

## CENTRAL LIBRARY

The Central Library is located in Fort Worth's central business district (CBD). The building occupies a prime location in the northwest quadrant of the CBD, at the intersection of 3rd and Taylor Streets.

**Official Name:** Central Library

**Building Address:** 500 W. 3rd Street

**Library Facility Code:** CEN

### Site Description

The building is situated on an urban lot of 2.39 acres, facing 3rd Street, with very limited landscaping. The topography of the site is almost flat, sloping downward from west to east. The primary maintenance responsibility for the site falls under the supervision of the City of Fort Worth Parks and Community Services Department. Routine maintenance includes landscaping around the building. Drawing CEN-1 illustrates the site of the Central Library (11" x 17" overleaf).

### Architectural Description

Construction of the original building was completed in 1972, with a major addition in 1993, and significant renovations in 1998 and 2008. The facility appears to be well built and in good condition. Drawings CEN-2 through CEN-4 depict the Lower Level, Plaza Level, and Upper Level of the Central Library, respectively (11" x 17" overleaf). Drawings CEN-5 through CEN-7 depict the square footage of each room of each Floor (also 11" x 17" overleaf) and as tabulated in Table A5.1.1.

**Square Footage:** There are currently 240,878 building gross square feet (bgsf) of which only 183,380 is currently being used for library service and administrative functions. There are 203,740 net assignable square feet (nasf) within the facility, of which only 149,202 is currently being used for library service

## Evaluations for both public & staff spaces of the facility

and administrative functions. There is shell space of 5,998 nasf on the east end of the Plaza Level and 38,343 nasf on the west side of the Upper Level - area that is unfinished and not air conditioned. The library currently shares the building with the City of Fort Worth's Cable Television operation, which occupies 10,197 nasf. Table A5.1.1 contains a floor-by-floor square footage summary for the facility.

**Table A5.1.1**

Existing Square Footage Tabulation, Room-by-Room, Central Library

### Summary

	<i>floor</i>	<i>net assignable square footage</i>	<i>building gross square footage</i>	<i>efficiency</i>
000	Lower Level	88,198.13	101,200.00	87.15%
100	Plaza Level	76,997.00	98,173.75	78.43%
200	Upper Level	38,544.38	41,504.52	92.87%
<b>TOTAL</b>		<b>203,739.51</b>	<b>240,878.27</b>	<b>84.58%</b>

The T/PW facilities database attributes 245,000 bgsf to the Central Library, which is an approximation of the enclosed space on all three floors of the building.

### Trade Area Population

The population within the 15-minute drive time trade area for the Central Library is 487,876, as determined by the Customer Analytics Consultants.

### Driving Distance/Time to Other Libraries

BOLD	1.49 miles	6 minutes
Shamblee	3.07 miles	6 minutes
Northside	3.03 miles	10 minutes

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### Demographics

Households	211,942
Persons age 17 and under	27.2%
Percent Asian	3.1%
Percent Black/African-American	20.4%
Percent Hispanic	40.2%

### Output Measures

The Library Consultants calculated a number of measurements of operating efficiency and their respective rankings among the 15 current FWL libraries. Table A5.1.2 summarizes our findings for the Central Library.

**Table A5.1.2**  
Output Measures, Central Library

<i>output</i>	<i>measure</i>	<i>ranking</i>
Contacts per capita	48.91	1 of 15
Cost efficiency per contact	\$3.05	13 of 15
Cost efficiency per SF to operate	\$21.55	1 of 15

### Collections

The current total collection size is 408,088 inclusive of the collections of the Local History, Genealogy, and Archives unit. At 0.84 items per capita, the collection does not compare favorably to the minimum standard of 2.00 items per capita.

The responsiveness of collections to younger core customers reveals that the population under 17 years of age is 27.2 percent of the total, and the combined Children's/Teen collections are 19.6 percent of total. The library materials and services more likely to be used at Central are Spanish Materials and Juvenile DVDs.

## Existing Facility Assessment

The space required to house the collections in an ADA/User-Friendly standard is 18,138 square feet, or 19.6% of the total building size.

### Computers & Seating

Based on the per capita number of computers provided for the public, the Central Library, with 104, will need a total of 26 additional public computers by 2020 to reach the "Enhanced" level.

The current public seating ratio, including computers, is one seat per 787 (1:787) collection items. This compares favorably to the central library standard of 1:800 to 1:1,000 collection items.

### Site & Building Capacity

The Central Library currently provides nine assigned parking spaces on site. As the Central Library of the Fort Worth Library System, the consultants recommend a total of at least 275 parking spaces for the current size of the Central Library (public, staff, and volunteers combined).

Staff workspace for public service functions (excluding Library System Administration) is 14.14% of total net assignable square feet (nasf) of the library space in the building, which appears adequate. In terms of square footage or percentage thereof, no standard has been recommended for central library workspace.

**Table A5.1.3**  
Site & Building Capacity, Central Library

<i>unit of capacity</i>	<i>current</i>	<i>2010 need</i>	<i>current vs.</i>
	<i>2010</i>	<i>to standards</i>	<i>standards</i>
Net assignable square feet	149,202	193,834	77.0%
Building gross square feet	183,380	242,305	75.7%
Site area, in acres	2.39	n/a	n/a
Parking spaces	9	275	3.3%

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### Growth Potential

**Adaptability:** The building is composed of open spaces, with typical structural spans of 27 feet both east-to-west and north-to-south on the all three levels of the building. One exception is the East Gallery, which is a clear span of 75 by 90 feet. Changes to the configuration of the spaces appear to be feasible, though the column spacing inhibits efficient layout of book stacks.

