction plan, which is discussed under Section 4.4., Plans Considered in Detail. It was determined the phased construction plan would result in short-term reductions in average vessel delays compared to the without-project condition. The year in which the net transportation cost savings of a particular size lock exceeds the average annual cost of the plan determined the optimal time when the new lock should be operational. For the optimally-sized, phased construction plan, it was determined that the lock should be operational by the year 2013, which is only two years after a lock would be completed by the non-phased construction plan. The phased plan was found to be clearly inferior economically, accounting for only 69 percent of the total average annual net benefits of the non-phased plan. It is not considered to be a viable alternative, and it has been eliminated from further discussion.

4.1.5. Steel-shell Lock Design

Social mitigation efforts focused on avoiding as many adverse impacts to adjacent neighborhoods as possible. A soil-founded lock design was investigated in detail to minimize the potential noise and vibration effects of driving a large number of pilings. For a soil-founded lock, only a small number of leveling pilings would be necessary, with the lock being supported from below by soils and bedding material. Plans for a steel-shell lock to be constructed in modules at an off-site location were developed. Foundations testing and analysis indicated that the plan would be feasible. During internal review of the steel-shell, soil-founded lock design, serious concerns surfaced over the long-term viability of a steel-shell lock. Corrosion, damage from vessels, maintenance costs, and lock closures for required repairs were critical topics. After much discussion and review within the Corps of Engineers, the steel-shell lock design was deemed infeasible from a long-term viability perspective. Planning then shifted to a concrete lock design which, because of its massive weight, can not be soil-founded and would require a large number of pilings for support.

4.2. NO ACTION/WITHOUT PROJECT CONDITIONS

4.2.1. If no Federal action is taken to address the planning objectives, waterborne commerce would continue to use the existing lock and would experience more frequent and costly delays due to lock congestion. The average waiting time at the IHNC lock is 10 to 15 hours. This condition is expected to continue into the future without any action to alleviate the situation. Florida Avenue bridge replacements and improvements by others are not expected to relieve the chronic vessel congestion problems at the lock.

4.2.2. There would be a change in vehicular transportation without a project. Vehicular traffic in the area of the IHNC would increase as the population of St. Bernard Parish grows and the more commuters use existing corridors for access to the New Orleans Central Business District.

4.2.3. The existing Florida Avenue bridge across the IHNC is a combination rail and vehicle bridge. It breaks down and is hit by barges frequently. The U.S. Coast Guard has declared it to be a hazard to navigation and has issued an Order to Alter to the Port of New Orleans to replace the bridge. Funding for replacing the bridge is from Truman-Hobbs legislation. The replacement bridge will have a 300-foot horizontal clearance, which is compatible with the proposed lock replacement. The bridge is in the final design phase and will be replaced in the near future. The U.S. Coast Guard has made a preliminary determination that the bridge will be replaced under a categorical exclusion, which excludes the action from further National Environmental Policy Act documentation. This bridge replacement must be completed before the new lock modules can be floated into place, since the existing bridge does not provide sufficient horizontal clearance.

4.2.4. In addition to the replacement bridge at Florida Avenue, the Louisiana Department of Transportation and Development is planning to construct a new high-level or mid-level vehicular bridge across the IHNC in the vicinity of Florida Avenue. Less definitive plans include an extension of Florida Avenue east to Paris Road (Louisiana Highway 47) which connects to Interstate 510 and west to Interstate 10. The new bridge, whether it is mid-level or high-level would be compatible with a new lock.

4.2.5. The two new bridges planned at Florida Avenue are not expected to significantly improve traffic flows in the study area without other improvements to the Florida Avenue corridor. There may be some additional use of Florida Avenue once the new bridges are constructed, but it is not expected to appreciably reduce traffic delays at either the St. Claude or Claiborne Avenue bridges. An extension of Florida Avenue to Paris Road would make the new bridge at Florida Avenue more attractive to commuters and would likely draw traffic away from the other crossing of the IHNC. For this study, the replacement bridge and the new bridge at Florida Avenue are included as part of the future without project condition. However, only the low-level replacement bridge is necessary for the construction of the recommended plan. Plans for a Florida Avenue extension to Paris Road are in preliminary stages and are not part of the future without-project condition.

4.2.6. According to the 1990 census, there is an 18.3 percent vacancy rate in the study area which is defined for most purposes as the area between the Mississippi River on the south and Florida Avenue on the north and between Franklin Avenue on the west and the Orleans-St. Bernard Parish line on the east. Twenty percent of the vacant units in the area are boarded-up. Vacancy rates are higher than in the City of New Orleans as a whole, which was reported to be 16.6 percent in the 1990 census. Property values in the study area are depressed. Without a Federal project, the IHNC neighborhoods would likely

continue to experience out-migration of population. However, recent development of a number of community organizations in the study area such as neighborhood associations, community development associations, neighborhood watch groups, parent-teacher associations, and community outreach groups indicate cohesive neighborhood group activity. These organizations have successfully worked to promote various improvements in the community including streets and playgrounds, and are actively engaged in renovation efforts to restore abandoned properties. The efforts of these organizations should help to slow down or reverse the decline of the neighborhoods in the study area.

