JUNE 17, 2022

Terminal Facility Assessment

RS&H

Terminal Facility Assessment

FINAL
Version 2.0
August 12, 2022
Toledo-Lucas County Port Authority
Eugene F. Kranz Toledo Express Airport
Swanton, Ohio
RS&H No.: 218-1858-012

Prepared by RS&H Ohio, Inc. at the direction of the Toledo-Lucas County Port Authority

RS&H

TABLE OF CONTENTS

Terminal Facility Assessment 1

1.1 Introduction to Report 2

1.1.1 Purpose of Assessment 2
1.1.2 Existing Facility 2

1.2 Assessment of Existing Facility and Infrastructure 4

1.2.1 Validate As-Built Facilities - Discussion and Purpose of Site Visit 4
1.2.2 Terminal Building Existing Program 4
1.2.3 Operational Efficiency 9

1.3 Existing Facility Components 12

1.3.1 Architectural 12
1.3.2 Electrical 39
1.3.3 Mechanical 45
1.3.4 Fire Protection & Plumbing (Sanitary/Storm) 58
1.3.5 IT/Security/Technology 62

1.4 Terminal Building Regulatory Assessment 76

1.4.1 Building Code Compliance (Intl/Fed/State/Local) 76
1.4.2 ADA Compliance 81
1.4.3 Energy Code 91

1.5 Summary and Conclusion 92

LIST OF TABLES

Table 1 – Existing Terminal Program Area - Total 5
Table 2 – Existing Terminal Program Area – Level 1 6
Table 3 – Existing Terminal Program Area – Level 2 7
Table 4 – Existing Terminal Program Area – Levels 3-5 (ATCT Levels 1-3) 8
Table 5 – Passenger Boarding Bridge Details 31
Table 6 - Electrical Demand and Energy Usage 40
Table 7 - Major Electric and Fire Alarm System Equipment Assessment 40
Table 8 – Major Mechanical Room Index 45
Table 9 – Packaged Roof Top Units (RTU) Assessment Summary 47
Table 10 - Heating Hot Water Plan Assessment Summary 50
Table 11 - Exhaust Fans and Ventilation Hoods 52
Table 12 – Split System Air Conditioners Assessment Summary 54

LIST OF FIGURES

Figure 1 – Existing Airport Terminal Plan - Level 1 6
Figure 2 – Existing Airport Terminal Plan - Level 2 7
Figure 3 – Existing Airport Terminal Plan - Levels 3-5 (ATCT Levels 1-3) 8
Figure 4 – Existing Airport Terminal Plan - Baggage Service Flow Diagram 9
Figure 5 – Existing Airport Terminal Plan – Passenger Flow Diagram 10
Figure 6 – TSA Passenger Recomposure Area 12
Figure 7 – Dining Area 13
Figure 8 – Passenger Holdroom 13
Figure 9 – Concessions Queue 13
Figure 10 – Concessions Storage 13
Figure 11 – Closed Restaurant 14
Figure 12 – Vacant ATO 14
Figure 13 – Vacant ATO 14
Figure 14 – Area Behind Escalators 14
Figure 15 – West End of Ticketing – View 1 15
Figure 16 – West End of Ticketing – View 2 15
Figure 17 – Port Authority Police Station 15
Figure 18 – Double Paned Windows 17
Figure 19 – Business Center 18
Figure 20 – Canopy Facing Parking Lot 19
Figure 21 – Canopy Facing Terminal 19
Figure 22 – Designated Smoking Area 19
Figure 23 – Airside Public Restroom 20
Figure 24 – SRE Equipment 21

Figure 25 – Inbound Baggage Area 21
Figure 26 – Hallway 22
Figure 27 – Concessions Storage 22
Figure 28 – Pedestrian Crossing Facing Terminal 23
Figure 29 – Pedestrian Crossing Facing Parking Lot 23
Figure 30 – Mold in East Holdroom 24
Figure 31 – Water Damage at Former Gate 1 25
Figure 32 – Water Damage at Former Gate 2 25
Figure 33 – Water Damage Inside Terminal 26
Figure 34 – Water Damage on the Roof 26
Figure 35 – Water Damage Inside Storage Space 26
Figure 36 – Peeling Paint 28
Figure 37 – Stained Carpet 28
Figure 38 – Dated Furniture 28
Figure 39 – Peeling WallPaper 28
Figure 40 – Missing Ceiling Titles 29
Figure 41 – Taped Cords 29
Figure 42 – Uneven Floor 29
Figure 43 – No Transition Strip 29
Figure 44 – Baggage Conveyor Panel Gap 30
Figure 45 – Baggage Conveyor Damage 30
Figure 46 – Passenger Boarding Bridge – Gate 1 31
Figure 47 – Passenger Boarding Bridge – Gate 3 31
Figure 48 – Passenger Boarding Bridge – Gate 4 31
Figure 49 – Passenger Boarding Bridge – Gate 5 31
Figure 50 – Airline Gate PA System 32
Figure 51 – Building Envelope 34
Figure 52 – Concrete Sill 34
Figure 53 – Peeling Paint 34
Figure 54 – Loading Dock 34
Figure 55 – Rusted Coping 34
Figure 56 – Rusted Column 35
Figure 57 – Rusted Column 35
Figure 58 – Windowsill 35
Figure 59 – Concrete Base 35
Figure 60 – Metal Wall Panels 36
Figure 61 – Metal Wall Panels 36
Figure 62 – Water Damage 36
Figure 63 – Water Damage 36
Figure 64 – Detached Flashing 37
Figure 65 – Patching Repairs 37
Figure 66 – Canopy Baseplates 37
Figure 67 – Airside Concrete 38

Figure 68 – Damaged Wall 38
Figure 69 – ATCT and Main Terminal Distribution Equipment 41
Figure 70 – Main Vault Room 41
Figure 71 – National Weather Service Equipment 42
Figure 72 – East Terminal Electrical Equipment 42
Figure 73 – Terminal Lighting 43
Figure 74 – Fire Alarm System 43
Figure 75 – Airfield Vault Substation 44
Figure 76 – Central Mechanical Plant Rooms 46
Figure 77 – RTU 4 Installed in 2009 48
Figure 78 – RTU 10 Installed in 2003 48
Figure 79 – RTU 12 Installed in 1988 48
Figure 80 – RTU 14 Condensing Unit Installed in 1979 49
Figure 81 – RTU 9 Installed in 1975 49
Figure 82 – RTU 13 Installed in 1988 49
Figure 83 – Heating Hot Water Boilers B-1 and B-2 50
Figure 84 – Primary Heating Hot Water Pumps: HHWP-1 and HHWP-2 50
Figure 85 – HHW System Components 51
Figure 86 – Glycol Feed System 51
Figure 87 – Air Separator Expansion Tank 51
Figure 88 – Secondary Dualarm HEating Hot Water Pump: HHWP-3/4 52
Figure 89 – Secondary Heating Hot Water Pump: PUMP #2 52
Figure 90 – Ventilation Fan for Tug Drive at Baggage Claim 53
Figure 91 – Exhaust Fans for Stairwell and Battery Charging 53
Figure 92 – Condensing Units ACU-2 & ACU-3 54
Figure 93 – Ducted Split AC Fan Coil Unit Serving Baggage Screening 55
Figure 94 – Condensing Units ACCU-4 & ACCU-5 55
Figure 95 – Front-End Computer Screen Captures Showing Limited Amount of Data Feedback for Portions of the Building 56
Figure 96 – Gas Fired Water Heaters Serving the Terminal and Concessions Kitchen 58
Figure 97 – Electric Water Heaters Service the East Concourse Restrooms, 2nd Floor Holdroom, Restrooms, and Maintenance Mop Sink 59
Figure 98 – Fire Protection Valves for the Two Set Pipe and One Dry Pipe System Serving the Facility 60
Figure 99 – Existing Equipment in the MCR 62
Figure 100 - Telecom and Security Equipment in Sprinkler Pipe and HVAC Room – Concourse Level 63
Figure 101 – Telecom and Security Equipment Rack in Electrical Room 63
Figure 102 – High Voltage Electrical Distribution Panel 63
Figure 103 – TSA Equipment Cabinet With Exposed Cables 64
Figure 104 – TOL Equipment Cabinet in Lobby Adjacent to TSA – Owned by FAA 64
Figure 105 – Public Address Equipment Cabinet 65
Figure 106 – Gate Counter With Speaker on a Stand 66
Figure 107 – Wall-Mounted FIDS Monitor 67
Figure 108 – Ceiling-Mounted FIDS Monitor 67

Figure 109 – Allegiant Air Ticket Counter FIDS Monitor 67
Figure 110 – American Airlines Ticket Counter FIDS Monitor 67
Figure 111 – Airport Operations Center 68
Figure 112 – Access Control Cabinet With DRACONi Equipment 69
Figure 113 – Sterile Side of Egress and Boarding Bridge Doors 70
Figure 114 – Boarding Bridge Door When Opened 70
Figure 115 – Access Control Enclosure on the Secure Side of the Door 71
Figure 116 – Secure Side of Access Controlled Door 71
Figure 117 – Access Control Door With Missing Key Core 72
Figure 118 – Existing 2-Factor Card Reader 72
Figure 119 – Existing Card Reader at FAA/TSA Door 72
Figure 120 – Existing FAA Door 72
Figure 121 – Existing Multi-Sensor Arecont Vision Camera – Outbound Baggage Makeup Area 73
Figure 122 – Existing Multi-Sensor Arecont Vision Camera – Ticketing Area 74
Figure 123 – Existing Pelco Interior Analog Dome Camera - Holdroom 74
Figure 124 – Typical Key Fob Controlled Vehicle Gate 75
Figure 125 – Storage on First Floor 76
Figure 126 – Baggage Make up 76
Figure 127 – Exposed Cables 77
Figure 128 – Accordion Gate 78
Figure 129 – No Vertical Grab Bar in Restrooms 79
Figure 130 – Stairway Landing 80
Figure 131 – Loading Dock 80
Figure 132 – Terminal Roof 81
Figure 133 – Exit Doors 81
Figure 134 – Items Protruding More Than 4" 82
Figure 135 – Elevator 83
Figure 136 – Escalator 83
Figure 137 – Rental Car Counters 84
Figure 138 – Passenger Boarding Bridge 85
Figure 139 – Stairwell 86
Figure 140 – Flush Control on Toilet 87
Figure 141 – Accessible Sink 88
Figure 142 – Second Floor Public Restroom 89
Figure 143 – Paper Towel Dispenser in Restroom 89
Figure 144 – First Floor Administration Restroom 90
Figure 145 – Parking Lot Sidewalk Facing East 90
Figure 146 – Parking Lot Sidewalk Facing West 90

TERMINAL FACILITY ASSESSMENT

1.1 INTRODUCTION TO REPORT

1.1.1 Purpose of Assessment

Originally constructed in the 1950s, the passenger terminal facility at Eugene F. Kranz Toledo Express Airport has had a number of terminal improvement and expansion projects conducted over the years, the last of which was completed in 2006. However, with the changing airline model and aviation demand inherit to the Toledo metropolitan area and the greater region, the terminal facility has fallen behind the times and is in need for an update. For three years, the Toledo-Lucas County Port Authority (TLCPA) has included a facility project in its Capital Improvement Plan (CIP). The first step to receiving federal funding support through the Federal Aviation Administration's (FAA) Airport Improvement Program (AIP) for terminal facility upgrades or development is to complete a comprehensive facility assessment. A recent Air Service Study, conducted in 2021, has also validated the need for terminal facility improvements. This assessment has been included as part of the 2022 Airport Master Plan Update. This assessment aims to validate the needs, and garner support for the necessary improvements.

Before proceeding with any building modifications, it is necessary to understand the existing terminal building conditions. This report will cover architectural, electrical, mechanical, fire protection, plumbing, and information technology considerations and assess conditions before any potential building modifications are recommended.

1.1.1.1 Problems

The team of architects, engineers, and planners discovered numerous issues with the terminal facility, including space surplus/deficiencies, passenger congestion, infrastructure inadequacies, code non-compliance, and unreliable secure access. These challenges will be addressed beginning in Section 1.3 of this report.

1.1.1.2 Recommendations

The recommendations for addressing the findings of this assessment will be discussed in the Facility Requirements and Alternatives Chapters of the TOL 2022 Airport Master Plan Update.

1.1.2 Existing Facility

The passenger terminal building is located on the north side of the Eugene F. Kranz Toledo Express Airport, immediately west of Runway 16/34. The original passenger terminal building was constructed in 1955. Since that time, the terminal building has undergone several renovations. The existing entrance canopy was constructed in the early 1990s, and the east terminal addition was added in the late 1990s. The most recent renovations began in 2005 and included a new baggage makeup area, baggage screening, airline ticketing offices, and holdroom expansion. The terminal building is configured with a linear concept and a parallel gate concourse. The first floor contains a combination of landside and airside operations. The second floor consists almost entirely of passenger holdrooms and associated services. However, a portion of the second floor is used for tenant office space.

The landside area accommodates the primary airline functions of ticketing, airline ticket offices, outbound/inbound baggage, and baggage claim. In addition, the first floor contains space dedicated to

rental car counters, vending machines, the TLCPA's offices, security checkpoint, and utilities. The linear terminal building is organized so that enplaning passenger facilities are in the western wing while deplaning passenger facilities are in the eastern wing. The two areas are connected by a central circulation lobby containing the security checkpoint facilities and a meet and greet lobby. This area also contains the stairs, elevators, and escalators to the second level. There is an additional waiting room with views onto the terminal apron and restrooms directly behind the escalators. The TLCPA's offices are located just behind and to the southeast of the escalators, directly across from the waiting room.

The second floor of the terminal building consists of passenger holdrooms for bridge-loaded aircraft and a food court, office space, and storage. To the east, a hallway leads to the east holdroom, a dual-level facility that consists of one bridge-loaded gate and two ground-loaded stands. Periodically, this holdroom is used for boarding and deplaning during irregular operations, a term used to describe airline activity that does not follow published schedules due to external factors but typically is closed for passenger use. To the west, a hallway connects the main holdroom to two formerly used bridge-loaded gate positions with no additional holdroom space. The bridges have been removed, and the hallway is closed for passenger use. At the time of this assessment, all regularly scheduled airline service is conducted at gates three and five.

Overall, there are eight aircraft parking positions, served by four passenger loading bridges and three apron loaded positions. The gates are sized to serve ADG (Airplane Design Group)-III and smaller aircraft.

1.2 ASSESSMENT OF EXISTING FACILITY AND INFRASTRUCTURE

1.2.1 Validate As-Built Facilities - Discussion and Purpose of Site Visit

A site assessment was conducted from March 21 through March 24, 2022, consisting of aviation facility planners, architects, and engineers. The purpose of the site visit was to observe and analyze the existing facility, document conditions, identify deficiencies in the design, maintenance, and operation, and develop recommendations on how to modernize the facility for the future master plan period. Airport management and personnel were present to guide the team and provide insight and expertise in answering questions.

1.2.1.1 Locations Surveyed

All aspects of the terminal were surveyed for the study, including the roof, parking lot, and air traffic control tower. Airport management led multiple teams around the facility to specific areas pertinent to the subject matter. All public areas were observed, and non-public, tenant, and closed parts of the terminal.

1.2.1.2 Stakeholder and Tenant Input

Throughout the site visit, airport management was on-hand to field questions and provide introductions to the airline, tenant, and TSA staff on an as-needed basis.

1.2.2 Terminal Building Existing Program

The terminal facility is categorized into different functional areas as listed below.

- **Airline Space:** The areas of the terminal used for ticketing/check-in, queuing spaces, and airline ticketing offices.
- **Airport Space:** The areas of the terminal used by the airport administration for offices, storage, and operations functions.
- **Baggage Service:** The areas of the terminal used to handle inbound and outbound baggage, including facilities necessary to perform baggage sorting, offloading, and retrieval.
- **Building Systems**: The areas of the terminal reserved for mechanical, electrical, telecom, and other services that provide the utilities to operate the terminal.
- **Concessions:** The areas of the terminal that generate revenue for the Airport, including food and beverage, retail, and banks/ATMs.
- **Ground Transportation:** The areas of the terminal used for car rental, taxi, bus, and ride-sharing functions.
- **Holdrooms:** The areas of the terminal where passengers wait to board an aircraft, including airline customer service counters, boarding queues, and other amenities.
- **Public Space:** The areas of the terminal used by the public for circulation and associated functions, including restrooms, waiting areas for meeter/greeters, and baggage claim.
- **Transportation Security Administration (TSA):** The areas of the terminal operated by the TSA, including the security screening checkpoint (SSCP), offices, and baggage screening rooms.

The existing terminal facility program in **Table 1** shows each element of the facility described in this chapter together into a total program area.