**Expandability:** Additions into the vacant space within the building are highly feasible. Using the area of the existing parking lot or Cable Television for future horizontal expansion could also be done, but would require a policy decision(s). It is not conceivable that vertical expansion could be achieved, given a preliminary analysis of the roof structure and the existing equipment mounted on the existing roof.

### Technology Assessment

Historic computer usage at the Central Library is presented below for fiscal years 2007 through 2009. See Table A5.1.4 for PC logins, PC logins to library visits, and wi-fi connections.

**Table A5.1.4**

Historic Computer Usage, Central Library

<i>service item</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>
PC Logins	93,986	83,307	80,281
PC Logins to Visits Ratio	25.9%	27.0%	27.2%
Wi-Fi Connections	n/a	190	624

**Computer Network:** The IT offices and server room for the library system are located in the Lower Level of the Central Library. The server room has a raised floor, which improves the flexibility in making additions, changes, and moves of equipment within the space. Network switches were recently upgraded to 1GB to improve performance.

## Existing Facility Assessment

Additional network drops are installed in the primary areas where public computers are currently located, providing some options for adding more computers or network devices and in locations of those systems. However, any relocation of the public computers would require re-cabling the space. Some spaces have been retrofitted with power and network connectivity as the use of the space changes, for example, the space currently occupied by the collection management team. While some power outlets and public reading tables are located next to each other, more are needed to support the wi-fi users. Wi-fi has been available at the Central Library since December of 2007.

**Public Computers:** A summary of the distribution of public computers is provided in Table A5.12.5 below. Computer reservation stations and print release stations are not included in the Adult Services quantity.

**Table A5.12.5**

Public Computer Distribution, Central Library

<i>computer location</i>	<i>quantity</i>
Public Access Catalog (PAC)	8
Adult Services	44
Intel Lab	26
Teen Services	8
Children's Services	18
<b>TOTAL</b>	<b>104</b>

On the Lower Level, a total of 52 computers are provided in the adult and Teen Services areas combined. On the Plaza Level, 18 computers are provided in the Children's Services area, and 26 in the Intel Lab. PACs are distributed throughout the public areas, including some in Spanish. Six are immediately available upon entering the building, in the Plaza Level Lobby.

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The Teen Services center includes eight Internet computers, and the Children's area includes 16 Internet computers, but the two Children's PACs can be converted to Internet as necessary. Reservation stations are conveniently located in areas of public computers. Two print release stations are provided on the Lower Level, one at each end of the space, conveniently located for customers.

Staff estimates that at least 25 more computers are required to supplement those on the Lower Level in order to meet demand. More than one staff member commented that the layout of the public computers in the Lower Level should be reevaluated. Four computers are provided in the Genealogy area, but staff believes that more are needed to meet demand. Using FY09 reports, Central ranks third highest in the system in the ratio of persons coming into the library compared to computer logins, with slightly more than one in four visitors logging into a computer during a visit.

**Public Technology:** A flat screen television mounted above the Circulation Desk serves as the digital signage system and to deliver news via cable TV. A material security system is installed. Both Children's Services and Teen Services provide gaming programs.

Customers request more copiers, scanners, and better printers. The location of the system for the hearing impaired may not be in the most ideal location. Micrographic equipment with digital imaging is needed, as well as systems that provide self-service digital scanning.

**Computer Training:** Most of the computer training is offered at Central. A primary focus is to develop job skills. Equipment in the lab was recently upgraded. The training lab includes 26 stations and two color printers. Classes are offered in English and Spanish. Children's staff is interested in offering training in the Discovery Center, using ten or twelve laptops.

## Existing Facility Assessment

**Self-Services:** A self-check station had been installed in the lobby but was relocated to another branch at the end of 2009. Use of the self-check was limited to less than one percent of all circulation (primarily check-out) transactions for Central during its time in use. The location of the unit was significantly determined by the availability of power and the ability to run a network connection to the location. However, the location away from the circulation desk, off by itself, worked against its success. A better location would be on the circulation desk or on a desk in line with the circulation desk. Staff also believes that the inability for customers to use credit cards at the self-check unit limited its use.

**Study Rooms:** Rooms in the lower level are equipped with power.

**Meeting Spaces:** The meeting room, Children's program room, and lecture hall are equipped to support the use of technology by presenters, including projectors and screens or video display panels.

**Technology for Staff:** A total of 165 staff computers are located at Central. Six computers are provided for checking-out materials. More than a dozen computers are provided for staff in the circulation workroom, some of which are used to check-in materials. However, in busy times, materials from the outside returns may be checked-in at the Children's Services staff computers or in the delivery area.

Materials are primarily returned to the Circulation Desk or to the two outside drive-up returns. Staff empties the outside returns every two hours. The outside return unit for non-book items is too small and is being replaced with a unit that holds more items. Staff does not encourage customers to return materials to the inside return. Materials returned there are deposited into a room for this purpose, but staff considers the room

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claustrophobic. The space, combined with some space from the workroom, could accommodate an automated return and sorter.

