EXHIBIT 7.3: Level II Alternative

Construction Costs
(Thousands of Dollars)

Element	Five Crossings Closed	Seven Crossing Gates
Metairie Road Underpass	$1,480	1,480
Two Pedestrian Overpasses	480	
Fence	275	
Interchange Relocation	1,600	1,600
Double Track	1,380	1,380
Trees and Bushes	470	470
Centralized Train Control	193	193
Two Crossing Gates	70	
Close Five Crossings	20	
Seven Crossing Gates		295
Total	$5,968	$5,368

kept open, the improved flow of rail traffic enhanced by a second track, centralized train control, and interchange relocation would reduce the highway delay currently experienced at these crossings. Highway hazards would be reduced because of the grade separation and the improved warning devices at the grade crossings should they all remain open.

Pedestrian hazards could be reduced if the remaining crossings were closed and fencing and pedestrian overpasses were erected, eliminating pedestrian access to the railroad tracks. Should the crossings remain open and gated, although highway hazards can be reduced, pedestrians still have access to the tracks and improved pedestrian safety would be minimal.

Railroad vibration would be reduced because the current interchange would be relocated to ICG property and hence train braking and accelerating and the interchanging of cars would be eliminated. General railroad hazards are reduced by the Level II alternative because of the interchange.

Railroad presence will not be reduced, but the direct impacts upon the Metairie neighborhood will be minimized and train operations will be less intrusive in the neighborhood.

7.1.3 Level III-Short Term-Low Cost Alternatives

As the name of this alternative implies, it is designed to provide immediate relief to the Metairie community without the expenditure of major construction dollars since this alternative is a variation of the previous two in-place packages, it does not preclude amplifying it to a major in-place package. In addition, the relocation alternatives discussed in Section 7.2 are not precluded by this alternative since the capital investment suggested would also be necessary in the relocation solutions.

The items contained in Level III include:

1) crossing gates at all eight crossings,
2) railroad interchange relocation, and
3) centralized train control.

The total construction cost of these items is $4.073 million and would require approximately one year to accomplish.

This alternative would require the Parish to obtain a variance to the state law requiring horns to be sounded at grade crossings in order to eliminate that source of irritation in the neighborhood. The crossing gates would provide added protection not only for the motorist but also for the railroad since a motorist would be negligent in willfully disregarding the warning device in order to cross the tracks. Highway delay would not be substantially improved although relocation of the interchange would reduce highway delay at Atherton Drive, Hollywood

Drive, LaBarre Road and Shrewsbury Road because those crossings would no longer be impacted by interchange movements and would reduce the blocking time at the other crossings by the train not having to slow down for the interchange. Railroad noise would only be reduced through elimination of the train whistle. Relocation of the interchange would eliminate the interchange noise in the LaBarre Road area.

This alternative would not substantially improve pedestrian safety for the pedestrian would still have access to the right-of-way at most points, but would reduce the general railroad hazards and railroad vibration as a result of the interchange relocation.

Although the benefits of this package are minimal, the cost and time for implementation are also small. This package could be viewed as an interim solution while negotiations continue for a major package solution to the problems.

7.1.4.1 Elevation of Tracks Through Metairie

This alternative would provide grade separation of existing rail-highway crossings in residential Metairie between 17th Street Canal and Atherton Drive by elevating the NOT tracks on an aerial structure supported by bents (see drawings No. 9, 10 and 11 in Volume II of this report).

A retained earthfill configuration was considered, but was not advanced because of its barrier effect in the neighborhood and because the construction cost would be of the same magnitude as for an elevated structure.

Starting at the existing NOT railroad bridge across Airline Highway, the new vertical alignment would ascend at a 0.65 percent gradient extending to Atherton Drive, where sufficient vertical clearance would be attained to carry Atherton Drive underneath the railroad structure with 15 feet of vertical clearance. The existing LaBarre Road grade crossing would be closed because sufficient vertical clearance underneath the railroad structure cannot be attained at this location.

At Atherton Drive the vertical alignment of the elevated NOTR tracks would flatten out as the double track structure continues east providing undercrossings at-grade for Hollywood Drive, Farnham Place, West Oakridge Drive, Metairie Road, and Carrollton Avenue. After the Carrollton Avenue crossing, the vertical alignment would descend on a 0.65 percent gradient crossing over 17th Street Canal to the north of the existing railroad trestle to join the existing NOT tracks at the I-10 railroad crossing.

The new elevated, double track NOT structure would consist of prestressed, reinforced concrete box girders supported on reinforced concrete bents. The tracks on top of the structure would be ballasted for noise attenuation, and in addition noise barriers consisting of 4 feet high concrete walls with accoustical treatment would be installed at the edges of the structure. The approaches to the elevated structure would consist of embankment and retained fill sections.

NOT freight traffic during construction would be maintained by the provision of a temporary track located on NOT right-of-way just south of the existing tracks and the use of the existing 17th Street Canal railroad trestle. The trestle and temporary track would be removed after the new facility is open for traffic. A short period of total shutdown of the NOT must be anticipated for connection of the new tracks with existing tracks at Airline Highway and I-10 railroad bridges.

Frisco Avenue between Nursery Avenue and Carrollton Avenue would be closed, and the right-of-way used for the elevated NOT structure; otherwise no additional right-of-way would be required.

Completion of this project would require three years and would include severe disruption to the surrounding neighborhood as piles must be driven to firm foundations for the supporting structure. The construction of the temporary track and freight train operations over

a single track would last for the duration of the project. The total construction cost of this project is $37.7 million.

Elevation of the tracks would create the spectre of a train catastrophe which would plague the local neighborhood. Although train operations over an elevated structure would take place at relatively slow speeds, be performed over a completely double tracked facility and not involve interchange activity thus reducing the probability of a mishap, the citizens would not be favorably inclined toward this alternative as indicated by the Citizens Review Committee. The general feeling expressed was that aesthetic damage to the area would be drastic due to the existence of a raised railroad structure in everyone's backyard.

The basic construction cost is similar to that of the Carrollton Curve, $37.7 million as compared with $37.3 million respectively. It would seem that the expenditure of $37 million should be made to relocate the railroad not create an eyesore in the Metairie neighborhood. Because of the magnitude of the cost of the project and the adverse reaction gained from the Citizens Review Committee, this alternative was not pursued.

7.1.4.2 Depression of the Tracks in Metairie

After considering the possibility of elevating the tracks through Metairie, the alternative of depressing the tracks was examined. It was

felt that if the railroad could be depressed enough utilizing an acceptable grade, 0.65 percent, then benefit would accrue to the Metairie neighborhood which would eliminate many of the conflicts which now exist. The idea would be to practically enclose the depression in order to permit the neighborhood streets to pass over the railroad and permit pedestrian access across the tracks. Elimination of the grade crossings would also remove the train whistle noise from the area.

Two natural barriers exist in Metairie which must be dealt with when one considers depression. First the depressed tracks must come back to surface grade to negotiate the existing Airline Highway underpass which is located west of the LaBarre Road grade crossing. Second, the depression could not begin until the railroad tracks have passed over the 17th Street Canal. In addition, the clearance provided for the railroad for any overhead structure must be twenty-three feet to permit transport of railroad equipment which is currently passing through Metairie and to permit necessary track and ballast maintenance over the years.

Using the grade mentioned above and depressing to provide proper railroad clearance between the two natural barriers does not produce the beneficial effect sought. LaBarre Road, Metairie Road, and Carrollton Avenue would either have to be closed or grade separations constructed to keep those roads open. Construction of the

depression would be detrimental to the Metairie neighborhood during the life of the project due to the requirement to remove the soil and dirt to create the depression and to pump the depression dry so that construction could continue. Because depression would require anywhere from 18 to 23 feet of depth, continual maintenance of the pumping facilities would be required to keep the roadbed and substructure dry.

Consideration of these negative aspects of this alternative did not encourage pursuit of this idea.

7.1.4.3 Noise Barrier

This alternative would help to alleviate some of the nuisance created by the operation of freight trains through the residential area of Metairie by the provision of a solid noise barrier along NOT tracks, and in addition by planting trees and shrubbery along the slopes of the railroad berm (see drawing No.s 6, 7 and 8 in Volume II of this report).

The solid noise barrier would be 9 feet high and would be installed on the top of the berm at a distance of 12 feet from track centerline. At the existing grade crossing the noise barrier would be discontinued for an appropriate distance on either side to provide adequate sight distance for crossing motorists and bicyclists. The solid noise barrier would consist of prefabricated, reinforced, low density concrete panels supported by steel columns spaced 10 feet apart.

In addition to the solid noise barriers, vegetative barriers consisting of trees and shrubbery would be provided along the NOT. The trees and shrubbery would be planted on the railroad right-of-way between the solid noise barrier and abutting property or parallel roadway. In areas with existing foliage additional trees and shrubbery would be planted as appropriate.

Construction of the noise barrier and planting of trees and shrubs would require approximately one year. The total project would require $3.46 million to complete. Essentially these monies would be expended to remove the general train noise and any other noise emanating from the coupler and wheels. Should the interchange be removed as described in Section 7.1.1.6, then all the interchange noise would be removed from the neighborhood. The remaining intrusive noise is the locomotive horn. Because the 9 foot wall (8 feet from top-of-rail) will not effect the locomotive horn, the wall is not cost-effective. The $3.46 million can better be spent in other areas such as grade separations which provide greater benefits for the cost.

7.1.4.4 Rescheduling Trains

The potential of rescheduling trains to reduce the impact of train movements upon the Metairie neighborhood was examined. Several controlling factors exist in the New Orleans Terminal operation which are constraints upon rescheduling. First, the traffic which moves over the NOT must be handled on an "as ready to be moved" basis because of the amount of the traffic, service requirements, and physical yard capacity. Although at the moment traffic volumes are depressed due to the state of the economy, during times when volumes are up, capacity, both yard and interchange, requires that cars be moved as quickly as possible to make room for incoming traffic. Space does not exist to merely hold cars for movement at certain periods of the day.

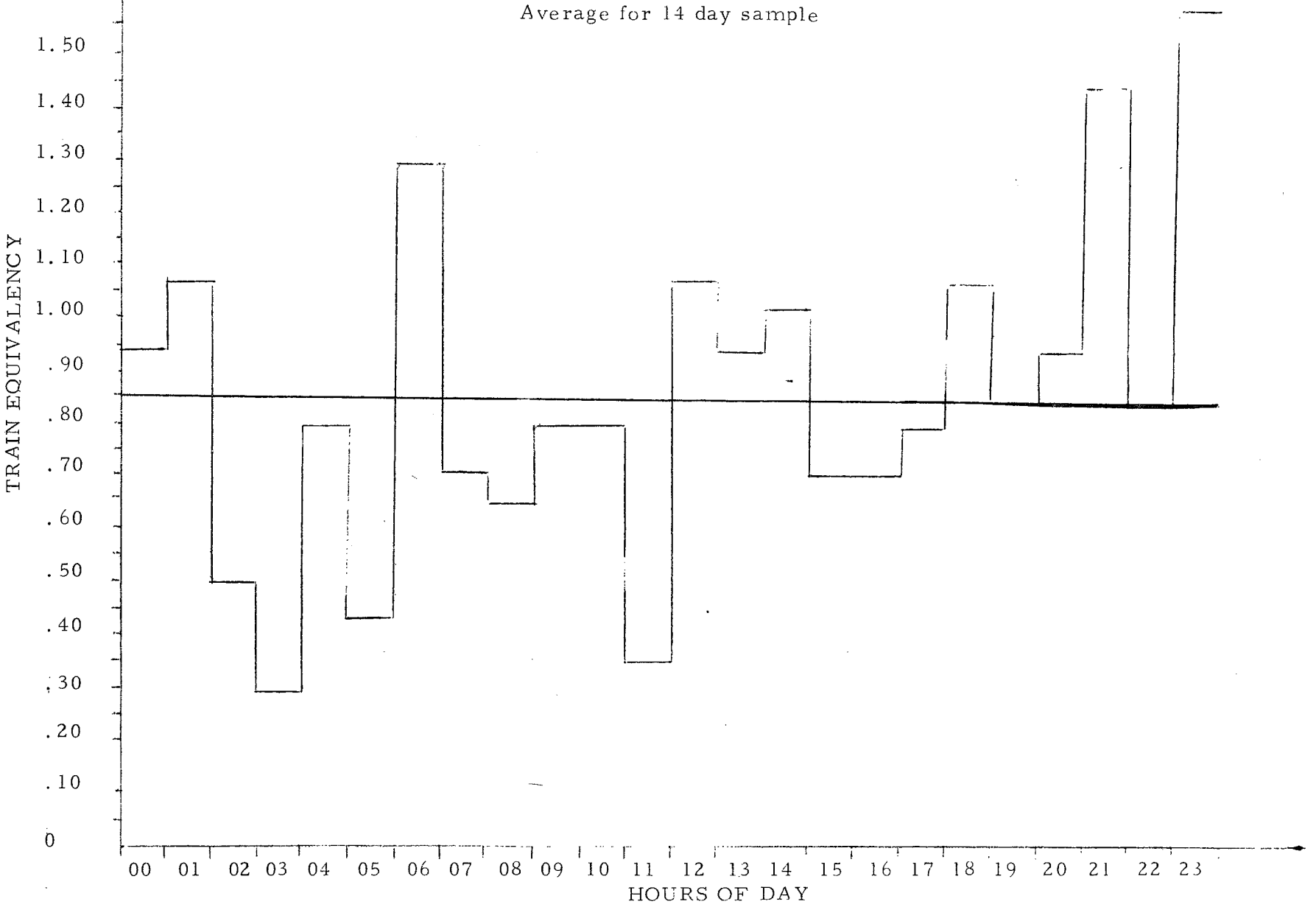
If trains were held for movement at specified times the impact in the neighborhood would be more severe during the period of movement than what is experienced now. If the trains moved through only during nighttime hours, an average of one train every thirty minutes would move through the neighborhood with locomotive horn noise causing disruption to individuals who were asleep. Movement during specified daylight hours would increase the impacts upon traffic flows over the grade crossings. Metairie Road, for example, experiences a build up of traffic which remains basically constant throughout the day. There is no appropriate time period to operate over Metairie Road.

By requiring the railroads to run more trains in a fewer number of hours increases per diem car costs and crew costs and also increases the potential of accidents during operation. Per diem car costs increase because of the increased idle time required in the New Orleans area waiting to be moved. Crew costs would increase due to either overtime payments or to new crews having to be called to handle the traffic across the Metairie line. Changing car movement schedules would impact rail users by requiring the industry to reorient production schedules.

As the trains operate today an average of one train per hour moves through Metairie (see Exhibit 7.4). Fifty-three percent of the trains move through the neighborhood between the hours of 7 p.m. and 7 a.m. One of the problems existing in Metairie is the fear of catastrophe. Increasing the trains over certain hours will increase the potential of mishap due to the single track section at Metairie Road and the interchange function at Shrewsbury. Any delay incurred from unforeseen circumstances such as mechanical failures would severely impact rail operations and the Metairie neighborhood. Neither occurrence would be in the best interest of either the community or the railroads.

The average number of train movements per hour over the Metairie line during normal rush hours is shown in the following table:

EXHIBIT 7.4: HOURLY DISPERSION OF TRAIN MOVEMENTS
(AVERAGE NUMBER TRAINS PER HOUR-SAMPLE)



Hour of Day	Average Number Trains per Hour
0700 (7 a.m.)	.71
0800 (8 a.m.)	.64
1200 (noon)	1.07
1700 (5 p.m.)	.79
1800 (6 p.m.)	1.07

In only the cases of the noon hour and the six oclock hour do the train movements exceed the normal average of one train per hour and even then by a very small amount.

In order to minimize safety hazards, grade crossing impacts, and noise from the locomotive horn, the current average of one train per hour is optional. Should grade separations, movement of interchange facilities, and double track of Metairie Road be considered, train movement through the neighborhood would be improved and benefits accrue to the community in the form of reduced grade crossing delays. In this case consideration of train scheduling is immaterial. Rescheduling of trains does not eleiminate rail-community conflicts and costs, but merely moves them to different hours of the day. Imposition of times of operation upon the railroad industry would be counter productive, detrimental to the movement of interstate commerce, and would not substantially solve the Metairie problems.

7.1.4.5 UPT Partial Reverse Move

The combined use of the Metairie line and the reverse move concept was explored. Because the reverse move (explained in 7.2.2 below) eliminates the value of the run through trains and because the yard cut movements pass through the Metairie neighborhood without requirement to stop these moves would still proceed through Metairie as before. The interchange movements would move over the NOT down the UPT tracks, over the Carrollton Avenue bridge, to a new interchange facility located on UPT property between the Carrollton Avenue rail bridge and the Broad Street Overpass. In an effort to minimize construction costs only normal size equipment would be permitted to use the new reverse move interchange route. Therefore all equipment requiring more than 18 feet of clearance must be moved through Metairie on the yard cut moves or a new train movement involving only the clearance loads.

The interchange of cars would therefore take place in two areas, the areas being decided by size of car. This would create an adverse impact upon operating costs by requiring pick up and delivery to two points instead of one interchange. In addition, unless the clearance loads were interchanged by an interchange move, they would be moved across Metairie on the yard cuts which would require the interchanging of cars by a third carrier and therefore technically placing another carrier in the overhead route through New Orleans.

The variation to this alternative is to locate the new interchange where it has been described in 7.1.1.6 above and merely move the interchange cars on a reverse move. This keeps the interchange facility in one place but increases the operating costs incurred by the interchange moves. Based upon the volume of interchange cars handled over the NOT, and making allowance for clearance loads such as the tri-level automobile racks, 36.8 percent of the traffic would move over the reverse move. With this volume of traffic the operating costs would be increased approximately $205,000 per year. This alternative would still require in place improvements to eliminate the railroad-community interface in Metairie. Implementation of practical in place improvements will reduce the railroad impacts to the point where an alternative route may be unnecessary.

It is doubtful if there is sufficient room on Union Passenger Terminal property to construct an interchange with sufficient space to handle the interchange traffic, permit ICG and KCS service to their patrons in that area, to permit movement of passenger train traffic and still permit efficient movement of switching required to affect interchange. Some of the right-of-way (twenty-two feet) is being consumed by the ramps and support facilities for the new I-10 overpass project between Carrollton Avenue and Jeff Davis overpass.

Use of this alternative would spread the impacts between Metairie and Carrollton area, not substantially removing the impacts from Metairie, and increasing railroad operating costs. This type solution is a stop gap measure which solves no problems and merely spreads the impacts.

7.2 Relocation Alternatives

In examining the potential for the relocation of the NOT tracks, consideration was given to three types of new corridor. Consideration was first given to existing railroad corridors, their current function and their potential or future function; second, duplicate use of transportation corridors was analyzed; and third, new railroad corridors which could be created to solve the Metairie problem were examined. Aerial photographs and topographical maps were examined, as fully described in Appendix IV, in an effort to identify these potential corridors. On sight inspection and a detailed research effort was performed for each alternative or idea that was developed from the above exercise.

Relocation demands additional considerations not found in the In-place Alternatives. Relocation, generally being of an expensive nature, might have to be examined in light of regional considerations. In addition, newly created problems or impacts created by moving the rail facility to another location must be considered in all relocation alternatives.

7.2.1 Carrollton Curve

This alternative would provide a double track railroad connection between the western rail carriers and the SOU utilizing the UPT right-of-way along Airline Highway and Interstate 10. The critical feature of

this alternative is the Carrollton Curve which would be provided at Carrollton Interchange to connect the east and west bound leads of the UPT through an anle of sixty degrees (see Drawing Nos. 21 and 21a in Volume II of this report).

7.2.1.1 Physical Description of the Curve

The new route would move off the NOT mainline east of the 17th Street Canal and I-10 railroad bridge at East City Switch and proceed south along the UPT right-of-way until reaching the Interstate 10-Airline Highway Interchange. At this point the track would curve through the highway interchange connecting with the westbound UPT track and proceed west on the UPT until reaching the ICG northbound main. From this point, the route would continue west until reaching the lead to the Huey P. Long Bridge or to a new railroad interchange. This route would require the current interchange activity which takes place at Shrewsbury on the NOT to be moved to the area described above in the In-place Alternatives. The route described above would be doubled tracked connecting the ICG northbound and southbound mains to the east of LaBarre Road and proceed east on UPT right-of-way along Airline Highway to the Carrollton Interchange. The 11^{o} 30' Carrollton Curve would be double tracked and the distance between the two tracks

would be increased in order to avoid interference with the proposed new I-10 viaduct supports to be constructed within the next four years to provide a new route for Interstate through traffic above the local interchange ramps of I-10.

Proceeding north from the Carrollton curve, the new double track would be located on UPT right-of-way along I-10 and connected to the NOT east of the I-10 railroad overpass. The existing single track of the UPT would be removed to the north and west of Carrollton Interchange. The UPT track from the south would be connected to the new double track at Carrollton Interchange. No new private right-of-way would be required for this alternative.

The route outlined would necessitate the raising of Interstate 10 to permit clearance for the movement of trains through the curve. This raising would lift Interstate 10 over the Airline Highway overpass. Currently, Airline Highway travels over Interstate 10 which is at grade at the location where the tracks would be constructed. A support bent of the Airline Highway overpass would be required to be moved to provide necessary horizontal clearance.

The Interstate 10 overpass would require 1) modification to the southbound Airline ramp and to Ramp E which is at ground level and provides access from Southbound I-10 to eastbound Airline Highway,

2) rebuilding Ramp J the southbound roadway of I-10, 3) rebuilding the northbound Airline Highway ramp, 4) rebuilding Ramp A which provides access from Airline Highway westbound to I-10 northbound, and 5) rebuilding Ramp M which is the northbound roadway for I-10.

In addition to the Interstate 10 overpass clearance problems, the Palmetto Overpass which is located to the west of the Carrollton Curve over the UPT tracks provides another clearance problem. Current clearance under this highway overpass is eighteen and one half feet. Because railroads need twenty-three feet of clearance to handle the larger rail cars and to permit maintenance of the ballast and track, the Palmetto Overpass must be raised.

In addition to requiring clearance under the Palmetto Overpass, the rail bridge which currently spans the drainage canal, running parallel to and down the middle of Palmetto, would require testing to insure that that structure could handle an influx of new traffic contemplated in this alternative. Currently, only local freight and passenger traffic use the structure.