4.2.7. Noise levels in the IHNC area would be expected to remain essentially unchanged. Business and industrial activity in the study area would likely change very little. There are approximately 50 businesses located on the IHNC between the Mississippi River and Lake Pontchartrain on property owned by the Port of New Orleans. These businesses employ about 3,000 persons (minimum) and many of the establishments rely on the lock for access to the river. Employment in the area would likely remain at its current level. If the existing delays at the lock are exacerbated and, as a result, waterborne traffic selects other routes and ports, the economy dependant upon the IHNC and the MRGO could suffer.

4.3. PLANS CONSIDERED IN DETAIL

4.3.1. General

Two action plans and the no-action alternative, which involves rehabilitation of the existing lock, will be considered in detail in this report. At present, a low-level, bascule, combination vehicle and railroad bridge crosses the IHNC at Florida Avenue. Using funds provided through the U.S. Coast Guard, the Port of New Orleans will replace this bridge with a new low-level bridge that will accommodate both rail and local vehicular traffic. This bridge replacement is necessary for any one of the lock replacement alternatives to be constructed since the existing bridge does not provide sufficient horizontal clearance to float-in the lock modules. The Louisiana Department of Transportation and Development will construct a new high-level or mid-level vehicular bridge across the IHNC at Florida Avenue. At some undetermined time, an elevated extension of Florida Avenue to Paris Road may be constructed, but the timing and funding for this effort are so uncertain that it has not been made part of the future scenario. The costs of the two new bridges at Florida Avenue are not included in the lock project, and their costs are not applicable NED costs.

4.3.2. Plan 1 (No-Action)

The no-action alternative requires extraordinary maintenance expenditures for the existing IHNC Lock. It is estimated that for the existing lock to operate at full capacity over the project life, it would be necessary to make these expenditures at an estimated cost of

\$16,100,000. Several canal closure periods of 1-2 month duration would be necessary to accomplish the work. The work would consist mainly of repair and replacement of machinery, and would have no social and environmental impacts on the nearby residential areas. Average annual operating and maintenance expenses for the existing lock are estimated at \$1,700,000 per year, which does not include the extraordinary maintenance.

4.3.3. Plan 2 (Bridge-Only Plan)

4.3.3.1. This plan does not involve replacement of the IHNC Lock, but rather, consists of a new bridge across the IHNC at St. Claude Avenue (Plate 8). The existing low-level St. Claude Avenue bridge is an impediment to navigation traffic. In order to facilitate vehicular traffic, the bridge is not raised during rush hour traffic times. This bridge "curfew" period is regulated by an agreement between the Port of New Orleans and the U.S. Coast Guard. Since the bridge is low-level and is located immediately next to the lock, no vessels can pass through the lock while the bridge is down. A mid-level bridge at St. Claude Avenue would allow most shallow-draft vessels to pass through the lock without opening the bridge, thereby improving both vehicular and vessel traffic.

4.3.3.2. The new St. Claude Avenue bridge for this plan would be mid-level, double bascule bridge that would be sufficient for vessels currently able to use the existing lock. The bridge would have 200-foot horizontal clearance and unlimited vertical clearance. The 200-foot horizontal clearance is the minimum required for safe navigation at this location as determined by the U.S. Coast Guard.

4.3.3.3. This plan would not be compatible with future construction of a replacement lock. In order to construct a new lock at the North of Claiborne Avenue location without shutting down vessels traffic for an extended period of time, a temporary bypass channel must be constructed on the east side of the existing lock. The bridge which would be constructed under this plan would not have sufficient horizontal clearance to allow construction of the bypass channel and therefore would have to be replaced or substantially modified before a new lock could become operational.

4.3.3.4. Significant adverse impacts of this plan would include traffic delays during the construction period and the rerouting of some bridge traffic through neighborhood streets upon completion of work. The aesthetic quality of the neighborhoods adjacent to St. Claude Avenue would also be adversely affected. Noise levels that are normally considered to be unacceptable would affect people living and working in the immediate area during certain phases of bridge construction. No displacements of businesses or residents would be necessary, however, customer access and parking for several businesses along St. Claude Avenue would be reduced. The construction period for bridge replacement would be expected to take about 3 years.

4.3.3.5. The community impact mitigation plan for this alternative focuses on avoidance and compensation for impacts to vehicular traffic, community cohesion, noise, aesthetic

qualities, and police and fire protection during project construction. The cultural resources mitigation plan would involve testing for the presence of cultural resources encountered during project construction and recordation of any significant items discovered. This plan would require demolition of one property which is eligible for the National Register -- the St. Claude Avenue bridge. Prior to demolition, the property would be recorded to Historic American Building Survey and Historic American Engineering Record standards. This plan would not impact fish and wildlife habitat and no mitigation for the loss of natural habitat is proposed.

