FINAL

SITE-SPECIFIC ENVIRONMENTAL ASSESSMENT DESIGN, CONSTRUCTION, AND OPERATION OF THE UNIVERSITY MEDICAL CENTER

NEW ORLEANS, LOUISIANA

FEMA-1603-DR-LA

July 2010

U.S. Department of Homeland Security
Federal Emergency Management Agency, Region VI
Louisiana Recovery Office
New Orleans, Louisiana 70114

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List of Acronyms and Abbreviations

A	Drainage Area
ABFE	Advisory Base Flood Elevation
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos Containing Materials
Adams	Adams Management Services Corporation
ADT	Average Daily Traffic
AM	Ante Meridiem or before noon
ANSI	American National Standards Institute
APE	Area of Potential Effect
APTA	American Public Transportation Association
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AVO	Average Vehicle Occupancy
B	Backlight
BFE	Base Flood Elevation
BMP	Best Management Practices
BUG	Backlight, Uplight and Glare
C	Weighted runoff coefficient
CAA	Clean Air Act of 1963
CBD	Central Business District
CEP	Central Energy Plant
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CH_4	Methane
City	City of New Orleans
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DFIRM	Digital Flood Insurance Rate Maps
DNL	day-night average sound level
D&T	Diagnostic and Treatment
ESA	Environmental Site Assessment
fc	Foot candle
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Maps
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FP&C	State Division of Administration, Office of Facility Planning and Control

FRT	Fire Retardant Treated
ft	Feet
G	Glare
GHG	Green House Gas
GIS	Geographic Information System
GNOBEDD	Greater New Orleans Biosciences Economic Development District
HCM	Highway Capacity Manual
HDLC	Historic District Landmarks Commission
HEAG	Highest Existing Adjacent Grade
HUD	U.S. Department of Housing and Urban Development
I-10	Interstate 10
ICU	Intensive Care Unit
IDA	International Dark Sky Association
IESNA	Illumination Engineering Society of North America
in/hr	Inches per hour
ITE	Institute of Transportation Engineers
kV	Kilovolt
kW	Kilowatt
LAC	Louisiana Administrative Code
LARS	Louisiana Revised Statutes
LBC	Louisiana Building Code
Lbs	pounds
LCRP	Louisiana Coastal Resources Program
LDEQ	Louisiana Department of Environmental Quality
LDNR/CMD	Louisiana Dept. of Natural Resources Coastal Management Division
LDOTD	Louisiana Department of Transportation
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
LSU	Louisiana State University
LSU HSC	Louisiana State University Health Sciences Center
mb	millibar
MBCI	Mississippi Band of Choctaw Indians
MCHD	Mid-City Historic District
MCLNO	Medical Center of Louisiana at New Orleans
MLO	Model Lighting Ordinance
MMBTU/hr	Million British Thermal Units per hour (MM = a thousand x thousand)
mph	Miles per hour
m/s	Meters per second
msl	mean sea level
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAL	Noise Assessment Locations
NAVD88	North American Vertical Datum of 1988
n.d.	no date
NELPAG	New England Light Pollution Advisory Group

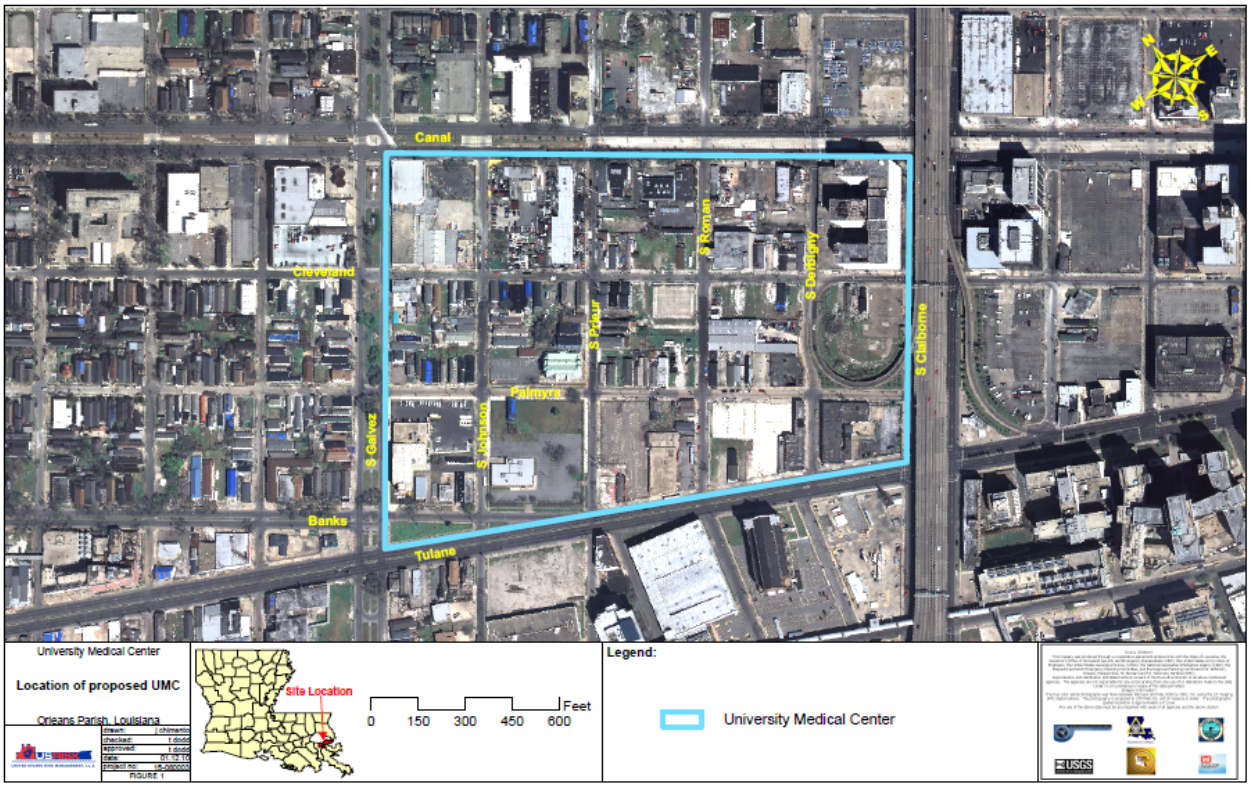
NEPA	National Environmental Policy Act of 1969
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOCPC	New Orleans City Planning Commission
NOCSF	New Orleans Community Support Foundation
NOI	Notice of Intent
NONA	New Orleans Notarial Archives
NORMC	New Orleans Regional Medical Complex
NORTA	New Orleans Transit Authority
NOx	Nitrogen Oxide
NRCS	Natural Resources Conservation Service
NRHD	National Register Historic District
NSR	New Source Review
NSW	New South Wales
NWS	National Water Summary
PA	Programmatic Agreement
PEA	Programmatic Environmental Assessment
PER	Pressure Equalizing Rainscreen
PM	Post Meridiem or after noon
PM_{10}	Particulate Matter less than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter less than 2.5 Microns in Diameter
PPV	peak particle velocities
psig	Pounds per Square Inch Gauge
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
ROE	Right of Entry
SEA	Site-specific Environmental Assessment
sf	Square Feet
SHPO	State Historic Preservation Office/Officer
SRCC	Southern Regional Climate Center
S&WB	Sewerage and Water Board
State	State of Louisiana
T	Time Interval
Tc	Rainfall intensity averaging time in minutes
TOC	Total Organic Compounds
TPY	Tons per year
TRB	Transportation Research Board
TSCA	Toxic Substances Control Act
U	Uplight
UH	Upper Uplight
UL	Lower Uplight
UMC	University Medical Center
UNOP	Unified New Orleans Plan
U.S. or US	United States

USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USDA/SCS	U.S. Department of Agriculture, Soil Conservation Service
USEPA	U.S. Environmental Protection Agency
USGBC	U.S. Green Building Council
USGS	U.S. Geological Survey
USRM	U.S. Risk Management, LLC
UST	Underground Storage Tank
VA	U.S. Department of Veterans Affairs
VAMC	New Orleans Veterans Affairs Medical Center
VMT	Vehicle Miles of Travel
VPD	Vehicle per Day

1.0 INTRODUCTION

The Federal Emergency Management Agency (FEMA), Public Assistance Grant Program has received an improved project application from the State Division of Administration, Office of Facility Planning and Control (FP&C) requesting funding to construct a University Medical Center (UMC) on a 15-block site in the Tulane/Gravier neighborhood of New Orleans (Figure 1-1) to replace the function of Charity Hospital. The Federal government's involvement triggers the requirements of the National Environmental Policy Act of 1969 (NEPA), which requires Federal agencies to evaluate the potential impact of proposed major Federal actions and consider such impacts during the decision making process. FEMA is conducting this Site-specific Environmental Assessment (SEA) in accordance with NEPA and its implementing regulations found in Title 40 of the Code of Federal Regulations (CFR) Parts 1500 through 1508 (Council on Environmental Quality's [CEQ] NEPA implementing regulations) and 44 CFR Part 10 (FEMA's NEPA procedures). This SEA also tiers from, and incorporates by reference, the findings of the *Final Programmatic Environmental Assessment for Site Selection for the Veterans Affairs Medical Center (VAMC) and Louisiana State University Academic Medical Center of Louisiana (LSU AMC)* (VA/FEMA 2008). It also incorporates by reference the PEA Finding of No Significant Impacts (FONSI) issued by FEMA and the U.S. Department of Veterans Affairs (VA), the Veterans Affairs SEA for design, construction and operations, and the FONSI issued by VA on that SEA. FEMA has supplemented the PEA findings regarding environmental impacts based on the information for each alternative for the design, construction, and operation of the Proposed UMC.

Figure 1-1: Project Location



1.1 PURPOSE OF AND NEED FOR ACTION

The purpose of the Proposed Action is to reestablish the healthcare system and the medical training centers for the community and the people of New Orleans. The need for the Proposed Action is to meet the purpose by providing (designing, constructing and operating) a facility that provides for present and future healthcare services and academic needs within the spatial, legal, environmental, and administrative constraints of the site selected. The original purpose and need for the action was addressed in detail in Section 1.1 of the Programmatic Environmental Assessment (PEA) (VA/FEMA 2008), and is summarized below.

Before Hurricane Katrina, MCLNO operated 550 patient beds, including a substantial number of psychiatric and mental healthcare beds, at Charity Hospital, located at 1532 Tulane Avenue. The City's primary trauma center, and the region's only Level 1 trauma center, was located at Charity Hospital. On 17 November 2006, MCLNO reopened University Hospital as the LSU Interim Hospital. This hospital currently operates 245 inpatient beds (including 38 behavioral health beds operating off-campus at the former DePaul Hospital). However, because Charity Hospital remains closed, MCLNO is only operating at approximately 45 percent of its pre-Katrina capacity.

In order to address accreditation concerns, the Adams Management Services Corporation (Adams) report provided a MCLNO Strategic/Financial Campus Master Plan for new and consolidated inpatient and outpatient facilities (Adams 2005). Following Hurricane Katrina, Adams updated their preliminary Master Plan (Adams 2007). The Plan estimated that the service area population would be 82 percent of its pre-Hurricane Katrina population by 2016 and total admissions would be 86 percent of pre-Katrina levels. The Adams report calculated a net need of 900 to 1,000 additional beds in the region by 2016. It also indicated that there was an immediate need for 310 to 416 medical and surgical beds and 52 to 68 mental health beds. The updated Master Plan continued to recommend a new facility for MCLNO in order to meet current accreditation standards (Adams 2007). More recently, Governor Jindal requested a review of the MCLNO business plan to reassess the medical needs for the area. This review, using revised demographics, recommended a new facility with 364 medical and surgical beds and 60 mental health beds, or 424 total beds (MCLNO 2008a).

Prior to Hurricane Katrina, MCLNO facilities operated with a medical staff of 1,400. Currently, the active medical staff is 805 personnel, which consists of primary and specialty care physicians and nurse practitioners. The shortage of medical professionals has resulted in patients being forced to travel out of the area for medical treatment or having to wait longer for patient care (diagnostics and treatment). This has reduced the quality of medical care available to a substantial portion of the region, including the indigent, the uninsured, the elderly, as well as private pay patients, and has further resulted in the reduction of access to medical care for all residents in the region.

1.2 SCOPE OF DOCUMENT

1.2.1 Tier I Programmatic Environmental Assessment

As described in Section 1.2 of the Tier I PEA, the CEQ NEPA regulations encourage agencies to prepare "tiered" environmental analyses to assist in the evaluation of a large-scale program or project involving a series of related decisions to allow Federal agencies to focus on issues that are ripe for decision. Thus, FEMA, VA, and the City (as the responsible entity for the U.S. Department of Housing and Urban Development [HUD]) selected a tiered approach and prepared a joint *Final Programmatic Environmental Assessment for Site Selection for the Veterans Affairs Medical Center (VAMC) and Louisiana State University Academic Medical Center of Louisiana (LSU AMC)* (VA/FEMA 2008). In addition, FEMA signed a Finding of No Significant Impact (FONSI) (FEMA 2008a).

The PEA was a broad review that identified and evaluated key resources of concern, and the impacts to those resources, to guide the issues that were ripe for decision, namely site selection and site preparation (VA/FEMA 2008). The PEA and FONSIs are hereby incorporated into this SEA by reference and sections of the PEA with more detailed information about topics being addressed will be cited throughout this document.

Based on the Tier I environmental review, the alternative selected for the proposed University Medical Center (UMC) [1] is to construct a new facility on a 15-block site in the Tulane/Gravier neighborhood of New Orleans, Louisiana. Canal Street, S. Claiborne Avenue, Tulane Avenue, and S. Galvez Street bound the site. In addition, based on the Tier I environmental review, VA selected to construct a replacement VAMC on an adjacent 12-block site bounded by Canal Street, Tulane Avenue, S. Galvez Street, and S. Rocheblave Street.

1.2.2 Tier II Site-specific Environmental Assessment

For Tier II, VA and FEMA are currently completing separate SEAs for the two projects, while remaining in close communication during the process. Because the proposed actions are separate and distinct projects with different funding mechanisms, design processes, and schedules, VA and FEMA made the decision to conduct separate SEAs.

This SEA is tiered from the PEA, and analyzes the potential environmental impacts of the design, construction and operation of the proposed UMC. FEMA will use the SEA to determine whether to prepare an Environmental Impact Statement or a FONSI for this tier. The specific actions being assessed in this SEA include the design, construction, and operation of the proposed UMC, and supplement the data and information previously collected and analyzed in the PEA.

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[1] In the PEA the State's proposed project was called the Louisiana State University Academic Medical Center (LSU AMC). The facility was renamed the University Medical Center (UMC) in August 2009.

In Chapter 2.0, each of the design alternatives being assessed show how future expansion might be placed on the site. Should Federal funding or approvals be required for the construction of any new or expanded UMC facilities in the future, the Federal agency involved would be responsible for compliance with NEPA.

At present, FEMA does not know the potential future use of Charity Hospital and the potential FEMA involvement in its final disposition. Therefore, FEMA cannot presently determine whether its actions will result in direct impacts, indirect impacts (i.e. the actions are the proximate cause of an impact that is later in time or geographically removed), or no impacts at all as it relates to the final disposition of Charity Hospital. Through the Section 106 Programmatic Agreement (PA) executed in November 2008, FEMA and FP&C have memorialized a process that would address the adverse effects of future plans on the historic features of Charity Hospital.

1.3 DETERMINING ENVIRONMENTAL SIGNIFICANCE

The CEQ NEPA Implementing Regulations (40 CFR 1508.27) define significance in terms of context and intensity. For context, FEMA took into account the uniqueness of New Orleans as an area with a significant presence of historic properties (i.e. buildings, districts, objects) and substantial Special Flood Hazard Area. For intensity, FEMA took into account the following factors from the CEQ NEPA Regulations:

1. Unique characteristics of the geographic area such as proximity to historic or cultural resources;
2. Whether the action is related to other actions with individually insignificant but cumulative significant impacts;
3. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources, and;
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

FEMA also evaluated the following factors to determine if the proposed action is one that typically would require preparation of an environmental impact statement (EIS) under 44 CFR §10.8(b)(2):

(i) If an action will result in an extensive change in land use or the commitment of a large amount of land;

(ii) If an action will result in a land use change which is incompatible with the existing or planned land use of the surrounding area;

(iii) If many people will be affected;

(iv) If an action will adversely affect a property listed on the National Register of Historic Places or eligible for listing on the Register if, after consultation with the Advisory Council on Historic Preservation an environmental assessment is not deemed sufficient;

(v) If an action is one of several actions underway or planned for an area and the cumulative impact of these projects is considered significant in terms of the above criteria, and;

(vi) If the environmental impact is likely to be controversial.

Although the presence of these factors does not automatically require FEMA to develop an EIS, they require FEMA to take them fully into account in its determination of whether to prepare an EIS.

As an additional set of criteria FEMA developed the following significant thresholds under each of the areas evaluated in the SEA. The purpose of these criteria was to provide an objective standard that would be clear and transparent to the general public. They were developed in response to concerns expressed from the public on how FEMA evaluated NEPA significance for this project.

Area Evaluated	Significance Threshold
Aesthetics and Visual Quality	Project design (including massing and landscape) will be incompatible with current surroundings.
Wind	Project (or any of its components) will result in more than 31 mph average wind speed or more than 46 mph high wind speed at any point. Project will not be designed to withstand Category III hurricane wind loads.
Light and Glare	Lighting will be incompatible with existing surrounding settings. Excessive ambient brightness that causes disability glare. Project will violate any locally approved lighting code or standard.
Air Quality	Project does not conform with existing State, Tribe or Federal Implementation Plan in non-attainment areas. Project will result in 250 or more tons per year of any criteria pollutant.
Coastal Zone	Project is inconsistent with enforceable policies of the State's approved coastal management plan.
Floodplain and Stormwater Management	Project will result in a floodway rise. Project will not follow minimization requirements for FEMA projects in 44 CFR Part 9. Project will increase stormwater runoff by 100% or more of existing conditions at project site.

Solid, Hazardous, and Biomedical Waste	Project will significantly impact landfill life or capacity. Project will result in 100% or more increase of solid, hazardous and biomedical waste managed at previous facility.
Infrastructure	Project will require infrastructure changes to accommodate an increase of 100% or more of existing infrastructure capacity at project site.
Cultural Resources	Adverse effects to, including loss or destruction of, historic properties that are not resolved or mitigated.
Noise and Vibrations	Project will result in significant increase from current ambient noise levels. Project will violate existing locally approved noise ordinance (> 75 dBA or > 85 dBA_{max} for non-exempt activities). Project will result in particle peak velocities of 0.4 in./sec. or more.
Transportation	Project is responsible for reducing Level of Service (LOS) to LOS F at access points servicing project.
Helicopter Operations	Lighting associated with helicopter operations will be incompatible with existing surrounding settings. Noise associated with helicopter operations will result in exposure to noise sensitive receptors of more than 65 dNL.

1.4 PUBLIC INVOLVEMENT

FEMA and FP&C have conducted extensive public involvement in preparing this SEA. Early in the Tier II NEPA process, FEMA and FP&C developed a project website to share information and to provide one mechanism by which the public could comment on or ask questions about the project. In addition, a public meeting was held to provide the public an opportunity to review and comment on the alternative designs for the project. FEMA also provided a 30-day comment period during which the public could submit comments on the draft SEA. During the 30-day review period, a public meeting was held to present the findings included in the draft SEA and to seek public input.

1.4.1 Website

In early April 2009, FEMA and FP&C launched a project website at www.lsuamc.com. The purpose of the website is to provide a mechanism for sharing information about the project and for receiving questions and comments from the public. Information about the public meeting, as well as the alternative designs being assessed during the environmental assessment process, is posted on the website. In addition, the website provides a link to the Tier I project information at the original www.valsumedcenters.com website. FEMA posted the draft EA on the www.lsuamc.com website to facilitate public access and review of the document.

1.4.2 Public Meetings and Design Reviews

A number of public involvement and consulting party meetings were held to seek input during the Tier II environmental review process. This section includes information about all of these meetings in chronological order.

Stipulation VI.C.2.d.iv of the PA (VA/FEMA et al. 2008) and the conditions of the FONSI for the PEA requires FP&C to conduct two design review meetings with the Section 106 consulting parties. In additional to the two required meetings, FP&C hosted a third design review web-based conference call. The consulting parties included 34 organizations as well as some owners of individual properties within the footprint of the proposed project. The purpose of the design review meetings was to provide the consulting parties with information about the design progress, discuss design options, and to explain what steps were taken to meet the design goals set forth in Stipulation VI.C.2.d of the PA (VA/FEMA et al. 2008). It also afforded the consulting parties an opportunity to offer input to the design process.

1.4.2.1 First Design Review Meeting

FP&C held its first design review meeting on January 22, 2009. At the design review meeting the consulting parties provided verbal comments and had a 21-day period to submit written comments. FP&C posted the comments received and its response(s) on the Section 106 website. FP&C addressed the substantive comments from the January 22, 2009 meeting. The comments and responses were posted on the Section 106 website on March 13, 2009 and are included in Appendix A of this SEA.

1.4.2.2 Public Scoping Meeting

A public meeting was held on April 29, 2009, from 6:30 pm to 9 pm at Grace Episcopal Church, 3700 Canal Street, New Orleans. The date and location of the public meeting was published as a display ad for four days (including a weekend) in the local newspaper and on the project website. In addition, information about the meeting was emailed to anyone who had previously registered at a public meeting during the Tier I NEPA compliance process associated with the proposed project. The purpose of the meeting was to gather information from the public regarding three alternative designs for the proposed project.

A total of 77 individuals registered their attendance at the meeting. The first 30-minutes of the meeting allowed participants to view the proposed design alternatives and talk directly with Federal and State representatives. This was followed by presentations regarding the Tier II NEPA Process, and about the Development of the Designs. The public had an opportunity to provide oral comments, which were documented by a transcript.

A total of 22 individuals spoke at the meeting. Additionally, 11 individuals submitted written questions or comments at the meeting that were read into the record. During the 14-day comment period, 29 individuals sent e-mail or hand-written comments. Of those 29, five also spoke at the meeting on April 29, 2009. In sum, there were 57 discrete sets of comments or questions. Appendix A of this SEA includes a summary of public comments received and their

responses. Comments were categorized by topic, and the topics are presented in order of their frequency of occurrence to help facilitate their evaluation in this SEA. Specific remarks are summarized under each topic followed by a general response.

1.4.2.3 Second Design Review Meeting

FP&C held a second design review meeting on August 18, 2009. At the design review meeting the consulting parties provided verbal comments and had a 14-day period to submit written comments. FP&C also addressed the substantive comments and their responses were posted on the Section 106 website on September 25, 2009, and are included in Appendix A of this SEA.

1.4.2.4 Design Review Web-based Conference Call

As a result of ACHP comments, on February 25, 2010, FP&C held a web-based conference call during which consulting parties could view a slide presentation over their computer while listening to the presentation. The purpose of the call was to allow the consulting parties to hear the basis for various design elements and to afford them the opportunity to provide comments. Comments were due to FP&C by March 8, 2010. FP&C posted the comments and its responses on the Section 106 website on April 30, 2010

1.4.2.5 Draft SEA Public Meeting

On 23 March 2010, a public meeting was held from 6:30 pm to 9 pm at Grace Episcopal Church, 3700 Canal Street, New Orleans. The date and location of the public meeting was published as a display ad for three days (including a weekend) in the local newspaper and on the project website. In addition, information about the meeting was emailed to anyone who had previously registered at a public meeting during the Tier 1 NEPA compliance process associated with the proposed project and to Section 106 Consulting Parties. The purpose of the meeting was to share the findings in the draft SEA with the public and to receive their questions and comments regarding the draft SEA.

A total of 14 citizens registered their attendance at the meeting, in addition to various agency and applicant representatives. The first 30-minutes of the meeting allowed participants to view the proposed design alternatives and talk directly with Federal and State representatives. This was followed by presentations about the Tier 2 NEPA Process, and about the Development of the Designs. The public had an opportunity to provide oral comments, which were documented by a transcript.

Eight individuals asked questions or gave comments at the meeting. Additionally, during the 30-day comment period, eight individuals sent written comments via email. Of those eight written comments, one also spoke at the meeting on March 23, 2010. Therefore, there were 15 discrete sets of comments or questions. Some of the comments received expressed either the individual's support or opposition for the proposed project and did not have a specific question or comment regarding the SEA. Appendix A of this SEA includes a summary of public comments received and their responses. Comments were categorized by topic, and the topics are presented in order

of their frequency of occurrence to help facilitate their evaluation in this SEA. Specific remarks are summarized under each topic followed by a general response.

1.5 AGENCY INVOLVEMENT

Preparation of this SEA has been coordinated with appropriate Federal, State, Tribal, and local agencies, as well as environmental and historic preservation organizations and groups and other interested parties. A partnering team was established for the proposed project in which Federal, State, and City agency staff coordinated the proposed projects' planning and alternatives analysis. Specifically, these agencies included FEMA, VA, FP&C, SHPO, ACHP, LSU, and the City of New Orleans.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 DESIGN DEVELOPMENT PROCESS

In developing the design alternatives, FP&C retained the services of Blitch Knevel/NBBJ Architects, a joint venture (Design Team) to develop the designs for the proposed UMC site in the area bounded by Canal Street, S. Galvez Street, Tulane Avenue and S. Claiborne Avenue.

The hospital component of the new UMC has two major hospital functions: 1) Inpatient Beds, and 2) Diagnostic and Treatment (D&T). In addition, the UMC has an outpatient clinic function. The inpatient beds encompass the full spectrum of inpatient care needs, from medical/surgical and Intensive Care Unit (ICU) beds to behavioral health and acute rehabilitation beds. The proposed project will operate 424 inpatient beds. The D&T component of the new facility encompasses a wide range of services focused on both the inpatient and outpatient populations, as well as the full range of logistical and ancillary support services needed to run the facility. The D&T functions include Central Admitting, Emergency/Trauma, Radiology, and Surgical/Interventional Services.

The Design Team developed the designs based upon a series of principles and design development processes, which are described in detail in Appendix B. In addition, sustainable approaches were incorporated into the design to improve operational efficiencies, reduce energy consumption and cost, and add long-term value.

The Design Team considered the functional relationship of the Inpatient tower, the D&T, the Clinics, and the Research and Teaching components. They then analyzed numerous relational configurations to identify an optimal functional relationship, and the best placement of that configuration on the site relative to the four bounding roadways.

Next, the Design Team studied four different stacking scenarios, four, six, eight, and twelve stories. This analysis was to identify the optimal relationship between department adjacencies, travel efficiencies, and maintaining room for future expansion. The 4-story scheme resulted in excessive travel distances and high footing costs. The 8-story scheme did not provide an ideal scenario for integration of Inpatient and D&T functions. The results of the evaluation showed that the 6-story stacking model best met the requirements of the proposed project. The design team also tested the 6-story stacking diagram for site fit.

The Design Team also evaluated various materials to use for the buildings by looking at the context of the facility and taking into consideration the patterns, shading, color, and texture of other institutional and non-institutional buildings in the Mid-City area. The Design Team reviewed the character and physical attributes of the Mid-City Historic District (MCHD) to ascertain any cues for an appropriate expression for the exterior materials selection. The Design Team recommended the pre-cast concrete panels as the exterior material for the UMC because the panels simulate stucco, which is consistent with existing large-scale Mid-City institutional buildings, without the maintenance requirements of stucco, and the panels meet the requirement to withstand hurricane force winds and impacts.

2.2 ALTERNATIVES CONSIDERED AND DISMISSED

The Design Team evaluated three functional configurations. Each configuration conformed to an idealized medical center that connects the three major components of Inpatient tower, D&T, and Outpatient Clinics. The T-Configuration placed the D&T perpendicular to the Inpatient towers, which resulted in inefficiencies with travel distances between the D&T and the Inpatient towers. Therefore, the T-Configuration was eliminated as a viable option.

The E-Configuration placed the three major components parallel to one another and the L-Configuration located the D&T and Outpatient Clinics perpendicular to each other. These two configurations were retained and the Design Team developed several alternatives for these configurations in various placements on the site.

Specifically, the Design Team evaluated twenty site design alternatives to identify the favorable orientation of the inpatient towers relative to the four perimeter streets: Claiborne Avenue, Tulane Avenue, S. Galvez Street and Canal Street (Appendix B). In addition, the Design Team incorporated the need for future expansion into the analysis. Ultimately, all but three of the alternatives were eliminated to maximize both short-term and long-term needs and efficiencies. The three alternatives retained for detailed study are described in Section 2.3.

2.3 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The four alternatives that were retained for detailed environmental review include:

- Alternative 1 – Canal Street E-Configuration;
- Alternative 2 – Canal Street L-Configuration;
- Alternative 3 – Tulane Avenue L-Configuration; and
- No Action Alternative.

2.3.1 Modification of Alternatives Based on Public or Consulting Party Input

The Design Team put forth considerable effort to consider and incorporate public and consulting party[2] comments regarding the design of the UMC. Consideration of comments received resulted in the following refinements to the designs:

1. Additional design alternatives were suggested at the consulting party meeting on January 22, 2009, where only two design alternatives were presented (Canal E- and Canal L-Configurations). As a result, the Design Team added a third design alternative for analysis, the Tulane L-Configuration.

[2] In accordance with 36 CFR Part 800, Consulting Parties were identified during the PEA. In total, 34 organizations participated in the Section 106 process; five signatories; one invited signatory; four concurring parties; and 24 consulting parties.

2. Exterior Materials –concerns were raised by the National Trust for Historic Preservation and the ACHP regarding the materials to be used on the exterior of campus buildings. The comments centered on a desire to achieve better compatibility with the MCHD. Additional studies were conducted to evaluate exterior design options that addressed the concerns. The design proposes the use of textured pre-cast concrete panels. The materials selection should not prove incompatible with the MCHD, since the pre-cast panels simulate the appearance of stucco. Additionally, there is a lack of consistent materials used for commercial and industrial buildings within the district, the site is located on the periphery of the district near the Central Business District (CBD), and there is pre-existing intrusion of commercial buildings located along the lower half of Canal Street[3]. The design incorporates pre-cast panels with a variation to the texture and treatment. The panels would be shaped to create repetitive patterns that would be further expressed as shadows are cast. The design strives to achieve compatibility not through imitation, but rather by providing a treatment of scale and textures that reinforce the vibrancy and variety of Mid-City's character.
3. Setbacks along Canal Street – the Design Team further evaluated the setbacks of existing commercial buildings in the surrounding neighborhood in an effort to be more compatible with the area. Setbacks for neighboring buildings were documented and these ranges were integrated into the setbacks established for UMC buildings. The proposed setbacks are consistent with other institutional buildings in the MCHD.
4. Retail/Urban edges along Tulane – Consistent with comments received requesting retail to be located within the facilities, the design incorporates a ground floor retail space at the base of the parking structure. In addition, the ground floor hospital functions that front the site perimeter edges are transparent settings allowing for views to the exterior from the ground floor building.
5. Exterior sunscreens were also used in an effort to improve compatibility with the surrounding area by incorporating the appearance of shutters found on many homes in the vicinity. "Block" or "strip style" windows were also replaced by slender windows, reflecting the look of the windows found on buildings in the surrounding area. Balconies were added along the Canal Street view imitating the use of balconies as a characteristic feature in New Orleans style architecture.
6. In response to comments regarding the aesthetics of parking spaces, additional landscaping has been added to these areas to serve as buffers and reduce the visual impacts of parking areas.
7. Requests were made to avoid acquisition of Orleans House located at 1800 Canal Street. The Design Team performed further evaluation, and FP&C made the decision to preserve

[3] As stated in the 1993 National Register Nomination package for the Mid-City Historic District.

the Orleans House through avoidance, and the building will not be incorporated into the campus.

2.3.2 Information Common to All Design Alternatives

2.3.2.1 Site Fill

This section summarizes the information used to determine the appropriate elevation of the buildings and the filling of the proposed project site to accommodate the project. There are two standards used to determine the appropriate elevation of the buildings, 1) the Advisory Base Flood Elevation (ABFE) requirement of elevating structures to +3.0 feet North American Vertical Datum of 88 (NAVD88) above the Highest Existing Adjacent Grade (HEAG) as mentioned in the PEA, or 2) to use the preliminary Digital Flood Insurance Rate Map (DFIRM).

The topography of the site ranges from -2.0 to 0.0 feet NAVD88 meaning the HEAG is 0.0 feet. The ABFE requirement would elevate portions of the site to +3.0 feet NAVD88. To determine elevations of new buildings, FEMA's policy is to use the best available information, which is the preliminary DFIRM. The preliminary DFIRM shows the proposed project site as a Zone AE, with a base flood elevation (BFE) of 0 feet (DFIRM 22071C0230F 2008).

The City of New Orleans adopted the ABFE maps dated April 12, 2006, by resolution on August 3, 2006. For the proposed project site, the ABFE requirement for the site is the higher of elevation 0, or +3 feet above HEAG. National Flood Insurance Program (NFIP) guidance on floodplain management, 44 CFR § 9.11(d)(6) states that "…no action may be taken if it is inconsistent with the criteria of the National Flood Insurance Program (44 CFR part 59 et seq.) or any <u>more restrictive Federal, State or local floodplain management standards</u>" (emphasis added) (see Appendix C). Since the ABFE requirement of +3.0 feet NAVD88 elevation is the more restrictive standard, it is used rather than the preliminary DFIRM. Therefore, the buildings on the proposed site would have a finished floor elevation of +3.0 feet NAVD88.

Since the existing site ranges from -2.0 to 0.0 feet NAVD88 in elevation, portions of the site, particularly around the buildings, would be raised a minimum of 3 feet and a maximum of 5 feet by bringing fill onto the site. The intent of this design is to place the first floor above the 100-year floodplain and above the Hurricane Katrina flood levels. Additionally, all critical services would be on the second floor or higher, and would be at 22 feet above the existing grade, which would allow hospital operations to continue for a minimum of seven days in the event of a major flood. Critical activities are those needed for the hospital to function after a flood.

Fill would be added to the site in the vicinity of the building locations. The perimeter roadways would remain at their current elevation. Appendix D includes maps showing the existing topography as well as the Site Finish Grading Plan. Because of the building setbacks, the transition from the perimeter roadways to the buildings would be gradual. Figures 2-1 and 2-2 show the gradual transition from Canal Street to the Inpatient Towers.

Figure 2-1: Cross Section Showing Elevation Transition from Canal Street to Inpatient Towers

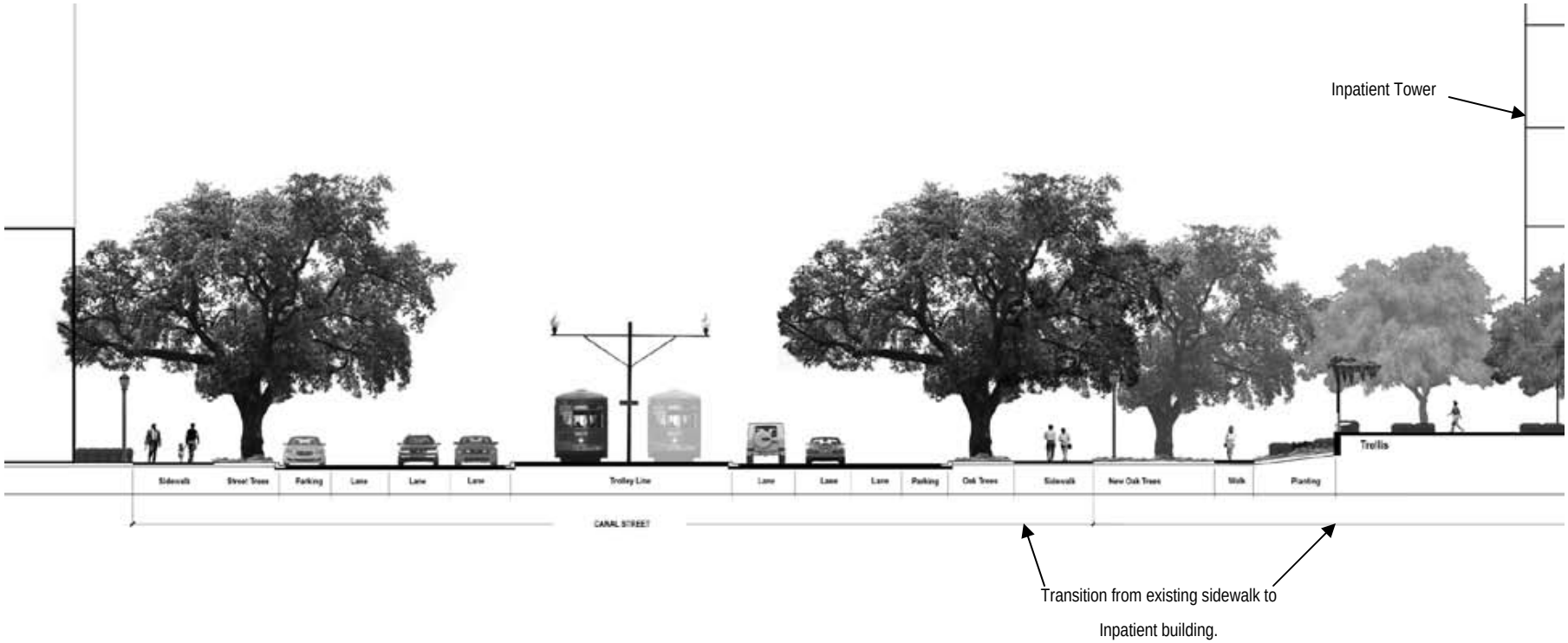


Figure 2-2: Rendering of Transition between Canal Street and the Inpatient Towers

The proposed design also includes an elevated access road from the Interstate 10 (I-10) off-ramp at Derbigny Street to the D&T building. The roadway would be elevated to the first floor height with fill. The roadway would be gradually raised approximately 3 feet over the distance from Derbigny Street to the D&T building. The ER ramp would go to the second level and would be elevated on structure, meaning there would be no fill underneath. This would be similar to the elevated roadway that accesses the upper level of the New Orleans Airport. The freight loading dock would be under the top or flat section of the emergency ramp. Trucks and deliveries would go around under the ramp to the loading docks. Since drainage is a concern in the New Orleans area, the site design would include features that prevent stormwater runoff from affecting the surrounding properties (see Section 2.3.2.2).

Any fill or borrow material used must be sourced from sites that are free from hazardous waste contamination and do not contain any buried cultural materials (i.e. wells, cisterns, foundations, basements, prehistoric Indian artifacts, human burials, and the like). If during the course of work, archaeological artifacts (prehistoric or historic) or human remains are discovered, FP&C must follow the procedures described in Section 3.10.2.3 *Post Review Discoveries*.

2.3.2.2 Stormwater Management

The stormwater management plan for all of the design alternatives manages and directs runoff to the storm drain system. Drainage retention features are designed onsite to ensure surface water runoff does not exceed existing conditions. These features would include bioswales to slow down the rate at which stormwater runoff leaves the site and other devices such as underground retention tanks. A bioswale or vegetated swale is a shallow planted depression that briefly stores stormwater runoff, slows its flow, and lets it soak into soil while pollutants adhere, degrade, evaporate, or are taken up by plants. Figure 2-3 shows how bioswales would be part of the

surface parking design. Photo 2-1 shows a bioswale used for stormwater management in a parking lot. In addition, for many buildings, roof runoff would be directed to cisterns, which are underground storage tanks that store rainwater that can be used to irrigate the site.

Figure 2-3: Bioswales Incorporated into the Parking Areas along Canal Street

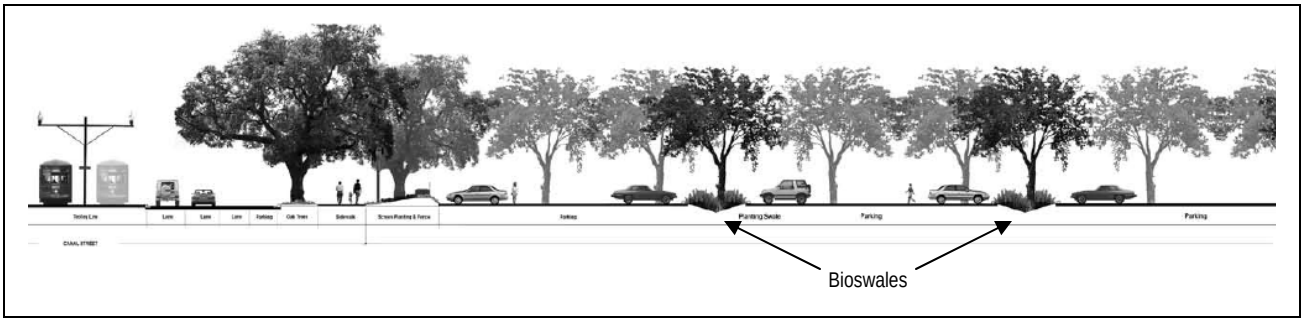


Photo 2-1: Bioswale used for Stormwater Management in a Parking Lot

Under all alternatives, the site would be divided into two drainage basins, with the dividing line running between S. Prieur Street and S. Roman Street. The runoff would be collected from the roof drains and the ground surfaces by various types of drain inlets and catch basins installed in both the paved and unpaved areas. Where appropriate, the bioswales would be used to intercept runoff in the parking areas. Once intercepted by the bioswales and drainage structures located throughout the site, the runoff would be directed via an underground collection system of pipes to the existing drainage culverts that run beneath S. Galvez Street and Claiborne Avenue. The

existing tie-in points of the culverts would not interfere with any of the current utilities along S. Galvez Street or Claiborne Avenue. The proposed designs use of existing tie-in points for the storm sewer system provide a defined clear path to the discharge point, free of any obstructions. The drainage plan would be coordinated with the Sewerage and Water Board of New Orleans (S&WB) and integrated into the basin-wide drainage system.

2.3.2.3 Energy

According to Entergy Thermal, LLC (Martins 2010), steam and hot water would be provided to the UMC from the existing Charity Boiler Plant by extending lines that currently supply the LSU HSC. Because UMC will use the existing Charity Boiler Plant, the shared Central Energy Plant (CEP) previously discussed by VA and FP&C will not be constructed. Therefore, the impact analysis for this SEA, is based on upgrading the existing facilities and constructing a Utility Building (formerly called the CEP), near the intersection of Tulane and S. Claiborne Avenues. The Utility Building would house emergency generators and the building and associated stack would not exceed a height of 100 feet. The existing Charity Boiler Plant, which operates three 52.9 million British thermal units per hour (MMBTU/hr) natural gas boilers and one emergency generator would add two 52.9 MMBTU/hr boilers to its existing capacity, and would route all emissions through the existing stack. The new boilers would be more energy efficient and would likely be equipped with modern control technologies such as low NOx burners and/or flue gas recirculation.