TABLE 1 – EXISTING TERMINAL PROGRAM AREA - TOTAL

Existing Terminal Program Area	
Category	**Area (sf)**
Airline Space	9,019
Airport Space	26,011
Baggage Service	19,806
Building Systems	7,216
Concessions	4,438
Ground Transportation	2,638
Holdroom	24,350
Public Space	38,541
Transportation Security Administration (TSA)	5,004
Total Program Area	**137,146**

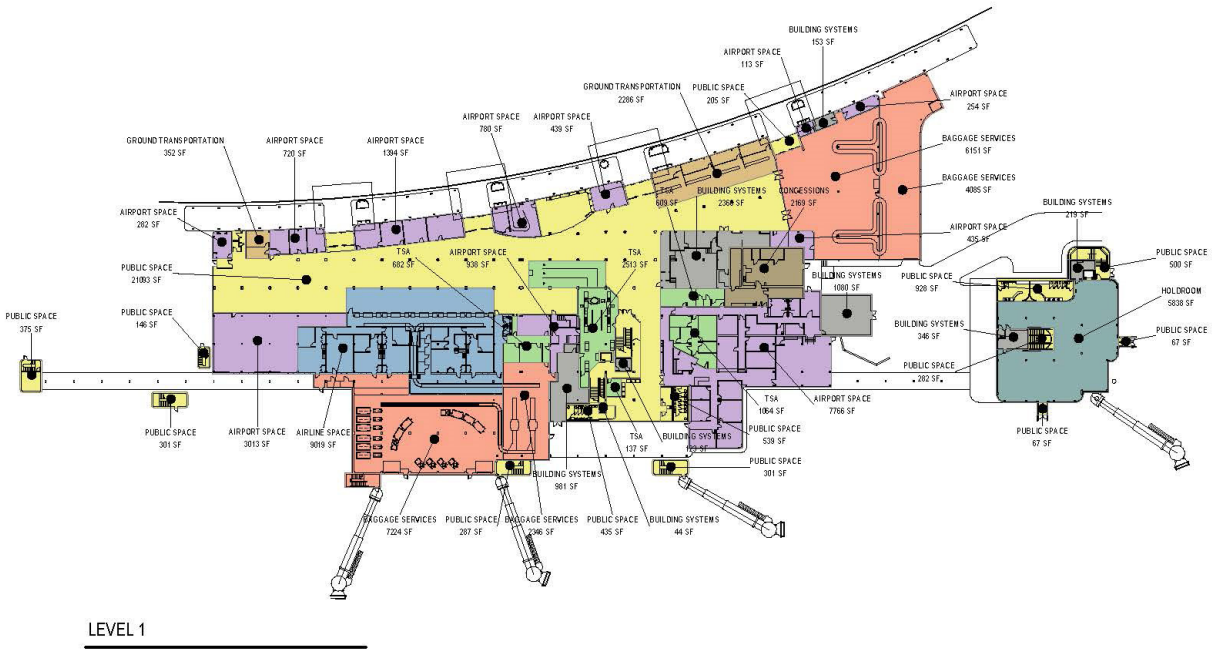

FIGURE 1 – EXISTING AIRPORT TERMINAL PLAN - LEVEL 1

Existing Terminal Program Area – Level 1	
Category	**Area (sf)**
Airline Space	9,019
Airport Space	16,135
Baggage Service	19,806
Building Systems	5,316
Concessions	2,169
Ground Transportation	2,638
Holdroom	5,838
Public Space	25,525
Transportation Security Administration (TSA)	5,004
Total Program Area	**91,451**

TABLE 2 – EXISTING TERMINAL PROGRAM AREA – LEVEL 1

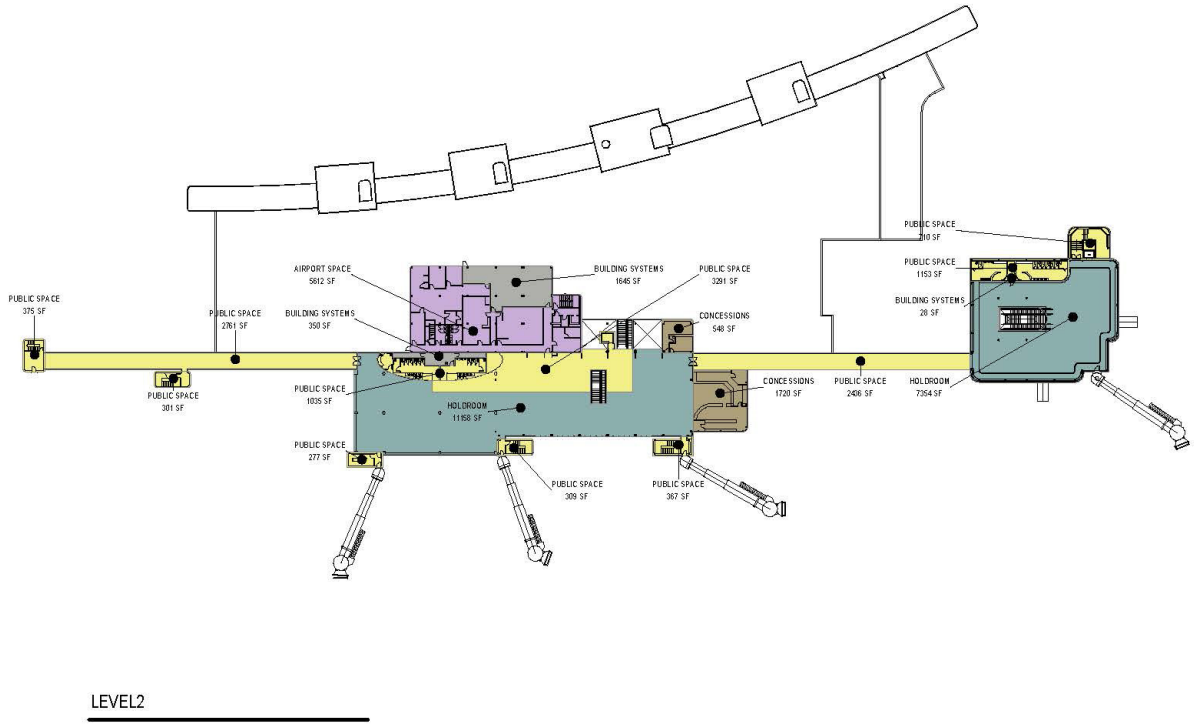

FIGURE 2 – EXISTING AIRPORT TERMINAL PLAN - LEVEL 2

Existing Terminal Program Area – Level 2	
Category	**Area (sf)**
Airport Space	5,612
Building Systems	2,023
Concessions	2,268
Holdroom	18,512
Public Space	13,015
Total Program Area	**41,431**

TABLE 3 – EXISTING TERMINAL PROGRAM AREA – LEVEL 2

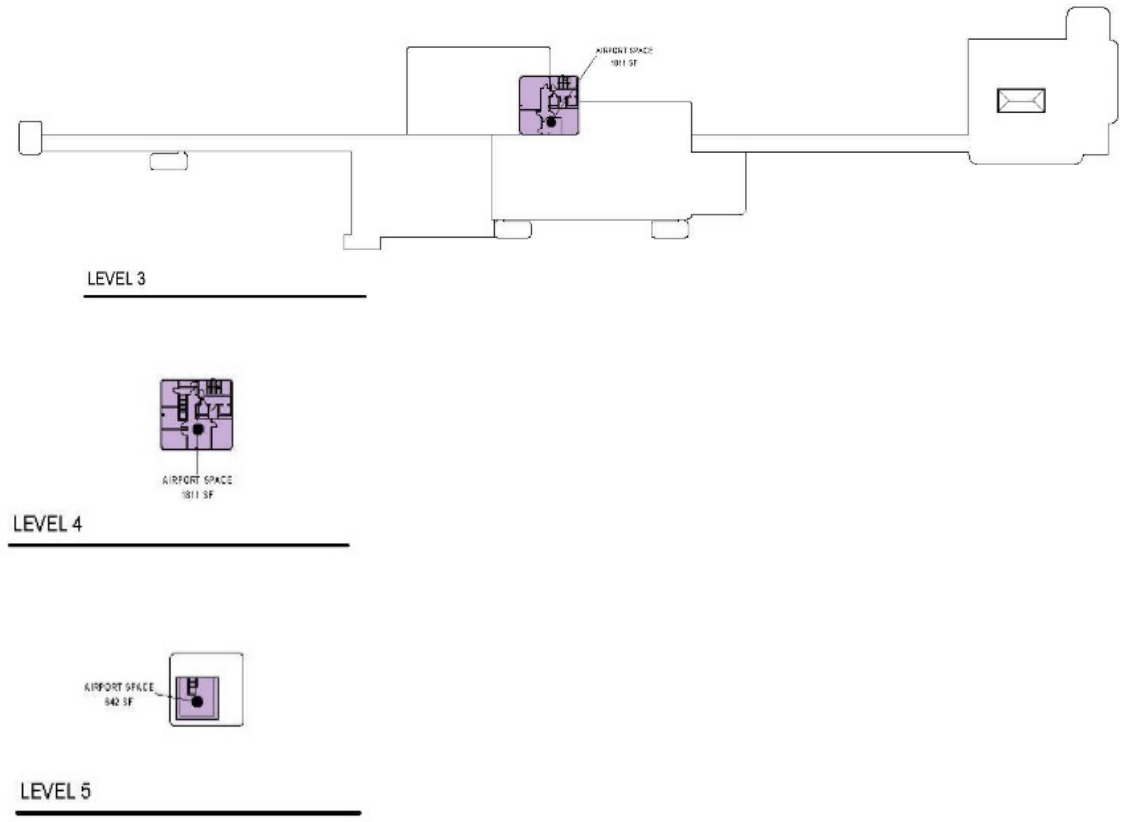

FIGURE 3 – EXISTING AIRPORT TERMINAL PLAN - LEVELS 3-5 (ATCT LEVELS 1-3)

Existing Terminal Program Area – Level 3 (ATCT Level 1)	
Category	Area (sf)
Airport Space	**1,811**

Existing Terminal Program Area – Level 4 (ATCT Level 2)	
Category	Area (sf)
Airport Space	**1,811**

Existing Terminal Program Area – Level 5 (ATCT Level 3)	
Category	Area (sf)
Airport Space	**642**

TABLE 4 – EXISTING TERMINAL PROGRAM AREA – LEVELS 3-5 (ATCT LEVELS 1-3)

1.2.3 Operational Efficiency

The following diagrams illustrate the operational flows of baggage and passengers. The organization of level 1 allows departing passengers to use the western portion of the terminal for check-in and security screening while arriving passengers utilize the eastern portion for exiting the secure area, baggage claim, and rental cars. Baggage service follows a similar arrangement: checked baggage gets checked in at ticketing in the western portion of the terminal and sent to baggage screening and sorting. Inbound baggage gets delivered in the eastern portion of the terminal adjacent to the baggage claim.

Level 2 is more comingled between departing and arriving passengers, as with most domestic passenger terminals.

Figure 4 illustrates the passenger flows on both levels 1 and 2, while Figure 5 illustrates the checked baggage flows.

1.2.3.1 Diagrams

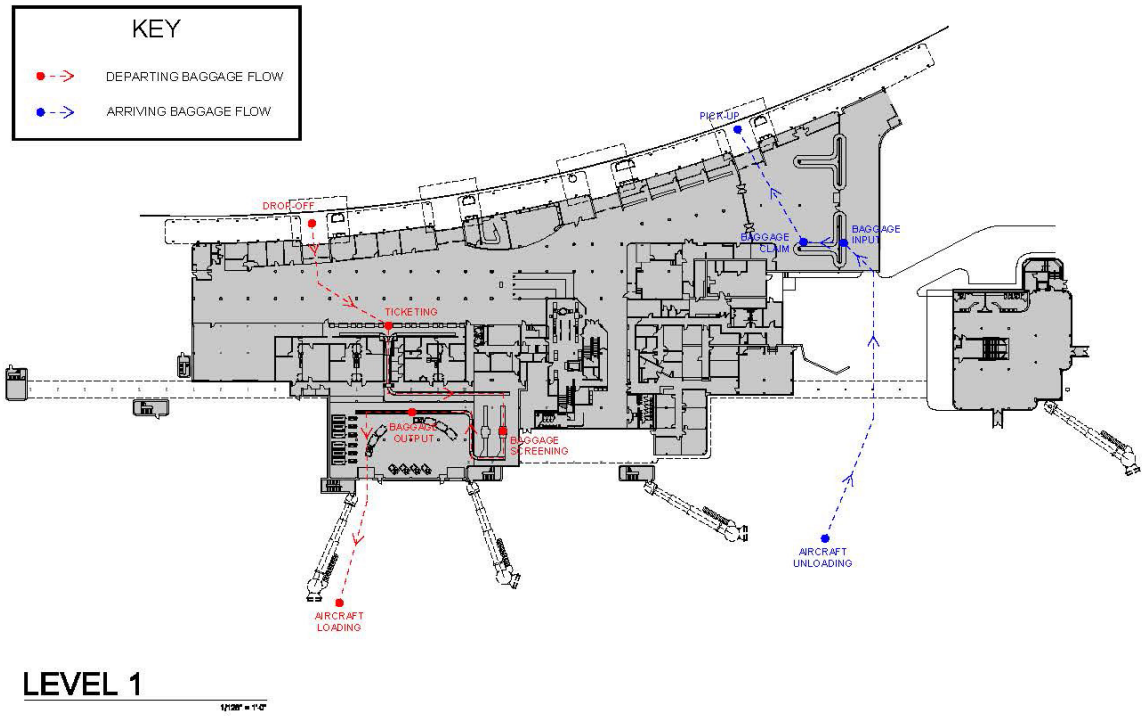

FIGURE 4 – EXISTING AIRPORT TERMINAL PLAN - BAGGAGE SERVICE FLOW DIAGRAM

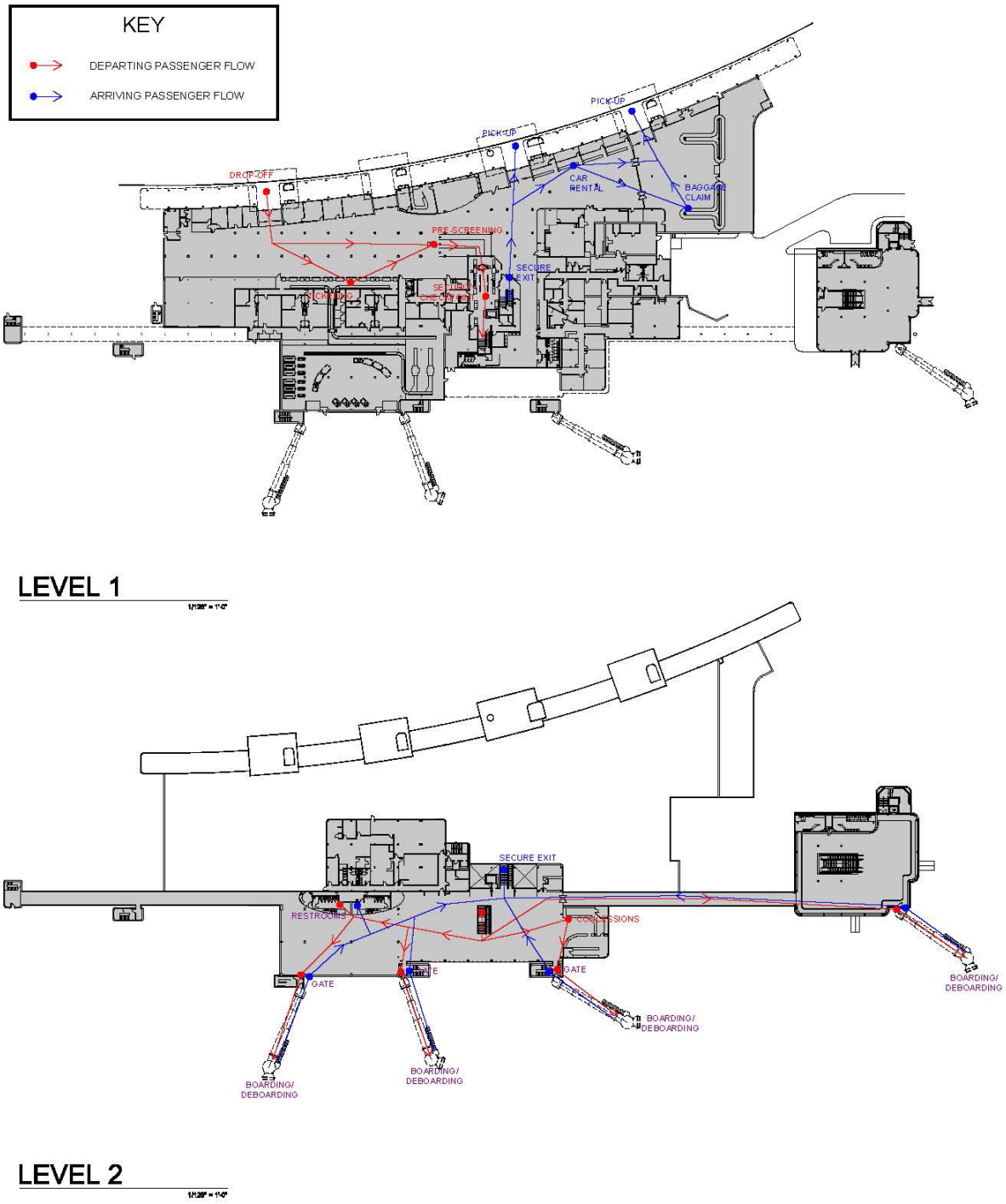

FIGURE 5 – EXISTING AIRPORT TERMINAL PLAN – PASSENGER FLOW DIAGRAM

1.2.3.2 Health and Wellness Measures (COVID)

The terminal facility was constructed before the COVID-19 pandemic; therefore, there are no structural health and wellness elements. The Port Authority has implemented appropriate measures compliant with federal and local guidelines throughout the pandemic to help protect the well-being of the traveling public. Further discussions in facility requirements will address updated guidance and design features for health and wellness.

1.3 EXISTING FACILITY COMPONENTS

The following sections describe the findings from the site visit in detail, complete with pictures and tables describing the existing conditions and whether they need replacing or are adequate for future use. The sections are organized by specialty, beginning with architectural and progressing through the engineering sub-specialties.

1.3.1 Architectural

The architectural section discusses the site-visit findings in relation to the terminal facility, including the condition of finishes, code compliance, and environmental hazards.