It is possible to have a conveyer, as part of an automated material handling system, move materials from an outside return which is located to allow drive-up returns, to inside the building, but such a system is expensive due to the need to go underground and significant distances. However, there are libraries that have such systems.

Materials returned before 3:00 PM are generally re-shelved that same day. Materials returned through the delivery system are checked-in at three computers in the delivery room.

Staff computers at service desks and workroom desks generally provide one computer per seat. However, staff did report shortages of staff computers, which means that staff must wait for a computer to be available in order to complete their assignments. Required software may not always be installed or be the current version despite the efforts of the IT staff.

No access to the catalog is available in the stacks, requiring staff to return to a PAC or a service desk in order to assist customers. Not all furniture was designed for technology, creating cramped spaces or spaces that are not the best ergonomic design.

Genealogy staff requested an additional scanner. Copy machines more conveniently located to staff work areas were identified as a need by staff. A computer is needed in the mailroom.

### Site Improvements

**G2010 Roadways:** No roadways are included on site. *composite rating: N/A.*

## Existing Facility Assessment

**G2020 Parking Lots:** An enclosed staff parking lot for nine cars, with seven spaces reserved for specific staff positions, is located near the northwest corner of the building. *composite rating: 4.*

**G2030 Pedestrian Paving:** Handicapped access to the public entrance appears to be compliant. All other egress points from the building also appear to provide an accessible route, with the exception of the shell space on the southeast end of the block. *composite rating: 4.*

**G2040 Site Development:** Lighting on the site uses metal halide lamps and appears adequate. One flag pole and one bike rack is provided at the public entrance on the south. *composite rating: 4.*

**G2050 Landscaping:** Small, mature trees are planted in the built-in planters on the north and south faces of the building. *composite rating: 4.*

**G3000 Site Utilities:** Underground utilities which appear to be available at the site include water, sanitary sewer, storm sewer, gas, power, cable television, and telephone. *composite rating: 4.*

### Substructure

**A1010 Foundations:** As indicated on the original construction drawings, the building utilizes a foundation comprised of steel-reinforced concrete grade beams supported by steel-reinforced concrete pier footings under each column and approximately 15 feet on center around the perimeter. No evidence of settlement was observed. *rating: 4.*

**A1030 Slabs on Grade:** Interior concrete floors are six-inch thick slab-on-grade type, reinforced with #4 and #5 re-bars, per the original construction drawings. No evidence of settlement was observed. *rating: 4.*

### Building Shell/Exterior Envelope

**B1020 Superstructure:** The original building's superstructure (Lower and east Plaza Levels) is comprised of load-bearing steel-reinforced concrete columns, supporting steel-reinforced concrete beams and floor slab. Eight-inch concrete walls provide lateral bracing around the perimeter of the Lower Level.

The superstructure of the addition (west Plaza and Upper Levels) is comprised of load-bearing steel columns, supporting steel beams supporting the floor and roof decks. Steel X-bracing provides lateral bracing around the perimeter. *rating: 4.*

**B2010 Exterior Walls:** The building uses an exterior insulation finish system (EIFS) veneer, backed by metal stud walls in most locations. Rigid insulation is covered with a thin layer of stucco. *rating: 4.*

**B2020 Exterior Windows:** Window units are a combination of fixed and operable insulated glass in aluminum frames. An aluminum storefront spans the main public entrance on the south of the building, using fixed insulated glass in aluminum frames. Glass is heavily tinted to the point of obscuring views into the facility at night. *rating: 3.*

**B2030 Exterior Doors:** The main entrance doors are automatic opening type, made of aluminum with vision glass, which appears to be tempered. Staff entrance doors are also made of aluminum with tempered vision glass. All other exterior doors in the building are hollow metal in hollow metal frames. *rating: 4.*

**B3010 Roofing:** The roof of the building is primarily flat, utilizing a two-ply modified bituminous/thermoplastic membrane roofing system, according to the T/PW database. The substrate material under the roofing membrane is metal decking, as indicated on the original construction drawings. Replacement of the roof membrane was completed in 2008. Skylights over the East Gallery were also replaced in 2001. *rating: 4.*

### Interior Items

These items were surveyed and rated on a room-by-room basis, and include composite ratings for all rooms in the entire building.

**C1020 Interior Doors & Hardware:** The interior doors are solid core wood in hollow metal frames. Door hardware consists of bronze doorknobs, which are not ADA compliant. Panic hardware is provided on the staff entrance/exit doors, and in some cases, appears to be original to the building. *composite rating: 3.*

**C3010 Wall Finishes:** Predominate wall finishes throughout the building are light colored paint on plaster or drywall partitions. Selected areas have exposed concrete block walls. Toilet Rooms have ceramic wall tiles. The Plaza Level Lobby utilizes a stone wainscot. The Lower Level is mostly unfinished, with the exception of the areas around the Plaza Level Lobby. The light colors offers good light reflectance and do not appear to be a cleaning or maintenance problem. *composite rating: 4.*

**C3020 Floor Finishes:** Floor covering throughout the Lower Level is predominantly carpet, with vinyl composition tile used in utility and staff areas, and ceramic tile used in Toilet Rooms. Generally, Lower Level floor finishes are in fair condition.