It should be noted that although the existing Charity Boiler did receive floodwaters following Hurricane Katrina, the three existing boilers were not impacted, as they are on a structure at approximately 3.5 feet above grade. The new boilers would also be elevated to 12 feet above grade.

2.3.2.4 Parking

The program requirement for parking includes 2,800 parking spaces, which would be provided through a combination of 1,400 surface parking spaces and 1,400 structured parking spaces. The proposed parking garage would have five floors of parking and a helipad on the sixth floor. FP&C estimates that to provide all parking needs through structured parking would increase project construction costs by at least $20 million. Therefore, the portions of the site that meet the needs for future expansion would be used to meet the immediate parking needs for the program. These staff parking areas would have a system of landscape dividers to mitigate the adverse visual effects of the surface parking, and bioswales to manage stormwater runoff. Future expansion would include an additional structured parking building.

2.3.2.5 Pedestrian Bridge

All design alternatives include an elevated pedestrian bridge from the UMC parking garage, across Tulane Avenue, and continuing along S. Prieur Street above the curb-line or sidewalk. The walkway would then connect with the existing Gravier Street pedestrian walkway near the

intersection of Gravier and S. Prieur Streets. The existing Gravier Street bridge is used as a pedestrian connector from the District Energy Parking Garage in the CBD, to multiple LSU HSC buildings along Gravier Street. The existing traffic signal at S. Prieur Street and Tulane Avenue would be retained, but the configuration of the signal display may be modified to accommodate the pedestrian bridge.

Conceptual plans show that the Tulane Connector would be 560 feet in length and 10 feet wide (Figure 2-4). The height of the connector would be approximately 34 feet, and it would be supported by concrete columns spaced approximately 60 feet apart, and have an uninterrupted span of 20 feet over Tulane Avenue. All of the supports would be located near the curb and sidewalk over the northwest side of S. Prieur Street. The walkway level of the connector would be approximately 24 feet above grade. In form and massing, the base of the connector would be similar to the Gravier Street Bridge. It would be enclosed with single-glazed windows and louvered sidewalls, and would have a slightly curved standing seam metal roof. The color scheme for the exterior of the connector would be a neutral shade of tan or gray.

At the intersection of S. Prieur and Gravier Streets, the pedestrian bridge would join with the Gravier Street Bridge, an existing pedestrian walkway of the LSU HSC campus (Photo 2-2). The Gravier Street Bridge provides both access and utilities to multiple buildings of the LSU HSC campus from S. Claiborne Avenue to S. Johnson Street. Utilities originate at the Charity Boiler Plant and run underground in the New Orleans Medical Historic District (NOMHD) until the Gravier Street Bridge, at which point they are elevated on the underside of the bridge. These utilities may be extended on the underside of the proposed pedestrian bridge to the UMC campus. The pipes would run between support beams and be screened from view.

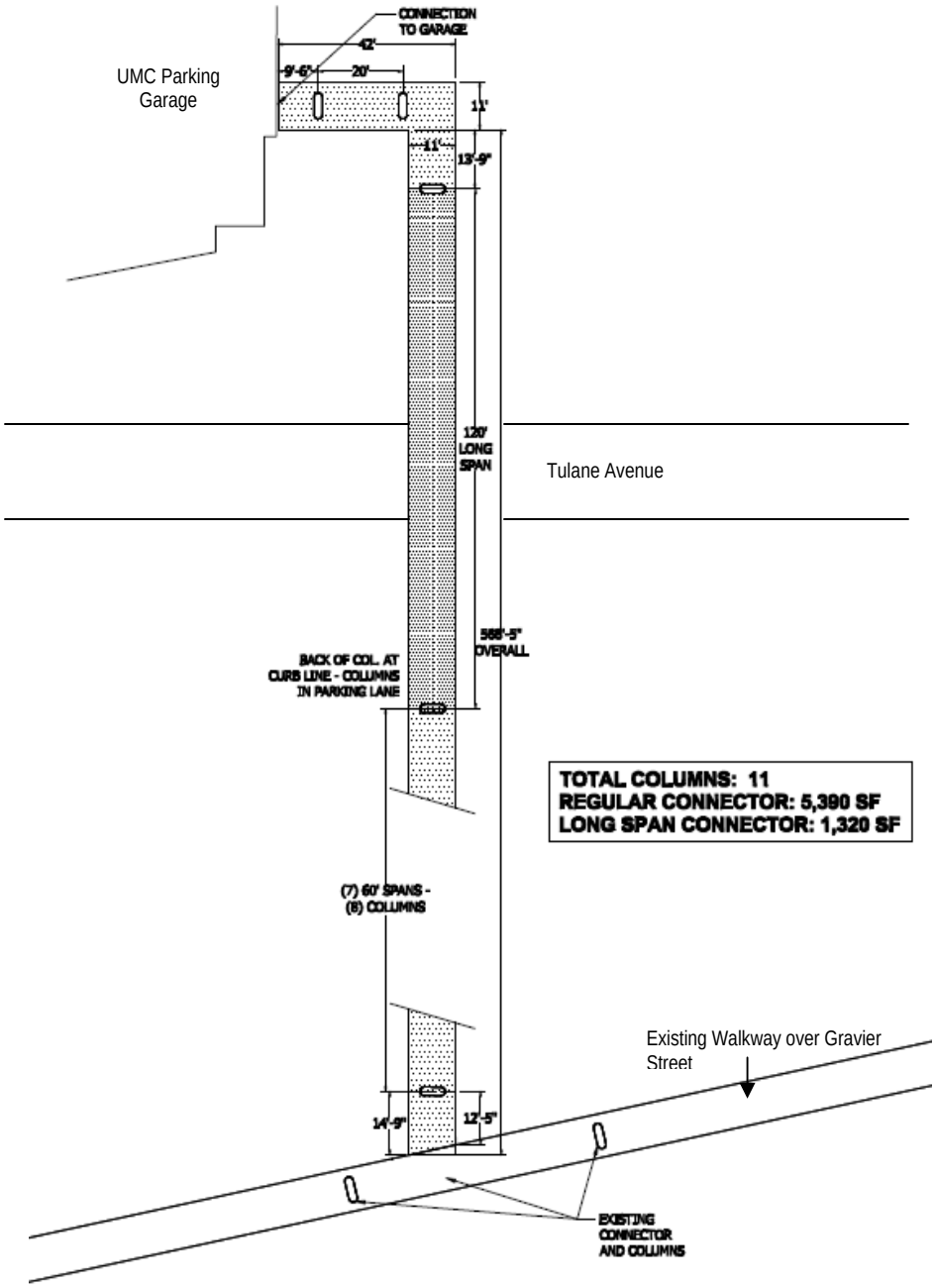
Photo 2-2: Existing Pedestrian Walkway near Intersection of S. Prieur and Gravier Streets

2.3.2.6 UMC and VA Shared Services and Operational Synergies

Common to all design alternatives is the continuation of the collaborative relationship with the VA to provide and support the extensive program of ongoing medical research and training in conjunction with the medical schools and allied health programs, which provided healthcare training prior to Hurricane Katrina. VA's medical education program began following World War II, authorized by VA's 1946 Policy Memorandum No. 2. For over 60 years, VA has worked in partnership with medical and associated health professions schools to accomplish a

dual mission of providing healthcare to the nation's veterans while also training new health care professionals to meet the patient care needs of veterans and the entire nation. The State has benefited from the long-standing affiliations between the VA and healthcare training institutions to provide advanced clinical training opportunities to the medical students, fellows, and residents who utilized the former MCLNO facilities to be replaced by the project under evaluation in this SEA.

Figure 2-4: Tulane Connector Concept Plan



Prior to Hurricane Katrina, the VAMC had active medical affiliations with the LSU HSC and Tulane Medical School, offering 124 resident positions and training over 500 residents, interns, and other allied health students. Historically, the VA trained over 450 residents and specialists and 900 associate health trainees annually. Adjacencies were considered in selecting the alternative orientations identified for further review, in order to ensure the success of this continued, collaborative relationship. Accordingly, all of the orientations share alignments that are centered closer to Galvez Street, across which is the location for the proposed VAMC replacement facilities, to ensure ease of access between the VAMC and UMC for the professionals, staff, residents and students who would utilize both facilities.

Additionally, Tulane doctors, professors and interns, as well as LSU doctors and staff working in the downtown area, can access the UMC in one of four ways. They can 1) take the above grade pedestrian bridge from the District Energy Garage near Tulane's Medical Center to the UMC; 2) take a shuttle bus that will be part of the shuttle system established when UMC is operational; 3) walk Cleveland Avenue between UMC and the Tulane MC; or 4) take a private vehicle to the UMC staff parking lots.

Apart from the benefits to staff, students and patients derived from locating the facilities adjacent to each other, the State and the VA have been in discussions and negotiations regarding a host of services, which might potentially be shared between the VAMC and UMC. Examples of other collaborative clinical opportunities that might be provided by the UMC to VA patients include Trauma, Hyperbarics, Mammography, Radiation Oncology, Complex neurosurgical interventions, Lithotripsy and Teleradiology. Additionally, specialized audiology and Prosthetics might be provided by the VA to UMC patients under the current negotiations.

While these clinical and operational possibilities remain uncertain as of the publication of this SEA, the importance of locating the facilities in adjacent sites would provide mutually beneficial staffing efficiencies for both the VAMC and UMC, notwithstanding the finalization of any of the clinical collaborations listed above currently under consideration.

2.3.2.7 Sustainable Design

Sustainable approaches were used in the design of the proposed UMC. These approaches would improve operational efficiencies, reduce energy consumption and cost, and add long-term value. The design team considered sustainable approaches in six categories:

Flexibility – The design would pursue adaptable planning principles that ensure the long-term facility use.

Sustainable Site Planning – The design team is considering a series of sustainable site technologies, such as, rainwater and stormwater collection, Brownfield redevelopment, reduction of heat island effect, bio-swales, and bio-infiltration. Climate-sensitive site design and orientation would contribute to a lower building energy use.

Healthier Indoor Air Quality and Materials – To the greatest extent possible, low-emitting materials would be considered and minimizing exposure to hazardous indoor pollutants and chemicals. Where options are available for materials, those with less or no known risk would be preferred.

Energy Efficiency – The State of Louisiana requires new construction to achieve an energy performance 30 percent greater than what is required in the 2004 edition of American National Standards Institute (ANSI) and American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) (ANSI/ASHRAE/ IESNA 90.1-2004). This mandate heightens the energy performance criteria for the new facility and the design is anticipated to exceed this energy performance.

Water Use and Conservation – The design team is evaluating strategies for reducing the usage of potable water, irrigation and wastewater production. Reducing demand for potable water through the selection of water efficient fixtures would enable the hospital to operate more efficiently under both normal and extreme circumstances and lessen the creation of wastewater. Rainwater is harvested for irrigation, further reducing the demand for potable water.

Healing Environments – Ensuring patient and staff access to daylight and nature is a key design goal. The design team is looking for opportunities for gardens as part of the design.

Leadership in Energy and Environmental Design (LEED) – The project is being designed such that it would obtain points equal to that required for LEED Silver if it were registered with the United States Green Building Council.

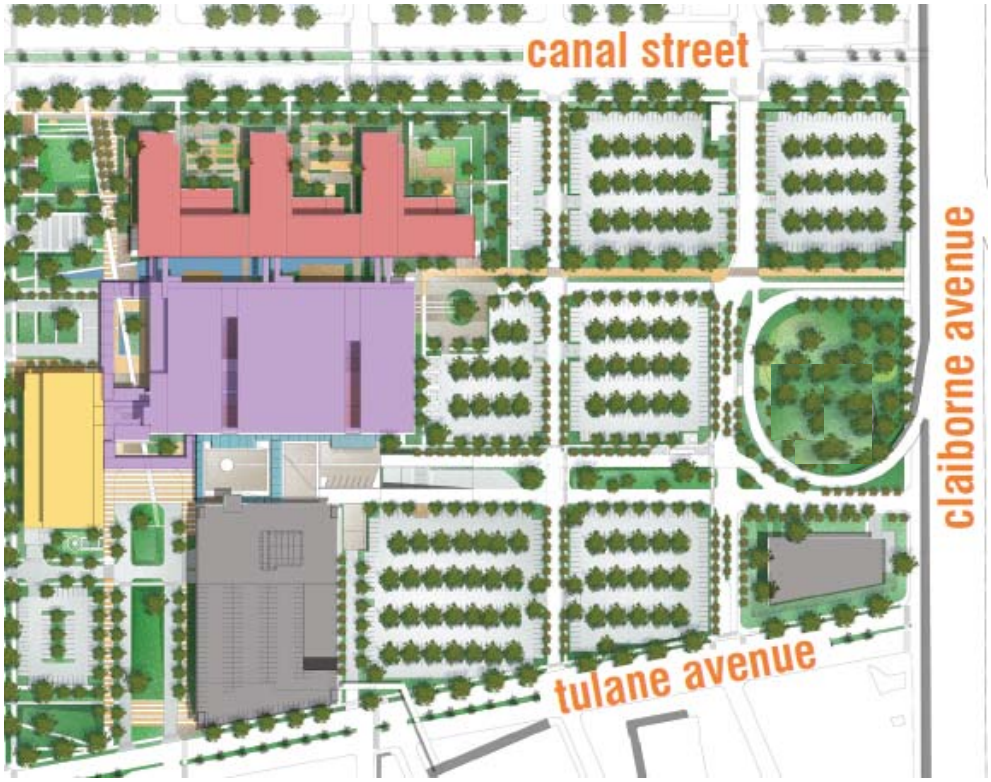
2.3.2.8 Features Common to All Alternatives

The current proposed action is the design, construction, and operation of the buildings, but does not include the buildings identified as "future" in the figures. Each design alternative illustrates how future expansion might be placed on the site, but the timeframe for any future development of the site is unknown. Should Federal funding or approvals be required for the construction of any new or expanded facilities in the future, the Federal agency involved in the project would be responsible for compliance with NEPA. As shown in Figure 2-5, many of the areas of the site where "future" buildings are shown, will be surface parking until the buildings are constructed.

The following aspects of the design are consistent in all of the alternatives:

- The final programmed area for the Inpatient tower is approximately 560,000 square feet (sf); the D&T is approximately 740,000 sf, and the Outpatient Clinics and Entry Pavilion is approximately 259,000 sf; for a total of approximately 1,559,000 sf;
- The buildings on the proposed site would have a finished floor elevation of +3.0 feet NAVD88. Because the site topography ranges from -2 to 0 feet mean sea level (msl), the first floor elevation would range from 3 feet to 5 feet above street level (3.0 NAVD88);

Figure 2-5: Site Plan Showing Surface Parking



Source: NBBJ 2009b

- Program elements placed on the first floor would be non-mission critical, so that in the event of a catastrophic flood, the temporary loss or damage to these components would not negatively impact the operational capacity of the hospital;
- The floor-to-floor heights would be 15 feet for all floors except the first level, where the height would be 17 feet and the fourth level where the floor-to-floor height is 16 feet;
- A Utility Building would be constructed on the southeastern corner of the site near the intersection of S. Claiborne and Tulane Avenues;
- The Inpatient Tower would be six stories in height and the D&T building would be five stories. In Alternative 1, the helipad is on roof of the D&T building;
- The height of the patient tower is approximately 114 feet, and the Outpatient Clinic is approximately 102 feet in height;
- The parking garage would have five floors of parking (1,400 spaces) and in Alternatives 2 and 3, would have a helipad on the sixth floor; an additional approximately 1,400 parking spaces would be provided in surface lots to provide the parking necessary to meet the program requirements as discussed in Section 2.3.2.4.

- A 33 feet x 32 feet structural bay would be standard throughout the facility to allow a high degree of planning and design flexibility;
- A pedestrian bridge would be constructed across Tulane Avenue from the proposed UMC parking garage and along S. Prieur Street to the existing pedestrian walkway at the LSU HSC;
- A pedestrian bridge is being considered across S. Galvez Street from the UMC to the VAMC. The optional pedestrian bridge, if installed, would span S. Galvez Street between the VAMC outpatient building and the UMC clinic. The agencies are designing these facilities to support such a bridge should that option be selected during initial construction or at a future time. Representatives from the VAMC and the UMC would consult on design of such a pedestrian bridge should this optional design feature be chosen. The design and materials would be selected to integrate the bridge into both facilities with minimal impacts on the surrounding area.
- An additional approximately 1,400 parking spaces would be provided in surface lots; and
- Circulation and mechanical/electrical zones are factored into each of the configurations. The placement of mechanical and electrical zones on each floor were developed to maximize the clear floor area on each floor, and minimize obstructions to allow the highest possible level of planning flexibility and future growth.

Additionally, all critical services would be on the second floor or higher, and would be at least 22-feet above the existing grade, which would allow hospital operations to continue for a minimum of seven days in the event of a major flood.

2.3.3 Alternative 1 – Canal Street E-Configuration

Under this alternative (Figure 2-6), Inpatient buildings would be constructed along Canal Street, with the parking garage along S. Galvez Street and D&T facilities located in the center of the campus area. The Inpatient and D&T buildings would expand towards Claiborne Avenue. A helipad would be located on the top of the D&T building. The clinic building would be located along Tulane Avenue, with a bridge from the clinics across Tulane Avenue to the LSU HSC. Clinic expansion space would be along Tulane Avenue and connect to the initial clinic building. An additional clinic would be located at the corner of S. Claiborne Avenue and Canal Street.

Public vehicular traffic accesses the campus from both S. Galvez Street and Tulane Avenue. Emergency vehicle, emergency walk-in and staff gain access to the campus using N. Derbigny Street from either Canal Street or Tulane Avenue. Emergency and emergency walk-in traffic would proceed up a ramp to an elevated drop-off deck. Service vehicles would access the campus from S. Claiborne Avenue. Walk-in vehicles can park in designated sections of the parking garage.

A plaza would anchor the corner of S. Galvez Street and Canal Street. The plaza would consist of a formal canopied hospital drop-off, UMC Cancer Center visitor parking, and a landscaped

arrival area. In addition, a vehicular plaza connects the hospital to Tulane Avenue and connects directly to the structured parking facilities.

Figure 2-6: Alternative 1 - Canal Street E-Configuration

2.3.4 Alternative 2 – Canal Street L-Configuration (Preferred)

Under this alternative (Figure 2-7), the Inpatient and D&T buildings remain in the same location as with Alternative 1; however, the clinics are placed along S. Galvez Street with the parking garage along Tulane Avenue, and a pedestrian bridge from the parking garage across Tulane Avenue to the LSU HSC. The clinics connect to the D&T via an enclosed entry pavilion with elevated pedestrian walkways. The Inpatient and D&T buildings expand toward Claiborne Avenue. Clinic expansion space occurs at the corner of S. Galvez Street and Tulane Avenue. Additional clinics would be located at the corner of S. Claiborne Avenue and Canal Street and between the Utility Building and expanded parking garage.

In this alternative, the helipad is placed on top of the parking garage. A covered walkway on the elevated deck would connect the parking garage elevators to the emergency entrance. The Utility Building is proposed for construction at the corner of S. Claiborne and Tulane Avenues. Public vehicular traffic accesses the campus from both S. Galvez Street and Tulane Avenue. Emergency vehicles, emergency walk-ins and staff gain access the campus via N. Derbigny Street from either Canal Street or Tulane Avenue. Emergency and emergency walk-in traffic would proceed up a ramp to an elevated drop off deck. Walk-in vehicles would park within a

designated section of the parking garage. Service vehicles access the facilities from S. Claiborne Avenue. Just as with Alternative 1, a plaza anchors the corner of S. Galvez Street and Canal Street.

Figure 2-7: Alternative 2 - Canal Street L-Configuration (Preferred)

2.3.5 Alternative 3 – Tulane Avenue L-Configuration

Under this alternative (Figure 2-8), the parking garage is placed along Canal Street, while the inpatient buildings are constructed along Tulane Avenue, with a bridge from the inpatient building across Tulane Avenue to the LSU HSC. Similar to the other alternatives, the D&T building is located between the inpatient building and the parking garage. The clinic building is located along S. Galvez Street. The clinic connects to the D&T building via an enclosed entry pavilion with elevated pedestrian walkways. The inpatient and D&T buildings expand towards Claiborne Avenue. Additional clinics would be located at the corner of S. Galvez Street and Canal Street, and at the corner of S. Claiborne Avenue and Canal Street adjacent to the expanded parking garage. In this scenario, the helipad is on top of the parking garage. A covered walkway on the elevated deck connects the parking garage elevators to the emergency entrance.

Public vehicular traffic accesses the campus from both S. Galvez Street and Canal Street. Emergency vehicles, emergency walk-ins and staff gain access to the campus using N. Derbigny

Street from either Canal Street or Tulane Avenue. Emergency vehicles and emergency patient vehicles proceed up a ramp to an elevated drop off deck. Walk-in vehicles can park within a designated section of the parking garage. Service vehicles access the facilities from S. Claiborne Avenue. A plaza anchors the corner of S. Galvez Street and Tulane Avenue. The plaza consists of a formal canopied hospital drop-off, UMC Cancer Center visitor parking, and a landscaped arrival area.

Figure 2-8: Alternative 3 - Tulane Avenue L-Configuration

2.3.6 No Action Alternative

NEPA requires a Federal agency to consider a "No Action" alternative when analyzing alternatives to a proposed action. Under the No Action alternative, FEMA would not provide Public Assistance funding to FP&C for the proposed UMC. For purposes of assessing the impacts of the No Action Alternative, it is assumed that without FEMA funding, the UMC would not be constructed at the Tulane/Gravier site bounded by Canal Street, S. Galvez, Tulane Avenue, and S. Claiborne Avenue. As discussed in Section 2.2.1 of the PEA, selection of the No Action Alternative would further delay completion of an integrated medical healthcare complex with the ability to provide the required full range of inpatient and outpatient services needed for the re-establishment of health care in southeastern Louisiana and the Gulf Coast region. In the interim, medical services would continue to be provided using the interim arrangements currently in use. Healthcare delivery and training formerly provided at Charity Hospital would continue, on a reduced level, at the LSU Interim Public Hospital, which was established

following Hurricane Katrina. LSU is operating a trauma center at the LSU Interim Public Hospital (formerly University Hospital), but the severe shortage of affordable medical care (including overall care, mental health care, and ambulatory care) and medical training opportunities would continue.

Under the No Action Alternative, some property owners within the site may begin to repair and improve properties damaged by Hurricane Katrina. Some properties may continue to degrade should owners choose not to, or are unable to rebuild. However, since property acquisitions have already begun, some properties are currently in the public domain or are engaged in the appraisal and review process for future acquisition. As a result, if the No Action Alternative were selected FP&C and/or the City would have to find another use for these properties, sell them back to the original owners, or open them up for general purchase. In addition, other mitigation measures currently being implemented at the site in compliance with the PA would be stopped or curtailed.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

As discussed in the previous chapters, this SEA is part of a tiered environmental assessment process related to the proposed UMC in New Orleans. This chapter describes the existing environment of the proposed UMC project site and assesses the impacts of the project alternatives on each potentially affected environmental resource.

3.1 EVALUATION OF POTENTIAL NEW AND IMPORTANT INFORMATION ON IMPACTS PREVIOUSLY ASSESSED

The CEQ NEPA regulations encourage agencies to prepare "tiered" environmental analyses to assist in the evaluation of large-scale programs or projects involving a series of related decisions. Preparation of a programmatic NEPA document, such as the PEA for Site Selection of the VAMC and UMC (VA/FEMA 2008), promotes the consideration of cumulative impacts that might otherwise be ignored in assessments prepared on a case-by-case basis (Sigal and Webb 1989). A subsequent statement, such as this SEA, "need only summarize the issues discussed in the broader statement and incorporate discussions from the broader statement by reference and shall concentrate on the issues specific to the subsequent action" (40 CFR 1502.20).

The PEA contains the results of a systematic assessment of site-selection and site preparation impacts on 11 primary areas: the physical environment, water and coastal resources, land use, infrastructure and utilities, cultural resources, socioeconomics, transportation, human health and safety, biological resources, air quality, and noise.

This SEA is being tiered from the PEA and presents the results of an assessment of the potential environmental impacts of the design, construction and operation of the proposed UMC. With respect to the design, construction and operation of the proposed UMC, no new or important information has become available for three of the 11 resources evaluated in the PEA (Physical Environment, land use, and biological resources). Additionally, the analysis of those three areas in the PEA does not change in light of the site-specific design information. Therefore, this SEA adopts the findings of the PEA and FONSIs with respect to these resources and does not repeat the evaluations.

This SEA re-evaluates the impacts to the remaining primary areas evaluated in the PEA in light of the new information on design, construction and operation of the proposed UMC and information of other reasonably foreseeable actions such as the VAMC design, construction, and operation. These areas of re-evaluation are floodplains, hazardous and biomedical waste, cultural resources (archeology), air quality, noise and vibration, transportation and infrastructure. In addition, this SEA includes aesthetics as another area of evaluation given the new information on design and construction of the UMC. Table 3-1 provides a reference of evaluated resources and their respective locations in both the PEA and this SEA.

Environmental Justice was addressed in Section 3.6.3 of the PEA. However, since publication of the PEA, new information has become available that should be considered in the SEA relative to the Proposed Action and Alternatives.

Table 3-1: Reference to Location of Resource Sections in the PEA and SEA

Resource	PEA Section Number	SEA Section Number	Comments
Physical Environment	3.1	--	Assessed in the PEA. There is no new information requiring reconsideration and the analysis remains the same.
Site Descriptions	3.1.1.1	--	Assessed in the PEA. There is no new information requiring reconsideration and the analysis remains the same.
Geology and Soils	3.1.1.2	--	Assessed in the PEA. There is no new information requiring reconsideration and the analysis remains the same.
Floodplain	3.1.1.3	3.7	Building elevation requirements and stormwater drainage assessment included in SEA
Water and Coastal Resources	3.2	3.6	Assessed in the PEA, further assessed in the SEA based on site-specific design information
Land Use	3.3	--	Assessed in the PEA. There is no new information requiring reconsideration and the analysis remains the same.
Aesthetics	--	3.2	Aesthetics and visual quality assessment added to SEA based on site-specific design information.
Wind	--	3.3	Wind assessment added to SEA based on site-specific design information.
Light and glare	--	3.4	Light and glare assessment added to SEA based on site-specific design information.
Infrastructure/Utilities	3.4	3.9	Further assessed based on site-specific design information.
Cultural Resources	3.5	3.10	Archeology evaluation and Section 106 Compliance activities discussed in SEA.
Socioeconomics/ Environmental Justice	3.6	3.1	Assessed in the PEA, further assessed in the SEA based on site-specific design information.

Transportation	3.7	3.12	Further assessed based on site-specific design information
Human Health & Safety/Hazardous & Biomedical Waste	3.8	3.8	Further assessed based on site-specific design information
Biological Resources	3.9	--	Assessed in the PEA. There is no new information requiring reconsideration and the analysis remains the same.
Air Quality	3.10	3.5	Further assessed based on site-specific design information
Noise and Vibration	3.11	3.11	Further assessed based on site-specific design information

New Information on Environmental Justice

As described in Section 3.6.3 of the PEA, environmental justice considerations must be considered for Federal actions under the NEPA process. EO 12898 (59 Federal Register 7629) directs Federal agencies to identify and address, as appropriate, potential disproportionately high and adverse human health and environmental impacts on minority and low-income populations. As presented in the PEA, the population residing on or within one-quarter mile of the UMC site is greater than 50 percent minority and exceeds the Louisiana average of persons below the poverty level by more than 20 percent.

Therefore, based on the CEQ definitions (CEQ 1997a), the population within one-quarter mile of the UMC site was identified as a community of concern for environmental justice considerations. The PEA and FONSI concluded that there would be no disproportionately high and adverse direct, indirect, or cumulative impacts to the community of concern due to construction of the UMC at the Tulane-Gravier site. Beneficial impacts would result from improved access to and quality of healthcare, as well as increased opportunities for employment. Residents of the Common Ground mixed-income housing facility would likely meet the definition of a community of concern. However, the Common Ground facility would not be displaced by the UMC project. Based on the environmental justice analysis performed in the PEA, the Proposed Action and Alternatives evaluated in this SEA would not result in disproportionately high and adverse direct, indirect, or cumulative impacts on the residents of the new housing facility.

As part of the land acquisition process, FP&C has retained relocation specialists to assist in compliance with the Uniform Relocation Act. While estimates in the PEA (based on ESRI data) showed 287 residents in 125 housing units residing on the UMC site (VA/FEMA 2008, pg 3-68), relocation specialists are conducting property-by-property surveys to ascertain the number of business and residential displacements that would occur as a result of land acquisition.

With 90-95 percent of the property inspections completed as of March 5, 2010, 65 occupied housing units and 32 businesses exist on the site. Of the 32 businesses, 26 are owner operated

and eight are tenant businesses. Additionally, 17 of the housing units are owner-occupied and 48 are tenant occupied. Using the identified 65 housing units and increasing it by 7.5 percent to account for the incomplete survey, there is an estimated 70 occupied housing units on the UMC site.

Using the U.S. Census Bureau occupancy rate of 2.51 for Census Tract 49, there is an estimated 176 residents on the UMC site. This is 39 percent less than the 287 residents originally estimated. Under the Proposed Actions, there would still be an adverse affect because of displacing community residents. However, the number of displacements would be less than originally anticipated.

New Information on Historic Properties

During the design process, a pedestrian walkway was proposed to cross Tulane Avenue (see Section 2.3.2.5 for details). The potential effects associated with the bridge were not evaluated as part of the Tier I NEPA or Section 106 processes. Based on staff analysis, FEMA believes there would be no direct effects to standing structures. Therefore, FEMA's evaluation focused on indirect effects such as view shed issues and whether the proposed walkway would affect access to, usage of, or the significance of historic properties. FEMA identified 22 potentially affected historic properties within the standing structures APE.

In addition, potential effects to archaeological resources were evaluated. The archaeological APE appears to fall mainly within the sidewalk and parking lane of S. Prieur Street and thus has had considerable disturbance through years from utility work and repaving of the streets and/or sidewalks. Additionally, the APE appears to be composed of disturbed soils and fill because of prior demolition and construction activities, and street construction. Thus, based on field inspection, archival evidence indicating substantial changes in the block layout, and the heavy soil disturbance in the APE from multiple large-scale projects, it is the recommendation of FEMA archaeologists that no archaeological resources would be affected by the proposed undertaking. However, the potential exists for archaeological resources to be affected on the proposed UMC site. Section 3.10.2 describes the archaeological surveys being conducted on the site.

FEMA conducted a an assessment of adverse effects, which resulted in a finding of No Adverse Effect to Historic Properties with Conditions. The specific conditions include:

- Ground vibrations that may be caused by the construction of the proposed Tulane Connector will be monitored, and meet the standards and procedures as set forth in the Vibration Tolerance and Monitoring Plan required per Stipulation VI.C.3.a (i-iv) of the PA.

- The design of the proposed Tulane Connector is consistent with the currently proposed design scheme of the UMC campus, which per Stipulation VI.C.2.d of the PA considers techniques to improve compatibility with the MCHD including materials selections, landscaping, setbacks, site layouts, and modifications to footprints and massing. Specific to

the Tulane Connector, these techniques will minimize, 1) potential visual effects to the MCHD along Tulane Avenue and Canal Street, and 2) potential effects upon access to St. Joseph's Church and the character of its use, including during the construction of the proposed Tulane Connector.

FEMA requested the concurrence of the SHPO, and provided its finding to the City of New Orleans, the ACHP, and the relevant Federally recognized tribes. FEMA also posted the information on the Section 106 website. FEMA received a letter from the SHPO dated April 23, 2010, concurring with FEMA's findings. FEMA did not receive any comments from any other consulting parties.

Significance of Direct, Indirect, and Cumulative Impacts

Area Evaluated	**No Action**	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Mitigation required to reduce impacts below significance?**
Aesthetics and Visual Quality	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Wind	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Light and Glare	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Air Quality	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Coastal Zone	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Floodplain and Stormwater Management	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Solid, Hazardous and Biomedical Waste	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Infrastructure	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Cultural Resources	*No significant impacts.*	***Significant impacts.***	***Significant impacts.***	***Significant impacts.***	Yes. Compliance with Programmatic Agreement.

Noise and Vibrations	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.
Transportation	*No significant impacts.*	***Significant cumulative impacts. LOS F in South Roman St and Tulane Ave. and S. Derbigny St. and Tulane Ave.***	***Significant cumulative impacts. LOS F in South Roman St and Tulane Ave. and S. Derbigny St. and Tulane Ave.***	***Significant cumulative impacts. LOS F in South Roman St and Tulane Ave. and S. Derbigny St. and Tulane Ave.***	Yes. Add new traffic signal at intersection S. Roman St. and Tulane Ave. Coordinate traffic signal at S. Derbigny St. and Tulane Ave.
Helicopter Operations	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	*No significant impacts.*	No.

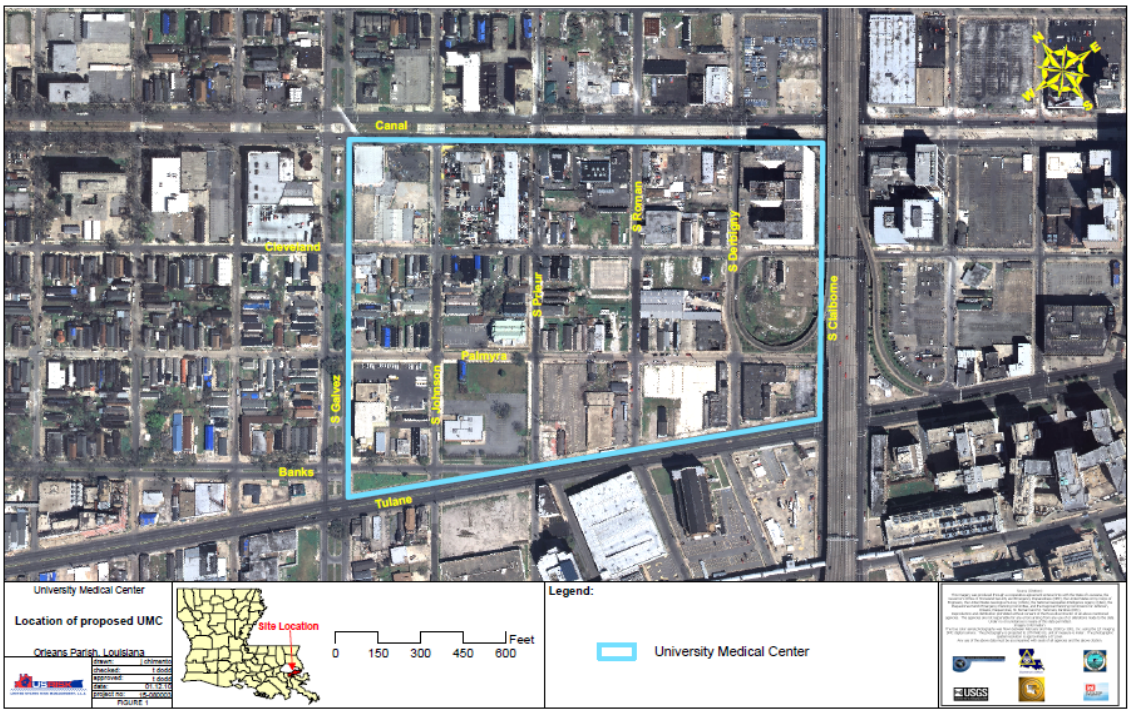
3.2 AESTHETICS AND VISUAL QUALITY

Aesthetic preferences are linked to one's personal and cultural experiences and perceptions of beauty. Aesthetics would include details such as the shape and color of the building and its neighbors, placement of the building with respect to roads, green space and other structures, light reflection (glare) and shading, as well as factors that could affect a person's experience of the area, such as wind tunnels and dark passageways (VA 2010). Please refer to Section 2.3.1 for a discussion of modifications made to the alternatives based on public or consulting party input.

3.2.1 Affected Environment

The 37-acre (15 city blocks) site is in the Tulane/Gravier neighborhood and portions of the site lie within the MCHD. The site is bounded by Canal Street to the northeast, S. Claiborne Avenue to the southeast, Tulane Avenue to the southwest, and S. Galvez Street to the northwest (Figure 3-1), and is also adjacent to the CBD, I-10, and the National Register eligible NOMHD. Land use on the site includes office buildings (including medical offices and the Blood Center of New Orleans), retail buildings, auto sales and repair facilities, residences, a large inactive hotel, green space, parking lots, and vacant properties. Most of the residences are located in the interior portion of the site.

Figure 3-1: Location of Proposed UMC



The area immediately surrounding the proposed project site is characterized by commercial development, as well as institutional and residential land uses, including office buildings, retail and commercial buildings, automobile sales and repair facilities, service stations, a church, LSU HSC facilities, and residences. In addition, Claiborne Avenue and I-10 border the site to the southeast (photo 3-1) with an exit ramp onto S. Derbigny Street within the site (photos 3-2 and 3-3).

Photo 3-1: Claiborne Avenue and I-10 facing northeast from the site

Photo 3-2: I-10 ramp as it appears from S. Derbigny and Palmyra Streets

Photo 3-3: I-10 ramp as it appears from S. Derbigny Street and Cleveland Avenue

Northeast of the site is Canal Street, a six-lane arterial with a large median on which the streetcar runs (photo 3-4). The adjacent properties along Canal Street primarily consist of parking lots, vacant lots and small one- to two-story commercial buildings (photo 3-5). The adjacent properties along Tulane Avenue approaching I-10 from S. Galvez Street consist of vacant lots, several small one- to two-story commercial buildings, LSU HSC (four stories), a four-story parking garage, a church, and the Louisiana Cancer Research Consortium currently under construction.

Photo 3-4: View of Canal Street looking northwest from S. Galvez Street

Source: VA 2010

In essence, the proposed project site lies within a transitional zone from the CBD to an urban mixed neighborhood of residential and commercial properties, bordered by two major arterial roads, Canal Street and Tulane Avenue. The existing buildings increase in size from the site towards the CBD and include a large hotel, Tulane Medical Center, and the buildings of the NOMHD (photo 3-6). This viewscape also includes a portion of I-10 and the large buildings of the LSU HSC (photo 3-7). In the near future, the Louisiana Cancer Research Consortium and the New Orleans Bio-Innovation Center will be completed on Tulane Avenue and Canal Street, respectively.

Photo 3-5: View of Canal Street looking northeast from Project Site

Viewscapes along the riverside portions of Canal Street and Tulane Avenue across I-10 (south of Claiborne Avenue) include a strong urban environment, mostly consisting of high-rise buildings in the downtown area, which are situated at the face of the property lines. The neutral ground along Canal Street in this area is also developed with a procession of palm trees surrounded by paved areas. This viewscape changes as Canal Street proceeds lakeside of I-10 into a more suburban-like area, indicated by the presence of mature live oak trees lining the sidewalks, and the presence of a more mixed-use building environment, consisting of commercial, residential and institutional uses.

Photo 3-6: View of I-10 and larger buildings in the CBD

Photo 3-7: View of LSU HSC buildings across Tulane Avenue from the site

Viewscapes along Tulane Avenue also change when proceeding riverside, as indicated by the presence of small commercial and residential properties. Neutral ground areas riverside of Tulane also vary in context, as some areas have very narrow neutral ground spaces with little or no landscaping and minimal access for left turns due to the narrowness of the roadway for vehicles.

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed UMC would not be constructed and the existing aesthetics would likely persist for an undetermined length of time. Presumably, some of the residential and commercial property owners would seek building permits to repair vacant or blighted structures damaged by Hurricane Katrina. Should such construction occur, there would be a beneficial impact on the aesthetics of the site and the surrounding area. Furthermore, it is possible that some of the residential and commercial properties would continue to fall into disrepair, creating potential adverse impacts to aesthetics.

Additionally, since property acquisitions have already begun, some properties are currently in the public domain or are engaged in the appraisal and review process for future acquisition. As a result, if the no action alternative were selected, FP&C/City would have to find another use for these properties, sell them back to the original owners, or open them up for general purchase.

In addition, mitigation measures that are currently being implemented at the site in compliance with the PA would be stopped or curtailed. The ultimate disposition of these properties is unknown and the impacts to the aesthetics of the site and the area cannot be determined.

3.2.2.2 Alternatives 1, 2 and 3

3.2.2.2.1 Direct Impacts

Under the Proposed Action, the existing mixture of land uses on the selected site, and the related visual quality, would be directly impacted. The existing residential, commercial, and other structures on these properties would be removed, medical-related buildings would be constructed in their place, and the land use on these sites would become medical. Thus, the existing land uses and associated aesthetics on the site would be changed.

The visual character of parcels adjacent to the proposed site includes commercial and industrial buildings, including the commercial corridor to its north on Canal Street. The buildings along Canal Street consist of occupied and vacant light commercial structures of no historic significance.

The buildings across Tulane Avenue to the south are the institutional buildings owned by LSU, and St. Joseph's Church, which is a contributing element to the MCHD. To the east of the site are I-10 and Claiborne Avenue, across which are the skyscrapers of downtown New Orleans. The Claiborne Avenue area to the east is devoid of any significant historic character, as it contains an elevated expressway. However, the NOMHD is on the riverside of Claiborne Avenue. The land to the west across S. Galvez Street is the site of the proposed VAMC, which is currently primarily residential and some commercial, and constitutes the closest concentration of historic structures.

Current design plans designate approximately 9.74 acres of surface parking, to meet the program needs of the project. Currently there are 8.23 acres of available parking areas within the proposed footprint. Therefore, the projected increase in surface parking is consistent with current aesthetics on the site, and would offers improved parking areas for employees, patients and visitors of the proposed facilities. The proposed parking areas would also be more aesthetically pleasing than the current parking areas, as they would be well maintained and landscaped. Further, plans for projected expansion of the facilities indicate that surface parking would ultimately be replaced with additional Inpatient, Ambulatory Care, and D&T Buildings. When the additional buildings are constructed, parking requirements would be satisfied by construction of an additional parking garage.

3.2.2.2.1.1 <u>Setbacks and Landscaping</u>

The setbacks of the proposed buildings that would be constructed along Canal Street are consistent with the institutional buildings already located within the district. Current building setbacks realized for larger scale commercial buildings within the adjacent area range from 47 feet – 90 feet from the street as shown in Figure 3-2, while proposed setbacks for the UMC are projected at 56 feet for courtyards and 71 feet for the building edge, demonstrating compatibility with existing neighborhood characteristics. In addition, the proposed setbacks take into consideration requirements for the location of utilities.