4.3.4. Plans 3a through 3f (New Lock - North of Claiborne Avenue)

4.3.4.1. A wide range of lock sizes for the North of Claiborne Avenue site have been investigated during the course of this study. Analyses have focused mainly on locks with lengths of 900 feet and 1,200 feet, widths of 90 feet and 110 feet, and depths of 22 and 36 feet. The 22-foot depth is the minimum necessary to allow safe and proper functioning of the lock for shallow-draft navigation. From the standpoint of impact analysis, locks of various sizes at a given location, and for a given construction scenario, produce very similar impacts. The main differences among the different size locks would be their effects on waterborne commerce. For details on the economic analyses performed, refer to the Main Report and the Economics Appendix. The right-of-way required for all lock sizes investigated at the North of Claiborne Avenue site would be essentially the same.

4.3.4.2. The plans designated 3a through 3f involve replacement of the IHNC lock with a new lock to be constructed within the IHNC, north of Claiborne Avenue. For most significant resources, there would be no differences among the plans. Table 3 shows the dimensions of each lock replacement plan.

**TABLE 3
LOCK DIMENSIONS FOR PLANS 3a THROUGH 3f**

Plan	Length	Width	Depth
Plan 3a	900'	90'	22'
Plan 3b	900'	110'	22'
Plan 3c	900'	110'	36'
Plan 3d	1,200'	90'	22'
Plan 3e	1,200'	110'	22'
Plan 3f	1,200'	110'	36'

4.3.4.3. Construction of a new lock at the North of Claiborne Avenue location would require a complex sequence of tasks that must occur in chronological order to minimize canal closure times and community impacts. The various components of the North of Claiborne Avenue plan are provided as Plates 7, 9, and 10 through 24. Also, a series of 16

computer-enhanced, project construction sequence illustrations are provided at the end of the Main Report. The following description of the construction sequence contains only the major actions which would occur.

4.3.4.4. The Galvez Street wharf and the U.S. Coast Guard facility on the west bank of the IHNC, along with businesses along the east side of the IHNC between the river and Florida Avenue, would be demolished and removed. A temporary bypass channel (the north bypass channel) would be excavated on the east side of the site designated for the new lock. The site for the new lock would be prepared by dredging the canal bottom, placing bedding material, and driving pilings. Material dredged for the bypass channel and from the canal bottom would be hydraulically deposited along the south bank of the MRGO in an area previously used for dredged material disposal and in a shallow open water area to develop marsh as mitigation for impacts of an offsite construction yard. Meanwhile, reinforced concrete lock modules would be partially constructed at the offsite construction yard (graving site) along the MRGO/GIWW near Paris Road. The four partially completed lock modules would be individually floated to the present site of the Galvez Street wharf where lock walls and accessories would be added. (In order for the lock sections to be floated into place, the Florida Avenue bridge would already have been removed and replaced by others.) The completed modules would be floated to the prepared foundation site and ballasted into position.

4.3.4.5. A detour road would be constructed through an undeveloped area in St. Bernard Parish to link St. Bernard Highway, Judge Perez Boulevard, and Florida Avenue. The road would allow commuters to easily access the Florida Avenue bridge and thereby bypass the chronically congested St. Claude and Claiborne Avenue bridges. Temporary, single-bascule bridges would be constructed adjacent to the St. Claude Avenue bridge to provide a comparable level of traffic flow at this location while the St. Claude Avenue bridge is replaced with a low-level, double-bascule bridge. The towers and lift-span of the Claiborne Avenue bridge would be replaced. The new towers and lift-span would be prefabricated off-site and floated into position on barges. The closure time of the bridge to vehicular traffic for this work would be 2-4 weeks. Levees and floodwalls would be relocated and upgraded as necessary to provide uninterrupted hurricane and river flood protection. The new lock would become operational and the north bypass channel would be back-filled mainly with material taken from a south bypass channel (demolition bypass channel) to be excavated around the east side of the old lock.

4.3.4.6. The existing lock would be demolished and material hauled away. Final dredging would be required in the vicinity of the old lock site, the old lock fore-bay, the new lock fore-bay. Some of this material would be used for additional backfill around the new lock site, with the excess pumped to the Mississippi River. The new lock guide walls would be installed and permanent mooring facilities would be constructed. The entire construction phase is expected to take about 11 years.

4.3.4.7. Industrial facilities or shipyards capable of constructing the lock modules are not readily available in the vicinity of the IHNC. In order to assure that the lock modules could be constructed, a site was selected in proximity to the IHNC, and plans have been developed for preparing the site for lock module construction. This site is referred to henceforth as the graving site. The graving site, known as the Aurora Property, is located on the north bank of the GIWW/MRGO just west of the Paris Road bridge. The site was selected from a list of alternatives suggested by the Port of New Orleans. The sites were subjected to a screening analysis to determine the best overall location Table 4.