1.3.1.1 Design Deficiencies

The following items were found from visual observations or in conversations with staff. There are large expanses of underutilized space and areas that are too condensed or insufficient. An area that does not function properly is the TSA security screening checkpoint, as it overlaps with airline ticketing. As passengers make their way through the screening stages, building columns obstruct the flow, and people with strollers or large bags are instructed to move in a different direction. The area for passengers to remove their shoes and present their items for scanning is tight and does not allow easy passage toward the body scanners. Once through the scanners, the area to pick up belongings is very congested due to the placement of the elevator. There is only one bench available for passengers to put on shoes, and it can become easily blocked by even just one passenger. This causes a delay in the movement of people through the body scanner, as there is no place for them to go. The following examples are areas where adjacent use spaces overlap:

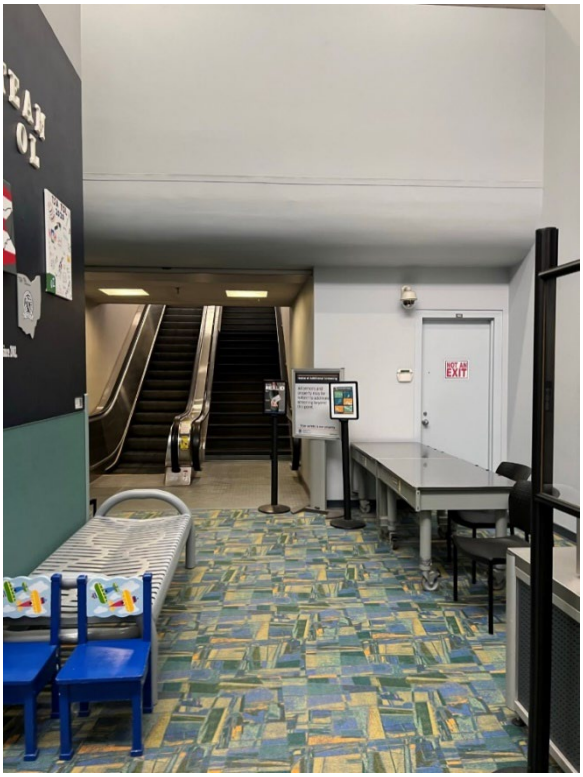

FIGURE 6 – TSA PASSENGER RECOMPOSURE AREA

- Queues for Allegiant Airlines check-in and the TSA security checkpoint are intermingled.
- Dining space near the concessions is limited, which causes further congestion in the queue and limits access to the bar area. This forces the dining space to be extended further into the terminal, causing a disconnect with the concessions area. See figures 7 and 8.
- The Concession queue extends to the bar seating area creating inefficiencies in circulation, see figure 9.

FIGURE 7 – DINING AREA

FIGURE 8 – PASSENGER HOLDROOM

The following spaces are allocated; however, the space is insufficient:

- TSA breakroom is missing basic amenities such as a kitchenette
- Concession storage is small, resulting in the use of adjacent unused hallways, see Figure 10

FIGURE 9 – CONCESSIONS QUEUE

FIGURE 10 – CONCESSIONS STORAGE

The following spaces are missing from the passenger terminal environment and are considered essential in the current industry standards for commercial passenger terminal buildings:

- Service Animal Relief Area
- Mother's Room
- Sensory Room

The following areas of the passenger terminal are underutilized:

- The former restaurant space opposite the ticketing counters, see figure 11
- Vacant airline ticketing office (ATO) space, see figures 12 and 13
- Corridor, open area, and restrooms facing airside, located behind the escalators coming from the secure side, see figure 14
- Open area west of the ticketing counters, see figures 15 and 16
- Former offices of the Port Authority Police Station (adjacent to Allegiant), see figure 17
- Both levels of the east holdroom, including restrooms
- West corridor to former gates 1 and 2, associated stairwells, and adjacent space

FIGURE 11 – CLOSED RESTAURANT

FIGURE 12 – VACANT ATO

FIGURE 13 – VACANT ATO

FIGURE 14 – AREA BEHIND ESCALATORS

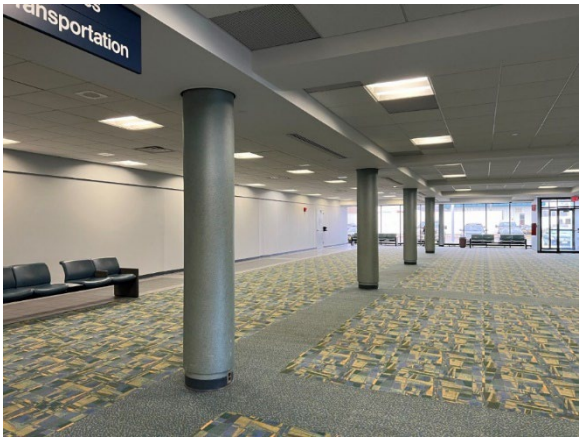

FIGURE 15 – WEST END OF TICKETING – VIEW 1

FIGURE 16 – WEST END OF TICKETING – VIEW 2

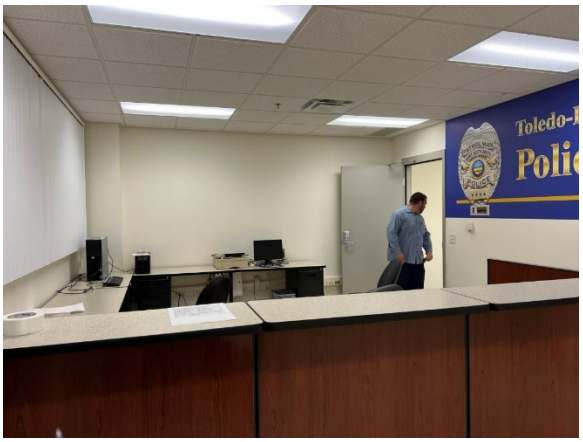

FIGURE 17 – PORT AUTHORITY POLICE STATION

Overall, the allocation of space needs to be revised. Existing conditions prove this to be problematic.

1.3.1.2 Service Animal Relief Area (SARA)

One Service Animal Relief Areas is present, landside, on the exterior, southwest of the terminal, adjacent to the employee parking. FAA requires wheelchair-accessible Service Animal Relief Areas for all public terminals with 10,000+ annual enplanements and for civil use airports that receive federal financial assistance through the Airport Improvement Program or Passenger Facility Charges program. This requirement does apply to TOL. Passengers with service animals, once on the airside of the terminal after passing through security or waiting for a transfer flight, are essentially confined. There is no access to a relief area or the possibility of taking the animal outdoors.

Minimum recommendation is the addition of one Service Animal Relief Area on the airside of the terminal. This is the most vital location. Appendix A of FAA Advisory Circular 150/5360-14A provides SARA guidelines. Highlights below:

- **Number**: At least one SARA must be located in each public sterile area of each terminal.
- **Size and Shape**: The SARA may be constructed in any shape, but the minimum size of a SARA should provide adequate space to accommodate a person using a wheelchair handling a service animal secured on a five-foot leash.

- **Surface**: A relief area should have at least two different surfaces. One should be a hard surface (e.g., non-slip epoxy flooring) and located immediately inside the entrance to allow wheelchair access; the other surface is the relief area itself. The hard surface should be delineated in a manner to indicate the portion intended to be traversed by people, and the portion intended for animal relief. The other surface should be an appropriate softer surface, such as gravel or mulch for outdoor areas, and artificial turf specially designed as an animal relief surface, treated to inhibit the spread of disease, for indoor (and outdoor) areas.
- **Fencing**: SARAs should be fenced or surrounded by another suitable enclosure adequate for containing animals and should be constructed with an accessible gate/entrance.
- **Plumbing**: SARAs should include a sink with a faucet for hand washing. When designing and installing the sink, airports should consider that users may use the sink to fill bowls for their service animal. A separate water supply should be included for use in cleaning the surface. The surface should be constructed with adequate drainage to facilitate regular cleaning. A hand sanitizer may be provided instead of sink.
- **Location**: There are a number of key factors that determine the location of a SARA:
    - The SARA must be located in the publicly accessible sterile area of each airport terminal, unless:
        a. The Transportation Security Administration prohibits the Airport from locating a relief area in the sterile area, or
        b. A service animal training organization, the Airport, and the carriers in the terminal in which the relief area will be located agree that a relief area would be better placed outside the terminal's sterile area. In that event, the Airport must retain documentation evidencing the recommendation that the relief area be located outside of the sterile area.
    - The SARA must be wheelchair accessible.
    - Similar to siting typical restrooms, a best practice is to choose a location that is proximate and conveniently accessible to concentrations of passengers (e.g., central circulation corridors, hold rooms, and or major concession concentrations).
- **Weather Protection**: Outdoor SARA should include weather protection from sun and precipitation. If the SARA is close to operating aircraft, protection from jet blast and prop wash should be provided.
- **Scent**: Because animals have a more acute sense of smell than humans, pheromone-scented surfaces or devices may encourage service animals to use the SARA, while disinfecting chemicals with strong odors may serve as a deterrent.
- **Accessories**: The SARA, at a minimum, should include:
    - A three-dimensional prop (e.g. rock or fake fire hydrant) to encourage urination by male dogs. Ensure that the prop is positioned in a location inside the SARA that will not obstruct a wheelchair user's entrance into, or maneuverability inside the SARA.
    - Disposable animal waste bags.
    - A waste receptacle.

The existing SARA does not meet FAA requirements. If it is to be retained in addition to the new airside SARA, it is recommended that it be fenced in or surround by another suitable enclosure with an accessible gate. The sidewalk leading to the area will need to be slightly reconfigured depending upon the location of the enclosure. A small shelter or canopy needs to be installed to provide weather protection. If the

new SARA location is moved further to the south, the existing building would provide protection against jet blast and prop wash. Rocks or other items to encourage male urination should be placed in the area. Disposable animal waste bags and receptacle should be provided.

1.3.1.3 Sound Transmission Class (STC)

Sound transmission is a rating of how an interior building element reduces airborne noise from one side to the other. Various interior elements such as walls, floors, ceilings, doors, and windows will transmit sound. The Conference Room and Offices facing the apron consist of double-paned windows and efficiently transmit the sound when aircraft are nearby or taking off on the runways. The high level of sound makes it difficult to function during airplane activity.

- STC ratings of the windows and adjacent walls between offices should be increased to provide a better performing space. Newer insulations, higher STC-rated windows, and sound transmission barrier products are available that provide greater protection which reduces the transmission of the airborne noise from adjacent spaces.

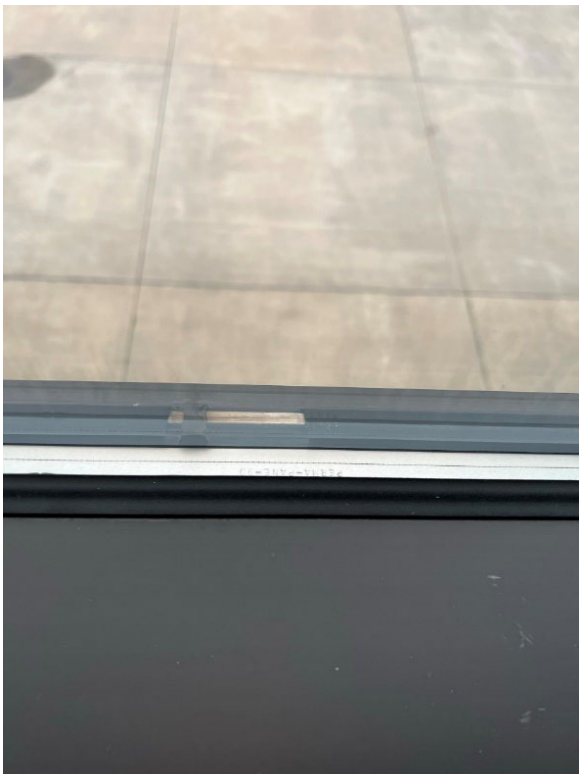

FIGURE 18 – DOUBLE PANED WINDOWS

1.3.1.3.1 Entry Barriers or Bollards

Entrances to the Airport are vulnerable to vehicles. No site elements such as bollards or planters would prevent vehicles from jumping the curb.

- It is recommended to provide site elements that protect individuals standing outside from vehicles. Site elements should be placed at regular intervals so that a vehicle should not be able to reach areas where pedestrians would be standing.

1.3.1.4 Business Center

Business Center is outdated. No USB/charging ports are provided. Light levels are insufficient. No access to wi-fi.

- It is recommended to provide a Business Center that allows for more sound privacy and updated charging ports.

FIGURE 19 – BUSINESS CENTER

1.3.1.5 Canopy

It was observed during heavy rainfall that the canopy leading to the parking lot did not provide any protection from the rain.

- The width of the canopy should be wider so that there is some protection from the elements.

FIGURE 20 – CANOPY FACING PARKING LOT

FIGURE 21 – CANOPY FACING TERMINAL

1.3.1.6 Designated Smoking Area

The Designated Smoking Area is far from the public entry and not used. People were seen smoking near the entrances.

- No smoking signage should be placed at all entries. Additional signage should be placed to indicate the smoking area to occur a minimum of 15′ from entry.

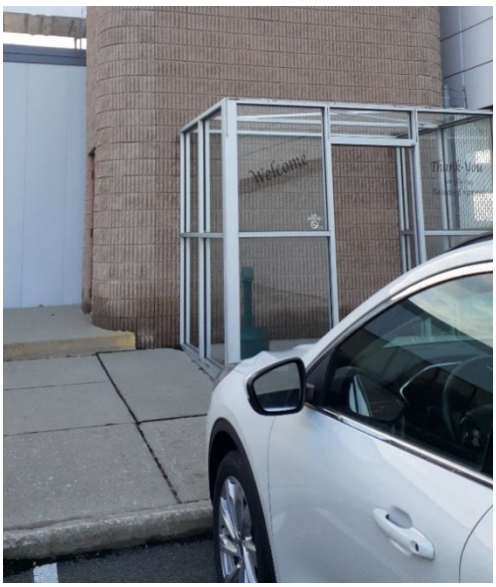

FIGURE 22 – DESIGNATED SMOKING AREA

1.3.1.7 Card Readers at Doors

Biometrics readers at all secure doors are outdated and do not function properly.

- It is recommended that card readers at all doors should be replaced.

1.3.1.8 Airside Restroom

Although the Airside Restrooms are newer construction, the Building Engineer stated there are issues with the faucets. The design of the faucets is not intuitive for users, and people try to rotate them. Parts are loosened, and leaks result.

- This will be an ongoing maintenance issue until faucets are replaced.

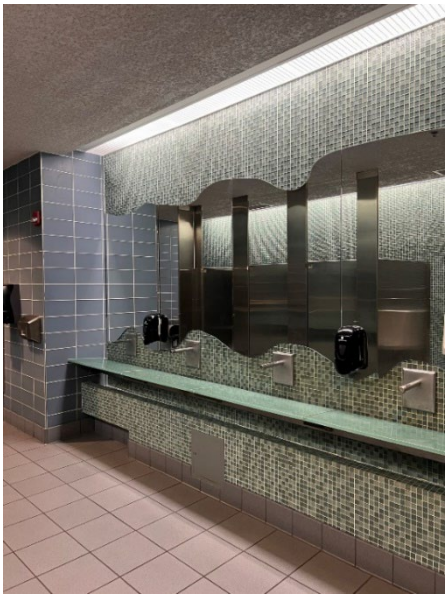

FIGURE 23 – AIRSIDE PUBLIC RESTROOM

1.3.1.9 Snow Removal Equipment

Snow Removal Equipment (SRE) is often parked at the inbound baggage area, which causes congestion in that space. This suggests that the allocated space for the SRE is inadequate or not in a convenient location.

- SRE should have sufficient space central to the areas of use.

FIGURE 24 – SRE EQUIPMENT

FIGURE 25 – INBOUND BAGGAGE AREA

1.3.1.10 Kitchen and Dishwash

The kitchen is used for food storage/preparation and is no longer for cooking. Space is limited to one table and a long countertop. There is a walk-in cooler/freezer, which is aged. The location is not convenient for Concessions personnel as items that are transported to the Concessions area need to go through the TSA security checkpoint. Retrieving stock can be very time-consuming and potentially delay passengers being screened.

Some storage is available near the restaurant but is insufficient. Overflow items are kept in the unused hallway to the East Holdroom.

- Restaurant and Concession storage should be increased and relocated so that as items are received from shipment, they can be scanned at security and held in an area closer to where they are readily accessed.

FIGURE 26 – HALLWAY

FIGURE 27 – CONCESSIONS STORAGE

1.3.1.11 Pedestrian Crossings

The curb cuts with flared sides and pedestrian crossing pavement markings do not align with the entrances to the building. However, parking lot access areas are directly across from the entrances, marked for pedestrian traffic by bollards. It was noted that customers would proceed directly from the doors straight across to the parking lot. In doing so, the marked pedestrian pavement crosswalks were not being utilized.

- Pedestrian crossing pavement markings and curb cuts should be relocated so that foot traffic is crossing at those areas.

FIGURE 28 – PEDESTRIAN CROSSING FACING TERMINAL

FIGURE 29 – PEDESTRIAN CROSSING FACING PARKING LOT

1.3.1.12 Environmental Hazards

Environmental health hazards are substances that can cause an adverse health events. These can include physical, chemical, or biological factors external to a person; these hazards can be natural or human-made. The following subsection explores the environmental hazards identified during the site assessment.

1.3.1.12.1 Mold

Mold is present in the East Holdroom. This is due to water infiltration at the exterior envelope. Blackwater retainage was found around the escalator pit in the East Holdroom.