Currently, approximately four acres, or 11 percent, of the UMC site is considered grass-covered open space. These open-spaces are vacant, not maintained or abandoned private lots. All of the proposed UMC campus design alternatives show landscaping and green spaces throughout the campus, with a variety of garden spaces along the perimeter of the campus and through the campus facilities. Proposed landscaping styles vary from grand and formal to small detailed sensory/healing gardens. In addition, the proposed designs show plazas and courtyards along Canal Street and Tulane Avenue. The design alternatives propose to retain and reuse existing major trees in the landscape design, where possible. The current plan is to save all Oak trees currently located along Canal and S. Galvez Streets. Additionally, the designs propose approximately 70 new live oak trees along the perimeters and pedestrian walkways. Other indigenous trees such as cypress, magnolia, crepe myrtle, and azaleas would be planted throughout the campus. Palms would be planted in ceremonial spaces and plazas.

Figure 3-2: Setbacks for Large Commercial and Institutional Buildings in Project Vicinity

Source: NBBJ 2009b.

3.2.2.2.1.2 Massing and Exterior

As discussed in Appendix B, various building height scenarios were evaluated and a six-story building configuration was established as the optimal building height. Limiting the massing of the buildings to three stories or less was evaluated, but was proven to decrease service efficiencies by increasing travel distances for patients and staff. Conversely, constructing high-rise buildings is not compatible with the majority of the buildings in the MCHD, or the areas

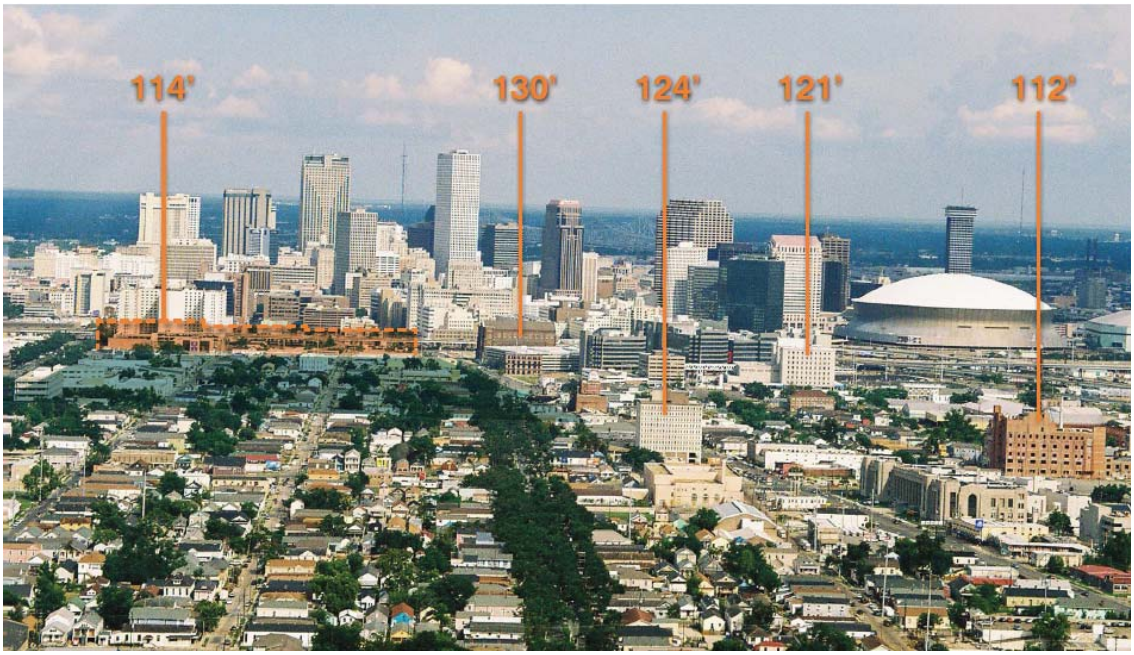
immediately adjacent to the site. Figure 3-3 is a rendering of how a 6-story Inpatient tower would look from Canal Street.

Figure 3-3: Rendering of 6-story Inpatient Towers from Canal Street

Source: NBBJ 2009b

Building heights in the immediate neighborhood range from approximately 16-18 feet for one-story residential buildings to 130 feet for St. Joseph's Church. The proposed height of the UMC inpatient tower is approximately 115 feet. This is similar in height to several buildings in the project vicinity (Figure 3-4), but smaller in height than the high-rise buildings across I-10. In addition, the stacks associated with the Utility Building would be no more than 100 feet tall.

Figure 3-4: Buildings in the Project Vicinity with Similar Heights to the Proposed UMC



Source: NBBJ 2009b

The Mid-City neighborhoods are characterized by a variation of architectural styles with separate and distinct qualities. However, each style shares a common use of repetitive elements (windows, doors, awnings) that add variety to the treatment of the buildings. The design of the hospital attempts to avoid the institutional appearance that is characteristic of hospital designs, while at the same time replicating elements found in the district, including fenestration, or slender vertical windows and sunshades. The proportions of the vertical elements in the design for the proposed facility recall the proportions of the traditional slender windows of the historic residential structures. In addition, the patient bed tower ends are accentuated by outdoor terraces that are synonymous with the use of balconies on traditional buildings.

The selection of appropriate materials that are compatible with the MCHD created a challenge since, as stated in the documentation supporting nomination of the district, "the overwhelming majority of the residential structures in the district are wood framed houses with some type of wood skin." However, there is a lack of any consistent materials used for commercial and industrial buildings within the MCHD. Based on this fact, and when combined with the site location on the periphery of the district near the CBD, as well as the pre-existing intrusion of commercial buildings along the lower half of Canal Street (as noted in documentation for the Mid City nomination), the aesthetics of the proposed buildings should be compatible with neighboring facilities.

The Design Team evaluated the use of appropriate materials for building a medical center of this type. Additionally, the exterior material palette of the hospital must comply with stringent codes requiring it to withstand hurricane force impacts, and must be as maintenance-free as possible. The MCHD nomination documentation stated that stucco and brick were generally chosen for larger commercial and institutional buildings located within the District at the time of nomination. However, brick and stucco cannot meet the requirements to withstand hurricane force impacts, so pre-cast concrete panels with variations in texture and treatment resembling stucco were selected as the best material for the construction of the facilities at the UMC.

All of the design alternatives include planting trees around the perimeter, and landscaping throughout the site. Design Alternatives 1 and 2 are similar, with the Inpatient Towers having setbacks and landscaped courtyards along Canal Street, and the entrance plaza at the corner of Canal and S. Galvez Streets. A combination of garage and Ambulatory Care buildings would front Tulane Avenue, with limited setbacks and additional green space along Tulane Avenue, close to S. Galvez Street. Design Alternative 3 proposes placement of the Inpatient Towers with setbacks and landscaped courtyards along Tulane Avenue and the entrance plaza at the corner of Tulane Avenue and S. Galvez Street. A combination of garage and Ambulatory Care buildings would front Canal Street, with limited setbacks. Scaling and massing for the UMC campus buildings is consistent among the three alternatives. However, variations in visual aesthetics would be found in the alternatives, primarily affecting the aesthetics along Canal Street and Tulane Avenue. Alternatives 1 and 2 allow for placement of inpatient towers along Canal Street, and would allow for setbacks similar to neighboring commercial properties with associated green space and landscaping. Alternative 3 allows for placement of inpatient towers along Tulane,

which would relocate setbacks and associated green space and landscaping, limiting the aesthetics along Canal to smaller setbacks and landscape areas. In addition, Alternative 3 envisions placing the garage along Canal Street, which would not be as aesthetically pleasing along as Canal as the exterior of the inpatient towers found in Alternatives 1 and 2, which were designed to improve compatibility with the area.

3.2.2.2.2 Indirect Impacts

Under the Proposed Action, the change in land use on the selected site likely would have indirect impacts on adjacent land uses. Because of the proposed development at the site that currently is predominately vacant, land use patterns in some of the surrounding areas could be affected. The change in land use within the site is anticipated to reduce the total amount of available land zoned for residential and commercial uses in the Tulane/Gravier area.

In addition, there are numerous areas of open space, surface parking lots, and damaged structures available for redevelopment near the project area. The availability of these nearby parcels of land for development could minimize the indirect effects of the land use changes on the surrounding area. Land in the other three quadrants of the New Orleans Medical District, adjoining the proposed project site to the south and southeast, is predominantly owned by medical-related or government institutions. Development of these nearby parcels for medical facilities and public institutions will further strengthen the compatibility of the proposed UMC within the Medical District. Additionally, conversion of the selected site to medical land use would complement the current and planned medical land uses in other sections of the Medical District and may indirectly promote further development of the Medical District (NOCPC 1999).

3.2.2.2.3 Summary of Aesthetics Impacts

During construction, there would be temporary minor adverse impacts to the aesthetics of the project area because of construction equipment and partially completed buildings. Massing associated with the proposed UMC would have an adverse, but minor impact on the project area. The proximity of the project site to the large buildings in the CBD and design considerations such as the planting of large trees to serve as screening would help to mitigate this effect. The compatibility of exterior building materials would have a minor adverse impact because of the variability of existing exterior styles, and because of measures taken during the planning process to be compatible with the surrounding neighborhood. Green space and landscaping would have overall beneficial impacts on aesthetics due to the creation of more green space than currently exists and the maintenance of sites that are currently abandoned and overgrown.

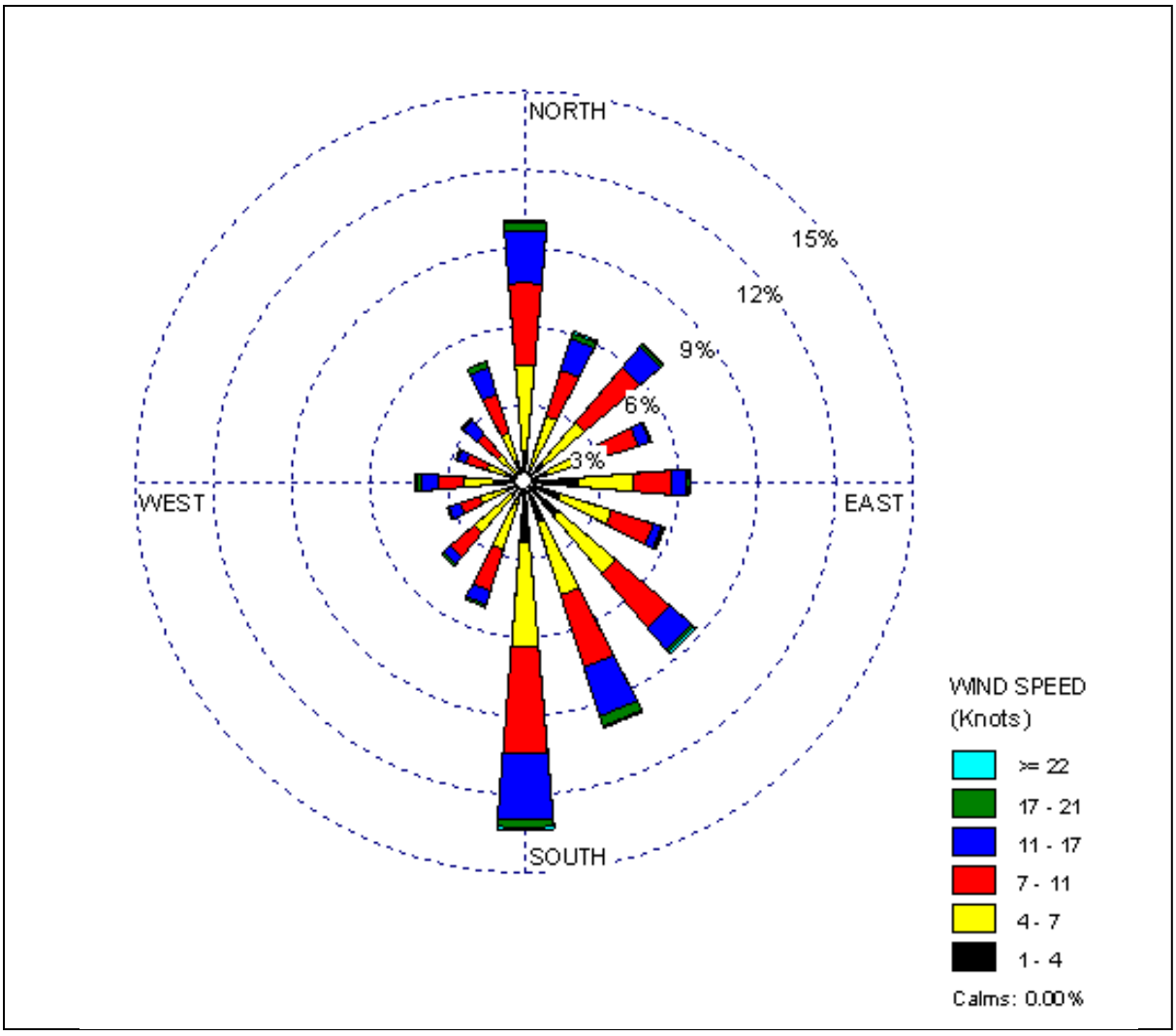
3.3 WIND

3.3.1 Affected Environment

Currently the large number of high-rise structures along the I-10 corridor influences wind conditions at the UMC site. The predominant wind direction is from the south and southeast, which parallels Canal Street and Tulane Avenue. Using data collected over 54 years, the

National Oceanic and Atmospheric Administration (NOAA) calculates the average annual wind speed in New Orleans at 8.2 miles per hour (mph), with average monthly wind speeds ranging from 6.1 mph in July, to 9.9 mph in March. Graphical representations of the wind speeds and directional frequency of winds blowing *from* particular directions are given in wind roses. A wind rose is divided into spokes, were the length of each "spoke" around the circle is related to the frequency that the wind blows from a particular direction. Each concentric circle represents a different frequency, emanating from zero at the center to increasing frequencies at the outer circles. A wind rose also represents wind speed ranges using color changes. Figure 3-5 is a wind rose computed from the 2008 meteorological observation data for the New Orleans International Airport (Louisiana Office of State Climatology 2009).

Figure 3-5: Wind Rose New Orleans International Airport 2008

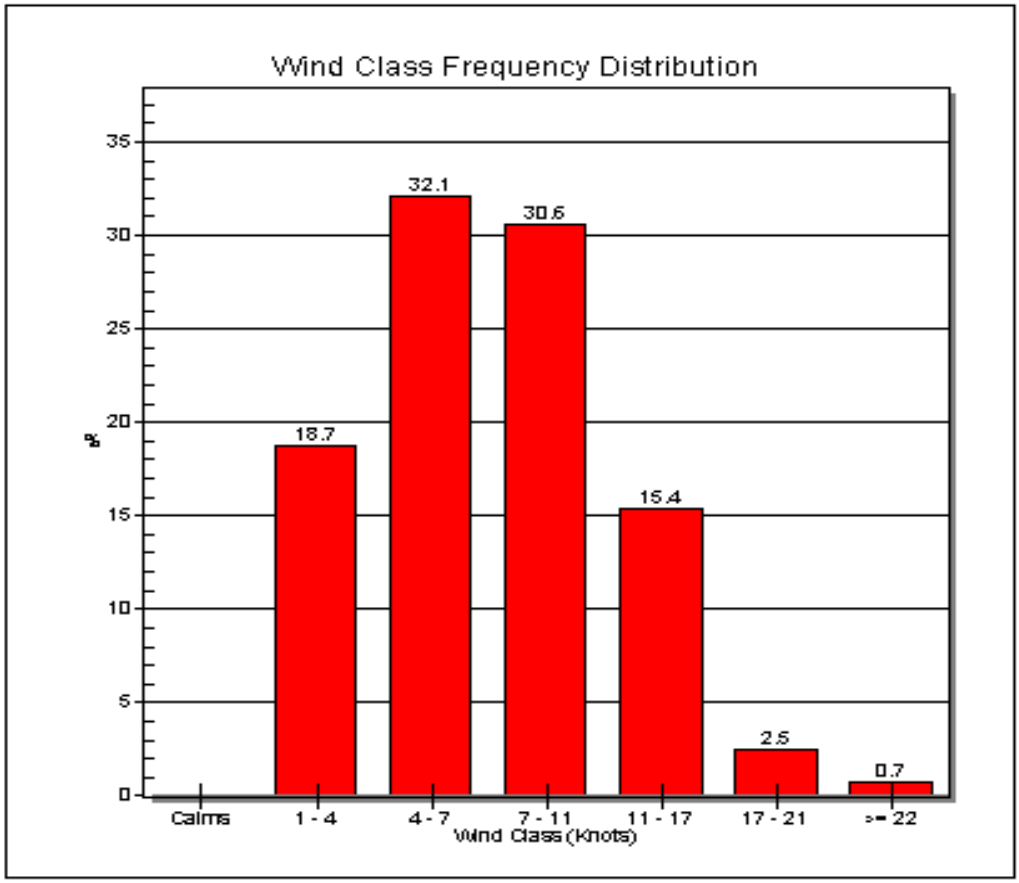


Source: Lakes Environmental Wind Rose Plot for Meteorological Data version 5.9

Average wind speeds for a particular time can also be graphically depicted as shown in Figure 3-6 where the 2008 average wind class of 4 to 7 knots (4.6 to 8.05 mph) correlates with the 54 years of data presented by NOAA as an average wind speed of 8.2 mph.

The wind impacts on the current site are influenced by the I-10 corridor and the vacant Palace Hotel, which serve as wind buffers, whereby the winds diverge around the building and create downwash. It should be noted that New Orleans is subject to tropical storms with wind speeds in excess of 100 mph and has experienced numerous storms over the last century. As a result, the design wind speed adopted by the Louisiana Uniform Building Code is 126 mph, which is equivalent to a Category 3 Hurricane.

Figure 3-6: Wind Speed Frequency, New Orleans International Airport 2008



Source: Lakes Environmental Wind Rose Plot for Meteorological Data version 5.9

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the no action alternative, no new structures would be built on the UMC site, and therefore changes to wind velocities and patterns would not occur. There would be no direct or cumulative impacts to wind in the project area. There may be indirect impacts, however, due to other potential development on the project site. Due to the many damaged buildings on the project site, a developer may be able to purchase several contiguous lots for a larger scale project. This could result in larger buildings being constructed on the project site, which although not likely, could result in minor adverse indirect impacts on wind velocities and patterns in the project area.

3.3.2.2 Alternatives 1, 2 and 3

During construction, there would be changes to the wind speed and direction because of construction activities. A slight increase in wind speed would be realized as the surface roughness is decreased by removal of houses and other obstacles such as trees, thereby reducing friction along the boundary layer. The demolition of the Palace Hotel along Canal and the I-10 Corridor would also result in an increase in wind over the site as the largest obstruction to the wind is removed and friction is reduced as buildings are demolished. As construction progresses, the surface roughness (increase in friction) would be increased and wind speeds would start to return to average wind speed.

The proposed building configuration is based on the physical layout of the two main transportation arteries (Canal Street and Tulane Avenue). The proposed design Alternatives 1 and 2 (Figures 3-7 and 3-8) both have the two largest structures fronting Canal Street (Inpatient and D&T). The design and placement of the two structures parallel to each other (Inpatient and D&T) along the main axis of the predominant wind direction would potentially produce an increase in wind speed between these two buildings. The layout for design Alternative 3 (Figure 3-9) is similar, but moves the Inpatient building to Tulane Avenue and places the parking garages along Canal Street. This layout would also result in an increase in wind speed between the Inpatient and D&T buildings. This phenomenon of increased wind speed between buildings is related to the Venturi effect where the airflow between the two buildings is constricted, thereby creating a reduction in pressure and a resulting increase in velocity. An equation can be derived to calculate a hypothetical wind speed in the spacing between two buildings.

All calculations assume a conservative worst-case upper bound wind speed of 9.9 mph. Assuming an entrance wind speed of 9.9 mph, atmospheric pressure of 1013 millibars (mb) at entrance with a corresponding pressure drop to 1012.5 mb, and smooth surface roughness, a potential wind speed increase to 21.6 mph could be realized at a height of 10 meters (32.8 feet), but would decrease in speed at the pedestrian level. The wind speed at ground level would be reduced based on landscaping and placement of vegetation, which would increase friction reducing the wind speed. Without a full design showing the landscaping one could assume a decrease lower than the 21.6 mph would be possible.

Figure 3-7: Proposed Design Alternative 1

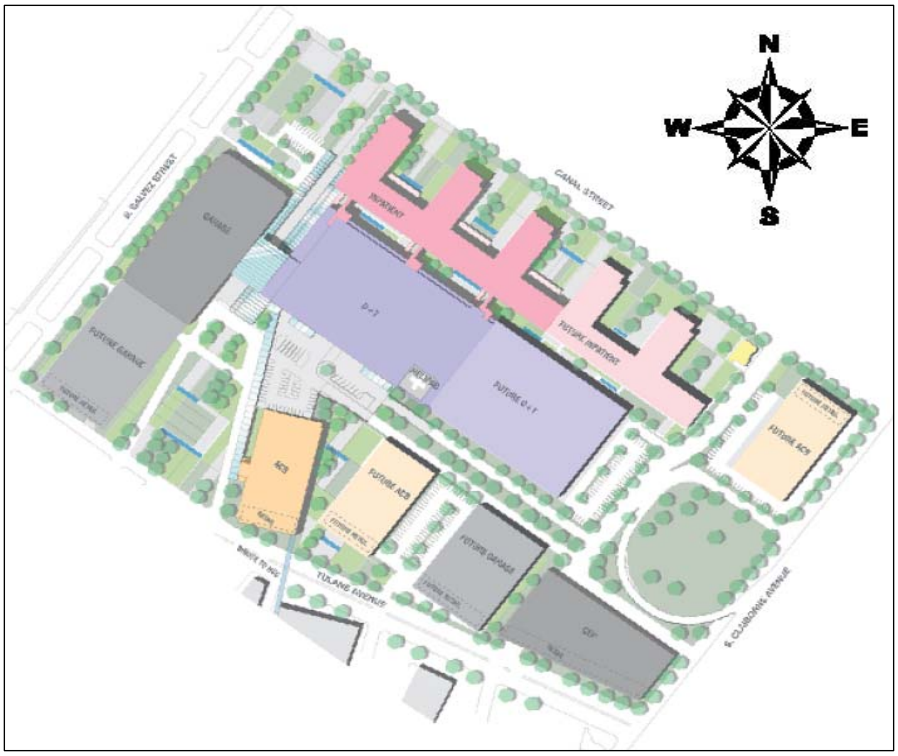


Figure 3-8: Proposed Design Alternative 2

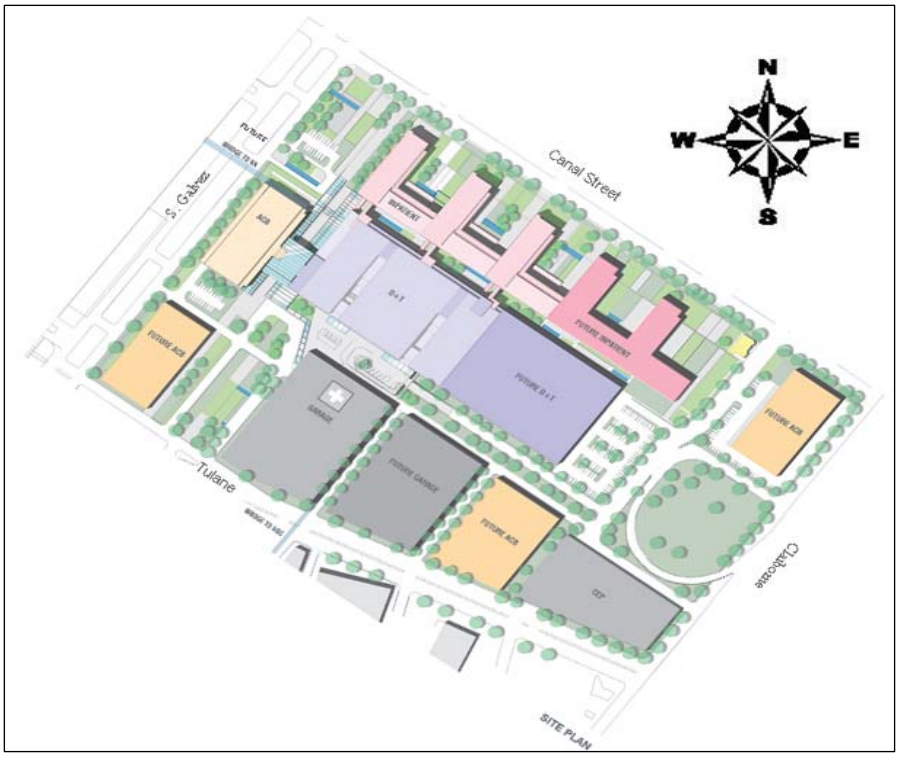
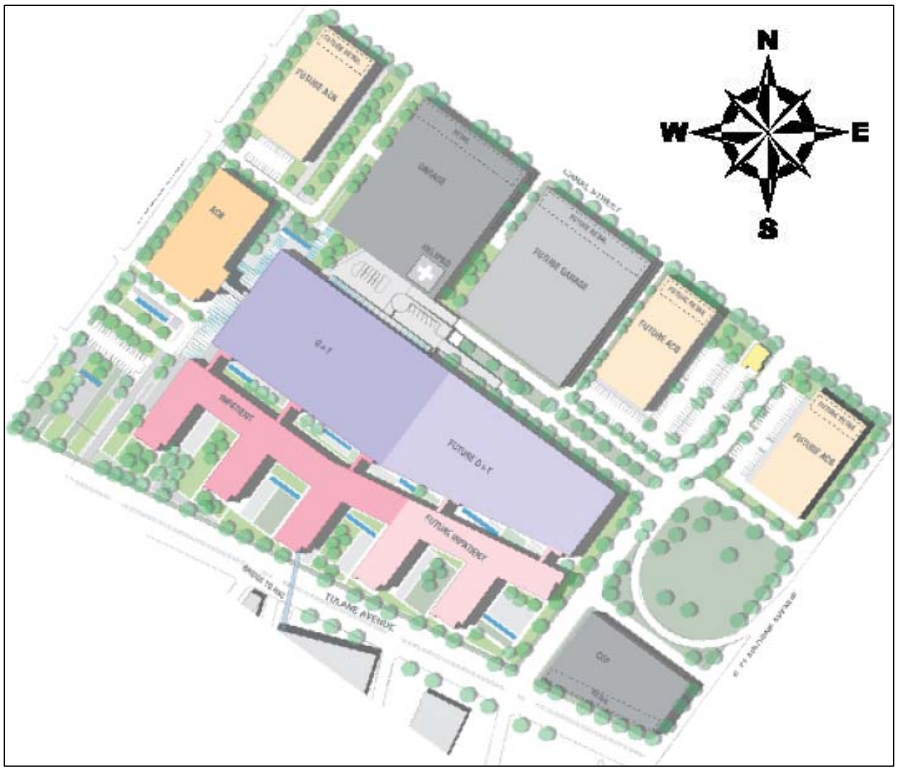


Figure 3-9: Proposed Design Alternative 3



Although there are standards for building design and wind speeds, which must be accounted for, the issue of significant wind speed and impacts to pedestrians between buildings does not have a universally recognized set of standards. However, a literature review was conducted and varying sets of criteria to evaluate wind impacts on pedestrians was identified. According to Dr. Johnny T.S. Yu, Hong Kong Institute of Steel Construction, "Wind Effects on Pedestrians" (http://www.hkisc.org/proceedings/2006421/6_Johnny_Yu%20Wind%20Effect%20on%20Pedestrians.pdf):

> "A number of research studies were undertaken to suggest different human comfort criteria [e.g. W.H. Melbourne, et. al. (1971), A.D. Penwarden (1973 , L. W. Apperley, et. al. (1974), A.D. Penwarden et. al. (1975), N. Isyumov (1975) and J.C.R. Hunt, et. al. (1976)]. Even though no unique criteria are agreed universally to evaluate the comfort level of pedestrian level wind, the following findings for the effects of different gust wind speeds on people are generally agreed in the above studies.
>
> $V \leq 5$ m/s (meters per second) (11.184 mph) No human discomfort induced
>
> 5m/s $< V \leq 10$ m/s (22.369 mph) Human unpleasant feeling induced and performance affected
>
> $V > 10$m/s Strong human unpleasant induced and performance seriously affected"

The City of New Orleans has no criteria for evaluating wind impacts. Therefore, standards developed by J.D. McAlpine, Envirometrics, Inc. Seattle, WA and found in *The Criteria for Determining the Impact of Wind Climatology on Pedestrian Comfort in an Urban Setting* (2004) were used (Table 3-2).

Table 3-2: Criteria for Determining Impact of Wind on Pedestrian Comfort

Activity	Average wind speed	Beaufort scale	percent of time	High wind speed	Beaufort scale	percent of time
Long stationary	> 7 mph	>2	< 1.5%	>12 mph	>3	< 0.3%
Short stationary	> 12 mph	>3	< 1.5%	> 18 mph	>4	< 0.3%
Recreational motion	> 18 mph	>4	< 1.5%	> 24 mph	>5	< 0.3%
Transitory motion	> 24 mph	>5	< 1.5%	> 31 mph	>6	< 0.3%
Dangerous	> 31 mph	>6	< 0.02%	> 46 mph	>8	any occurrence

Envirometrics, Inc., "*The Criteria for Determining the Impact of Wind Climatology on Pedestrian Comfort in an Urban Setting*", http://www.envirometrics.com/abstracts/main.html

The criteria include both an average wind speed and a high wind speed category. This takes into account that there would always be some days with high winds at virtually any location. The high wind speed category restricts the time in which these speeds occur to a lower amount of time than the average. It is important to note that these wind speeds are measured at approximately 1.5 meters (street level) and not at the conventional 10 meters of a meteorological tower. A recorded or measured wind speed at 10 meters would be lower as it approached street level due to increase in friction and obstacles.

For each category, a location is appropriate for the listed activity if the indicated wind speed limit is exceeded only for a limited amount of time. The types of activities that coincide with each category are defined here:

***Long stationary*:** regions where persons will spend more than 10 minutes involved in the outdoor activity. Examples include picnic areas, outdoor seating areas (for stationary activities such as eating a meal, reading, writing, etc.)

***Short stationary*:** regions where persons will spend up to 10 minutes standing or sitting in an outdoor environment. Examples include entrances to buildings, bus stops, smoking areas, vendor area and areas where a queue could form.

Recreational motion: regions where the average person will be walking at slower speeds or will be involved in physical activities such as Frisbee. Examples include recreational walkways, open play fields and parks.

***Transitory motion*:** regions where the average person will be walking briskly to get from one place to another. Examples include sidewalks, walkways and city streets.

Based on the calculated potential increase in wind speed between the buildings and the assumptions for the changes in atmospheric pressure, as well as total distances between and along the buildings' axes, there is a potential for the wind field to reach a recreational motion category between the buildings, as classified by the above studies. This would be a minor adverse impact on wind in the project area.

Based on potential wind speeds and design criteria, all potential increases in wind speed would be taken into consideration in the design, and landscaping would be placed to minimize the potential wind speed increase at the pedestrian level. All designs would employ mitigation measures to reduce wind speeds across the site by placement of trees. This placement would naturally slow down the wind speed by creating an additional source of friction across which the wind field must pass.

Wind speeds were derived from data collected by NOAA over the last 54 years and applied to the site. All wind speed data is collected at a standard height of 10 meters, therefore represents a worst-case scenario. The model estimated a worst-case, conservative assumption by not including landscaping as a factor that would reduce potential wind speeds. However, there would be landscaping developed throughout the UMC facility, which would reduce the potential wind speed. In order to mitigate potential impacts from increased wind speed as a direct result of building placement, wind breaks would be incorporated into the design and vegetation and trees would be strategically placed to break up wind reaches.

Additionally, all buildings designs would meet the minimum wind loads for buildings in Orleans Parish. The design wind speed adopted by the Louisiana Uniform Building Code is 126 mph, which is equivalent to a category 3 hurricane.

3.4 LIGHT AND GLARE

3.4.1 Affected Environment

Outdoor lighting illuminates roadways, parking lots, sidewalks, outdoor public areas, signs, work sites, and buildings. The design for the proposed UMC includes indoor and outdoor lighting plans, different from existing lighting. This section focuses on the physical appearance of the proposed project site relative to its lighting plan, including the current lighting, proposed lighting plan, the impacts of the lighting plan on the site and adjacent properties, and mitigation measures incorporated into the lighting plan.

Lighting provides us with better visibility and a sense of security. However, in terms of public safety and crime deterrence, experts say that more light is not necessarily better. According to the Illuminating Engineering Society of North America (IESNA) guideline, *IESNA G-1-03, Guideline for Security Lighting for People, Property, and Public Spaces* (2003) prepared by the IESNA Security Lighting Committee, security lighting should be evaluated for its appropriateness in the context of the overall environment and surrounding community. Lighting can affect crime by both enabling surveillance by authorities and enhancing community comfort for pedestrian traffic. Properly designed and lighted spaces allow for clear views of areas from a distance, vertical illumination for facial identification (at a distance of at least 9 meters [29.5 feet]), and appropriate contrast between bright and dark surroundings.

3.4.1.1 Project Vicinity

The location of the proposed UMC is within the city limits of New Orleans near the CBD and in proximity to I-10 and Highway 90. The site is therefore urban and surrounding land use is predominantly commercial properties, a church, roadways, and a few residences. There are few sensitive receptors near the project site. Sensitive receptors are groups of individuals who are considered more sensitive to impacts than other populations. Locations that may contain a high concentration of these sensitive populations with respect to lighting impacts include residential areas, hospitals, schools, and elder care facilities. However, the nearest residential area is across S. Rocheblave Street, and schools and elder care facilities are not located in close proximity to the UMC facility.

Existing properties and roadways in the immediate vicinity such as the LSU Health Sciences Center, Tulane Avenue and Canal Street contribute to light pollution. Additionally, construction is underway for the Louisiana Cancer Research Consortium, which is across Tulane Avenue and adjacent to the proposed UMC site, between S. Claiborne Avenue and S. Derbigny Street. Also, light pollution currently exists from the nearby CBD and roadways, especially to the south and west of the proposed project site, and include streetlights, building lights, and advertising signs. The background view from the proposed project site towards the south reveals lighting haze from I-10 and medical complexes, and the view from the proposed project site towards the west reveals lighting haze from the nearby LSU HSC. The view towards the north is mainly residential and commercial. Post-top luminaires line the neutral ground of Canal Street to the east on either side of the Canal Streetcar Line. The view east of Canal Street is mainly commercial and some residential.

3.4.1.2 Project Site

The project site is bordered by S. Claiborne Avenue and the elevated I-10 to the south, Tulane Avenue to the west, S. Galvez Street to the north, and Canal Street to the east. Commercial and residential properties, parking lots and green spaces are present throughout the site; however, many of these properties are currently vacant, offering less lighting than a typical neighborhood. Security lighting is found around most commercial properties. Several different types of lights were found throughout the proposed UMC site. Typical roadway luminaires were found along

perimeter and interior roadways; general-purpose floodlights and security lights were present around several parking lots and commercial properties; and post-top luminaires were present in the neutral ground of Canal Street.

3.4.1.3 Recommended Nighttime Light Levels

Illuminance is the measure of the perceived power of light on a surface. Lux and footcandles (fc) measure illuminance, as lux measures the number of lumens per square meter and footcandles measure lumens per square foot. One footcandle is equal to approximately 10.764 lux. The IESNA has recommended light levels that are appropriate for different scenarios. The designers for the UMC would consider and incorporate these levels within their lighting design plan. IESNA recommended levels, given in fc, include:

- Roadway (collector, commercial) – 1.2fc
- Sidewalks horizontal (roadside, commercial) – 1fc
- Sidewalks vertical (roadside, commercial) – 2.2fc
- Walkways horizontal (distant from roadways) – 0.5fc
- Walkways vertical (distant from roadways) – 0.5fc
- Building Entrances – 3 to 5fc
- Outdoor Dining – 3fc
- Parking Areas – 0.2 to 0.5fc
- Large Open Areas – 0.5 to 2fc
- Buildings (vertical illuminance on facade) – 0.5 to 2fc
- Security Elements – To Be Determined
- Contrast Ratio (average to minimum) – 4:1

3.4.1.4 Current Night Site Lighting

In order to evaluate the current illuminance of the proposed UMC project site, a general light survey was performed by U.S. Risk Management, LLC (USRM) in September 2009, utilizing a Testo 545 Light Meter following guidance from the *IESNA G-1-03 Guideline for Security Lighting for People, Property, and Public Spaces* (2003). Illumination levels were collected from the perimeter sidewalks and roadways of the blocks within the proposed UMC site. In addition, illumination levels from construction of the Louisiana Cancer Research Consortium at the time of the survey offer insight to anticipated illumination levels during construction of the proposed UMC. Observations and illumination levels from the general light survey of the immediate vicinity of the proposed UMC site are as follows:

- Horizontal illumination levels along the sidewalk of Tulane Avenue adjacent to the proposed project site averaged 1.8fc.

- Horizontal illumination levels on Tulane Avenue at the UMC project site, at the corner of Tulane Avenue and S. Derbigny, and across the street from the construction site of the Louisiana Cancer Research Consortium ranged from 1.1 to 5.1fc.
- Horizontal illumination levels of the sidewalks of Canal Street along the proposed site averaged 0.74fc; however, the higher light levels on Canal Street were around parking lots, with illumination levels of up to 11.43fc.
- The largest source of existing lighting at the proposed UMC site is around the parking lot and security entrance of the Blood Center of Louisiana with horizontal illumination levels of 55fc.
- Typical horizontal illumination levels around commercial properties of the proposed UMC project site averaged 0.75fc with greater horizontal illumination levels around parking lots. The highest level was 11.4fc.
- Residential properties are typically centrally located and in close proximity to parking lots, commercial properties, vacant lots and green space, with few areas existing solely of residential properties. Average horizontal illumination levels were between zero and 0.45fc. Higher levels of illumination in residential areas were found in close proximity to parking lots with illumination levels of 7.9fc.
- Parking lots exist throughout the proposed UMC project site. These parking lots are well lit with horizontal illumination levels averaging 1.75fc. Where vacant properties existed, some lighting had been abandoned, resulting in illumination levels as low as 0.09fc.

For the purposes of this general light survey, readings were collected only from the perimeter of each block. Due to the presence of residences, vacant buildings and lots, lighting levels are low in several parts of the interior of the proposed site. However, based on the light survey, existing levels of illumination fall within, if not slightly above, recommended light levels by the IESNA.

3.4.1.5 Applicable Standards and Policies

The City of New Orleans does not currently have a lighting standard. However, the City does offer guidance from the Historic District Landmarks Commission (HDLC). That guidance suggests that only incandescent lamps be used in residential settings, and mercury vapor, sodium vapor and fluorescent lamp types should be considered for commercial settings on a case-by-case basis. Existing lights in the site appear to be diverse, due to the commercial and residential setting. Streetlights currently in use along perimeter streets such as Tulane Avenue, S. Claiborne Avenue and S. Galvez Street, as well as throughout the interior of the site, appear to be sodium vapor and mercury vapor pole-mounted lamps with shoebox, cobra head and yard light fixtures. Street lamps along Canal Street appear to be incandescent lights with acorn style light fixtures. It appears that incandescent lights are used on and around residential properties. Pole mounted fluorescent floodlights and security lights are currently in use around parking lots and commercial properties. On several commercial properties, surface-mounted incandescent and

fluorescent lights are present. Commercial signage, of what appears to be fluorescent lighting, is present as well.

3.4.2 Environmental Consequences

3.4.2.1 General Lighting Impacts

The assessment of existing lighting and the proposed lighting designs consider the potential impacts created by the proposed UMC project. Many municipalities are concerned with "light trespass," potentially creating nuisance glare, which can be a safety hazard by impacting drivers. For the purpose of this discussion, various impact scenarios are discussed in the following sections.

3.4.2.1.1 Light and Glare

Light trespass falls into two categories

1. Adjacent property receives unwanted light (high horizontal or vertical illuminance levels on property surfaces); or
2. Excessive brightness occurs in the normal field of vision (nuisance glare) making it difficult to see a task, causing an annoyance, or creating a safety hazard.

Nuisance glare is a somewhat subjective description of luminances within the visual field that are sufficiently greater than the luminance to which the eye is adapted. We are concerned with disability glare, where high luminances caused by insufficiently shielded light sources are directly in the field of view and produce discomfort whereby visibility and visual performance are reduced. Figure 3-10 shows the before and after photos of a movie theatre parking lot where shielding was added to light fixtures to reduce glare.

Figure 3-10: Glare, Before and After Adding "Cutoff" Shields

Source: NELPAG at http://www.cfa.harvard.edu/nelpag/crelin.jpg

3.4.2.1.2 Human Factors

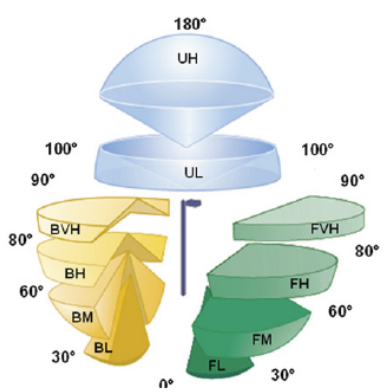
Nighttime Vision – At nighttime light levels of less than 0.01 lux, the human eye's process of visual adaptation and recognition are scotopic, using the rod photoreceptors in our eyes, which do not see colors in the red end of the spectrum and depth very well.

Age – As humans get older, our vision deteriorates and eyes take longer for adaptation to occur. Adaptation is the process by which the eye becomes accustomed to more or less light than it was exposed to during an immediately preceding period. Frequent adaptation results in eye fatigue.

3.4.2.1.3 Light Pollution

The International Dark-Sky Association (IDA) describes light pollution as, "any adverse effect caused by artificial light. This includes sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste" (IDA 2009). The IDA, in conjunction with the IESNA has created a draft Model Lighting Ordinance (MLO). The MLO describes a prescriptive system for regulating common lighting installations, in five different lighting zones, using a new rating system called BUG (Backlight-Uplight-Glare) that enables more accurate selection of reduced glare light fixtures. Figure 3-11 shows the revised outdoor luminaire distribution measuring system from the IESNA's Technical Memorandum #15-07 (revised) (IESNA 2007).

