IEc

MEMORANDUM | November 19, 2024

TO Chris Gilmore, PE; Port of New Orleans

FROM Industrial Economics, Incorporated

SUBJECT Potential Residential Property Value Effects of the LIT Development

Construction and operation of the Port of New Orleans Louisiana International Terminal (LIT) has the potential to impact nearby property values. IEc conducted a detailed review of site characteristics, development plans, and relevant empirical literature to evaluate the likelihood and magnitude of such impacts. Our analysis suggests that increased noise levels, in particular, could depress property values between approximately 0.5 and 4 percent for three groups of properties within about a one-mile radius of the facility. This range reflects variation in the distance and direction of defined groups of properties, as well as differences in predicted noise levels associated with LIT construction versus operations.

Other project aspects including lighting and visible structures/equipment do not readily lend themselves to quantification separately but are not expected to be material and result in additional significant impacts. Through creation of economic activity and employment opportunities, facilities such as the LIT can enhance local property values. However, the potential for such effects here is uncertain.

Background

The Port of New Orleans plans to finish construction of the LIT by 2038. The container terminal, associated infrastructure, and buffer areas will span approximately 400 acres of space currently occupied by woodlands, wetlands, the W. Smith Elementary School, and the Violet Park. The facility will include four large shipping container yards, a few smaller shipping container storage areas, a railyard, wharves for docking, a parking lot, security and customs buildings, and other administrative buildings.

Adjacent areas are primarily residential and vacant land. Property value impacts could arise from several different mechanisms, including conversion of undeveloped natural areas, aesthetic changes due to visible structures, equipment, nighttime lighting, noise, and creation of economic activity and employment opportunities.

Although the LIT development involves the conversion of open space to development, which can be associated with impacts to nearby property values, the area is currently, and was historically, privately held, not offering public access, recreational opportunities, or other specific amenities. Thus, we do not anticipate adverse property value impacts based on this conversion alone. Facility construction and operations will alter the landscape in the sense that equipment and buildings will

be visible from an array of vantage points and add nighttime light sources. Current renderings suggest that these changes will not be overly obtrusive or affect many properties.

However, the LIT is expected to measurably increase noise levels in the area as described in the following sections. Construction, which is expected to take place over 15 years, will generate noise from a variety of sources including pile driving, demolition activities, tugboats and barges, and construction equipment (e.g., trucks, tractors, excavators). Similarly, terminal operations will result in long-term elevated noise levels from large container vessels and barges maneuvering near the wharf, container trucks, freight trains, and cargo handling equipment. At present our understanding is that any change in traffic volume or patterns incidental to construction or operations is not expected to further exacerbate noise levels.

Noise pollution is an annoyance, has been implicated in certain health effects, and is frequently cited in conjunction with property value impacts from industrial and transportation-related sources. LIT operation noise is expected to attenuate to levels that meet the St. Bernard Parish daytime and nighttime limits of 65 decibels (dB) and 60 dB, respectively. The Port has made several mitigation commitments to alleviate concerns about noise levels, including a green space buffer of about 300 feet separating neighborhoods from the terminal. Taking these measures into account, predictions still exceed current levels, which may manifest in some impacts to nearby properties.

Finally, construction and operation of the LIT is expected to generate employment opportunities and economic activity for the surrounding community.[1] On average and on an annual basis, construction is expected to generate approximately 1,900 jobs, 100 of which will be in St. Bernard Parish, while operation is expected to support approximately 32,000 jobs by 2050, 4,300 of which will be in St. Bernard Parish. In addition, construction and operation are expected to generate approximately $1.4 billion and $170 billion for the U.S. economy, respectively, including about $440 million and $68 billion for St. Bernard Parish. Increased employment and economic activity have the potential to increase demand for housing in St. Bernard Parish, thereby increasing property values. However, there is insufficient information to quantify this effect. It is difficult to predict when over the next 26 years these benefits will be realized, and the residential locations of the employees that will fill these jobs is uncertain. Similarly, while increased spending at local businesses is likely, it is unclear how the economic output generated by the project will benefit nearby property owners specifically. While it is not possible to translate these changes into a quantitative estimate of property value impacts, we acknowledge the potential for increased employment opportunities and economic activity to put upward pressure on property values.