7.2.1.2 Alternative Alignments of Carrollton Curve

The discussion above relative to elimination or alleviation of Metairie problems by moving the NOT to Carrollton are assessed based upon the 11o 30' curve location. Several other alignments were

considered and analyzed but were not profitable in comparison to the chosen alignment. Any other alignment is equal or greater in expense and merely superimposes the problems currently existing in Metairie upon the New Orleans-Carrollton community -- a mere shift of the problems, not a solution of the problems.

In referring to Drawing 21a in Volume II, one will note the location of a 9°30' curve in addition to the 11°30' curve. Although the 9°30' curve is certainly less severe and more desirable for rail operations than a 11°30' curve, the construction cost of the less severe curvature is approximately $9 million higher than the 11°30' curve. The additional cost is incurred because not only does I-10 require rasing, but Airline Highway must be raised higher than its current elevation to permit clearance for freight rail traffic. This requires that I-10 be raised higher than contemplated for the 11°30' curve. This less severe curvature alignment also requires the closing of Airline Highway during construction, thereby increasing the highway user impact associated with this alternative.

Consideration was given to locating the Carrollton Curve on an elevated railroad structure commencing at East City Switch, proceeding over I-10 with sufficient highway clearance (18 feet) through the residential area contained in the vortex of the "Y" formed by I-10 and Airline Highway, over Airline Highway and back to grade to join the

Illinois Central Gulf Railroad northbound main at the junction with the UPT tracks. By referring to Drawing No. 21 in Volume II, one can see that construction of such a facility would merely blight the residential area through which it passed. No benefit would be gained by the New Orleans area through construction of such a facility.

In analyzing the Airline Highway-Interstate 10 complex, two important reference points are found. The first is the point where the existing UPTR tracks pass under Airline Highway. Clearance at this point is 18.7 feet above the rail with the potential of achieving 22.7 feet of clearance. At this point, raising Airline Highway has critical impact upon the Airline Highway-Tulane Avenue-Carrollton Avenue intersection. The intersection would be eliminated by raising Airline Highway at this point, thus significantly affecting highway access to the Carrollton Avenue Shopping Center, Garrard Chevrolet, and the Fountainbleu Motor Hotel and access to Carrollton Avenue generally. The second reference point is the maximum clearance achieved by I-10 over the UPT tracks on the westbound level. This point is where the westbound lead of the UPT proceeds over the Carrollton Avenue railroad bridge and passes under I-10. Clearance in this area varies between 18.01 feet and 19.05 feet. In order to construct a rail line under I-10 at this point without impacting I-10 and still provide clearance, the tracks would have to be depressed five feet. To clear

the overpass and rise back to the level of the tracks on the Carrollton railroad bridge would produce an infeasible railroad operating grade for continued operation of passenger trains to the UPT Building. Such a track for obtaining clearance under I-10 would also affect the eastbound lead of the UPT in the same manner. The level of the Carrollton Avenue railroad bridge cannot be lowered without lowering Carrollton Avenue. Clearance for Carrollton Avenue is currently 14 feet under the railroad bridge. Depressing Carrollton Avenue at this point would severely impact the Carrollton-Tulane-Airline Highway intersection and could eliminate it or at least create a hazardous highway grade.

Therefore, using the two highest clearance points in the highway interchange complex the best clearance obtainable without altering I-10 is 18 feet. Even if sufficient clearance could be gained at that point under I-10, construction of even an 11° 30' curve would severely impact the adjacent neighborhood. Construction dollars saved by not altering I-10 would be spent condemning and relocating Hazard Drayage and Construction, Baumer Foods, Carrollton Shopping Center and innumerable residential structures south of the UPT track and west of the shopping center. Adequate rail facilities would be required to clear the Metairie Relief Canal and provide grade separation for Washington Avenue. St. John Vianney School and Church and the immediate

residential properties would be as severely impacted as Metairie is today.

The other possibility is to depress the railroad tracks underneath I-10 to gain the required clearance. Depression at the current 11^{o} 30' alignment still requires I-10 to be raised and does not save construction dollars. Depressing the tracks at the maximum clearance under I-10 requires Airline Highway to be raised impacting the area as explained above and requires private right-of-way east of the UPT tracks to be taken. Such an alignment places the new rail facility next to another residential area and recreates the problems which exist in Metairie. Although the current 11^{o} 30' curve is admittedly expensive due to the construction costs, it is the best alignment to minimize the impacts upon the Carrollton area. Although on the surface this area would seem to be a good location to which to move the NOT and relieve Metairie of its rail-community interface problems, a delicate balance currently exists among many variables in the area. This balance has been taken into consideration in locating the 11^{o} 30' curve on the proposed route.

7.2.1.3 Impacts of the Relocation

This alternative would relocate the NOT from Metairie to Orleans Parish. The immediate effect would increase the route mileage one and two-tenths miles. The new route would eliminate

eight grade crossings in Metairie and would not interface with any highways or streets at grade once I-10 had been raised to permit construction of the Carrollton rail curve. The new movement would impose a 11° 30' rail curve on the route between Oliver Yard on the east and Shrewsbury on the west. Imposition of an 11° 30' rail curve upon the route between Oliver Yard and Shrewsbury would increase the potential of railroad mishaps which could obstruct railroad traffic flows and adversely impact the Carrollton area. Railroad operations over an 11° 30' curve require special blocking of cars within a train in order to permit the longer cars, such as piggyback flat cars, to negotiate the curve. Such handling and blocking requirements are not now present on the relatively straight segment of track through Metairie.

While it is admittedly engineeringly and technically feasible to place an 11° 30' curve under the Carrollton Interchange, although also admittedly expensive, it is not in the best interests of either the railroads or the surrounding Carrollton community to do so. The dollars spent to construct this alternative buy a solution to the Metairie problem and buy potential operating and safety problems for Orleans Parish and the railroads.

A derailment on such a curve would interrupt rail freight traffic flows until the equipment was removed and the track repaired. During such a time, railroad traffic would require movement over another route, most likely the river front through New Orleans. Should such derailment knock down the highway support structures, highway traffic would be severed and the possibility of life lost due to the collapse of the highway facility. The correct combination of factors could lead to a catastrophic occurrence due to the derailment which would destroy the railroad facility, highway facility, and property and lives in the adjacent neighborhoods.

Admittedly the railroads in general and the SOU in particular operate over sharp curvature today. But this does not mean that construction of additional sharp curves on mainline track are in order. The SOU has expended large sums of money to flatten existing curves in its system to increase operating efficiencies. Construction of a new substandard cruve may be contrary to what the railroads feel is a reasonable solution to the Metairie problem.

7.2.1.3.1 Neighborhood Affected

The neighborhoods impacted by the location of the NOT upon the UPT right-of-way include brick, multiple family dwelling units and single family dwelling units to the south of the westbound UPT lead. In addition, St. John Vianney Church and school and the Carrollton

Avenue Shopping Plaza are located in this area very near the UPT tracks. To the north of this lead is Airline Highway which experiences minimal impact from noises or railroad presence.

To the east of the northbound UPT lead are located three businesses; Garrard Chevrolet; Baumer Foods, Division of Crystal Foods; and Hazard Drayage and Construction Company. Further east of Garrard Chevrolet on the east side of Carrollton Avenue is located the Fountainblue Motor Hotel and located south of the Motor Hotel is Xavier University. To the east of Baumer Foods and Hazard Drayage and Construction is a residential neighborhood. This residential area runs north along the UPT track to East City Switch.

The area enclosed by the vortex of the "Y" formed by Airline Highway and the UPT tracks on the west and I-10 and the UPT tracks on the east is also residential. Two schools, Mid-City School and Benjamin School, are located in this area. Drawing 21 in Volume II is an aerial photograph of the Carrollton Curve neighborhood which locates the facilities mentioned above. In terms of noise and highway user impacts, this area, contained in the "Y", would be minimally impacted.

7.2.1.3.2 The I-10 Viaduct and the UPT Agreement

To relieve the traffic pressure upon the I-10-Carrollton Interchange, the Louisiana State Highway Department has commenced a

program to construct an overpass over an overpass. The new structure will directly connect the east-westbound through lanes on each side of the interchange to create a through route which will be divorced from the local interchange traffic. This project will be completed within the next four years.

Construction of the Carrollton Curve could not commence until the new I-10 bypass was completed. If the curve were constructed beforehand, necessitating the closing of I-10 to raise the structure, the I-10 artery to New Orleans would be severed and would eliminate the only major access to the Central Business District from the west side of New Orleans. Even though the through lanes would provide access to New Orleans, by 1980 the local interchange traffic volume will be approximately 80,000 vehicles. The raising of the old I-10 facility would require a reroute of these 80,000 vehicles during the construction period.

In case of both the Carrollton Curve and the Carrollton Reverse move described below, the use of the UPT tracks are involved. The use of these tracks must be agreed upon by the board which governs the operation of the UPT. The Union Passenger Terminal Agreement signed in 1947 stipulates that eastbound lead tracks are strictly for passenger use. The westbound UPT tracks are designated for both passenger and freight traffic. The freight traffic permitted on this

track is only that of the KCS and ICG who exchanged right-of-way for UPT consolidation for the use of UPT tracks to maintain freight service to patrons located in New Orleans. Any other use of the UPT tracks will require an amendment to the Union Passenger Terminal Agreement. The ultimate authority over this agreement is held by the City of New Orleans.

7.2.1.3.3 Time Frame and Construction Costs

To complete the Carrollton Curve facility would require three years and would cost $37,300,000.* The expenditure of $37,300,000 includes the construction of the new double track rail facility including the 11° 30' curve, new Palmetto overpass to provide sufficient clearance, new Ramp M and other modifications to the interchange area, utility relocation, train control and engineering, procurement and construction management. This construction estimate also includes escalation during the construction period. In light of the the State highway project to construct a new I-10 overpass which will take four years to complete, this alternative could experience a four year delay prior to commencing work on the I-10 overpasses. Should such a delay

*This number includes $10,000,000 estimated by Modjeski and Masters Consulting Engineers as required by the Louisiana State Highway Department to determine the extent of impact upon existing I-10 ramp facilities.

be incurred and using current escalation rates, the $37.3 million could reach $65.7 million. The four year delay is probable because without the new through route, I-10 would be completely severed, thus requiring a rerouting of the 100,000 vehicles which use the I-10 facility daily.

Because the Carrollton Curve alternative would require relocation of the current Shrewsbury interchange facility, that step would be taken immediately. The cost of moving the interchange, $1,600,000, is not included in the cost for the Carrollton Curve mentioned above. Therefore, the cost of moving the interchange would be expended within one year and the Carrollton Curve alternative would still be approximately $65,700,000.

7.2.1.3.4 Community and Highway Impacts

During the four year period required to finish the new I-10 overpass and the three year period to construct the new rail route, the Metairie community would experience an annual highway user cost of $310,000. This user cost, in addition to the highway user cost of rerouting the 80,000 vehicles per day which will be using the local I-10 interchange ramps by 1980 during the three year construction of the new rail facility, negates the highway user benefit accrued in Metairie from moving the railroad.

Moving the NOT from Metairie to the Carrollton area of Orleans Parish produces direct benefits to Metairie. The Locomotive horn noise is eliminated, delay at the highway crossings is eliminated, highway safety is improved, pedestrian safety is improved, vibration is eliminated, and the general safety of the Metairie community is improved by relocation. In addition the psychological affect of the presence of the railroad in Metairie is eliminated. All of these benefits taken together might warrant the moving of the NOT given the costs involved if each of these benefits were reduced in total value to Metairie.

In many respects the moving of the railroad from Metairie to the Carrollton area only produces net benefits. In other words, there are existing costs to the Carrollton area which must be taken into account. In evaluating the Carrollton Curve alternative as a solution to the Metairie problem, it is essential that the disbenefits accruing to Orleans be understood.

The general train noise and Locomotive horn noise existing in Metairie would be removed. The interchange noise would also be removed but is not an important consideration because a new interchange would be required west of Shrewsbury to make the Carrollton Curve alternative work and this interchange facility can be provided today thus eliminating the interchange noise in Metairie without moving

the railroad. The general train noise in the Metairie area is not the single, most important factor about noise. The locomotive horn is the major complaint. Moving the railroad to Carrollton would eliminate the hor noise in Metairie and would cause no new locomotive horn noise in the Carrollton area because there are no grade crossings. However, general tain noise produced by operating around a curve would be increased.

Delay at the highway crossing is eliminated by relocating the railroad and is not imposed at Carrollton because there are no grade crossings. However, as pointed out above, during the construction phase of the Carrollton Curve, highway user costs to both Metairie and New Orleans are incurred which cannot be offset by the benefit gained for highway users due to relocation. However, highway safety is improved in Metairie by relocating the railroad for there are no grade crossings incurred over the Carrollton Curve route.

Pedestrian safety is improved in Metairie but some problems exist with pedestrian safety along Airline Highway because residents near the highway cross the UPT tracks to catch the bus which runs to and from New Orleans.

The problem of vibration existing in Metairie is merely moved from that neighborhood to the residential areas and churches and schools along the UPT tracks. The problem of vibration would actually

produce a more severe situation in New Orleans if the 11° 30' curve alignment is altered from its contemplated location. The current location under I-10 and Airline attempts to minimize vibration impacts by removing the rail facility as far as possible from the local residential areas. Actually even the 11° 30' location cannot eliminate the impact of vibration upon the local residents in the Carrollton area.

General safety and railroad presence are two areas of contention in Metairie. The individuals who live along the track are fearful of a catastrophic happening. Part of this fear can be alleviated by removing the interchange tracks. This would eliminate the storage of cars carrying dangerous articles near residential sections. Placing this rail traffic on a new route over the Carrollton Curve would not eliminate the potential cost of a calamity. It would definitely change the impact of that cost from Metairie to New Orleans. The highway systems parallel to and over the new route alignment are the most heavily traveled highways in New Orleans providing the major access to the areas immediately west of the city. The Carrollton area is not devoid of residential areas near the tracks nor is it devoid of schools, churches, hotels, or shopping centers. The argument that moving the railroad to the Carrollton Cuve reduces the cost of calamity is not entirely true, a netting effect takes place, but the value of this netting effect is argumentative and not substantial.

7.2.1.3.5 Railroad Impacts

Although the Carrollton Curve alignment provides an alternative route for movement across New Orleans, it is not a cost-free alternative from a rail operating standpoint. Annual operating expenses would increase approximately $178,000. This level of cost could be reduced somewhat from the advantage of the new interchange. The Carrollton Curve route would eliminate the eight grade crossings in Metairie and the affect of the five minute grade crossing blockage ordinance. Without the requirement to break interchange cuts when delivering and to connect them when removing cars from the interchange, the interchange activity could be improved by $32,000 per year. Savings of this type would reduce the $178,000 cost increase attributed to this alternative. However, defrayment of additional extraordinary operating expenses would have to be worked out between the Parish and the railroads.

The railroad operating cost increase primarily is derived from the increased route mileage, transit time increases and increased maintenance costs due to the $11^{o}30'$ curve. Allocation of crew wages is increased over this new route. Increased wages to line haul crews are slightly offset by the increase in speed assigned to this route for the through trains and yard cuts. Switching crew wages associated with interchange moves are a matter of cost allocation and are an opportunity cost incurred because other work cannot be performed

while spending more time over the new route. Part of this increase in crew wage cost may be offset by the more efficient interchange function due to the new interchange not containing grade crossings. Car costs are a direct function of the increased distance and time. The operation around a 11^{o} 30' curve is also a direct cost increase. Some of the new maintenance expenses are offset by the elimination of maintenance performed on the eight grade crossings in Metairie.

7.2.2 Carrollton Reverse Movement

7.2.2.1 Description

This alternative utilizes the same UPT tracks described and referred to above (see Drawing No. 21a in Volume II). In place of the rail curve underneath Interstate 10 and Airline Highway overpasses, the train movement would continue across the Carrollton Avenue railroad bridge toward New Orleans. Once the train has cleared this bridge, the engine would be run around the train, air for the brakes would be built back up, a brake test made, and then the train would move back across the Carrollton Avenue bridge over the UPT tracks parallel to Airline Highway toward Shrewsbury and the Huey P. Long Bridge. This alternative contemplates that the interchange facilities which currently exist in Metairie have been relocated to the area described in the in-place improvement section above. Movements in the reverse direction would take place in the same manner. Double

track would be provided from East City Switch over the UPT facilities and out to Shrewsbury as described above in the Carrollton Curve alternative.

The physical structures encountered in such a case are similar to these in the curve alternative. Clearance can be gained under Airline Highway overpass, but in proceeding toward New Orleans the Jefferson Davis Parkway overpass must be raised as clearance now is only eighteen and one half feet. In addition, prior to reaching the UPT wye track, the Broad Street Overpass is encountered which also offers only eighteen and one half feet of clearance, but operations over this track would not include freight traffic moving under this overpass. Interstate 10 and Palmetto overpasses are encountered in this alternative as the track moves west toward the ICG Mays Yard. As mentioned above in the Carrollton Curve alternative, these structures would have to be raised to permit clearance for freight traffic.

Today the westbound UPT lead and the UPT tracks toward New Orleans are used by the KCS and the ICG to deliver traffic to the industries located along I-10. The type of freight traffic involved is only normal sized box car and hopper car equipment which can negotiate the low clearances. The type of additional railroad equipment (tri-level autoracks, etc.) encountered on the through movement require the higher clearance.

This route would require the use of the Carrollton Avenue railroad bridge. Today local freight traffic move over this bridge. This bridge facility would require testing prior to moving the increased freight traffic over it as contemplated in this alternative.

7.2.2.2 Impacts and Costs

In order to provide the necessary rail facility to handle the traffic moving over the NOT, clearance problems presented by the highway overpasses and the provision of double track operation must be solved. Providing the double track facility, with train control, providing clearance under Palmetto, I-10, and Jefferson Davis Parkway, and providing for engineering, procurement, and construction management would cost an estimated $23 million. The project would require three years to complete and may also require waiting for the completion of the new State Highway Department I-10 overpass which could escalate the cost to $42.7 million. Although this estimated construction cost is lower than the Carrollton Curve alternative construction costs, in terms of magnitudes, they are relatively equal. The important impacts involved in the reverse move are those imposed upon the community surrounding the Carrollton Interchange area and upon the railroads.

7.2.2.2.1 Railroad Impacts

A limiting factor which exists in considering this alternative is the lenght of trains which can be placed in the UPT tracks toward New Orleans and still clear the rail bridge over Carrollton avenue. The run through trains moving over the Metairie line can number as many as 130 to 150 cars and sometimes higher. In these circumstances the run through trains could not use the reverse move method as the distance from Carrollton Avenue to Broad Avenue, where the UPT wye track is located, is approximately 5,600 feet. This distance would only permit trains of 110 cars to make this type of movement.

Railroad operation costs would be adversely affected using this reverse move route. Train movement would approach the Carrollton Avenue railroad bridge from East City switch and proceed across the bridge. Once the end of the train had cleared the bridge, the train would be bought to a complete stop. The locomotive power would run around the train, build up air for the brakes, make an air test and then move out the westbound lead of the UPT for either interchange or movement over the Huey P. Long Bridge. A similar process would be followed to handle the eastbound movements. Due to the increased route mileage and time required to make such a train movement as compared with what currently occurs over the Metairie line, operating costs could increase $558,000 per year. This cost estimate does not

include the impact upon the efficiencies currently enjoyed by the run through trains. Direct impacts would accrue not only because of the reverse movement, but also because of the restriction in the length of the trains due to the reverse move. This cost does not include additional expenses incurred due to missed interchanges or increased transit time due to missed interchanges. In speaking of $558,000 of additional cost per year, current volumes are contemplated. This cost would escalate through time as train volumes increased due to a rise in demand for transportation services.

7.2.2.2.2 Community Impacts

The impacts of this alternative upon the immediate community area in Orleans Parish would be similar to that described above for the Carrolton Curve alternative. The increased noise due to operating over a curved track would be replaced by acceleration and deceleration noises of the motive units and the taking up of train slack in the UPT behind the Fountainbleu Motor Hotel and along I-10 toward New Orleans. The residential units and St. John Vianny Church and School would also be adversely impacted due to the increase in train noise in that area.

Highway user impact benefits would accrue to Metairie because of the elimination of the eight grade crossings. However, on a net benefit basis as described above in the Carrollton Curve alternative, accumulated highway user benefits would remain negative due to the

accumulation of highway user costs in Metairie prior to beginning construction on I-10 local interchange ramps.

The impacts upon general safety and pedestrian safety are similar to those described above. The reverse move could potentially impact large numbers of people due to the proximity to the residential areas, motor hotels, and I-10 facilities should a catastrophe occur. The number of people potentially impacted in the Metairie area compared to those impacted in the Carrollton areas becomes argumentative, because the fact exists that in either plan large numbers of people would be affected. There is no benefit to merely move the problem into another neighborhood if the problem cannot be completely solved or eliminated.

For the reasons described above, that construction costs are of a relatively equal magnitude to the Carrollton Curve alternative, operating cost impacts upon the railroads are substantially increased, and on a net basis community impacts are not substantially eliminated, this alternative is considered to be infeasible and not a solution to the immediate Metairie problem.

7.2.3 River Front Route

The use of railroad right-of-way and track facilities which exist from the east side of New Orleans, around the river front to the west side of the city, and make connection with the lead to the Huey P. Long Bridge was examined (see Exhibit 7.5).