FIGURE 30 – MOLD IN EAST HOLDROOM

The west corridor and stairwell have sustained a lot of water damage. Although no signs of mold were noticed, the space had a strong, musty smell and is suspected of having mold in areas not visible during the walk-through.

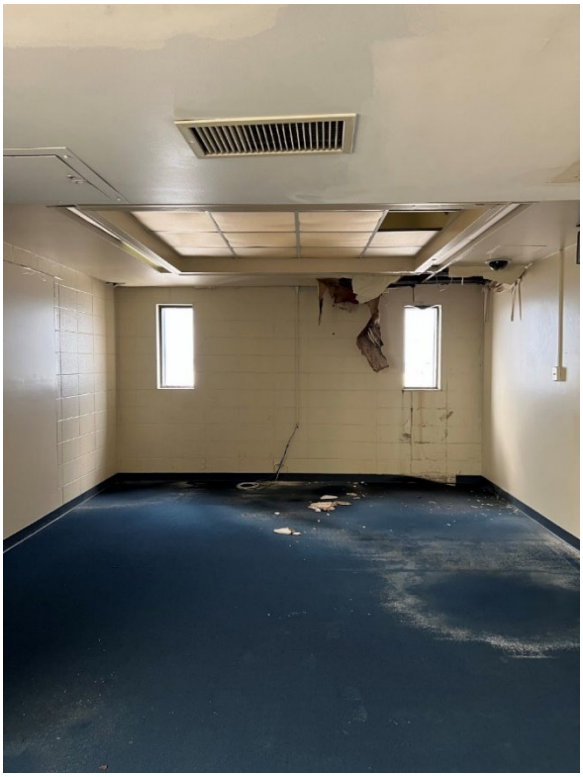

FIGURE 31 – WATER DAMAGE AT FORMER GATE 1

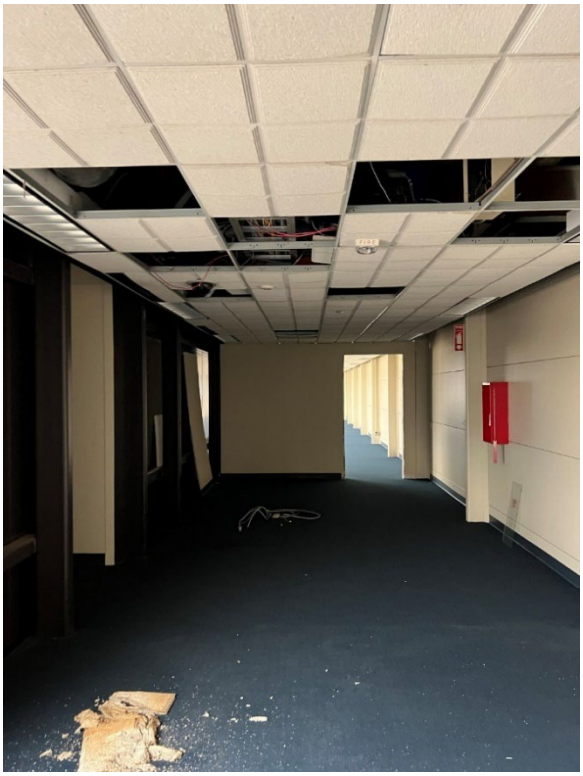

FIGURE 32 – WATER DAMAGE AT FORMER GATE 2

- Due to mold and water infiltration issues, the East Holdroom, the West Corridor, and the associated stairs.

There are many indications throughout the building of water damage due to uninsulated pipes, envelope water infiltration, and perhaps leaks from HVAC and plumbing systems. The water sources are innumerable, and it is unknown, aside from cosmetic damage, if there is mold growth in cavities, chases, or plenums.

- A replacement of the exterior envelope, mechanical, and plumbing systems to rectify the water damage caused throughout would most certainly call for the demolition of the building. At the very least, an extensive renovation would be warranted beyond cosmetic and life cycle needs.

FIGURE 33 – WATER DAMAGE INSIDE TERMINAL

FIGURE 34 – WATER DAMAGE ON THE ROOF

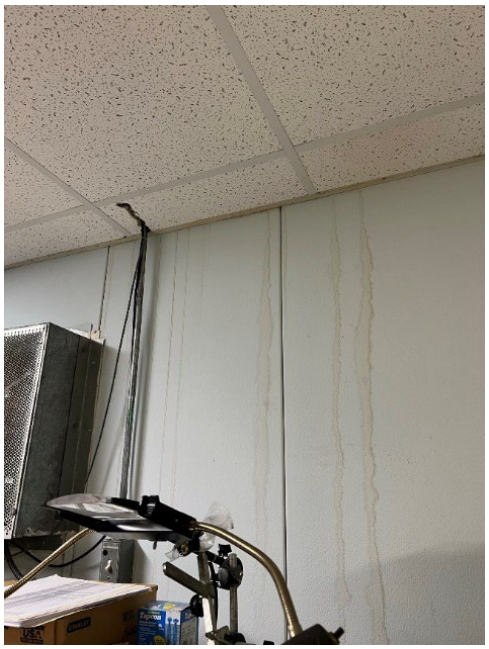

FIGURE 35 – WATER DAMAGE INSIDE STORAGE SPACE

1.3.1.12.2 Asbestos

The Building Engineer was unsure if the building had been fully remediated of asbestos-containing materials. Unless the building has been cleared of asbestos, testing of materials should be performed and, if found, abated ahead of a prospective development program. Some potential sources of asbestos-containing material are:

- Mastic
- Pipe insulation
- Duct insulation
- Gaskets
- Joint compounds
- Floor Tile
- Adhesives

- Electric Wiring insulation

1.3.1.13 Life Cycle Upgrades

The following sub-sections describe areas and elements that need replacement based on the useful life of the associated materials.

1.3.1.13.1 Finishes

The following is a list of finishes that were found to be dated, beyond their usable life, or had sustained damage either caused by abuse or water infiltration:

- Inoperable window blinds
- Peeling paint, see figure 36
- Faded/Stained carpet, see figure 37
- Delaminated/chipped countertops/cabinets
- Detached wall base
- Furniture is dated, split vinyl, see figure 38
- Peeling wallpaper, see figure 39
- Light fixtures missing lenses show signs of rust
- Stained/missing acoustical ceiling tile (ACT), see figure 40
- Water damaged drywall
- Aged/stained floor tile
- Trip hazards
    - Electrical cords are taped to the ground, see figure 41
    - Broken/uneven floor tile, see figure 42
    - Between floor finishes/missing transition strip, see figure 43
    - Loose gasket at the escalator access panel

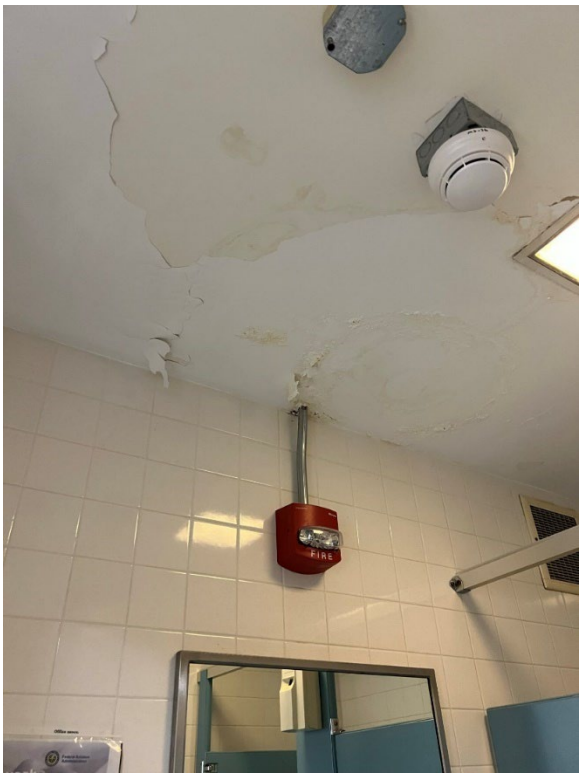

FIGURE 36 – PEELING PAINT

FIGURE 37 – STAINED CARPET

FIGURE 38 – DATED FURNITURE

FIGURE 39 – PEELING WALLPAPER

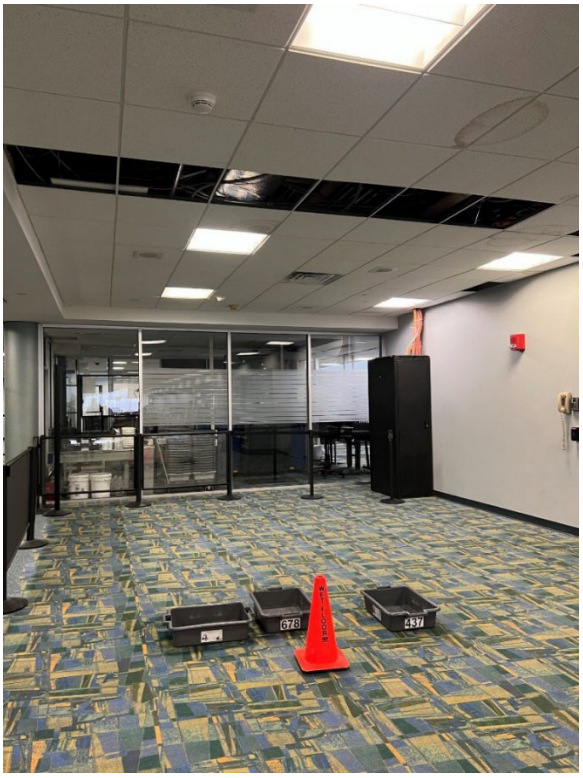

FIGURE 40 – MISSING CEILING TITLES

FIGURE 41 – TAPED CORDS

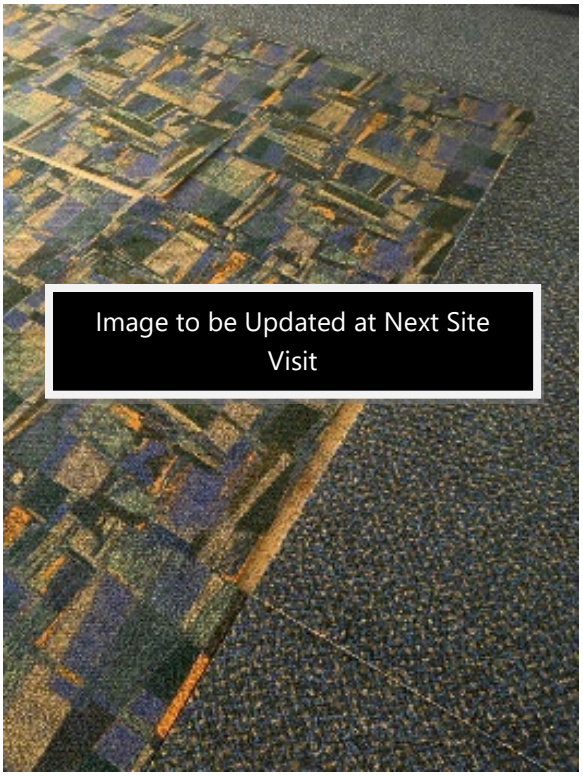

FIGURE 42 – UNEVEN FLOOR

FIGURE 43 – NO TRANSITION STRIP

It is recommended that all the finishes in the passenger terminal facility are replaced.

1.3.1.14 Inbound Baggage

The baggage conveyor is beyond its useful life. It had a belt that showed large worn, cracked areas and holes. There are misaligned gaps in the stainless steel that are open to potential injuries.

FIGURE 44 – BAGGAGE CONVEYOR PANEL GAP

FIGURE 45 – BAGGAGE CONVEYOR DAMAGE

- The baggage conveyor system should be replaced. Sensors, card readers, associated overhead doors and other system components should all be replaced with a new baggage conveyor system.

1.3.1.15 Outbound Baggage

The outbound baggage system is automated from Ticketing to screening. At Baggage Makeup, the system combines automated and inclined rollers that feed to the far end of the system.

The current conveyor belt that feeds the bags from the airline ticketing area into the inline baggage system is failing, and the side guards in that area are also deteriorating.

1.3.1.16 Passenger Boarding Bridge

The passenger terminal currently has four passenger boarding bridges (PBB) at gates 2, and 3-5. Gate 2 is in the east holdroom, while gates 3-5 are in the main terminal. The devices at gates 2, 3, and 5 are operational, while the device at gate 4 is inoperable. Gates 3 and 5 are used most often, while gate 2 is used during irregular operations only.

FIGURE 46 – PASSENGER BOARDING BRIDGE – GATE 1

FIGURE 47 – PASSENGER BOARDING BRIDGE – GATE 3

FIGURE 48 – PASSENGER BOARDING BRIDGE – GATE 4

FIGURE 49 – PASSENGER BOARDING BRIDGE – GATE 5

Gate	Manufacturer	Installation Date	Operational (Y/N)	Age (Years)
2	Jetway Equipment Corporation	U	Y	U
3	Jetway Equipment Corporation	1970's	Y	~50
4	DEW Engineering and Development Ltd.	July 2002	Y	20
5	ThyssenKrupp Airport Systems	May 2017	Y	5

(u) Unavailable

TABLE 5 – PASSENGER BOARDING BRIDGE DETAILS

- Passenger boarding bridges are expected to last approximately 20 years. Two of the three PBBs have exceeded that time and need replacement.

1.3.1.17 Public Address System

The public address system (PA) system for the airlines in the passenger terminal is inoperable. They are currently using portable speakers.

- A new PA system should be provided for the use of the airlines.

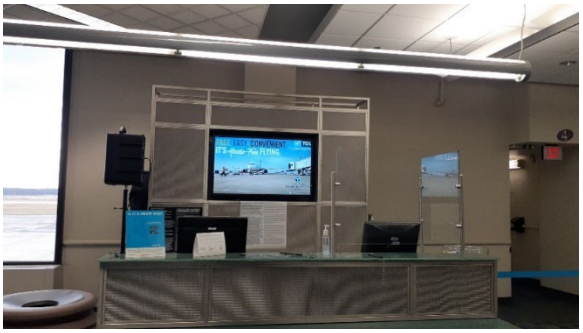

FIGURE 50 – AIRLINE GATE PA SYSTEM

1.3.1.18 Building Envelope

The biggest issues are caused by the water infiltration that is occurring all over the building envelope. These are also the costliest. These components exhibit signs of water infiltration, abuse, and overall end of useful life:

- Ribbed concrete panels-some cracks visible, dark areas at the base of panels which is indicative of water at interior. No base flashing was visible, see figure 40
- Missing windowsill/flashing, see figure 50
- Deteriorated concrete sill at storefront glazing system, see figure 41
- Rusted column enclosures, figures 51 and 52
- Peeling paint, including on columns, metal exterior doors, and guardrails, see figure 53
- Loading dock damage, see figure 54
- Rusted coping, including soft spots at roof cover board, figure 55
- Cracked concrete base at column due to storm sewer water freeze/thaw cycle, figure 56
- Expansion joint failure
- No lightning protection

The exterior metal panels are showing the following signs of needing replacement:

- Dark areas at individual panel perimeters exhibits infiltration from missing, loose, or failed gaskets (attempted repairs with sealant)
- Evidence of rust
- Caulking at base of metal panels does not allow water to drain
- Gaps/detached flashing at metal panels on roof
- Patches with sealant
- Exterior soffits exhibit history of patching adjacent to metal panels

Water damage has begun to affect the interior finish components and has resulted in notable organic growth, staining, and damage in many areas.

- Ceilings
- Walls
- Window soffits
- Flooring

All the ceilings and soffits are recommended for complete demolition. Areas, where water was detected, may require additional repairs, and should be further inspected for a full scope of select demolition.

FIGURE 51 – BUILDING ENVELOPE

FIGURE 52 – CONCRETE SILL

FIGURE 53 – PEELING PAINT

FIGURE 54 – LOADING DOCK

FIGURE 55 – RUSTED COPING

FIGURE 56 – RUSTED COLUMN

FIGURE 57 – RUSTED COLUMN

FIGURE 58 – WINDOWSILL

FIGURE 59 – CONCRETE BASE

FIGURE 60 – METAL WALL PANELS

FIGURE 61 – METAL WALL PANELS

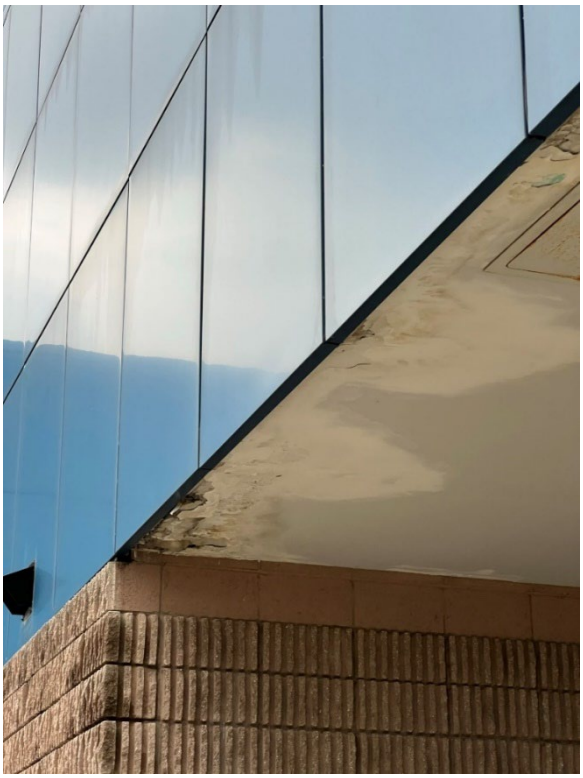

FIGURE 62 – WATER DAMAGE

FIGURE 63 – WATER DAMAGE

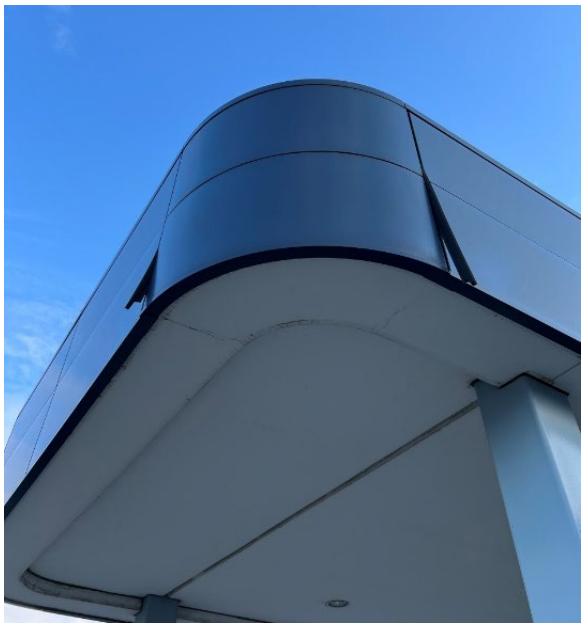

FIGURE 64 – DETACHED FLASHING

FIGURE 65 – PATCHING REPAIRS

1.3.1.19 Canopy to parking lots

Canopy baseplates have rust-jacking and corroded. Some bolt heads have completely rusted off. There is a lot of rust staining at the concrete piers. Minor rusting is noted at some tension rods and steel members.