Approach

The standard approach for analysis of the effects of nearby amenities and disamenities on residential properties is the hedonic property value method. This method entails statistical analysis of property transactions to isolate the incremental impact of a feature of interest, while controlling

[1] Terrell, D., 2021. "Louisiana International Container Growth: The Economic Impact of the Louisiana International Terminal Complex," https://portnola.com/assets/pdf/LIT/LIT-Economic-Impact-Study.pdf. Accessed 13 November 2024.

for structural (house and lot characteristics), locational, and temporal factors that affect prices. Hedonic models are widely applied in policy analysis and planning.

To develop an estimate of potential property value impacts associated with LIT construction and operations, we employ a 'benefit transfer' approach. Benefit transfer entails adapting estimates from existing studies to develop a prediction of outcomes at a new site and is commonly relied upon in regulatory analysis and other applications.[2]

We conducted a broad search of online sources and databases to identify hedonic studies addressing sites with similar physical and operational attributes to the LIT project. After extensive review, we did not locate any appropriate sources specifically addressing shipping terminals or similar facilities. However, we identified an array of studies that focused on the property value effects of airports, industrial sites, and traffic. The majority of these studies focused on noise impacts. As noted above, the potential impacts of the LIT development are not limited to increased noise levels. However, the various impacts of industrial sites are difficult to disentangle from one another because nearly all the impacts are highly correlated with proximity. Though most of the studies we identified exclusively examined noise effects, many of them likely capture a mix of other impacts confounded with proximity, including light, aesthetic, and traffic effects. We focus this analysis on the effect of noise on property values both because we have access to baseline and predicted noise levels for the project site and because these impacts are thoroughly researched in the hedonic literature. We note however that the study estimates we apply may also capture some of the additional potential negative impacts correlated with proximity.

Table 1 provides a summary of the most applicable studies, reporting changes in property values (expressed as a percentage) associated with alternative noise levels from airports, railroads, and highway/road traffic.

Table 1. Summary of Hedonic Literature

Study	Study Timeframe	Location	Development Type	Impacts on Property Value
Cohen & Coughlin (2009)	2000-2002	Atlanta, GA (Hartsfield-Jackson International Airport)	Airport	The noise discount for property values was 10.6% for homes within a 65 dB noise contour band of the airport.

[2] For example, see U.S. Environmental Protection Agency's *Guidelines for Preparing Economic Analyses*: https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses-2016

Friedt & Cohen (2021)	2006-2017	Minneapolis, MN (Minneapolis-Saint Paul International Airport)	Airport	A 100% increase in local noise complaints was associated with a 0.5% discount for property values.
Jud & Winkler (2006)	1997-2004	Greensboro, NC	Airport	The announcement of a new airport was associated with a 9.2% discount for property values within a 2.5-mile band of the site and 5.7% for those within the next 1.5-mile band.
Li & Saphores (2012)	2003-2004	Los Angeles, CA	Highway	A 1% increase in truck traffic was associated with a noise discount for property values between 0.48% and 0.65% for homes located between 100 and 400 meters from the nearest freeway.[3]
Nelson (2004)	Pre-2003	US and Canada	Airport	In a meta-analysis of hedonic studies of airport noise, the discount for property values was between 0.51% and 0.67% per decibel.
Ozdenerol et al. (2015)	2001-2012	Shelby County, TN	Road and rail transportation system	Noise levels of 45, 50, and 55 dB and above led to discounts for property values of 1.6%, 3.7%, and 4.3%, respectively.
Swoboda et al. (2015)	2005-2010	St. Paul, MN	Road	The noise discount for property values was between 0.25% and 0.5% per decibel.
Walker (2016)	2010	Memphis, TN	Railroad	The noise discount for property values was between 14% and 18% for homes within a 65 dB noise contour band of the railroad.