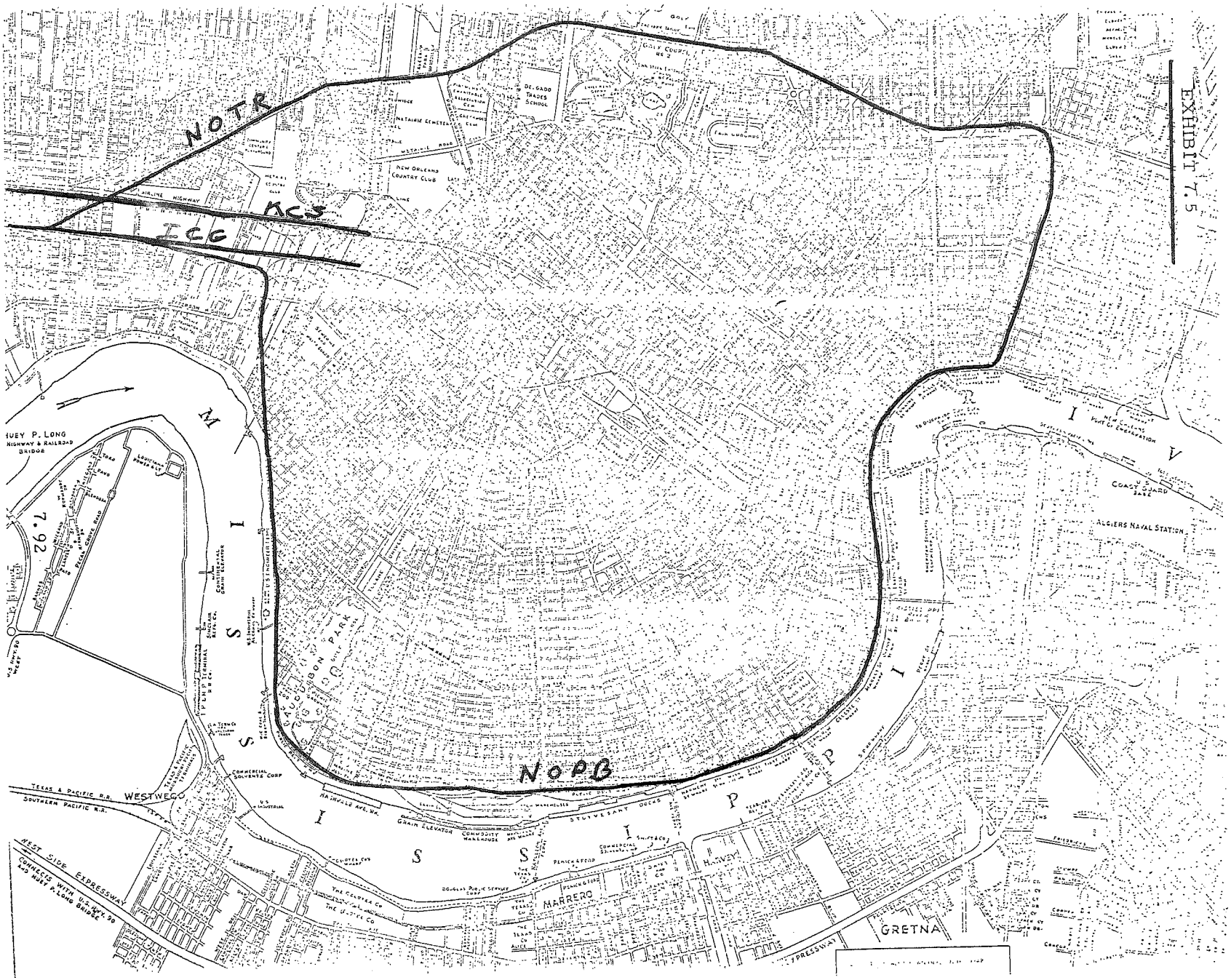


EXHIBIT 7.5
NOTR
ICG
ACS
NOPB
HUEY P. LONG HIGHWAY & RAILROAD BRIDGE
7.92
MISSISSIPPI RIVER
GRETNA
MARRERO
WESTWEGO
ALGIERS NAVAL STATION
COAST GUARD BASE
DE GADO TRADES SCHOOL
NEW ORLEANS COUNTRY CLUB
AUDUBON PARK
WEST SIDE EXPRESSWAY
TEXAS & PACIFIC R.R.
SOUTHERN PACIFIC R.R.

This move could be accomplished over a combination of two routes. First is the NOPB route. Use of this facility for movement of through traffic would be restricted to the hours of seven in the morning to seven in the evening because the NOPB services the wharf facilities along the river front during the evening and night hours and ties up the track, preventing through movements. A move over the river front route on NOPB tracks would require use of NOPB power and crews as specified in the NOPB charter. Approval of the use of the facility rests with the City of New Orleans, which owns the railroad.

The second route involves the use of LN and MP trackage which parallels the NOPB tracks. Interchange of traffic between these two carriers currently takes place at Canal Street where the crews change.

In either case the route mileage is approximately ten miles longer than the current route through Metairie. The river fron route involves train movements over approximately twenty-six public grade crossings as compared with the eight grade crossings in Metairie. The twenty-six grade crossings provide street access to the wharfs and Mississippi River ferries and cruise ships. Rail operating speed over the river route is approximately 4 to 6 miles per hour as compared with 10 to 13 miles per hour over the Metairie line.

Channeling train traffic around the river front would involve movement through the downtown area of New Orleans and would adversely affect access to wharf facilities. Rail traffic would be placed upon a route which the City of New Orleans hopes to reduce, or at least not permit to increase, in order to develop access to the river front.

Consideration of this alternative involves the provision of a two track facility to permit efficient movement of trains. Areas exist along the rail corridor which will not permit construction of a two track facility. Most notable of these areas is the foot of Canal Street where the International Trade Mart is located. The existing rail tracks pass under the building. Room does not exist for expansion of the number of tracks. Construction of another track to provide adequate clearance would impact the levee. This area is already severely congested as Canal Street provides access to several wharfs and is the entrance and exit to the Canal Street Automobile Ferry. Influx of heavy rail traffic would adversely affect this area and could create a major safety problem between the interface of rail traffic and automobile-pedestrian traffic to and from the ferry.

Adjacent to the International Trade Mart, new construction has begun to erect a large hotel. This is the one of several steps to develop and beautify the river front. Increases in rail traffic will severely impact this area of new development.

The contemplated river front route passes between the Veaux Carre and the Mississippi River. The land between the French Quarter and the river, starting with the French Market is being renovated and developed to beautify the river front and add to the enormous tourist facilities which exist in New Orleans. Increasing rail traffic near an historical area and near newly designed tourist facilities will be seriously challenged by historical societies and the city.

One of the major complaints in Metairie concerns the potential of calamity. Although no calamatous acts have occurred in that neighborhood due to the unique rail operation which exists there, fear of potential problems exist. Routing the rail traffic around the river front route does not solve that problem. The problem is merely moved from Metairie to the City of New Orleans. In many respects the severity of the aftermath of a calamity would be increased in the City of New Orleans as compared with Metairie.

The net alleviation of noise by moving the rail facility from Metairie to New Orleans is minimal and merely impacts different people.

Highway and pedestrian safety in Metairie would be improved by movement of the railroad. Relocation to the river front route would produce a lessening of these problems once necessary changes were made. One such change would be construction of pedestrian overpasses

at the ferries and tourist facilities to eliminate one's climbing through train.

Construction of the rail facility contemplated includes upgrading existing track facilities and new track construction so that the train activity over the new route can be handled as efficiently as possible. Two years of construction would be required and would cost approximately $22,400,000.

Once the facility was operational the same volume of cars and train movements which pass over the Metairie line would then move over the river front. The Metairie line would be removed. Operationally, this could provide difficulties in time of severe flooding along the river front. In such cases in the past, the NOT becomes the alternate route. Without the NOT there would be no alternate route and New Orleans would be embargoed as a rail gateway until conditions which had caused the embargo were eliminated or alleviated.

Contemplation of the river front is not free of severe operating impacts upon the railroad system in New Orleans. The increase in the route mileage and the slower operational speeds produce not only real operational cost increases but also an increase in cost allocations to effect the movement of traffic. The increases in costs due to cost allocation is an opportunity cost. Crew time invested in the new route

may not increase the total number of crews needed to affect the movement of rail traffic through New Orleans but will mean that work otherwise performed will have to be done by another crew or crews.

Based upon the calculations outlined in Appendix II, the river front route will increase rail operating costs over current cost levels for the movement of rail traffic over the Metairie line by $1,450,000 per year. This cost increase is primarily due to the increased route mileage and the reduced speed. Crew costs, train mile expenses and fuel costs are directly impacted. Maintenance of way costs are increased because the route is increased. The distance and time factors directly affect freight car costs and grade crossing maintenance costs are increased due to the increased number of grade crossings from eight to twenty-six. This cost estimate does not include additional operating impacts derived from scheduling changes required due to the increased transit time through New Orleans nor due to service commitments changed because of interchanges which may be missed from the increased transit time. The river front route, although solving the problems which exist in Metairie, merely increase problems existing in New Orleans and as a solution has moved the conflicts from one area to another without accomplishing alleviation. Impacts upon the railroad system in the form of operating costs imposes the solution upon the railroads and the City of New Orleans and is therefore not considered as an equitable solution for all parties concerned.

7.2.4 West Bank Route

The concept of a bypass of the City of New Orleans on the west bank of the Mississippi River requires that a new rail bridge be located on the east side of New Orleans. The bridge location would be near the current sight chosen for the Interstate 410 bridge in the areas of Paris Road. Connection to this bridge would be provided to the SOU and the LN over the NOT in Chalmette. Tracks connecting the new bridge with Avondale and the Huey P. Long Bridge on the west bank would be constructed and located south of the principally developed areas. Alignment could be similar to Interstate 410 but could not involve the circuitry which that facility has had designed into it due to external pressures exerted upon that project.

The railroad bypass would be required to clear the Harvey Canal on an elevated structure to allow the continuous flow of waterborne traffic. The entire bypass would require a route length of approximately twenty-five miles as compared with the 13.3 miles currently traveled from Oliver Yard to Avondale. The bypass would be designed to eliminate major grade crossings to remove highway-railroad interface.

Consideration of such a bypass alternative would face severe opposition from various interest groups in the New Orleans area concerning the alignment of tracks in the wetlands and the placement of a new Mississippi River bridge. It is expected that such an alternative

would run into environmental opposition similar to I-410 and would require a long period of time to progress through the planning and administrative phases of compliance with Environmental Protection Agency regulations through environmental impact statements prior to construction. In addition a process similar to that followed in the selection of a new automobile bridge sight in New Orleans would be required to select the best location for the new rail bridge structure.

Consideration of such a bypass could produce benefits to the City of New Orleans through elimination of current community-railroad interface on the east bank. However, trade offs would be involved on the west bank for this area would not be void of problems. Yet, the west bank alternative would provide a bypass of the City of New Orleans without disrupting rail yard facilities and use of the Huey P. Long Bridge which could occur through other regional location alternatives.

Consideration of this alternative requires a broader base of support, benefits and funding sources, than those generated within the Metairie area. Pursuit of an alternative such as this cannot be undertaken without a detailed analysis of benefits and impacts accrued on a regional basis.

7.2.5 North of Lake Pontchartrain Route

This alternative would provide an east-west rail bypass of the New Orleans areas by construction of a new railroad between opelouses and Slidell. The connection from Opelouses to Baton Rouge would be a single track line to provide the SP a connection from its mainline at Lafayette to the river crossing at Baton Rouge. This track construction would be necessary if the SP could not negotiate trackage rights over the Missouri Pacific to Baton Rouge. Between Baton Rouge and Slidell a double track connection north of Lake Pontchartrain would cross the existing rail bridge and move south on the ICG to the ICG eastbound mainline toward Hammond. From the ICG line in Baton Rouge the route would proceed east through Hammond providing a north-south connection with the ICG in Hammond. The route would continue to Covington, south to Mandeville and east to Slidell where a connection would be made with the SOU main line toward either Meridian, Mississippi or New Orleans.

The new double track rail facility would utilize existing railroad rights-of-way to the greatest extent feasible. Between Hammond and West Covington the defunct industrial railroad right-of-way would be used. Covington and Abita Springs would be bypassed by routing the

double track north of Covington, then turning south to a location midway between Covington and Abita Springs along an existing pipeline right-of-way to join the ICG right-of-way south of Abita Springs. New right-of-way would have to be acquired for the Covington-Abita Springs bypass.

From the junction with the ICG alignment south of Abita Springs the route would proceed south to Mandeville, then east to Slidell occupying the ICG right-of-way, and the existing single track would be replaced by a new double track facility. New right-of-way would be required in Mandeville to increase the existing curvature to mainline standards. The connection to the SOU mainline in North Slidell would also require acquisition of new right-of-way.

The total length of the route from Slidell to Opelousas would be 159 miles. Several river and bayou crossings would be provided with new double track trestles and railroad bridges. Major road crossings would be grade-separated by the provision of road overpasses and minor grade-crossings would be protected by flashing lights signals and gates with bells. The existing Interstate 12 overpass south of Abita Springs can accommodate a double track rail facility.

This east-west rail bypass would require an additional connecting link to be constructed east of New Orleans to provide the LN access to Slidell. This can be accomplished most easily in east New Orleans

where a nine mile connection could be constructed between the SOU mainline as it approaches New Orleans near the mouth of Lake Pontchartrain and the LN mainline south of this point. The new facility would be constructed inside of an existing levee and would have no affect on wetlands.

The major drawback to this east-west bypass of New Orleans is the need to provide rail service to the existing industries in New Orleans and to the port. Unlike other city rail relocation schemes, New Orleans requires the maintenance of rail service which would not permit the abandonment of existing facilities in the city. Rather, any bypass for the movement of through traffic is merely a duplication of facilities which are required to provide local service to the port and to the city.

The bypass of Covington and Abita Springs areas is an attempt to reduce the rail impact upon those two towns. Today the ICG runs through the middle of the two cities. With the increase in the volume of through traffic moving over this route due to relocation, the downtown areas of Covington and Abita Springs must be bypassed. The rail route through Hammond moves north of the major portion of the town. Once this route enters Baton Rouge, an industrial area of town flanks each side of the track.

Some residential developments about the railroad and several streets cross the railroad tracks at grade. However, sufficient room exists to construct grade separations. Once the bridge is crossed in Baton Rouge, the terrain opens up and minimal impacts would be encountered enroute to Opelousas where the Southern Pacific would operate over its own line to Lafayette.

A variation of this bypass route would utilize the ICG mainline between Hammond and New Orleans. Rail traffic ould move from Slidell to Hammond thence south to New Orleans for interchange. Route distance of SOU traffic would be increased approximately 89 miles. LN traffic would face a route increase of 115 miles due to the necessity to travel from the New Orleans areas to Slidell prior to connecting with a bypass of the city. An alternative such as this could force the LN to move all of its traffic around the river front rather than increase the route mileage due to the bypass. In that case, either the MP or NOPB would be required to deliver cars to the western carriers unless the LN negotiated trackage rights over the MP to accomplish delivery. The NOPB charter, as presently written, would preclude the LN from operating over the NOPB.

The Slidell-Baton Rouge bypass would provide a new route around New Orleans which would not substantially increase the route mileage for the SOU through traffic. As mentioned above, additional miles would be encountered by the LN traffic due to the requirement to reach Slidell before bypassing New Orleans.

An alternative such as this bypass route would require the trunkline railroads to examine their current operating practices in New Orleans to determine their best course of action. The railroads could elect to withdraw from New Orleans or move the through traffic north of the lake and provide service to the city through local trains rather than from the yards which are located in New Orleans.

Although a regional bypass would enable the removing of the Metairie line from the 17th Street Canal to Shrewsbury, it would not provide the ability for the removal of that portion on NOT track from Oliver Yard to the 17th Street Canal. Rail users exist along the NOT line extending southeast from East City Switch and the UPT access from the east is provided over the NOT. Until such time as passenger service is relocated within the city from its present terminal and the industries along the NOT tracks in New Orleans do not require rail service, that portion of the NOT from Oliver Yard to East City Switch must remain operational.

Potential benefits could accrue to the city of New Orleans through consolidation os SOU and LN right-of-way in New Orleans East to permit development of the lake front property. Benefits of shared maintenance expenses may be realized by the railroads in such a case. Many other benefits from elimination of highway-rail and community-rail interfaces could be realized through a regional solution to transportation problems existing in the New Orleans area. During the regional evaluation, impacts upon other areas such as Slidell, Mandeville, Hammond and Baton Rouge must be considered as in case of the west bank bypass, the north of the Lake bypasses requires a broad base of support to accomplish new routes. Because the Metarie area cannot generate the broad base of support required and because such a solution must consider all impacted areas, these two regional alternatives are not considered to be a feasible solution to the Metarie problem.

7.2.6 Other Railroad Corridors

7.2.6.1 Interstate 10-Causeway

The possibility of combined use of the Interstate 10-Causeway Boulevard corridor was examined to determine its feasibility. The impact of a rail corridor through Metairie using the I-10 corridor would be tremendous. Interstate 10 does not possess sufficient clearance for placement of a double track railroad facility upon the neutral

area. Causeway Boulevard presents the same problem. Interstate 10 is the main east-west artery to New Orleans and the highway would require reconstruction to handle a new rail corridor. Causeway Boulevard is a major north-south artery providing access from Jefferson Highway to the Causeway bridge across Lake Pontchartrain. Disruption of automobile traffic and severance of local traffic would be considerable.

Consideration of such a corridor merely moves the Metairie problem from its current location and places it in another area within the same community. For these reasons this corridor was not considered as a feasible solution to the problem.

7.2.6.2 Midtown Corridor

Another possible rail corridor with long term implications exists if one were to connect the UPT trackage with the river front trackage by building a connecting link of approximately 1.25 miles. This corridor would be located on what is currently St. Joseph Street and would require the consumption of right-of-way on each side of the street. Relocation of major buildings would also be required to affect this solution.

Several major streets are impacted. Tchoupitoulas Street, Constance, Magazine, Camp Street, St. Charles Avenue, Carondelet, Barrone, O'Keefe, South Rampart, and Loyola Avenue would be directly

affected. These streets provide major thoroughfares and would require grade separations. The warehouses area along St. Joseph Street would be consumed together with smaller industrial supply companies. Closer toward Loyola Avenue, new office and bank buildings and the UPT terminal building would be consumed. Immediately north of the UPT building are the Post Office and Federal Buildings, which would also be impacted. Exits from the Greater Mississippe River Bridge would be affected at both Camp Street and O'Keefe Avenue.

Northwest of the UPT building along the UPT tracks are located the Caliborne Avenue, I-10, Broad Street and Jefferson Parkway overpasses which, with the exception of the I-10 overpass, would require adjustment to permit railroad clearances. Beyond this point the Carrollton Avenue Bridge, I-10 and Palmetto overpasses would be encountered as explained above in the Carrollton Curve and Reverse Move alternatives.

Although the south bound main of ICG is shown on maps as extending from Mays Yard to the UPT building, the map is not entirely correct. East of Mays Yard the right-of-way was sold to a small industrial complex which subsequently built new facilities over the track. At Carrollton Avenue in Orleans Parish, this track becomes buried by streets and dirt. Between Carrollton and the UPT tracks, this old south bound main crosses many streets at grade. The south

track crosses over the north track, under I-10 near the Times-Picayune Building, and connects with the UPT tracks. The northern most tracks which appear on the map do exist and pass through residential and industrial areas.

Consideration of this alternative would require a major long term rebuilding program for the City of New Orleans and would require much right-of-way acquisition and condemnation. Literally thousands of people who live in the area of the contemplated route would be severely impacted and hundreds would have to be relocated. In searching for a long term, new rail corridor within the New Orleans area, the existing Metairie facility is superior to a concept described in this segment.

Railroad facilities similar to those located on St. Joseph Street are located on Julia Street. The impacts are more severe than the St. Joseph Street alignment because new office buildings which were recently erected would be required to be torn down or severely altered. Impacts in the UPT building area are more severe because an alignment with UPT tracks does not exist.

Because a railroad corridor through New Orleans as described above is a long term alternative which requires consideration not only on a regional basis, but more importantly by the City of New Orleans, pursuit of this idea as a solution to the Metairie problem is considered infeasible.

7.2.7 Railroad Traffic Rerouting

The potential of rerouting rail traffic from the New Orleans gateway to relieve the impacts upon the Metairie Community was examined. The establishment of a railroad gateway is a process which takes place over extended periods of time. Ultimate effects upon routes, rates and divisions are examined closely and shifts to new gateways are primarily accomplished due to changes in operating policy, mergers and acquisitions and other evolutionary changes in the transportation industry.

The flow of rail traffic through the New Orleans gateway over the NOT is primarily between Texas and Louisiana on the one hand and Alabama, Georgia, North Carolina and Tennessee on the other. Eighty-five percent of the NOT traffic either originates or terminates in Texas and Louisiana and sixty-eight percent must use the Huey P. Long Bridge. New Orleans is the most direct gateway for this traffic to cross the Mississippi River. The next closest major east-west gateway to New Orleans is Memphis. Moving traffic through the Memphis gateway increases the route mileage from 13 to 23 percent over its current course through New Orleans. When using the Memphis gateway, a two carrier route becomes a four carrier route requiring more interchange of traffic and providing a smaller division of revenue among the railroads included in the route.

In most cases rerouting means that revenues generated for a given movement must be divided among different carriers than those currently moving the traffic. The net effect is either to reduce or deprive railroads in the route of previously collected revenue. When revenues of the origin and destination railroads are reduced, they are forced to absorb terminal costs associated with serving a patron. One such cost is equipment investment. The investment required to provide adequate car supply on the part of the origin carrier is sizable. The best interest of the origin carrier is served by deriving maximum linehaul revenues to cover operating costs and provide an adequate return on equipment investment. The best interest of the patron is served by his receiving efficient rail service which includes adequate car supply to handle his product.

Railroad traffic is not routed by the railroads. Shipments are routed by the shipper. Only in the case when a shipper tenders a bill of lading to a railroad with neither a rate nor a route can the railroad select the route over which the shipment will move. And even in this rare case, the railroad is bound by law to assess the applicable rate which produces the lowest total freight charge and to move the shipment over the applicable route. With the exception of rather obtuse combination of rates, the lowest rates apply over the most efficient routes.

Rerouting traffic would produce adverse affects on the railroads operating through New Orleans. These affects would ultimately reach the rail user in the form of longer transit time and less efficient rail service. These effects would not be in the best interests of the City of New Orleans, the port of New Orleans nor the State of Louisiana.

Rerouting would merely impose the volume of traffic moving through New Orleans onto another rail gateway and would merely move the problem from one city to another. Therefore as a solution to the Metairie problem in particular, rerouting is not considered to be a feasible alternative. Prior to rerouting becoming feasible, several policy decisions by the railroads must be made which will determine the long term flow of traffic across the country and the gateways to be utilized to accomplish this movement. These decisions have not been made and until they are, rerouting cannot be considered as a solution to the Metairie problem.

7.3 Cost-Benefit Analysis of Alternatives

7.3.1 Introduction

The previous two sections have fully described each alternative studied and delineated the quantitative and qualitative impacts of each. The intent of this section is to summarize all costs and benefits for each alternative not eliminated from detail consideration due to current infeasibility.