FIGURE 66 – CANOPY BASEPLATES

- Canopy can be salvaged; however, it needs to be painted and several of the baseplates will require repair or replacement. However, as noted above, the width of the canopy is not sufficient to protect from the rain, especially where it has increased height.

1.3.1.20 Pavement

- Airside concrete pavement is in good condition
- Airside asphalt has some cracks without noticeable upheaval

FIGURE 67 – AIRSIDE CONCRETE

FIGURE 68 – DAMAGED WALL

- Pavement is in good condition and can remain for future use.

The screening wall at the airside is missing precast coping and exhibits water infiltration noted by darkened areas. Some of the wall is slightly sunken or shifted.

- If it is determined that selective demolition is to occur, repairs will be required of the screening wall. If the building is to be demolished, since the screening wall is an extension from the building, it too should be demolished.

Overall, the number of building envelope elements and interior components affected by the water infiltration would warrant a complete demolition.

1.3.2 Electrical

The terminal building is served from the Airfield Vault Building by two (2) underground 15KV feeders. The feeders serve a unit substation located in the Terminal vault room. The substation consists of a 15KV, manual selector switch, a 2000KVA dry type transformer and a secondary circuit breaker distribution section. This substation serves all Terminal building downstream panelboards and associated step-down transformers. In addition, an 800-amp feeder is tapped from the substation to serve the main distribution panel (MDP) in the East Terminal Building. In addition to this 15KV service, a separate electric service (480 volt, 3 phase) exists for the Air Traffic Control Tower (ATCT). Power is provided via a dedicated pad mount transformer. The FAA meter/service disconnect is in a dedicated electric room located adjacent to the exit of the inbound baggage tug lane.

The majority of the electrical distribution equipment was installed with the initial terminal construction in the 1950's. Upgrades to the system have occurred under the following projects:

- General Terminal Facility Upgrades (1975)
- East Terminal Building Expansion (1998)
- Terminal Building Security Reconfiguration (2005)
- Apron Lighting Controls Upgrade (2018)
- FAA Service Disconnect Install (2016)
- Terminal Fire Alarm System Upgrade (2007)
- ATCT fire Alarm System Upgrade (2017)

A 150KW/187.5KVA, 480/277-volt, standby diesel generator provides emergency power for the Terminal. The generator has a skid mounted fuel tank. The loads served by the generator is limited primarily to code defined life safety related loads. Power is distributed through ATS1 & ATS2 to panels EP1, EP2, ERP2, LP-EMB, LP-EM AND LPP-EM. The generator does not have the capacity to power additional standby loads to facilitate airport operation during an electric power outage.
A second generator is installed to serve the FAA ATCT. The enclosure containing the generator and associated ATS was not accessible at the time of the site survey.

1.3.2.1 Electric Service Capacity

Constellation Energy/Toledo Edison provides power to the Airport. Table 6, Electrical Demand and Energy Usage reflects the Airport's energy consumption, peak electrical demand, and electrical utility costs over the past 12 months. As indicated, the peak electrical demand during this period was 618 KW. Assuming a power factor of .9, this equates to 687 KVA. Based on the existing service capacity of 2000 KVA, the terminal building's electrical service is experiencing a 34.5% loading factor. Based on the present load profile, the existing service is oversized by 30-40%. Likewise, the terminal building consumed over 2.9 million KWH of energy that resulted in a total annual electric bill of approximately $226,000. By "right sizing" the terminal's square footage and installing energy efficiency equipment/systems, a similar percentage in the reduction of energy costs could be realized.

TOLEDO EXPRESS AIRPORT						
ELECTRICAL DEMAND AND ENERGY USAGE(JANUARY 2021-JANUARY 2022)						
ELECTRIC METER # 5327769040						
			UTILITY CHARGE($)			
MONTH/YEAR	ENERGY USE(KWH)	PEAK DEMAND(KW)	TOLEDO EDISON	CONSTELLATION ENERGY	TOTAL	COMMENTS
DECEMBER/2020	168,600	402.6	$6,242.00	$7,536.42	$13,778.42	
JANUARY/2021	226,800	431.4	$7,455.98	$10,137.96	$17,593.94	
FEBRUARY/2021	221,400	435	$7,472.69	$9,896.58	$17,369.27	
MARCH/2021	219,300	395	$6,825.27	$9,802.71	$16,627.98	UTILITY BILL NOT PROVIDED. VALUE INDICATED REFLECTS THE AVERAGE OF THE MONTH PRECEEDING AND FOLLOWING .
APRIL/2021	217,200	355.8	$6,177.85	$9,708.84	$15,886.69	
MAY/2021	212,400	568.2	$8,049.59	$9,494.28	$17,543.87	
JUNE/2021	271,200	618	$9,025.57	$12,122.64	$21,148.21	
JULY/2021	292,800	547.8	$8,155.16	$13,088.16	$21,243.32	
AUGUST/2021	256,200	527	$7,517.81	$11,452.14	$18,969.95	UTILITY BILL NOT PROVIDED. VALUE INDICATED REFLECTS THE AVERAGE OF THE MONTH PRECEEDING AND FOLLOWING .
SEPTEMBER/2021	219,600	507	$6,880.45	$9,816.12	$16,696.57	
OCTOBER/2021	208,200	462	$6,394.27	$9,306.54	$15,700.81	
NOVEMBER/2021	234,000	417.6	$6,113.35	$10,459.80	$16,573.15	
DECEMBER/2021	237,600	417.6	$6,267.28	$10,620.72	$16,888.00	
TOTAL	2,985,300		$92,577	$133,443	$226,020	

TABLE 6 - ELECTRICAL DEMAND AND ENERGY USAGE

1.3.2.2 Electrical Equipment Assessment

Table 7, Major Electric and Fire Alarm System Equipment Assessment, indicates the remaining useful life for electrical equipment in the Main Terminal, East Terminal, ATCT, and Airfield Vault buildings. The following general assessments can be made:

MAIN TERMINAL: MAJOR ELECTRIC AND FIRE ALARM SYSTEM COMPONENTS									
		Code Deficiencies		Condition Assessment					
Location	Equipment	Yes/No	Description	Rating	Recommendations	Useful Life Term (In Years)	Useful Life Remaining (In Years)	Replacement Year	Comments
Terminal Vault Rm.	Substation MS	Yes	Equipment clearance does not meet NEC 110.31. Main switch does not have ground fault protection as required in NEC 230.95.	5	Immediate replacement recommended	30	0	2022	A sump is located adjacent to the 15KV primary selector switch. Based on discussions with maintenance personnel, the vault room has flooded in the past. This condition must be mitigated . All substation breakers were retrofiited in 2006.
	Panelboards PP-1A,1B,1C,1D,1E,1F,1G,1H, LP-1A,1B,1C,1D,LP-A,C,E, LP-EM	No	N/A	5	Immediate replacement recommended	30	0	2022	
	Transformer TRP-1A	No	N/A	3	Immediate inspection and repair recommended	30	10	2032	During the site visit, a loud buzzing was coming from the transformer. This condition is not normal. Immediate inspection and repair is needed.
	Transformers T1,T2,T3,T4 &T5	No	N/A	5	Immediate replacement recommended	30	0	2022	
	Fire Alarm Control Panel Simplex 4100U	Yes	Equipment clearance does not meet NEC 110.26A.	3	Fire Alarm Control Panel should be upgraded in the next 5-7 years	30	10	2032	All initiating and notification devices were upgraded in 2007. Control panel should be relocated in the electric room to meet NEC clearance requirements.
	FAA Main Disconnect Switch(Panel PP-2A)	Yes	Equipment clearance does not meet NEC 110.26A.	1	Upgrade not required at this time	30	24	2046	FAA disconnect must be relocated to accommodate NEC code clearancerequirements
	Glycol Containment Control Panel	No	N/A	1	Containment system is not operational. Repairs should be performed to bring the system online.	30	20	2042	Based on discussions with maintenance personnel, the glycol containment system has never worked. Recommend performing the required repairs . If not, the equipment should be removed .
	Panelboard LP-D	No	N/A	1	Upgrade not required at this time	30	26	2046	New Panel LP-D and associated lighting contactors were installed as part of the 2018 Apron Lighting Controls Upgrade. Based on discussions with maintenance personnel, the system is not functioning properly. Recommend performing the required repairs for a proper functioning lighting control system.
Emerg.Generator/ E.Closet 114	150 KW, 480/277v,Diesel Generator	No	N/A	2	Upgrade not required at this time	30	14	2036	
	Autotransfer Switch ATS1 & ATS2	No	N/A	2	Upgrade not required at this time	30	14	2036	
	Panelboards EP-1,EP-2	No	N/A	2	Upgrade not required at this time	30	14	2036	
FAA SERVICE/METER RM.	2000A QED Switchboard	Yes	Equipment clearance does not meet NEC 110.26A.	5	Immediate replacement recommended	30	0	2022	
	Service meters	No	N/A	3	Upgrade not required at this time	30	10	2032	
Bag Makeup	Panelboards RP-1H1, RP-1H2,PP-1K,PP-1J,ERP-2	No	N/A	2	Upgrade not required at this time	30	11	2033	

EAST TERMINAL: MAJOR ELECTRIC AND FIRE ALARM SYSTEM COMPONENTS									
		Code Deficiencies		Condition Assessment					
Location	Equipment	Yes/No	Description	Rating	Recommendations	Useful Life Term (In Years)	Useful Life Remaining (In Years)	Replacement Year	Comments
East Expansion Eqp. Rm.	Panelboards MDP, LPA,RPA,RPB, Emerg. Panel	No	N/A	3	Panel should be upgraded in the next 5-7 years.	30	6	2028	

TABLE 7 - MAJOR ELECTRIC AND FIRE ALARM SYSTEM EQUIPMENT ASSESSMENT

FIGURE 69 – ATCT AND MAIN TERMINAL DISTRIBUTION EQUIPMENT

1. Over 50% of the ATCT and Main Terminal's distribution equipment should be replaced immediately or within the next 5-7 years.
2. Substation MS is of particular concern. Circuit breaker parts are no longer made requiring a retrofit of circuit breakers. Consequently, any future breaker failure and the extended time needed to obtain a replacement breaker will impact airport operations.
3. The Terminal main vault room contains numerous code violations.

The layout of Substation MS, the main fire alarm control panel, and the FAA main disconnect does not meet NEC clearance requirements. (Article 110.31 and 110.26A) A redesign of this space is needed to mitigate these code deficiencies.

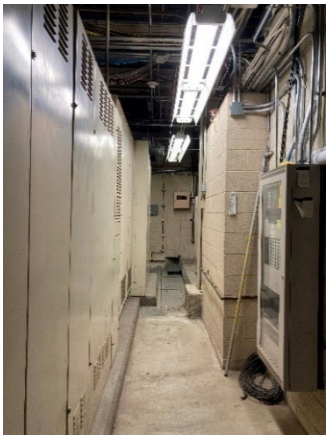

FIGURE 70 – MAIN VAULT ROOM

4. The main vault room is subject to flooding.

   Given the presence of medium voltage (15,000 volts), this condition is extremely dangerous. This necessitated the installation of a sump pit next to the substation lineup.

FIGURE 71 – NATIONAL WEATHER SERVICE EQUIPMENT

5. Equipment was incorrectly installed. The installation was never corrected.

   A disconnect switch serving National Weather Service equipment was wired backwards. Instead of correcting the problem, a label was put on the switch warning of the incorrect installation

FIGURE 72 – EAST TERMINAL ELECTRICAL EQUIPMENT

6. East Terminal electrical equipment is in fair condition and can be reused.

   The equipment installed under the East Terminal Expansion is in fair condition and can be reused for short-term solutions. Due to its age, the equipment requires replacement in 5-7 years.

1.3.2.3 Lighting Systems

The Main Terminal, East Terminal, and the ATCT interior lighting consists of luminaires utilizing mostly fluorescent sources. Some luminaires were retrofitted with specular reflectors to increase light out and

lumen efficacy. In either case, the energy efficiency of these systems does not match the output and efficiency of the latest LED technology. All fluorescent based luminaires will need to be replaced. Lighting in the airport administration area utilizes LED sources. These fixtures can be reused. (See Figure 70)

FIGURE 73 – TERMINAL LIGHTING

1.3.2.4 Fire Alarm System

The Main Terminal fire alarm system was upgraded in 2007 to a Simplex 4100U addressable platform. (see Figure 71) New control panel, initiation and notification devices were installed in the Main Terminal, East Terminal and ATCT. In 2017, an additional upgrade occurred in the ATCT. The system is in good condition and can be reused.

FIGURE 74 – FIRE ALARM SYSTEM

1.3.2.5 Airfield Vault 15 KV Substation

As indicated previously, the incoming service to the Main Terminal is derived from a double ended, 15 KV substation located in the Airfield Vault Building. The substation is in good condition. (see Figure 75). The provision of dual feeders to the main terminal provides additional electric service redundancy. This concept and its associated equipment should be reused. A 300KW diesel generator and associated automatic transfer switch (ATS) supports the airfield lighting. The generator, ATS, and associated distribution equipment is in good condition and can be reused.

FIGURE 75 – AIRFIELD VAULT SUBSTATION

1.3.3 Mechanical

Heating and Air Conditioning requirements for Eugene F. Kranz Toledo Express Airport are provided primarily by Packaged Roof Top Air Conditioning units (RTU) with gas-fired furnaces and a Heating Hot Water (HHW) distribution piping system serving terminal unit heating coils and radiant heaters throughout the building. The original terminal was constructed in the 1950's with renovation projects of different scales occurring in 1975, 1988, 1991, 1992, 1993, 1998, and 2003/05. The renovation in 2003/05 was Phase 1 of a major multiphase Terminal Building Reconfiguration Project. However, the later phases of that project were never completed. As each renovation project occurred, mechanical systems were added and expanded to suit the new architectural layouts. Currently, there are Sixteen (16) large capacity RTU's. Two (2) Split Condenser/Air Handling Units (SC-AHU) and one Make-up Air Unit (MAU) serving the Terminal Building and the ATCT located centrally within the in the Terminal Building. The HHW system was designed and constructed as a primary/secondary system and consists of Two (2) natural gas-fired boilers, Two (2) primary pumps (one dedicated to each boiler) and One (1) Dualarm secondary distribution pump. The HHW piping system consists of newer piping from the renovation project completed in 2003/05, but also utilizes system piping and secondary distribution pumps from 1975. Figure 1 shows the location of the two main mechanical rooms within the terminal building.