4.3.4.8. The graving site is located within the New Orleans Business and Industrial District (NOBID). Mitigation for impacts to wetlands within the NOBID was accomplished in the 1980's by donation of funds to the Nature Conservancy for the purchase of the White Kitchen wetland in St. Tammany Parish, Louisiana. At the time, the graving site was under forced drainage and was not identified as a jurisdictional wetland. Therefore, the mitigation did not account for the graving site. Since then, drainage patterns have changed, and the area has reverted to a consistently flooded condition, providing suitable habitat to a wide variety of wetland-dependent wildlife species.

4.3.4.9. Engineering investigations to be conducted during preparation of detailed designs could indicate that other locations for the graving site would be less costly and less environmentally damaging. Also, the successful bidder on the lock module construction contract could devise a method to construct the lock modules at an existing industrial facility. Although there is a strong possibility that the designated graving site would not be used, a mitigation plan for impacts to the site has been developed. Impacts to the site would be minimized by restricting the area to be impacted to the minimum necessary for graving site construction and associated staging and stockpile areas. Direct impacts would be restricted to 25 acres of freshwater wetlands.

4.3.4.10. The tentative dredged material disposal plan for most of the soil and sediment excavated during the early stage of project construction is to dispose of the material, either hydraulically or by hauling, in previously-used disposal areas for the MRGO. Use of the material for wetland restoration has been investigated in detail, but the USFWS has determined that canal bottom sediment and some of the soil (the uppermost 5 feet) from the east bank of the IHNC is too contaminated for use in wetland restoration. The material contains heavy metals, volatile organic compounds, and polycyclic aromatic hydrocarbons.

4.3.4.11. Mitigation plans for impacts of the graving site focused on beneficial use of the material to be dredged for project construction. The soil from the east bank of the IHNC, below 5 feet in depth, is uncontaminated and suitable for wetland restoration. This material would be used to develop between 31 and 41 acres of vegetated wetland (the amount varies with lock size). Habitat evaluation procedures of the USFWS were used to verify that the use of the clean, east-bank soils for wetland restoration would adequately mitigate for adverse project impacts of the graving site.

TABLE 4
IHNC LOCK REPLACEMENT - GRAVING SITE SELECTION EVALUATION
QUALITATIVE RANKING

Site Description	Port of New Orleans Ranking	Space Available	Disposal Available/ Refill Slip	Foundation Conditions	HTRW Status	Levee Protection Impacts	Utilities Relocation Impacts	Proximity to Lock Site	Wetland Impacts
Site 1 - Aurora MRGO @ Paris Road, Northwest	1	Yes	Yes/No	Fair	Good	Yes	No	6.2 miles	Yes
Site 2 - Newport, MRGO @ Paris Road, Southeast	2	Yes	Yes/No	Fair	Good	Yes	No	6.5 miles	Yes
Site 3 - Gott, MRGO @ Paris Road, Southwest	3	Yes	Yes/No	Fair	Good (Oil Tanks?)	Yes	Yes Natural Gas and Communication Lines	6.3 miles	Yes
Site 4 - Public Bulk Terminal, MRGO - North Bank	4	Yes	Yes/No?	Fair-Good	Fair	Yes	Yes 54" Forced Main, Rail	3.1 miles	Possibly
Site 5 - Barriere, MRGO @ IHNC, Northeast	5	Possibly	Possibly/ Probably	Good	Fair	Probably	Yes Roadway, Utility Poles	1.6 miles	No
Site 6 - Gulf Outlet Fuel Dock, MRGO @ IHNC, Southeast	6	Marginal	No / Probably	Good	Needs Work	No	No	1.5 miles	No

* Alternate offsite disposal by truck hauling or hopper barge is available. Dredged soil material (high clay content) is merchantable.

Note: Another site considered on the IHNC (not listed herein) is Slip No. 4 located along the east bank of the IHNC. This site has a 99-year lease which doesn't expire until 2047. Any temporary usage would have to be negotiated.

4.3.4.12. A broad-based community impact mitigation plan is an integral part of this plan. The plan in this final report is substantially different from that proposed in the draft, with changes prompted by public comments made during the public review period for the draft report. The mitigation plan now includes temporary bridges that eliminate bridge closure periods, and many items in the draft mitigation plan were transferred into the category of normal construction activities. Funding for most of the items remaining in the mitigation plan were increased. The current mitigation plan calls for specific actions to minimize and compensate for adverse impacts to the local community that are expected from project construction, mainly in areas of community facilities and services, community cohesion, noise, police and fire protection, aesthetics, and pedestrian access.

4.3.4.13. Lock replacement plans would require the demolition of three National Register eligible properties. Prior to project construction, these properties would be recorded to Historic American Building Survey and Historic American Engineering Record standards.