Floor covering throughout the Plaza Level is predominantly carpet tile, with terrazzo used in high-traffic areas, hardwood in the East Gallery, vinyl composition tile used in utility and storage areas, and ceramic tile used in Toilet Rooms. Generally, Plaza Level floor finishes are in good condition.

The Upper Level is mostly unfinished, with the exception of the areas around the Plaza Level Lobby, which are in good condition. *composite rating: 3.*

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**C3030 Ceiling Finishes:** The dominant ceiling finish throughout the building is two-foot by four-foot lay-in suspended acoustical ceiling tile, with paint on drywall borders and in select areas. The Upper Level is unfinished, with the exception of the areas around the Plaza Level Lobby, which are visible to the floor below. All ceiling finishes appear to be in good condition. *composite rating: 4.*

### Vertical Movement & Egress

**C2010 Stairs/Ramps/Ladders:** Three enclosed fire stairs are provided between the Lower and Plaza Levels. No code-compliant stairs are provided to the Upper Level, though future provisions appear to have been made to add a stair. Two open monumental stairways are provided between the Lower and Plaza Levels. All stairs appear to be code-compliant.

Ramps were constructed with the addition to the Plaza Level to negotiate the changes in floor levels appear to be code-compliant.

Ladders provide roof access and “temporary” access to the Upper Level. *composite rating: 4.*

**D1010 Elevators:** Three elevators are provided for this three-story building, including two public elevators and one very large service elevator. Anecdotal evidence suggests repairs may be needed. *rating: 3.*

**Z1020 Handicapped Accessibility:** The building provides 12 means of egress at grade level, of which all but one is an accessible route. Lower Level Toilet Rooms have been modified from their original configuration, but do not meet all current TAS standards. Plaza Level Toilet Rooms do not meet all current TAS standards either. *rating: 3.*

## Existing Facility Assessment

### Equipment & Furnishings

**E2010 Millwork & Casework:** The cabinetry in many spaces on the Lower Level appears to be original to the building, but is in working condition. Some appears to be from the 1998 renovation and in good condition.

The cabinetry on the Plaza Level appears to be from the 1998 renovation and is in good condition. The Circulation Desk appears to function adequately. *composite rating: 4.*

**E2020 Furnishings, Fixtures, & Equipment:** In general, the furnishings in each space are those installed when the building renovated. The Lower Level wood furnishings are well worn and in need of replacement. The Plaza Level furnishings appear to be in good condition. *composite rating: 3.*

### Mechanical System Description

There are five mechanical rooms in the Lower Level. One mechanical room, located in the northwest corner of the building, serves as the Central Plant for the facility and the four remaining mechanical rooms house air handling units (AHU's) which serve the areas of the Lower Level.

Included in the Central Plant are two water cooled chillers, two gas-fired boilers, two heating water pumps, two chilled water pumps with variable frequency drives, two condenser water pumps, chilled and heating water expansion tanks, domestic electric hot water heater, air compressors, and fire protection headers and risers. One chiller is a 250-ton centrifugal type with variable frequency drive and the other is a 200-ton screw type chiller. A two-cell ceramic cooling tower providing 430 tons of cooling capacity is located on the roof directly above the Central Plant area. The chilled water system is a variable-primary system with two-way control valves throughout. The gas-fired boilers have a total rating of 5,000 MBH input/4,000 MBH output.

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The heating water system is a constant volume system with three-way control valves throughout. The four AHU's at the Lower Level are double duct systems, delivering hot and cold air to double duct boxes with dampers upstream of each box which modulate to satisfy room temperature requirements.

The Computer Server Room in the Lower Level has three air conditioning units in the Room. Two of the units are direct expansion (DX) split systems with air cooled condensers on the roof and another unit is a chilled water unit. Typically, the chilled water unit operates during normal business hours and the DX units operate during business off-hours. Building maintenance staff was in the process of removing two DX units and installing new roof-mounted units to serve the Computer Server Room.

There are two separate Mechanical Rooms, located in penthouses between the Upper Level and the Roof, which house four multi-zone AHU's (two in each Mechanical Room) which serve the East Gallery areas and associated adjacent rooms of the Plaza Level (Ground Floor).

The West half of the Plaza Level is served by an AHU mounted on the roof. This AHU is a variable air volume (VAV), chilled water unit which delivers air to cooling only single damper VAV terminal units on the facility's interior and to fan powered VAV terminal units with electric reheat at the facility's exterior.

A third Mechanical Room is located near the Lecture Hall and contains a constant volume AHU which is dedicated to the Lecture Hall.

### Plumbing System

**D2020 Domestic Water Distribution:** Copper piping is utilized throughout the building. Water pressure appears adequate with a 3" service to the building entering the facility through a backflow preventer. *rating: 4.*

## Existing Facility Assessment

**D2020 Domestic Water Heater:** The domestic hot water heater is an A.O. Smith 80 gallon storage tank with 18 KW electric heating elements. It was installed in 2003. There is an in-line circulation pump installed in 2002. Both items are in good condition. Water heater system does not include a thermostatic mixing valve to limit hot water temperatures to public lavatories. *rating: 3*

**D2030 Sanitary Collection:** Piping is a combination of PVC and cast iron. *rating: 4.*

**D2040 Storm Water Collection:** Scuppers, aluminum gutters, and downspouts provide roof drainage. Piping for interior roof drainage appears to be adequate. *rating: 4.*