Equipment Item	Median Years
Air conditioners	
Window unit	10
Residential single or Split	
Package	15
Commercial through-the wall	15
Water-cooled package	15
Heat Pumps	
Residential air-to-air	15
Commercial air-to-air	15
Commercial water-to-air	19
Roof-top air conditioners	
Single-zone	15
Multi-zone	15
Boilers, hot water (steam)	
Steel water-tube	24 (30)
Steel fire-tube	25 (25)
Cast iron	35 (30)
Electric	15
Burners	21
Furnaces	
Gas- or oil-fired	18
Unit heaters	
Gas or electric	13
Hot water or steam	20
Radiant Heaters	
Electric	10
Hot water or steam	25

Equipment Item	Median Years
Air terminals	
Diffusers, grilles, and registers	27
Induction and fan coil units	20
VAV and double-duct boxes	20
Air washers	17
Ductwork	30
Dampers	20
Fans	
Centrifugal	25
Axial	20
Propeller	15
Ventilating roof-mounted	20
Coils	
DX, water, or steam	20
Electric	15
Heat Exchangers	
Shell-and-tube	24
Reciprocating compressors	20
Packaged chillers	
Reciprocating	20
Centrifugal	23
Absorption	23
Cooling towers	
Galvanized metal	20
Wood	20
Ceramic	34

Equipment Item	Median Years
Air-cooled condensers	20
Evaporative condensers	20
Insulation	
Molded	20
Blanket	24
Pumps	
Base-mounted	20
Pipe-mounted	10
Sump and well	10
Condensate 15	
Reciprocating engines	20
Steam turbines	30
Electric motors	18
Motor starters	17
Electric transformers	30
Controls	
Pneumatic	20
Electric	16
Electronic	15
Valve actuators	
Hydraulic	15
Pneumatic	20
Self-contained	10

TABLE 8 – MAJOR MECHANICAL ROOM INDEX

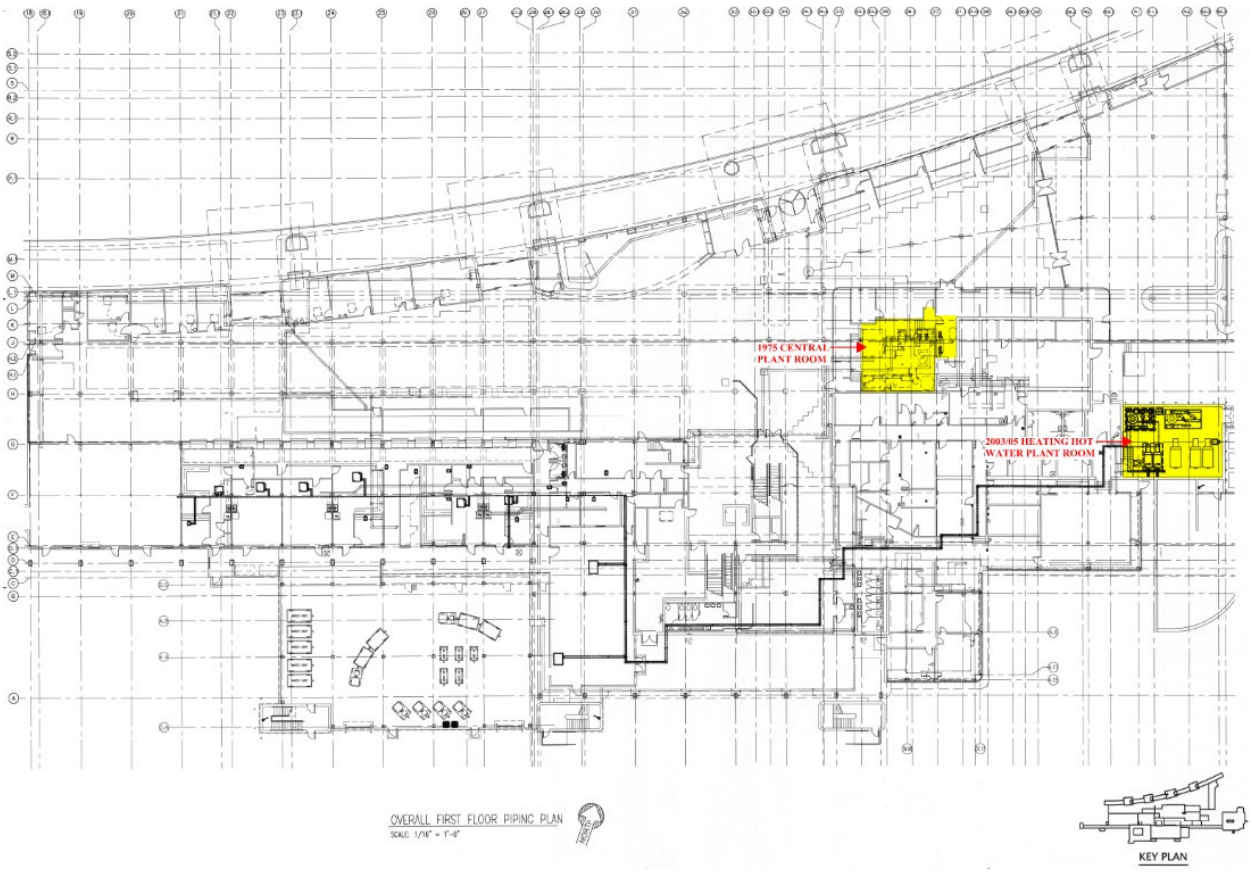

FIGURE 76 – CENTRAL MECHANICAL PLANT ROOMS

The age and condition of the major mechanical system components vary greatly throughout the building with some equipment observed to be part of the 1975 renovation project. In general, it is clear that the HVAC equipment serving the terminal building has been well maintained but is either beyond the typical useful life period or nearing the end of its useful life. Life expectancy for each major equipment type has been estimated by industry experience and by the ASHRAE Equipment Life Expectancy chart for HVAC-R equipment. Based on the ASHRAE Equipment Life Expectancy chart data, and information gathered during the site observations made on March 26th and 27th of 2022, the existing HVAC equipment was assessed and rated.

The condition of the major HVAC equipment serving the terminal building has been summarized and grouped together into similar types of equipment. The condition of each type of equipment or the individual piece of equipment has been rated per the following general scale:

- Excellent, New, Being Replaced
- Good, Operational, Useful
- Fair, Marginal, Repairable
- Failed, Broken, Needs Replacement

Tag	Location & Area Served	Manufacturer & Model	Manufactured Install Date	Nominal Capacity (Tons)	Rating	Recommendations	Useful Life Term (Yrs)	Useful Life Remaining (Yrs)	Replacement Year	Comments or Notes
RTU-1	Roof | Ticket Lobby - West End	Daikin McQuay MPS	2009	25	2	Maintain	20	7	2029	Unit in fair operating and visual condition. Supply fan speed observed to cycling up and down. Investigate issue and repair. Continue regular general maintenance per manufacturers recommendations.
RTU-2	Roof | Ticket Lobby	Daikin McQuay MPS	2009	60	2	Maintain	20	7	2029	Unit in good operating and visual condition. Continue regular general maintenance per manufacturers recommendations.
RTU-3	Roof | Ticket Lobby	Daikin McQuay MPS	2009	40	2	Maintain	20	7	2029	Unit in good operating and visual condition. Continue regular general maintenance per manufacturers recommendations.
RTU-4	Roof | Baggage Claim	Daikin McQuay MPS	2009	25	2	Maintain	20	7	2029	Unit in good operating and visual condition. Surface rust on compressors observed. Continue regular general maintenance per manufacturers recommendations.
RTU-5	Roof | Hold Room West End	York Sunline D2CG	1999	25	4	Replace	20	-3	2019	Unit in poor condition. OA mesh screens damaged, exterior of unit base rails. Replacement of unit recommended.
RTU-6	Roof | Hold Room East End	Trane Intellipak	2003	30	2/3	Maintain/Replace	20	1	2023	Unit in fair operating and visual condition. Continue regular general maintenance per manufacturers recommendations until end of useful life.
RTU-7	Roof | Majority of 2nd level	Trane Intellipak	2003	30	2/3	Maintain/Replace	20	1	2023	Unit in fair visual and operating condition. Fins on evaporator coil badly damaged adjacent fan motor from thrown fan belt. Continue regular general maintenance per manufacturers recommendations until end of useful life.
RTU-8	RTU-8 removed and not replaced between 2005 and present.									
RTU-9	Roof | West Concourse Corridor	ESC Comfort Temp	1974	25	4	Replace	20	-28	1994	Unit in poor condition and well beyond typical useful life. Requires daily manual reset to operate. Replacement of unit recommended. Exterior connected ductwork in poor condition.

Tag	Location & Area Served	Manufacturer & Model	Manufactured Install Date	Nominal Capacity (Tons)	Rating	Recommendations	Useful Life Term (Yrs)	Useful Life Remaining (Yrs)	Replacement Year	Comments or Notes
RTU-10	Roof | East Concourse Corridor	Trane Intellipak	2003	20	2/3	Maintain/Replace	20	1	2023	Unit in fair visual and operating condition. Interior of unit base and support rails rusted. Connecting exterior ductwork in poor condition. Continue general maintenance per manufacturers recommendations until end of useful life.
RTU-11	RTU-11 removed from building between 2005 and present.									
RTU-12	Roof | Airport Administration	York Sunline D1EG	1988	Unknown	4	Replace	20	-14	2008	Unit in poor operating and visual condition and well beyond typical useful life. Replacement of unit recommended.
RTU-13	Roof | Concessions Area	Trane ?	1988	Unknown	4	Replace	20	-14	2008	Unit in poor operating and visual condition and well beyond typical useful life. Replacement of unit recommended.
RTU-14	Roof CU | AHU ATCT Level 3	Trane Climate Changer	1979	8.5	4	Replace	20	-23	1999	Unit(s) in poor condition serving Level 3 of ATCT. AHU damper and valves manually operated. Both AHU and condensing unit very rusted. Replacement of unit(s) recommended.
RTU-15	Roof | First Floor East	York Sunline D2CG	1999	25	4	Replace	20	-3	2019	Unit in poor operating and visual condition. Unit near end of useful life. Replacement of unit recommended.
RTU-16	Roof | Second Floor East	York Millennium	1999	40	4	Replace	20	-3	2019	Unit in poor operating and visual condition. Unit near end of useful life. Replacement of unit recommended.
RTU-17	Roof | Banquet Room	Trane Voyager	2003	15	3/4	Maintain/Replace	20	1	2023	Unit in fair operating and visual condition. Continue regular general maintenance per manufacturers recommendations until end of useful life.
RTU-18	Roof | In-Flight Kitchen, Offices	Trane Voyager	2003	20	3/4	Maintain/Replace	20	1	2023	Unit in fair operating and visual condition. Continue regular general maintenance per manufacturers recommendations until end of useful life.
RTU-19 / AHU 1	Roof | Holdroom	Daikin McQuay OAH	2006	20	2/3	Maintain	20	4	2026	Unit(s) in fair operating and visual condition. Air Handling unit separate from Condensing unit. Continue regular general maintenance per manufacturers recommendations.
MAU	Roof | Inflight Kitchen	Sterling SDR	2006	Unknown	2/3	Maintain	20	4	2026	Unit in fair visual condition. Unit operation not observed. Continue regular general maintenance per manufacturers recommendations.
RTU-20 | AC unit	Roof CU | AHU ATCT Level 4 & Cab	Trane CRBB | SCRBB	2003	Unknown	3/4	Maintain/Replace	20	1	2023	Unit is poor visual and operating condition. Modifications previously made to unit that has caused detrimental air flow issues within the Cab and Level 3 of the ATCT. Replacement of unit(s) recommended.

TABLE 9 – PACKAGED ROOF TOP UNITS (RTU) ASSESSMENT SUMMARY

The following images (Figures 74 through 79) show examples of the RTU's and the various ages and conditions of the units observed during the site inspection of the terminal building roof.

FIGURE 77 – RTU 4 INSTALLED IN 2009

FIGURE 78 – RTU 10 INSTALLED IN 2003

FIGURE 79 – RTU 12 INSTALLED IN 1988

FIGURE 80 – RTU 14 CONDENSING UNIT INSTALLED IN 1979

FIGURE 81 – RTU 9 INSTALLED IN 1975

FIGURE 82 – RTU 13 INSTALLED IN 1988

Tag	Location & Area Served	Manufacturer & Model	Manufactured Install Date	Capacity / Size	Rating	Recommendations	Useful Life Term (Yrs)	Useful Life Remaining (Yrs)	Replacement Year	Comments or Notes
B-1	Heating Water Plant | Terminal HHW	Cleaver Brooks ProFire	2006	1500MBH	2	Maintain	25	9	2031	Low Capacity natural gas fired boiler in good operating and visual condition. Continue regular general maintenance per manufacturers recommendations.
B-2	Heating Water Plant | Terminal HHW	Cleaver Brooks ProFire	2006	2500MBH	2	Maintain	25	9	2031	High Capacity natural gas fired boiler in good operating and visual condition. Continue regular general maintenance per manufacturers recommendations.
HHWP-1	Primary HHW Pump	Armstrong	2006	2HP	2/3	Maintain	20	4	2026	Primary heating hot water pump in fair operating and visual condition. Exterior of pump corroded but doesn't affect operation. Continue regular general maintenance per manufacturers recommendations of pump and motor.
HHWP-2	Primary HHW Pump	Armstrong	2006	1.5HP	2/3	Maintain	20	4	2026	Primary heating hot water pump in fair operating and visual condition. Exterior of pump corroded but doesn't affect operation. Continue regular general maintenance per manufacturers recommendations of pump and motor.
HHWP-3/4	Secondary HHW Pump	Armstrong	2006	7.5	2/3	Maintain	20	4	2026	Dualarm secondary heating hot water pump in fair operating and visual condition. Pump has two separate 7.5HP motors. Controls should alternate which is duty on monthly schedule. Continue regular general maintenance per manufacturers recommendations of pump and motors.
HHWP - #2	Secondary HHW Pump	Armstrong	1975	5	4	Replace	20	-27	1995	Original HHW secondary distribution pump in poor operating and visual condition. Replacement of pump recommended.
HHW System Components	Expansion Tank, Air Separator, Glycol	Armstrong | J.L. Wingert Co.	2006	N/A	2	Maintain	15-20	-1 to 4	2019 to 2024	Expansion Tank, Air Separator and Glycol system observed to be in good condition. Continue regular general maintenance by flushing out tanks and system per manufacturers recommendations.
Wall & Fin Tube Heaters	Throughout | Perimeter Areas	Unknown	1975	Unknown	3/4	Replace	25	-22 to 1	2000 to 2023	Unit information not readily available. Some units shown on 1975 drawings with others added during subsequent renovations. Newest units over 20years old. No units observed to be operating during site inspection. Replacement of all units recommended.

TABLE 10 - HEATING HOT WATER PLAN ASSESSMENT SUMMARY

FIGURE 83 – HEATING HOT WATER BOILERS B-1 AND B-2

FIGURE 84 – PRIMARY HEATING HOT WATER PUMPS: HHWP-1 AND HHWP-2

FIGURE 85 – HHW SYSTEM COMPONENTS

FIGURE 86 – GLYCOL FEED SYSTEM

FIGURE 87 – AIR SEPARATOR EXPANSION TANK

Tag	Location & Area Served	Manufacturer & Model	Manufactured Install Date	Size	Rating	Recommendations	Useful Life Term (Yrs)	Useful Life Remaining (Yrs)	Replacement Year	Comments or Notes
EF-1 thru EF-18	Roof | Various areas throughout Terminal	Penn Barry, Twin City, Greenheck, Dayton	1975 - recent	1/8HP up to 1/2HP	2 to 4	Maintain or Replace	20	Varies	1995 to 2030	Roof mounted exhaust fans observed to be in various operating and visual condition. Majority of fans observed to be in poor condition and were not operating. Majority of fan nameplate information was illegible. Recommend replacing all fans more than 15 years old.
EF-19 thru EF 25 (approx.)	Inline | Various areas throughout Terminal	Unknown	Unknown	Under 1/4HP	2 to 4	Maintain or Replace	20	Varies	Current out to 2030	Several in-line fans are located around the building (exact quantity unknown) and are assumed to be of varying ages either close to the end of their useful life or beyond. Recommend replacement of all in-line fans older than 15 years.

TABLE 11 - EXHAUST FANS AND VENTILATION HOODS

FIGURE 88 – SECONDARY DUALARM HEATING HOT WATER PUMP: HHWP-3/4

FIGURE 89 – SECONDARY HEATING HOT WATER PUMP: PUMP #2

FIGURE 90 – VENTILATION FAN FOR TUG DRIVE AT BAGGAGE CLAIM

FIGURE 91 – EXHAUST FANS FOR STAIRWELL AND BATTERY CHARGING

Tag	Location & Area Served	Manufacturer & Model	Manufactured Install Date	Capacity (Tons)	Rating	Recommendations	Useful Life Term (Yrs)	Useful Life Remaining (Yrs)	Replacement Year	Comments or Notes
CRAC-1	Roof CU | AHU Tracon Equipment Room	Liebert DCDL | VS035ADC	2015	15	2	Maintain	20	13	2035	Exterior condensing unit and interior air handling unit observed to be in good visual and operating condition. Continue regular general maintenance per manufacturers recommendations.
AC-1	Roof CU | AHU ATCT Level 2	Liebert PFH | VS035ADC	2015	5	2	Maintain	20	13	2035	Exterior condensing unit and interior air handling unit observed to be in good visual and operating condition. Continue regular general maintenance per manufacturers recommendations.
ACU-2	Baggage Out CU | AHU Baggage Claim	McQuay PA13	2011	3.5	2	Maintain	20	9	2031	Exterior condensing unit and interior air handling unit observed to be in good visual and operating condition. Condensing unit replced in 2011. Continue regular general maintenance per manufacturers recommendations until end of useful life.
ACU-3	Baggage Out CU | AHU Baggage Claim	McQuay / Goodman CLJ42	2003	3.5	2/3	Maintain	20	1	2023	Exterior condensing unit and interior air handling unit observed to be in decent visual and operating condition. Continue regular general maintenance per manufacturers recommendations until end of useful life.
ACCU#4	Baggage Out CU | AHU Electrical Vault	McQuay ACU100D	2005	6.5	2/3	Maintain	20	3	2025	Exterior condensing unit and interior air handling unit observed to be in good visual and operating condition. Continue regular general maintenance per manufacturers recommendations until end of useful life.
ACCU#5	Baggage Out CU | AHU Electrical Vault	McQuay ACU100D	2005	6.5	2/3	Maintain	20	3	2025	Exterior condensing unit and interior air handling unit observed to be in good visual and operating condition. Continue regular general maintenance per manufacturers recommendations until end of useful life.
AC-2 No Tag on CU	South Exterior CU | Unknown	Carrier 38GVQ	2012	3	2	Maintain	20	10	2032	Exterior condensing unit bserved to be in good visual and operating condition. Interior unit not observed. Based on age continue regular general maintenance per manufacturers recommendations until end of useful life.