Figure 3-11: BUG Rating System



After reviewing hundreds of candidate luminaires, the MLO task force established the three composite (BUG) ratings based on TM-15-07 (revised):

Backlight, which creates light trespass onto adjacent sites. The B rating takes into account the amount of light in the BL, BM, BH and BVH zones, which are in the direction of the luminaire OPPOSITE from the area intended to be lighted.

Uplight, which causes artificial sky glow. Lower uplight (zone UL) causes the most sky glow and negatively affects professional and academic astronomy. Upper uplight (UH) is mostly energy waste. The U rating accounts for the amount of light into the upper hemisphere with greater concern for the lower uplight angles in UL.

Glare, which can be annoying or visually disabling. The G rating takes into account the amount of frontlight in the FH and FVH zones as well as BH and BVH Zones.

Source: IDA, 2009a. Specifier Bulletin for Dark Sky Applications, Volume 2: Issue 1.

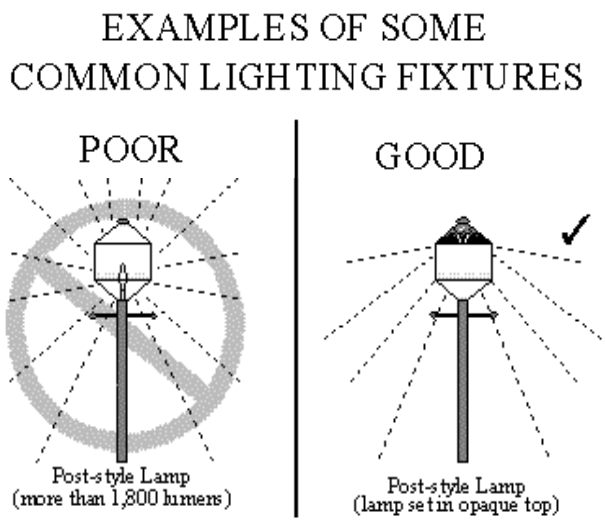
The New England Light Pollution Advisory Group (NELPAG) (2009) also defines several aspects of light pollution, including:

Energy Waste **-** energy is wasted when much of the light spills where it is not needed, such as up into the sky.

Excess Lighting – when some homes and businesses are flooded with much stronger light than is necessary for safety and security.

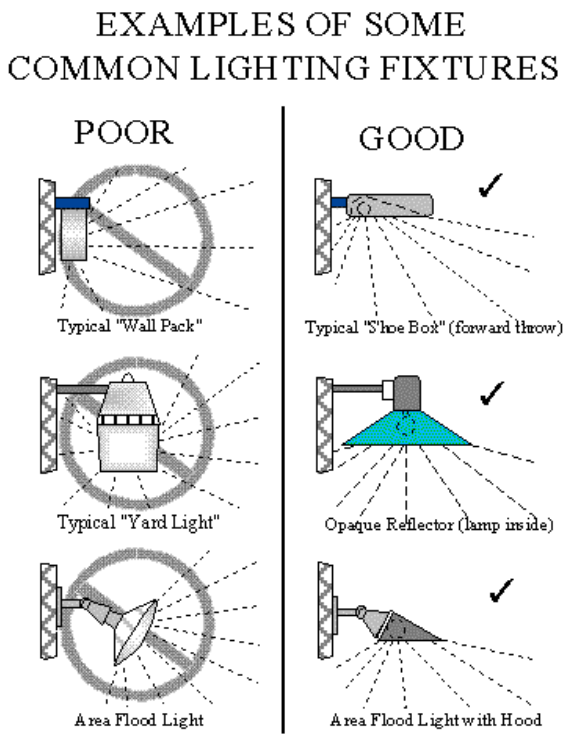
Astronomers and many environmentalists recognize light pollution as a concern. Claims include inconvenience by unnecessary light streaming in bedroom windows at night, and harm to nocturnal wildlife and ecosystems through sky glow. The US Green Building Council (USGBC) has incorporated an outdoor lighting credit into their environmentally friendly building standard known as Leadership in Energy and Environmental Design or LEED (USGBC 2009), which gives merit to designs that avoid light trespass from a project site and reduced upward light distribution. Even considering the USGBC standard, what constitutes light pollution is somewhat subjective. The amount of light that one individual finds appropriate may seem excessive to another. Therefore, the focus should be on lighting practices. Good lighting is characterized by NELPAG in the following: "*Good outdoor lights improve visibility, safety, and a sense of security, while minimizing energy use, operating costs, and ugly, dazzling glare*" (NELPAG 2009). Good and poor lighting examples are shown in Figures 3-12 and 3-13.

Figure 3-12: Examples of Good and Poor Outdoor Lighting



Source: NELPAG at http://www.cfa.harvard.edu/nelpag/DIAG2.gif

Figure 3-13: More Examples of Good and Poor Outdoor Lighting



Source: NELPAG at http://www.cfa.harvard.edu/nelpag/DIAG1.gif

3.4.2.2 No Action Alternative

Under the No Action Alternative, the proposed UMC would not be constructed and there would be no changes to the lighting in the project area. Therefore, there would be no direct or cumulative impacts on lighting and glare in the project area. There could be indirect impacts, however, should property owners on the project site decide to renovate or replace their structures, and if additional lighting is included in those plans. This increased lighting could result in an increase in light trespass and/or nuisance glare in the area. Depending on the types and placement of these potential new lighting sources, the impacts could be either beneficial or adverse. Although minor, the no action alternative may result in indirect impacts to lighting and glare in the project area.

3.4.2.3 Alternatives 1, 2 and 3

An initial lighting plan has been developed for the proposed UMC. The lighting plan calls for the future facility to be reasonably well lit to promote safety and security. Light levels, light trespass, and lighting environment should consider the surrounding neighborhood. Using the IESNA G-1-03 guidelines, the campus area may be described as Zone E2 or E3, or of low to medium ambient brightness. Using the MLO, the campus area is described as LZ2 to LZ3, with areas of human activity where the vision of human residents and users is adapted to moderate or

moderately high light levels. Using LEED zone descriptions, the campus is considered LZ3, Medium (Commercial/Industrial, High-Density Residential). Regardless of the category, the lighting responds to safety and security considerations, without needless light trespass and energy consumption. Additionally, specialized lighting would be used as part of the helipad operation. It can also be anticipated that because the facility is adjacent to I-10 there is the potential to create a visual distraction from the lighting. Lighting for the proposed facility must be designed in a manner that minimizes the potential for such disability glare.

Because lighting is an integral part of the UMC design, careful design and planning would continue to provide appropriate, task specific lighting while creating a cohesive campus. Lighting goals established in the initial design plan would be incorporated into the final lighting design for the proposed UMC project, in order to assist in creating a well-lit and safe environment while minimizing glare and ensuring that nuisance glare does not occur. Appropriate nighttime light levels, contrast ratios and coordination with security consultants would support the safety of staff, patients and the public. Lighting designs and techniques would be considered to reinforce green design goals. The proposed lighting design for the proposed UMC project would focus on lighting areas with higher light levels for specific tasks and lower light levels in general. Areas of high light levels would be found mainly around the Emergency Department and Ambulance Drop Off areas, from the common area to the D&T building and surrounding the loading docks. Canopy integrated and cut-off pole lighting, as well as integrated accent lights, would be considered for the drop-off areas, while functional cut-off lighting would be considered for use around loading docks where the need exists for higher levels of light. These areas of high light levels, with anticipated horizontal illuminance levels between 10 and 50fc and vertical illuminance levels between three and 10fc, are proposed to be concentrated toward the center of the site. Locating high light level activities in the center of the site minimizes the impact of glare and light trespass onto adjacent properties. Roadway lighting would adopt city approved street light fixtures, assumed to include tall, slender pole fixtures, creating minimal visual impact at ground level and illumination appropriate for traffic purposes.

Lower light levels found in and around parking areas, pedestrian pathways and connectors are concentrated toward the perimeter of the proposed site. Bollard and pedestrian scale pole fixtures would be considered for pedestrian pathways, full cut-off pole fixtures with metal halide lamps would be considered for surface parking areas and downlighting would be considered for canopies and connectors. Low light levels anticipated for these areas range between 0.2 and 0.5fc horizontal illuminance and 0.25 and 0.5fc vertical illuminance and are designed to create minimal impact on the surrounding views of the proposed UMC site.

Accent lighting would be used in and around trees and water features, exhibiting higher levels, averaging 5fc horizontal illuminance and 3fc vertical illuminance, and found throughout the proposed UMC campus in an effort to create lighting distractions and an appealing setting. Light levels of approximately 3fc horizontal illuminance and 30fc vertical illuminance are anticipated for signage and potentially located at pedestrian and public vehicular entrances along the perimeter of the site.

In addition to exterior and perimeter lighting, light reflected from the structure would likely impact visibility and brighten the atmosphere between the ground and the night sky. These nighttime visual impacts are possible during both construction and operation of the project. Dwellings and businesses in the area, as well as visitors and passers-by could be impacted by lighting from the proposed UMC. Since the location of the proposed facility is an urban, well-lit area, the impact would primarily be cumulative. However, with careful selection and placement of lighting, the impact would be minor.

3.4.2.3.1 Site Lighting Goals and Control

Just as proposed layouts of the campus assist in naturally establishing the majority of high light level areas towards the center of the campus and majority of lower light level areas towards the perimeter with the exception of signage and accent lighting, additional consideration can be made to further assist in minimizing lighting impact.

- Light trespass and glare can be controlled by selecting products that meet strict light distribution guidelines, such as assessing light fixtures relative to the newly released BUG luminaire rating system. This can be accomplished with the use of a variety of lighting techniques, such as using pedestrian poles that provide adequate vertical illumination without causing disability glare and reduced lighting in the BUG system "UH", "UL", and "FVH" zones.

- Cut-off pole fixtures, ensuring minimum reflectance, lamps without unnecessarily high wattage and appropriate spacing would maximize efficiency and minimize impacts. Lights of appropriate height levels and daytime appearance, such as bollards and pedestrian scale pole fixtures would not overpower the environment and would create an inviting campus while serving the purposes of way finding and safety.

- Trees, while critical during the daytime, can hinder lighting uniformity at night. It is important that low-level branches are removed and pruning occurs so as not to block needed light. Strategic lighting of trees, using an up-lighting source, may provide valuable vertical surface illumination.

- The use of accent light on specialty surfaces and silhouette of items against lighted surfaces provide valuable guiding light, orientation and reflected illumination. Accent lighting of trees and water features also provides a positive distraction and creates added appeal for the site.

- Lighting controls would be included in the lighting plan. Time clocks and/or photocells controlled through the building management system can be used for energy savings. Occupancy sensors may regulate nighttime light levels in connectors to reduce light levels when not in use.

- While the lighting design plan currently accounts for the design and placement of lights, it would also evaluate the type of lighting used to comply with HDLC guidelines, where possible.

The lighting plan for the proposed UMC project strives to create a safe, secure and appealing campus using environmentally conscious design coupled with control efforts to minimize lighting impact on the surrounding community. The proposed site is within an urban area, and the contribution of light pollution currently exists from immediately adjacent and nearby properties and roadways. Based on the limited data collected regarding existing light levels at the proposed UMC site, anticipated lighting levels from the proposed lighting plans would not substantially exceed current levels. Certain measures would be integrated into the plan to provide appropriate light levels, reduce nuisance glare and light trespass, and to safely and attractively light the proposed facility.

The highest light levels would be within the central portion of the campus area for all design alternatives, therefore minimal impacts are expected to surrounding businesses and residents. However, Alternatives 1 and 2 allow for the majority of lighting from inpatient towers to be realized along Canal Street, with primarily security lighting realized along S. Galvez Street and Tulane Avenue for the ancillary buildings and garage areas. Alternative 3 allows for the majority of lighting from the inpatient towers to be realized along Tulane Avenue, with more security lighting realized along Canal Street. As discussed previously, these existing roadways and adjacent properties already contribute to lighting in the area, and the lighting realized from the proposed project is unlikely to significantly impact the surrounding area.

3.5 AIR QUALITY

This section addresses the potential impacts of the proposed project on ambient air quality and the exposure of people, especially sensitive individuals, to changes in pollutant concentrations of the type and quantity of emissions that could be generated by the construction and operation of the proposed project. Although there are three design alternatives presented in this document, potential air quality impacts resulting from construction and operation of the proposed facility would be the same for all alternatives. Therefore, the results of the impact analysis are presented as a single discussion.

3.5.1 Affected Environment

As discussed in the Section 3.10.1 of the PEA, since 1995, all parishes in the metropolitan New Orleans area have been in attainment for all criteria pollutants. The U.S. Environmental Protection Agency (USEPA), under the requirements of the Clean Air Act of 1963 (CAA), has established National Ambient Air Quality Standards (NAAQS) for six contaminants, referred to as criteria pollutants (40 CFR Part 50). These are carbon monoxide, nitrogen dioxide, ozone, particulate matter (less than 10 microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), lead, and sulfur dioxide. Areas that meet the NAAQS for criteria pollutants are designated as being “in attainment” while areas where a criteria pollutant level

exceeds the NAAQS are designated as being "in nonattainment." Given that the entire metropolitan area is in attainment, the air quality at the selected site is considered to comply with NAAQS, as it is within the metropolitan area and since there are no major point sources of air pollution identified near the site.

The MCLNO facilities, prior to Hurricane Katrina, operated at a capacity of 550 patient beds. The associated facilities had support functions or activities to support the provision of medical services. The support activities that have the potential to impact air quality include operation of a Chilled Water Facility and Boiler Plant, which serviced the former MCLNO facility. The Chilled Water Facility and Boiler Plant are owned by Entergy Thermal, LLC, and permitted by the Louisiana Department of Environmental Quality (LDEQ) as minor sources of air pollutants. Permitted emissions from these facilities are shown below in Table 3-3.

Facilities such as the Charity Boiler Plant are permitted by LDEQ based on the emissions that would be generated by the plant. Small Source permits are for facilities that generate less than 25 tons per year (TPY) of any regulated pollutant. A Minor Source permit is for facilities that generate more than 25 but less than 100 TPY of any regulated pollutant, and a Major Source permit is for facilities that generate 100 TPY or more of any regulated pollutant (LAC Title 33 Part III).

Additionally, mobile source emissions from traffic and transportation sources (automobiles, buses, etc.) used by patients and staff have the potential to impact air quality. According the USEPA AP-42 Emission Factors guidance document, the primary pollutants from mobile sources are oxides of nitrogen (NOx), total organic compounds (TOC), carbon monoxide (CO), and particulates.

3.5.1.1 Green House Gases

Green House Gases (GHGs) are compounds found naturally within the earth's atmosphere. These compounds trap and convert sunlight into infrared heat. In this way, greenhouse gases act as insulation in the stratosphere and contribute to the maintenance of global temperatures. As the levels of greenhouse gases increase at ground level, the result is an increase in temperature on earth, commonly known as global warming. The climate change associated with global warming is predicted to produce negative economic and social consequences across the globe through changes in weather (e.g., more intense hurricanes, greater risk of forest fires, flooding).

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The primary GHG emitted by human activities in the U.S. is CO_2, representing approximately 85 percent of total GHG emissions. The largest source of CO_2 and of overall GHG emissions is fossil fuel combustion. CH_4 emissions, which have declined from 1990 levels, result primarily from enteric fermentation (digestion) associated with domestic livestock, decomposition of wastes in landfills, and natural gas systems. Agricultural soil management and mobile source fuel combustion are the major sources of N_2O emissions in the U.S. Because CO_2 emissions comprise approximately 85 percent of

GHGs, this SEA selected CO_2 to represent GHG emissions and provides the estimated CO_2 quantities that would be generated under the proposed action.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Since no construction would occur at the Tulane/Gravier site, existing conditions described in Section 3.5.1 would persist and there would be no adverse air quality impacts within the project area under the No Action Alternative.

3.5.2.2 Alternatives 1, 2 and 3

3.5.2.2.1 Construction

Construction activities resulting from the proposed action would cause short-term air quality impacts and would be similar in nature for all design alternatives. Impacts primarily result from the following activities:

- Fugitive dust generated during construction operations; and
- Construction activities including the use of construction equipment involving:
  - Operation of equipment;
  - Movement of trucks containing construction materials;
  - Use of paving equipment;
  - Asphalt curing; and
  - Commuting of construction workers.

Estimates of construction equipment emissions (Table 3-3) were based on estimated hours of equipment use and the emission factors for each applicable non-road source predicted using the USEPA NONROAD model. Emission factors related to delivery trucks and worker commuting were estimated using the EPA Mobile 6 emission factor model. Equipment and vehicle operation hours were estimated primarily based on R.S. Means Co., Inc. data (2003).

Table 3-3: Annual Construction Emission Levels

Emission Source	Pollutant (tons per year [TPY])						
	SO_2	CO	PM_{10}	$PM_{2.5}$	NO_x	VOC	CO_2

Construction Equipment	0.12	1.79	0.34	0.33	4.99	0.49	544.52
Construction Vehicles	0.01	9.62	0.08	0.05	2.16	0.99	818.88
Paving	-	-	-	-	-	0.02	-
Total Annual Emissions	0.13	11.41	0.42	0.38	7.16	1.49	1,363.40

Source: VAMC, 2010

Under the CAA, mobile sources and construction equipment are exempt from air permitting requirements. Since the emissions from these sources associated with the Proposed Action would occur in areas that are in attainment of the NAAQS for all criteria pollutants, as indicated previously, the general conformity rule is not applicable. Nonetheless, NEPA and its implementing regulations require analysis of the significance of air quality impacts from these sources as well as non-major stationary sources. However, neither NEPA nor its implementing regulations have established criteria for determining the significance of air quality impacts from such sources in CAA attainment areas.

In the general conformity rule applicable to non-attainment areas, USEPA uses the "major stationary source" definition under the new source review (NSR) program as the *de minimis* levels to separate presumably exempt actions from those requiring a positive conformity determination. Since the Proposed Action would occur in an area that has always been in attainment, the SEA selected the "major stationary source" definition (250 TPY or more of any air pollutant subject to regulations under the CAA) from the Prevention of Significant Deterioration (PSD) program. For locations that are in attainment, the PSD source threshold is the criteria for determining the potential significance of air quality impacts from these sources. The criteria pollutants included in this analysis are SO_2, CO, $PM_{2.5}$, NO_x and VOC. Carbon Dioxide is not a criteria air pollutant and there is no regulatory threshold for comparison of CO_2 emissions from mobile sources. As shown in Table 3-3, the annual construction emissions are well below the 250 TPY threshold. Therefore, construction emissions under the Proposed Action are not considered significant. As noted above, neither the PSD permitting program or the general conformity rule are applicable to these mobile sources or minor (i.e., non-major) stationary sources in attainment areas. Therefore, the analysis of construction period incremental emissions in attainment areas and the significance criteria selected are solely for informing the public and decision makers about the relative air quality impacts from the proposed actions.

During construction, the operation of equipment and the handling, transportation or storage of construction materials, among other activities, can generate dust (particulate matter). To ensure that the potential dust generation does not impact the surrounding area, Best Management Practices (BMPs) such as using wetting agents, or cleaning equipment as they leave the site, would be used in all construction phases of the project. Additional environmental programs,

which incorporate the BMPs, are the stormwater regulations. These regulations detail the practices that must be followed for any construction site that involves greater than 0.5 acres of land disturbance. Some of the BMPs proposed include use of wetting agents, temporary seeding, and silt fences to control dust and erosion.

Based on wind rose data presented in Section 3.3.1, dust and associated emissions from construction activities would generally disperse in a northward direction. Since average annual wind speeds are estimated to be fairly low (8.2 mph), it is not anticipated that winds would significantly affect the intensity and dispersion of dust and associated construction vehicle emissions. Mitigation measures to minimize the impacts of dust to neighboring communities include implementation of BMPs as previously discussed. Construction vehicle emissions can be mitigated through operational controls (equipment idle reduction and control, engine preventive maintenance, or equipment operator training); fuel usage strategies (ultra-low sulfur diesel or bio-diesel); or equipment strategies (retrofit technologies, engine re-power or upgrades, or electrification). Emissions from both construction activities and mobile sources are considered temporary and minor in nature, and therefore, not expected to have a significant impact on air quality.

3.5.2.2.2 Operations

According to Entergy Thermal, LLC (Martins 2010), steam and hot water services would be provided to the proposed UMC by the existing Charity Boiler Plant by extending lines that currently supply the LSU HSC. Chilled Water would also be provided in a similar manner. A new Utility Building is proposed as part of the UMC. The Charity Boiler Plant, the emergency generators in the Utility Building, and increased traffic associated with the operation of the proposed 424 bed UMC facility would contribute to air emissions in the surrounding area.

The existing Charity Boiler Plant, which operates three 52.9 million British thermal units per hour (MMBTU/hr) natural gas boilers and one emergency generator under a minor source air permit would continue to provide these services to the UMC. In order to provide these services, Entergy Thermal would add two 52.9 MMBTU/hr boiler to its existing capacity, one to provide services to the proposed UMC facility and one to serve as backup. The additional boilers may result in an increase in CO2 emissions of 54,518.12. These emissions would be routed through the existing stack. It should be noted that emissions included in this total from the backup boiler would likely not be realized.

Existing lines are currently in place along the Gravier Street pedestrian bridge, which connect Entergy Thermal's Charity Boiler Plant to LSU HSC facilities in the area. Plans would allow for tie-in of a new line to service the UMC facilities at the intersection of Gravier and S. Prieur Streets, and may be carried along the proposed UMC pedestrian bridge in a similar manner. No exterior modifications would be made to the existing Charity Boiler Plant. Although the existing Charity Boiler did receive floodwaters following Hurricane Katrina, the three existing boilers were not impacted, as they are on a structure at approximately 3.5 feet above grade. The new boilers would be elevated to twelve feet above grade.

The proposed UMC Utility Building would be designed to hold emergency backup generators and one electric powered heat recovery chiller. Plans include staging nine generators (six 2500 kilowatt (kW) generators and three 2000 kW generators). The nine generators would only be used for emergency purposes. Three generators would be housed in the Utility Building as backup generators or redundant system generators. No more than nine generators would be operated at any one time. Emission increases associated with the proposed action are listed in Table 3-4, and are based on using the emergency generators to service the entire UMC facility for seven days in the event of a power outage.

The emissions estimate assumes one generator each to service the six equipment branches, and one generator each to service the three buildings (Inpatient Towers, D&T and clinics). The UMC emergency generators are listed by LDEQ as insignificant activities in accordance with Louisiana Administrative Code (LAC) 33:III.501.B.32 and do not require permitting. Emissions resulting from operation of the emergency generators would be minimal and temporary in nature and would be routed thru a small pipe or stack exiting the building. In addition, these emissions would only be realized if services from the Charity Boiler Plant are not available. Since the emissions from the Charity Boiler Facility would be realized during normal operation, the net change in emissions is based on this scenario.

Table 3-4: Emission Increases from Changes to the Existing Charity Boiler Plant

Pollutant	Proposed UMC Generator Emissions (TPY)	Existing Charity Boiler Plant Emissions (TPY)	Proposed Charity Boiler Plant Emissions (TPY)	Net Increase from Additional Boilers (TPY)
PM_{10}	6.57	5.19	8.63	3.45
SO_2	6.12	0.42	0.68	0.27
NO_x	92.61	68.16	90.86	22.72
CO	19.96	57.24	95.41	38.16
VOC	7.47	3.75	6.25	2.5
CO_2*	3,435.47	81,777.18	136,295.29	54,518.12

* CO emissions are not included in the analysis of emissions to determine permit classification and regulatory analyses that may be required. Greenhouse gas emissions in terms of CO2 are included for disclosure purposes.

All emissions assume boilers operate at 100 percent efficiency 8,760 hours per year, and were estimated using US EPA AP-42 emission factors Tables 1.4-1 and 1.4-2, as published July 1998, which are the most recent factors currently used. Diesel generator emissions were estimated based on seven days of operation for emergency purposes and used US EPA AP-42 emission factors.

The changes to the existing boiler plant would result in a minimal increase in air emissions, and Entergy Thermal would modify its minor source permit, but retain its minor source

classification. The existing stack height would not change because of this action, as the facility had at one time operated four boilers, and the fifth boiler would be considered a standby.

In selecting the fuel source for the additional boiler, consideration was given to the fact that combustion of natural gas emits almost 30 percent less CO_2 than oil, and just under 45 percent less CO_2 than coal, thus resulting in a reduction in potential GHG emissions.

3.6 COASTAL ZONE CONSISTENCY

3.6.1 Affected Environment

The Coastal Zone Management Act (CZMA) encourages states/tribes to preserve, protect, develop, and where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats (USEPA 2007). In its reauthorization of the CZMA in 1990, Congress identified nonpoint source pollution as a major factor in the continuing degradation of coastal waters. Additionally, they called upon approved coastal zone management programs to develop and implement coastal nonpoint pollution control programs to address five major sources of nonpoint pollution: 1) urban runoff, 2) agriculture runoff, 3) forestry runoff, 4) marinas and recreational boating, and 5) altering the natural flow of water through a landscape (hydromodification) (USEPA 2007).

The Louisiana Department of Natural Resources, Coastal Management Division (LDNR/CMD) is the lead agency implementing the Louisiana Coastal Resources Program (LCRP) to protect, develop, and restore or enhance resources of the Louisiana coastal zone. The coastal zone of Louisiana varies from 16 to 32 miles from the Gulf of Mexico inland (NOAA 2004). Orleans Parish and Jefferson Parish are entirely within the Louisiana coastal zone; therefore, the proposed UMC site is located within the Louisiana coastal zone (LDNR 2002). Review of proposed projects by the LDNR/CMD for consistency with the LCRP is required for Federal agencies whose activities (including new policies or regulations) may affect the land use, water use, or natural resources of the Coastal Zone. Additionally, parish or local governments receiving Federal grants or loans, such as HUD Block grants; and anyone whose activities, even those occurring outside of the Coastal Zone, might affect the land use, water use, or natural resources of the Coastal Zone must also be reviewed.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Since, no Federal dollars would be used under the No Action Alternative to construct the UMC at the Tulane/Gravier site, there would be no requirement for a coastal zone consistency determination and no impacts to the coastal zone within the project area.

3.6.2.2 Alternatives 1, 2 and 3

In a letter dated June 24, 2009 (Appendix E), the LDNR/CMD responded to a Request for Determination of the proposed project consistency with the LCRP. In that response, the LDNR/CMD stated that the proposed design, construction, and operation of the UMC is consistent with the LCRP. This determination of consistency with the LCRP satisfies the requirements of the Coastal Zone Management Act for this assessment. No adverse impacts on the Coastal Zone are expected as a result of constructing and operating the proposed UMC.

A Coastal Use Permit may also be required for the proposed project from the Orleans Parish Local Coastal Management Program. If a permit is required, it is the responsibility of the applicant to apply for and obtain the permit before any work commences.

3.7 FLOODPLAIN AND STORMWATER MANAGEMENT

Impacts to stormwater runoff and floodplain areas were evaluated below from activities including construction and operation of the proposed UMC. Although there are three design alternatives presented in this document, potential impacts resulting from construction and operation would be the same for each of the alternatives, and therefore the findings are presented as a single analysis. Construction of the UMC facilities would require the use of fill, which is discussed in Section 2.3.2.1. The use of fill has been factored into the impacts associated with floodplain and stormwater management (also see Section 2.3.2.2). It is anticipated that the use of fill and increased elevation of the site would have no effect on flood or stormwater management on the surrounding areas due to the use of appropriate stormwater retention and management measures. Appendix D includes maps showing the existing topography as well as the Site Finish Grading Plan.

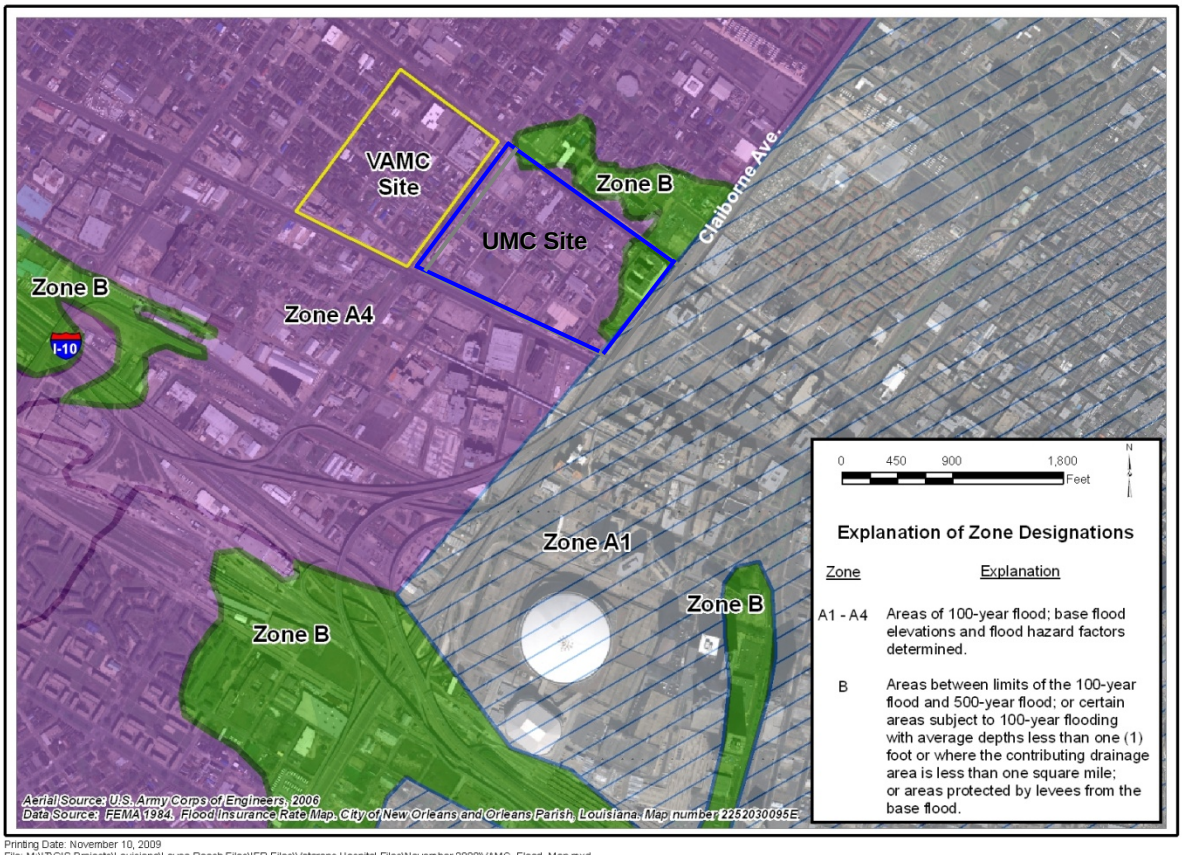
3.7.1 Affected Environment

FEMA considers the proposed medical center to be a critical facility. Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities. A critical facility should not be located in a floodplain if possible. If a critical facility must be located in a floodplain, it should be provided a higher level of protection so that it can continue to function and provide services after a flood event occurs.

Under Executive Order 11988, Floodplain Management, Federal agencies funding and/or permitting critical facilities are required to avoid the 500-year floodplain or construct the facility to the 500-year flood elevation. The 100-year floodplain is the area that has one percent chance or greater of being flooded in any given year. For critical actions, such as locating a hospital, Federal agencies use the 500-year flood elevation, which is the area that has a 0.2 percent chance or greater of being flooded in any given year. FEMA delineates flood hazard areas on Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps (FHBMs) for all communities that are members of the National Flood Insurance Program. The best available source for floodplain data for Orleans Parish is the DFIRMs. The topography of the area surrounding the

selected site is relatively flat, with elevations ranging from -2 to 0 feet above msl (U.S. Geological Survey [USGS] 1998) (see Appendix D). The proposed site is within both the 100-year and 500-year floodplains (Figure 3-14).

Figure 3-14: Floodplain Map



Printing Date: November 10, 2009
File: M:\TN\GIS Projects\LouisianaLevee Reach Files\IER Files\Veterans Hospital Files\November 2009\VAMC_Flood_Map.mxd

FEMA's Digital Flood Mapping contractor calculated the 500-year elevation for several addresses across the site. The 500-year base flood elevation (BFE) for all of the addresses is 12 feet above msl (FEMA 2009). All three alternative designs for the proposed facility place critical activities at an elevation of 20 feet NAVD88. Critical activities are those needed for the hospital to function after a flood. The activities that would be placed below the 20-foot elevation include some administrative functions, offices, conference rooms, storage of non-essential equipment and supplies, dining rooms (but not food preparation), and retail (NBBJ 2009). Additionally, some non-critical diagnostic equipment that cannot be elevated because of its weight would also be on the lower level. As described in Section 2.3.2.1, the buildings on the proposed site would have a finished floor elevation of +3.0 NAVD88.

The current footprint of the proposed site is a combination of land use, including commercial buildings, parking lots, residential homes, green space and paved streets. Land use data was obtained from pedestrian surveys performed by USRM, and Volkert and Associates, which was also incorporated into the PEA and PA process. Land use on the site currently is approximately

89.6 percent impermeable surface (including buildings and homes), and 10.4 percent green space or permeable surfaces.

Currently, runoff from these structures is diverted into the main street where it collects in subsurface stormwater drains and is then pumped to drainage canals. The existing drainage system was designed to accommodate a 2-year storm capacity. Any improvements to stormwater management systems would be designed to accommodate the 10-year storm (Mendoza 2010). Drainage capacities are evaluated through calculation of runoff to ensure adequate drainage is provided in order to minimize impacts from stormwater runoff and non-stormwater discharges.

Runoff calculations were projected using a 10-year storm event. This accounts for a level of protection for a storm that has a 10 percent chance of occurring in any year. The term 10-year storm describes a rainfall event that is rare and only likely to occur once every 10 years, so it has a 10 percent likelihood of occurring in any given year. The term 100-year storm describes a rainfall event that is extremely rare and will occur with a likelihood of only once in 100 years, so it has a 1 percent likelihood in any given year. The rainfall will be extreme and flooding worse than with a 10-year event. Because the 10-year storm is more likely to occur, many communities use it as the standard for stormwater designs.

Civil engineers used the Rational Method, along with a weighted runoff coefficient, to estimate and compare the runoff from the proposed project site as it currently exists, during construction, and once the facility is operating. The Rational Method equation is the simplest, and most common, method to determine peak discharge form drainage basin runoff associated with rainfall events of varying intensity. It is also used for sizing sewer systems.

The Rational Method is expressed as $Q = C \times I \times A$

Where:

Q = estimate of the peak rate of runoff for a time interval (T), expressed in cubic feet per second (cfs)

C = weighted runoff coefficient (dimensionless)

I = rainfall rate for time interval (T) expressed as inches/hour (in/hr) during the time equal to Tc

A = drainage area in acres that produces the maximum rate of runoff

A weighted runoff coefficient was established using the percentage of area attributable to each land use and the appropriate runoff coefficient for that type of use. The time of concentration is estimated based upon current topography, surface type and permeability, and average distance to the nearest storm drain or roadway, and was estimated based on information obtained from the USDA Soil Conservation Services Technical Release 55, "Urban Hydrology for Small Watersheds" and the Louisiana DOTD Hydraulics Manual, 1987. The rainfall rates for these calculations also incorporate information obtained from the National Weather Service.

Discussions with the Design Team's stormwater hydrologist indicated they are using a 10-year storm to calculate rainfall intensity. Using the 10-year storm event is the standard design storm event for the metropolitan New Orleans area, and would account for impacts resulting from normal rainfall and flooding that is anticipated during this event. This calculation resulted in a rainfall intensity of 5.11 in/hr for the current land use.

The rainfall intensity (in/hr) identified for each scenario is dependent on the area of the drainage basin (the amount of permeable and impermeable areas) and the extent to which this basin can absorb or allow for faster flow of rainfall. It is also dependent on the time of concentration, which is defined as the time required for the runoff from the most remote part of the drainage area to become established and flow to the discharge point. Each scenario has a different drainage basin, as the amount of permeable and impermeable surface areas will change from existing, construction and operation changes in land use, type and topography. Each scenario will also have a different time of concentration based on the pattern of flow resulting from changes in topography.

Based on the percentages of impermeable and permeable surface areas, the following weighted coefficient was calculated. The coefficient for the site as it currently exists, is 0.78. The total acreage is 37.

Runoff rate at the site as it currently exists:

$Q = C \times I \times A$

$C = 0.78$

$I = 5.11$

$A = 37$

$Q = 147.47$ cfs

This is the estimate of the peak rate of runoff for a time interval (T), expressed in cfs. Estimation of the current runoff coefficient, 147.47 cfs, allows for comparison of the estimated runoff during construction and operation of the proposed facility.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, the replacement UMC would not be constructed. Since no construction would occur, there would be no adverse direct, indirect, or cumulative impacts to the floodplain or stormwater management within the project site or to the surrounding area. The existing area currently experiences flooding as a result of certain storm events and this would continue to be a problem and the area would continue to be vulnerable to damages from flooding during storm events.

3.7.2.2 Alternatives 1, 2 and 3

3.7.2.2.1 Construction

Construction of the proposed project would be performed in a phased approach and would not occur over the entire site at one time. This phased approach would cause less soil disturbance, promote greater rainfall infiltration into the soil and less over land flow, and would limit the amount of denuded property subject to erosion. In estimating the runoff from construction activities, the Rational Method was used along with weighted runoff coefficients.

A weighted runoff coefficient was established using the percentage of area attributable to each land use and the appropriate runoff coefficient for that type of usage. Since construction would be phased, a theoretical conservative area of 1/3 of the total project site, or 12.3 acres, of construction activity during a single phased construction event was assumed. The estimated area of construction activity during a single construction event is based on construction of the two largest buildings, the Inpatient and D&T buildings, undergoing construction activities simultaneously.

As stated previously, 10-year storm event was used to calculate rainfall intensity. This calculation results in a rainfall intensity of 4.37 in/hr. The time of concentration is estimated based upon current topography, surface type and permeability, and average distance to the nearest storm drain or roadway. The time of concentration was estimated based on information obtained from the USDA Soil Conservation Services Technical Release 55, "Urban Hydrology for Small Watersheds" and the Louisiana DOTD Hydraulics Manual, 1987. The rainfall rates for these calculations also incorporate information obtained from the National Weather Service.

Based on a 33 percent increase in the amount of permeable surfaces, a weighted coefficient for construction activities would be 0.63. The total acreage is 37.

Runoff rate at the site during construction:

$Q = C \times I \times A$

$C = 0.63$

$I = 4.37$

$A = 37$

$Q = 101.86$ cfs

This is the estimate of the peak rate of runoff for a time interval (T) expressed in cfs.

Based on the calculations above, the runoff estimate for construction activities of 101.86 cfs represents a decrease in the runoff potential to the surrounding areas, when compared to the runoff estimate for the current land use of 147.47 cfs.

As part of the construction activities, FP&C would also obtain a Stormwater permit. This permit is applied for under the LDEQ, Louisiana Pollution Discharge Elimination System, General Permit number LAR100000 - AI83363 Stormwater General Permit for Construction Activities

five acres or more (LAC 33:IX.2511.B.14.j). The permit details specific items, which must be implemented in order to minimize stormwater runoff. The permit requires implementation of a Stormwater Pollution Prevention Plan, to include BMPs. BMPs would be employed to control sediment transport and minimize stormwater runoff at the construction site. Evaluation of typical BMPs would be detailed and include:

- Erosion and Sediment Controls
- Stabilization Practices
- Structural Practices
- Stormwater Management

The BMPs would conform with the EPA Guidance Manual, *Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices*, and would be detailed upon completion of the design, which is the standard procedure for these project types. The final BMPs would be detailed in a site plan, and are part of the contractor's requirements during demolition and construction activities. As required by law, a Notice to Intent (NOI) to discharge would be filed with the regulatory agency prior to the initiation of the construction activities and following implementation of the BMPs. No adverse impacts on the floodplain are expected during construction of the proposed UMC.

3.7.2.2.2 Operations

For stormwater management, the goal of the design is to provide drainage features that keep the site runoff from exceeding what occurs there now. These features may include bioswales to slow down the rate at which stormwater runoff leaves the site, as well as other devices such as underground detention tanks. Bioswales are low-gradient, often vegetated surface channels through which surface water runoff is directed. In many buildings, roof runoff may be directed to cisterns, which are underground storage tanks that may also serve to irrigate the site with the collected stormwater during dry conditions.

Placement of fill throughout the site would vary to accommodate both the elevation requirements set by FEMA, and to provide for effective placement of bioswales to control runoff. The topography of the site would range from no fill to just over five feet. About one-third of the site would have a maximum of five feet of fill, another third would be transitional from existing grade up to the buildings and the remaining third would be near native grade (see Grading Plan in Appendix D).

For all alternatives, the site would be divided into two drainage basins, with the dividing line running between S. Prieur Street and S. Roman Street. The runoff would be collected from the roof drains and the ground surfaces by various types of drain inlets and catch basins installed in both the paved and un-paved areas. The bioswales can also be used to intercept runoff in the parking areas. Once intercepted by the bioswales and inlet structures located throughout the site, the runoff is ultimately directed via an underground collection system of pipes to the existing drainage box culverts that run beneath S. Galvez Street and Claiborne Avenue. It is important to

attempt to use the existing tie-in points of the box culverts, since they do not currently interfere with any of the numerous utilities along S. Galvez Street or Claiborne Avenue. The existing tie-in points provide the proposed design of the storm sewer system with a defined clear path to the discharge point, free of any obstructions. The drainage plan would be coordinated with the S&WB so that it can be integrated into the basin-wide drainage system.

The footprint of the proposed project is a combination of land use that includes medical buildings, parking lots, green spaces and paved streets. Usage space percentage is approximated to be 84.3 percent impermeable surfaces (including buildings, parking lots and paved streets), and 15.7 percent permeable surfaces. Drainage capacities were evaluated through calculation of runoff to ensure adequate drainage is provided to minimize impacts from stormwater runoff and non-stormwater discharges.

As stated previously, 10-year storm event was used to calculate rainfall intensity. This calculation results in a rainfall intensity of 4.93 in/hr. The time of concentration is estimated based upon proposed topography, surface type and permeability, and average distance to the nearest storm drain or roadway. The time of concentration was estimated based on information obtained from the USDA Soil Conservation Services Technical Release 55, "Urban Hydrology for Small Watersheds" and the Louisiana DOTD Hydraulics Manual, 1987. The rainfall rates for these calculations also incorporate information obtained from the National Weather Service.

A weighted runoff coefficient was established using the percentage of area attributable to each land use and the appropriate runoff coefficient for that type of usage. The runoff coefficient was calculated by taking into consideration the change in the amounts of impermeable and permeable areas, which are relatively consistent among the three design alternatives, and the incorporation of a sloped ground and paved surface as a result of raising the building elevation, with resulting changes in the time of concentration factor as detailed above.