### Air Conditioning System

**D3030 Chillers:** There are two York water cooled chillers which utilize HFC-134A refrigerant: 250-ton centrifugal with variable speed drive and a 200-ton screw. Chillers were installed in 2006 and in good condition. An on-going issue with the screw chiller maintaining condenser water flow through it at the required temperature was identified during the assessment. The Central Plant only has one entrance/exit although current codes require a minimum of two exits for refrigeration rooms. The Central Plant has refrigeration monitoring devices installed with emergency ventilation exhaust. *rating: 3.*

**D3030 Cooling Towers:** There is a two-cell ceramic cooling tower original to the facility with a total capacity of approximately 430 tons. New fan motors were installed in 2006. The concrete structure appears to be in good condition with the exception of one of the fan stacks. At the time of the assessment, staff was planning on replacing the drift eliminators and fan assembly. Overall, the tower is approaching its life expectancy of 34 years. *rating: 0.*

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**D3040 Pumps:** There are a total of four pumps in the Central Plant associated with the chillers. The two condenser pumps are constant flow Paco split-case 25 HP pumps and installed in 2006. The two chilled water pumps are variable flow Paco split-case 30 HP pumps and installed in 2006. All four pumps are in good condition. *rating: 4.*

**D3040 Air Handling Equipment:** The four air handling units in the Lower Level are original to the facility but had new supply motors with variable frequency drives and controls installed in 2006. These units contain hydronic heating and cooling coils which provide a hot and cold deck to the approximate 23 dual duct boxes located throughout the Lower Level. Also, in 2006 hot and cold deck motorized dampers were installed upstream of the dual duct boxes. There is a separate relief fan located in each of the four Lower Level Mechanical Rooms which are also original to the facility. The small sizes of the Mechanical Rooms provide limited access to unit and coil cleaning capability.

The four air handling units (AHUs) located in the Penthouses at the Roof Level are also original to the facility. These units are multi-zone units which hydronic heating and cooling coils. Three of the units are utilized to satisfy the space conditions. The fourth unit is manually operated as required. Each AHU averages about six zones per unit. Humidifier systems were added to these units in 2006. The units are past their life expectancy of 20 years. The Penthouse Mechanical Rooms are very congested and allow little room for access, as AHU's and ductwork consume the room. There is a single access to each Mechanical Room through a small access door at the Roof Level from stairs down into the Room.

There is a Mechanical Room that houses a single zone AHU which serves the Lecture Hall on the Plaza Level. This unit is a constant volume unit with hydronic heating and cooling coils and is original to the facility.

## Existing Facility Assessment

The AAON VAV roof mounted AHU rests on a structural frame located a couple of feet above the roof. This unit was installed in 1997 and was originally a direct expansion VAV AHU. In 2006, this unit was converted from DX to a chilled water unit. Since the conversion, there have been issues with meeting temperature requirements in the spaces served. This AHU has excessive air leakage at the numerous man access doors located on the unit. The AAON VAV unit distributes air to about 44 single damper VAV terminal units, fan powered with electric reheat terminal units throughout the Plaza Level. In most cases, multiple terminal units are controlled by a common temperature sensor. Additional temperature sensors would allow better control of space environment. These terminal units were installed in 2006.

All AHU's have three-way heating water control valves and two-way chilled water control valves. The chilled water control valves were installed in the 2006 renovation project.

Despite the age, the air handling equipment appears to be in relatively good condition and seems to create minimal maintenance issues, except for some performance issues with the AAON roof top AHU. The age of the equipment and very limited to no access to AHU's in the Mechanical Rooms are primary concerns. There did not appear to be any outside air airflow measuring stations at the VAV AHU's to insure proper outside air intake airflow rates over the entire operating span of the supply fan motor variable frequency drive. As result, there is potential for insufficient outside air during operating periods. *rating: 1.*

**D3040 HVAC Distribution Systems:** All heating, ventilating, and air conditioning (HVAC) systems are ducted supply and ducted return air. The majority of ductwork at the Lower Level is original to the facility, and ductwork in the east half of the Plaza Level is original to the 1998 addition. The majority of ductwork at the west half of the Plaza Level was installed in 2006.

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In general, the air distributions systems in the building work well, but anecdotal evidence reveals some problems, as described below.

Staff indicated the Amon Carter Multimedia Center is warm and stuffy a majority of the time. Staff has placed a floor mounted circulation fan at the entrance to provide additional air circulation near the desks. This area is currently served by one VAV terminal unit and seems to provide insufficient airflow to the space.

Staff indicated the Collection Management area is typically too warm. There are a lot of office cubicles and computers in this area. Ceiling fans are located throughout this area. It also is currently served by a single VAV terminal unit.

Staff indicated the Circulation Workroom Men's and Women's restrooms continually have lingering odors. There are exhaust air grilles in these restrooms, but still odor persist.

Staff indicated the Manager's Office at the Youth Center is either too hot or too cold. There is a single VAV terminal unit that serves this office and additional reading rooms. The temperature sensor is located in the Manager's office so the issue seems to be airflow balancing.

There is excessive noise generated from the mechanical equipment and supply air devices for the south and west ends of the Youth Center at the Plaza Level and the Genealogy area at the Lower Level.