Of the studies in Table 1, we rely on estimates from Nelson (2004), a meta-analysis that combines results from 20 different studies of airport noise (including some Canadian studies). In his preferred models, the author estimates a noise discount on property values of about 0.5 to 0.7 percent per decibel for U.S. sites. We conservatively adopt the upper end of this range and apply the estimate to expected changes in noise levels in the following section.

[3] This study expresses property value impacts in terms of a decrease of $2,000 to $2,750 in the value of a $420,000 home. For consistency, we convert these values to percentages: $2,000/$420,000 = 0.48%; $2,750/$420,000 = 0.65%.

Estimation of Noise Impacts

We rely on current and projected noise levels provided by the Port to estimate how construction and operation of the LIT development will increase sound levels for nearby residential properties. Arcadis, an engineering firm hired by the Port, measured baseline noise levels in 12 noise-sensitive areas (NSAs) located near the terminal.[4] Arcadis then used Computer Aided Noise Abatement (Cadna/A), a noise modeling program, to predict sound levels in the NSAs during each phase of construction and operation. [5] Arcadis also produced more specific, noise contour maps for each construction and operation phase.

Arcadis selected NSA locations for their sensitivity to changes in noise levels, which we take as sufficiently representative of noise impacts within and adjacent to nearby communities. Based on the distribution of the 12 NSAs and publicly available data from St. Bernard Parish, we used geographic information system (GIS) software to delineate three contiguous areas of properties for purposes of summarizing noise levels (Figure 1).[6]

Owing to the shape of the project and configuration of surrounding developed areas, we estimate noise impacts for the three groups as follows: Group 1 includes 109 properties north of the terminal footprint from General Pershing Street to Canal Street between LA 46 and E Judge Perez Drive. We approximate sound levels for this subset of properties using noise levels measured at and projected for R9. Group 2 includes 205 properties from Canal Street to the site boundary. To estimate noise levels for Group 2, we take an average of noise readings measured at and projected for R2, R3, R6, R7, and R8. To the south of the site, Group 3 includes 541 properties from the site boundary to Senko Street. We estimate noise levels for this group by averaging noise readings measured at and projected for R1, R4, and R5. The total number of properties included in our analysis is 855.

[4] The NSAs were identified as susceptible to noise impacts due to their proximity to people. In the study area, NSAs include residential areas, churches, an art gallery, and a wilderness park.

[5] Noise levels are measured using the A-weighted decibel (dBA), which expresses the relative loudness of sounds as perceived by the human ear. The A-weighted scale is the most commonly used scale for measuring loud noise. Source: European Environment Agency. "A-weighted decibel," https://www.eea.europa.eu/help/glossary/eea-glossary/a-weighted-decibel.

[6] St. Bernard Parish land parcel data, https://gis-stbernard.opendata.arcgis.com/datasets/StBernard::parcels-1/about. Accessed 24 April 2023.

Figure 1 Property Groups and NSAs

Time-varying noise exposure is measured in the 24-hour equivalent sound level (L_{eq}). The L_{eq} is the level of steady sound with the same total energy as the time-varying sound, averaged over a 24-hour period. To quantify baseline sound levels, Arcadis took sound level measurements on March 12-14, 2024. At each NSA, one-hour measurements were taken during the daytime, and 30-minute measurements were taken at nighttime using a sound level meter. Table 2 shows the existing noise levels at these NSAs prior to construction of the terminal. Because St. Bernard Parish imposes nighttime noise limits from 10 p.m. to 7 a.m., we weight noise levels during the day and night by 15/24 and 9/24, respectively, to capture an average 24-hour noise level.[7]

Table 2. Measured Existing Sound Levels at Nearest NSAs

NSA ID	NSA Type	Daytime Measurements L_{eq} (dBA)	Nighttime Measurements L_{eq} (dBA)	Weighted Average L_{eq} (dBA)[8]
R1	Residences on LA 46	73.8	63.0	69.8
R2	Residences on C St.	63.3	57.9	61.3

[7] St. Bernard Parish Code of Ordinances, Article VI: Noise Provisions and Prohibitions. September 30, 2024.