A cost-benefit analysis usually implies a quantitative decision making tool that determines the net benefit or cost of each of a set of alternatives that are under consideration. Rarely, though, are all costs and benefits quantifiable, necessitating the input of a subjective valuation of the qualitative costs and benefits. There is little doubt that any two analysts would subjectively evaluate qualitative factors differently. The important question to be answered then, is who will make the appropriate valuations. It is the opinion of the Federal Railroad Administration and CONSAD that these valuations be made by those parties responsible for developing a course of action from the alternatives herein described. Undoubtedly there are numerous interest groups that are party to this decision and hence, many different valuations will arise which must be reconciled through negotiation.

To facilitate understanding of all costs and benefits, those costs and benefits which are quantifiable with little subjective input are analyzed in a traditional cost-benefit framework. The remaining qualitative costs and benefits are delineated and given a general subjective value such as eliminated, reduced or increased as was interpreted by CONSAD during the course of the study. Although the reader may disagree with the general evaluation of these qualitative factors, CONSAD and FRA have maintained a high degree of objectivity in this evaluation. This qualitative evaluation is based on the description of the impacts provided in the two previous sections, but should be viewed only as a guideline for decision making capable of new interpretation.

7.3.2 Quantifiable Costs and Benefits

The only costs that were determined to be easily quantifiable included the cost of construction and related ancillary costs; highway costs from delay and accidents; and railroad costs due to changes in maintenance and/or operations. The term "cost" is used here in a generic sense to include all dollar costs and dollar benefits (negative costs).

All dollar costs and dollar benefits shown in this analysis are not escalated for inflation, either during the waiting period for the start of construction or during construction itself. This is standard practice in cost-benefit analysis to keep all costs on an equivalent basis.

In the calculation of the net present value of costs and benefits, a 10 percent rate of discount was used for 25 years to bring all future costs and benefits to an equivalent value in current dollars. The 10 percent discount rate has been recommended by the Office of Management and Budget for use in government calculations of present value. A 25 year time frame was chosen to correspond with the likely period of a local bond issue.

Since some of the railroad and all of the highway costs are direct functions of their respective volumes of traffic, a growth factor was included to reflect the changes in this volume over time. Based upon historical trends, it can be estimated that railroad traffic will increase by three percent per year. All railroad costs and benefits were therefore increased at this rate. Similarly, highway traffic has been growing historically at about one percent a year, but since highway costs are a function of both railroad and highway traffic, highway costs and benefits were increased at a rate of four percent a year (1.03 x 1.01 = 1.0403).

7.3.2.1 Level I: Complete Alleviation Package

The total construction cost for the complete alleviation package is 7,372,000 dollars. The elements of these construction costs are displayed in Exhibit 7.6.

EXHIBIT 7.6: Level I Complete Alleviation Package, In-Place Construction Costs (Thousands of Dollars)

Element	Year 0	Year 1
1. Metairie Road Underpass	472	708
2. LaBarre Road Underpass	402	748
3. Carrollton Avenue Underpass	402	747
4. New Railroad Interchange	1,330	
5. Two Pedestrian Overpasses	480	
6. Close Five Crossings		15
7. Double Track	741	399
8. Fence		275
9. Trees and Shrubs	470	
10. CTC	183	
Total	4,480	2,892

The cost of maintaining the eight grade crossings in Metairie today is approximately $8,000 per year. With the elimination of this maintenance after the two years of construction to complete all improvements, the NOTR would recognize an $8,000 saving per year.

At the end of the first year of construction, the new railroad interchange would be complete. The extra miles and time to interchange cars at the new facility will cost the railroads $69,000 per year. There is a saving, though, of $32,000 per year from the use of this new facility due to not having to break the interchange cuts at the grade crossings. The railroads will therefore realize an increased cost of $37,000 per year, from the new interchange. This, of course, will increase at a rate of 3 percent per year since the cost and savings are both a function of the volume of railroad traffic. When this cost is first incurred in the second year, it will have a value of $38,000 (37,000 x 1.03).

A double track at Metairie Road will save the NOTR $12,000 per year by eliminating the delay to trains trying to cross the single track within the same period of time. This savings will also increase at three percent per year, but will not be realized until the third year after the start of construction when it will be worth approximately $13,000 (12,000 x 1.03 x 1.03).

Since by the third year the incremental operating cost of the new interchange will be approximately $39,000 and the incremental savings from the double track will be equal to $13,000, the net cost to the railroads for the third year would be equal to $26,000. This $26,000 cost will grow at three percent per year.

The current cost to highway users of the eight Metairie grade crossings is $310,000 per year, which is based upon the analysis in Section 6.3. This cost will be realized in the first year since construction of grade separations would not be complete and none of the remaining crossings would be closed. After the first year of construction, the new interchange would be complete and the centralized traffic control installed. This will have the effect of moving trains through the neighborhood at a faster speed (13 mph at all crossings), and avoiding additional delays at Hollywood Drive, Atherton Drive, LaBarre Road and Shrewsbury Road during the interchange of railroad cars. The cost saving in the current year would amount to $95,000, but in the second year would increase to $99,000 dollars due to increased railroad and highway traffic.

After completion of the construction of grade separations at Metairie Road, LaBarre Road and Carrollton Avenue, all highway costs will be realized as a saving. By the third year when these savings are fully realized, the dollar amount per year would be $335,000, which will grow at four percent per year.

All costs and benefits by year are displayed in Exhibit 7.7. Although highway savings over a 25 year period are greater than three million dollars, they are offset by the high cost of construction. The total net present value of this project is therefore $3,809,000. In and of itself, the high present cost would seem to indicate an inferior project, but this cost does not account for the qualitative costs and benefits.

7.3.2.2 Level II: Practical Alleviation Package with Five Crossings Closed

The total construction cost for the practical alleviation package is $4,868,000. The elements of these construction costs are displayed in Exhibit 7.8.

Because the railroads will still have two grade crossings with gates to maintain, the full $8,000 dollar per year savings will not be realized from this alternative. The annual railroad savings amounts to $3,000 per year. The costs and benefits attributable to the new interchange facility remain the same as in the Level I alternative.

Although the highway users will still incur a cost of $310,000 in the first year during construction, a savings of $110,000 will be realized in the second year due to the removal of the interchange facilities and the provision of gates at Carrollton Avenue and LaBarre Road. After the completion of the Metairie Road grade separation, a $265,000

EXHIBIT 7.7: Net Present Value of In-Place Alternative, Level I

Year	Incremental Construction Cost	Incremental Railroad Cost	Incremental Highway Cost
0	$4,480,000		$ 310,000
1	2,892,000	$ 38,000	(99,000)
2		26,000 (8,000)	(335,000)
		3% growth per year	4% growth per year
25			
Net Present Value	$6,845,000	$221,000	($3,257,000)

Total Net Present Value = $3,809,000

EXHIBIT 7.8: Level II Practical Alleviation Package, In-Place with Five Crossings Closed Construction Costs (thousands of dollars)

Element	Year 0	Year 1
1. Metairie Road Underpass	472	708
2. New Railroad Interchange	1,330	
3. Two Pedestrian Overpass	480	
4. Close Five Crossings	--	15
5. Double Track	741	399
6. Fence		275
7. Trees and Shrubs	470	
8. CTC	183	
9. Two Crossing Gates	70	
Total	3,746	1,397

benefit will be realized by highway users. This will grow at four percent a year as explained.

Exhibit 7. 9 displays all costs and benefits from this in-place package. Although the net present value is still negative in dollar terms, it has a more favorable cash flow than Level I.

7.3.2.3 Level II: Practical Alleviation Package with Seven Crossing Gates

As explained in Section 7.1.2.2, an alternative to closing five grade crossings and placing gates at the other two, all seven crossings could be provided with gates. With all crossings other than Metairie Road open, there would not be a need for pedestrian overpasses or for a fence along the right-of-way. The elements of the total construction cost of $4,548,000 are shown in Exhibit 7.10.

This alternative would increase railroad operating costs more than the two previous alternatives due to the increased maintenance required for grade crossings with gates. The increased cost amounts to $13,000 annually. The cost of operating at the new interchange remains the same.

After the first year of construction, highway users will realize a $102,000 saving from the reduced accident costs attributable to the crossing gates and decreased delay due to the removal of the interchange facility. With the completion of Metairie Road, these savings would increase to $203,000 annually. All costs are displayed in Exhibit 7.11.

EXHIBIT 7.9: Net Present Value of In-Place Alternative, Level II (Five Crossings Closed)

Year	Incremental Construction Cost	Incremental Railroad Cost	Incremental Highway Cost
0	$3,746,000		$ 310,000
1	1,397,000	38,000	(110,000)
2		26,000	(265,000)
.		3% growth per year	4% growth per year
.			
.			
.			
.			
25		(3,000)	
Net Present Value	$5,016,000	$258,000	($2,541,000)

Total Net Present Value = $2,733,000

EXHIBIT 7.10: Level II, Practical Alleviation Package, In-Place with Seven Crossings Closed Construction Costs (Thousands of Dollars)

Element	Year 0	Year 1
1. Metairie Road Underpass	472	708
2. New Railroad Interchange	1,330	
3. Double Track	741	399
4. Trees and Shrubs	470	
5. CTC	183	
6. Seven Crossing Gates	245	
Total	3,441	1,107

EXHIBIT 7.11: Net Present Value of In-Place Alternative, Level II (with Seven Gates)

Year	Incremental Construction Cost	Incremental Railroad Cost	Incremental Highway Cost
0	$3,441,000		$ 310,000
1	1,107,000	38,000	(102,000)
2		26,000	13,000	(203,000)
.		3% growth per year		4% growth per year
.				
.				
.				
.				
25				
Net Present Value	$4,447,000	$427,000	($1,890,000)

Total Net Present Value = $2,984,000

7.3.2.4 Level III: Short Term-Low Cost Package

The total construction cost for this alternative is $1,793,000 which is composed of $1,330,000 for interchange relocation, $280,000 for eight automatic crossing gates and $183,000 for centralized train control. Railroad costs would increase $37,000 annually (plus 3 percent growth per year) due to interchange relocation plus $14,000 annually for increased maintenance on the automatic crossing gates. The savings to highway users amounts to $125,000 annually (plus 4 percent growth per year) due to time savings from the removal of the interchange facilities and reduced accident costs attributable to the automatic crossing gates. These costs and benefits are displayed in Exhibit 7.12.

7.3.2.5 Carrollton Curve

As discussed in Section 7.2.1, the construction costs of implementing the Carrollton Curve alternative are extremely high. Without any inflationary escalation, the construction cost amount to $31,743,000 the majority of which comes from the necessary modifications to the I-10 - Airline Highway interchange. The elements of these construction costs are shown in Exhibit 7.13. These construction costs would be expended over a three year period on a 20 percent - 40 percent - 40 percent basis.

The railroads would incur an increased operating cost from routing all rail traffic around the Carrollton Curve of $178,000 annually

EXHIBIT 7:12: Net Present Value of In-Place Alternative, Level III

Year	Incremental Construction Cost	Incremental Railroad Cost	Incremental Highway Cost
0	$1,793,000		$ 310,000
1		38,000	(125,000)
2		3% growth per year	4% growth per year
.			
.			
.			
25			
Net Present Value	$1,793,000	$507,000	($1,147,000)

Total Net Present Value = $1,153,000

EXHIBIT 7:13: Carrollton Curve

Construction Cost
(Thousands of Dollars)

Element	Cost
1. New Railroad Interchange	$ 1,330
2. Railroad Track Work	3,163
3. Modification of Palmetto Overpass	2,875
4. Modification of I-10 Interchange	24,375
Total	$31,743

at the current volume of traffic. After seven years to complete construction, this cost would be $192,000 annually and growing at a three percent rate per year. As reflected in Section 7.2.1.3.5, this added cost is due to increased time and mileage costs as well as right-of-way maintenance. Also reflected in this cost is a deduction for the savings to the NOT from not having to maintain eight grade crossings in Metairie. The railroad would realize a small saving of $32,000 per year from the use of the new interchange facility. This would amount to a $39,000 per year after a seven year waiting period. The net cost to the railroads in seven years would be $153,000 which would appreciate at three percent per year.

For the first seven years until completion of the new route, highway users will continue to incur costs of $310,000 annually at current traffic volumes. In the seventh year this cost will amount to $392,000. Starting in the eighth year, the highway users will realize a saving of $408,000 annually, which will continue to grow at four percent per year, since all highway costs will be eliminated.

Exhibit 7.14 displays all costs and benefits.

7.3.2.6 Carrollton Reverse Move

The construction costs of the Carrollton Reverse Movement are of a similar magnitude to the Carrollton Curve since most of the same modifications must be made to the I-10-Airline Highway interchange.

EXHIBIT 7.14: Net Present Value of Carrollton Curve Alternative

Year	Incremental Construction Cost	Incremental Railroad Cost	Incremental Highway Cost
0			
1			$310,000
2			↓
			4% growth per year
3			↓
4	$6,347,000		↓
5	$12,697,000		↓
6	12,697,000	$153,000	(408,000)
7		↓	↓
.			
.		3% growth per year	4% growth per year
.		↓	↓
.		↓	↓
25		↓	↓
Net Present Value	$19,386,000	$802,000	(367,000)

Total Net Present Value = $19,821,000

Although ramp M of I-10 need not be modified, Jefferson Davis Parkway overpass must be raised. The total cost of construction as shown in Exhibit 7.15 is $20,961,000 which would be incurred on a 20 percent-40 percent-40 percent basis over three years.

Because of the necessity of stopping and starting the train, running the engine around the train and the overall increase in time and mileage, the cost to the railroads would be $558,000 annually. As in the Carrollton Curve alternative, the railroads will realize a $32,000 a year saving from the new interchange. In eight years when these additional costs would start being incurred, the annual cost to the railroads would be $647,000 due to the increase in rail traffic at three percent per year.

As was true in the Carrollton Curve alternative, highway users will continue to incur costs of $310,000 per year until the completion of all construction at which time the highway users will realize a saving of $408,000 per year. These costs are displayed in Exhibit 7.16.

7.3.2.7 River Front Route

The only major construction costs involved in accomplishing the River Front Route alternative are for rehabilitating the existing railroad track. This would involve an expense of $19,130,000 for rehabilitating the approximately 10 miles of double track to provide an adequate facility for the increased railroad traffic.

EXHIBIT 7:15: Carrollton Reverse Move

Construction Costs
(Thousands of Dollars)

Element	Cost
1. New Interchange	$ 1,330
2. Modification to Palmetto Overpass	2,875
3. Modification to Jeff. Davis Overpass	2,875
4. Railroad Track Work	3,881
5. Modification to I-10 Interchange	10,000
Total	$20,961

EXHIBIT 7.16: Net Present Value of Carrollton Reverse Move Alternative

Year	Incremental Construction Cost	Incremental Railroad Cost	Incremental Highway Cost
0			$ 310,000
1			↓
2			4% growth per year
3			↓
4	$ 4,192,000		↓
5	8,384,000		↓
6	8,384,000		↓
7		$ 647,000	(408,000)
⋮		↓	↓
		3% growth per year	4% growth per year
		↓	↓
25			
Net Present Value	$12,802,000	$3,390,000	(367,000)

Total Net Present Value = $15,825,000

Railroad costs would increase dramatically due to the increased mileage of the new route and the reduced speed of operations after completion of construction. The railroads would incur a $1,450,000 increased cost of operations. The highway users on the other hand would realize a saving from the elimination of all current highway user costs of $335,000 in the first year after construction. All costs and benefits are displayed in Exhibit 7.17.

7.3.3 Qualitative Costs and Benefits

In the following section, those impacts which do not lend themselves to a dollar evaluation are presented in a qualitative format. Some of these impacts are quantitative, such as noise, and have been treated as such in Chapter 6 with the appropriate detail. Also presented in this section is a qualitative evaluation of highway delay and highway hazards for comparison with other impacts even though they were presented quantitatively in the previous section.

It should be re-emphasized that the words used to describe the qualitative impacts are subjective and do not contain any measure of degree. The word "reduced" may imply minor reductions or great reductions depending upon the perception of the individual viewing the problem. The word "reduced" does imply, though, a positive change and the word eliminated is a definitive statement of the degree of problem solution. Even these may be debated, but they are CONSAD's and FRA's best estimate of the impacts.

EXHIBIT 7.17: Net Present Value of River Front Route Alternative

Year	Incremental Construction Cost	Incremental Railroad Cost	Incremental Highway Cost
0	$ 8,950,000		$ 310,000
1	10,280,000		322,000
2		$ 1,416,000	(335,000)
		3% growth per year	4% growth per year
25			
Net Present Value	$18,296,000	$13,422,000	($2,874,000)

Total Net Present Value = $28,844,000

7.3.3.1 In-Place Alternatives, Qualitative Impacts

In Exhibit 7.18, the subjective evaluation of the qualitative factors outlined in Chapter 6 are delineated. As fully explained in the discussion of the complete alleviation package in Section 7.1.1, train noise will be reduced due to the elimination of whistles at the eight grade crossings; highway delays, highway hazards and pedestrian hazards are eliminated due to the elimination of all grade crossings and the provision of pedestrian overpasses; train vibration and general railroad hazards are reduced due to the removal of the interchange tracks in the neighborhood; but railroad presence will not change since the railroad is not being relocated under this alternative.

Replacing the grade separations at LaBarre Road and Carrollton Avenue with automatic crossing gates in the Level II alternative does not continue to eliminate highway delay, highway hazards and pedestrian hazards, but they would be reduced from their current level by the Metairie Road grade separation. All other impacts in Level II remain the same as in Level I.

Since the Level III alternative does not provide for any grade separations, highway delay would not change from the current level. The horn noise would only be eliminated in this alternative by a variance in the state law. Noise would be reduced in the current

EXHIBIT 7.18: In-Place Alternatives - Problem Alleviation

Alternative	Train Noise	Hwy. Delay	Hwy. Hazards	Ped. Hazards	Train Vibration	Gen Railroad Hazards	Railroad Presence
LEVEL I	Reduced	Eliminated	Eliminated	Eliminated	Reduced	Reduced	No Change
LEVEL II	Reduced	Reduced	Reduced	Reduced	Reduced	Reduced	No Change
LEVEL III	Limited	No Change	Reduced	No Change	Reduced	Reduced	No Change

interchange area, though, after the removal of the facility, but in general the noise level would only be reduced a limited amount. The removal of the interchange would also have the effect of reducing vibration and general railroad hazards. Although highway hazards would be reduced by crossing gates at all crossings, pedestrian hazards would remain the same.

7.3.3.2 Relocation Alternatives, Qualitative Impacts

Because all relocation alternatives move the railroad operations to Orleans Parish, the qualitative impacts on both Metairie and Orleans Parish were identified. As is evident in Exhibit 7.19 all relocation alternatives have the effect of eliminating all railroad impacts in Metairie since the railroad would not be physically present.

The impacts upon Orleans Parish for the Carrollton Curve alternative and the Carrollton Reverse move alternative are identical. Train noise and vibration would be increased over its present level in the curve alternative due to the squeal of the steel wheels on the steel rails. In the reverse move the stopping and starting of the train and the acceleration of the engine dramatically increase the noise and vibration level in the Carrollton area.

General railroad hazards and railroad presence are increased in the Carrollton area under both alternatives due to the substantial increase in the volume of rail traffic moving through this area.

EXHIBIT 7.19: Relocation Alternatives - Problem Alleviation

Alternative	Train Noise	Hwy. Delay	Hwy. Hazards	Ped. Hazards	Train Vibration	Gen. Railroad Hazards	Railroad Presence
Carrollton Curve							
. Metairie	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated
. Orleans	Increased	None	None	None	Increased	Increased	Increased
Carrollton Reverse Move							
. Metairie	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated
. Orleans	Increased	None	None	None	Increased	Increased	Increased
Riverfront Route							
. Metairie	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated	Eliminated
. Orleans	Increased	Increased	Increased	Increased	Increased	Increased	Increased

Although neighborhood adjacent to the River Front route currently experiences all of the same impatts as the Metairie neighborhood, the increase in rail traffic will substantially increase these impacts.

8.0 AVAILABILITY OF FUNDING

To this point in the study, the railroad-community problems that exist in Metairie have been identified and analyzed, the total environment in which these problems exist has been described, and the costs and benefits of various alternatives for the alleviation of these problems in this environment have been delineated. The description of the environment of these problems was necessary to identify the constraints that must be imposed upon the pursuit of any one of the alternatives.

One of the major constraints not yet discussed is the availability of funding for the implementation of alternatives. Although dollar cost should not be the sole determinant for the acceptance or rejection of any alternative, only those alternatives that fall within the budget constraints can be realistically considered. The limitation of dollars prevents the decision maker from simply picking that alternative with the greatest long term net benefits.

In the following three sections, those funds that are potentially available for the implementation of one of the previously discussed alternatives are described. This information was derived from extensive discussions with financial and program administrators at the federal, state and local level. It should be noted that the funds

described are currently available or available in the near future. This does not presume to imply that no other funds will become available at a future date or that current funds will be reduced or eliminated. Where a general direction with regard to particular funds was developing, this information was included to provide information to project the source of future funds.

8.1 Local Funding Sources

8.1.1 Jefferson Parish

Due to the accelerated growth of population in Jefferson Parish over the past ten years, public service demands have grown faster than revenue. Part of this is explained by the normal urbanization process which creates a greater per capita demand for public goods and services than in non-urbanized areas. Jefferson Parish has been able to offset some of this pressure by high millage rates on rental and commercial properties, which have been the backbone of the past growth. In addition, a 1 1/2 percent sales tax generates an equally large revenue fund from the rapidly expanding retail trade in the Parish. It should be noted that due to the structure of the property tax in Jefferson Parish, homeowners are paying virtually no tax on their own property. Although the millage rate of 134 1/4 mills is one of the highest in the country, the assessment ratio of 5 percent coupled

with a $3,000 homestead exemption and a $3,000 veterans exemption reduces the taxable base to zero valuation. Hence the major generators of revenue are the property tax on commercial, rental and industrial properties and the general sales tax.

These revenues have allowed the Parish to sustain operating budgets of between 30 and 40 million dollars annually over the past few years. It has been made clear though by the Jefferson Parish director of finance and the Parish council chairman that new large appropriations such as would be needed to alleviate the Metairie problems would be unavailable.

8.1.2 Railroad Taxing District

The only funding vehicle available to the Parish is a bond issue. According to Louisiana law, Jefferson Parish can only incur debt up to 10 percent of its assessed valuation, but can by local ordinance, create special districts which also have a bonding capacility of 10 percent of assessed valuation. Currently Jefferson Parish has 17 such special districts and the sum of all indebtedness of these special districts and the Parish indebtedness is equal to 40 percent of the total assessed valuation. A debt to assessment ratio of 40 percent is considered to be extremely high by most bond financers, but Parish officials believe that they could sell a Parish bond, if passed, with little trouble.