The Electrical Room located at the Youth Center area is too warm. There are several transformers located in the room which are generating heat with only a 6" round supply duct to the space. This room is currently served from a VAV terminal unit with temperature sensor located in the Youth Center area. An independent air conditioning source with its own temperature sensor should be provided for Electrical rooms. *rating: 3.*

## Existing Facility Assessment

### Heating System

**D3040 Boiler:** There are two Weil McLain gas-fired boilers, original to the building. Each boiler has a rating of 2,500 MBH input/2,000 MBH output. Based on information from Maintenance personnel, the boilers are in good condition and do not present many maintenance issues. These boilers have a life expectancy of 30 to 35 years and are approaching that point. *rating: 1.*

**D3040 Pumps:** There are two pumps associated with the hydronic heating system. The two heating water pumps are constant flow Paco 15 HP pumps and are original to the facility (1978). These pumps are past their life expectancy of 20 years and are due for replacement. *rating: 0.*

**D3040 Distribution Piping:** Piping is primarily black steel and copper tube, and for the most part, appear to be in good condition. *rating: 4.*

### Automatic Temperature Controls

**D3060 Automated HVAC Controls:** There is a facility-wide computerized control system, Johnson Control's Metasys system, which was installed in 2006 and controls all the HVAC equipment including humidity and carbon dioxide control and monitoring. *rating: 4.*

### Interior Mechanical Items

**D2010 Plumbing Fixtures:** The Men's Restroom in the Staff area on the Lower Level has one wall hung lavatory, one urinal, and one wall mount flush valve water closet. All fixtures are vitreous china and appear to be in good condition. The Women's Restroom in the Staff area on the Lower Level has one wall hung lavatory and two wall mount flush valve water closets. All fixtures are vitreous china and appear to be in good condition.

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There is a single level electric water cooler in the Staff area on the Lower Level and in good condition. Also in the Lower Level is a Kitchen with a stainless steel double compartment sink and in good condition.

The main public Men's Restroom on the Plaza Level has two counter mount lavatories, three urinals, and two wall mount flush valve water closets with one of them handicap accessible. All fixtures are vitreous china and appear to be in good condition. The main public Women's Restroom on the Plaza Level has two counter mount lavatories and twelve wall mounted flush valve water closets with two of them handicap accessible. All fixtures are vitreous china and appear to be in good condition.

There is a bi-level electric water cooler located between these two restrooms and appears to be in good condition.

The Men's Restroom located in the Circulation Work Room area on the Plaza Level has one counter mount lavatory, one urinal, and one wall mount flush valve water closet. All fixtures are vitreous china and appear to be in good condition. The Women's Restroom located in the Circulation Work Room area on the Plaza Level has one counter mount lavatory, and three wall mounted flush valve water closets. All fixtures are vitreous china and appear to be in good condition.

There is a bi-level electric water cooler located between these two restrooms and appears to be in good condition.

The Men's Restroom located in the Youth Center area on the Plaza Level has one counter mount lavatory and one wall mount flush valve water closet. This water closet is loose to the wall. All fixtures are vitreous china and appear to be in good condition. The Women's Restroom located in the Youth Center area on the Plaza Level has one counter mount lavatory and one wall mount flush valve water closet. All fixtures are vitreous china and appear to be in good condition. *composite rating: 4.*

## Existing Facility Assessment

**D3040 Ventilation:** Throughout most of the facility, air movement was good with the exception of the various rooms previously mentioned. *composite rating: 3*

**D3040 Diffusers:** The condition of the supply and return air devices vary throughout the facility. The Lower Level area devices are showing signs of age and rust and vary in appearance throughout. The Plaza Level air devices are in better condition. *composite rating: 3.*

**D3060 Local Automatic Temperature Control:** There are temperature sensors throughout the facility. There are humidity sensors located at the East Gallery area on the Plaza Level to maintain humidity conditions for the wood floor area. There are carbon dioxide sensors for the Lower and Plaza Levels. *composite rating: 4.*

## Fire Protection System

**D4010 Fire Protection Sprinklers:** The entire facility is provided with a fire sprinkler system. It appears the Computer Server Room on the Lower Level has a Halon protection system based on signs posted on the entrance door. Alternatives to Halon should be considered since Halon use is being phased out for safety reasons. *rating: 3.*

## Electrical System Description

The electrical distribution system of the Central Library has grown with the Library. The original 2000A service is now connected to an electrical vault built during the 1993 addition. Two separate services come from the vault. The first one is a 2000A, dedicated switchboard for the original service and the second one is a 2500A switchboard for the new addition, including the City of Fort Worth's Cable Television Studio adjacent to the Library. The both services are 480/277V, 3-phase, 4-wire. Distribution panels are located mostly in Mechanical Rooms and share space with mechanical

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equipment. There are no clearance problems, or apparent code violations. Branch circuit panels vary on spare capacity, and there seems to be enough capacity to accommodate minor changes, where there is enough physical space in electrical areas to add panels or transformers if needed for renovation. The emergency distribution system consists of a single generator and a 100A panel. It is primarily used for emergency lighting. IT infrastructure includes several IT rooms with racks, cable trays, and structured wiring demonstrating good practices.