TABLE 12 – SPLIT SYSTEM AIR CONDITIONERS ASSESSMENT SUMMARY

FIGURE 92 – CONDENSING UNITS ACU-2 & ACU-3

1.3.3.1 Building Management System (BMS) & HVAC Controls

The existing BMS for the facility is an outdated Java-based Tracer system by Trane. The front-end computer is in a small communications room adjacent the original terminal boiler mechanical room and provides little information to airport personnel and maintenance staff. The controls system currently comprises up to seven (7) different controller types due to the number of renovation projects since the 1975 expansion. The lack of quality information provided to airport personnel and maintenance staff via the current BMS has become such a detriment to airport operations that a current project is underway to upgrade the system. The updated BMS – a Tridium Niagara Framework system, is due for completion in 2022 and will have a new Innotech front end and allow web access via remote user interfaces. The updated BMS is expected to capture about 95% of airport facility systems, incorporating existing LON-based controllers for lighting into one interface. The BMS upgrades project also includes changing out LON-based controllers for the HVAC equipment to BACnet to improve the speed and connectivity of the system.

FIGURE 93 – DUCTED SPLIT AC FAN COIL UNIT SERVING BAGGAGE SCREENING

FIGURE 94 – CONDENSING UNITS ACCU-4 & ACCU-5

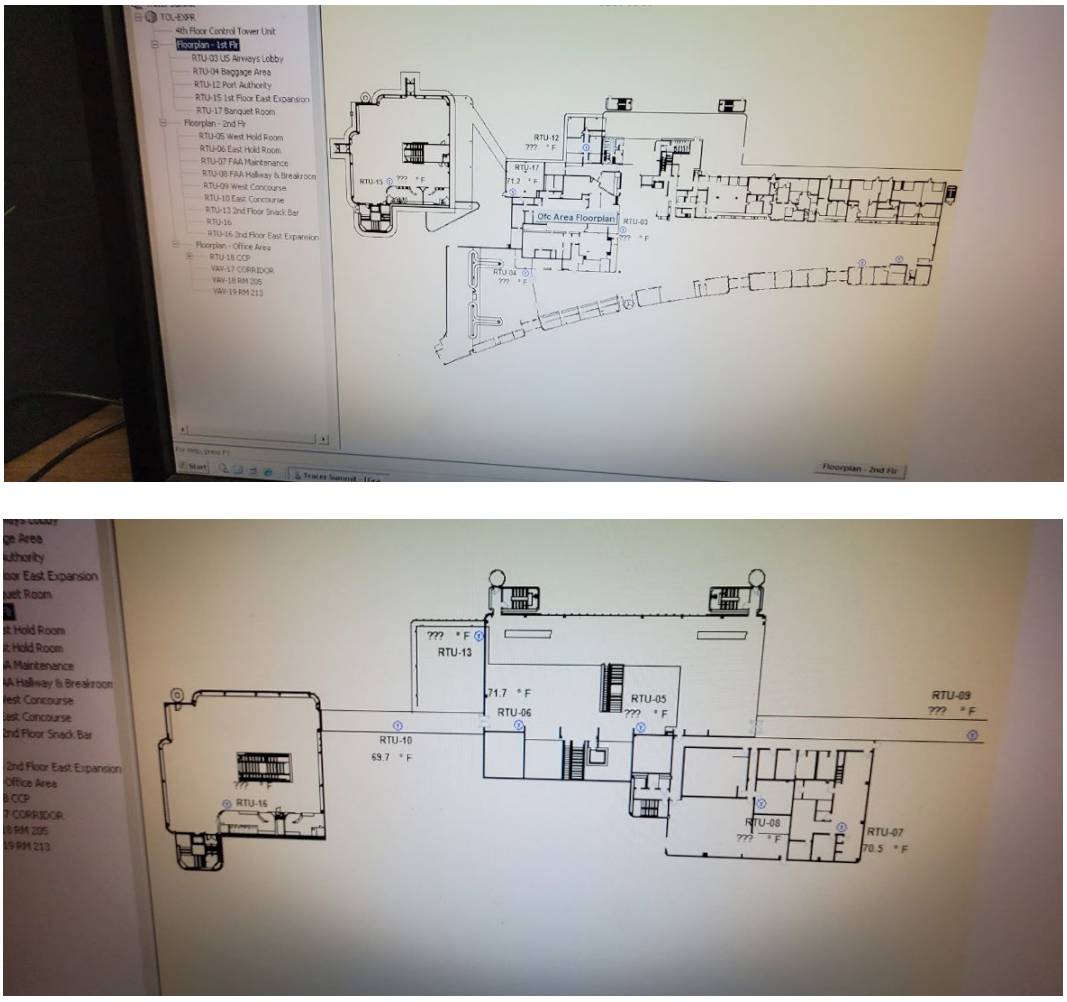

FIGURE 95 – FRONT-END COMPUTER SCREEN CAPTURES SHOWING LIMITED AMOUNT OF DATA FEEDBACK FOR PORTIONS OF THE BUILDING

1.3.3.2 HVAC System Deficiencies Observed

- The ventilation system serving the Tug Drive area for Baggage Claim is not functional and will therefore allow exhaust fumes from the gas-powered tugs to build up during unloading and potentially enter the Baggage Claim area of the terminal.
- Refrigeration equipment components serving the tenant Walk-in Coolers observed to be past its useful life and not energy efficient.
- Several spaces throughout the terminal building were observed to be out of normal setpoint temperature ranges.
- Previously abandoned ventilation openings in the roof for the original boiler plant equipment have not been infilled, which is allowing water and snow to directly enter the main mechanical room.
- The water make-up system for the HHW system depicted on the 2003/05 Phase 1 reconfiguration plans was never installed, therefore water make-up for the system is being pulled through the Glycol Feed system.
- The Split Condenser Air Handling Unit serving Level 4 and the Cab of the ATCT observed to be operating incorrectly, causing issue with the return air path back to the AHU.
- Hydronic Fin Tube heaters installed around the perimeter of the building to address heat loss of exterior walls and glazing were observed to be nonoperational during mid 40deg F wet weather.
- Hydronic heating piping throughout a sizable portion of the facility is from 1975 and has degraded significantly, causing frequent leaks to occur, disrupting airport operations and regular maintenance schedules of other equipment.
- Arrangement of HHW primary piping at pumps does not allow quick isolation of the primary pumps as the two butterfly valves were installed on the same side of the pumps.

1.3.3.3 HVAC Assessment Summary

Overall, the vast majority of HVAC systems, equipment and piping serving the terminal building and the ATCT are close to or already well beyond the typical useful life expected. Due to the diligence of the maintenance staff many of the older systems and equipment have exceeded the normal useful life expectancy.

1.3.4 Fire Protection & Plumbing (Sanitary/Storm)

The existing plumbing systems within the terminal are outdated and beginning to fail on a frequent basis due to the age of the piping, equipment, and system components. Similar to the HVAC building systems, the plumbing systems throughout the terminal building have been added to and modified since the original terminal building was constructed in the 1950's. Cast iron piping for the DWV and Storm systems from the original building and the major terminal expansion in 1975 are still in use. The original 4" Cold Water main enters the building within the main terminal mechanical room (Boiler Room) and branches off to the various areas of the terminal building. Water usage for the facility is not readily accessible via a smart advanced water meter through the BMS but is due to be incorporated under the current BMS upgrade project. The Insulation on the domestic water piping was observed to be in poor condition or non-existent in various parts of the building.

During the site inspection completed by RS&H in March of 2022, a total of five (5) hot water heaters, two (2) natural gas, and three (3) electrical water heaters were observed to be in operation. The two (2) natural gas domestic water heaters are located in the main terminal mechanical room. One 420MBH heater serves the majority of the building, while the smaller capacity water heater serves the concession kitchen. Both natural gas water heaters were manufactured in 1997 and are beyond their typical life expectancy.

FIGURE 96 – GAS FIRED WATER HEATERS SERVING THE TERMINAL AND CONCESSIONS KITCHEN

The electric water heaters observed serve the East Concourse restrooms, the 2nd Floor Holdroom restrooms and a back-of-house janitors' closet in the maintenance area. The electrical water heaters are 40gal, 30gal and 10gal, respectively and are all beyond the typical life expectancy.

FIGURE 97 – ELECTRIC WATER HEATERS SERVICE THE EAST CONCOURSE RESTROOMS, 2ND FLOOR HOLDROOM, RESTROOMS, AND MAINTENANCE MOP SINK

The terminal building is fully sprinkled with Concealed type sprinkler heads in the public areas of the building and exposed FP piping and sprinklers in the support spaces. There are two wet pipe systems and one dry pipe system serving the facility, with each system passing an annual inspection in October of 2021. The compressor for the dry pipe system was replaced in 2019 and is in good condition.

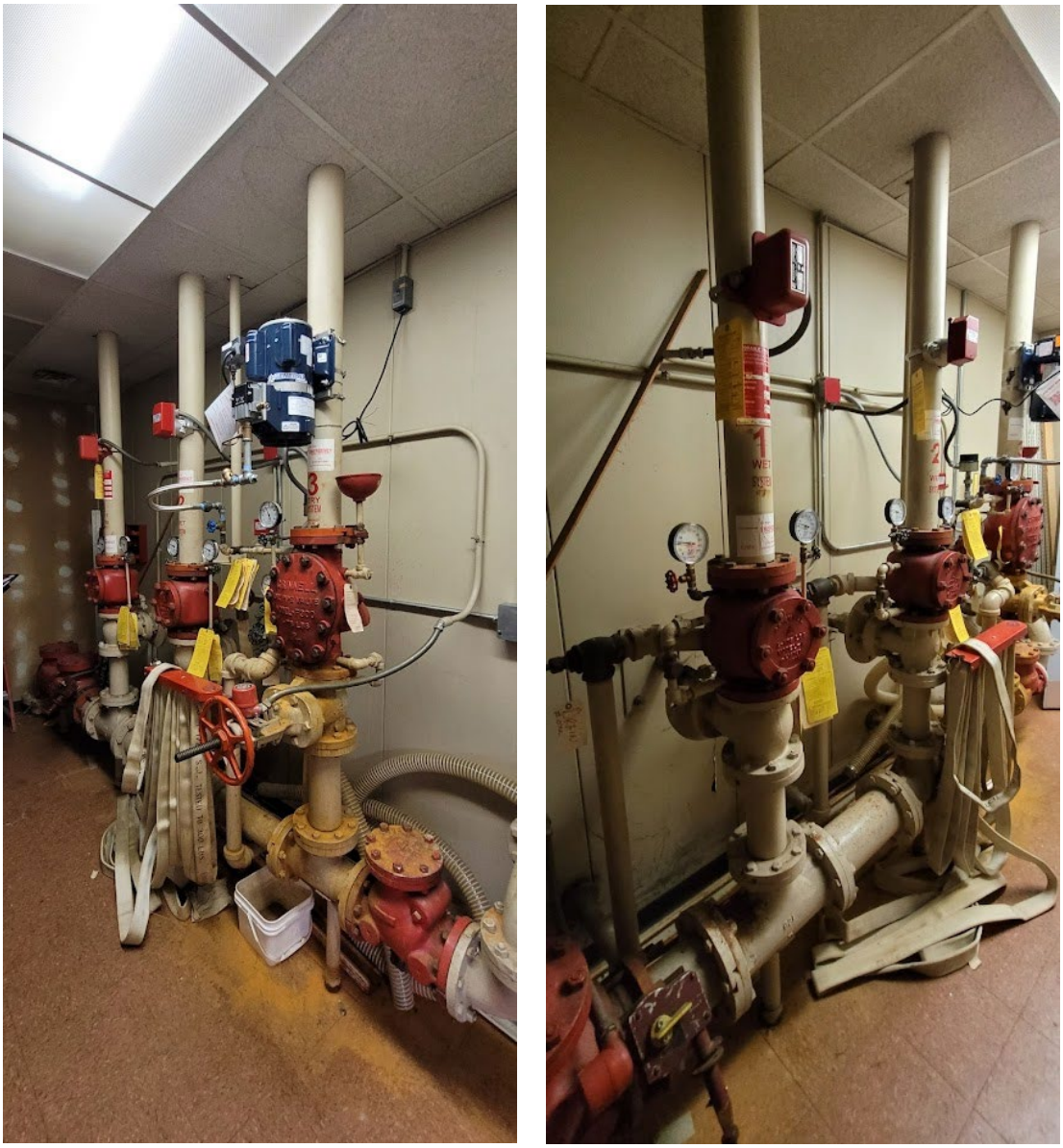

FIGURE 98 – FIRE PROTECTION VALVES FOR THE TWO SET PIPE AND ONE DRY PIPE SYSTEM SERVING THE FACILITY

1.3.4.1 System Deficiencies Summary – Plumbing

- No heating hot water recirculation for the two electric water heaters serving the East Concourse restrooms and the 2nd floor Holdroom restrooms observed. This creates lengthy delays in hot water reaching the plumbing fixtures and wastes energy and water.
- Old, deteriorated cast-iron DWV piping throughout the facility is beginning to fail, causing water leaks and maintenance issues.
- Plumbing fixtures within the various patron restrooms were observed to have a mixture of manual and automatic flush valves. Maintenance staff conveyed that the battery-operated flush valves and sensor faucets were problematic to maintain and keep operational.
- Cast Iron piping for the DWV and storm piping systems within ceiling spaces has been replaced with PVC as portions of the cast iron piping fails. This has created a code violation as the ceiling plenums are utilized for return air.

1.3.5 IT/Security/Technology

The IT/Security/Technology section discusses the site-visit findings concerning the terminal facility, including the condition of low voltage systems, IT infrastructure, security systems, and various other technologies within the terminal building.

1.3.5.1 Low Voltage Systems

There are several components comprising the low voltage – technology systems at TOL. Observations of these elements are presented below:

1.3.5.2 IT Infrastructure and Communications/Equipment Rooms

The Terminal's cable entrance facility is located adjacent to the HVAC room and Airport Operations Office area. The Main Communications Room (MCR) is centrally located just beyond the TSA Passenger Security Screening Checkpoint in the Sterile Area. The room has poor cable management with nonstandard labeling. The MCR is the only room in the Terminal dedicated for telecom/security equipment and is not of sufficient size for future expansion. Over time, various equipment has been installed wherever space was available, making equipment challenging to service and maintain.

FIGURE 99 – EXISTING EQUIPMENT IN THE MCR

- The MCR has an existing computer room air conditioning (CRAC) unit and was found to be cool enough.

FIGURE 100 - TELECOM AND SECURITY EQUIPMENT IN SPRINKLER PIPE AND HVAC ROOM – CONCOURSE LEVEL

- There are other locations where the telecom/security equipment share the space with other systems (mainly electrical and mechanical equipment). In some instances, the equipment rack was found in a baggage make-up area, or in spaces that are not properly climate controlled.
- Telecom/security equipment is also found in electrical rooms, which is not in compliance with NEC Article 110 – Requirements for the electrical equipment (refer to photos below).

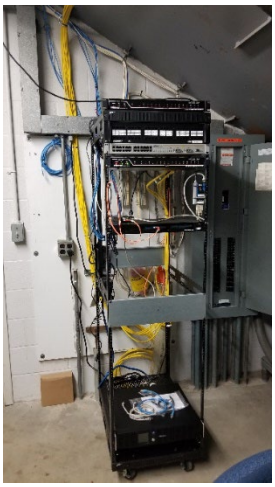

FIGURE 101 – TELECOM AND SECURITY EQUIPMENT RACK IN ELECTRICAL ROOM

FIGURE 102 – HIGH VOLTAGE ELECTRICAL DISTRIBUTION PANEL

- In some locations, the telecom equipment rack is place outside the dedicated communications room as there is no space available within the existing communications or other electrical/mechanical room. Examples include the TSA telecom equipment rack, which is currently at the ticketing area, and TOL equipment rack in kitchen area (see photos below).

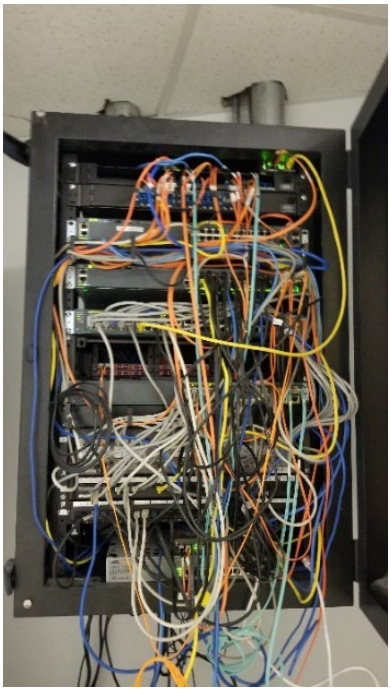

FIGURE 103 – TSA EQUIPMENT CABINET WITH EXPOSED CABLES

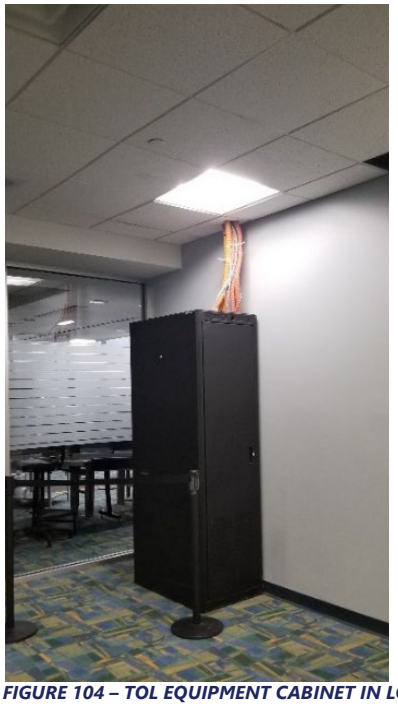

FIGURE 104 – TOL EQUIPMENT CABINET IN LOBBY ADJACENT TO TSA – OWNED BY FAA

1.3.5.2.1 DATA NETWORK

- The airport data network resides on the TLCPA local area network (LAN) system.
- The telephone system is a web-based VoIP. The service provider is Buckeye Broadband, Toledo Ohio.
- The following systems reside on the TLCPA LAN as virtual LANs (VLANs):
  - Security (Access Control and Video Management System)
  - Flight Information Display System (FIDS)
  - Wi-fi System
- The entire network is not currently being monitored for alerts or system failures.