Parish officials believe that if a special district were to be created to support a bond issue to use in the alleviation of Metairie's railroad problems, it must be restricted to the east bank of the Parish in order to have any chance of approval by the voters. Ideally, the special district would be restricted to the Metairie area where the impacts of the NOT railroad are most evident to citizens. This would almost assure passage of a bond issue, but the bond issue would have to be very small. Because the Metairie area is mainly residential and as explained previously, residential properties usually are assessed at a zero valuation, there is too little assessed valuation in the area to finance a bond of any reasonable size. Depending on the definition used in defining a special district in Metairie, approximately a $2-4 million bond issue could be floated.

Consideration was given to the potential of the eighth ward, which encompasses the Metairie area, to fully finance an alternative solution. Since the eighth ward is predominantly residential and most residential property in Jefferson Parish is assessed at a zero valuation, only $3.5 million could be raised through a bond issue ($35 million assessed valuation x 10%). If the citizens of the eighth ward desired to impose a head tax upon themselves to fully finance a solution, it would require approximately $11.52 per person per million dollars of solution. This is based on the 1970 census of the eighth ward, 86,792 individuals. If for

example the citizens desired to fund the "Carrollton Curve" alternative through a self imposed head tax, it would require $429.70 from every individual to raise the required $37.3 million dollars for construction ($37.3 million x 11.52 per million). This of course does not cover the increased operating cost to the railroad.

The magnitude of cost necessary to alleviate the Metairie problems with the NOT would seem to indicate that the Parish council would define the east bank as the special district, either inclusive or exclusive of the incorporated cities of Kenner and Harahan. The assessed valuation of the east bank inclusive of the two incorporated cities is $166 million and hence, a bond issue in this district could be a maximum of $16.6 million. Excluding the two cities leaves an assessed valuation of $127 million, which would support a $12.7 million bond issue.

Although the Louisiana law permits a 40 year term on bonds, the Parish would desire to maintain the term of the bond to 25 years for the purposes of fiscal rationality. A $12.7 million bond issue for 25 years at 6 percent interest (the current allowable maximum) would require between a 9.5 mill tax increase to support the new debt service.

The extent of voter support for a bond issue on the east bank to solve Metairie's railroad problems is currently in question. Parish officials are dubious that such a bond issue could pass the voters even if Kenner and Harahan are excluded from the special district. An

alternative that the Parish council might pursue is the creation of the special district for the alleviation of all east bank railroad problems, not just those of Metairie. Although this would decrease the dollar amount usable in Metairie, it would increase the probability of passing the bond issue.

8.1.3 Orleans Parish

As explained in Section 2.4.5, Orleans Parish main concern is that the current railroad problems in Metairie not be solved at the expense of Orleans Parish citizens. This is not to say though that Orleans Parish would not financially support a solution which accrued benefits to Orleans Parish as well as to Metairie. The current alternative solutions to the Metairie problems do not accrue benefits to Orleans Parish, with the possible exception of the two regional solutions, "west bank" and "north of the lake". Hence, it is not believed that Orleans Parish would contribute any funds to these solutions. Should further studies of the regional alternatives be completed and planned for implementation, Orleans Parish as well as the other Parishes in the region might make a contribution of funds for implementation.

8.2 State Funding Sources

8.2.1 Department of Streets and Highways

There are no programs in the Department of Streets and Highways that are funded by state revenues that could be used for either relocation or in-place improvement alternatives. The Department does play a major role as the administrator of federal program funds from the Federal Highway Administration. Many of the Federal Highway Administration funds which are described in Section 8.3.1, are administered by the Department of Streets and Highways without any specific pass through provisions to the urban or rural areas of the state. The Department must establish priorities for the use of these funds and hence any contributions made from these funds to the implementation of an alternative for the solution of Metairie's railroad problems must be cleared through the Department.

8.2.2 The Governor's Office

Governor Edwards has publicly stated that he would support the implementation of an alternative solution to the Metairie railroad problem with a $2 million request from the legislature. This $2 million allocation to Metairie faces similar scrutiny as would the Federal highway funds administered by the State Department of Streets and Highways. The legislature having a responsibility to the entire

state would have to evaluate the importance of this railroad problem in light of all railroad problems in the state. The Governor would support the use of this money in Metairie, but the action of the legislature is uncertain. The $2 million should therefore be viewed as a maximum.

8.3 Federal Funding Sources

8.3.1 Federal Highway Administration

The "Federal-Aid Highway Act of 1973" and the "Highway Safety Act of 1973" appropriates three sources of funds which are applicable to solving the Metairie Railroad conflicts. Although the act only provides funding in these programs through fiscal year '76, it is believed that these funds will be carried on in future years.

Urban Systems Funds: The State of Louisiana is granted $11.4 million per year for use in road improvement in the designated urbanized areas of the state. This Federal fund of 11.4 million represents 70 percent of the total that the state has available for expenditure in this program; the other 30 percent or 4.9 million dollars must come from state funds in order to obtain the federal share. Of the total $16.3 million, $7.3 million must be passed directly through to the designated urban areas. The New Orleans urbanized area receives $4.9 million for fiscal year '76 of which Jefferson Parish receives $1.6 million.

The allocation of funds within the New Orleans urbanized area is directed through the New Orleans Metropolitan Transportation Planning Program on a project basis. Jefferson Parish has obtained $1.6 million for use in a major road improvement program, some of which could be used for the improvement of Metairie Road and Carrollton Avenue, both of which are on the Federal urban system. Future allocations could be used to perform additional in-place improvements or to relocate the railroad. Financing the relocation of the railroad with these funds could be justified as improvements to the urban system roads which cross the tracks.

Rail-Highway Crossing Funds: The "Highway Safety Act of 1973" appropriated funds to be allocated to the states on a 90 %-10 % matching basis to be applied in eliminating hazards at rail-highway crossings on the federal-aid highway system. It is stipulated that 50 percent of these funds must be used in the provision of improved warning devices, while the other 50 percent could be used in an unrestricted manner.

The State of Louisiana Department of Streets and Highways administers the annual allocation of $1 million from this program. The distribution of these funds throughout the state is determined by a priority ranking by the Department of Streets and Highways. These funds are directly applicable to the implementation of alternatives in the resolution of Metairie's railroad problems. Naturally, Metairie

must compete with other areas in the state with railroad crossing problems for the use of these funds.

Safer Road Funds: The "Highway Safety Act of 1973" also provides funds for the elimination of all types of safety hazards on non-Federal aid highways. Railroad-highway grade crossings are specifically mentioned as a safety hazard to which these funds could be applied.

As with the rail-highway crossing funds, the annual allocations to Louisiana are administered by the Department of Streets and Highways, which distributes these funds throughout the state on a priority basis. The current annual allocation to Louisiana is $1.6 million.

8.3.2 Federal Railroad Administration

The Federal Railroad Administration does not have any programs for funding the implementation of railroad relocation plans or for the funding of improvements to existing railroad-community problems. Although there has been discussion among the citizens that the analysis of the NOT in Metairie was a "pilot study" in the sense that implementation funds would be available after completion of the final report, funds of this nature do not exist in the budget of the Federal Railroad Administration.

8.3.3 Community Development Funds

Title I of the Housing and Community Development Act of 1974, Public Law 93-383, provides block grants to "metropolitan cities" and

"urban counties" for the purpose of developing urban communities, including the provision for decent housing and the creation of an adequate living environment. It is clear from the federal regulations governing the use of these funds (Federal Register, Vol. 39, No. 220, Wednesday, November 13, 1974) that the problems identified in the Metairie railroad-community conflict and the alternatives developed to alleviate them are appropriate for the application of these funds.

The annual distribution of these funds to the metropolitan and non-metropolitan areas and to the urban counties and metropolitan cities are based upon allocation formulas in the law. The grants are designed to be "passed through" directly to the appropriate unit of government without application to any state administrative office.

Jefferson Parish is to receive approximately $8 million over the three year initial funding of the program or $2.67 million per year on the average. These funds can be applied in full or in part to the implementation of any alternative to alleviate the railroad-community conflicts in Metairie.

It should be noted that Jefferson Parish is not without other community development needs and hence it is expected that these funds would be applied throughout the Parish on a priority basis.

APPENDIX I: Highway Cost Analysis

The procedures for estimating the magnitude and cost of vehicle delay due to the blocking of grade crossing was based upon a recently released document prepared for the Federal Railroad Administration and the Federal Highway Administration entitled Guidebook for Planning to Alleviate Urban Railroad Problems. Modifications to the highway user analysis presented in that document were made to more accurately estimate the magnitude and cost of the highway delay problems in Metairie. The following fully describes the methodology used in the results as shown in Section 6.3 of this report.

Input Data

The average daily traffic at each of the eight grade crossings in Metairie was measured on four consecutive 24 hour periods in September and October. The traffic tapes generated by the Parish counters displayed the number of vehicles traversing a particular crossing in a particular direction for 15 minute intervals throughout the 24 hour period.

A record was made of the hourly traffic recorded at each grade crossing in each direction for each of the four 24 hour periods. The four observations for each hour in each direction for each grade

crossing were averaged to produce one hourly figure for each of the 24 hours. These average hourly traffic figures are shown in Exhibit I. 1.

Most traffic analyses use the average daily traffic as the basic measure of analysis, but the obvious dispersion of traffic throughout the 24 hour period, necessitated looking at a smaller time frame than 24 hours. Five time periods were chosen to capture distinct characteristics of the traffic and to keep the hours within the period as uniform as possible. The five periods included the morning and evening rush hours (6 a.m. -10 a.m. and 3 p.m. to 7 p.m.), the afternoon shopping hours (10 a.m. -3 p.m.), the late evening shopping and recreation traffic (7 p.m. -12 midnight) and the early morning traffic (12 midnight-6 a.m.). The average hourly traffic for these periods was shown in Exhibit 6. 7, and is reproduced here in Exhibit I. 2.

Based on information supplied by the railroads, it was determined that an average of 24 trains per day cross the NOT in Metairie and in fact move very close to one an hour for 24 hours. There is little variance in this average. The same data produced the average length of a train at approximately 48 cars per train, but there is a large variance in this number. Trains that cross the NOT range in size from 1 to 150 cars per train, but because there is no pattern to the length of trains, there was little choice but to use 48 cars per train in the analysis.

EXHIBIT I. 1
Average Hourly Highway Traffic
Number of Vehicles Per Hour

Hour	Carrollton Avenue		Metairie Road		W. Oakridge Drive		Farnham Place		Atherton Drive		Hollywood Drive		Labarre Road		Shrewsbury Road	
	Nbd	Sbd	Nbd	Sbd	Nbd	Sbd	Nbd	Sbd	Nbd	Sbd	Nbd	Sbd	Nbd	Sbd	Nbd	Sbd
12-1 am	7	5	83	50	3	1	4	1	3	2	35	5	5	5	1	6
1-2	8	19	45	21	2	1	1	0	2	3	19	3	3	4	0	2
2-3	5	2	30	16	0	0	0	1	4	2	1	1	1	1	0	1
3-4	2	2	25	14	1	0	2	0	0	2	1	0	0	4	0	0
4-5	1	3	21	25	1	1	1	0	0	5	5	4	3	2	1	1
5-6	2	14	47	94	2	1	2	2	3	7	6	5	5	19	2	15
6-7	18	105	156	377	2	7	8	33	7	28	25	17	17	68	6	29
7-8	47	506	314	948	13	105	15	15	45	167	66	71	40	197	17	80
8-9	99	329	484	769	34	69	66	66	34	164	95	155	77	175	27	37
9-10	73	115	485	553	27	23	34	42	36	92	68	131	116	192	20	30
10-11	72	93	530	475	26	19	33	26	35	83	74	77	138	172	12	22
11-12	90	99	578	481	25	16	30	27	58	97	88	91	178	184	24	38
12-1 pm	110	116	616	501	30	29	41	25	63	90	84	88	163	178	14	25
1-2	90	98	640	474	31	18	34	26	56	99	66	54	159	213	38	35
2-3	103	99	617	471	29	20	65	35	57	92	66	81	146	160	24	28
3-4	239	121	776	459	89	28	58	44	68	98	81	90	180	179	43	37
4-5	393	120	871	458	54	25	88	51	102	102	157	93	218	179	39	49
5-6	541	105	869	382	69	28	123	49	129	85	114	67	209	162	13	35
6-7	139	101	570	387	51	34	66	28	67	92	115	50	153	144	9	24
7-8	86	78	405	330	19	19	30	26	56	61	83	84	120	102	9	27
8-9	64	50	290	231	16	12	28	14	29	43	66	45	65	56	6	15
9-10	49	38	323	209	10	5	16	10	21	30	53	37	38	39	3	15
10-11	28	20	204	176	11	4	10	6	10	16	40	24	18	24	1	12
11-12	19	12	123	112	3	2	7	5	4	14	14	9	8	12	1	8

EXHIBIT I.2: Average Hourly Traffic

	12 Midnight 6 a.m.	6 a.m. 10 a.m.	10 a.m. 3 p.m.	3 p.m. 7 p.m.	7 p.m. 12 Mid.
Carrollton					
Northbound (N)	4	59	93	328	49
Southbound (S)	7	263	101	112	40
Metairie					
N	42	360	596	771	269
S	37	662	480	421	212
W. Oakridge					
N	1	19	28	66	12
S	1	51	21	29	8
Farnham					
N	1	31	40	84	18
S	1	39	28	43	12
Hollywood					
N	11	63	76	117	51
S	3	93	78	75	40
Atherton					
N	2	31	54	91	24
S	3	113	92	94	33
LaBarre					
N	3	62	157	190	50
S	6	158	181	166	47
Shrewsbury					
N	1	16	22	26	4
S	4	44	30	36	15

Other input data to the analysis were made by on-site inspection and observation. This included the roughness of a crossing, the approach speed of the highway vehicles, the average speed of the train and the type of warning device at the grade crossing. This data was displayed in Exhibit 6.5 and 6.6 and is reproduced here in Exhibit I.3.

Highway Delay Methodology

In order to determine the cost to highway users in terms of time and operations from train delay it is necessary to estimate how many vehicles will be stopped by the train blocking the crossing and/or the queue created by this blocking. The basic methodology described below is a modification from the aforementioned FRA/FHWA publication. The basic modifications treat the average daily highway traffic in discrete periods rather than 24 hour periods and make a more explicit estimate of the queues created at the crossing.

Variables

TD	=	Average vehicle delay (min.)
TB	=	Train blocking time (min.)
CPT	=	Railroad cars per train
L	=	Length of train (feet)
V	=	Velocity of train (mph)
	=	Probability of being stopped
TPD	=	Trains per day
TPP	=	Trains per period
HPP	=	Hours per period
APT	=	Average hourly period traffic

EXHIBIT I.3: Highway-Grade Crossing Inventory

Crossing	Average Daily Traffic	Average Auto Approach Speed (mph)	Speed Reduction Percent	Warning Device
1. Carrollton Avenue	4,528	25	100	Crossbucks
2. Metairie Road	17,113	30	65	Flashing Lights
3. W. Oakridge Drive	1,012	25	100	Crossbucks
4. Farnham Place	1,289	25	100	Crossbucks
5. Hollywood Drive	2,400	25	100	Crossbucks
6. Atherton Drive	2,363	25	100	Crossbucks
7. LaBarre Road	4,529	30	65	Flashing Lights
8. Shrewsbury Road	871	25	65	Flashing Lights

EXHIBIT I. 3: Rail-Grade Crossing Inventory

Crossing	Trains per Day	Train Crossings Per Day	Cars per Train	Average Train Speed (mph)
1. Carrollton Ave.	24	24	48	10
2. Metairie Road	24	24	48	10
3. W. Oakridge Dr.	24	24	48	10
4. Farnham Place	24	24	48	10
5. Hollywood Dr.	24	27	48	5
6. Atherton Drive	24	27	48	5
7. LaBarre Road	24	27	48	5
8. Shrewsbury Rd.	24	31	48	5

AQDT = Average queue delay time (min.)
VB = Vehicle blocking time from queuing
TAD = Total average delay (min.)
TVS = Total vehicles stopped

Train blocking time is a function of the length of the average train and its average speed.

(1) $TB = L/(V \times 88) + .5$

The constant 88 converts miles per hour to feet per minute. The constant .5 allows 30 seconds for the train to clear the crossing prior to the first vehicle moving

where

(2) $L = \left[CPT + (LOG_{10}\ CPT)^2\right] \times 50$ feet/car

Trains per period

(3) $TPP = \frac{TPD \times HPP}{24 \text{ hrs/day}}$

The average vehicle delay is broken down into two parts, the average delay for vehicles stopped while the train was blocking the crossing and the average delay for vehicles stopped by the queue. The average delay to vehicles stopped by the train is equal to

(4) $TD = .5 \times TB$

This can be proved by the following:

Let α = the uniform arrival rate of vehicles to the crossing (vehicles/minute).

The number of vehicles stopped by the train (VS) equals

(5) $VS = \alpha (TB) - 1$

Each vehicle stopped is delayed sometime less than the actual train blocking time. The first vehicle is delayed $(TB - 1/\alpha)$ minutes. The second vehicle is delayed $(TB - 2/\alpha)$ minutes or generally the $(VS-Z)^{th}$ vehicle is delayed

(6) $TB - (VS-Z)\ 1/\alpha$ minutes

where Z goes from VS-1 to 0.

The average delay time is therefore equal to:

$$(7) \quad TD = \frac{\sum_{Z=0}^{VS-1} \left[TB - (VS-Z)\ 1/\alpha \right]}{VS}$$

This can be solved as follows:

$$\frac{VS(TB) - 1/\alpha \quad \Sigma (VS-Z)}{VS}$$

$$= TB - 1/\alpha \left[\frac{\Sigma (VS-Z)}{VS} \right]$$

But $\sum_{Z=0}^{VS-1} \frac{(VS-Z)}{VS} = 1/2 + VS/2$

Therefore

(8) $TD = TB - 1/\alpha\ (1/2 + VS/2)$

$$= TB - \frac{VS + 1}{2\alpha}$$

From Equation (5) we know

$$VS + 1 = \alpha(TB)$$

Therefore,

$$TD = TB - \frac{\alpha(TB)}{2\alpha}$$

$$= TB - TB/2$$

$$TD = .5 \times TB$$

The probability of being stopped by a passing train is

(9) $$\beta = \frac{TB}{60\ (HPP/TPP)}$$

and hence the number of vehicles stopped in a given period can be calculated as

(10) $$VS = \beta \times APT$$

It is assumed that the rate of queue dissipation is two seconds per stopped vehicle. Therefore the average queue delay can be shown to be equal to:

(11) $$AQDT = \frac{(VS + 1) \text{ seconds}}{60 \text{ sec/min}}$$

During the time that the queue dissipates, additional vehicles will be blocked. The time during which these vehicles will be blocked (VB) is equal to:

(12) $$VB = \frac{VS \times 2 \text{ sec/vehicle}}{60 \text{ sec/min}}$$

Therefore, the probability of being stopped by the queue is equal to

(13) $$\beta' = \frac{VB}{(60 \text{ min/hr} \times HPP/TPP) - TB}$$

and the number of vehicles stopped is equal to

(14) $VS' = \beta' \times (APT - VS)$

and the average blocking delay for these additional vehicles is equal to

(15) $TD' = .5 \times VB$

A third iteration would be as follows:

(16) $$AQDT' = \frac{(VS' + 1) \text{ seconds}}{60 \text{ sec/min}}$$

(17) $$VB'' = \frac{VS' \times 2 \text{ sec/veh.}}{60 \text{ sec/min}}$$

(18) $$\beta'' = \frac{VB''}{(60 \text{ min/hr} \times HPP/TPP) - (TB + VB)}$$

(19) $VS'' = \beta'' \times (APT - VS - VS')$

(20) $TD'' = .5 \times VB''$

(21) $$AQDT'' = \frac{(VS'' + 1) \text{ seconds}}{60 \text{ sec/min.}}$$

The total average delay is therefore equal to the weighted average delay experienced by each group of vehicles

(22) $$TAD = \frac{VS(TD + AQDT) + VS'(TD' + AQDT') + VS''(TD'' + AQDT'')}{VS + VS' + VS''}$$

Example delay calculation:

Let:

HPP = 5
TPD = 24
CPT = 48
V = 10 mph
APT = 500 vehicles/hr.

Then from (2)

$$L = \left[48 + (\text{LOG}_{10}\ 48)^2\right] \times 50 \text{ feet/car}$$

$$= 2550 \text{ feet}$$

(1) $TB = (2550/\ 10 \times 88) + .5$

$= 3.4$ minutes

(3) $TPP = \frac{24 \times 5}{24} = 5$

(4) $TD = .5 \times 3.4 = 1.7$ minutes

(9) $\beta = 3.4/(60 \times 5/5) = .06$

(10) $VS = .06 \times 500 = 30$ vehicles

(11) $AQDT = \frac{30 + 1}{60} = .52$ minutes

(12) $VB = (30 \times 2)/60 = 1$ minute

(13) $\beta' = \frac{1}{(60 \times 5/5) - 3.4} = .02$

(14) $VS' = .02\ (500-30) = 9$ vehicles

(15) $TD' = .5 \times 1 = .5$ minutes

(16) $AQDT' = (9 + 1)/60 = .17$ minutes

(17) $VB'' = (9 \times 2)/60 = .3$ minutes

(18) $\beta = \frac{.3}{(60 \times 5/5) - (3.4 + 1)} = .01$

(19) VS'' = /01 (500 - 30-9) = 5 vehicles

(20) TD'' = .5 x .3 = .15 minutes

(21) AQDT'' = (5+ 1)/60 = .1 minutes

(22) $TAD = \frac{30(1.7+.52) + 9(.5+.17) + 5(.15+.1)}{30 + 9 + 5}$

= 1.7 minutes

In this example we see that of the 500 vehicles per hour for the five hour period, 44 vehicles per hour (220 vehicles per period) are stopped at the crossing, each for an average of 1.7 minutes. Hence, in each hour a total of 74.8 minutes are lost to delay.

For each period of the day, for each grade crossing and for each traffic direction, the calculation of the number of vehicles stopped is calculated. This was shown in Exhibit 6.8 and again here in Exhibit I.4.