Based on the percentages of impermeable areas and permeable areas, the following weighted coefficient was calculated. The coefficient for the site with the proposed project (for all three alternatives) is 0.72. The total acreage is 37.

Runoff rate at the site during operation of the proposed facility:

$Q = C \times I \times A$

$C = 0.0.72$

$I = 4.93$

$A = 37$

$Q = 131.14$ cfs

This is the estimate of the peak rate of runoff for a time interval (T) expressed in cfs.

Based on the calculations above, the runoff rate estimate for the operation of the proposed facility is 131.14 cfs. Table 3-5 is a comparison of the permeable and impermeable surfaces as well as the runoff rate for all three scenarios. The data shows that the runoff rate during

construction and operation of the UMC is less than the current rate. Specifically, the runoff rate during operation of the facility is 11 percent less than the current rate. One of the primary factors contributing to this decrease in runoff is a 5.3 percent increase in permeable surface areas resulting from additional green space, and from the use of bioswales and other stormwater management measures.

Table 3-5: Comparison of Permeable and Impermeable Surfaces and Runoff Rates

Site Scenarios	Permeable Surface (percent)	Impermeable Surface (percent)	Runoff Rate (cfs)
Existing Conditions	10.4	89.6	147.47
Construction	--	--	101.86
Operation	15.7	84.3	131.14

As discussed above, the analysis indicates that runoff would be reduced slightly from current levels from both construction and operation. As described previously, the proposed design for the facility includes mitigation measures such as strategically placed storm drains, and landscape design. The landscape assists in diverting and channeling the water flow away from the buildings and surrounding area and into the storm drain system. Use and placement of bioswales and culverts would also be included in the design to assist in maintaining a runoff rate that can be handled by the drainage capacities of the existing system. Stormwater management measures incorporated into the site design, in conjunction with off-site drainage improvements by the City (Mendoza 2010), would result in only minor changes to floodplain and stormwater management. There is also the potential that such improvements could result in beneficial impacts.

As described in Section 2.3.2.3, steam and hot water would be provided to the UMC from the existing Charity Boiler Plant. No exterior modifications would be made to the existing Charity Boiler Plant, and although the existing plant did receive floodwaters following Hurricane Katrina, the three existing boilers were not impacted, as they are on a structure at approximately 3.5 feet above grade. The two new boilers that would be added to support the UMC would be elevated to twelve feet above grade.

3.8 SOLID, HAZARDOUS AND BIOMEDICAL WASTE

Hazardous materials and wastes are regulated in the U.S. under a variety of Federal and state laws. Federal laws and subsequent regulations governing the assessment, transportation, and disposal of hazardous materials and wastes include the Resource Conservation and Recovery Act (RCRA); the RCRA Hazardous and Solid Waste Amendments; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Solid Waste Act; the Toxic Substances Control Act (TSCA); and the CAA. RCRA is the Federal law that regulates hazardous waste. RCRA regulates hazardous waste from “cradle to grave,” that is, from the time the waste is generated through its management, storage, handling, transport, treatment, and final

disposal. The USEPA, who is responsible for implementing this law, has delegated this responsibility to the State. RCRA also sets forth a framework for the management of non-hazardous wastes. The 1986 amendments to RCRA enable USEPA to address the environmental problems that can result from underground tanks storing petroleum and hazardous substances. RCRA focuses only on active and proposed facilities, and does not address abandoned or historical sites.

The following section addresses potential impacts related to solid, hazardous, and biomedical wastes. Although there are three design alternatives presented in this document, potential waste impacts resulting from construction and operation would be consistent among the alternatives, and therefore is presented as a single analysis.

3.8.1 Affected Environment

For former MCLNO facility operations, all waste handling, transportation and disposal practices were conducted in accordance with the facility's Hazardous Materials and Waste Management Plan. Pre-Hurricane Katrina figures indicate that the former MCLNO facility generated approximately 430 cubic yards per week of solid waste, 70,000 lbs per week of biomedical waste, and 2,900 lbs per year of hazardous waste.

3.8.1.1 Hazardous Waste

The site of the proposed UMC consists of approximately 276 parcels. Prior to demolition and construction activities, Phase I Environmental Site Assessments (ESAs) will be performed on all parcels in accordance with American Society for Testing and Materials (ASTM) standards and are currently underway. As of May 1, 2010, 252 parcels, or 91 percent of the total parcels, have been evaluated in accordance with Phase I ESA requirements. It should be noted that all of the parcels have been evaluated by the Phase I ESA process except for: a) the parcels designated as LSU-owned property, and b) the Cox Communications parcels that the State will not be acquiring. These aforementioned exceptions account for the remaining nine percent that have not been evaluated by the Phase I ESA process.

The findings of these inspections have revealed the potential presence of asbestos-containing materials (ACM) in 44 properties, of which, 16 properties (commercial) have been inspected and sampled by a certified asbestos inspector and have confirmed the presence of ACM. Of the 16 inspected properties, ACM was confirmed by laboratory analysis at 13 properties. All properties with confirmed ACM must be abated in accordance with State regulations prior to demolition, and all ACM must be disposed of in an appropriately licensed landfill.

In addition, the results of the 252 Phase I ESAs recommended that Phase II site investigations be performed for 19 properties. As of May 1, 2010, 18 of the 19 Phase II site investigations have been performed. The findings indicate remediation is not required for the specific properties evaluated, with the following exception:

- LSU-434-12 – 213 S. Claiborne: The results of the Phase II investigation indicate the presence of lead above the LDEQ's Risk Evaluation/Corrective Action Program (RECAP) Screening Standard in the shallow soil depth interval of 0'-3'. An area of approximately 600 square feet is proposed for remediation by excavation to a depth of approximately 3 feet below ground surface.
- It should be noted that sampling results on the contiguous property (LSU-434-11 – 209-11 S. Claiborne) did not show lead reveal lead exceedances in soil: however, remediation may take place on this property if confirmatory sample results for 213 S. Claiborne indicate the need for further excavation to the east of the identified impacted area.

All remediation activities will be performed in accordance with LDEQ regulations.

Of the 251 parcels inspected, two aboveground storage tanks (ASTs) and two underground storage tanks (USTs) have been located at the following properties:

- LSU-469-01 & 02 – 2024-2030 Canal Street – one inactive 12,000-gallon UST (formerly contained gasoline)
- LSU-471-01 – 2017 Banks Street – one closed-in-place 6,000-gallon UST (formerly contained diesel)
- LSU-522-01 – 2120 Canal Street – one inactive AST (size estimated at 550 gallons – contents unknown)
- LSU-520-01 – 315 S. Johnson Street – one active 12,000-gallon AST (contains diesel for emergency generator)

Tank removal activities will also be performed in accordance with State requirements. Should any unanticipated contamination be discovered during construction activities, FP&C would notify the LDEQ of any findings and follow regulatory requirements concerning notification and remediation activities.

Although not regulated by the LDEQ, it should be noted that subsurface hydraulic lifts may need to be removed at two locations, so as not to interfere with foundation or piling work:

- LSU-522-01 - 2120 Canal Street – at least 11 former subsurface hydraulic lifts were identified. It is not known if the lifts are still in place in the subsurface. Once confirmed, the lifts may be removed.
- LSU-469-06 - 2000 Canal Street - 13 subsurface hydraulic lifts were identified and may be removed.

3.8.1.2 Biomedical Waste

Waste generated in health care facilities typically includes general solid wastes, biomedical wastes, and hazardous wastes. Solid wastes from facility operations include wastes from the

offices, kitchens, patient rooms, utensils, paper, etc. This waste is similar in nature to household waste and is disposed of in accordance with municipal solid waste regulations. Solid waste generated at MCLNO was collected and transported for proper disposal by a private sanitation firm, with no expected long-term adverse impacts on the capacity of receiving landfills.

As detailed in the PEA (Section 3.8), the USEPA reports that the following hazardous materials are commonly used in hospitals:

- mercury,
- items containing mercury,
- photographic/x-ray fixer solutions,
- silver recovered from fixer solutions,
- ethanol,
- formaldehyde,
- x-ray film containing silver/metals,
- spent/off spec/excess laboratory chemicals (solvents, acids, bases),
- chemotherapy drugs,
- waste/excess paints and cleaning products,
- fluorescent light bulbs,
- high intensity discharge lamps,
- batteries,
- computer equipment,
- lead aprons and shielding,
- cathode ray tube screens,
- compressed gasses, and
- waste/excess pesticides and fungicides.

Biomedical waste often has multiple terms for references, including regulated medical or infectious waste. This waste includes cultures and stocks of infectious substances, anatomical wastes from medical procedures, human blood, and associated contaminated surgical instruments, among others.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, the replacement UMC would not be constructed. Consequently, this Alternative would not result in the generation of hazardous or biomedical wastes associated with hospital operations, and the existing conditions, as described for the Tulane/Gravier site in Section 3.8.1.2 of the PEA and elaborated in Section 3.8.1 of this SEA, would persist. This could result in adverse impacts due to the deteriorating condition of some of the properties on the project site, which may contain asbestos, lead based paints, and other hazardous materials.

3.8.2.2 Alternatives 1, 2 and 3

3.8.2.2.1 Construction

Construction activities would generate solid and hazardous wastes as a by-product of building the proposed medical facility. The potential impacts associated with each category of waste are detailed below.

3.8.2.2.1.1 Solid Wastes

Construction activities for the UMC would result in the generation of solid waste from the use of general building materials including wood, drywall, carpet, flooring, cardboard, metals, concrete, and roofing materials. Solid wastes are generated over the course of any construction project, and are expected to be generated in a similar fashion during construction of the UMC facility. Exact amounts cannot be quantified, but qualitatively can be discussed and are anticipated to occur. In anticipation of creation of the waste associated with construction, a Waste Management Plan would be instituted to minimize the amount of solid waste that goes to the landfill. The waste management plan, including components for recycling and salvage, would be developed by the contractor in an effort to divert waste from the landfill for recycling or reuse. Included in this plan would be efforts to segregate wastes to reduce potential contamination and allowing for the diversion of waste to other disposal facilities.

Solid wastes that cannot be reused, recycled or salvaged would ultimately be sent to a landfill that accepts construction and demolition debris for disposal. Within Orleans Parish, Gentilly Landfill is a designated "Type III" landfill that accepts construction and demolition debris. The landfill is located approximately 11 miles east of the proposed UMC site. Other landfills that could receive the waste include the River Birch and Killona facilities. The River Birch facility is located in Westwego, Louisiana, approximately 20 miles from the site, and the Killona facility is located in Killona, Louisiana, approximately 25 miles from the site. All wastes would be transported by licensed transporters to licensed disposal facilities throughout the construction period.

As discussed in Section 3.4.2.2 of the PEA, the worst case-analysis of sending all demolition waste, which is significantly greater in anticipated volume, to the closest landfill indicates that even this scenario does not have a significant impact on landfill capacity or life. Therefore, further detailed analysis of solid waste impacts is not necessary for evaluating site construction activities.

3.8.2.2.1.2 Hazardous Wastes

Hazardous wastes generated from construction activities are expected to include concrete curing compounds, wood preservatives, pesticides, acids, paints, paint thinners, spent cleaners and solvents among other materials. Similar to the discussion of solid wastes generated during construction activities, hazardous wastes are generated over the course of any construction project, and are expected to be generated in a similar fashion during construction of the UMC facility. Exact amounts cannot be quantified, but qualitatively can be discussed and are anticipated to occur. In anticipation of creation of the waste associated with construction, a Waste Management Plan would be instituted to ensure segregation of hazardous wastes from solid wastes and minimize the amount of hazardous waste generation. The Hazardous Materials and Waste Management Plan, including components for minimization, handling and disposal, would be developed by the contractor in an effort to reduce waste generation. All hazardous wastes would be transported by licensed transporters and ultimately be disposed of at licensed disposal facilities. Subtitle C Hazardous Waste Landfills are permitted to accept these wastes.

The closest facility to New Orleans is the Chemical Waste Management facility located in Sulphur, Louisiana, approximately 250 miles from the site.

3.8.2.2.2 Operations

Operational waste impacts are grouped into three categories for discussion, including solid wastes, hazardous wastes and biomedical wastes. All solid, hazardous, and biomedical wastes generated during operation would be managed in accordance with the Hazardous Materials and Waste Management Plan that is in operation for the MCLNO facilities. The Plan provides provisions for collection, storage, transportation and disposal of these materials.

Based on the amount of wastes generated at the former MCLNO facility, UMC operations personnel project a 20 percent reduction in this quantity during operation of the UMC, because of a reduction in bed capacity and associated staffing needs in comparison from the former facility. No new types of wastes are expected to be generated at the UMC facilities, and the facility operations would evaluate and consider waste stream reductions throughout the operation of the facility.

3.8.2.2.2.1 Solid Wastes

Solid waste generated on the proposed sites would continue to be collected and handled by the City Department of Sanitation, with no expected long-term adverse impacts on the capacity of receiving landfills (see PEA Section 3.4.2.2).

UMC operations personnel project the new facility would generate approximately 344 cubic yards of solid waste per week. This is a reduction of approximately 86 cubic yards, or 20 percent, per week because of a lower bed capacity. All waste handling, transportation and disposal practices would be conducted in accordance with the facility's Solid and Hazardous Materials and Waste Management Plan. A component of the facility's operation would be to evaluate solid waste reduction practices throughout facility operations and, where implemented, to incorporate such practices into the facility's operation.

3.8.2.2.2.2 Hazardous Wastes

Hazardous waste generated on the site as described above, would be collected and handled in accordance with existing and approved management practices. Pre-Hurricane Katrina figures indicate that the former MCLNO facility generated approximately 2,900 lbs of hazardous waste annually. UMC operations personnel estimate the proposed facility would generate approximately 2,320 lbs of hazardous waste per year. This represents a 580-lbs or 20 percent reduction because of a lower bed capacity. All waste handling, transportation and disposal practices would be conducted in accordance with the facility's Hazardous Materials and Waste Management Plan as well as all Federal, State, and local regulations for handling and disposing of hazardous wastes. In addition, a component of the facility's operation would be to evaluate solid waste reduction practices throughout facility operations and, where implemented, to incorporate such practices into the facility's operation.

3.8.2.2.2.3 Biomedical Wastes

Biomedical waste generated on the site as described above, would be collected and handled in accordance with previous management practices. Pre-Katrina figures indicate that the former MCLNO facility generated approximately 70,000 lbs of medical waste per week. UMC operations personnel estimate generating approximately 56,000 lbs of medical waste per week. This represents a 14,000-lbs or 20 percent reduction because of the lower bed capacity. No new waste streams are expected to be generated by the proposed facility, and the quantity of waste generated by hospital operations would be less than at MCLNO, and there would be no incineration or disposal of medical wastes on site.

All waste handling, transportation and disposal practices would be conducted in accordance with the facility's Hazardous Materials and Waste Management Plan as well as all Federal, State, and local regulations for handling and disposing of solid, hazardous, or biomedical wastes. Further, biomedical waste reduction practices would be reviewed, and, where implemented, would be incorporated into the facility's operation.

3.8.2.2.2.4 <u>Transportation of Solid, Hazardous, and Biomedical Wastes</u>

All wastes would be transported for disposal at permitted, off-site facilities in accordance with regulatory requirements. Although the new facility would be located closer to residential areas, service entrances used by waste handling and transportation vehicles are located on the portion of the campus closer to downtown and I-10. These vehicles are expected to enter from and exit to Canal Street and Tulane Avenue to access I-10 from the campus, thereby reducing the risk of exposing the neighboring community to potential hazards that may result from waste transportation.

Based on the above analysis, solid, hazardous, and biomedical waste would be less for the proposed UMC facility than for the former MCLNO, thus there would be no significant impact on the environment with regard to waste.

3.9 INFRASTRUCTURE

3.9.1 Affected Environment

The existing infrastructure at the proposed UMC location includes utility systems as well as communication systems provided by various utility companies and communication system providers. Services include potable water, sewerage, storm drainage, electrical, natural gas, solid waste collection, cable television, and wired and cellular communications. Under all alternatives, removal of utilities would occur without interruption to services, as replacement infrastructure would be constructed prior to commencement of removal.

3.9.1.1 Water and Sewer

There are two existing box culverts used for drainage of stormwater located along S. Claiborne Avenue and S. Galvez Street. Currently, there are two primary drainage patterns along the proposed campus area. Properties east of S. Roman Street drain towards to S. Claiborne Avenue using 15 inch drainage lines within a 21 inch tie-in to the box culvert, whereas properties west of

S. Roman Street drain towards S. Galvez Street using 15 inch – 21 inch drainage lines with 27 inch and 21 inch tie-ins to the box culvert along S. Galvez Street.

3.9.1.2 Electric, Natural Gas, and Telecommunications

Electric and natural gas services are provided by Entergy New Orleans, Inc. (LDNR 2008). Three major companies provide communication services in the area. AT&T (formerly Bell South) provides telephone and internet service (Bell South 2008) and Comcast and Cox Communications provide bundled services including telephone, internet, and cable television (Cox 2008). N-Y Associates is currently identifying the location of all service lines in the UMC footprint.

Cox Communications has a system transfer station or hub located at 1924 Canal Street, which is on the site of the proposed UMC. This hub will remain on the site and ownership will be retained by Cox Communications. No interruption of Cox Communications service is anticipated because of the UMC project. Although the Cox Communications hub and associated building and driveway would be retained on the UMC footprint, FP&C would provide landscaping to the perimeter of this property in the same manner as the remainder of the UMC footprint, in order to integrate the building into the site. Efforts would include incorporation of a retaining wall with a trellis to foster vegetative growth similar to the surrounding site.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the No Action Alternative, no construction would occur at the proposed site and there would be no adverse direct, indirect, or cumulative impacts to the infrastructure within the project area. The existing conditions described in Section 3.9.1 would continue.

3.9.2.2 Alternatives 1, 2 and 3

3.9.2.2.1 Direct Impacts

Construction and operation of the proposed UMC facilities would increase the demands on the existing infrastructure from current levels to near or above pre-Katrina levels. As discussed below, based on available information, the existing systems and services have adequate capacity to support the proposed facilities.

3.9.2.2.1.1 <u>Water Utilities</u>

According to the S&WB, an existing 20-inch water main on Gravier Street would provide a sufficient source of potable water for the proposed UMC facilities. The site water supply service would be provided by connecting to the domestic water system operated by the S&WB. Based on available information, it appears the existing water mains in the project area are of sufficient capacity to provide the needed flow and thus no upgrading of these lines is anticipated. Major 12-inch to 30-inch water supply lines run along main thoroughfares, such as Canal Street and Claiborne Avenue.

A minimum of two connections would be made to the existing mains, which run along the city streets adjacent to the project site. This would allow for constant flushing of the lines and independent fire protection. An 8-inch diameter trunk line would be routed through the development in such a way that it provides a looped connection to the public system, insuring redundancy of service and pressure maintenance. PVC lines ranging from 2 to 6 inches in diameter would branch off the trunk line to provide services to the individual buildings on the campus. Small diameter (1 inch and smaller) PVC piping would be installed subsurface to provide for irrigation of the site green space areas.

Standard tees, bends and fittings would be used to connect the various segments of pipe. The water lines would be installed by trenching approximately 3 feet below grade followed by placing and compacting select backfill material for pipe support. The pipe would then be covered and the overburden would be raised to the proposed grade. The backfill would be compacted underneath roadways, parking or buildings, requiring structural fill for the overburden as well. However, the excavated materials can be used for filling above the pipe in areas where the lines are not routed underneath load-bearing infrastructure.

Fire hydrants would be installed off the 8-inch trunk line in multiple locations throughout the site. Each hydrant would be designed to supply adequate water for the subject buildings in case of fire and to meet all standards specified by the National Fire Protection Association. The design would incorporate the existing local fire hydrants for fire suppression; however, the City may require additional hydrants. In addition, valves and meters would also be required in numerous locations throughout the site. Gate valves, check valves, and various other valve types would be needed to direct, isolate, and control water distribution operations and prevent unwanted backflow. The meters would be designed by the Engineer for the City's approval, but they would be provided and installed by the S&WB on a service fee basis.

3.9.2.2.1.2 Sanitary Sewerage Facilities

According to the PEA (Section 3.4.1), the East Bank Wastewater Treatment Plant should have sufficient capacity to meet the facilities' requirements in place of existing business and residential needs at the selected site (VA/FEMA 2008).

Wastewater disposal would be provided for the site by connecting to the S&WB sanitary sewage collection system. It is anticipated that the tie-ins would be made to existing sewer manholes in the vicinity, however, new manholes may be required, if such connections are either not feasible or sufficient. Based on available information, it appears the City's collection network is of adequate capacity to accept the wastewater generated by the development, so that no upgrades to the public system are anticipated.

Sewage is pumped through the City to the East Bank Wastewater Treatment Plant along force main trunk lines ranging from 30 inches to 54 inches in diameter, which run along the major roadways. Gravity lines and smaller force mains tie in to these main lines throughout the City. The sanitary sewage generated from each building would be collected by gravity and routed to the public system by an on-site network of subsurface lines. The gravity portion of the sanitary

sewer collection network shall consist of PVC piping ranging in size from 8 inches to 30 inches in diameter.

All gravity lines must be installed at a constant slope, which would be very flat, due to the local topography. Although the majority of the sewage collection system would be fed by gravity, the size of the site requires runs too long for gravity alone. The drainage plan is to collect sewage on the site near the intersection of S. Derbigny Street and Cleveland Avenue and provide a lift station to pump to the existing 20-inch line along Palmyra Street that drains to an existing line in S Claiborne Avenue. In addition to the normal sewer operation, the site development would include an emergency sewage storage tank with capacity for seven days of discharge for the hospital only. If the existing City system becomes incapable of accepting waste from the hospital, the waste would be diverted to a storage tank. Once the City system is returned to service the tank would be slowly discharged into the City system, cleaned and returned to standby.

The onsite force main would be installed a minimum of 3 feet below grade with compacted structural fill above and below the pipe in paved areas. For non-paved areas, the overburden placed above the pipe can consist of the excavated materials. For all of the gravity lines, a more robust bedding configuration is required, consisting of two layers of hardwood boards and a 1-foot to 1½ feet layer of crushed stone or clamshell, for 8 to 30 inch pipes, respectively. The foundation requirements for a sewer manhole consist of a 6-inch compacted stone base and a 7-inch thick concrete pad. The lines and manholes must be installed per the standards and details set forth by the S&WB, which includes but is not limited to backfilling, compaction, excavation limits, and bedding.

3.9.2.2.1.3 <u>Storm Drainage Utilities</u>

According to the PEA (Section 3.4.2), a drainage box on Galvez Street should provide significant drainage capacity during rain events (VA/FEMA 2008). All rainwater falling on the site that becomes runoff would be discharged to the municipal drainage system. This would be accomplished via connection to the public stormwater-piping network that runs along the adjacent street network. Tie-ins to very large existing box culverts within the street medians are anticipated. Due to the age of the existing infrastructure, new manholes and conflict boxes may be required.

The runoff would be collected on-site by various types of drain inlets and catch basins installed in both the paved and un-paved areas. The inlets and basins would be connected by a network of subsurface pipes that route the flow by gravity from the various collection points to the discharge location into the City system. The pipe network would be connected at all changes of alignment and grade by stormwater manholes. The drainage piping shall be reinforced concrete pipe, ranging from a minimum of 15 inches to a maximum of 42 inches in diameter. Due to the flat topography of the local area, the pipes would be installed at the minimum slope necessary to convey the design flow.

For all of the drainage lines, the bedding requirements would consist of two layers of hardwood boards and a 1½-foot to 2½-foot layer of crushed stone or clam shell, for 15-inch to 42-inch pipes, respectively. The foundation requirements for the stormwater manholes shall consist of a 6-inch compacted stone base and a 7-inch thick concrete pad. All lines less than 36 inch in diameter must be installed per the standards and details set forth by the New Orleans Department of Public Works. All lines 36 inches in diameter and larger must be installed per the requirements of the S&WB. This includes but is not limited to bedding, trenching, grading, compacting, backfilling, excavating, and installation requirements.

3.9.2.2.1.4 Electric, Natural Gas, and Telecommunications

According to Entergy New Orleans, Inc., electric service is adequate for the UMC site, and high-pressure natural gas is available to service the needs of a hospital site comparable in size and load to the former MCLNO (VA/FEMA 2008). Since the existing line intersects with the location of the Inpatient and D&T buildings in the preferred alternative, current proposals include re-routing the 230 kilovolt (kV) line down Canal Street, across either S. Roman or S. Claiborne Avenue, and up Tulane Avenue, to re-connect to the existing 230 kV line across S. Prieur Street.

Currently, there are telephone poles along the proposed route, and 230 kV poles would be added to the route. The poles would be approx 90 – 110 ft tall and would be similar to the existing 230 kV poles that crosses S. Prieur Street. The proposed 230 kV poles would be approximately 300-400 yards apart along the proposed route. Studies are also underway to evaluate the feasibility of re-locating this service underground. Entergy distribution lines would also be relocated to accommodate the UMC development. The exact re-location is still being evaluated, where some of these lines may be re-routed in a similar manner to the 230 kV lines and some may be re-routed underground along Galvez Street.

Natural gas lines located within the proposed project site would be removed and replaced with underground lines along the perimeter of the site. Per N-Y Associates, an underground connection would be established at the intersection of S. Prieur and Canal Streets. The line would run down Canal Street and turn into the campus onto S. Derbigny Street, then turn again onto Cleveland Avenue, crossing under Claiborne Avenue and intersecting with the existing line along the downtown side of Claiborne Avenue. The size of these lines would range from 2-4”.

The Cox Communications hub would remain at its current locations, while telephone poles within the footprint would be removed. Cox communications lines would be run underground along Canal Street, turning onto Galvez Street, then crossing Tulane Avenue to connect to the existing link. AT&T lines would also be relocated underground, along S. Claiborne Avenue, turning onto Canal Street to S. Dorgenois Street.

3.9.2.2.1.5 Chilled Water

The UMC would be provided chilled water by Entergy Thermal from the existing MCLNO facilities. A line from the existing Chilled Water Facility currently runs up Gravier Street, suspended along the existing pedestrian bridge. Entergy Thermal proposes to add a connector at

the intersection of S. Gravier and S. Johnson Streets, taking the line underground along S. Johnson and under Tulane Avenue. The line would continue, turning at Palmyra Street to S. Derbigny Street where it would tie in to the new Utility Building. A loop is being considered to extend the service lines underground to continue across S. Derbigny Street to Cleveland Avenue, then across Claiborne Avenue, under I-10 and re-connect with the existing Chilled Water Facility, located at the intersection of Gravier Street and Claiborne Avenue.

3.9.2.2.2 Indirect Impacts

No long-term, adverse, indirect impacts to infrastructure within the project area are anticipated under the proposed action or alternatives. However, there could be short-term disruptions to services, either planned or accidental, during site construction or switchovers from existing to new infrastructure services, particularly in the event of unforeseen difficulties. With the use of BMPs however, it is expected that the modifications could be made without the need for service interruptions. Should temporary service interruptions be required, sufficient notice would be issued to residents indicating the date, time, and expected duration of the interruption. Such scheduled service interruptions would generally only be expected to last for a few hours.

Following implementation of the infrastructure changes, there should be no further impacts to these services from construction and operation of the UMC. In fact, in the event of regional service interruptions because of weather, or other unforeseen incidents, it is possible that priority status of the medical center would lead to faster service restoration for the immediate vicinity than in the past. This would be a potential beneficial impact. It is therefore anticipated that the modifications made to accommodate the UMC would have little to no adverse impacts on infrastructure for the surrounding area.

3.10 CULTURAL RESOURCES

FEMA chose to fulfill its historic preservation compliance responsibilities through a PA, as outlined in 36 CFR Part 800.14(b), in consultation with VA, the City, FP&C, the SHPO, and the ACHP, along with numerous other consulting parties. The PA established a historic preservation review process for selection of the VAMC and UMC sites, and identified all aboveground historic properties located in each alternative site. Additionally, the PA, which was developed simultaneously with the preparation of the PEA for site selection, addressed all remaining activities anticipated in subsequent phases of the proposed undertakings including site-specific archaeological investigations. The following activities associated with the implementation of the PA are taking place concurrent with the Tier II NEPA process:

- the treatment measures required for each alternative to mitigate adverse effects of the Undertaking; and
- the method of identification and evaluation of archaeological historic properties that would be used on the selected site once it is accessible.

These two efforts are ongoing, will continue throughout the site-specific compliance phase, and are discussed in the following sections.

3.10.1 Programmatic Agreement Implementation

The PA identifies a series of mitigation measures to avoid, reduce, or compensate for adverse impacts upon historic properties. These measures are described in the PA (VA/FEMA et al. 2008), summarized in the PEA (VA/FEMA 2008), and listed in Table 3-6.

Table 3-6: Measures to Avoid, Minimize, and Mitigate Adverse Effects to Historic Properties

Measures to Avoid Adverse Effects		
Stipulation # VI.C.2.a)	*Site Security*	FP&C will ensure adequate site security at the proposed site to prohibit, to the extent possible, looting and vandalism to historic properties contained within the site.
Stipulation # VI.C.2.b)	*Secure and Ventilate*	Within six months of site selection, FP&C had taken measures to secure and ventilate the nine existing historic MCLNO buildings. FP&C posted a report of these measures on the Consult 106 website.
Stipulation # VI.C.2.c)	*Retention of Historic Properties: Deutsches Haus*	FP&C has evaluated the feasibility of retaining the Deutsches Haus and Orleans House. Through this evaluation, FP&C determined that the Deutsches Haus could not be retained. FP&C is working with Deutsches Haus to provide assistance to relocate the function of the facility to another location. FP&C posted a report of the evaluation of this facility on the Consult 106 website.
Stipulation # VI.C.2.c)	*Retention of Historic Properties: Orleans House*	FP&C has determined that the Orleans House can be avoided and will not be acquired. FP&C posted a report of the evaluation of this facility on the Consult 106 website.
Stipulation # VI.C.2.d).iv	*Design Review Process*	FP&C held two design review sessions for consulting parties that participated in the Section 106 process. The first meeting was on January 22, 2008 and the second meeting was on August 18, 2009 (see Section 1.3.3 for more details). Within 30-days of each meeting, FP&C posted the documentation of the substantive comments received, and FP&C's response to those comments, on the Consult 106 website (see Appendix A).
Measures to Minimize Adverse Effects		
Stipulation # VI.C.3.a)	*Vibration Monitoring*	FP&C has finalized the Vibration Monitoring Plan and posted it to the Section 106 website.

Table 3-6: Measures to Avoid, Minimize, and Mitigate Adverse Effects to Historic Properties

Stipulation # VI.C.3.b)	*Phased Demolition and Construction*	FP&C will phase demolition and construction activities as necessary to ensure that the treatment measures stipulated in the PA can be implemented.
Stipulation # VI.C.3.b).iii	*Funding Stream*	In a letter dated June 24, 2010, FP&C provided written notification to the Chairman of the ACHP identifying a funding stream for design and construction and stating that a business plan has been approved for the proposed hospital.
Measures to Mitigate Adverse Effects		
Stipulation # VI.C.4.a).	*Mid-City Historic Preservation Mitigation Program*	FP&C, in conjunction with VA and the City, are supporting the SHPO in its effort to develop and implement a program to promote the preservation and rehabilitation of contributing elements within the MCHD. FP&C, VA and the City would remit to SHPO up to $300,000, $700,000 and $400,000, respectively for a total of $1.4 million, for eligible historic preservation projects within MCHD.
Stipulation # VI.C.4.b).	*Recordation*	FP&C is currently documenting historic properties not being retained within the project footprint, as well as Charity Hospital. The recordation will be completed prior to any transfer, sale, demolition, or architectural salvage, and the data and material will be posted to the Section106 website.
Stipulation # VI.C.4.c).	*Architectural Salvage*	FP&C has finalized the architectural salvage plan and posted it to the Section 106 website.
Stipulation # VI.C.4.d).	*Public Interpretation*	FP&C will design and implement a public interpretation program related to the MCHD, Old Charity Hospital, McDonogh School No. 11, Deutsches House, and Orleans House.
Stipulation # VI.C.4.e).	*Local Historic District Designation*	Should any neighborhood group wish to pursue local historic district designation for the MCHD within the next two years, the City would fund a nomination report. FEMA has provided the City's Historic District Landmarks Commission with data that was gathered and prepared for identification and evaluation of the MCHD.
Stipulation # VI.C.4.f).	*Reuse and/or Disposition of the*	FP&C will address the reuse and/or disposition of the nine historically significant buildings that were

Table 3-6: Measures to Avoid, Minimize, and Mitigate Adverse Effects to Historic Properties

	Historic Buildings in the former MCLNO	part of the former MCLNO and Charity Hospital.
Stipulation # VI.C.4.f).iv	*National Register Nomination of Charity Hospital*	FP&C submitted draft documentation to the SHPO in November 2009. They are revising the nomination packet in coordination with SHPO to present the final form to the National Park Service.

3.10.2 Archaeology

3.10.2.1 Affected Environment

3.10.2.1.1 Background Research

As required by the Archaeological Stipulation (VII.) in the PA, FP&C (through a contract with Earth Search Inc. [ESI]) researched and delineated the probable locations of archaeological properties on the proposed project site, within the areas that are likely to be disturbed during construction. Existing data on geomorphology and topography, historic maps, previous cultural resources investigations, cartographic information on the history of public works improvements, oral histories, and census, deed and tax records were all examined as appropriate. Geological and soils data were correlated with prehistoric, protohistoric, and historic land use patterns. All these data were recorded and analyzed using geographic information system (GIS) technology, and a historic context was developed to assist in evaluating the National Register eligibility of archaeological properties that may be identified.

As part of this background research, a Disturbance Study was conducted. ESI identified those portions of the selected site that have been sufficiently disturbed by previous construction, development, grading and demolition so that it is unlikely that intact National Register eligible archaeological properties remain. The Disturbance Study included a block-by-block reconnaissance survey of the selected site. The historic context, background research, and the Disturbance Study were used to identify areas within the proposed project site that have a high and a low probability of containing intact National Register eligible archaeological properties. As per the PA, the SHPO and the Mississippi Band of Choctaw Indians (MBCI) reviewed and commented on the results of the background research and the Disturbance Study.

3.10.2.1.2 Historic Overview

Located on the back edge of the natural levee, the project area was probably not permanently occupied by American Indians prior to European contact. Vast swaths of the area around New Orleans remained uninhabitable swamps and near-swamps in the late-eighteenth century. Consequently, when New Orleans began to outgrow the Vieux Carré, population spread laterally, up and down the river, rather than inland. The project area was not developed until the mid-nineteenth century (Campanella 2008; Kelman 2006; Lewis 2003).

The largely undeveloped area immediately adjacent to and behind the west side of town evolved into public Commons between Iberville (the western border of the town in the early eighteenth century) and the Bienville-Jesuit Plantation landline, an angled line that eventually became Common Street (later Tulane Avenue). The first step in developing the previously uninhabitable areas behind New Orleans began in 1794 when Spanish Governor Carondelet ordered the construction of a canal that began at Bayou St. Jean and terminated in a turnaround basin at present Basin Street. The canal was designed to provide drainage as well as access to Lake Pontchartrain and the Mississippi River. Occupation of the area fronting the canal developed slowly and the project area remained largely undeveloped (Campanella 2008; Lewis 2003; Toledano et al.1980; Wilson 1974).

The 1803 Louisiana Purchase would see a great influx of Americans into the territory. These new residents sought to establish themselves away from the Creole-dominated old city, and suburbs like Lafayette and Carrollton developed above the canal. Shortly thereafter, President Thomas Jefferson spearheaded a large land grant near New Orleans for the Marquis de Lafayette, a tribute to his support during the American Revolution. The grant included the Commons and the present project area. Controversial from the beginning and subject to years of litigation, the grant was eventually reconfigured and ownership of the Commons to an extent of 600 yards from the old city fortifications was confirmed to the City Corporation. Congress also earmarked money to build a new canal to connect the Carondelet Canal with the Mississippi River. The canal was never built, but Canal Street along which it was to be located, became one of the most important avenues of commerce in the United States, and the unofficial line of demarcation between the Creole and American sectors of New Orleans (Burns 1928; Toledano et al. 1980).

Population in New Orleans exploded after 1794, with the influx of refugees from the conflicts in Saint-Domingue, Americans seeking their fortunes in the city, and waves of immigrants from Ireland, Germany, and later Italy. After the Civil War, newly freed slaves were also drawn to the city hoping to find work. Between 1806 and 1813, at least seven faubourgs grew out of old colonial plantations that were broken up and sold off to accommodate the need for city expansion. These new suburbs hugged the natural levee and were inhabited by those affluent enough to live in the highest and best-drained areas. Directly behind this commercial and residential inner core developed a corridor of working- and middle-class neighborhoods. On the very fringe of the city was a semi-rural periphery where thousands of working-class, poor, and free blacks lived precariously at the back-of-town. Faubourg Hagan, which included the project area, sat in the transitional zone where the natural levee disappeared and the backswamp cypress forest began (Campanella 2008).

Faubourg Hagan appears to have experienced slower development than faubourgs closer to the Vieux Carré. Although antebellum New Orleans was greatly in need of the housing and infrastructure the new suburb could offer, the area retained the taint of “back-of-town” disease and pestilence, although its situation between the New Basin Canal, begun in 1838, and the Carondelet Canal aided in drainage of the area. The 1845 Norman map shows that the area is laid out, but with no major development noted. The closest structure was the Maison de Santé, the

precursor of Hotel Dieu, on Claiborne at Canal opposite the project area (Campanella 2002; Lewis 2003).

The neighborhood attracted many new immigrants, especially German and Irish newcomers who steadily moved into Faubourg Hagan, usually as renters. Families were sometimes able to purchase their rental homes or other houses in the neighborhood, establishing a pattern of interrelated land ownership and grassroots economic relationships. The opening of the Canal streetcar line made Faubourg Hagan and other areas north of downtown even more attractive. Affluent citizens also moved into the project area primarily facing Canal Street, a major thoroughfare by that time but only spottily occupied above Claiborne Avenue (Merrill 2005).

The district retained many of its nineteenth-century characteristics through the first part of the twentieth century. It remained a mainly residential area buffeted by growing commercial corridors and was populated primarily by working class and middle class residents. The area was predominately white, but included significant numbers of Creoles of color and African Americans. By 1900, Italians were moving into the area in larger numbers, as the Germans and Irish assimilated more into the mainstream white population. More people purchased their homes and remained in the area, forming a strong sense of community. The housing stock, which was dominated by shotgun singles and doubles in the late nineteenth century, was enriched by the variety of Craftsmen-style houses that gained popularity in the twentieth century.

With increasing suburbanization, the Tulane-Gravier neighborhood became less racially and economically diverse. After World War II, there was a steady increase in commercial intrusion into the area, and by 1951, businesses were intermixed with residences along the primary streets bordering the project area: Claiborne Avenue, Tulane Avenue, Galvez Street, and Canal Street.

From its inception as Faubourg Hagan, the area now called Tulane-Gravier was ethnically and economically mixed, with a variety of day laborers, clerks, washwomen, and the unemployed on one end of the spectrum, and lawyers, politicians, and doctors on the other end. In the middle were the trades people, craftspeople, artists, and musicians, the middle class workers who defined the community. Primarily Irish and German in the nineteenth century, Italians and later African Americans came to dominate the population in the twentieth to twenty-first century. The neighborhood remains architecturally rich with a wealth of wooden shotgun-style houses, built perhaps by craftsmen who lived in the neighborhood, as well as the Second French Empire McDonogh School and the gothic-inspired St. Joseph Catholic Church. Deutsches Haus, incorporated in 1928 to provide support for German immigrants, remains a viable social organization today. In 1993, the MCHD, which includes a portion of the project site, was placed on the National Register of Historic Places (Campanella 2006; Hirsch 2007).

3.10.2.1.3 Field Investigations

The results of the background research and Disturbance Study are being used to program archaeological field investigations, which began June 2, 2009, and are ongoing. As of this writing, seven weeks of Phase 1 archaeological investigations have been completed within the

high probability areas of the proposed project site. All artifacts recovered to-date are being processed and stored in a climate-controlled facility.

Phase I archaeological testing is being conducted at locations deemed as high probability for containing undisturbed deposits of material culture. Phase I testing consists of a combination of background research and archaeological fieldwork designed to identify resources and define site boundaries within a given project area. One of the basic criteria for separating high and low probability areas for the proposed project was the presence/absence of large structures, the construction of which would likely have disturbed subsurface deposits.

During the fieldwork on the high probability parcels, a surface survey of the properties precedes intrusive testing. The surface survey includes a visual inspection of the ground surface and locations of partially exposed architectural features, depressions, or rises in the ground surface are noted. The features observed during the surface survey may indicate locations where intrusive testing can be particularly productive. For example, depressions on the ground surface can indicate the location of a filled-in well or privy. Once they fall in disuse, wells and privies are often used as trash pits and become caches of artifacts.

Placement of shovel tests is determined using the information gathered from the surface survey as well as an assessment of land-use based upon the Sanborn maps for the proposed project area. The Sanborn map company has created maps of American cities dating back to 1866. These maps are critical tools for urban archaeologists as they describe the locations of structures within city blocks and in some cases indicate activities associated with these structures.

Following the completion of the Phase I shovel testing and/or once properties are acquired, backhoe test trenching will be conducted. Timing the project this way will allow for the placement of test trenches to incorporate information gathered during the shovel testing. This sequence of methods is important, as the shovel testing can indicate areas of interest that can be more fully explored through mechanical stripping.

During the field investigations, in areas where sterile soils could not be reached by shovel testing alone, the team used a slot-probe and a hand-auger to augment the shovel tests. All excavated soil was screened through ¼-inch hardware mesh.

Shovel testing has been conducted on all of the parcels where property owners have provided right-of-entry (ROE). Portions of nine city blocks have been investigated to date. This accounts for approximately 75 percent of the total project area that is accessible to shovel testing. Table 3-7 presents the total number of properties that are accessible to shovel testing versus the number of properties that have been tested to date. The table also includes areas that need to be explored by mechanical testing as well as areas where shovel testing has already revealed deposits that will require Phase II investigation. Phase II archaeological investigation is conducted in order to test or evaluate an archaeological site's eligibility for inclusion in the National Register of Historic Places.