[8] Weighted average L_{wq} = Daytime L_{eq}*(15/24) + Nighttime L_{eq}*(9/24)

R3	Merrick Cemetery	61.7	56.7	59.8
R4	Residences on Reunion Dr. (eastern portion)	50.8	43.6	48.1
R5	Residences on Reunion Dr. (western portion)	53.2	44.7	50.0
R6	Residences on 4th St.	61.3	49.4	56.8
R7	Church on Louis Elam St.	57.0	46.4	53.0
R8	Church on Canal St.	53.7	46.3	50.9
R9	Residences on Packenham Rd.	64.8	53.9	60.7
R10	A Studio in the Woods	61.7	50.5	57.5
R11	Audubon Wilderness Park	60.9	51.3	57.3
R12	W. Smith Junior Elementary School[9]	61.7	56.7	59.8

Existing sources of noise near the project site include local roadway traffic from highways LA 47, LA 46, and LA 49 as well as marine vessel traffic. All but one of the NSAs experience noise levels within the St. Bernard Parish residential day- and nighttime noise level limits of 65 and 60 dB, respectively.[10] R1 currently exceeds these limits due to its proximity to LA 46.

Arcadis projected future noise levels using Cadna/A software and known equipment sound levels for three phases of construction and three phases of operation. Each phase requires the use of different equipment and therefore has distinct sources of noise. Once construction is complete and the LIT is open, noise levels will remain elevated and continue to increase during operation phases as the terminal expands to full capacity by 2050.[11] The current project timeline is outlined below:

- Construction Phase 1: 2025
- Construction Phase 2: 2029
- Construction Phase 3: 2038
- Operation Phase 1: 2028-2029
- Operation Phase 2: 2031-2032

[9] Measurements not taken at the school; the Port assumes ambient sound level for R3 due to proximity to LA 46.

[10] St. Bernard Parish Code of Ordinances, Article VI: Noise Provisions and Prohibitions. September 30, 2024.

[11] Louisiana International Terminal, "LIT Project Overview." February 2023.

- Operation Phase 3: 2041-2042[12]

The predicted noise levels in each NSA exclude existing noise levels; therefore, we predict total noise levels in each NSA by combining baseline noise levels with construction and operation noise levels. As described in the previous section, the Arcadis analysis predicts both day- and nighttime noise levels at each phase, so we weight these estimates to calculate a 24-hour noise level. Because the decibel scale is logarithmic, we use logarithmic addition to combine the weighted average 24-hour noise levels at baseline and during each phase of construction and operation.[13] Table 3 shows our predicted total noise levels during each of these phases.

Table 3. Predicted Total Noise Levels at Nearest NSAs during Construction and Operation

NSA ID	Phase 1 Construction L_{eq} (dBA)[14]	Phase 2 Construction L_{eq} (dBA)	Phase 3 Construction L_{eq} (dBA)	Phase 1 Operation L_{eq} (dBA)	Phase 2 Operation L_{eq} (dBA)	Phase 3 Operation L_{eq} (dBA)
R1	71.1	69.9	70.0	69.8	69.9	69.9
R2	64.3	63.2	66.4	62.2	62.4	62.9
R3	65.6	64.0	69.7	62.0	62.0	64.1
R4	60.9	55.2	56.3	53.5	54.2	55.0
R5	60.1	54.5	55.6	53.5	54.8	55.5
R6	63.6	60.1	60.6	60.5	61.1	62.4
R7	62.2	58.6	61.0	60.0	60.0	60.8
R8	61.1	57.4	59.0	58.0	58.0	58.8
R9	62.4	61.2	61.2	61.3	61.4	61.6
R10	58.2	57.8	57.9	57.7	57.6	57.7
R11	58.5	57.9	58.2	57.5	57.5	57.5

To find the change in noise level expected to result from the LIT development, we take the difference between noise levels during construction and operation and baseline noise levels in each of the NSAs. For the purposes of this analysis, we average noise impacts over the construction period as levels are not expected to vary significantly across the three phases of construction. Additionally, we use Phase 3 Operation estimates to represent noise impacts over the lifespan of

[12] Personal communications with Port staff, October 27, 2024.