In order to evaluate the cost associated with this delay, the data were summarized as is shown in the following table. The previously discussed FRA/FHWA "Guidebook ....." makes the assumption of a traffic mix of 92.7 percent passenger cars, 4.7 percent single unit trucks and 2.7 percent combination trucks and places an operating cost of $1.80 per hour for passenger vehicles and $5.00 per hour for trucks. Using these assumptions, an average daily incremental operating cost to the community was calculated. Using the FRA/FHWA assumption of

EXHIBIT I.4: Vehicles Stopped per Hour

	12 Midnight 6 a.m.	6 a.m. 10 a.m.	10 a.m. 3 p.m.	3 p.m. 7 p.m.	7 p.m. 12 Mid.
10 mph, 24 trains per day					
Carrollton					
Northbound (N)	0	3	6	23	3
Southbound (S)	0	17	6	7	2
Metairie					
N	2	25	49	70	18
S	2	56	36	31	14
W. Oakridge					
N	0	1	2	4	1
S	0	3	1	2	0
Farnham					
N	0	2	2	5	1
S	0	2	2	2	1
5 mph, 27 trains per day					
Hollywood					
N	1	8	9	15	6
S	0	12	10	9	5
Atherton					
N	0	4	7	11	3
S	0	14	12	12	4
LaBarre					
N	0	8	21	26	6
S	1	21	24	22	6
5 mph, 31 trains per day					
Shrewsbury					
N	0	2	3	4	1
S	1	6	4	5	2

$2.25 per hour cost for time lost to vehicles the average daily incremental time cost to the community was calculated. These are shown in Exhibit 6.10 which is reproduced here.

Accident Costs

The calculation of the probability of an accident at a grade crossing and the cost of such accidents is far from an exact science. Although research continues on the determination of the probability and cost of rail-highway accidents, the FRA/FHWA Guidebook recommends the use of the following formula to estimate the daily accident cost at a grade crossing, which is based on material from "Factors Influencing Safety at Highway-Rail Grade Crossings" by David W. Schoppert and Dan W. Hoyt, National Cooperative Highway Research Program, Report 50, Highway Research Board, Washington, D.C., 1968.

Protection factor x trains per day x average daily traffic x 0.000088 where the protection factors are as follows:

Warning Device	Protection Factor
Crossbucks	3.06
Stop signs (ADT 500)	4.51
Stop signs (ADT 500)	1.15
Wigwags	0.61
Flashing lights	0.23
Automatic gates	0.08

EXHIBIT I.5

Street	Total Daily Incremental Operating Costs	Total Daily Incremental User Time Costs	Daily Incremental Accident Costs
Carrollton Ave.	$ 45,99	$ 36.93	$29.24
Metairie Rd.	131.82	170.06	8.31
W. Oakridge Dr.	10.27	8.13	6.54
Farnham Pl.	13.08	10.17	8.33
Hollywood Dr.	26.32	57.03	17.45
Atherton Dr.	25.69	51.34	17.18
LaBarre Rd.	38.59	105.57	2.48
Shrewsbury Rd.	7.37	21.61	0.55
	$299.13	$460.84	$90.08

Total daily incremental highway costs = $850.05

Highway Costs for Alternatives

For each alternative discussed in Chapter 7, it was determined what changes in rail or vehicle operations would occur as a result of implementing the alternative. These changes were then inserted into the methodology to recalculate all costs. The major savings in highway cost were the result of removing the interchange tracks from Metairie and either the elimination or reduction of accident cost due to elimination of the grade crossing or the provision of automatic gates. The interchange relocation had the dual effect of increasing the average speed of all trains to 13 mph and reducing the number of train crossings in the interchange area. The provision of automatic gates had the impact of reducing accident costs anywhere from 33-97 percent due to the reduction of the protection factor (increased protection).

APPENDIX II: Calculation of Railroad Operating Costs

For the purposes of this study railroad operating costs were calculated to place relativity and perspective upon the impacts each alternative exerted upon railroad operations. The calculations made for this purpose are merely magnitude of cost calculations and are not to be considered as detailed actual costs incurred. The calculations are based upon the types of movements generally occurring over the New Orleans Terminal Company and do not contemplate revolutionary changes. One reason for this is that the analysis required to develop a new universe of rail operations and the costs or benefits of each is an undertaking equivalent to the total study of the Metairie problem. In cases where increased costs are shown, the increase is a combination of actual incurred cost and opportunity costs incurred through cost allocation.

The basis for the cost calculations is the route distance of each alternative and the time required to accomplish the work over the route, which is a function of speed. Four basic categories of cost are calculated for each alternative; linehaul costs, freight car cost, maintenance costs, and grade crossing maintenance costs. These costs

were calculated for the rail system that exists between Oliver Yard on the east side of New Orleans, over the NOT through Shrewsbury, and over the Huey P. Long Bridge to Avondale Yard on the west side of New Orleans. Included in this rail system were the interchange movements to and from Shrewsbury.

Train movements were divided into four groups due to the character of each: run through trains, yard cut trains, local trains (Chalmette run) and interchange moves. Each of the above categories were costed to take place 365 days each year with the exception of the Chalmette run which was costed to occur 310 days per year.

Maximum average speeds were measured for train movements over the NOT additional train movement speed such as KCS, ICG, and MP interchange moves were estimated. Train running times were statistically arrived at by multiplying measured speed times the distance travelled.

As inputs to the calculation of fuel consumption each move which used the Huey P. Long Bridge was considered to have operated over a grade of 1.25 percent and experienced a total verticle rise of 150 feet. In the case of the alternative of elevating the tracks through Metairie, all movements were considered to have operated over an elevated structure providing .65 percent grade and 15 feet of verticle rise.

The train movements which were used to calculate the cost of operations are the train movements which normally occur through Metairie. It must be recognized that due to business volume fluctuations the actual number of train movements can vary from the number used in the calculations. Exhibit II. 1 displays the data discussed above.

The alternatives which were analyzed were those which involve changes in operating costs to the railroad system. For example relocating the interchange and elevating the railroad tracks in Metairie would have a direct impact upon railroad operating costs. Inaddition each alternative was compared to the cost level calculated to exist over rail system defined above. Therefore the column "Do Nothing" is the base cost to which each subsequent alternative is compared. Each alternative involves the relocation of the interchange from the Shrewsbury area. This is required by train operations contemplated. Train operations would be more efficient in each alternative (elevation of tracks, Carrollton Curve, Carrollton Reverse Move and River Front Route) to the relocated interchange than if operations contemplated using the old interchange facilities. In addition without relocating the interchange many of the impacts in the LaBarre Road-Shrewsbury Road area would not be eliminated.

EXHIBIT II. I

Basic Train Information

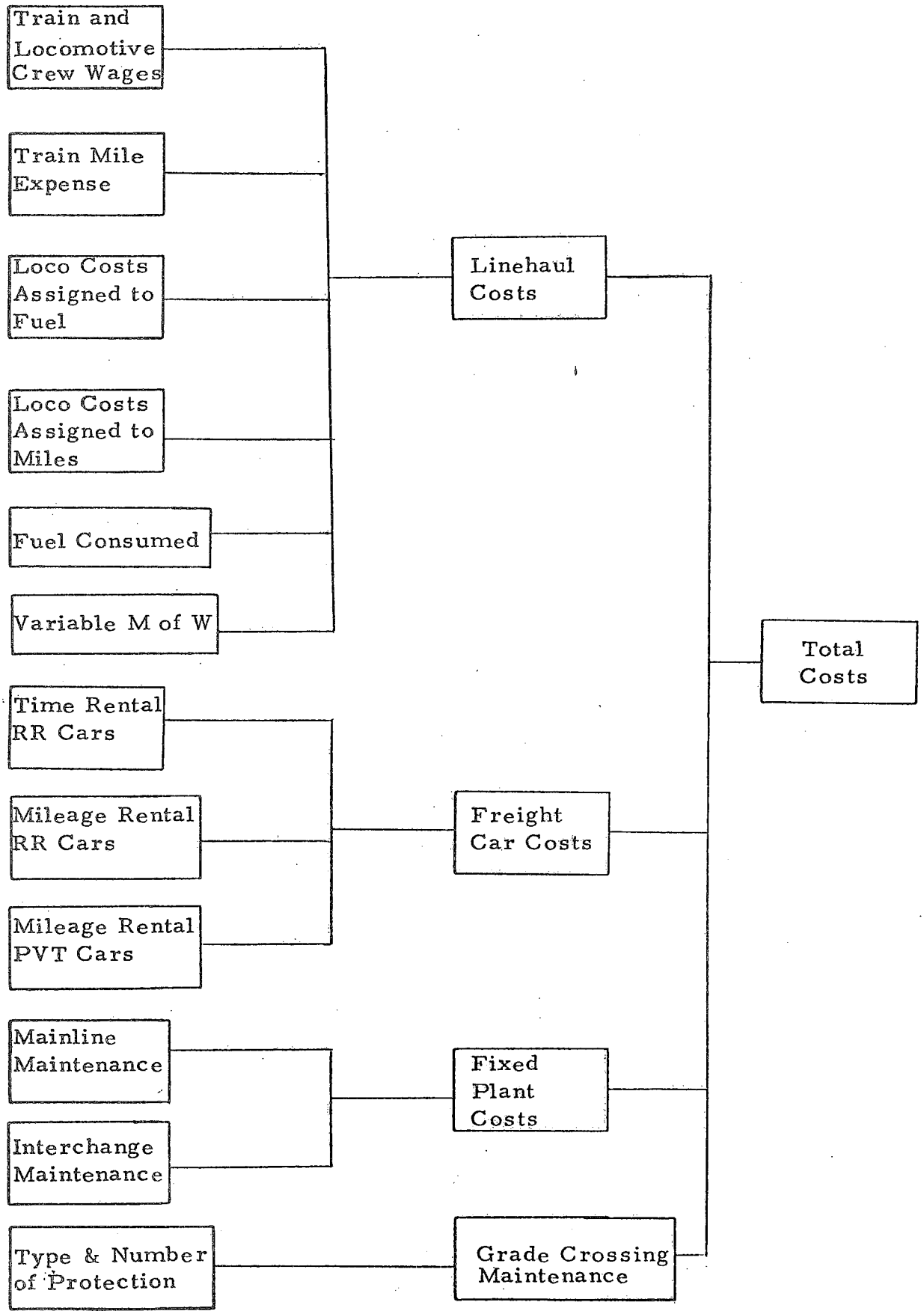
Item/Alternative	Do Nothing	In Place Interchange Relocation	Elevation of Tracks	Carrollton Curve	Relocation Carrollton Reverse Move	Relocation River Front Route
1. Route Miles						
a. Through Trains	13.3	13.3	13.3	14.5	17.2	23.3
b. Local	13.3	13.3	13.3	14.5	17.2	23.3
c. Yard Cut	13.3	13.3	13.3	14.5	17.2	23.3
d. Interchange-SOU	7.8	10.2	10.2	11.4	14.1	20.2
KCS	2.9	2.3	2.3	2.3	2.3	2.3
ICG	2.4	--	--	--	--	--
MP	5.0	5.0	5.0	5.0	5.0	5.0
2. Track Miles						
a. Main Line	26.0	26.0	26.0	28.7	34.1	46.0
b. Interchange Track	5.3	2.3	2.3	2.3	2.3	2.3
c. Interchange Yard	2.1	2.3	2.3	2.3	2.3	2.3
3. Train Movements						
a. Through Trains	3E 2W	3E 2W	3E 2W	3E 2W	3E 2W	3E 2W
b. Local	1E 1W	1E 1W	1E 1W	1E 1W	1E 1W	1E 1W
c. Yard Cuts	2E 2W	2E 2W	2E 2W	2E 2W	2E 2W	2E 2W
d. Interchange-SOU	13	13	13	13	13	13
KCS	12	12	12	12	12	12
ICG	8	--	--	--	--	--
MP	2	2	2	2	2	2
4. Maximum Average Speed(mph)						
a. Through Trains	13.3	13.3	13.3	15.0	8.6	5.9
b. Local	10.0	10.0	10.0	9.3	7.1	5.9
c. Yard Cuts	13.3	13.3	13.3	15.0	8.6	5.9
d. Interchange-SOU	10.0	11.0	11.0	11.3	5.6	5.0
KCS	5.0	5.0	5.0	5.0	5.0	5.0
ICG	5.0	--	--	--	--	--
MP	5.0	5.0	5.0	5.0	5.0	5.0
5. Train Running Time(hours)						
a. Through Train	1.0	1.0	1.0	1.0	2.0	3.87
b. Local	1.33	1.33	1.33	1.57	2.42	3.87
c. Yard cut	1.0	1.0	1.0	1.0	2.0	3.87
d. Interchange-SOU	.77	.93	.93	1.01	2.53	4.04
KCS	.58	.46	.46	.46	.46	.46
ICG	.48	--	--	--	--	--
MP	.55	.55	.55	.55	.55	.55

The calculation of average tons per train was determined from information received from each linehaul carrier at the beginning of the study. The traffic was broken down to eastbound and westbound traffic. Average tons per car were determined. Average number of cars for each of the types of moves was determined from actual counts. Interchange sheets provided the breakdown between loads and empties. Once this basic data was collected, the calculation of average tons per train was accomplished and the results used to calculate average ton-miles and tonnage movements for inclusion in the calculations concerning maintenance costs and fuel consumption costs.

Exhibit II. 2 is a flow chart depicting the method in which railroad operating costs were calculated. The costs contained in the calculation are direct operating costs associated with the movements over the NOT.

Train and engine crew wages are related to train miles traveled as is train mile expense. Locomotive costs assigned to miles is a function of the number of locomotives and the miles that are consumed. Locomotive costs assigned to fuel consumption takes into account fuel consumed due to changes in speed and changes in equivalent rise. The calculations concerning locomotive costs assigned to fuel consumption considers the number of train movements, average tons per train, changes in speed, work performed, and average rate of fuel consumed.

EXHIBIT II. 2


Train and Locomotive Crew Wages
Train Mile Expense
Loco Costs Assigned to Fuel
Loco Costs Assigned to Miles
Fuel Consumed
Variable M of W
Linehaul Costs
Time Rental RR Cars
Mileage Rental RR Cars
Mileage Rental PVT Cars
Freight Car Costs
Mainline Maintenance
Interchange Maintenance
Fixed Plant Costs
Type & Number of Protection
Grade Crossing Maintenance
Total Costs

These calculations were made for the run through trains, local-Chalmette run, yard cut movements, and interchange moves. The reason for this is the difference in operation of each type of movement and the work performed. Calculations concerning fuel consumption due to changes in equivalent rise were also made for each category of train movement and included the average tons per train, changes in equivalent rise, average rate of fuel consumed, and the number of trains in each category.

The calculations above concerning fuel consumtpion due to changes in both speed and equivalent rise produced the total number of gallons of fuel consumed due to operations. This total number of gallons was dollarized at 30 cents per gallon to obtain the cost of fuel consumed.

The variable cost of maintenance of way is dependent upon gross ton-miles. Gross ton-miles were calculated for the railroad system between Oliver Yard and Avondale Yard. The ton-mile calculation took into account the number of locomotives, average tons per locomotive, average tons for empty cars, average tons for loaded cars, percent of loaded and empty cars in the trains, average cars per train, number of train movements and route miles. These calculations were made for one day and then annualized.

The car cost calculations were based upon the percent of railroad cars, percent of private cars, route miles, train running time, number of cars, and current time and mileage cost factors.

Fixed plant costs consisted of the fixed maintenance for mainline and interchange track. Grade crossing maintenance was based upon the number of grade crossings and the type of protection.

These costs were calculated for each of the alternatives considered where necessary. Each alternative was then compared to the cost base of "Do Nothing". Exhibit II. 3 lists the major headings of costs for the alternatives and indicates the marginal increase associated with each alternative.

The general approach used to calculate the costs of operating was extracted from "Guidebook for Planning to Alleviate Urban Railroad Problems", prepared for Federal Railroad Administration and Federal Highway Administration. This general approach was altered to correspond and deal with the precise train movements experienced in the Metairie neighborhood. The costs calculated are not meant to be precise measurements of actual costs but rather as an estimate of actual costs experienced due to costs associated with each alternative in an effort to place alternatives in relation to each other. Costs calculated are more correctly interpreted as magnitude costs for comparison of operating impacts of each alternative.

EXHIBIT II. 3

Summary of Railroad Operating Cost Calculations

Costs	Do Nothing	Interchange Relocation	Elevation of Tracks	Carrollton Curve	Carrollton Reverse Move	River Front Route
Linehaul	$ 979,000	$1,034,000	$1,031,000	$1,119,000	$1,358,000	$1,801,000
Freight Car	388,000	401,000	401,000	436,000	539,000	858,000
Fixed Plant	224,000	225,000	225,000	222,000	260,000	343,000
Grade Crossing	8,000	8,000	--	--	--	45,000
TOTAL	$1,599,000	$1,668,000	$1,657,000	$1,777,000	$2,157,000	$3,047,000
Marginal Increase		$ 69,000	$ 58,000	$ 178,000	$ 558,000	$1,448,000

APPENDIX III: Engineering Analysis

The engineering analysis was prepared by Kaiser Engineers for CONSAD Research Corporation, prime contractor for the Federal Railroad Administration of the United States Department of Transportation, for a study of alternatives to alleviate the conflicts generated by the New Orleans Terminal Company (NOT) facilities traversing the residential area of Metairie, Louisiana.

The analysis presents a number of alternative sketch plans that comply with the above stated objective. One group of sketch plans termed "In-place improvements" involve upgrading of existing NOT facilities through Metairie, ranging from the provision of noise and visual barriers along NOT through residential Metairie, to elevating the NOT tracks in order to provide underpasses at-grade for existing road crossing. Another group of alternative sketch plans involve relocation of NOT facilities through Metairie. Included in this group is the Carrollton Interchange alternative, use of the New Orleans Public Belt railroad tracks, and provision of a new railroad connection north of Lake Pontchartrain.

Order-of-magnitude costs have been developed for each alternative sketch plan, and summaries are presented herein. The order-of-magnitude costs have been escalated according to construction time schedules established for each alternative.

The order-of-magnitude cost data presented below have been prepared on the basis of the conceptual design layouts shown in Volume II and sketches where no drawings are included. The cost data are order-of-magnitude type only, based on typical structures and cross-sections, and suitable for general feasibility analysis. More precise cost estimates for financial planning or funding request must be developed from engineering analyses beyond the scope of the present study.

The order-of-magnitude costs have been estimated on the basis of the following assumptions and conditions:

- The cost estimates are based on labor and materials costs prevalent in the New Orleans area in December 1974.
- Local and/or state taxes have not been included.
- The cost estimates are based on a standard one-shift work week.
- All owner costs, such as condemnation, legal fees and administrative costs, have been excluded.

The order-of-magnitude cost estimates include elements for construction, engineering, procurement, and construction management; contingency; and escalation to completion.

Construction

The construction cost estimates were based on quantity take-offs from the conceptual drawings. Included in the cost of railroad track work were such items as right-of-way clearing and removals, preparation of subgrade, drainage facilities, new track construction, road grade crossings, control and communication facilities, and allowance for utility relocations as appropriate.

Structure and bridge costs were based on costs from previous, similar projects with allowances for such items as pumping stations, utility relocations and removals. Subsurface soils explorations have not been made for this study, but structure costs include allowances covering foundation conditions usually found in the New Orleans region.

Track Salvage

Where existing tracks are replaced by new, certain items can be salvaged, including rail, ties, and tie plates. Track salvage values have been assessed and are included in the order-of-magnitude cost estimates as appropriate.

Engineering, Procurement and Construction Management

These costs are estimated as a percentage of construction costs.

Contingency

A contingency sum to cover the unknown and unanticipated conditions which might develop during design and construction has been

included as a percentage of the aggregated costs for construction, engineering and construction management.

Escalation

An allowance for escalation to completion was included to anticipate the increase in wages and prices. The escalation allowance was based on implementation schedules established for each alternative sketch plan as shown in Exhibit III. 1 following.

Conceptual Layouts and Route Descriptions

Conceptual layouts of the alternative sketch plans were developed using U.S. Geological Survey maps and larger scale street maps furnished by Jefferson and Orleans Parishes as background. A field survey was carried out early in the study and a number of pictures showing existing conditions were taken to assist in the layout and costing process.

The following railroad design criteria were used in developing the alternative sketch plans:

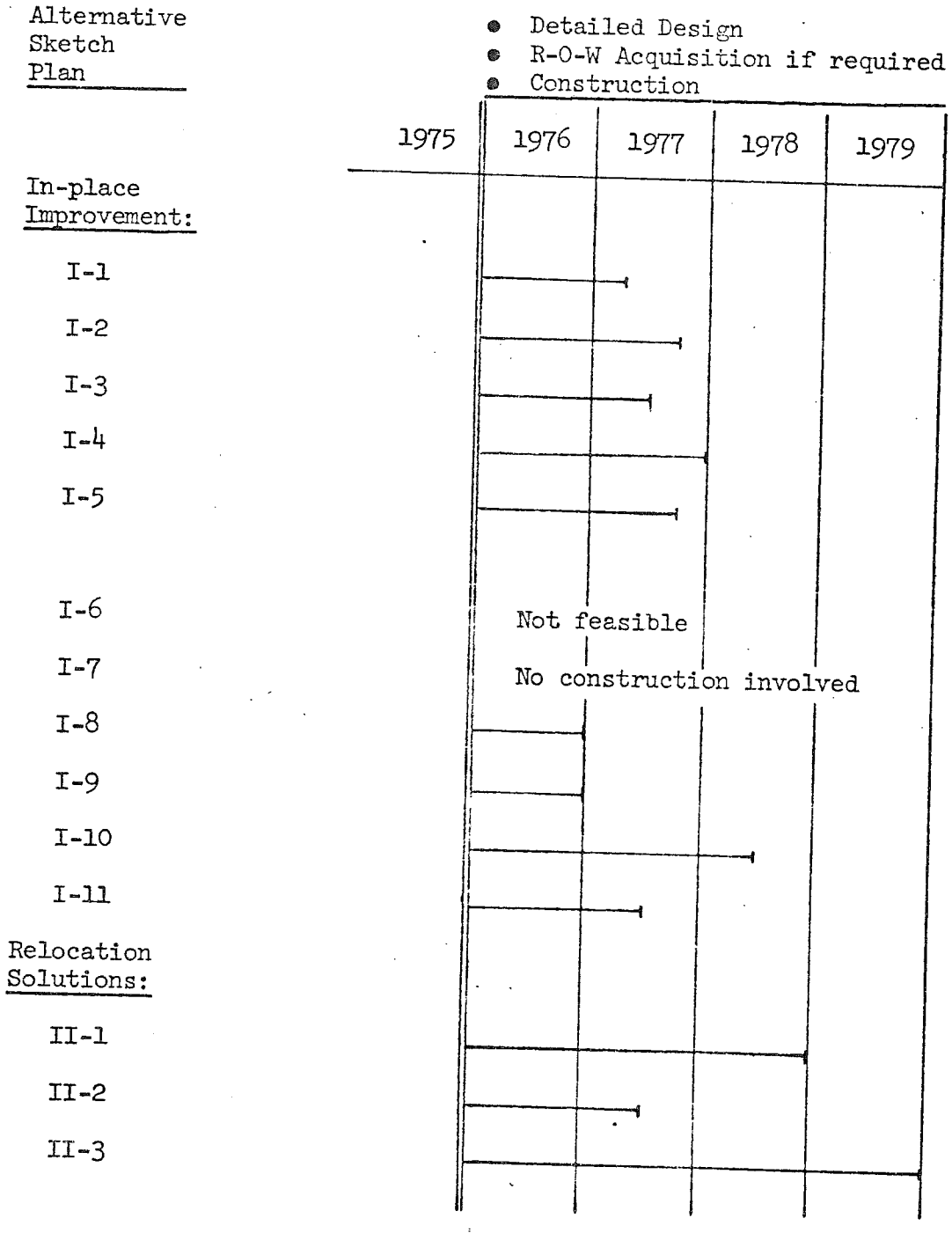
Railroad Design Criteria

Horizontal alignment:

- 1^{o} curves desirable
- 3^{o} curves maximum
- Allowance for spiral transitions

Exhibit III. 1

IMPLEMENTATION SCHEDULES



Vertical alignment:

- 0.5% mainline desirable
- 0.65% mainline maximum
- 1.00% connector track or sidings
- 0.04% reduction per degree of curvature.