Shovel testing still needs to be conducted in approximately 25 percent of the project area, and backhoe trenching needs to be undertaken in high probability locations that are not accessible through shovel testing. Additionally, monitoring of geotechnical borings is being conducted. An ESI archaeologist is present for the first three meters of all geotechnical boring activities. A total of nine boring locations have been monitored as of this writing. The archaeological monitor recorded all cultural materials revealed by the geotechnical borings as well as soil stratigraphy.

3.10.2.1.4 Results

During the initial phase of the fieldwork, 15 sites have been identified (see Table 3-7). The site boundaries are established based on the extent of the historic city block. Within each site, there are a variable number of cultural loci that may be associated with individual parcels or households on the block. Shovel tests at about half of the identified sites (n=7) have revealed intact deposits of nineteenth- to twentieth-century cultural materials and need further testing. Seven of the sites require mechanical testing and one site (16OR498) will require demolition monitoring because the block is occupied by a large building. Cultural loci discovered during testing are being evaluated within the historic context that was developed for the area using NRHP criteria.

Table 3-7: Archaeology Shovel Testing Conducted as of 5/4/2010

Square	State Site Number	No. of parcels accessible to shovel testing	No. of parcels shovel tested	Percentage of parcels tested*	Mechanical testing required	Phase II testing required
433	16OR496	0	0	0	Yes	Undetermined
434	16OR497	12	10	83.33	No	Undetermined
435	16OR498	0	0	0	No	Monitoring recommended
436	16OR493	6	6	100	Yes	Yes
437	16OR494	12	12	100	Yes	Yes
438	16OR490	24	18	75	Yes	Yes
466	16OR491	7	3	42.85	Yes	Undetermined
467	16OR495	35	26	74.28	Yes	Yes
468	16OR492	13	4	30.76	Yes	Yes
469	16OR487	3	0	0	Yes	Undetermined
470	16OR488	19	5	26.31	Yes	Yes
471	16OR489	13	12	92.30	Yes	Yes
520	16OR484	3	3	100	Yes	Undetermined
521	16OR485	27	17	62.96	Yes	Yes
522	16OR486	1	0	0	Yes	Undetermined
	Total	**175**	**116**	**66.28**		

*Percent does not take into account total physical area of lot size. Many of the lots have very small "green" spaces accessible to shovel testing. The total percentage of actual physical area that is open to shovel testing that has been tested is approximately 85 percent.

3.10.2.2 Environmental Consequences

3.10.2.2.1 No Action Alternative

Since no construction would occur at the site, there would be no adverse direct, indirect, or cumulative impacts to archaeology within the project area.

3.10.2.2.2 Proposed Action and Alternative

During testing, ESI will provide information to FEMA regarding the potential eligibility of sites found. This will be done in consideration of the National Register criteria for eligibility (36 CFR

60.4 [a-d]), and will apply standard archaeological methodologies, as defined in Louisiana Division of Archaeology Guidelines for Field Methods. The eligibility determination will identify those sites and individual loci that possess important research potential under National Register criteria and the *Louisiana Comprehensive Archaeological Plan*, and that retain those qualities of integrity and significance as defined by the National Register criteria. FEMA will share these findings with the SHPO and MBCI and seek their concurrence.

Once eligible sites have been identified, ESI will provide information and recommendations to FEMA regarding the Undertaking's potential adverse effects and the means to resolve such effects. FEMA will then consult with SHPO and MBCI regarding the means to avoid or minimize any such adverse effects to National Register-eligible archaeological sites. Such measures may include but are not limited to encapsulation, preservation in situ, and construction fencing.

If adverse effects to National Register-eligible archaeological sites may not be avoided, FEMA will consult with SHPO and MBCI regarding appropriate treatment strategies. Treatment strategies may include:

- **Data Recovery** - A Data Recovery Plan may employ a sampling strategy to achieve the objectives of the data recovery and promote the efficient completion of the Undertakings.
- **Oral Histories** - If appropriate to enhance the Data Recovery Plan, FP&C will conduct oral history interviews in accordance with Oral History Association Principles and Standards, with members of the public that may contribute to the research goals of the data recovery effort or record knowledge of the local history of the selected site. The oral histories would be placed at a public depository or archive.
- **Public Outreach** - FP&C may incorporate a public archaeology program into the public interpretation plan required by PA stipulation VI.C.4.d.

FEMA and FP&C will ensure that a comprehensive draft report follows the standards of the Louisiana Division of Archaeology and includes the results of the archival research, sensitivity modeling and probability mapping, field identification methods and results, site evaluation methods and results, and data recovery methods and results. FP&C will submit the report to FEMA, who will submit the report to the SHPO and MBCI for review. Final Louisiana Division of Archaeology site forms for all sites identified will accompany the report.

FP&C will curate all archaeological materials, reports and associated records resulting from this investigation in accordance with the standards of the Louisiana Division of Archaeology, and all collections and associated records will be curated with the Louisiana Division of Archaeology.

3.10.2.3 Post Review Discoveries

If during the course of work, archaeological artifacts (prehistoric or historic) or human remains are discovered, FP&C and/or its contractors must stop work near the discovery and take all reasonable measures to avoid or minimize harm to the finds. FP&C must immediately inform

the FEMA Public Assistance program, who would in turn contact the FEMA Historic Preservation staff. Within 48 hours of notification, FEMA must contact the SHPO, City, relevant federally recognized tribes, and the ACHP. FP&C would not proceed with work until FEMA completes consultation with the SHPO.

In addition, if unmarked graves are present, compliance with the Louisiana Unmarked Human Burial Sites Preservation Act is required. In that situation, FP&C must notify the local law enforcement agency within 24 hours of the discovery, and notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within 72 hours of the discovery.

3.11 NOISE AND VIBRATION

3.11.1 Affected Environment

This section provides an overview of the current and projected future noise in the proposed project area, including the effects of construction, operation and stationary noise sources. The PEA (Section 3.11) contained an in-depth discussion of ambient noise levels and existing noise sources near the project site. For informational purposes, selected language from the PEA is provided to assess future noise environments. The noise analysis included in this SEA is related to traffic, operational, and construction related noise.

Although there are three design alternatives presented in this document, potential noise impacts resulting from construction and operation are anticipated to be the same for all alternatives. Therefore, the results of the impact analysis are presented as a single discussion.

3.11.1.1 Sound and Noise

The urban noise environment is primarily comprised of transportation sources, such as automobiles, light and heavy trucks, buses and streetcars, passenger and freight trains, and aircraft. The primary sources of noise at the project site and in the vicinity include vehicular traffic on the major thoroughfares of I-10, Canal Street, Tulane and S. Claiborne Avenues. The elevated I-10 structure runs above S. Claiborne Avenue with an exit ramp to the project site on S. Derbigny Street. S. Derbigny Street serves as a roadway link to Canal Street and S. Claiborne Avenue. Noise levels along these heavily traveled transportation corridors usually exceed noise levels along the surrounding arterial streets.

The January 2008, noise assessment survey (Appendix F, FP&C 2008) calculated noise impacts from external traffic sources to be at a normally unacceptable level of 71.7 dBA, while aircraft and railway noise was lower than acceptable levels (DNL < 55 dBA). Vehicular traffic noise includes honking horns, emergency sirens, and other operational noises for automobiles, light trucks, buses, and heavy trucks. Compared against the calculated noise level in the survey, the ambient noise measurements recorded at the site ranged on average between 56.7 dBA to 78.3 dBA, with the majority of the site above 65 dBA. However, ambient noise levels measured along the periphery of S. Claiborne Avenue, Canal Street/S. Prieur Street corridor, and Tulane Avenue/S. Prieur Street corridor exceeded levels of 75 dBA.

The Louisiana Department of Transportation and Development (LDOTD) provided actual traffic counts along various highways in Orleans Parish. Traffic counts are given in units of Annual Daily Traffic (ADT). The LDOTD set up a collection station on Tulane Avenue at S. Roman Street, coincidently adjacent to the project site. In 2008, the ADT amounted to 17,467, with counts at the I-10 elevated structure near the Superdome at 66,343 (Table 3-8). This data provides a baseline level of noise generated by current and historic traffic volumes.

Table 3-8: LDOTD Average Daily Traffic Counts

Collection Station	2004	2008
Tulane/S. Roman	36,261	17,467
I-10 near Superdome	101,467	66,343

The application of attenuation equation for a noise source producing a noise level of 85 dBA at a reference distance of 50 feet over a hard surface, estimates a noise level of 79 dBA at a distance of 100 feet from the noise source and 73 dBA at a distance of 200 feet. When estimating the attenuation of the noise over a given distance, the following relationship is used:

Equation 1: $dBA_2 = dBA_1 - 20 \log (d_2/d_1)$

Where:

dBA_2 = dBA at distance 2 from source (predicted)
dBA_1 = dBA at distance 1 from source (measured)
d_2 = Distance to location 2 from the source
d_1 = Distance to location 1 from the source

Sources: *"Noise Guide for Local Government"* Department of Environment and Conservation (NSW) 59-61 Goulburn St, Sydney NSW 2000, and California Department of Transportation 1998.

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

Under the No Action Alternative, there would be no construction associated with the proposed UMC. Thus, noise receptors near the project site would not experience additional noise associated with construction activities such as pile-driving and construction vehicles. However, they would continue to experience ambient noise levels in excess of 65 dBA from trucks and cars traveling on roadways in the area, and from normal operational noises associated with the commercial businesses in the area, as described in Section 3.11.1. Therefore, there would be no direct, indirect, or cumulative impacts beyond those associated with the previously described conditions.

3.11.2.2 Alternatives 1, 2 and 3

3.11.2.2.1 Traffic Noise

A HUD noise assessment survey contained in Appendix F was performed to further evaluate the current traffic noise exposure yielded by automobiles, light, and heavy trucks. Noise Assessment Locations (NALs) were selected at reference locations where noise was expected to be at worse case. The study concluded that the current noise impacts from aircraft and railways are acceptable (DNL ≤ 55). However, the aggregate DNL for aircraft, railways, and current roadway sources was 68.5, a normally unacceptable level (FP&C 2009).

Current traffic noise levels may increase due to construction traffic and the closure of interior streets within the proposed project site. An increase in construction traffic and traffic diverted to the surrounding streets may result in an increase in traffic volume, which may impact noise levels as well as traffic circulation and flow. North and southbound traffic would be closed on the interior streets of S. Prieur and S. Roman Streets with limited use of S. Johnson Street, Cleveland Avenue and Palmyra Street. S. Derbigny and Banks Streets would remain in service on the UMC site. The surrounding streets of Canal, Tulane, and N. and S. Claiborne each provide six-lanes of ingress and egress to the site. According to LDOTD 2004 ADT, the infrastructure serviced nearly twice the amount of 2008 traffic; therefore, any impacts associated with the closure of interior streets and the additional traffic volume would be minimal. Further, the neighboring I-10 merge and exit ramps allow immediate traffic flow and circulation, which decreases stationary vehicular noise. Future traffic noise environments resulting from the operation of the UMC is further discussed in the operational noise section.

3.11.2.2.2 Construction Noise

Demolition and construction activities can generate high noise levels, which could adversely affect noise-sensitive land uses. Noise-sensitive land uses where indoor and outdoor activities may be sensitive to receiving external noise include residential dwellings, hospitals, nursing homes, educational facilities, libraries and historical properties and/or districts. The potential impact that demolition and construction noise would have on noise sensitive-receptors underwent an additional evaluation to determine the sound level impact to the surrounding area. The impact assessment of demolition and construction noise incorporated the nature of activities generating the noise, the noise transmission pathway, and the potential sensitivity to the receptors. All the data collected and calculated was used and compared against HUD external noise standards.

Due to the complexity of the project, construction may occur for a longer period compared to most development projects. The impacts associated with the anticipated demolition and construction activities assume the UMC to be sequentially developed in phases as presented in the design alternatives. The analysis assumed the UMC core buildings to be complete prior to the construction of Future Phase buildings.

In addition, all demolition and construction noise was assumed to be generated at the property boundary and did not assume any attenuation from nearby structures or vegetation, nor did it assume noise sources more centrally located within the property during any period of demolition and construction. The calculated noise estimates assessed a worst-case noise exposure event and the potential effect on the surrounding receptors.

Typical demolition and construction equipment types presented in Table 3-9 indicate noise levels range from 76 to 91 dBA for equipment powered by internal combustion engines, saws, and vibrators, and range from the mid-80s to greater than 100 dBA for impact equipment. Assuming the worst-case scenario of 101 dBA produced during foundational pile-driving and 89 dBA for general construction equipment, all noise-sensitive land use within 1,000 feet of the project area was assessed for noise levels potentially exceeding 65 dBA.

Table 3-9: Noise Level Ranges of Typical Construction Equipment

Equipment	Range in dBA at 50 feet
Earthmoving	
Front Loader	73-86
Back Hoe	73-95
Tractor	77-98
Scraper/Grader	80-93
Paver	85-88
Materials Handling	
Concrete Mixers	75-88
Concrete Pumps	81-85
Cranes (moveable)	75-88
Cranes (derrick)	86-89
Stationary	
Pumps	68-72
Generators	71-83
Impact	
Pile-driving (peaks)	95-107 (peak)
Jackhammers	81-98
Pneumatic Impact Equipment	83-88
Other Equipment	
Vibrator	68-82
Saws	72-82
Compressors	75-87
Trucks	82-95

Source: EPA, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717, 1971.

Potential noise- and vibration-sensitive receptors near the construction site include churches, hospitals, schools, cemeteries and older residences. Sensitive receptors within 1,000 feet of the proposed project site are shown in Table 3-10.

Table 3-10: Sensitive Noise Receptors in Close Proximity to the Proposed Project Site

Noise Receptor	Distance from Construction Site	Construction Noise Exposure
Allen Wicker Elementary School	Within 850 feet	Less than or equal to 65 dBA
McDonough School No. 33	Within 800 feet	Less than or equal to 65 dBA
Charity Hospital	Within 700 feet	Greater than 65dBA, Less than 75 dBA
St. Louis No. 2 Cemetery	Within 550 feet	Greater than 65dBA, Less than 75 dBA
St. James Church	Within 550 feet	Greater than 65dBA, Less than 75 dBA
St. John's Church	Within 450 feet	Greater than 65dBA, Less than 75 dBA
Residential Units	Within 250 feet	Greater than 65dBA, Less than 75 dBA
New Orleans Medical Historic District	Within 150 feet	Greater than 75 dBA
St. Joseph's Church	Within 100 feet	Greater than 75 dBA
Charles Orleans House	Onsite	Greater than 75 dBA

The worst-case scenario infers noise levels from general construction would have to travel more than 700 feet before noise levels would attenuate at or below 65 dBA, and equipment noise would have to travel more than 1,000 feet. However, the existing ambient noise levels along the perimeter of the UMC site exceed normally unacceptable levels of 68 dBA, thus most construction equipment should not be heard over the ambient noise at distances greater than 200 feet. Compared to areas with dense residential and outdoor recreation land uses, the commercial and institutional environment near the site is likely to be less sensitive to noise due to the duration of existing noise exposure and the types of activities occurring.

The construction activities for the design alternatives would be expected to create temporary noise impacts above 65 dBA to a limited number of receptors within 1,000 feet of the north end of the project area for the worst-case scenario. In accordance with the City noise ordinance (Section 66-138(7)), major demolition, installation, and setup construction activities would occur in the daylight hours (7:00 a.m. and 6:00 p.m.), as residential properties are located within 300 feet of the construction site perimeter. Any general site construction activities occurring at the site outside of these hours would comply with prevailing noise requirements.

The construction of the UMC and the associated construction traffic would temporarily increase heavy and light truck traffic on surface streets and on major roadways through the course of construction. Construction traffic includes a commuting construction workforce, transportation of demolition debris and delivery of construction materials. The additional increase in construction traffic could potentially elevate noise levels along construction routes. However, given the proximity of heavily traveled roadways and multiple routing options, the overall effect of traffic noise and volume is not expected to exceed current noise already generated by normal truck traffic within the project area.

3.11.2.2.3 Construction Vibration

Construction-related vibrations, with high levels of vibration associated with jack hammering, pile-driving, soil compacting, and demolition activities, can generate a substantial amount of noise. Ground-borne, continuous vibration can potentially cause damage to nearby structures; although, the amplitude is rarely sufficient enough to result in even minor cosmetic damage to buildings. Vibration concerns are usually related to the intrusive and irritating effects on people living and working in the vicinity, where threshold perception and annoyance is higher for transient, single event sources of vibration than continuous. The effects of continuous vibration amplitudes on both humans and buildings are reported in Table 3-11.

Table 3-11: Effects of Continuous Vibration

Peak Particle Velocity (inch/second)	Effects on Humans	Effects on Buildings
0.006-0.019	Threshold of Perception	Vibration unlikely to cause damage of any type
0.08	Readily Perceptible	Recommended upper limit of vibration to which ruins and ancient monuments should be subjected
0.1	Begins to Annoy	Virtually no risk of architectural damage to normal buildings
0.2	Annoying	Threshold at which there is a risk of architectural damage to normal dwelling houses (houses with plastered walls and ceilings)
0.4-0.6	Unpleasant	Architectural damage and possible minor structural damage

Source: Transportation and Construction Induced Vibration Guidance Manual 2004.
Peak Particle Velocity values in the table are listed at 20 Hz.

In accordance with PA requirements (VA/FEMA et al. 2008), FP&C completed a Vibration Monitoring Program to safeguard historic properties from inadvertent damage from vibration due

to ground disturbing activities. The SHPO reviewed and approved the plan and it was posted to the Section 106 website for consulting parties. Baseline vibration levels were collected in the area surrounding the UMC footprint, with peak particle velocities (PPV) ranging from of 0.0282 inches per second (in/sec) to 0.271 in/sec. In addition, a threshold limit for sustained vibration of 0.25 in/sec will be established for vibration levels. This threshold is commonly used by structural engineers in the New Orleans area including the USACE as the standard to safeguard historic properties. Vibration levels will be monitored during demolition and construction activities to ensure the threshold limits are not exceeded. Stop work protocols will be established to detail actions to be taken as a result of activities that may approach or exceed this limit. The Program defines:

- acceptable ranges of vibration within the Area of Potential Effect (APE) based on geographic proximity to resources;
- existing baseline vibration levels;
- protocols for regular on-site monitoring;
- stop work protocols;
- protocols for further reducing vibrations, as necessary; and
- specific protocols to address vibration at St. Louis Cemetery No. 2.

A copy of the Vibration Monitoring Program is available as Appendix G.

3.11.2.2.4 Operational Noise

Once the new medical facilities (meaning both UMC and VAMC?) are operational, there would be an increase in the current number of emergency vehicles utilizing sirens in the area. Typical ambulance sirens operate in the range of 100 to 120 dBA. Noise from ambulance sirens is used to alert pedestrians and vehicular traffic of the approaching emergency vehicles en route to the facilities. However, noise resulting from an authorized emergency vehicle responding to an emergency is exempt from City noise level limits. Most of the emergency medical vehicular traffic would be on Canal Street and Tulane Avenue near I-10 and S. Claiborne Avenue utilizing Derbigny Street as the campus access to the ER. Using Canal Street and Tulane Avenue as the primary ingress routes is consistent with historical routes servicing the former MCLNO facilities. The primary emergency ingress/egress route is approximately 300 feet from I-10 and runs parallel to the roadway arterials where ambient noise levels are generally high. The anticipated noise levels generated along the emergency routes are consistent with the current ambient levels.

To estimate the projected traffic noise environment resulting from the operation of the UMC, a HUD noise assessment survey contained in Appendix F was performed to evaluate historic noise levels generated during MCLNO operations. LDOTD 2004 traffic data was selected to establish historic baseline levels representative of pre-storm conditions when the infrastructure was operating and sustaining service to 550 patient beds. The 2008 LDOTD traffic data was used to evaluate current external noise levels in comparison with the 24-hour, two-way traffic counts collected in the 2009 Traffic Impact Study (Stanley, 2009). The Traffic Impact Study estimated

traffic diversion counts and projected trip generation during the 2014 operation of 424 patient beds and clinics (Table 3-12). The HUD noise assessment survey determined the current and projected traffic counts in the Traffic Impact Study to be consistent with current and historic normally unacceptable noise levels ranging from 68.2 dBA to 70 dBA.

Table 3-12: Traffic Impact Study 24-Hour Traffic Counts

Collection Point	2009	2014
Tulane/Derbigny	19,085	26,123
Canal Street	20,589	24,003

The UMC design alternatives generally place inpatient and outpatient structures near the center of the campus and away from the high noise environment along I-10 and S. Claiborne Avenue. The placement of parking structures along the major roadways shields the interior campus and the neighboring land use from general sound transmission. The design schematics incorporate retail space at pedestrian level. There will also be multiple landscape features throughout the campus to buffer interior and external noise generated during daily operations. Noise sources such as the Utility Building and other infrastructure utilities are located away from noise-sensitive areas. For example, the Utility Building would be located on the eastern periphery of the campus where ambient noise levels already exceed acceptable levels.

Each design alternative places non-critical operations on the first floor of the medical center. The first floor would be five feet above existing grade and all critical services would be at twenty-two feet above grade. This would allow the hospital to operate independently in emergencies. Organizing noise-sensitive activities above and away from external noise sources minimizes internal noise levels. If interior noise levels were elevated, additional exterior and interior noise attenuating features would be incorporated into the building design to assure compliance with the HUD standard for interior noise (≤ 45 dBA).

Under the analysis provided above, it is anticipated that noise levels resulting from construction and operation of the proposed UMC, regardless of the alternative, would not exceed pre-existing noise levels found in and around the project site. Therefore, no long-term increases in noise levels are anticipated and no impacts to the environment related to noise are expected.

3.12 TRANSPORTATION

3.12.1 Traffic

3.12.1.1 Affected Environment

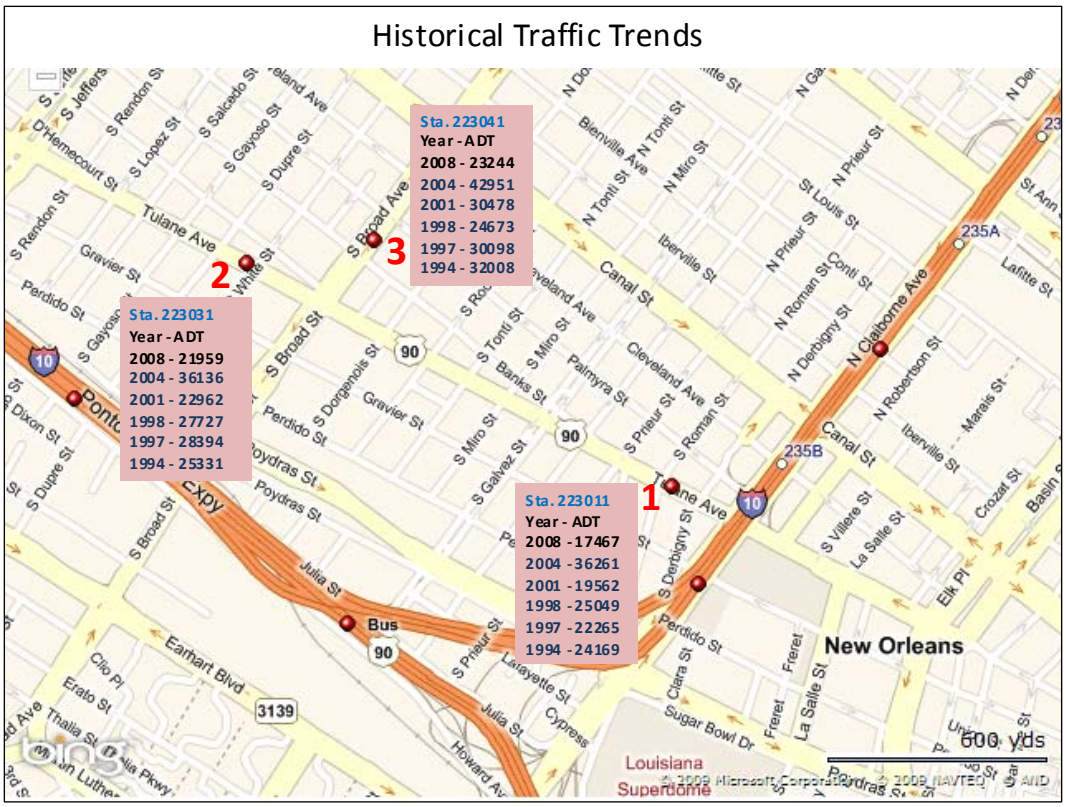
A traffic impact study was conducted to evaluate the transportation and traffic impacts that may result from the proposed UMC project. The proposed project is expected to change the traffic patterns in the project vicinity due to the closure of some local streets and increased traffic on the major arterials along the perimeter of the proposed project location. These changes in traffic

patterns could have an indirect impact on local residents and business owners in the Tulane/ Gravier area surrounding the proposed location by increasing work commute times or redirecting consumer traffic. The traffic impact study evaluated the possible impacts associated with each of the alternatives.

3.12.1.1.1 Traffic Growth Rate

The LDOTD monitors traffic volumes at various locations throughout the City of New Orleans. Three monitoring stations (223011, 223031 and 223041) are near the proposed UMC project site. Figure 3-15 shows pre-Katrina traffic trends and 2008 traffic volumes for the three data monitoring stations near the proposed project. Pre-Katrina traffic trends show inconsistent growth from 1994 to 2004.

Figure 3-15: Pre-Katrina Traffic Trends in the Vicinity of the Study Area



Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

The impact of Hurricane Katrina is evident from the traffic data recorded in 2008. Traffic experienced a 52 percent, 39 percent and 46 percent reduction from 2004 to 2008 at data monitoring stations 223011, 223031 and 223041, respectively. For data monitoring station 223011, which is closest to the proposed project site (along Tulane Avenue between S. Roman Street and S. Derbigny Street), the 2004 ADT was 36,261 vehicles per day (vpd) compared to 17,467 vpd in 2008.

For the purposes of this study, a 10-year annual average growth rate was used. The average annual growth rate at station 223011 from 1994 to 2004 was estimated to be 0.63 percent, at station 223031 from 1994 to 2004 was estimated to be -0.16 percent and 2.94 percent at station 223041 from 1994 to 2004. The average of annual growth rates from the three historical data sites was therefore estimated to be 1.70 percent. Using 1.70 percent as an initial estimate, and to take into account possible traffic increase due to redevelopment activities, a 2 percent traffic growth rate was adopted in the study.

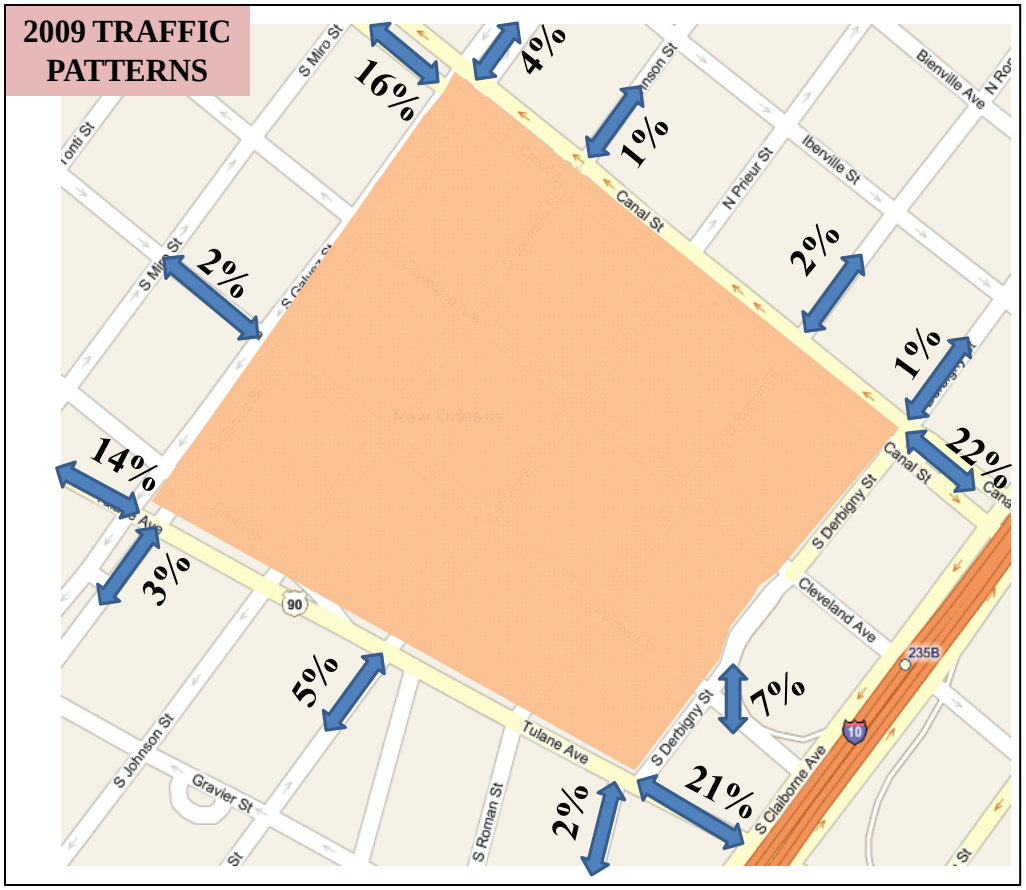
3.12.1.1.2 Current Traffic

Twenty-four hour (24-hour) approach counts were conducted at 23 selected locations near the proposed UMC project site on Tuesday August 25, 2009. Not surprisingly, the highest traffic volumes were along Canal Street. Traffic volumes ranged from 11,062 vpd on northbound Canal Street approaching S. Roman Street, to 9,529 vpd on southbound Canal Street approaching S. Roman Street. Tulane Avenue had traffic volumes ranging from 9,883 southbound approaching S. Derbigny Street to 9,119 northbound approaching S. Prieur Street.

For roadways that are interior to the proposed project site, the highest traffic volumes were 4,215 vpd on S. Derbigny Street, eastbound approaching Canal Street. The majority of these were vehicles exiting I-10 on the ramp that intersects with S. Derbigny Street and Cleveland Avenue. This is demonstrated by the relatively low number of vehicles that travel eastbound on S. Derbigny Street approaching Cleveland Avenue (292 vpd). Additionally, there were 1,063 vpd on Cleveland Avenue southbound approaching S. Derbigny Street. These vehicles may continue on Cleveland Avenue towards Claiborne Avenue or may turn left onto S. Derbigny Street.

Figure 3-16 shows the distribution of 2009 traffic volumes collected along the links within the proposed UMC site. As shown, Prieur Street, Palmyra Street, Johnson Street and Roman Street compromise 10 percent of total traffic currently passing through the site. Should the proposed project be constructed, regardless of the selected design alternative, this portion of traffic would be diverted to Tulane Avenue, S. Derbigny Street, Canal Street and S. Galvez Street.

Figure 3-16: Year 2009 Traffic Distributions near the Proposed Project Site



Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

3.12.1.2 Environmental Consequences

3.12.1.2.1 No Action Alternative

Since no construction would occur at the existing site, there would be no adverse direct, indirect, or cumulative impacts on the characteristics of the transportation environment within the project area under the No Action Alternative. However, the existing conditions described in Section 3.12.1.1 would continue.

3.12.1.2.2 Alternatives 1, 2 and 3

The proposed UMC is programmed to have 424 beds. The programmed area for the Hospital (beds and D & T) is 1,290,500 square feet; the Ambulatory Care building (Clinics) is 236,000 square feet, which is a total of 1,526,500 square feet. This information was used to calculate the number of trips generated by the proposed project. The trips generated by the proposed UMC were estimated using the formulas and rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, Eighth Edition*. Table 3-13 shows the projected trips generated by the proposed project in relation to land use peak rates, size, and peak traffic volumes as provided for in the ITE Trip General Manual. These peak rates account for worst-

case traffic volumes associated with both clinic and hospital generated trips as listed below, and represent a 24-hour period in the middle column and the PM peak in the right column. The formulas used in this estimation method are more conservative in nature and the data generated should be used for initial planning and evaluation purposes.

Table 3-13: Generated Trips

	Daily (vpd)	*PM Peak (vph)
Hospital	4,880	548 (197 enter, 351 exit)
Clinic	5,850	526 (216 enter, 310 exit)
Subtotal	***10,730***	***1,074 (413 enter, 661 exit)***
25% Internal Capture	2,683	269 (104 enter, 165 exit)
Trips Generated	**8,047**	**805 (309 enter, 496 exit)**

Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.
*PM was used as a Peak Hour for Impact Analysis

3.12.1.2.2.1 Trip Distribution

The estimated trips generated during evening peak hours for the proposed project were distributed based on the three proposed design alternatives, access, and traffic patterns obtained from the approach counts. To identify the worst case conditions, the peak hour trips were not distributed over standard hospital employee shift changes and visiting hours. The distribution considered the location of proposed parking garages and parking lots with respect to access points. Access to the UMC was evaluated for each alternative and from all possible approaches. Distribution of traffic from each approach to and from the site through different access points was summed to a common combined effect. Trip distribution is discussed below for each of the alternatives.

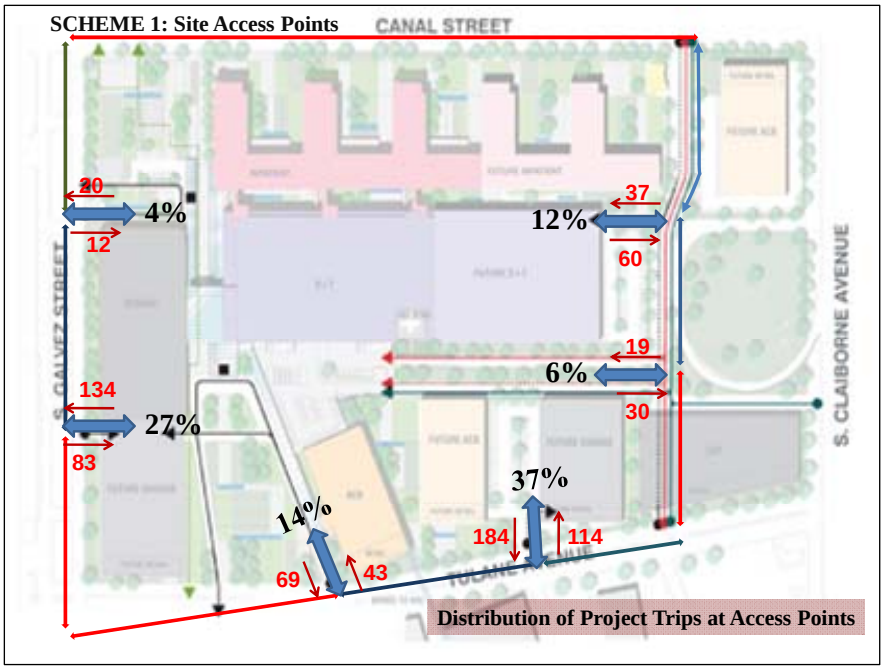
Alternative 1 Trip Distribution

Alternative 1 proposes six access points located along Tulane Avenue (two access points), S. Galvez Street (two access points), and S. Derbigny Street (two access points including emergency and service vehicles). The combined percentage of generated trips to the access points and surrounding links for Alternative 1 are shown in Figures 3-17 and 3-18, respectively.

Alternative 2 Trip Distribution

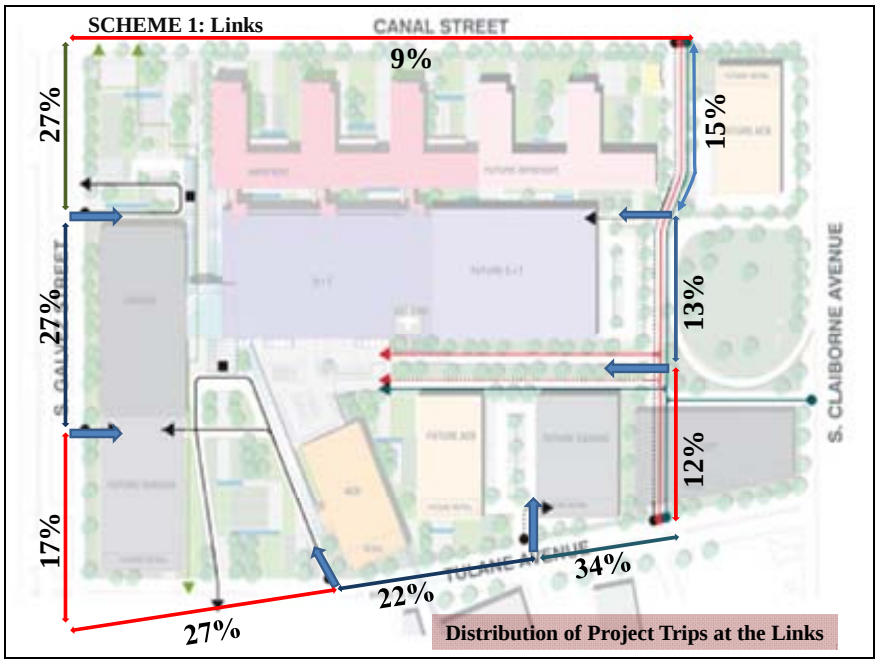
Site access for Alternative 2 is similar to Alternative 1 except the location of parking garages. Alternative 2 has six proposed access points located along Tulane Avenue (two access points), S. Galvez Street (two access points), and S. Derbigny Street (two access points including emergency and service vehicles). The combined percentage of generated trips to the access points and surrounding links for Alternative 2 are shown in Figures 3-19 and 3-20.

Figure 3-17: Distribution of Project Trips through Alternative 1 Access Points



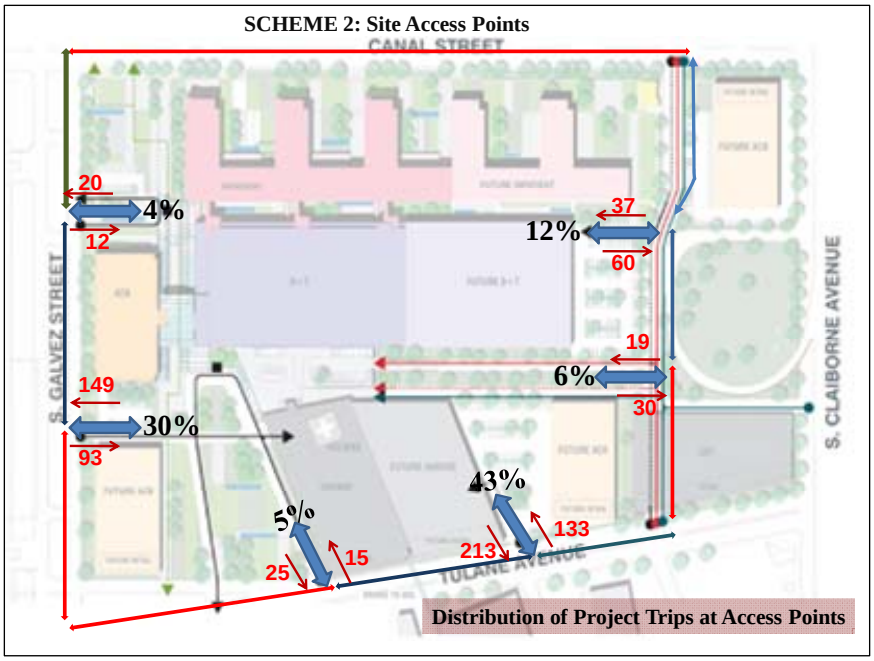
Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

Figure 3-18: Distribution of Project Trips through Alternative 1 Surrounding Links



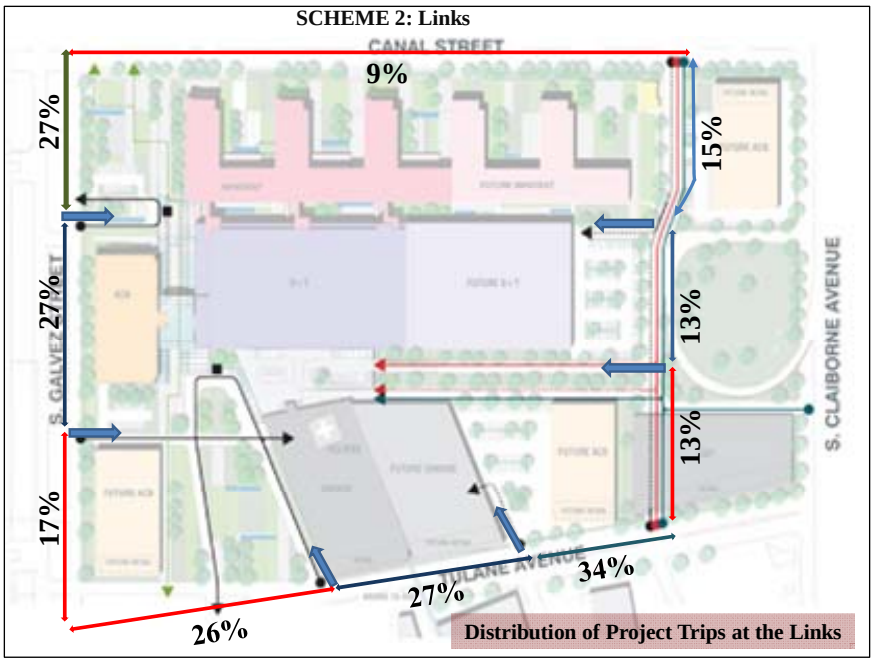
Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

Figure 3-19: Distribution of Project Trips through Alternative 2 Access Points



Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

Figure 3-20: Distribution of Project Trips through Alternative 2 Surrounding Links



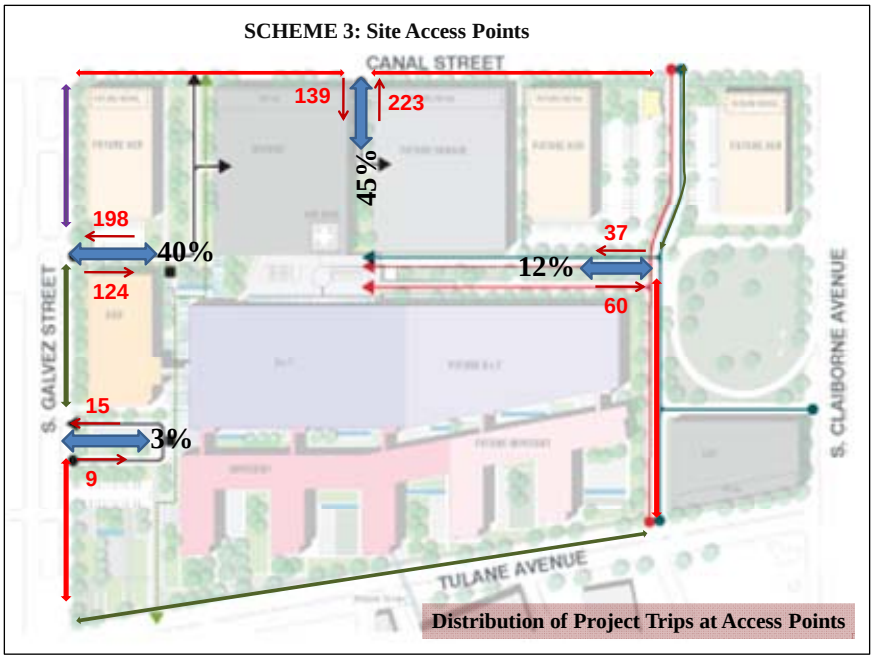
Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

Alternative 3 Trip Distribution

Alternative 3 has four access points. The major access points are along Canal Street (1 access and 1 exit only point), S. Galvez Street (two access points), and S. Derbigny Street (one access

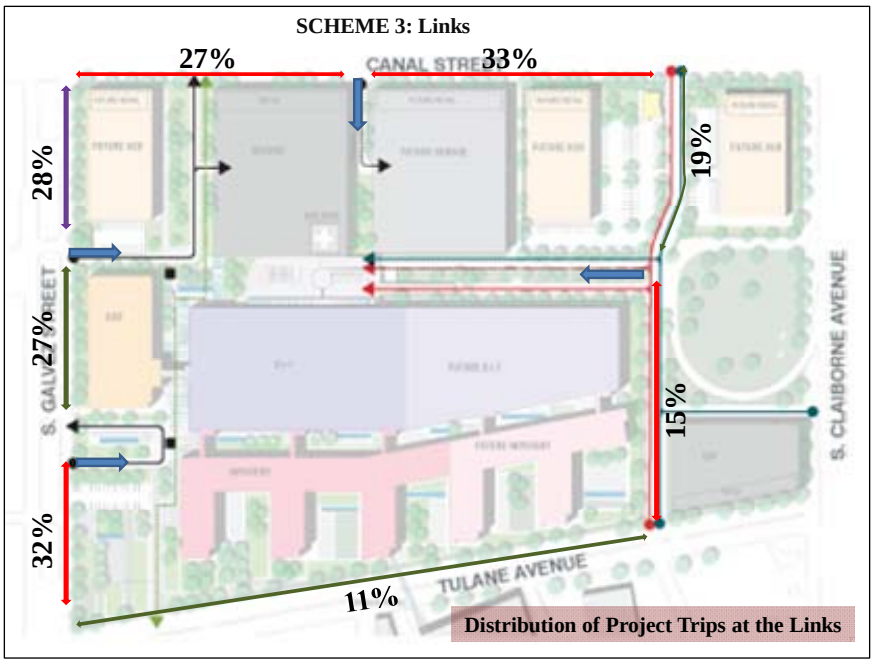
point including emergency and service vehicles). The combined percentage of generated trips for these access points and surrounding links are shown in Figures 3-21 and 3-22, respectively.