**D5010 Service Equipment:** The Central Library has two 480/277V, 3-phase, 4-wire services. The first one serves the original switchboard and has a 2000A capacity. The second one serves the new addition with a capacity of 2500A. Equipment seems to be in good condition. Power distribution bus ducts from the electrical vault and to the original switchboard seem to be in good condition. Power distribution to distribution panels and transformers across the facility is done using conduit and wire. Observations indicate that they do not need to be replaced or repaired. *rating: 4.*

**D5010 Power Distribution Panels:** Lighting and branch circuit panels are located throughout the facility in Electrical or Mechanical Rooms. Spare capacity varies depending on location, but there is enough physical space and spare electrical capacity to add new panels if needed for renovation. Current capacity seems to be enough to handle normal maintenance needs. *rating: 4.*

**D5020 Lighting & Branch Wiring:** There is no evidence that, branch circuits, and other conductors need to be replaced. *rating: 4.*

**D5040 Emergency Power:** Building has one generator with a single, 100A 480/277V emergency panel that feeds a 30 KVA transformer for a 100A 120/208V panel. Emergency power is mostly used for egress lighting. *rating: 4.*

## Existing Facility Assessment

### Interior Electrical Items

**D5020 Receptacles:** Availability of receptacles in reading areas varies considerably. Older sections of the Library have limited amounts while newer areas, such as the Children's Area, have floor-mounted receptacles every few feet. Additional receptacle infrastructure may be needed depending on planned area use. *composite rating: 3.*

**D5020 Lighting:** Lighting throughout the Library varies significantly. Some reading areas have large decorative fixtures while others have two-foot by four-foot fluorescent fixtures. In general, lighting levels are adequate for reading. All lighting seems to be in good condition. Automatic lighting controls are separate for Lower and Plaza Levels. The East Gallery has new lighting provided by the Library Foundation. The Auditorium has incandescent lighting that exceeds current Energy Code allowances. Children's area lighting has different color lamps. A new lighting system for the Auditorium and replacement of lamps in the Children's area to a single color are recommended. *composite rating: 3.*

**D5030 Data Infrastructure:** Data infrastructure in the Library consists of several IT rooms located throughout the facility and a computer room in the Lower Level. Wiring practices seem to be according the recommended standards by BICSI. Most IT rooms have enough space to add more equipment and data points as needed. All racks are located in dedicated rooms except one, which is enclosed in a dust resistance cabinet. *composite rating: 4.*

**D5030 Public Address System:** There are two public address systems, one each on the Lower and Plaza Levels. Library staff report that the systems work satisfactorily. *composite rating: 4.*

**D5030 Security System:** This building does not have a security system. *composite rating: 0.*

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**D5040 Fire Alarm:** This building has a fire alarm system. Observations found no deficiencies. *composite rating: 4.*

**D5040 Emergency/Egress Lighting:** This building has emergency egress lighting backed up by a generator. *composite rating: 4.*

### Additional Systems

The following are systems which are either good practice in library facility design or would be required by current building codes if a renovation or expansion were to be undertaken. They do not presently exist in the building, so it is suggested they be added.

**Handicapped Accessibility:** Provisions are adequate to access the building, and essential facilities within, but some additional requirements are applicable. Door hardware, toilet room configuration, and some furniture placement within the facility create limited accessibility to many areas. Of particular concern are the primary public toilets on both the Lower and Plaza Levels.

**Exiting:** Provisions are generally adequate, but some additional requirements will be applicable to this facility if the shell space is occupied, including the need to extend fire stairs to the Upper Level.

**Install Smoke Detection:** This code requirement was not applicable to this facility when originally built, but current codes may require additional system components, depending on the extent of renovation.

**Install Security Systems:** An intrusion alarm system should be considered, with either locally sounding alarms at the exits from public spaces, or a central monitor.

## Existing Facility Assessment

### Construction Cost Impacts

The building-wide survey includes the identification of issues which may impact the cost of expansion. Examples of these issues include the degree of difficulty of construction on the site, the current state of the local economy, how renovation will impact the operations of a facility, etcetera.

**Location:** The site, being within the central business district and being ringed by one-way streets, is in a difficult location for the delivery of construction materials. There is adequate parking available in the immediate area to support construction labor.

**Site Limitations:** No City-owned land is available for future horizontal expansion, or for staging of construction. Any significant construction at the site would no doubt require closing lanes on the surrounding streets. A large parking lot adjacent to the north façade of the building could be used for staging of materials and parking.

**Construction Difficulty:** Typical urban limitations exist to additional construction at the site.

**Phasing:** It is conceivable that internal renovations can take place without impact to the existing operations or requiring the Library to relocate to another building, but steps would need to be taken to mitigate construction dust, noise, and vibration.

**Historic Issues:** The building is not located within a historic district.

**Asbestos:** No asbestos is known to exist in the building or on the site at this time.

**Costs to Retrofit Existing Building Systems**

Table A5.1.6 provides the unit costs of the various retrofit projects. The unit prices apply to either the total building gross (bgsf) or net assignable square footage (nasf), as appropriate, to develop the cost for system retrofits for the entire building – not just the space occupied by the Fort Worth Library.

**Analysis.** The total cost to retrofit the building systems is \$6,309,568, or \$26.19 per square foot. When excluding the cost for new furniture of \$1,146,038, the total cost to retrofit the building systems is reduced to \$5,163,530. Most of the systems affected would be made more energy efficient.