Vertical curves:

- Parabolas
- 0.10 ft rate of change per 100 ft station.

Rail:

- 132 lb/yd, welded - mainline
- 115 lb/yd - sidings.

Turnouts:

- #15 mainline
- #10 sidings.

Ballast:

- 8" below tie, crushed rock or slag and 8" of subballast.

Crossties:

- 7" x 9" x 8' - 6" creosoted wood at 20" spacing.

Clearances:

- 23'-0" minimum vertical
- 10'-0" minimum horizontal.

Track Spacing:

- 15 ft between mainline tracks
- 16 ft between mainline track and adjacent yard track
- 14 ft between yard tracks.

Roadbed Width:

- 39 ft double track
- 24 ft single track.

Embankment Slope:

. 1.5 horizontal to 1.0 vertical.

Right-of-Way Width:

. 100 ft minimum for new r-o-w purchase.

Signaling:

. Centralized Train Control (CTC), mainline.

Trestles and Bridges:

. Cooper E-80 load rating.

Attached are Exhibit III.2, the Louisiana Department of Highways Minimum Design Standards for Urban Streets and Highways and Exhibit III. 3, the Louisiana Department of Highways Minimum Design Standards for Rural Highways and Roads which were used in designing highway and street modifications required by the alternatives under study.

Outlined below are the various in-place alternatives and relocation alternatives for which order-of-magnitude costs were provided.

I. In-place Improvements

1. Double track existing single track portion of NOT between Metairie Road and 17th Street Canal including a second bridge across the canal.

2. Provide an underpass for Metairie Road at the NOT crossing, or

3. Provide an overpass for Metairie Road at the NOT crossing, or

4. Provide an underpass for LaBarre Road at the NOT crossing, or

EXHIBIT III.2

LOUISIANA DEPARTMENT OF HIGHWAYS
MINIMUM DESIGN STANDARDS FOR URBAN STREETS & HIGHWAYS

ITEM NO.	ITEM	STREET CLASSIFICATIONS			
		FREEWAY	ARTERIAL	COLLECTOR	LOCAL STREET
1	NUMBER OF LANES (MIN.)①	4	4	2	2
2	WIDTH OF TRAVEL LANES (MIN.)	12'	11'(12' DESIRABLE)	10'(12' DESIRABLE)	9'(12' DESIRABLE)
3	MINIMUM WIDTH OF PARKING LANES (WHERE USED)	NONE	10'(12' DESIRABLE)	8'	8'
4	SHOULDER WIDTH (MIN.)(WHERE USED)				
	A) OUTSIDE	10'	8'(10' DESIRABLE)	8'(MIN)⑤	3'(MIN)②
	B) MEDIAN	4'(6' DESIRABLE)	4'(6' DESIRABLE)	NOT REQUIRED	NOT REQUIRED
5	WIDTH MEDIAN (MIN)				
	A) DEPRESSED	44			
	B) RAISED (WHERE USED)	NOT USED	4'(22' DESIRABLE)	4'(22' DESIRABLE)	4'(22' DESIRABLE)
	C) CONTINUOUS BARRIER	12'+ BARRIER WIDTH③	NOT USED	NOT USED	NOT USED
6	WIDTH OF BORDER AREA (MIN)	30'(MIN)	8'(12' DESIRABLE)	6'(MIN)	6'(MIN)
7	WIDTH OF SIDEWALK (MIN)(WHERE USED)	NOT USED	4'	4'	4'
8	MIN. LATERAL CLEARANCE (FROM EDGE OF TRAVEL LANE)				
	A) OUTSIDE	30'	6'(MIN)④(15' DESIRABLE)	6'(MIN)④(15' DESIRABLE)	6'(MIN)④(15' DESIRABLE)
	B) MEDIAN SIDE	6'⑤(30' DESIRABLE)	6'(MIN)④(15' DESIRABLE)	6'(MIN)④(15' DESIRABLE)	6'(MIN)④(15' DESIRABLE)
9	MIN VERTICAL CLEARANCE⑦	15'	15'	15'	15'
10	DESIGN SPEED (MIN)(MILES PER HOUR)	50'	40(30 IN SPECIAL CASES)	30(40 DESIRABLE)	20(30 DESIRABLE)
11	MAXIMUM HORIZONTAL CURVATURE (WITH SUPERELEVATION)⑧	5°(8°30' IN SPECIAL CASES)	11°30'	21°	50°
12	MAXIMUM HORIZONTAL CURVATURE (WITHOUT SUPERELEVATION)⑧	NOT APPLICABLE	8°	14°30'	29°
13	STOPPING SIGHT DISTANCE (MIN)⑧	350'(450' DESIRABLE)	275'(300' DESIRABLE)	200'	150'
14	MAXIMUM SUPERELEVATION (FT. PER FT.)	010	006	006	006
15	CROSS SLOPE (MIN)(FT PER FT.)	025	025	025	025
16	MAXIMUM GRADE (%)	5	6(8 IN SPECIAL CASES)	10(7 DESIRABLE)	12(9 DESIRABLE)
17	CUT SLOPE (MIN. RATIO)	6:1 FIRST 30'(4:1 THEREAFTER)	3:1(4:1 DESIRABLE)	2:1(3:1 DESIRABLE)	2:1(3:1 DESIRABLE)
18	FILL SLOPE (MIN RATIO)	6:1 FIRST 30'(4:1 THEREAFTER)	4:1	3:1(4:1 DESIRABLE)	2:1(3:1 DESIRABLE)
19	BRIDGE DESIGN LOAD	HS20-44	HS20-44	HS20-44	HS15-44
20	MIN. BRIDGE WIDTH (FACE TO FACE BRIDGE RAIL)	APPROACH PAVEMENT + SHOULDERS⑨⑪	APPROACH PAVEMENT + SHOULDERS①⑨⑪	APPROACH PAVEMENT + SHOULDERS⑨⑪	APPROACH PAVEMENT WIDTH + 2⑨
21	GUARDRAIL REQUIRED AT BRIDGE ENDS	YES	YES WITH SHOULDERS OPTIONAL WITH CURB	OPTIONAL	OPTIONAL⑩
22	DESIGN STORM-MIN. FREQUENCY				
	A) DEPRESSED ROADWAY	50 YEARS	50 YEARS	50 YEARS	25 YEARS
	B) BRIDGE	50 YEARS	50 YEARS	25 YEARS	2 YEARS
	C) SUBSURFACE DRAINAGE	10 YEARS	10 YEARS	5 YEARS	

① NUMBER OF LANES TO BE DETERMINED BY FUTURE D.H.V. (20 YEARS HENCE)
② VARIES WITH TRAFFIC VOLUME, SEE RURAL STANDARDS
③ MAY BE REDUCED TO 8' + BARRIER WIDTH FOR PROJECTS INVOLVING MAJOR RIVER CROSSINGS
④ LESS CLEARANCE MAY BE USED IF PROTECTION IS PROVIDED
⑤ 6' MINIMUM PERMITTED ON THE MEDIAN EDGE WHEN G. M. BARRIER IS USED
⑥ APPLIES ONLY WHEN THERE IS A MEDIAN ON THE FACILITY
⑦ 16' VERTICAL CLEARANCE OVER TRUNK LINE ROUTES
⑧ CURVATURE AND SIGHT DISTANCES SHOWN (BOTH MINIMUM AND DESIRABLE VALUES) CORRESPOND TO DESIGN SPEEDS (ITEM 10) WHICH ARE NOT IN PARENTHESIS
⑨ IN SPECIAL CASES PARTIAL SHOULDERS MAY BE USED
⑩ 4' MINIMUM MUST BE PROVIDED FROM EDGE OF [illegible] LANE TO FACE OF BRIDGE RAIL
⑪ 18' MINIMUM WIDTH FOR RETENTION OF BRIDGES IN GOOD CONDITION

ADOPTED A. B. Ratcliff
A. B. RATCLIFF, JR. 4/22/72
CHIEF ENGINEER

III.8

EXHIBIT III. 3

LOUISIANA DEPARTMENT OF HIGHWAYS

MINIMUM DESIGN STANDARDS FOR RURAL HIGHWAYS AND ROADS

DATE
JULY 1, 1969
REV. AUGUST 8, 1969
REV. MARCH 10, 1971

			C SYSTEM						LOCAL ROADS	
			B SYSTEM							
			A SYSTEM						HARD SURFACED	AGGREGATE OR NO SURFACE
ITEM NO.	ITEMS		CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6		
1	CURRENT AVERAGE DAILY TRAFFIC		OVER 12,000	12,000 - 3,001	3,000 OR LESS	1,500 - 751	750 OR LESS	400 OR LESS	300 OR LESS	100 OR LESS
2	DESIGN HOURLY VOLUME (1)		OVER 2,400	2,400 - 601	600 OR LESS	400 - 200				
3	NUMBER OF TRAFFIC LANES		6	4	2	2	2	2	2	2
4	WIDTH OF EACH LANE		12'	12'	12'	12'	10'	10'	9'	9'
5	WIDTH OF SHOULDERS	MINIMUM	8' OUT. INS. 6'	8' OUT. INS. 6'	8'	8'	8'	5'	3'	3'
		DESIRABLE	10' OUT. INS. 6'	10' OUT. INS. 6'	10'					
6	TYPE OF SHOULDERS		STABILIZED & SURFACED	STABILIZED & SURFACED	AGGREGATE (2)	AGGREGATE	AGGREGATE	AGGREGATE		
7	WIDTH OF MEDIAN		44' DEPRESSED 20' OTHER	44' DEPRESSED 20' OTHER						
8	FORE SLOPE RATIO	MINIMUM	4:1	4:1	4:1	3:1	3:1	3:1	2:1	2:1
		DESIRABLE	6:1	6:1	6:1	4:1				
9	BACK SLOPE - RATIO	MINIMUM	3:1	3:1	3:1	3:1	3:1	2:1	2:1	2:1
		DESIRABLE	4:1	4:1	4:1			3:1		
10	DESIGN SPEED M.P.H.		70	70	60 (3)	60	50	40	40	20
11	STOPPING SIGHT DISTANCE		600'	600'	475' (3)	475'	350'	275'	275'	200'
12	CONTROLLING CURVATURE (4)	DESIRABLE	3°	3°	3°					
		MAXIMUM	4°	4°	5°30'	5°30'	8°30'	13°30'	13°30'	84°
13	CONTROLLING GRADE (5)		4%	4%	5% (3)	5%	6%	7%	10%	
14	VERTICAL CLEARANCE (6)		15'	15'	15'	15'	15'	15'	15'	15'
15	HORIZ. CLEARANCE (MEASURED FROM EDGE OF PAVEMENT) (7)		30'	30'	30'	15'	15'	11'	8'	
16	RIGHT OF WAY WIDTH (8)		300'	300'	150' (9)	120'	100'	80'	(10)	(10)
17	DESIGN LOADING FOR BRIDGES		HS 20-44	HS 20-44	HS 20-44	HS 20-44	HS 20-44	HS 20-44	H-15	H-15
18	MINIMUM WIDTH OF BRIDGES (MEASURED FROM FACE TO FACE OF BRIDGE RAIL)		APPROACH PAVEMENT & SHOULDERS (11)	APPROACH PAVEMENT & SHOULDERS (11)	APPROACH PAVEMENT & SHOULDERS (11)	APPROACH PAVEMENT & SHOULDERS (11)	28'	28'	20' (12)	20' (12)
19	PAVEMENT CROSS SLOPE		0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	
20	GUARDRAIL REQUIRED AT BRIDGE ENDS		YES	YES	YES	YES	YES	YES	YES	NO

(1)— DETAILED INFORMATION TO BE FURNISHED BY TRAFFIC AND PLANNING.

(2)— STABILIZED AND SURFACED DESIRABLE.

(3)— ON FUTURE FOUR LANE FACILITY DESIGN FOR 70 MPH WITH 600' S.S.D. AND 4% CONTROLLING GRADE.

(4)— BASED ON 0.10 FT/FT MAXIMUM SUPERELEVATION.

(5)— GRADES MAY BE INCREASED TO MAXIMUM USEABLE WITH DESIGN SPEED SELECTED, BUT NOT TO EXCEED 6% IN ANY CASE, EXCEPT FOR CLASS 6 HIGHWAYS AND LOCAL ROADS.

(6)— 16 FT. VERTICAL CLEARANCE OVER TRUNK LINE ROUTES.

(7)— MAY BE LESS IF PROTECTED BY GUARDRAIL.

(8)— MINIMUM FOR NEW LOCATION. FOR EXISTING LOCATION NOT LESS THAN THAT REQUIRED FOR ALL ELEMENTS OF THE CROSS-SECTION AND APPROPRIATE BORDER AREAS.

(9)— 300' WHERE FUTURE FOUR LANES ARE INDICATED.

(10)— AS REQUIRED TO ACCOMMODATE SECTION.

(11)— IN SPECIAL CASES PARTIAL SHOULDERS MAY BE USED.

(12)— 18' MINIMUM WIDTH FOR RETENTION OF BRIDGES IN GOOD CONDITION.

ADOPTED

A.B. RATCLIFF, JR.
CHIEF ENGINEER
MARCH 10, 1971

5. Provide an overpass for LaBarre Road at the NOT crossing.

6. Investigate possible underpass with access roads paralleling NOT.

7. Relocate the NOT- ICG interchange tracks to ICG-A1 track (Old Southbound Main). No engineering or construction cost involved.

8. Provide new NOT-ICG interchange tracks on ICG right-of-way west of existing interchange tracks, and use existing NOT-ICG interchange tracks for NOT - KCS interchange. Remove existing NOT-KCS interchange tracks at Airline Highway and remove NOT-Long Siding.

9. Provide noise and visual barriers in the form of solid noise barriers and trees and shrubbery.

10. Elevate NOT from Airline Highway bridge to I-10 overpass and provide underpasses at-grade for existing road crossings in residential Metairie except LaBarre Road.

11. Provide a pedestrian/bicyclist underpass or overpass.

12. Provide fencing along the NOT right-of-way.

II. Relocation Solutions

1. Carrollton Curve: Provide double track connection over 11^{o}-30' curve between UPT tracks under Carrollton Interchange. Provide new double track from Carrollton Interchange north along UPT right-of-way to ICG Northbound Main and Southbound Main (Track A1).

2. Carrollton Reverse Move: Provide double track rail facilities on UPT tracks for reverse movement of freight trains.

3. River Front Route: No engineering drawing provided. Cost estimate upgrading of 17.5 miles of existing double track.

4. New Railroad Connection North of Lake Pontchartrain: Provide new double track railroad connection between ICG in Hammond and SOU in Slidell and SP connection between Opelousses and Baton Rouge.

5. West Bank: Provide new double track railroad connection on west bank, approximately 25 miles in length. Also requires new railroad bridge over the Mississippi River.

Alternative Sketch Plan I-1:
Double Track Existing Single
Track Portion of NOT

The second main track of the NOT located on the south side of first main track joins the first main just west of Metairie Road crossing, and the first main continues east crossing Metairie Road, Carrollton Avenue, Orpheum Avenue, and 17th Street Canal on a single track trestle. East of the canal crossing the first main becomes second main and a first main located on the north side branches off from the second main.

Alternative Sketch Plan I-1 would provide NOT with a double track through this single track section by connecting the first and second main tracks west of Metairie Road with the first and second mains east of 17th Street Canal.

The existing 17th Street Canal single track trestle would be retained and a new single track trestle would be provided on the north side.

The existing single track embankment between 17th Street Canal and Metairie Road would be widened and the grade crossings at Metairie Road and Carrollton Avenue rebuilt to accommodate the double track.

Frisco Avenue between Nursery Avenue and Carrollton Avenue would be closed and the right-of-way used for widening of the NOT berm to accommodate the double track.

Railroad track work: remove existing track, fill, rough grade and clear, new track, one turnout, rebuild Carrollton crossing, rebuild Metairie crossing, close Frisco Avenue, relocate utilities, landscaping, train control, and track salvage	$ 570,000
New 17th Street Canal Trestle (single track)	200,000
Subtotal	$ 770,000
Track salvage	(10,000)
Subtotal	$ 760,000
Engineering, procurement and construction management	150,000
Subtotal	$ 910,000
Contingency	230,000
Subtotal	$1,140,000
Escalation to completion	240,000
TOTAL ESTIMATE	$1,380,000

Alternative Sketch Plan I-2:
Metairie Road Underpass at
NOT Crossing

The Metairie Road underpass or overpass would be designed to meet Louisiana Department of Highways Minimum Standards for a two-lane collector street.

The two-lane Metairie Road would be carried underneath the NOT in an open, retained cut, and a double track railroad bridge for the NOT spanning the retained cut would be provided. The existing elevation of the NOT would be maintained unchanged, and the new profile of Metairie Road would be set for 30 mph maximum speed with 15 feet of vertical clearance underneath the railroad bridge structure.

A pumping station with three 1750 gpm capacity pumps (two operating and one standby) would be provided at the bottom of the underpass. The pump station would discharge directly to 17th Stret Canal via a 1700 foot long, 18" diameter buried pipeline along the railroad right-of-way.

Access to existing buildings along the underpass would be provided by service roads on both sides of the underpass. The underpass and service roads would be constructed within existing right-of-way limits.

Underpass complete with pump station: clear and grade, railroad bridge, utilities, excavation, backfill, paving, retaining wall,

landscaping, piping, electrical	$ 740,000
Engineering, procurement and construction management	170,000
Subtotal	$ 910,000
Contingency	270,000
Subtotal	$1,180,000
Escalation to completion	300,000
TOTAL ESTIMATE	$1,480,000

Alternative Sketch Plan I-3: Metairie Road Overpass at NOT Crossing

The Metairie Road overpass would provide grade separation of the NOT by elevating Metairie Road on a structure with 23 feet vertical clearance over the railroad track, which would be maintained at the existing elevation.

The two-lane road structure would be supported on bents spaced approximately 60 feet with approaches consisting of short retained fill sections. The vertical profile of the overpass would be set for 30 mph maximum speed.

Access to existing buildings along the overpass would be provided by service roads on the east and west side. The area underneath the overpass would be paved and could be used for parking, storage, or other purposes.

The overpass structure and service roads would be constructed within existing right-of-way limits, except for a small portion of private right-of-way which would be required for the entrance to the service road on the west side of Metairie Road north of the NOT crossing.

Overpass: clear and grade, overpass, utilities, earth fill, paving, retaining wall, landscaping, piping	$1,590,000
Engineering, procurement and construction management	320,000
Subtotal	$1,910,000
Contingency	480,000
Subtotal	$2,390,000
Escalation to completion	600,000
TOTAL ESTIMATE	$2,990,000

Alternative Sketch Plan I-4:
LaBarre Road Underpass
at NOT Crossing

The LaBarre Road underpass would be designed to meet Louisiana Department of Highways Minimum Design Standards for a two-lane collector street.

The two-lane LaBarre Road underpass would be quite similar to the Metairie Road underpass described previously. The pumping station would discharge to the existing storm drain system.

The LaBarre Road underpass with parallel service roads would require some additional private right-of-way. On the south side of the NOT crossing two strips of additional right-of way would have to be acquired from the existing parking lots, and in the residential area on the north side of NOT a strip of right-of-way on the east side of LaBarre Road would be required.

Underpass complete with pumping station: clear and grade, railroad bridge, piping, utilities, excavation, backfill, paving, retaining wall, landscaping, electrical	$ 720,000
Engineering, procurement and construction management	170,000
Subtotal	890,000
Contingency	260,000
Subtotal	$1,150,000
Escalation to completion	320,000
TOTAL ESTIMATE	$1,470,000

Alternative Sketch Plan I-5:
LaBarre Road Overpass
at NOT Crossing

The LaBarre Road overpass would be designed to meet Louisiana Department of Highways Minimum Design Standards for a two-lane local street.

The overpass structure would be similar to the Metairie Road overpass, the vertical profile, however, would be set for 20 mph

maximum speed with a maximum gradient of 12 percent, since the available distance from Airline Highway to NOT precludes provision of a vertical profile to collector street standards.

Service roads on either side of the overpass would be provided, and the area underneath the overpass would be paved and could be used for parking, storage, or other purposes.

The LaBarre Road overpass would require additional private right-of-way similar to that described for the underpass, but extending further north on the east side of LaBarre Road.