Figure 3-21: Distribution of Project Trips through Alternative 3 Access Points



Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

Figure 3-22: Distribution of Project Trips through Alternative 3 Surrounding Links



Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

Impact of Transit on Trip Distribution

Some trips to and from the proposed UMC are expected to be via public transportation. New Orleans Regional Transit Authority (NORTA) bus routes have stops at locations along Tulane Avenue, Claiborne Avenue, Canal Street and S. Galvez Street near the proposed UMC project site. To evaluate the impact of transit on trip distribution, percentage ridership and average vehicle occupancy (AVO) were incorporated in the analysis. Generated project trips were converted to person trips by multiplying vehicle trips by the AVO, which according to the 2000 US Census is estimated to be 1.10 for the State of Louisiana (US Census 2000). Based on the report published by the American Public Transportation Association (APTA) on June 15, 2009, the average ridership in New Orleans is approximately 18 percent. Therefore, 18 percent of the person project trips are expected to be on public transportation and were deducted from total trips. The remaining 82 percent person trips were converted to vehicle trips using the occupancy rate of 1.1 persons per vehicle.

3.12.1.2.2.2 Link Operational Impact Analysis

The intent of the traffic impact study was to identify potential impacts to traffic volumes and patterns associated with the design alternatives. The collected peak hour traffic count, the bed count, and the total square footage of the proposed hospital and ambulatory clinic (1,526,500 sq. ft.) were used to estimate trips generated as outlined in the ITE Trip Generation Manual. The estimation in Table 3-13 was applied to each alternative to reflect the worst-case traffic conditions and project the level of service (LOS) at respective access points to aid in interim and long-term planning. The conservative projections do not reflect trip distribution over a 24-hour period, current trips generated to and from interior buildings, nor current employee trips generated within the project area, thus not a true representation of current and future conditions. The traffic impact study strictly focuses on projecting the worse case traffic conditions based on design, access points, and interior road closures for planning purposes.

The potential impacts associated with diverted traffic from street closures, and from project-generated trips, were performed for the roadways that bound the site. The segments that would receive the most diverted traffic are those within Tulane Avenue (from Claiborne Avenue to S. Galvez Street), S. Galvez Street (from Canal Street to Tulane Avenue), Canal Street (from Claiborne Avenue to S. Galvez Street) and Derbigny Street (from Tulane Avenue to Canal Street). The impact study used 2014 as the date when the UMC facility would be operational. As discussed in Section 3.12.1.1.1, a 2 percent annual traffic growth rate was used. A link LOS analysis was conducted using thresholds from the 2000 Highway Capacity Manual (HCM) (Transportation Research board [TRB] 2000). The transportation LOS system uses the letters A through F to rate the operational efficiency of the transportation infrastructure, with "A" being best and "F" being worst.

Link Operational Impacts for Alternatives 1 and 2

Should Alternatives 1 or 2 be constructed, the operational impact analysis shows that all links would be expected to operate at a LOS D or better by year 2014 except Tulane Avenue from Derbigny Street to the second site entrance. That roadway segment is expected to operate at LOS E if the indicated number of lanes is maintained.

LOS D has been described as the level of service of a busy shopping corridor in the middle of a weekday, or a functional urban highway during commuting hours. Speeds are somewhat reduced, motorists are hemmed in by other cars and trucks. LOS D is a common goal for urban streets during peak hours, as attaining LOS C would require a prohibitive cost and societal impact in bypass roads and lane additions (TRB 2000).

LOS E is a marginal service state. Flow becomes irregular and speed varies rapidly, but rarely reaches the posted limit. LOS E is a common standard in larger urban areas, where some roadway congestion is inevitable (TRB 2000).

Link Operational Impacts for Alternative 3

Should Alternative 3 be constructed, the operational impact analysis shows that all links would operate at a LOS D or better by year 2014.

Impact of Road Closures on the Surrounding Community

The impact of closing and diverting the traffic currently using Prieur Street, Cleveland Avenue, Roman Street, Johnson Street and Palmyra Street to the surrounding community was analyzed. The impact to the community was evaluated in terms of increased driving distance (vehicle miles of travel or VMT), and travel time. As shown in Table 3-15, total travel distance would increase from 1.39 miles before closure to 2.72 miles after closure (diversion). This would mean that for the total traffic volumes currently using sections of these roads, daily VMT would increase from 791 vehicle-miles to 1,439 vehicle-miles.

The average travel time from one side of the closed road to the opposite side is expected to increase from 28 seconds to 41 seconds, which is a delay of 13 seconds compared to pre-closure travel time. In general, the closure of all roads currently passing through the proposed UMC site is expected to create a potential travel time delay of 78 seconds from one side to the other. The neighborhood streets surrounding the proposed project site consist of a square grid system of well-interconnected local facilities. No major inconvenience or increase in congestion is expected from the diversion process. Additionally, it was considered that some of the internal traffic is currently destined to downtown New Orleans, which is south of the project.

Table 3-15 Impact of Road Closures on Commuter Traffic

Traffic Diverted from	**Daily Traffic Volume** (vpd)	**Travel Distance (Miles)**			**Vehicle Miles of Travel (VMT) per Day**			**Travel Time (Minutes) per Day**		
		Before Diversion	After Diversion	Increase	Before Diversion	After Diversion	percent Increase	Before Diversion	After Diversion	%
S Prieur St EB Approach	385	0.25	0.54	0.29	96	208	116%	0.5	0.81	62%
Cleveland Av. SB Approach	1063	0.19	0.31	0.12	202	330	63%	0.38	0.465	22%
Cleveland Ave NB Approach	306	0.14	0.31	0.17	43	95	121%	0.28	0.465	66%
S Roman St WB Approach	400	0.22	0.67	0.45	88	268	205%	0.44	1.005	128%
S Johnson St WB Approach	484	0.25	0.41	0.16	121	198	64%	0.5	0.615	23%
Palmyra St SB Approach	708	0.34	0.48	0.14	241	340	41%	0.68	0.72	6%
Total	**3346**	**1.39**	**2.72**	**1.33**	**791**	**1439**	**82%**	**2.78 (167sec)**	**4.08 (245sec)**	47%
Average								**0.46 (28 sec)**	**0.68 (41 sec)**	

Source: Stanley Consultants. 2009. LSU Academic Medical Center Traffic Impact Study.

3.12.2 Helicopter Operations

3.12.2.1 Affected Environment

This section describes various aspects of the medical helicopter flight operations that would be part of the proposed UMC. Construction of a helipad on the proposed UMC campus is estimated to reduce patient transfer time from 15 minutes to 5 minutes, with estimated usage at seven helicopter trips per week. Helicopter operations are evaluate in two sections, one for helicopter lighting and the second for helicopter noise. Although there are three design alternatives, potential impacts resulting from helicopter operations would be similar for each alternative, and therefore is presented as a single analysis.

Aircraft Noise Metrics

Several noise metrics assist in the evaluation and assessment of aircraft noise, including noise from helicopter operations. The most widely accepted and used noise metric for aircraft noise assessment is the Day-Night Average Sound Level (DNL or L_{dn}). For aircraft noise, DNL measures the accumulation of noise produced by every aircraft operation at any point on the ground within the facility environs during a 24-hour period. The DNL metric also adds a 10-dB penalty to the noise that occurs during the nighttime hours of 10 pm to 7 am. This penalty is applied to account for people's greater sensitivity to nighttime noise.

Noise Sensitive Areas

Noise sensitive areas are defined as areas where noise interferes with the area's typical activities or its uses. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, parks, recreational areas (including areas having wilderness characteristics), wildlife refuges, and cultural and historical sites. For example, in the context of noise from airplanes and helicopters, noise sensitive areas would realize noise impacts above the 65 DNL contour. The proposed UMC would be considered a noise sensitive area.

3.12.2.1.1.1 <u>Current Noise Measurements</u>

Ambient noise measurements recorded at the site averaged between 56.7 dBA to 78.3 dBA, with the majority of the site above 65 dBA. Ambient noise levels measured along the periphery of S. Claiborne Avenue, the Canal Street/S. Prieur Street corridor, and the Tulane Avenue/S. Prieur Street corridor exceeded levels of 75 dBA. Additionally, a HUD Noise Assessment Survey was performed in January 2008 to calculate noise impacts near the project site. The survey found that noise from external traffic sources were normally at an unacceptable level of 71.7 dBA, while aircraft and railway noise was at a lower level (DNL < 55 dBA). The assessment took into consideration vehicular activities, including honking horns, emergency sirens, and other operational noises from automobiles, light trucks, buses, and heavy trucks.

3.12.2.2 Environmental Consequences

3.12.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed UMC would not be constructed at the Tulane/Gravier site. Therefore, no helipad would be constructed and there would be no adverse direct, indirect, or cumulative impacts on lighting or noise because of helicopter operations.

3.12.2.2.2 Alternatives 1, 2 and 3

3.12.2.2.2.1 Helicopter Lighting

Construction of a helipad on the proposed UMC campus is estimated to reduce patient transfer time from 15 minutes to 5 minutes, with projected usage estimated at seven helicopter trips per week. While the flight schedule would be dependent on patient needs, flights occurring at night would have the impact of providing additional lighting and glare because of nighttime operations.

The development of the helipad on the project site has the potential to introduce additional sources of light and glare at and surrounding the project site, which may be noticeable after dark and may affect nighttime views. These sources would be attributable to features such as a flashing beacon, lighted wind cone, and helipad perimeter lights. While general illumination and helipad landing area lighting requirements are the same for both locations, a summary of the impacts resulting from this service is discussed below.

Designs have been established to minimize light and glare associated with the proposed helipad operation. As discussed in Section 3.2.1.3, the proposed location of the UMC is within the city limits of New Orleans near the CBD and adjacent to I-10 and Highway 90. The site is therefore urban and currently surrounded by primarily commercial properties, roadways and some residential properties. Several of the commercial and residential properties in the proposed site are currently vacant, offering less lighting than a typical neighborhood. The major light sources in the area are predominately from the CBD and nearby roadways. The background view towards the south reveals lighting haze from I-10 and medical complexes, and the view towards the west reveals lighting haze from the nearby LSU HSC. The view towards the north is mainly residential and commercial. Post-top luminaires line the neutral ground of Canal Street to the east on either side of the Canal Street Streetcar Line. The view east of Canal Street is mainly residential and commercial.

The proposed location of the helipad among the three design alternatives generally situates it towards the center portion of the campus, either on top of the Parking Garage, or on top of the D&T facility. To reduce helipad-related light effects, a helipad design plan would be prepared to minimize light and glare, including:

- **Evaluation of Perimeter Lights**: Perimeter lights may be flush mounted along the edge of the landing pad and may have green lenses. A minimum of eight lights may be spaced evenly around a square pad, or around the perimeter of a circular pad. Care shall be

exercised in the design to ensure that perimeter lights do not impede movement of gurneys to and from the access ramp. The lighting layout shall be planned so that lights are to the sides of, rather than at the entrance to, the ramp. With the helipad on top of either the Parking Garage or the D&T facility, these lights would not be visible from street level.

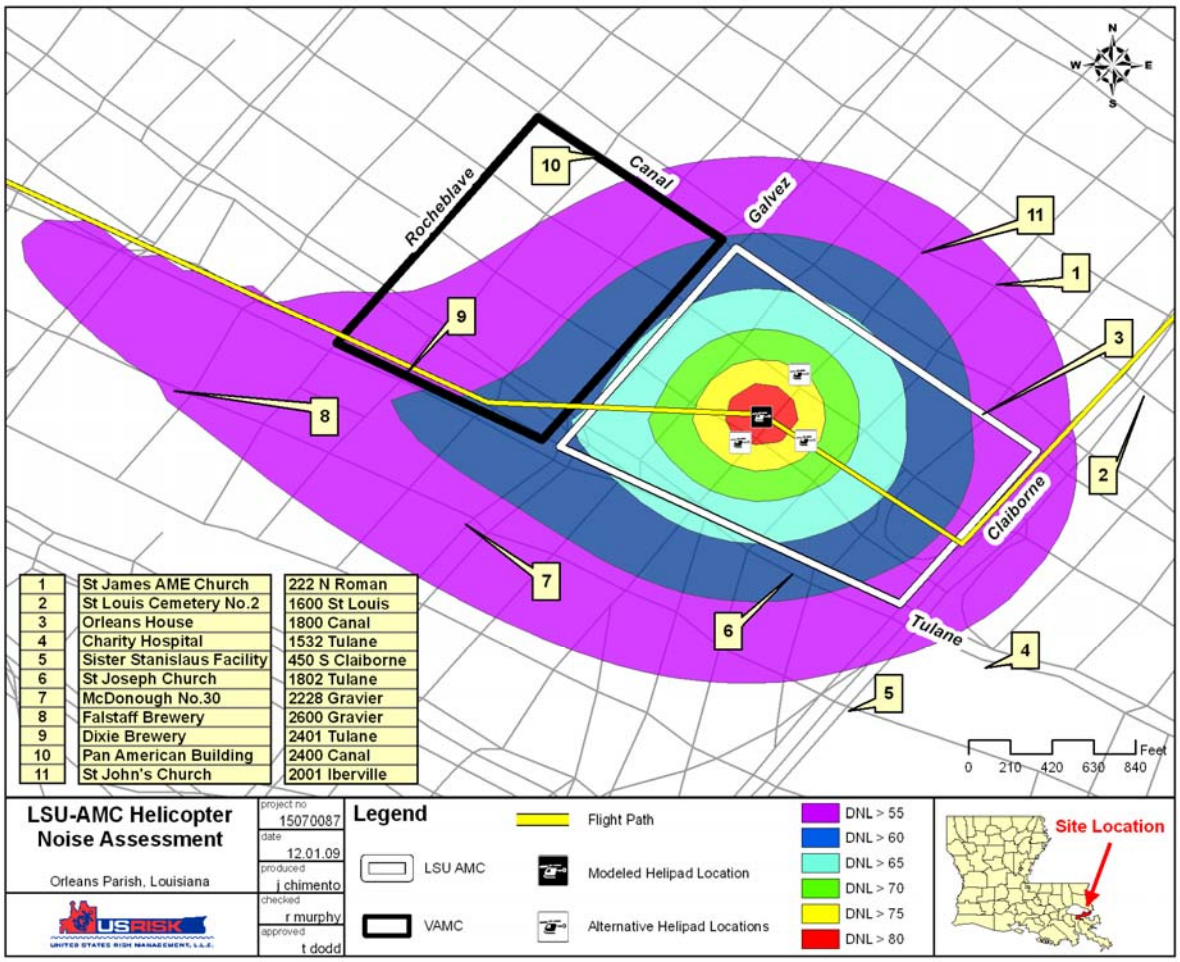
- **Windcone**: A windcone (windsock) shall be installed and lighted for nighttime operations. Lighted windcones are normally equipped with four 150-watt floodlights mounted at the ends of crossbars, and are usually equipped with red obstruction lights at the top of their masts. The floods shine down on the orange cone so that it remains illuminated in all quadrants. The downward-directed lights do not normally cause glare to nearby land uses. As an alternate, an internally lighted windcone shall be used. This system employs two floodlights inside the windcone that rotate with it rather than the four external lights.
- **Lighting Activation**: Activation of perimeter lights would occur only when a helicopter is on approach. Two remote activations are feasible:
  - Manually switched from inside the hospital: This would minimize energy usage and lamp replacement costs but would require that staff is available to activate lighting when an aircraft is inbound.
  - Pilot-controlled lighting: This system requires a radio receiver/lighting controller at the hospital. Pilots would tune the helicopter's communications radio to the receiver's frequency and key the microphone to activate the lighting. This would allow the pilot to activate the lighting when inbound, eliminating reliance on hospital staff. The weatherproof receiver/controller enclosure has a short whip antenna and can be located outside of the hospital in a secure location.
- **Lighting Deactivation**: Lighting deactivation can be set to a timer so that perimeter lighting would not remain on for a long period following departure of the helicopter.

Placement of the proposed helipad would be higher at the proposed UMC campus (approximately 73.5 feet above msl), in comparison to the location of the helipad used for the previous MCLNO facilities, which was located on top of the Superdome parking garage (approximately 30 feet above msl). Lighting associated with the helipad and helicopter would therefore be projected at the 70-foot level, thereby limiting associated lighting and glare impacts to the community due to helipad elevation.

3.12.2.2.2.2 Helicopter Noise

An overview of the UMC campus and the surrounding community along with the location of the proposed helipad as used for modeling purposes is shown in Figure 3-23. The helipad location is slightly different for all three alternatives. However, for purposes of this evaluation, the location was modeled at an elevation of 73.5 feet above msl towards the center of the campus area. The potential noise impacts presented are based on federal, state, and local laws and guidelines.

Figure 3-23: Results of Helicopter Noise Model



Helicopter Noise Modeling

Only FAA-approved noise models may be used for quantifying aviation noise exposure when preparing environmental documentation within the United States. The most recent version of the INM (version 7.0A) was used to model the noise environment from the UMC proposed helipad.

The INM calculation modules are based on data derived from standards documents produced by the Society of Automotive Engineers Aviation Noise Committee. This committee is composed of international research institutions, engineering firms, aircraft and engine manufacturers, and government regulatory agencies. The INM is designed to estimate long-term average effects using annual-average inputs. It is not a detailed acoustics model, therefore differences between predicted and measured values can and do occur. This is generally due to not averaging important local acoustical variables, or not explicitly modeling complicated physical events. The INM calculates the noise of the aircraft alone and, except for rare occurrences, does not incorporate any existing ambient or background noise into its results. The modeling does not account for any existing or projected buildings that may shield or otherwise affect the noise at a

location. Therefore, all noise results are aircraft only and are what would be experienced in an outdoor setting.

Noise Model Input

The INM requires an accounting of aircraft activity to include the numbers and types of operations (i.e., arrival, departure, and hover) for each aircraft type operating at the facility. For this assessment, estimates are based on information provided by UMC personnel for future operations involving helicopters. For the purposes of this analysis, one flight operation was modeled with the following assumptions:

- One transport per day (for modeling purposes, each transport consists of one arrival and one departure);
- One helicopter type UH60L Blackhawk;
- The helipad location selected for modeling purposes was generally located in the center point located between the helipad locations provided in the three design alternatives;
- Expected flight path used to arrive and depart the helipad was based on information provided by the Design Team;
- The default arrival and departure profiles contained in the model used were recommended by the INM User Manual;
- The model results accounted for noise impacts resulting from daytime and nighttime helicopter operations only.

Noise Modeling Results

Federal regulations have established that residential land use is compatible with cumulative noise exposure of less than 65 dB DNL for aircrafts. The modeling effort, as detailed by the modeling inputs above, determined that helicopter operations at the proposed helipad site fall within the greater than 65-dB DNL contour as identified in Figure 3-23. However, the 65-dB contour is predominantly within the proposed project site boundaries, and as the helicopter approaches the site the noise generated in the surrounding community would be less than 65-dB. Therefore, noise from emergency helicopter operations at the proposed helipad would be compatible with the existing land use in the surrounding community, as noise levels in these areas are currently above the 65-dB level. At this time, although the helicopter flight path has not been finalized, modeling results indicate that minimal changes in contour placement would be realized from alternate approach/departure paths, and no significant impacts would be realized in the surrounding area.

The maximum sound levels from individual helicopter operations are expected to be short in duration and are not incompatible with the current noise levels in the project area. As with some existing community noise sources, helicopter arrivals and departures may have the potential to interfere with speech recognition for short periods of time. Lower ambient noise levels at night

may make the helicopter noise more prominent for brief temporary periods. The immediate area around the UMC would hear the helicopter operations just as they currently hear buses and trucks on the elevated I-10 corridor and since helicopters have a unique sound, the community would know the sound source is a helicopter.

As stated previously, the neighborhood has existing noise exposure levels consistent with an urban environment. Ambient noise levels have been measured above 65 dB DNL, with a baseline range of 56.7 to 78.3 dB. When the helicopter noise is added to the overall background noise levels, the baseline range increases slightly to 57.2 to 78.5 dB. Therefore, noise impacts associated with helicopter operations is expected to be periodic, and minor.

4.0 CUMULATIVE IMPACTS

This section discusses the cumulative impacts that may be associated with the Proposed Action and alternatives in conjunction with other recent past, present, and reasonably foreseeable future activities within the project area. Cumulative impacts occur when the effects of an action is added to the effects of other activities occurring in a specific geographic area and timeframe. The analysis is based on CEQ's guidance: *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997).

The first step in the cumulative impacts analysis is to use the scoping process, including public meetings and investigative research, to identify those resources with the potential to experience significant cumulative impacts. To focus the cumulative impact analysis on the issues that are relevant to the eventual decision, the analysis took into account the nature of the affected environment (an urban environment surrounded by existing development), and the issues that would likely receive more than minimal direct or indirect impacts, either adverse or beneficial, from the implementation of the Proposed Action or the alternatives.

This SEA incorporates the findings of the PEA and FONSIs in regards to the cumulative impacts discussed for land use, cultural resources, and socioeconomics with respect to site selection. The potential cumulative impacts of the site selection of both the UMC and replacement VAMC were summarized in Section 4.5.2 of the PEA. The PEA concluded that the selection of the Tulane/Gravier site for the UMC and replacement VAMC would not substantially contribute, in conjunction with effects from other projects or activities in the City, to significant cumulative impacts on most components of the potentially affected environment (VA/FEMA 2008). This SEA also incorporates information into this cumulative impact assessment from the *Site-Specific Environmental Assessment for Veterans Affairs Medical Center (VAMC)* and FONSI issued on April 4th, 2010.

The PEA concluded the adverse cumulative impacts to which the Proposed Actions could substantially contribute would be impacts on cultural resources that may result from other redevelopment activities in the community. However, adverse impacts on cultural resources from the proposed activities on these sites would be avoided if possible and minimized to the extent practicable, and any remaining impacts would be mitigated such that they would not be significant. Mitigation measures were outlined in the PA and in Section 5.0 of the PEA. It is anticipated that all populations would greatly benefit from the expanded employment opportunities for construction, operation, and maintenance of the improved facilities.

This SEA further evaluates the cumulative effects for eight resources – aesthetics and visual quality, wind, light and glare, air quality, floodplain and stormwater management, cultural resources, noise and vibration, and transportation – in relation to the design, construction, and operation of the UMC in conjunctions with the replacement VAMC and other past, present, and reasonably foreseeable future projects.

The next step in the cumulative impact analysis is to establish the geographic scope and timeframe for the analysis. The geographic scope of this analysis was limited to those areas surrounding the project site including the MCHD , the Tulane/Gravier Neighborhood, and the proposed NOMHD within the CBD. The timeframe for this analysis is the period after Hurricane Katrina through the completion of the UMC in 2014. This timeframe was selected because of the substantial impacts that the disaster had on the City of New Orleans and FP&C's pre-Katrina plans. The geographic scope and timeframe selected is similar to that used by the VA in their SEA (VA 2010). This section also addresses potential cumulative impacts with respect to other projects in the area, most specifically:

1. the adjacent replacement VAMC (a 2.3 million square foot medical campus facility projected to open in 2014);
2. the Louisiana Cancer Research Consortium (a 10-story, 175,000 square foot structure currently under construction and scheduled to open in 2012);
3. the New Orleans Bio-Innovation Center (a 65,000 square foot, four-story facility currently under construction and scheduled to open in the near future); and
4. several apartment complexes that either are under construction or have been recently completed near the project area (Figure 4-1).

Figure 4-1: Location of New Developments in the Project Area

Source: VA 2010

Potential cumulative impacts resulting from construction and operation of both the UMC and replacement VAMC are anticipated to be similar for each of the design alternatives, and therefore are presented as a single cumulative impact analysis. Differences between the individual alternatives are addressed where appropriate.

4.1 AESTHETICS AND VISUAL QUALITY

As described in Section 3.2 of this SEA, aesthetics can be a function of size, placement of structures, visual appearance, open space and landscaping design, ease of access and integration with the surrounding area. These different aspects are discussed below in separate subsections that parallel the impact discussion in Section 3.2.2.

4.1.1 Setbacks and Landscaping

The setbacks of the proposed UMC buildings along Canal Street are consistent with the institutional buildings in the area. As shown in Figure 3-2, setbacks for existing buildings range from 47 feet – 90 feet from the street. The proposed setbacks for the UMC are 56 feet for courtyards, and 71 feet for the building edge. Setbacks for the replacement VAMC vary from 18 feet (at Dixie Brewery when the parking lane is removed) to 300 feet (D&T building to S. Rocheblave Street) (VA 2010).

Design alternatives for both the UMC and VAMC projects show landscaping and green spaces throughout the two campuses, with a variety of garden spaces and trees planted along the perimeter and throughout the campus facilities. Green space and landscaping can have a large impact on the aesthetics of an area. New Orleans in general has ample amounts of green space, due to parks, neutral grounds in the middle of the larger avenues and many trees planted along the smaller streets. Landscaping can create a visual screen and shelter or soften a view, which is important for the pedestrian experience.

In addition, the design alternatives for both facilities propose to retain and reuse existing major trees in the landscape design, where possible and to add additional native plants along the perimeters and pedestrian walkways, as well as throughout the campus. The proposed setbacks of the buildings for both the UMC and the VAMC would be consistent with those already present. These wide setbacks, along with landscaping, would assist to reduce the aesthetic impacts of the large buildings for all of the alternatives, creating a pedestrian-friendly area between the traffic and the buildings.

The designs of the Louisiana Cancer Research Consortium and the New Orleans Bio-Innovation Center include some street-side landscaping and green space. These structures, however, occupy a large portion of the properties upon which they are located, and provide few options for extensive green space. The cumulative impacts on green space from these two new buildings would be beneficial, but relatively small. The various new apartment complexes in the project area currently have no green space or landscaping visible from the street. It is unknown at this time if the Falstaff Apartments will incorporate landscaping into its final design, as renovations

continue while the building is being occupied (VA 2010). The contribution of these buildings to cumulative impacts on green space would be adverse, but minor.

4.1.2 Massing and Exterior

Existing massing in the vicinity of both the UMC and VAMC campus areas varies from small scale residential structures to larger industrial and commercial structures to very large commercial and institutional structures. Building heights in the immediate surrounding neighborhood are shown in Figure 3-4 and range from approximately 16-18 feet for residential buildings to 130 feet for St. Joseph's Church, and 125 feet for the Falstaff weather ball (NBBJ 2009b, and New Orleans Daily Photo, 2007).

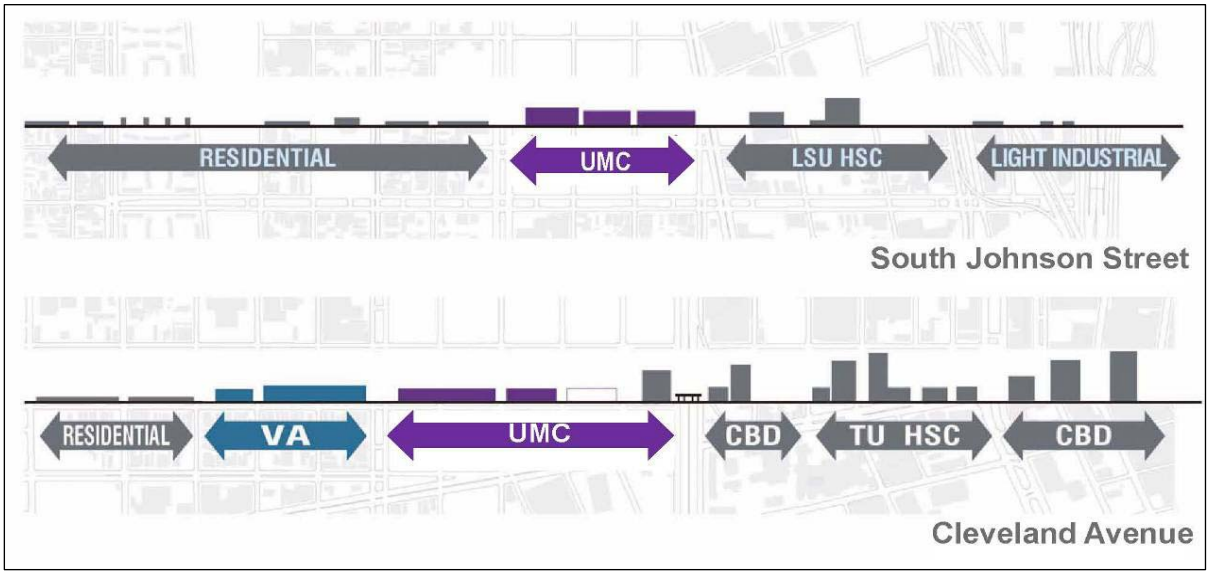
In the nearby CBD, just across I-10, structures are very tall with most of these buildings being are over 15 stories. For the Proposed Action, the tallest building on the UMC campus is estimated at 114 feet, which will be similar in height to the neighboring replacement VAMC, but smaller in height than the high-rise buildings situated across I-10. The tallest building on the replacement VAMC campus (the Outpatient Building) is estimated at 154 feet tall (the top of the Dixie Brewery cupola is 155 feet tall). The nearby Louisiana Cancer Research Consortium will be ten stories in height, the New Orleans Bio-Innovation Center will be four stories high and the new or renovated apartment complexes vary in height from approximately three to eight stories.

Projected massing near the project site is shown in Figure 4-2. This diagram illustrates the general progression of building heights from the residential neighborhoods to the downtown area (along Cleveland Avenue) and from the residential areas to the more industrial areas near I-10 (along S. Johnson Street). The transition from lakeside to riverside along Cleveland Avenue is relatively smooth, especially with the UMC design including building heights that are comparable to the institutional buildings in the project area, and the VAMC's design having larger setbacks, landscaping, and smaller structures along S. Rocheblave Street to transition to the residential area.

The other direction, along S. Johnson Street, presents a less smooth transition. The commercial structures along Canal Street and the adjacent large buildings of the LSU HSC soften the effect. Additionally, green space and setbacks would be used by both the UMC and VAMC along Canal Street to transition to the smaller scale buildings currently adjacent.

Overall massing associated with the UMC does not vary greatly between the alternatives, but rather serves as the cornerstone for placement of green space and landscaping, and the associated visual impacts. Alternatives 1 and 2 provide for placement of the Inpatient Towers along Canal Street with the entry plaza at the corner of Canal Street and S. Galvez Street. As discussed in Section 3.2.2.2, inpatient balconies, plazas and courtyards, which serve as sensory healing areas, would be located surrounding these buildings along Canal Street, whereas for Alternative 3 the location of these features would be along Tulane Avenue.

Figure 4-2: Projected Massing Near the Project Site

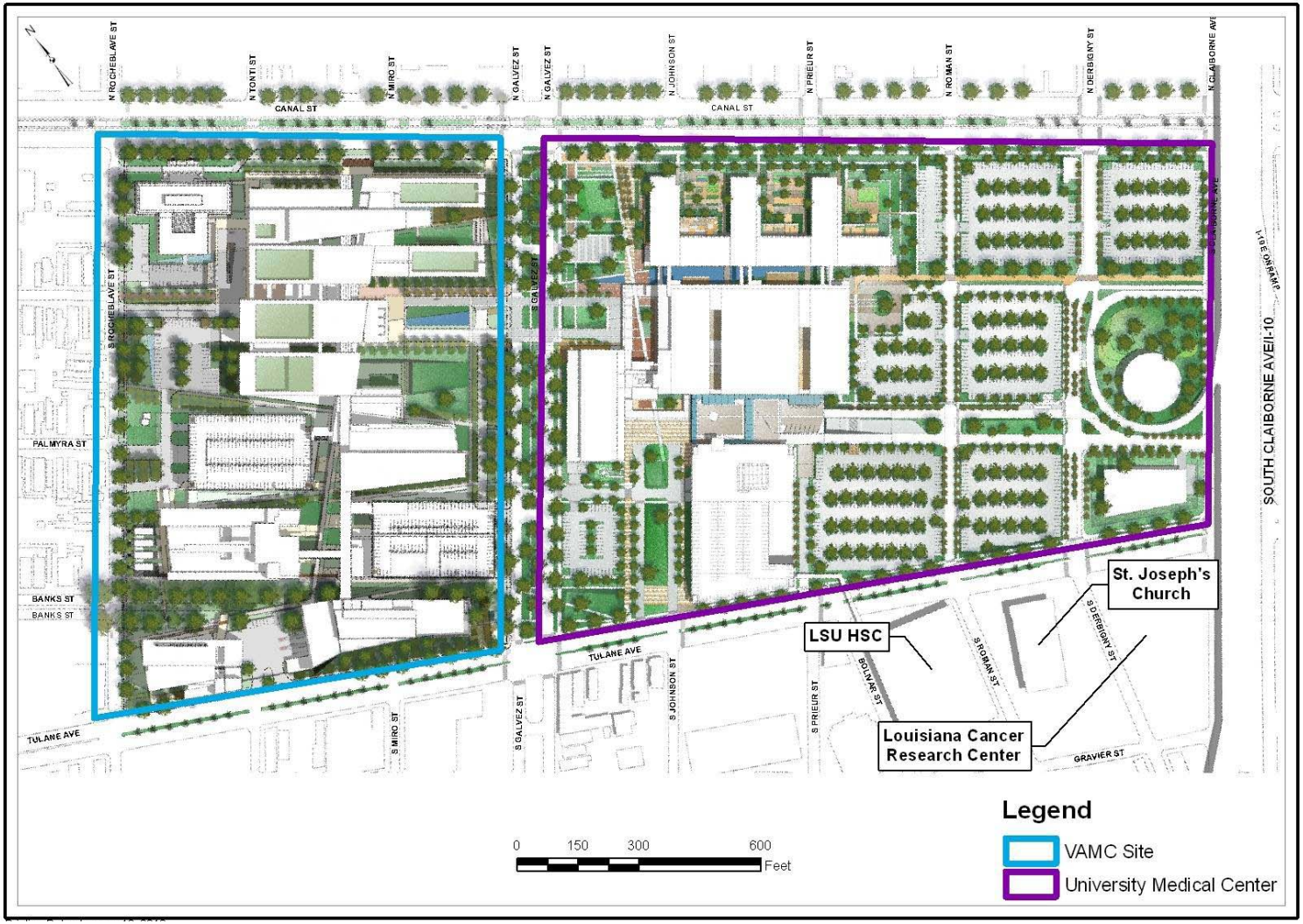


Source: NBBJ 2009b

Figure 4-3 is an aerial view of both proposed medical centers. It illustrates the massing relationship between the UMC and the replacement VAMC, and shows that the larger buildings would be concentrated towards S. Galvez Street, where the overall massing would create a consistent visual character. The landscaped perimeters of both medical facilities are also apparent. The massing of the UMC would be slightly different depending on the alternative chosen. One of the alternatives places the parking garage on Canal Street, while the others place it on Tulane Avenue. Parking garage placement would have minor impacts on massing in the area, as this structure is located closer to the street than the inpatient towers. Therefore, it would be perceived as a larger structure, even though it is not. Cumulatively, the placement of the garage would have minimal impacts as, regardless of placement, it would be adjacent to or across the street from other larger commercial or medical buildings. Additionally, although the setback of the garage would be smaller than for the other buildings, there would also be landscaping placed between the structure and the street, reducing the visual impact.

A pedestrian walkway would be used for staff and students to travel between the UMC and the LSU HSC, this walkway may also convey the infrastructure support to supply hot water and steam to the UMC campus. This walkway would cross Tulane Avenue at S. Prieur Street and attach to the existing LSU HSC walkway at Gravier Street. It is not anticipated that this walkway would have adverse impacts to the massing of the area as it will be small in relation to the existing and proposed structures. There may be a minor impact to the view down Tulane Avenue towards the CBD, but this view is already obstructed by the elevated freeway.

Figure 4-3: Rendering Illustrating the UMC and Adjacent VAMC with the Elevated I-10, St Joseph Church, and the LSU HSC



Source: NBBJ 2009b

Potential future expansion of the UMC could include constructing buildings on the surface parking areas adjacent I-10. However, this would not increase the massing in the area, due to their proximity to nearby tall buildings such as the Louisiana Cancer Research Consortium and other tall buildings in the CBD across I-10. The New Orleans Bio-Innovation Center is located within the CBD and would not be expected to add to the visual impacts associated with massing in the context of the Mid-City NRHD. Overall, the massing associated with the UMC, the VAMC facility, and nearby new institutional and residential buildings could potentially have adverse cumulative, but not significant, impacts on aesthetic resources in the project area. With appropriate design, setbacks, and landscaping, however, the effects of these changes would be reduced, and the visual impacts experienced by a casual passerby or a neighborhood resident would be minimized.

The design of the UMC attempts to avoid the institutional appearance characteristic of hospital designs, while at the same time replicating use of aesthetic elements found in New Orleans, as described in Appendix B. Such elements include slender vertical windows, balconies, sunshades, complimentary building materials and colors, and use of local vegetation. The external materials proposed for the UMC is a pre-cast concrete panel that simulates stucco, which is consistent with existing large-scale Mid-City institutional buildings. However, the panels do not have the maintenance requirements of stucco, and meet the requirement to withstand hurricane force winds and impacts.

The VAMC design includes similar features in addition to reflecting the architectural elements of the Pam-Am Building along Canal Street. The facade of the VAMC buildings would be visually broken up into smaller pieces by the wall angles, materials and window placement, resulting in less imposing structures. All of these design aspects have been used to lessen the aesthetic impacts associated with differences between modern and historic designs and materials (VA 2010).

The UMC and the VAMC would have similar types of façades and would use similar materials. Therefore, the cumulative aesthetic impacts of these two adjacent facilities on the surrounding area would be reduced. Nonetheless, since most of the residential structures in the area are wooden on the outside, some aesthetic changes in the area's appearance would occur. Due to structural, institutional, energy savings, maintenance and security requirements, neither the VAMC nor the UMC could be constructed of wooden or wooden-appearing materials. However, the perimeter of both existing sites are currently occupied primarily by commercial facilities and the building materials for the medical centers would be similar to the materials already in use in these commercial facilities. Therefore, the aesthetic impacts would be minimized with respect to the surrounding area. Figure 4-4 shows a rendering of the proposed UMC from the intersection of Canal and S. Galvez Streets illustrating repetitive window openings, shutters and balconies reminiscent of local New Orleans architecture. Figure 4-5 shows the main entrance and outpatient buildings of the replacement VAMC looking toward the southwest. The Patient/Visitor parking garage is visible in the distance on the far left side of the image. The Inpatient tower would be located off image to the right.

Figure 4-4: Rendering of the UMC from the intersection of Canal and S. Galvez Streets

Source: NBBJ 2009b

Figure 4-5: Main Entrance and Outpatient Buildings of the Replacement VAMC

Source: VA 2010

The Louisiana Cancer Research Consortium (Figure 4-6) and the New Orleans Bio-Innovation Center (Figure 4-7) are closer to the larger and more modern buildings of the CBD, and will use similar building materials to the UMC and the replacement VAMC. The New Orleans Bio-Innovation Center is located within the CBD and is not expected to add to the visual impacts associated with placing modern designs and materials in the context of the MCHD. The Louisiana Cancer Research Consortium would be complimentary to the nearby CBD and the LSU HSC; however, it would be in contrast to the historic St. Joseph's Church immediately adjacent to the facility.

Figure 4-6: Louisiana Cancer Research Consortium located at S. Claiborne and Tulane Avenue

Source: New Orleans BioInnovation Center (NOBC) 2010

Figure 4-7: New Orleans Bio-Innovation Center

Source: NORBIC 2009

The various new apartment complexes in the project area have different designs and materials. The Falstaff Apartments have been built within the renovated Falstaff Brewery, which retains the existing external appearance (Photos 4-1, 4-2, and 4-3). In summary, the contribution of the massing and exterior materials for the Louisiana Cancer Research Consortium, and the New Orleans Bio-Innovation Center and new apartment complexes to cumulative impacts on aesthetics would be minor.