4.3.5. National Economic Development Plan

Plan 3b, the shallow-draft (22-foot deep) lock with a length of 900 feet and width of 110 feet, is designated as the National Economic Development (NED) plan because it produces the greatest net benefits over costs of any of the plans considered in detail. It is considered to be a socioeconomically and environmentally acceptable plan. The cost of Plan 3b would be allocated equally between the General Fund of the U.S. Treasury and the Inland Waterways Trust Fund. The Federal government (Corps of Engineers) would be responsible for obtaining all lands, easements, and right-of-ways required for project construction, the costs of which would be included in the overall project cost.

4.3.6. Locally Preferred Plan

The plan preferred by the Port of New Orleans, the local project sponsor, is Plan 3f. Plan 3f is the largest lock size investigated in detail (1200- by 110- by 36 feet). This plan would provide the flexibility and capacity preferred by the Port of New Orleans, and it would produce the greatest net benefits of any deep-draft lock investigated in detail. The 36-foot lock depth is compatible with the controlling depth of the MRGO and would allow deep-draft vessels using the MRGO and docks along its banks, to pass to and from the Mississippi River.

4.3.7. Environmentally Preferred Plan

From a natural environment perspective, all of the lock replacement alternatives (Plans 3a through 3f) would have similar impacts. A graving site would be required for all lock replacement alternatives, and disposal of contaminated soils and sediments would be necessary. Plan 2 (Bridge-Only) is designated as the environmentally preferred plan because it is less disruptive of the social and cultural aspects of the human environment,

compared to the lock replacement plans, and it would have no direct impacts on the natural environment.

4.3.8. Recommended Plan

The recommended plan (TSP) is Plan 3f, which provides for a new lock with dimensions of 110 feet wide by 1,200 feet long by 36 feet deep. It is also the locally preferred plan, favored by the Port of New Orleans, the local sponsor. From an economic perspective, Plan 3f would produce greater gross economic benefits, but is not incrementally justified over Plan 3b. The Port of New Orleans would be responsible for the incremental cost of Plan 3f over Plan 3b.

4.4. COMPARATIVE IMPACTS OF ALTERNATIVES

Table 5 provides a summary of the impacts associated with alternatives investigated in detail on significant resources and issues. The table lists the impacts expected without mitigation. However, a community impact mitigation plan and fish and wildlife mitigation plan are integral parts of all action alternatives considered. A description of each significant resource and a more detailed analysis of the impacts are contained in Section 5, *Affected Environment/Environmental Effects*. Table 6 provides a comparative view of the costs and benefits associated with the action alternatives investigated.

**TABLE 5
COMPARATIVE IMPACTS OF ALTERNATIVES**

RESOURCE	EXISTING AND FUTURE WITHOUT-PROJECT CONDITION	PLAN 2 BRIDGE ONLY	PLANS 3a THROUGH 3f NEW LOCK
Waterborne Transportation	Continued increases in commerce on the Mississippi River and the GIWW would increase the average delay times at the IHNC lock. As delay times increase, some tows would switch to alternate waterways or products would be diverted to other forms of carriage.	The new bridge would reduce, but not eliminate, future transit delays.	The expected level of shallow-draft transit delays would be reduced considerably with the shallow-draft lock plans. Deep-draft lock plans would also considerably reduce transit times for deep-draft vessels between the MRGO and Mississippi River.
Flood Protection Systems	Mississippi River levees, hurricane protection levees, and internal drainage systems would be maintained and upgraded as necessary to protect developed areas.	A relatively minor amount of Mississippi River levee modification would be necessary in the vicinity of the St. Claude Avenue bridge. Flood protection would be maintained throughout construction period.	Flood protection levees and floodwalls would be modified between the river and the new lock site to accommodate Mississippi River floods. Some realignment would be necessary on the west side of the IHNC. The hurricane protection levee at the graving site would be re-aligned. Adequate flood protection would be maintained during the construction period.
Business and Industrial Activity	A wide variety of businesses and industries are located along and in the vicinity of the IHNC. Business activity would likely change very little in the near future.	Activity at some businesses in the vicinity of the IHNC would be impacted during periods of bridge closure by traffic delays and detours and noise. After project construction, altered traffic patterns would continue to affect some local businesses near St. Claude Avenue.	Project construction, including bridge work, could adversely affect businesses in the vicinity, especially those dependent upon trans-canal traffic. After project construction, no adverse impacts to local businesses would be expected.
Employment	Available information indicates that unemployment rates in the study area are higher than the average in metropolitan New Orleans. This condition would likely continue.	Employment at local businesses that depend on trans-canal customers could be adversely affected during the period of bridge closure.	Employment at local businesses could be adversely affected during the construction period, especially during bridge work. Effects to employment at the two businesses to be relocated cannot be determined.
Land Use	No significant changes are expected in the industrialized corridor along the IHNC or in the urban residential communities of the area.	No significant change in the mix of land uses would be expected.	Publicly-owned lands along both sides of the IHNC would be converted to an alternate use as part of the inland waterway system.