[13] Abbot, D. *Understanding Sound,* https://pressbooks.pub/sound/. Accessed October 8, 2024.

[14] Total noise level = $10\log_{10}(10^{\text{Additional noise level}/10}+10^{\text{Existing noise level}/10})$

the terminal once construction is complete. As there is little variation in noise levels between operation phases, and the Phase 3 noise levels are expected to continue indefinitely, we assume they best represent the long-term noise impacts of the terminal. Table 4 reports the change from baseline noise levels at the NSAs for each phase of construction and Phase 3 of operation.

Table 4. Predicted Increase in Noise Levels at Nearest NSAs

NSA ID	Phase 1 Construction L_{eq} (dBA)	Phase 2 Construction L_{eq} (dBA)	Phase 3 Construction L_{eq} (dBA)	Construction Average L_{eq} (dBA)	Phase 3 Operation L_{eq} (dBA)
R1	1.4	0.2	0.3	0.6	0.1
R2	3.0	2.0	5.2	3.4	1.7
R3	5.8	4.2	9.9	6.6	4.2
R4	12.8	7.1	8.2	9.4	6.9
R5	10.1	4.5	5.6	6.7	5.4
R6	6.8	3.2	3.8	4.6	5.6
R7	9.2	5.6	8.0	7.6	7.8
R8	10.1	6.4	8.1	8.2	7.9
R9	1.7	0.5	0.5	0.9	0.8
R10	0.7	0.3	0.4	0.5	0.2
R11	1.2	0.6	0.9	0.9	0.2

Results

As described above, we estimate property value impacts across three groups of properties using the NSA(s) contained within each group to characterize noise levels:

- Group 1: R9
- Group 2: average of R2, R3, R6, R7, and R8
- Group 3: average of R1, R4, and R5

Table 5 reports the results of our property value analysis, including the change in noise levels for each group during the construction phases and Phase 3 of operation. For each property group, we report percentages reflecting the estimated property value loss during construction and the estimated property value loss during operation. To calculate these percentages, we use the estimate of 0.67 percent per dB above existing levels as reported by Nelson (2004). Note that these do not reflect separate and additive percentage losses, but rather an average diminution that is expected to prevail during each time period (construction, then operation).

Table 5. Predicted Property Value Losses Due to Noise

Affected Properties	Existing Noise L_{eq} (dBA)	Average Construction L_{eq} (dBA)	Phase 3 Operation L_{eq} (dBA)	Increase During Construction L_{eq} (dBA)	Increase During Phase 3 Operation L_{eq} (dBA)	Loss in Value During Construction	Loss in Value During Operation Phase 3
Group 1	60.7	61.6	61.6	0.9	0.8	**0.6%**	**0.5%**
Group 2	56.4	62.5	61.8	6.1	5.4	**4.1%**	**3.6%**
Group 3	56.0	61.5	60.1	5.6	4.2	**3.8%**	**2.8%**

Conclusions

The analysis presented here utilizes a benefit-transfer approach to combine estimates of property value impacts from existing empirical studies with site-specific information on current and expected future conditions in residential areas surrounding the LIT development. It focuses on incremental changes in noise levels from project construction and subsequent operations as the operative mechanism for potential property value diminution. This emphasis is supported by a relatively extensive literature linking noise impacts and property values. While it is not possible to isolate and separately quantify any potential adverse impacts associated with aesthetic changes (visible structures, equipment, lighting), we note that these may be partially captured in our estimates. Depending on the aggregated group of properties, LIT impacts are estimated to range between 0.6 and 4.1 percent during the construction phase, and between 0.5 and 3.6 percent once operational. These are not additive impacts, but rather reflect differences in the estimated noise levels during the two periods.

As noted, the LIT development is anticipated to generate employment opportunities and increased output within the local/regional economy. Uncertainty regarding the timing and spatial distribution of these changes, as well as the lack of appropriate corresponding information in the hedonic literature, preclude estimation of any associated property value impacts. However, we acknowledge the potential for these changes to increase demand and exert upward pressure on property values.

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