Photo 4-1: Falstaff Apartments on the corner of S. Gravier and S. Broad Streets

Source: VA 2010

Photo 4-2: Crescent Club, 3000/3100 Tulane Avenue

Source: VA 2010

Photo 4-3: Marquis Apartments, with the Falstaff Apartments visible to the right

Source: VA 2010

4.1.3 Summary of Cumulative Impacts on Aesthetics

In summary, cumulative impacts on aesthetics due to the combined implementation of the UMC, the replacement VAMC, the Louisiana Cancer Research Consortium, the New Orleans Bio-Innovation Center and the various new apartments in the project area would be either beneficial or minimally adverse. Cumulative aesthetic impacts due to massing and exterior materials could be adverse, but due to design measures taken to better integrate the facility into the surrounding area, are minor. Cumulative impacts on landscaping and green space would be beneficial.

4.2 WIND

Cumulative impacts due to wind velocities and patterns in the project area are possible. Changes in wind resulting from the UMC and from other new developments would be analyzed as the design process progresses further. It is anticipated, however, that no wind tunnels or other unpleasant wind-related circumstances would be created by the construction of the UMC and the VAMC. The distances between the buildings, the relative angles of the buildings and site landscaping are expected to reduce this possibility. Because the other new construction in the project area is not immediately adjacent to the UMC site, there is little likelihood they would contribute to wind impacts. Therefore, it is anticipated that there would be only minor adverse cumulative impacts on wind velocities and patterns, as a result of constructing the two medical centers.

4.3 LIGHT AND GLARE

4.3.1 Construction and Operation

Lighting in the project area is currently supplied by street lamps along the larger arterials and the smaller side streets. The construction of the proposed UMC and VAMC, in conjunction with other new development in the area would increase lighting sources. The UMC and the replacement VAMC would both have some active lighting at all hours of the day. This would result in both beneficial and negative impacts. The beneficial impacts include an increase in general neighborhood security, since increased street lighting would decrease the likelihood of criminal activity.

There are several City ordinances regarding lighting in public places, these are discussed in Section 3.4. All City lighting ordinances would be adhered to by both the UMC and replacement VAMC during the construction process and the operational period. It is expected that all new development in the area would also comply with City lighting codes. Negative impacts resulting from added lighting include the potential for increased glare and unwanted spillover into adjacent residential neighborhoods. This is less of an issue for the UMC project because there are few residences adjacent to the site.

During the design phase of the UMC project, a lighting survey was conducted, and it was established that current lighting in the area consists of Zone E2 or E3, or of low to medium

ambient brightness according to the Illumination Engineering Society of North America (IESNA) G-1-03. This generally means that the residents are adapted to relatively high ambient light levels. Light levels would increase in the area due to the UMC, and more specifically due to the helipad operations, because of safety requirements. The UMC would both adhere to the City's lighting codes and impose restrictions regarding lighting, especially at night. Lighting would be task specific. Areas that need more light would be brighter than areas that do not, reducing potential ambient light in the area. For example, the emergency entrance and loading docks would be maintained at higher light levels than the patient buildings. Therefore, brighter areas of the facility would be located in the interior of the campus, while lower light levels would be found around the exterior, in the parking lots and in patient quarters. Additionally, nighttime-appropriate lighting schemes would be developed, while still providing adequate security for patients and staff. UMC lighting design measures may include canopy integrated and cut-off pole lighting, as well as integrated accent lights, landscaping lighting, occupancy sensors and reflective exterior lights. As this is an urban setting, and when considering that existing lighting from properties and roadways along the perimeter of the proposed site already contribute to light pollution, the UMC project would not significantly impact the surrounding area.

The design of the VAMC also includes several provisions that would decrease negative impacts. These include reduced lighting at night, anti-glare materials on windows, shielded lighting at the periphery, the use of reflective lighting instead of direct, the use of color specific lamps and bulbs and directional lighting (VA 2010).

All of the lighting designs and methods to reduce impacts would decrease the amount of light received by adjacent residential neighborhoods and would prevent light at the UMC and VAMC from interfering with traffic on both the surface streets and the elevated I-10.

The New Orleans Bio-Innovation Center and the Louisiana Cancer Research Consortium are also closer to the downtown area and therefore, farther away from the residential areas that may experience increased ambient lighting. This distance results in very little contribution to the potential for adverse cumulative lighting impacts. The apartment complexes will presumably have night lighting along the streets, but this is anticipated to have minor affects on the surrounding neighborhoods.

Adverse impacts from lighting and glare associated with the UMC and VAMC, in conjunction with other new development in the area, would be minimized by good lighting designs and thus the cumulative impact would be minor. Changes to the lighting in the project area would produce beneficial cumulative impacts due to security but adverse, minor cumulative impacts due to increases in adjacent neighborhood ambient lighting.

4.3.2 Helicopter Operations

The UMC and the replacement VAMC would both have the capability of receiving helicopters on site. The UMC would operate a helicopter landing pad on a regular basis, an estimated average of seven flights per week. The UMC helipad activities would likely result in some adverse visual

impacts from the takeoff and landing of the helicopters and the potential associated lighting requirements, particularly during evening operations. However, the UMC intends to develop a design plan including an evaluation of the placement of perimeter lights, windcone, and activation of lights only during active operations, and elevation of the helipad to minimize potential adverse impacts.

The VAMC helistop would be used only in catastrophic emergencies, such as a natural disaster. During normal operations, the helistop would not be visible or lit, and no equipment would be in place (VA 2010). Therefore, the VAMC helistop would not contribute to the cumulative aesthetic impacts and there would be no cumulative impacts due to helicopter operations.

4.4 AIR QUALITY

The existing Charity Boiler Plant would be used to provide hot water, steam, and chilled water to the UMC. The VAMC would construct a CEP on their site.

A dispersion modeling analysis was conducted for the proposed VAMC CEP/Warehouse. The analysis results determined that the CEP design did not require mitigation measures since all modeled pollutants resulted in levels below the NAAQS thresholds, inclusive of the worst-case scenarios, with the highest levels of existing background emissions.

Estimates of the total emissions from the VAMC's proposed new CEP and the modifications to the existing Charity Boiler Plant are shown in Table 4-1. The existing stack height on the Charity Boiler Plant would not need to be changed, nor would a new permit need to be acquired. A permit modification, however, would need to be filed by Entergy Thermal.

Table 4-1: Estimates of emissions from the proposed VAMC CEP and Charity Boiler Plant

Pollutant	Emissions from Upgraded Charity Boiler Plant	Emissions from Proposed VAMC CEP
PM_{10}	8.63	3.29
SO_2	0.68	3.06
NO_x	90.86	46.30
CO	95.41	9.98
VOC	6.25	3.73
CO_2*	136,295.29	1,717.73

Source of VAMC CEP numbers: VA 2010

The proposed VAMC CEP and UMC Utility Building are located approximately 1,825 feet apart along Tulane Avenue. The VAMC CEP and the Charity Boiler Plant are approximately 0.6 miles apart. Given the size of the facilities and the separation distances, there are no anticipated

cumulative impacts. Both facilities would coordinate with the LDEQ regarding air permitting. Any potential adverse impacts would be addressed or minimized through these individual processes. Therefore, no significant cumulative impacts are anticipated.

4.5 FLOODPLAIN AND STORMWATER MANAGEMENT

Under Executive Order 11988, Floodplain Management, Federal agencies funding and/or permitting critical facilities are required to avoid the 500-year floodplain or construct the facility to the 500-year flood elevation. Federal agencies use the 500-year flood elevation, which is the area that has a 0.2 percent chance or greater of being flooded in any given year. Floodplains are established by FEMA and are shown on Flood Insurance Rate Maps (FIRMs) or FHBMs for all communities that are members of the National Flood Insurance Program. The best available source for floodplain data for Orleans Parish is the preliminary Digital Flood Insurance Rate Map (DFIRM). The 500-year flood elevation for both the UMC and replacement VAMC sites is 12 feet above msl (FEMA 2009). The proposed sites for the UMC and VAMC are within both the FEMA 100-year and 500-year floodplains. The topography of the area surrounding the sites is relatively flat. Elevations on the replacement VAMC site range from -1.67 to -4.53 feet below msl (VA 2010), and elevations on the UMC site generally range from -2 feet below msl to 0 feet msl (USGS 1998).

Both sites are currently heavily urbanized with a high level of impermeable surfaces (buildings and pavement), approximately 76 percent impermeable for the replacement VAMC site (VA 2010), and approximately 89.6 percent impermeable for the UMC site. Currently there are few, if any, comprehensive stormwater management measures in place as both sites consist of a number of individual residential and commercial parcels. The design for the replacement VAMC would have a gross impermeable area of approximately 59 percent (VA 2010), while the new UMC would have approximately 84.3 percent impermeable surface. This would equate to an overall decrease in the impermeable area over both of these sites. The remainder of the area on both sites would be landscaped. The reduction in impervious areas would contribute to minor beneficial cumulative impacts to stormwater runoff from both facilities through the increased absorption.

In addition, sustainable design features would provide for significant improvements in stormwater runoff management for both sites. On both sites, storm drains, catch basins, and rainwater infiltration areas (bioswales) would be strategically placed to maximize drainage, improve the water quality of stormwater discharged to the city's storm drain system, and to assist in maintaining a runoff rate that is no larger than what is at the site now.

In addition to the above-described landscaping features on both sites, the UMC and replacement VAMC include several other design measures intended to reduce runoff from the sites to the city system. The proposed improvements to the site mentioned above would effectively reduce the volume and peak flow rate of runoff generated at both sites during a rain event. Hydrologic calculations for normal storm events show that the runoff flow rate draining to the S. Galvez Street box culvert from the UMC site following development would decrease by approximately 11

percent in comparison to existing conditions. On the VAMC site, the runoff flow rate would decrease by approximately 25 percent (VA 2010). During construction, contractors on both sites would use BMPs to control sediment transport and minimize stormwater runoff.

Site design measures as described above, would actually provide for better management of stormwater than under current conditions in the project area whether from reductions in flow rate or increased retention capability during larger storm events (using stormwater retention tanks.

The various new apartment complexes in the area either are existing buildings or have been built at grade. These structures would not add to the cumulative impacts to floodplain management in the project area. Therefore, there would be no cumulative adverse impacts to the floodplain because of the UMC and replacement VAMC. There likely would be beneficial cumulative impacts because of less runoff entering the drainage system near the two projects. It should be noted that the stormwater management measures that would be employed on both campuses to control the rate of stormwater runoff would neither worsen nor correct existing, unrelated, drainage problems in the surrounding area.

4.6 SOLID, HAZARDOUS, AND BIOMEDICAL WASTE

4.6.1 Construction

Phase I Environmental Site Assessments are currently being performed as part of the land acquisition activities. As such, several properties have been identified as having asbestos containing materials and also USTs and ASTs, which would be removed prior to construction. Only one (1) property has currently been identified as requiring removal of contaminated soil and has identified USTs associated with removal of the contaminated soil. The extent of soil removed could range from 60 cubic yards – 300 cubic yards depending on the extent of tank fill material and contamination found Performance of remediation activities and removal of the ASTs and USTs within the UMC and VAMC footprint areas prior to construction would have a positive impact on the environment. In addition, abatement of buildings found to have asbestos containing materials would also have a positive impact on the environment.

The total volume of wastes generated during construction efforts for both facilities are expected to have minimal impacts on the landfill capacity or life of a designated "Type III" landfill that accepts construction and demolition debris. Both facilities will have a Waste Management Plan to minimize the amount of solid waste that goes to the landfill. The waste management plan, including components for recycling and salvage, would be developed by the contractor in an effort to divert waste from the landfill for recycling or reuse. Included in this plan would be efforts to segregate wastes to reduce potential contamination and allowing for the diversion of waste to other disposal facilities.

4.6.2 Operations

Based on the amount of wastes generated at the former MCLNO facility, UMC operations personnel project a 20 percent reduction in this quantity during operation of the UMC, because of a

reduction in bed capacity and associated staffing needs in comparison from the former facility. No new types of wastes are expected to be generated at the UMC facilities. The VAMC is expected to produce small amounts of additional wastes due to the larger size of the facility and additional research capacities. This includes solid wastes, hazardous wastes and medical wastes (VA 2010). Waste management at both facilities would be performed in accordance with regulatory requirements and both facilities would encourage recycling and minimization programs to the best extent practical.

It is not anticipated that the Louisiana Cancer Research Consortium or the New Orleans Bio-Innovation Center will contribute substantial amounts of additional solid and biomedical waste. The residential complexes will add to the solid waste only. Solid wastes will still be collected by the city sanitation department. It is anticipated that the increase in waste from the replacement VAMC, the UMC, the Louisiana Cancer Research Consortium, the New Orleans Bio-Innovation Center, and the apartment complexes in the area will not impact either the collection process, or the capacities of the local landfills which receive solid waste (VA 2010).

An increase in the amount of general hazardous material will occur, due to the need to store fuels and supplies for emergency use. This increase in stored materials results in an increased potential for accidental releases to the environment. This increased risk will be minimized with the use of site management and emergency plans at both medical facilities. Therefore, there will be minor adverse cumulative impacts to the project area with respect to waste, but with appropriate management, the risks to the neighborhood will be minimal. Additionally, Phase I ESAs are being conducted for both the UMC and VAMC sites on all the parcels. Therefore, cumulative impacts could also be environmentally beneficial as existing contamination is cleaned prior to construction and would have stricter waste management in place during operations.

4.7 INFRASTRUCTURE

The water, sewer, drainage, electrical and natural gas supply and telecommunications systems in the area could be impacted by the new developments in the area due to the age and condition of these systems in New Orleans. As reported in the PEA, according to the S&WB and Entergy, existing infrastructure in the Tulane/Gravier area is sufficient to accommodate both medical complexes (VA/FEMA 2008). The Cox Communications hub will remain on the UMC site, resulting in no service interruptions. Some modifications to the city infrastructure in the project area are proposed in conjunction with the UMC and/or replacement VAMC. Additionally, the City is currently in the process of repairing and upgrading many of its services. These modifications, repairs and upgrades should result in little or no permanent adverse impacts to the infrastructure in the area, and should improve the systems. Future development, which may occur as a result of these projects, could impact the infrastructure. It is anticipated that the City will make additional modifications as necessary. Minimal temporary service interruptions may occur during the construction of both medical facilities. As it is anticipated that the facilities will be in various stages of construction at any one time, these interruptions are unlikely to have cumulative impacts.

4.8 CULTURAL RESOURCES

Cultural resources include archaeological remains and historically significant structures. These resources are addressed in depth in Section 3.10 of this SEA, Section 3.5 of the PEA, and in the PA with respect to the UMC and replacement VAMC projects. Since the PA was written and executed during the Tier I analysis and has stipulations for both proposed medical complexes, the cumulative impacts to cultural resources have already been determined and are addressed in Section 4.3 of the PEA. Both facilities have requirements stipulated in the PA that must be satisfied in accordance with Section 106 and therefore, any cumulative impacts with respect to these facilities are mitigated by the measures outlined in the executed PA.

The various apartment complexes in the area could potentially contribute to the cumulative impacts to cultural resources. The Falstaff Apartments will retaining the existing building; therefore, no impacts to cultural resources are anticipated, as there would be no excavation or demolition of structures. The newly constructed apartment complexes may have contributed to cumulative impacts on cultural resources in the project area, particularly with respect to historic structures.

The Louisiana Cancer Research Consortium and the Bio-Innovation Center are being constructed on land that was previously disturbed, therefore it is unlikely that intact archaeological resources were present or impacted. These parcels were also not occupied by the original structures immediately prior to their construction. Therefore, any impacts to cultural resources with respect to historic structures at these new developments would have already occurred, which would result in no additional cumulative impacts from these sources. In summary, impacts to cultural resources as a result of the UMC, VAMC, and the other new development in the area is expected to be minor due primarily to the mitigation measures outlined in the PA.

4.9 NOISE AND VIBRATION

Existing ambient noise levels in the project area are relatively high due to the presence of elevated freeways and major arterial streets. Additional noise sources include airports, railroads and infrequent emergency vehicle sirens. Operation of the UMC and replacement VAMC medical facilities is projected to result in a slight increase in traffic levels in the area. Additionally, construction and operational noise generated by the facilities would temporarily add to the ambient noise levels.

4.9.1 Traffic

Compared against the calculated noise level in the survey, the ambient noise measurements recorded at the site ranged on average between 56.7 dBA to 78.3 dBA, with the majority of the site above 65 dBA. However, ambient noise levels measured along the periphery of S. Claiborne Avenue, Canal Street/S. Prieur Street corridor, and Tulane Avenue/S. Prieur Street corridor exceeded levels of 75 dBA.

For purposes of the cumulative impact assessment of traffic noise, the traffic volumes used were obtained from Traffic Impact Studies conducted by Urban Systems (2009 and 2010). This was because this report included traffic inputs from the UMC, the VAMC, the Louisiana Cancer Research Consortium and the New Orleans Bio-Innovation Center. The number of vehicles was projected to increase along the major access roads off-site. The resulting traffic noise increases were calculated by comparing the estimated future traffic conditions to the existing baseline conditions. The cumulative increase in traffic noise levels due to operation of the two medical facilities was projected to be 0 to 2 dBA, which is below a perceptible level. The UMC noise analysis predicted that traffic noise levels would be consistent with current levels. Additional traffic noise would result from the development of the new apartment complexes along Tulane Avenue. Some of those apartments were already occupied when the traffic study was completed in 2009 and, therefore, were reflected in the analysis. The traffic noise due to the remaining apartment complexes is expected to be less than that generated by the medical facilities. Thus, cumulative impacts on noise from increased traffic associated with the UMC in conjunction with other new development in the project area would be negligible.

4.9.2 Construction

4.9.2.1 Noise

Permitted construction noise is exempt from city ordinance in residential areas between the hours of 7 am and 6 pm. Significant noise associated with construction activities on the UMC and replacement VAMC are expected to occur during these hours. Pile-driving operations are expected to be the loudest construction activity with a maximum noise level of 101 dB. Based on 101 dB as the worst case, construction activities for the UMC would create temporary noise impacts above 65 dBA to a limited number of receptors within 1,000 feet of the site. There are ten noise sensitive receptors within this 1,000-foot area (see Table 3-10). Two of these receptors would experience construction noise levels less than 65 dB, five would experience noise levels that are greater than 65 dB but less than 75 dB, and three would experience levels that are greater than 75 dB. Since the ambient noise levels in the project vicinity range from 56.7 – 78.3 dB, and since the receptors that are closer to the site are also closer to I-10 and have the higher ambient noise levels, the overall impact of the construction noise would be minimal. The residences that are closest to the proposed UMC are located across Canal Street beyond a commercial corridor, and are at least 300 feet from the UMC site. While the pile driver would produce 101 dB at the construction site, by the time it reaches the receptors the noise level is reduced.

As part of the noise assessment for the VAMC, six different pile-driving scenarios were evaluated using various schedule and rig combinations. Within the six scenarios, there are 11 locations on the replacement VAMC site where pile-driving would occur. Six of the pile-driving locations had noise sensitive receptors within 300 feet. As stated previously, while the pile driver would produce 101 dB at the construction site, by the time it reaches the receptors the noise level would be reduced. The nearest residences to the VAMC project site are across S. Rocheblave Street in an area that has an increased design setback, with the closest distance being approximately 185 feet

from the pile-driving activities. Using the assumption that noise levels on the VAMC site range between 56.7 to 78.4 dBA, the assessment shows that pile-driving noise at these sensitive receptors would range from 75 to 85 dBA due to the noise reduction because of travel distance (VA 2010a).

The Louisiana Cancer Research Consortium is currently under construction, but pile-driving is complete. Construction of this building is also expected to be complete prior to the construction of the UMC or VAMC. Therefore, cumulative impacts from construction noise are not expected from this project. The New Orleans Bio-Innovation Center and the various apartment complexes are located far enough away from the sites, and separated by major roadways so that construction noise at these locations would not contribute to potential cumulative impacts. Also, the New Orleans Bio-Innovation Center and the various apartment complexes are not anticipated to require any pile-driving; therefore, construction noise at these locations would be limited to other equipment on site.

Nearby residents would experience some adverse cumulative impacts from noise during construction of the UMC and VAMC. However, these impacts would be short-term and, due to the restricted hours of construction activities permitted by the City, would not occur during the sensitive nighttime hours.

4.9.2.2 Vibration

Construction vibration is addressed in Section 3.11.2.2.3 of this SEA. In addition, an analysis presented in Section 3.7.2.2 of the VAMC SEA concluded that vibration levels from VAMC pile-driving was predicted to be 0.1 in/sec (VA 2010). This is less than the 0.25 in/sec (the U.S. Army Corps of Engineers Standard for New Orleans) and a level far below potential building damage (0.5 in/sec) or human discomfort thresholds (0.4 to 0.6 in/sec). It is likely that pile-driving activities at the UMC would result in similar vibration levels. A vibration monitoring program was developed for both the UMC and replacement VAMC construction activities with respect to potential damage to historic properties in the area (see Appendix G). The vibration monitoring program requires all construction activities to cease if vibration levels exceed an established threshold. Construction activities can only resume once the contractor has enacted measures to reduce vibrations to established acceptable levels.

Pile-driving is either complete or will not be employed at the other construction projects in the area that are included in this cumulative impact analysis. Considering that projected vibration levels from the most intensive construction activities would be below damage or discomfort thresholds, there would be no adverse cumulative impacts from vibrations associated with the construction of the UMC and VAMC.

4.9.3 Operations

During the operation of the UMC and the replacement VAMC, some operational noise would be generated, including noise from the VAMC CEP, the UMC Utility Building and ambulance siren noise. The UMC Utility Building is located next to the elevated freeway, and any noise generated would be imperceptible in comparison to the traffic noise. The VAMC CEP has been designed

with noise attenuation measures in its exterior walls. Therefore, its operation would not contribute significantly to ambient noise in the area.

Although ambulance sirens are exempt from City ordinance, they still generate a large amount of noise for short durations. Emergency traffic en route to the UMC would use Canal Street and Tulane Avenue near I-10 and S. Claiborne Avenue using Derbigny Street as the campus access to the ER. Using Canal Street and Tulane Avenue as the primary ingress routes is consistent with historical routes servicing the former MCLNO facilities. The primary emergency ingress/egress route is approximately 300 feet from I-10 and runs parallel to the roadway arterials where ambient noise levels are generally high. The UMC ambulance bay is located in the center of the facility, and presumably, the sirens would be turned off upon entry to the facility. The temporary and intermittent noise from ambulance sirens would be minor and similar to that experienced currently on these roadways for vehicles enroute to the LSU Interim Hospital and to levels experienced prior to Hurricane Katrina when Charity Hospital was operational. Additionally, there are few residences immediately adjacent to the UMC. There are no residences on the Tulane Avenue side of the UMC and those on the Canal Street side would be partially shielded from siren noise by the commercial buildings lining Canal Street.

The replacement VAMC would not operate a trauma emergency room, though it is anticipated that there would be regular ambulance deliveries to the facility via the emergency entrance located off S. Rocheblave Street. Emergency medical vehicular traffic for the VAMC would travel Canal Street, Tulane Avenue, and S. Rocheblave Street. Ambulances delivering patients to the VAMC for longer-term care would not need to activate the sirens. All trauma patients would be taken to the adjacent UMC or another area medical facility (VA 2010).

The Louisiana Cancer Research Consortium, New Orleans Bio-Innovation Center, and new apartment complexes are not expected to generate much operational noise under normal conditions. Operation noise levels are expected to be similar to existing levels. Therefore, adverse cumulative impacts to noise levels from the operation of the UMC in conjunction with the VAMC and other development in the area, would be minor.

4.9.4 Helicopter Operations

Both the UMC and replacement VAMC would have the capability of receiving helicopters on site. Helicopter flights to and from the UMC would provide an additional source of noise to the surrounding community, particularly at night; however, the flight schedule would be intermittent and dependent on critical patient needs with an estimated seven flights occurring per week.

While helicopter sound is unique and immediately identifiable, the current ambient noise in the surrounding area has been measured to be above 65dB DNL with a baseline range of 56.7 to 78.3 dB. UMC modeling results indicate that helicopter operations would raise these noise levels to 57.2 to 78.5 dB. These noise levels are virtually identical to the existing conditions, and represent a negligible increase in the overall noise levels in the surrounding area as a result of helicopter

operations. Noise from the helicopters and ambulance sirens would be short lived and compatible with current noise levels in the area due to the proximity to the I-10.

The VAMC would only operate their helistop in catastrophic conditions. The helistop is the top deck of the parking structure and would be used for automobile parking under normal medical center operating conditions (VA 2010). During these extreme situations, it is expected that very few residents will remain in the area. As there will be few people in the vicinity to hear helicopter noise when the VAMC is using the helistop, it is unlikely that it would add to the cumulative impacts from the UMC helicopter operations (VA 2010).

4.10 TRANSPORTATION

4.10.1 Traffic

FP&C contracted Stanley Consultants to conduct a traffic impact study of the proposed UMC. The results of this study are described in Section 3.12 of this SEA, and used projected 24-hour trip generation numbers to evaluate the operational LOS for various roadways links in the project area. This traffic study also used an average growth rate of 2 percent. The study determined that by the year 2014, all links were expected to operate at a LOS D or better, except for the second site entrance at Tulane Avenue and Derbigny Street (LOS E). This is due to internal road closures that cause an increase of between 0.23 to 0.45 miles in travel distance, with a corresponding 78 seconds delay, to travel from one side of the site to the other. The study found that the arterial roadways that surround the UMC could accommodate the project-generated trips as well as the diverted traffic from roadway closures (Stanley Consultants, Inc. 2009).

Additionally, FP&C contracted Urban Systems, Inc. to conduct a traffic impact analysis. Urban Systems projected future traffic volumes associated with the proposed UMC and traffic generated by the VAMC, Louisiana Cancer Research Consortium, New Orleans Bio-Innovation Center, and residential and commercial uses under construction in the Tulane corridor (Urban Systems 2010). The results of the Urban Systems study were different from the Stanley study because Uraban Systems evaluated impacts on intersections and Stanley evaluated impacts on roadway links or segments.

Urban Systems estimated that 60 percent of trips generated by the proposed UMC are trips that are currently accessing existing medical facilities and are not considered new trips. The remaining 40 percent of site trips are considered a net increase because of the development. Table 4-1 shows the total and the net increase to background traffic in the CBD/Medical Center area from the proposed UMC for the AM and PM peak periods only. The net increase in volumes only refers to the changes in volume at intersections that are on the perimeter of the study area and that provide access to existing facilities and parking areas in the existing complex (Urban Systems 2010).

Table 4-1: Peak Hour Trip Generation Estimates for UMC

	Weekday AM Peak			Weekday PM Peak		
	In	**Out**	**Total**	**In**	**Out**	**Total**
4,000 Employees (future population)	932	362	1294	376	835	1211
2,500 Employees (current population)	586	228	814	241	535	776
Net Increase	346	134	480	135	300	435

Source: Urban Systems 2010

Urban Systems also projected traffic demand for other developments in the study area. Table 4-2 shows the vehicle trip generation estimates for the VAMC, Louisiana Cancer Research Consortium, New Orleans Bio-Innovation Center, and residential and commercial uses under construction in the Tulane corridor (Urban Systems 2010). These generated trips are also only during the AM and PM peak periods.

Table 4-2: Peak Hour Trip Generation Estimates for Other Developments

	Weekday AM Peak			Weekday PM Peak		
	In	**Out**	**Total**	**In**	**Out**	**Total**
VAMC	715	106	821	202	763	965
LA Cancer Research Center	180	37	217	30	172	202
NOLA Bio-Innovation Center	82	16	98	14	76	90
Tulane Corridor Development*	101	71	182	106	57	163

Source: Urban Systems 2010 * Estimated volumes reflect trips assigned to project intersections on Tulane Avenue

The trip generation data was used to estimate cumulative LOS intersection ratings for the remaining streets in the project area. As stated in Section 3.12.1, these ratings range from A, no delays, to F, unacceptable delays and congestion. A LOS of C is acceptable but beginning to experience some delays (Urban Systems 2009). The results of the Urban Systems traffic analyses for intersections near the UMC and VAMC are presented in Table 4-3 and, as previously discussed, include the cumulative impacts associated with the identified development in the area.

Table 4-3 Cumulative Projected Intersection LOS for Identified Development in the Area

Intersection	LOS - AM	LOS - PM
Signalized Intersections		
Canal at Claiborne	B	B
Canal at S. Derbigny	B	B
Canal at S. Galvez	B	B
Canal at Broad	B	C
Cleveland at S. Claiborne NB	B	B
Cleveland at S. Claiborne SB	C	B
Tulane at S. Claiborne	C	B
Tulane at S. Prier	A	A
Tulane at S. Galvez	B	C
Tulane at S. Broad	C	C
Bienville at N. Galvez	B	B
Unsignalized Intersections		
Canal EB at S. Roman	A	B
Canal WB at S. Roman	C	A
Canal at SB N. Roman	D	C
Cleveland at S. Derbigny/I-10 Exit Ramp	E	C
Tulane at S. Derbigny	B	B
Tulane at S. Derbigny NB	E	F
Tulane at S. Derbigny SB	B	C
Tulane EB at S. Roman	A	B
Tulane WB at S. Roman	B	A
Tulane at S. Rocheblave	B	C*
S. Roman at Tulane	F	F

Source: VA 2010 and Urban Systems 2010

* This is the overall LOS rating for the full intersection. The southbound traffic-flow of the S. Rocheblave Street portion of the intersection of Tulane Avenue and S. Rocheblave Street received a LOS of E. (VA 2010).

The results of the traffic impact analysis shows that the signalized intersections that provide access to the UMC and the other proposed developments in the study area can accommodate future traffic demands. There is sufficient excess capacity under current traffic demand and future traffic operations (Urban Systems 2010).

At the unsignalized intersections that provide access to UMC surface parking areas, however, substantial delay and congestion is expected. LOS F conditions are projected for S. Roman Street at Tulane Avenue. The congestion would be on S. Roman Street on the UMC site and would impact UMC employees leaving the parking lot during the peak hour, and attempting to turn left onto Tulane Avenue. Under current conditions, this movement operates at LOS E. The LOS could be improved by installing a traffic signal at the intersection of Tulane Avenue and S. Roman Street (Urban Systems 2010).

Additionally, LOS F conditions are projected for the northbound approach of S. Derbigny Street to Tulane Avenue. It should be noted that the projected PM peak hour capacity constraints at the intersection of Tulane Avenue at S. Derbigny Street are associated with traffic exiting the Louisiana Cancer Research Consortium garage during the PM peak, and are not specifically related to the UMC project (Urban Systems 2010). FP&C will be responsible for coordinating traffic signals in this area to mitigate this cumulative impact.

Southbound S. Rocheblave Street at Tulane Avenue had a LOS E during the PM peak hours. Urban Systems recommends modifying the traffic signal timing to give more green time for the southbound approach minimize any adverse impact on the LOS on S. Rocheblave Street at Tulane Avenue (VA 2010).

In addition to implementing a traffic signal control at the intersection of Tulane Avenue and S. Roman Street, Urban Systems recommends further minimizing any adverse impact on the LOS by coordinating the new traffic signal with the existing signals (Urban Systems 2010).

Both the UMC and VAMC traffic studies concluded that the addition of the facilities would only have a minor impact on travel times and distances. The results of the cumulative traffic analysis indicate that the existing roadway network has sufficient capacity to support the UMC, VAMC, Louisiana Cancer Research Consortium, and New Orleans Bio-Innovation Center. However, cumulative adverse impacts on transportation from the proposed UMC would be significant in the intersection at S. Roman Street and Tulane Avenue where a LOS F is expected.

A Tulane Beautification Project is currently being evaluated by the LADOTD and the RPC. The scope includes modifications to Tulane Avenue. The current conditions along Tulane Avenue include three travel lanes and a parking lane in each direction with a median. Proposed changes would include a wider, landscaped median and would allow for two travel lanes bike lanes and parking lanes in each direction. The larger, landscaped median would have median cuts and turning lanes in selected areas. As this project is still under consideration, LADOTD will evaluate the impact of these changes through use of traffic modeling once the design is developed. This modeling will incorporate the traffic volumes projected from the VAMC and UMC facilities, as well as additional developments in the surrounding area. The LADOTD would modify the design or add mitigation measures such as traffic signals or signal sequencing to accommodate the projected traffic.

All three traffic studies determined that the existing arterial roadways could accommodate the additional traffic generated by the projects, although there would be minor increases in travel times due to the street closures. The functionality of some intersections would be reduced, and mitigation measures were suggested to alleviate any traffic impacts. To improve LOS on S. Roman Street at Tulane Avenue, Urban Systems recommended adding a traffic signal at Tulane Avenue and South Roman Street (Urban Systems 2010). To improve LOS on S. Rocheblave Street at Tulane Avenue, Urban Systems recommended installing a signal at the corner of Tulane Avenue and S. Rocheblave Street with left turn phasing, and modifying the signal timing at the intersections of S. Broad Street and Tulane Avenue, and S. Galvez Street and Tulane Avenue, giving more green time for the southbound movements.

4.11 SUMMARY OF CUMULATIVE IMPACTS

In summary, the UMC, in combination with other known development in the area, would not be expected to contribute to significant adverse cumulative impacts on aesthetics, air quality, floodplain, wastes, noise, infrastructure, cultural resources. Due to design measures implemented, cumulative aesthetic impacts due to massing, design and materials are expected to be minor.

Cumulative impacts on green space would be beneficial, and changes to the lighting in the project area would produce beneficial cumulative impacts due to security but adverse, minor cumulative impacts due to nearby neighborhood ambient lighting. There would be no additional cumulative impacts on wind velocities and patterns and no additional cumulative aesthetic impacts due to the helipad.

With the implementation of appropriate control technology and stack heights, and approval of an air permit, the cumulative impacts to air quality from both the UMC and VAMC would be minimized.

Nearby residents would experience some adverse cumulative impacts from noise during construction of the replacement UMC in conjunction with other new development in the area. However, those impacts would be short-term and, due the restricted hours of construction activities permitted by the City, would not occur during the sensitive nighttime hours. A vibration monitoring program was developed for both the UMC and VAMC construction activities with respect to potential damage to historic properties in the area. Pile-driving is either complete or will not be employed at the other construction projects in the area. Considering that projected vibration levels from the most intensive construction activity would be below damage or discomfort thresholds, there would be no adverse cumulative impacts from vibrations associated with the UMC and replacement VAMC. Cumulative impacts on noise from increased traffic associated with the UMC and replacement VAMC in conjunction with other new development in the project area would be negligible. Adverse cumulative impacts to noise levels from the operation of the UMC and replacement VAMC would be minor. The VAMC would only operate their helistop in catastrophic conditions. During these extreme situations, it is expected that very few residents will

remain in the area; therefore, it is unlikely that it would add to the cumulative impacts from the UMC helicopter operations.

Significant impacts have been identified on traffic as a LOS F is expected in the intersection at S. Roman Street and Tulane Avenue where a LOS F and S. Derbigny Street and Tulane Avenue. Mitigation is proposed to reduce the impacts below significance. This includes adding a traffic signal at Tulane Avenue and South Roman Street and coordinating traffic signals at S. Derbigny Street and Tulane Avenue.

5.0 MITIGATION

Throughout the SEA evaluation process, no significant impacts were identified. As part of the UMC project, FP&C committed to a design process that would avoid and minimize potential visual and land use impacts. This meant paying careful attention to crucial features like buffers, setbacks, building height, coloration, etc. in all design efforts.

5.1 AESTHETICS

The UMC's design efforts included extensive efforts to minimize potential adverse impacts to the aesthetics of the Tulane/Gravier neighborhood resulting from construction of the UMC. These efforts involved both the appearance of the UMC and its relationship to the existing surroundings, and potentially the appearance of the historic neighborhood itself. Extensive consideration was given to massing, building placement, external materials, green space and landscaping, and lighting in order to minimize the visual impact of the UMC to the area, with special attention to public and institutional comments received.

Measures to minimize massing included the design of building heights to be consistent with respect to the surrounding structures including the adjacent VAMC, St. Joseph's Church, the Louisiana Cancer Research Consortium and the New Orleans Bio-Innovation Center, while transitioning from high-rise buildings found opposite of I-10. Building and design measures have also included external materials that approximate or are compatible with the surrounding existing structures. Use of pre-cast exterior skin material that imitates stucco will be used in an effort to improve compatibility with neighboring large-scale commercial buildings, in addition to incorporation of shutters, sunscreens and balconies.

The facility design retained and enhanced green space along the perimeter of the facility, creating a welcoming aspect for the UMC campus, contributing to the minimization of potential visual impacts. This green space includes large trees along Canal and S. Galvez Streets and Tulane Avenue, and is designed to serve as a visual distraction from the larger buildings behind them. From street level, some of the larger structures will be partially hidden by the landscaping. Additional green space and landscaping will also be provided throughout the campus area. Setbacks have also been incorporated into the design for the buildings along Canal Street in accordance with neighboring large-scale commercial buildings.

The facility design included several measures that were intended to minimize lighting impacts. Screens were incorporated to shield the adjacent residential neighborhood from direct night lighting. Additionally, softer types of lighting, directional lighting and reflective lighting will be used to soften the color and shape of the ambient light. Night lighting has been reduced for most of the buildings, since clinics would not be operational at night, and patient rooms would be either dark or shaded.

As a general mitigation measure for the Tulane/Gravier neighborhood, the FP&C established a fund to promote the preservation and rehabilitation of contributing elements within the MCHD

through the Louisiana SHPO, as per the Stipulations in the PA. This mitigation measure was undertaken as an effort to reduce the impacts of the UMC on the MCHD , as well as to enhance the existing aesthetic environment in the MCHD .

5.2 FLOODPLAIN AND STORMWATER MANAGEMENT

The construction of the new UMC is estimated to result in an 11 percent reduction in the current stormwater runoff rate. Factors contributing to this decrease include changes to the topography, including slope increases and changes in the types of permeable and impermeable areas, primarily resulting from additional green space, the use of bioswales, strategically placed storm drains, and implementation of landscape design. The landscape would assist in diverting and channeling the water flow away from the buildings and surrounding area and into the storm drain system. Use and placement of bioswales and culverts would also be included in the design to assist in maintaining a runoff rate that can be managed by the established drainage capacities.

As part of the construction activities, FP&C would obtain a Stormwater permit. This permit is applied for under the LDEQ, Louisiana Pollution Discharge Elimination System, General Permit number LAR100000 - AI83363 Stormwater General Permit for Construction Activities five acres or more (LAC 33:IX.2511.B.14.j). The permit details specific items, which must be implemented in order to minimize stormwater runoff. The permit requires implementation of a Stormwater Pollution Prevention Plan, to include BMPs. BMPs would be employed to control sediment transport and minimize stormwater runoff at the construction site. Evaluation of typical BMPs would be detailed and include:

- Erosion and Sediment Controls
- Stabilization Practices
- Structural Practices
- Stormwater Management

The BMPs would conform with the EPA Guidance Manual, *Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices*, and would be detailed upon completion of the design, which is the standard procedure for these project types. The final BMPs would be detailed in a site plan, and are part of the contractor's requirements during demolition and construction activities. As required by law, a Notice to Intent (NOI) to discharge would be filed with the regulatory agency prior to the initiation of the construction activities and following implementation of the BMPs. No adverse impacts on the floodplain are expected during construction of the proposed UMC.

Additionally, Floodplain and Stormwater Management Plans must be coordinated with the New Orleans Floodplain Coordinator.

Critical activities in the new UMC facility must be place at an elevation of 20 feet NAVD88. Critical activities are those needed for the hospital to function after a flood.

5.3 TRAFFIC

A site-specific traffic impact study was conducted by Stanley Consultants in 2009 to evaluate the transportation and traffic impacts that may result from the proposed UMC project. The proposed project is expected to change the traffic patterns in the project vicinity, due to the closure of some local streets. The results of the study discussed impacts to the community in terms of increased driving distance (vehicle miles of travel, VMT), and travel time. In general, the closure of all roads currently passing through the proposed UMC site is expected to create a potential travel time delay of 78 seconds from one side to the other. Total travel distance would increase from 1.39 miles before closure of the interior campus streets to 2.72 miles after closure (diversion). This means that for the total traffic volumes currently using sections of these roads, daily VMT would increase from 791 vehicle-miles to 1,439 vehicle-miles. Average travel time from one side of the closed road to the opposite side is expected to increase from 28 seconds to 41 seconds, for a delay of 13 seconds compared to pre-closure travel time.

Additionally, FP&C contracted Urban Systems, Inc. to conduct a traffic impact analysis. Urban Systems projected future traffic volumes associated with the proposed UMC and traffic generated by the VAMC, Louisiana Cancer Research Consortium, New Orleans Bio-Innovation Center, and residential and commercial uses under construction in the Tulane corridor (Urban Systems 2010). From this data, projected intersection traffic volumes and projected LOS at all relevant intersections were calculated. The results of the cumulative traffic analysis indicate that the existing roadway network has sufficient capacity to support the UMC, as well as other development underway or planned for the area (Urban Systems 2010). Although there is sufficient roadway capacity, some intersections had less than optimal LOS. Urban Systems provided the following mitigation to improve traffic flow and utilization:

1. Implement traffic signal control at intersection of Tulane Avenue and S. Roman Street.
2. Coordinate new traffic signal with existing traffic signals (Urban Systems 2010).
3. Modify traffic signal timing at intersection of S. Rocheblave Street and Tulane Avenue to give more green time for the southbound approach (VA 2010).
4. Coordinate traffic signal timing at the intersection of S. Derbigny Street and Tulane Avenue.

These modifications would help to ensure that traffic flow in the area would be improved.

5.4 AIR QUALITY

Through the planning process, UMC changed their plan to construct a new CEP. Instead, UMC plans to obtain steam and hot water from Entergy's existing Charity Boiler Plant. The Utility Building (in the location of the former CEP) would house emergency generators and the building and associated stack would not exceed a height of 100 feet. The existing Charity Boiler Plant, which operates three 52.9 million British thermal units per hour (MMBTU/hr) natural gas boilers and one emergency generator would add two 52.9 MMBTU/hr boilers to its existing capacity,

and would route all emissions through the existing stack. The new boilers would be more energy efficient and would likely be equipped with modern control technologies such as low NOx burners and/or flue gas recirculation.

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Appendix A – Public Involvement

Appendix B – Design Development Process

Appendix C – National Flood Insurance Guidance

Appendix D – Existing Site Topography and Grading Plan

Appendix E – Correspondence

Appendix F – Noise Assessment Study

Appendix G – Vibration Monitoring Plan