**TABLE 5
COMPARATIVE IMPACTS OF ALTERNATIVES**

RESOURCE	EXISTING AND FUTURE WITHOUT-PROJECT CONDITION	PLAN 2 BRIDGE ONLY	PLANS 3a THROUGH 3f NEW LOCK
Property Values	Property values in the study area reflect a range of influences, many of which are regional in nature. A 1991 study suggests continuing property value decline in the study area.	Property values would likely be adversely, though temporarily, affected by bridge closures. Increased traffic congestion would tend to discourage potential residents.	Property values could be adversely, though temporarily, affected by project construction. Increased traffic congestion would tend to discourage potential residents. Long-term, adverse effects from more frequent bridge openings at Claiborne Avenue also possible.
Public/Community Facilities and Services	Existing facilities and services which are typical for an urban community are expected to continue in the vicinity of the IHNC.	The bridge closure period would adversely affect access to community facilities. Police, EMS, and fire fighting services would also be adversely affected.	Project construction, especially bridge work, could adversely affect access to community facilities. Police, EMS, and fire fighting services could also be adversely affected.
Tax Revenues	No significant change in existing tax revenues is expected. State and local governments are heavily dependent on sales taxes which approach 10 percent.	No net effect on tax revenues is expected although individual businesses may experience increased or decreased sales.	No net effect on tax revenues is expected although individual businesses may experience increased or decreased sales.
Population	The neighborhoods around the IHNC are expected to continue experiencing an out-migration. Vacancy rates are expected to remain high.	No residential relocations would be required. Traffic congestion associated with bridge closure could influence some residents to move elsewhere.	No residential relocations would be required. Perceived and real inconveniences could influence some residents to move elsewhere.
Community and Regional Growth	Neighborhoods around the IHNC are mature. Community growth depends on redeveloping or intensifying the existing neighborhoods.	The potential for community growth would be diminished during periods of bridge closure. Long-term beneficial effects may result from improved vehicular access across the IHNC.	The potential for community growth would be diminished during the construction period. No long-term adverse effects on community growth are expected.
Vehicular Transportation	A new bridge to be constructed across the IHNC at Florida Avenue by others, will not significantly reduce existing traffic delays for commuters and residents crossing the IHNC.	Closure of the St. Claude Avenue bridge would significantly increase trans-canal traffic congestion. Long-term beneficial effects would be expected from a more efficient crossing at St. Claude Avenue. Pedestrian access across the IHNC would be significantly impacted both during construction and over the long term.	The bridge restriction period required for up to 4 months at St. Claude Avenue would adversely affect vehicular traffic. In the post-construction period, traffic across IHNC should be improved. Eventually, with projected increases in navigation traffic, the total amount of time that the bridges would be in the open position, would be higher than what would occur in the no-action scenario.

**TABLE 5
COMPARATIVE IMPACTS OF ALTERNATIVES**

RESOURCE	EXISTING AND FUTURE WITHOUT-PROJECT CONDITION	PLAN 2 BRIDGE ONLY	PLANS 3a THROUGH 3f NEW LOCK
Housing	Housing varies from well-maintained residences to vacant, abandoned houses. Vacancy rates are relatively high. The housing market is depressed.	No residential relocations would be necessary and no damage to residential structures would be expected.	No residential relocations would be necessary and no damage to residential structures would be expected.
Community Cohesion	The presence of a large number of community organizations indicates cohesive neighborhood group activity. Neighborhoods have developed individual identities.	Bridge closure would disrupt some routine daily activities such as shopping, visiting with neighbors, and walking.	Bridge work at St. Claude Avenue, requiring a reduction to two lanes of traffic, would disrupt some routine daily activities such as shopping, visiting with neighbors, and walking for up to a 4 month period.
Noise	Noise levels are commensurate with the urban setting of the IHNC. Vehicular traffic is the largest noise generator. Existing noise levels are expected to continue in most areas.	Under a worst-case scenario, as many as 315 housing units could be affected by "normally unacceptable" noise levels. The duration of the noise impacts would vary along the bridge construction corridor.	Under a worst-case scenario, "normally unacceptable" noise levels from lock construction could impact 286 housing units. St. Claude Avenue bridge replacement could affect 315 housing units. Refitting of the Claiborne Avenue bridge would affect an undetermined number of housing units.
Air Quality	Orleans and St. Bernard Parishes are classified as non-attainment areas for air quality. Ozone is the problem constituent. A request for reclassification to attainment status is being prepared. Conditions are expected to continue without significant change.	Traffic delays during bridge construction would increase pollutants in the immediate vicinity. Construction equipment would add additional emissions and cause an increase in dust (particulate) levels during the 2-3 year construction period.	Extensive demolition of buildings and structures, hauling of fill material, and general construction would increase emissions and dust during the 11-year construction period. Emissions from construction equipment would not violate air quality regulations.
Forested Areas	Small forested areas occur along the banks of canals and bayous and in remnant tracts in St. Bernard Parish. These forested areas provide habitat for a variety of wildlife species.	No effect -- same as future without-project condition.	A detour road planned to connect Florida Avenue to Judge Perez Boulevard and St. Bernard Highway would skirt the western edge of a 155-acre forested area. At most, 28 acres of forested land would have to be cleared. Dredged material disposal would impact MRGO disposal areas which contain early successional woody vegetation.