**Table A5.1.6**  
Retrofit of Existing Building Systems, Central Library

<i>uniformat code</i>	<i>construction element</i>	<i>rating</i>	<i>weight factor</i>	<i>square footage</i>	<i>unit cost</i>	<i>total cost</i>	<i>comments</i>
A1010	Foundations	4	0%	240,878	bgsf	\$5.22	\$0
A1030	Slabs on grade	4	0%	240,878	bgsf	2.65	0
B1020	Superstructure	4	0%	240,878	bgsf	12.45	0
B2010	Exterior walls	4	0%	240,878	bgsf	9.55	0
B2020	Exterior windows	3	25%	240,878	bgsf	8.11	488,380 remove window tinting on Plaza Level
B2030	Exterior doors	4	0%	240,878	bgsf	4.85	0
B3010	Roofing 2008	4	0%	240,878	bgsf	6.89	0
C1020	Interior doors & hardware	3	25%	203,740	nasf	3.15	160,445 upgrade hardware/install lever handles
C2010	Stairs/ramps/ladders	4	0%	240,878	bgsf	7.55	0
C3010	Wall finishes	4	0%	203,740	nasf	3.33	0
C3020	Floor finishes	3	25%	203,740	nasf	3.15	160,445 install new carpet tile on Lower Level
C3030	Ceiling finishes	4	0%	203,740	nasf	3.28	0
D1010	Elevators	3	25%	240,878	bgsf	4.77	287,247 budget to repair existing elevators
D2010	Plumbing fixtures	4	0%	203,740	nasf	2.50	0
D2020	Domestic water distribution	4	0%	240,878	bgsf	1.72	0
D2020	Domestic water heaters	3	25%	240,878	bgsf	0.25	15,055 add thermostatic mixing valves
D2030	Sanitary collection	4	0%	240,878	bgsf	1.15	0
D2040	Storm water collection	4	0%	240,878	bgsf	1.77	0
D3020	Boilers	1	75%	240,878	bgsf	4.78	863,548 replace existing units
D3030	Chillers	3	25%	240,878	bgsf	0.28	16,861 remedy water flow/temperature issues
D3030	Cooling towers	0	110%	240,878	bgsf	1.15	304,711 replace existing unit
D3040	Air handling equipment	1	75%	240,878	bgsf	7.10	1,282,675 replace existing units, better access
D3040	Air conditioning system pumps	4	0%	240,878	bgsf	0.85	0
D3040	Refrigerant piping	4	0%	240,878	bgsf	1.05	0

**Table A5.1.6 (continued)**  
Retrofit of Existing Building Systems, Central Library

<i>uniformat code</i>	<i>construction element</i>	<i>rating</i>	<i>weight factor</i>	<i>square footage</i>	<i>unit cost</i>	<i>total cost</i>	<i>comments</i>	
D3040	Heating system pumps	0	110%	240,878	bgsf	\$0.87	\$230,520	replace existing units
D3040	Distribution piping	4	0%	240,878	bgsf	1.05	0	
D3040	HVAC ductwork	3	25%	203,740	nasf	4.25	216,474	extend cooling to Electrical Rooms
D3040	Ventilation	3	25%	203,740	nasf	2.03	103,398	address issues in various spaces
D3050	Air conditioning units	4	0%	240,878	bgsf	6.55	0	
D3050	HVAC diffusers	3	25%	203,740	nasf	1.21	61,631	address issues on Lower Level
D3060	Building temperature controls	4	0%	203,740	nasf	3.15	0	
D3060	Local temperature controls	4	0%	203,740	nasf	0.48	0	
D4010	Fire protection system	3	25%	240,878	bgsf	3.90	234,856	replace existing Halon system
D5010	Electrical service equipment	4	0%	240,878	bgsf	1.97	0	
D5010	Distribution panels	4	0%	240,878	bgsf	3.43	0	
D5010	Branch power distribution	4	0%	240,878	bgsf	2.30	0	
D5020	Lighting fixtures	3	25%	203,740	nasf	3.50	178,273	replace select lamps/fixtures
D5020	Emergency lighting	4	0%	203,740	nasf	0.90	0	
D5020	Convenience receptacles	3	25%	203,740	nasf	2.90	147,712	add receptacles where needed
D5030	Data infrastructure	4	0%	240,878	bgsf	3.77	0	
D5030	Public address system	4	0%	203,740	nasf	1.55	0	
D5030	Building security system	new	100%	240,878	bgsf	1.10	264,966	install new system
D5040	Fire alarm system	4	0%	240,878	bgsf	1.75	0	
D5040	Emergency power	4	0%	240,878	bgsf	1.66	0	
E2010	Casework & millwork	4	0%	203,740	nasf	8.22	0	
E2020	Furniture & equipment	3	25%	203,740	nasf	22.50	1,146,038	replace wood furniture on Lower Level
G2020	Parking lots	4	0%	240,878	bgsf	0.97	0	
G2030	Pedestrian Paving	4	0%	240,878	bgsf	0.76	0	
G2040	Site Development	4	0%	240,878	bgsf	1.42	0	
G2050	Landscaping	4	0%	240,878	bgsf	0.23	0	
G3000	Site Utilities	4	0%	240,878	bgsf	1.44	0	
Z1010	Handicapped access	3	25%	240,878	bgsf	2.43	\$146,333	address toilet rooms, door knobs
<b>TOTAL RETROFIT COST</b>						<b>\$6,309,568</b>		