Overpass: clear and grade, overpass, utilities, earth fill, paving, retaining wall, landscaping, piping	$1,300,000
Engineering, procurement and construction management	260,000
Subtotal	$1,560,000
Contingency	390,000
Subtotal	$1,950,000
Escalation to completion	510,000
TOTAL ESTIMATE	$2,460,000

Alternative Sketch Plan I-6:
Vehicular Underpass under NOT
with Access Paralleling the Railroad

The underpass would provide connection between the streets paralleling the NOT on the north and south side. The approaches

would be located within the railroad right-of-way between the railroad tracks and the two parallel streets.

This alternative does not appear feasible because the required width of the two-lane approaches in retained cut together with the required width of the double track NOT would exceed the available railroad right-of-way width, and a single-lane underpass is not considered a feasible solution.

Alternative Sketch Plan I-7
Relocate the NOT/ICG Interchange
Tracks to ICG, A1 Track (Old Southbound Main)

This alternative would not require any engineering or cost estimating.

Alternative Sketch Plan I-8
Provide New NOT/ICG
Interchange Tracks

This alternative would provide four new NOT/ICG interchange tracks on ICG right-of-way west of the existing interchange.

One of the new interchange tracks would be located along the north side of ICG North Bound Main between Central Avenue and NOT, and the other three on the south side of North Bound Main, extending between South Bound Main to the west and the existing crossover between South Bound Main and North Bound Main to the east. Two single crossovers between North Bound Main and South Bound Main would be provided west of Central Avenue.

Railroad track work: remove existing track, grade and clear, ditching, new single track, 12 turnouts, utilities, paving four cross-overs, single track salvage	$ 880,000
Engineering, procurement and construction management	180,000
Subtotal	$1,060,000
Contingency	270,000
Subtotal	$1,330,000
Escalation to completion	270,000
TOTAL ESTIMATE	$1,600,000

Alternative Sketch Plan I-9:
Provide Noise and Visual Barriers
along NOT through Residential Metairie

This alternative would help to alleviate some of the nuisance created by the operation of freight trains through the residential area of Metairie by the provision of a solid noise barrier along NOT tracks, and in addition by planting trees and shrubbery along the slopes of the railroad berm.

The solid noise barrier would be 9 feet high and would be installed on the top of the berm at a distance of 12 feet from track centerline. At the existing grade crossing the noise barrier would be discontinued for an approximate distance on either side to provide adequate sight distance for crossing motorists and bicyclists. The solid noise barrier

would consist of prefabricated, reinforced, low density concrete panels supported by steel columns spaced 10 feet apart.

In addition to the solid noise barriers, vegetative barriers consisting of trees and shrubbery would be provided along the NOT. The trees and shrubbery would be provided along the NOT. The trees and shrubbery would be planted on the railroad right-of-way between the solid noise barrier and abutting property or parallel roadway. In areas with existing foliage additional trees and shrubbery would be planted as appropriate.

Noise barrier walls	$1,450,000
Trees and shrubs	470,000
Subtotal	$1,920,000
Engineering, procurement and construction management	380,000
Subtotal	$2,300,000
Contingency	580,000
Subtotal	$2,880,000
Escalation to completion	580,000
TOTAL ESTIMATE	$3,460,000

Alternative Sketch Plan I-10:
Elevate NOT through
Residential Metairie

This alternative would provide grade separation of existing road crossings in residential Metairie between 17th Street Canal and Atherton Drive by elevating the NOT tracks on an aerial structure supported by bents.

A retained earthfill configuration was considered, but was not advanced because of its barrier effect, and because the cost would be of the same magnitude as for an elevated structure.

Starting at the existing NOT railroad bridge across Airline Highway, the new vertical alignment would ascend at a 0.65 percent gradient extending to Atherton Drive where sufficient vertical clearance would be attained to carry Atherton Drive underneath the railroad structure with 15 feet vertical clearance. The existing LaBarre Road grade crossing would be closed because sufficient vertical clearance underneath the railroad structure cannot be attained at this location.

At Atherton Drive the vertical alignment of the elevated NOT tracks would flatten out as the double track structure continues east providing undercrossings at-grade for Hollywood Drive, Farnham Place, West Avenue, Metairie Road, and Carrollton Avenue.

After the Carrollton Avenue crossing, the vertical alignment would descend on a 0.65 percent gradient crossing over 17th Street

Canal to the north of the existing railroad trestle to join the existing NOT tracks at the I-10 railroad crossing.

The new elevated, double track NOT structure would consist of prestressed, reinforced concrete box girders supported on reinforced concrete bents. The tracks on top of the structure would be ballasted for noise attenuation, and in addition noise barriers consisting of 4 feet highconcrete walls with accoustical treatment would be installed at the edges of the structure.

The approaches to the elevated structure would consist of embankment and retained fill sections.

NOT freight traffic during construction would be maintained by the provision of a temporary track located on NOT right-of-way just south of the existing tracks. Also, the existing 17th Street Canal railroad trestle would be used by NOT during construction of the new elevated track facility. The trestle would be removed after the new facility is open for traffic. A short period of total shutdown of the NOT must be anticipated for connection of the new tracks with existing tracks at Airline Highway and I-10 railroad bridges.

Frisco Avenue between Nursery Avenue and Carrollton Avenue would be closed, and the right-of-way used for the elevated NOT structure; otherwise no additional right-of-way would be required.

Railroad track work: remove double track, remove single track, new single track, new double track, clear and grade, earthfill, ditching, six turnouts, six grade crossings, single track salvage and double track salvage, train control	$ 3,600,000
New elevated double track structure	$17,290,000
Subtotal	$20,890,000
Engineering, procurement and construction management	3,080,000
Subtotal	$23,620,000
Contingency	4,720,000
Subtotal	$28,340,000
Escalation to completion	9,360,000
TOTAL ESTIMATE	$37,700,000

Alternative Sketch Plan I-11:
Pedestrian/Bicyclist Underpass
or Overpass

This underpass would provide grade-separated connection for pedestrians and bicyclists between the residential area on the north side of NOT and Metairie Playground and Community Park facilities on the south side.

The underpass would consist of a 16 foot wide by 10 foot high concrete box structure under the NOT tracks, and be located just east of Magnolia Drive. Access to the underpass would be by ramps

paralleling the NOT tracks and located within the railroad right-of-way. The ramps would be approximately 100 feet long in retained cut with a 12 percent gradient.

A pumping station with two 500 gpm capacity pumps would be provided at the bottom of the underpass. The pumping station would discharge to the existing storm drain system.

Order-of-magnitude cost of this alternative has been estimated, whereas no formal drawing has been included in the Appendix. As an alternative to the pedestrian/bicyclist underpass order-of-magnitude cost was prepared for an overpass.

This facility would be supported on concrete pilars and would provide 23 feet of clearance over the railroad tracks. Approaches to the overpass would be spiral ramps where bicyclists would be required to walk their bicycles up and over the overpass. The overpass itself would be enclosed by cyclone fencing.

Pedestrian/bicyclists underpass, complete with pump station: excavation, tunnelling supports, concrete, paving, railing, piping, electrical	$250,000
Engineering, procurement and construction management	60,000
Subtotal	$310,000
Contingency	75,000
Subtotal	$385,000

Escalation to completion	75,000
TOTAL ESTIMATE	$460,000
Pedestrian/bicyclist overpass	$240,000

Alternative Sketch Plan I-12:
Fencing

Fencing was costed as both cyclone fencing and wooden fencing to extend the entire length of the NOT through Metairie.

The cyclone fence alternative is the same as that seen along interstate highway systems, most notably along Interstate 10 in Metairie. The top of the fence could be provided with three strands of barbed wire to keep people from climbing over the fence.

The wooden fence would be the same as the cyclone with the addition of wooden slats for aesthetic purposes only. A higher degree of maintenance would be required for the wooden fence.

Cyclone fencing	$275,000
Wooden fencing	$375,000

Alternative Sketch Plan II-1:
Carrollton Curve

This alternative would provide a new double track railroad connection between the western and eastern rail carriers utilizing UPT right-of-way along Airline Highway and I-10. The critical feature of the alternative would be Carrollton Curve, which would be provided at Carrollton Interchange to connect the UPT right-of-way from the

west along Airline Highway to the north along I-10 over an angle of approximately 120°.

Several locations for this curvature were investigated including some with reversed curves at the approaches, which would require acquisition of private right-of-way to the south and east of UPT. As a result of the location studies and field investigations, it was concluded that a 11°-30' (R=500 feet) curve with appropriate spirals extending between the existing UPTR tracks would form the best compromise solution to this rather difficult problem. This curve would be located to provide sufficient vertical clearance under the existing Airline Highway overpass and would require modification and rebuilding of several of the existing interchange ramps and roadways. The required structural work on the interchange to provide for the selected 11°-30' curvature would amount to $10 million according to Modjeski and Masters, Consulting Engineers on the proposed new I-10 viaduct. The $10 million price tag, however, would not include rebuilding of Ramp M, which provides connection from Carrollton Avenue north to I-10. This important connection would have to be located one level above the proposed I-10 viaduct at considerable expense.

The selected 11°-30' curve would have adequate horizontal and vertical clearances to the new I-10 viaduct structure according to Modjeski and Masters.

The 11° - 30' curve would violate the design standards for horizontal curves and would require special approval by the railroad companies involved.

The new double track would connect to IGG Northbound and Southbound Mains to the east of LaBarre Road and proceed east on UPT right-of-way along Airline Highway to Carrollton Interchange. The existing Palmetto Street overpass with 18'6" vertical clearance would be rebuilt to provide the required vertical clearance of 23'0".

The 11° - 30' Carrollton curve would be double tracked, and the distance between the two tracks would be increased in order to avoid interference with the proposed new I-10 viaduct supports.

Proceeding north from the Carrollton curve the new double track would be located in UPT right-of-way along I-10, and connected to NOT east of the I-10 railroad overpass. The existing single track of the UPT would be removed to the north and west of Carrollton Interchange. The UPT track from the south would be connected to the new double track at Carrollton Interchange.

No new private right-of-way would be required for this alternative.

Railroad track work: remove single track, new single track, new double track, ditching and grading, utility relocation, train control, one crossover, track salvage	$ 2,200,000
Rebuild Palmetto Street overpass	2,000,000
Rebuild Ramp "M", Carrollton Interchange	10,000,000
Subtotal	$14,200,000
Track salvage	(120,000)
Subtotal	$14,080,000
Engineering, procurement and construction management	2,120,000
Subtotal	$16,200,000
Contingency	4,000,000
Subtotal	$20,200,000
Escalation to completion	7,100,000
TOTAL ESTIMATE	$27,300,000

Note: An additional $10 million (1974 dollars) of structural work would be required according to Modjeski and Masters' cost estimate. This estimate was submitted to the Louisiana State Highway Department at that Department's request in relation to the new Interstate 10 overpass project now underway.

Alternative Sketch Plan II-2:
Carrollton Reverse Move

This alternative would utilize the same route of movement as outlined for the Carrollton curve, except that in place of the 11°-30' railroad curve the trains would cross over the Carrollton Avenue railroad angle, stop, the locomotives would move to the rear of the train, be reconnected and move to destination. This alternative requires the provision of a double track railroad facility over the UPT, raising I-10 Palmetto and Jeff Davis Parkway.

Railroad track work: remove single track, new single track, new double track, ditching and grading, two crossovers, train control, track salvage $ 2,700,000

Rebuild Palmetto overpass	2,000,000
Rebuild Jeff Davis overpass	2,000,000
Subtotal	$ 6,700,000
Engineering, procurement and construction management	1,000,000
Subtotal	$ 7,700,000
Contingency	1,925,000
Subtotal	$ 9,625,000
Escalation to completion	3,369,000
TOTAL ESTIMATE	$12,994,000

Note: An additional $10 million (1974 dollars) of structural work would

be required according to Modjeski and Masters' cost estimate. This estimate was submitted to the Louisiana State Highway Department at that Department's request in relation to the new Interstate 10 overpass project now underway.

Alternative Sketch Plan II-3:
River Front Route

This alternative would utilize two NOPB tracks for east-west rail transit. The two NOPB tracks would be upgraded for a total distance of 17.5 miles to provide this service.

No drawing is included in the Appendix for this alternative.

Railroad Track work: remove existing double track, clear and grade, new double track, rebuild 32 grade crossings	$13,900,000
Track salvage	(1,500,000)
Subtotal	$12,400,000
Engineering, procurement and construction management	1,900,000
Subtotal	$14,300,000
Contingency	3,600,000
Subtotal	$17,900,000
Escalation to completion	4,500,000
TOTAL ESTIMATE	$22,400,000

Alternative Sketch Plan II-4
New Railroad Connection North
of Lake Pontchartrain

This alternative would provide a new east-west double track rail connection north of Lake Pontchartrain between Hammon and Slidell. In Hammond connection would be provided to ICG mainline to the north and also to the ICG line to Baton Rouge, and in Slidell to SDU's mainline to the north.

The new double track rail facility would utilize existing railroad rights-of-way to the greatest extent feasible. Between Hammond and West Covington the abandoned industrial railroad right-of-way would be used. Covington and Abita Springs would be bypassed by routing the double track north of Covington, then turning south to a location midway between Covington and Abita Springs along an existing pipeline right-of-way to join the ICG right-of-way south of Abita Springs. New right-of-way would have to be acquired for the Covington -Abita Springs bypass.

From the junction with the ICG alignment south of Abita Springs the route would proceed to Mandeville, then east to Slidell occupying the ICG right-of-way, and the existing single track would be replaced by a new double track facility. New right-of-way would be required in Mandeville to increase the existing substandard curvature to mainline standards.

The connection to the SOU mainline in North Slidell would also require acquisition of new right-of-way.

The total lenght of the route from Hammond to Slidell would be 52.0 miles. The several river and bayou crossings would be provided with new double track trestles and railroad bridges. Major road crossins would be grade-separated by the provision of road overpasses, and minor road grade-crossings would be protected by flashing light signals and gates with bell. The existing I-12 overpass south of Abita Springs can accommodate a double track rail facility.

The connecting link between Baton Rouge and Hammond would require construction of a single track to supplement the existing single track facility. This would require 48 miles of new single track.

An additional single track facility from Opelousas to Baton Rouge would be required to provide the SP an opportunity to interchange with the eastern carriers. This would require construction of 53 miles of single track parallel to the MP tracks between those two points. This expenditure would not be necessary should the SP and MP be able to negotiate trackage rights agreement for SP use of the MP tracks betwwen Opelousas and Baton Rouge.

To provide the LN a link to Slidell and not require their trains to enter New Orleans, nine miles of new single track between the SOU mainline where that track moves from the Lake Pontchartrain trestle

back to land to the LN mainline would be required. This link could be constructed parallel to Highway 11 on the east side of Orleans Parish. This right-of-way was obtained several years ago by the City of New Orleans in an effort to induce the Southern Railway to give up its lake front property. When SOU refused, the city released its option to the land. The land is still available and is situated inside of a levee thereby reducing its environmental impact upon live wetlands. Cost estimates and rule of thumb costs are itemized below in four units.

I. Slidell to Hammond

Railroad track work: remove existing track, rough grade and clear, new single track, new double track, rebuild grade crossings signs, utility relocation, train control $ 37,100,000

Grade crossing, signals and gates (124)	7,400,000
Road overcrossings (10)	13,300,000
Bayou and river crossings and trestles (73)	12,200,000
Subtotal	$ 70,000,000
Track salvage	(1,000,000)
Subtotal	69,000,000
Engineering, procurement and construction management	10,300,000
Subtotal	79,300,000

Escalation to completion	43,000,000
TOTAL ESTIMATE	$138,000,000

II. Hammond to Baton Rouge

Construction, engineering, procurement, construction management and contingency	$ 45,000,000
Escalation (3 years)	15,000,000
TOTAL*	$ 60,000,000

III. Opelousus to Baton Rouge

Construction, engineering, procurement, construction management and contingency	$ 45,000,000
Escalation (3 years)	15,000,000
TOTAL*	$ 60,000,000

IV. LN Connector Link

Construction, engineering, procurement, construction management and contingency	$ 20,000,000
Escalation (2 years)	5,000,000
TOTAL*	$ 25,000,000
GRAND TOTAL (I, II, III, IV)	$283,000,000

(If three years are required to gain full study program acceptance and right-of-way acquisition, then project would approximately cost $426,000,000 at current escalation rates).

*Rule of thumb cost indications derived from units developed for the order-of-magnitude cost estimates.

Alternative Sketch Plan II-5:
West Bank

Construction of 25 miles of new double track between Avondale and Chalmette area is required. Railroad bridge structures are required over the Industrial Canal (Harvey Canal) and the Mississippi River.

Construction of 25 miles of new double track including engineering, procurement, construction management and contingency	$55,000,000
Escalation (5 years)	25,000,000
TOTAL*	$80,000,000

*Rule of thumb cost indications derived from units developed for the order-of-magnitude cost estimates.

APPENDIX IV: Criteria for Alternative Solutions

The purpose of this study is to identify all alternatives available to solve or alleviate railroad-community conflict in Metairie. Contract requirements include consideration of both in place solution alternatives and relocation alternatives. The goal of the study was to identify possible solutions which would be feasible and acceptable to both the community and railroads. In this instance, definition of community would fluctuate with the alternative under consideration. For example, in place grade separations would require analysis from the local Metairie community standpoint and relocation within the immediate New Orleans area will require analysis from a broader regional standpoint to include Metairie, Jefferson Parish and Orleans Parish (City of New Orleans).

During the course of the study, it became apparent that no solution was straightforward in the sense that both the desires and needs of the community and railroads could be satisfied. Therefore, alternatives require understanding and appreciation of the tradeoffs and nuances involved in each. Since no clear cut solution appeared, selection of a mutually agreeable solution will involve negotiation by both the community and the railroads.

In place solutions involved consideration of any possible steps which could be taken to strike directly at the problems created in Metairie by railroad-community interface. Consideration included the following possibilities:

- elevating the railroad tracks through Metairie,
- depressing the tracks through Metairie to gain sufficient vertical clearance to eliminate all grade crossings,
- construction of grade separations,
- construction of fencing along the railroad right-of-way to preclude pedestrian access to railroad property,
- construction of noise barriers along the right-of-way to channel railroad noise away from the surrounding neighborhood,
- planting of trees and shrubs to improve the aesthetics of the existence of railroad facilities in Metairie,
- construction of another railroad track to completely double track the single track portion of the NOT in Metairie between Metairie Road and the 17th Street canal,
- investigation of closing crossings to eliminate rail-highway interface and need for sounding of locomotive horns,
- establishment of single authority to control and coordinate train movements through the Shrewsbury - Huey P. Long rail complex to eliminate train delay,

- relocation of interchange facilities from Shrewsbury to another location to remove interchange function from Metairie,

- investigation of potential of rearranging train movement schedules to reduce impacts of interface at peak rush hours,

- construction of either pedestrian overpasses or underpass to provide access across track facility without one's coming in contact with the tracks,

- construction of streets parallel to the railroad tracks but which passed under the tracks,

- obtaining a defined variance to the state law requiring railroads to sound locomotive horns at grade crossings. This variance would not preclude railroad's sounding of horns in an emergency, and would require construction of crossing gates at the grade crossing involved.

Each of the possibilities listed above were examined as to their effectiveness in combating problems in Metairie, creation of new impacts and cost of construction.

Pursuit of relocation alternatives involved several steps in order to determine the possibilities and to narrow the list of these alternatives worthy of further examination. An understanding of current railroad operations through Metairie was gained to create a list of transportation services which must be maintained in the New Orleans gateway in order to assess alternatives impacts upon the transportation system in the immediate New Orleans area. Additionally an understanding of

the geography of the New Orleans region was gained into to assess alternatives impacts upon the community.

Utilization of current railroad corridors to achieve relocation was examined first. Next, the possibility of new railroad corridors was determined by examining existing street grids, vacant land and location of neighborhoods. The third step involved the analysis of potential rerouting.

Examination of relocation alternatives was performed in light of impacts upon the railroads and upon the community. Alternatives which were detrimental from both standpoints were discarded. Criteria used to examine alternatives from a railroad viewpoint included the following factors:

- Maintain integrity of current interchange needs,
- Maintain service to the Port of New Orleans,
- Minimize impacts upon railroad operating costs,
- Eliminate conflicts in Metairie and preclude creating the same problems in another neighborhood.

From the community standpoint, alternatives were developed to coincide with the following criteria:

- Eliminate Metairie conflict,
- Preclude or minimize creation of new impacts in the area to which the railroad might be moved,

- Create open ended alternatives which do not preclude coordination or incorporation in regional transportation or community development plans.

Relocation alternatives included the following possibilities:

- Construction of Metairie by-pass utilizing Union Passenger Terminal tracks in the Carrollton area, referred to as the Carrollton Curve;
  - elevate railroad tracks through 3^{o} railroad curve north west of highway interchange,
  - elevate highway interchange to provide either an 11^{o} 30' or 9^{o} 30' railroad curve,
  - depress railroad through highway interchange,
  - construct 3^{o} railroad curve east of highway interchange.

- Construction of Metairie by-pass utilizing Union Passenger Terminal tracks in the Carrollton area necessitating change in railroad operation requiring motive power to be moved from one end of train to other, referred to as Carrollton Reverse Move;

- Use, after improvements, of the riverfront railroad corridor, referred to as the River-Front Route;

- Construction of New Orleans by-pass on West Bank of Mississippi River which necessitates construction of new railroad bridge over Mississippi River;

- Construction of New Orleans by-pass north of Lake Pontchartrain;
  - complete by-pass crossing Mississippi River in Baton Rouge,

  - partial by-pass through Hammond, La. returning on ICG tracks to use Huey P. Long Bridge to cross Mississippi River,
  - partial by-pass involving construction of new railroad causeway bisecting Lake Pontchartrain,

- Use of both Metairie line and Union Passenger Terminal tracks to reduce rail impacts in Metairie by restricting Metairie line to one way traffic movement;

- Construct new interchange using Union Passenger Terminal right-of-way east of Carrollton Avenue to by-pass Metairie;

- Use of I-10 corridor toward Airport for multiple transportation use to by-pass Metairie;

- Construction of mid-town rail corridor using riverfront tracks, St. Joseph Street and Union Passenger Terminal tracks,

- Reroute rail traffic out of New Orleans gateway.

Several of these alternatives were eliminated due to creation or mere transfer of community impacts from Metairie to another neighborhood, geographic restrictions, or regional impacts which could not be adequately assessed through this study. Those alternatives which remained were studied to measure community and railroad impacts. During the course of this examination several of the remaining alternatives were discarded. Those that remained are described in Chapter 7.0 of this report.