**TABLE 5
COMPARATIVE IMPACTS OF ALTERNATIVES**

RESOURCE	EXISTING AND FUTURE WITHOUT-PROJECT CONDITION	PLAN 2 BRIDGE ONLY	PLANS 3a THROUGH 3f NEW LOCK
Coastal Wetlands	The coastal wetlands (especially marsh) to the east of the IHNC will continue to be lost to soil compaction and subsidence, erosion by wave action, and developmental activities.	No effect -- same as future without-project condition.	The grading site necessary for lock module construction would destroy 25 acres of freshwater wetland. Clean soil from the east bank of the IHNC would be used to build vegetation wetlands and mitigate for lost habitat value.
Water Quality	The IHNC, tidal wetlands, and the Mississippi River are negatively affected by pollutants in urban runoff, industrial discharge, and vessel waste. Conditions are expected to remain the same or improve slightly.	Impacts to water quality would be localized, minor, and of short duration. Some turbidity would occur during construction.	Dredging and disposal activities would increase concentrations of several constituents, namely chromium, copper, and zinc in the Mississippi River, and copper and zinc in the IHNC. Short-term increases in turbidity and decreases in dissolved oxygen are also expected.
Aesthetic Values	The two historic neighborhoods in the IHNC vicinity offer a unique aesthetic value. Other aesthetic resources are the Holy Cross levee and batture area and the grove of live oak trees next to the IHNC lock. No significant changes are expected to these areas.	The new St. Claude Avenue bridge would have various effects, both positive and negative, on the aesthetic appeal of the area. The new bridge would be larger and higher but new open areas would be created under the bridge approach ramps.	The new St. Claude Avenue bridge would have both positive and negative aesthetic effects. The grove of oak trees next to the existing lock would be removed. A fold-down floodwall on top of a section of levee near the Holy Cross neighborhood, would have adverse effects only when raised during high-water conditions.
Recreational Opportunities	Recreational opportunities in the IHNC area include activities at neighborhood playgrounds and gyms, and activities associated with the levee and batture areas such as walking, bicycling, picnicking, fishing, and relaxing. No significant changes are expected.	Both long and short-term adverse impacts to recreational pursuits would be expected. During bridge construction, pedestrian and bicycle traffic across the IHNC would be virtually eliminated. After the construction period, the mid-rise bridge would be difficult, at best, to cross by foot or bicycle.	Crossings of the IHNC by foot or bicycle would be greatly impaired, if not eliminated, during bridge construction but would be restored afterward. A fold-down floodwall on top of a section of levee near the Holy Cross neighborhood, would have adverse effects only when raised during high-water conditions.

**TABLE 5
COMPARATIVE IMPACTS OF ALTERNATIVES**

RESOURCE	EXISTING AND FUTURE WITHOUT-PROJECT CONDITION	PLAN 2 BRIDGE ONLY	PLANS 3a THROUGH 3f NEW LOCK
Cultural Resources including National Register Sites	Two historic neighborhoods adjacent to the IHNC are listed in the National Register. Also, the Galvez Street Wharf, St. Claude Avenue Bridge, the existing IHNC lock, and a sewage pumping plant are all eligible for listing in the Federal Register.	The St. Claude Avenue bridge, which is eligible for the Federal Register would be demolished. It would be documented to accepted standards. The replacement bridge would have an adverse visual impact on the nearby historic neighborhoods.	The IHNC lock, St. Claude Avenue bridge, and Galvez Street wharf, all eligible for the Federal Register, would be demolished. They would be recorded to accepted standards. No significant adverse post-construction impacts expected.

TABLE 6
COMPARATIVE ECONOMIC CHARACTERISTICS OF ALTERNATIVES
 (Based on 1996 price levels, 7.375% interest rate, and 50 year project life)
 (x \$1,000)

ALTERNATIVE	FIRST COST	TOTAL ANNUAL COSTS	TOTAL ANNUAL BENEFITS ¹	NET BENEFITS ¹ ADJUSTED TO 2010	BENEFIT/COST RATIO
Plan 2	61,056	5,465	20,973	20,614	3.84
Plan 3a	410,707	49,352	97,117	47,765	1.97
Plan 3b (NED)	443,907	53,146	104,379	51,233	1.96
Plan 3c	462,307	57,846	106,823	45,613	1.85
Plan 3d	430,907	54,745	108,365	49,937	1.98
Plan 3e	458,307	58,086	109,410	47,799	1.88
Plan 3f (Recommended)	512,107	63,438	110,427	43,762	1.74

¹ Bridge curfews are assumed to be abolished for Plan 2. For Plans 3a through 3f, bridge curfews are assumed to remain in effect.

5. AFFECTED ENVIRONMENT/ENVIRONMENTAL EFFECTS

5.1. ENVIRONMENTAL CONDITIONS

5.1.1. The study area, for socioeconomic impact analysis purposes, is Orleans and St. Bernard Parishes. Discussions will be limited mainly to the area between the Mississippi River on the south, Florida Avenue on the north, Franklin Avenue on the west, and the Orleans-St. Bernard Parish line (Jackson Barracks) on the east. This is an area of about 4.5 square miles. The biological study area includes the Mississippi River from the IHNC to the river's mouth, the IHNC, Orleans Parish east of the IHNC, and St. Bernard Parish west of Paris Road (Louisiana Highway 47).

5.1.2. The land in Orleans and St. Bernard Parishes was created relatively recently in geologic history by sedimentary processes of the Mississippi River. Land elevations within the area range from below sea level to a maximum of 15 to 20 feet above sea level. The higher lands are the natural and man-made levees along the Mississippi River and its inactive distributaries. The area immediately adjacent to the IHNC is totally developed for industrial, commercial, and residential usage. The undeveloped portions of the biological study area contain large areas of shallow brackish water, bayous, canals, freshwater wetlands, brackish marsh, vegetated canal banks, and scrub/shrub wetlands.

5.1.3. Levees along the Mississippi River protect Orleans and St. Bernard Parishes from river flooding. Hurricane protection levees and floodwalls protect portions of these parishes from storm-induced tidal flooding. All of Orleans Parish west of the IHNC is protected by levees and is under forced pumping to remove excess rainwater. Developed portions of Orleans and St. Bernard Parishes, east of the IHNC, are also leveed and under forced drainage. During normal meteorological conditions, floodgates allow tidal fluctuation within some parts of the hurricane levee system to maintain wetland characteristics and allow access by vessels. A secondary, local levee and floodwall system separates most of the developed area from the tidal wetlands within the larger hurricane protection system.

5.1.4. Climatically, the area is warm and humid with mild winters and hot summers. Rainfall is high, averaging about 60 inches per year, and tropical storms and hurricanes periodically cross the area. The biological study area contains populations of resident and transient estuarine fish and shellfish, small mammals, resident and wintering waterfowl, and wading birds, and many other avian species.

5.2. ITEMS NOT SIGNIFICANTLY AFFECTED

5.2.1. Several items that are often affected by large civil works projects would not be affected by any of the alternatives under consideration, mainly because of the urban, developed conditions of the IHNC area. No agricultural lands and farms are present in the area near the IHNC. Correspondence with the Department of Agriculture, Soil Conservation Service confirmed that no prime or unique land subject to provisions of the Farmland Protection Policy Act are located in the vicinity of the IHNC. Documentation is provided in Appendix D, Section 6.

5.2.2. Consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service revealed that no threatened or endangered species are likely to be affected by any project alternative. There are several listed species that may be found in the area, but most occur as strays or vagrants from areas where they are more likely to be found. The only listed species that is normally found in the area is the endangered brown pelican. Brown pelicans occasionally forage in the tidal wetlands and water bodies of the study area, especially during winter, but breed on islands closer to the Gulf of Mexico. No adverse impacts to this species is anticipated from any alternative under consideration. Documentation of compliance with the Endangered Species Act is provided in Appendix D, Section 2.

5.2.3. Seven bayous that are part of the Louisiana Scenic Rivers System are located in the tidal wetlands of St. Bernard Parish. These streams are far removed from the areas that would be affected by the alternatives under consideration and no impacts to these streams are expected. No Federally listed scenic rivers are located in Louisiana.

5.2.4. The Bayou Sauvage National Urban Wildlife Refuge is located in eastern Orleans Parish. A large part of the refuge is located within the Lake Pontchartrain and Vicinity Hurricane Protection levees. This part of the refuge is drained by both gravity drainage and forced pumping systems. The refuge also includes tidal, brackish marshes between the GIWW and Lake Borgne and between the hurricane protection levee and Lake Pontchartrain. The refuge is sufficiently removed from IHNC that no effects to the refuge would occur from any of the alternatives under consideration. No other Federal or State wildlife refuges, management areas, or parks are located in the vicinity of the IHNC.

5.3. SIGNIFICANT RESOURCES AND ALTERNATIVE EFFECTS

5.3.1. Introduction.

5.3.1.1. A resource is considered significant if it is identified in the laws, regulations, guidelines, or other institutional standards of national, regional, and local public agencies; if it is specifically identified as a concern by local public interests; or if it is