1.3.5.2.2 Wi-fi

- The Terminal has both the Administrative and the Guest wi-fi systems that reside as VLANs on the TLCPA Network. Wi-fi systems are fully operational.
- The Administrative and Guest wi-fi switch is found in the wall-mounted equipment cabinet in the Kitchen/Pantry (Airport Operations Office area).

1.3.5.2.3 PUBLIC ADDRESS (PA) SYSTEM

- The existing PA system in the Airport is a mixture of different makes and models; specifically, Crown Com-Tech 400, Torrence Sound Equipment Company, and Universal Sound. PA equipment is located in a cabinet in the MCR.

FIGURE 105 – PUBLIC ADDRESS EQUIPMENT CABINET

- At present, the PA system in the Airport is not working. There are no prerecorded public announcements, specific pages from the gate counters, or background music playing.
- The existing analog speakers are found throughout the terminal areas, including baggage claim, ticketing, and concourse holdrooms, etc.

- One of the gate counters uses a speaker on a stand for boarding-related announcements, as shown below.

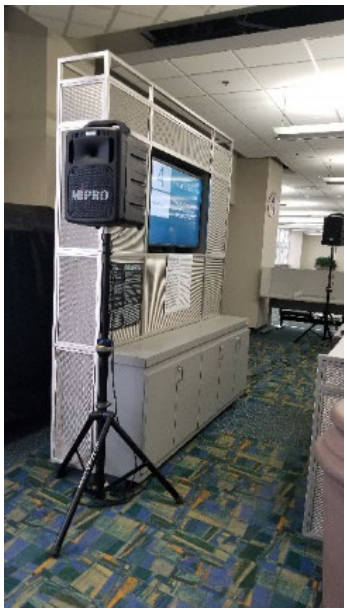

FIGURE 106 – GATE COUNTER WITH SPEAKER ON A STAND

- The Terminal does not currently have a voice evacuation system tied to the fire alarm system.

1.3.5.2.4 FLIGHT INFORMATION DISPLAY SYSTEM (FIDS)

- The existing FIDS at TOL is a cloud-hosted system made by iFIDS, Inc. The FIDS includes about five (5) flight information displays (FIDS) that reside as a VLAN on the TLCPA network.
- The FIDS monitors are located at the following locations around the Terminal.
  - One at each ticket counter location displaying the Airline logo (two total).
  - One at the common waiting area outside the Airport Operations Office area.
  - Two at the concourse level holdroom areas.
- The FIDS monitor at the waiting area and concourse has both arrival and departure information as shown below.

FIGURE 107 – WALL-MOUNTED FIDS MONITOR

FIGURE 108 – CEILING-MOUNTED FIDS MONITOR

- Gate information displays (GIDS) are also on the iFIDS system. There are about four (4) gate displays that reside as a VLAN on the TLCPA network.
- Standard displays are made by NEC and use a small form factor direct digital controller (SFF DDC) mounted back of the display to transmit data to the display.

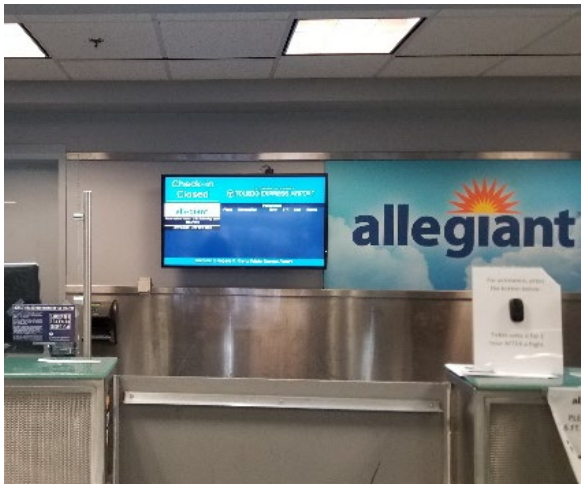

FIGURE 109 – ALLEGIANT AIR TICKET COUNTER FIDS MONITOR

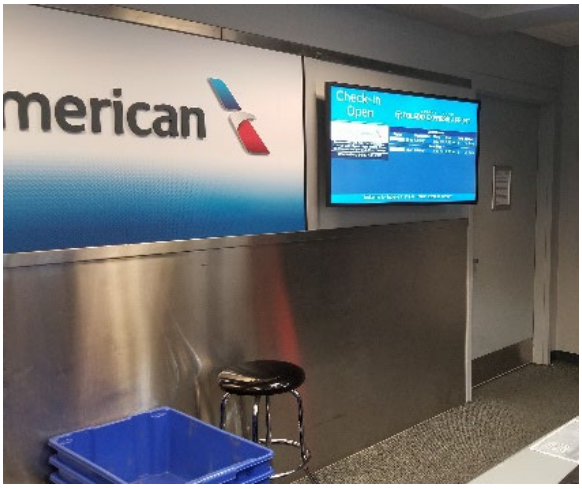

FIGURE 110 – AMERICAN AIRLINES TICKET COUNTER FIDS MONITOR

1.3.5.2.5 VARIOUS MISCELLANEOUS SYSTEMS

- There is no cable television (CATV) at the Airport. There are TVs at the restaurant and food court areas provided by the tenants using dish antenna.
- The Airport does not have a distributed antenna system (DAS) for cellular and radio communications.
- The Parking Control System (PCS) is maintained by a vendor, Parksmart Toledo Ohio.

1.3.5.2.6 AIRPORT OPERATIONS CENTER (AOC)

- The AOC is located at Emergency Vehicle (Ambulance) Garage. Personnel are on duty 24/7 to manage the AOC; however, their tasks result in the physical space being occupied intermittently throughout the day.

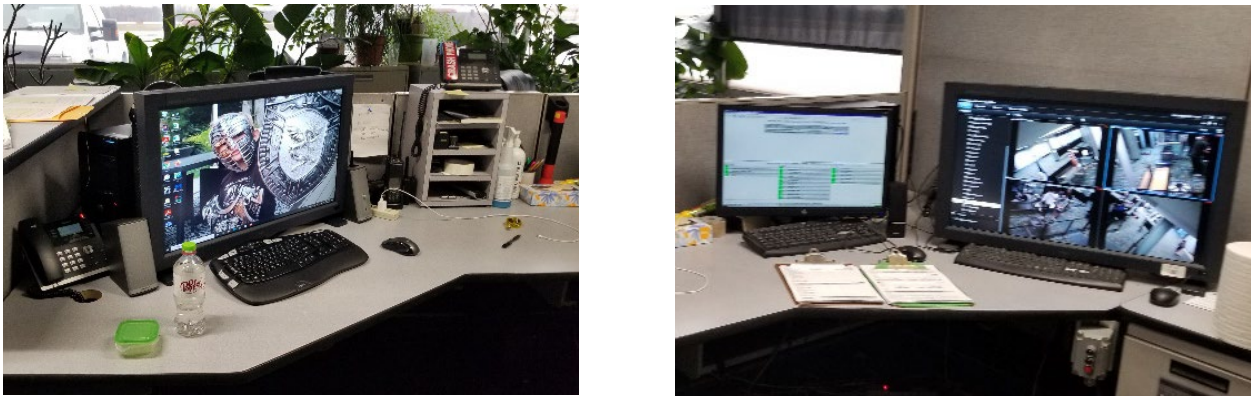

FIGURE 111 – AIRPORT OPERATIONS CENTER

- The AOC has three (3) workstations, one each for access control functions, video management functions, and for Internet access.
- The AOC has an emergency crash phone system connected to the ATCT. The center also has a radio console station and handheld radio sets.
- When the AOC is not occupied or staffed, a text message is generated in the event of a door alarm and sent to airport staff and/or Police Department (PD), depending on the type of alarm.

1.3.5.2.7 ACCESS CONTROL SYSTEM (ACS)

The ACS used in the Airport is old and is not up to the current industry standards. The access control and video management systems and their databases are separate and are running independently of each other with no integration. There is no automatic camera call-up at the monitoring station. The operator is required to search and select the correct camera (if any) associated with the alarmed door/portal.

FIGURE 112 – ACCESS CONTROL CABINET WITH DRACONI EQUIPMENT

- The existing ACS is made by DRACONi and the headend equipment is located in the MCR. The system is not reliable due to the end of useful life and lack of technical support from the manufacturer. A local electrical firm maintains the system.
- The ACS has primary and secondary "DRACONi AIRS" storage servers (IBM X3630 M4). At the time of survey, the secondary storage server was out of service.
- The Airport is mainly using electromagnetic locks and electric strikes at access-controlled doors. The boarding bridge doors have magnetic locks and stair tower egress doors have time-delayed magnetic locks. Doors from public areas to the designated Security Identification Display Area (SIDA) or back-of-house areas have electric strikes.
- The secure doors separating the passenger boarding bridges and the terminal holdrooms have magnetic locks and card reader access. There are emergency egress doors with time-delayed magnetic locks and card readers in the stair towers in close proximity to boarding bridge doors (see photos below).

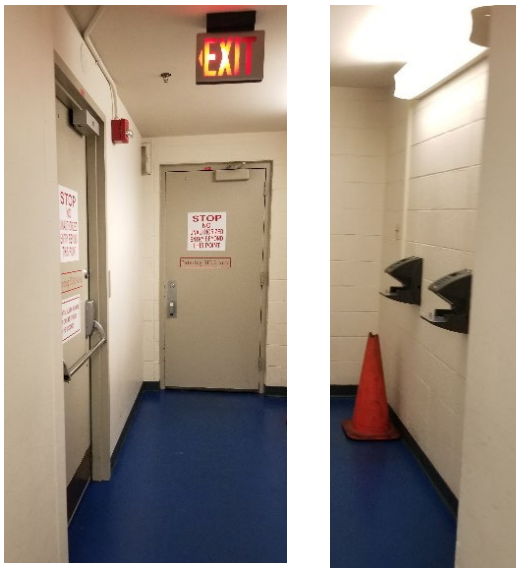

FIGURE 113 – STERILE SIDE OF EGRESS AND BOARDING BRIDGE DOORS

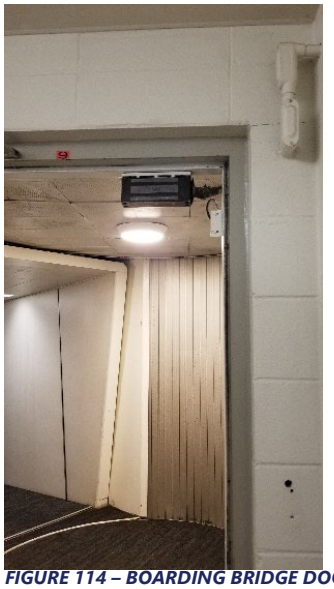

FIGURE 114 – BOARDING BRIDGE DOOR WHEN OPENED

- The doors on the sterile (public) sides are in good condition, whereas the back of house (or secured) side doors were found to be in poor condition.

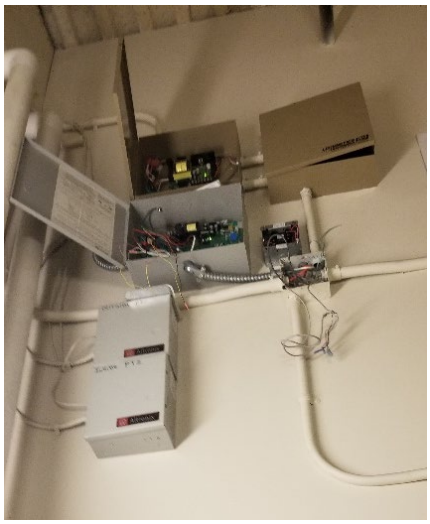

FIGURE 115 – ACCESS CONTROL ENCLOSURE ON THE SECURE SIDE OF THE DOOR

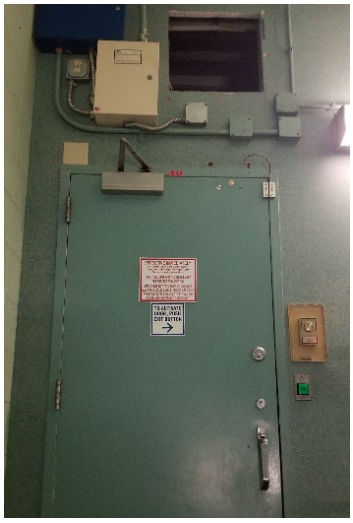

FIGURE 116 – SECURE SIDE OF ACCESS CONTROLLED DOOR

- The access control field panels are located above the door or nearby electrical rooms. The field panels are made by Securitron (ASSA ABLOY), and the door power supplies are made by Altronix®. Some of the field panels at the stair tower are in bad condition and the panel covers are opened or missing.

FIGURE 117 – ACCESS CONTROL DOOR WITH MISSING KEY CORE

- The card reader used in the Airport is Schlage's HandKey 2, consisting of contactless card readers and finger/palm readers. The reader is having problems reading the finger/palm print and requires two or three attempts for successful read to enter through the secured door/portals. (TOL is willing to replace existing biometric card reader, Schlage HandKey 2, with the contactless card readers).

FIGURE 118 – EXISTING 2-FACTOR CARD READER

FIGURE 119 – EXISTING CARD READER AT FAA/TSA DOOR

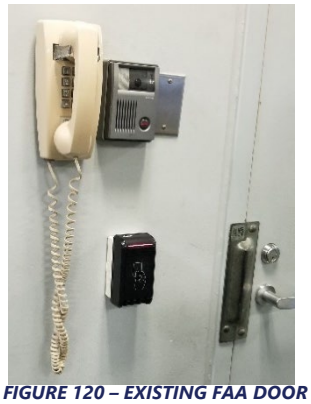

FIGURE 120 – EXISTING FAA DOOR

- In some locations, a different type of card reader made by Veridt is used. The Veridt is a FIPS 201-compliant contactless card reader. These are used at the door leading to the ATCT and are supplemented by video intercom and telephone to request entry (refer to photo above).

1.3.5.2.8 SECURITY BADGING SYSTEM

- The current Security Badging System at TOL is made by LAUNCH Point. The current badging system does not have the capability of using an online portal to submit biographical or biometric data with airport badge applications to the Clearinghouse for security threat assessment (STA) or criminal history records check (CHRC). The "Live Scan" third-party software is used for fingerprinting.
- There is no AAAE-compliant automated SIDA training capability at the TOL. The SIDA training uses PowerPoint slides for individual training.
- The existing badging space is located within the Airport Operations Office area.

1.3.5.2.9 VIDEO MANAGEMENT SYSTEM (VMS)

- The VMS is an IP-based system made by Milestone, using XPROTECT® software.
- The camera video coverage is continuously recorded. The video recording is not archived at present. The video storage/server headend is located in the MCR. The existing video server is DELL EMC Power Edge model R730xd. There are 16.5 TB of storage and 36TB unused (not powered) storage devices.
- The Airport has recently introduced new multi-sensor IP cameras. The new IP cameras are made by Arecont Vision with 4-cameras in each housing. These cameras are placed in the ticketing, holdroom, outbound baggage makeup, and TSA CBIS areas.
- There are existing Pelco® analog cameras (both interior and exterior) throughout the Airport. The interior cameras are found in ticketing, holdrooms, and outbound baggage make-up areas. The exterior cameras are found in parapet housings looking at the ramp areas on the airside and passenger pick up and drop off areas in front of the Terminal. Most of these analog cameras are not working or not connected to the VMS. The camera looking at the parking lot exit lanes are viewed remotely at the TLCPA office located in downtown Toledo.

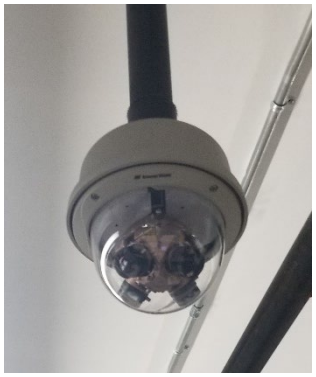

FIGURE 121 – EXISTING MULTI-SENSOR ARECONT VISION CAMERA – OUTBOUND BAGGAGE MAKEUP AREA

FIGURE 122 – EXISTING MULTI-SENSOR ARECONT VISION CAMERA – TICKETING AREA

FIGURE 123 – EXISTING PELCO INTERIOR ANALOG DOME CAMERA - HOLDROOM

- The existing SIDA doors do not have camera coverage on the secured side per TSA standards.

1.3.5.2.10 PERIMETER VEHICLE GATES

- There are over 50 vehicle gates at TOL.
- The north airfield gates are used by TLCPA staff, and the southern airfield gates primarily used by BX Solutions (cargo handler).
- The Fixed-Base Operators (FBOs) and tenants also utilize the vehicle gates.
- Upgrades to the systems are recommended.

FIGURE 124 – TYPICAL KEY FOB CONTROLLED VEHICLE GATE

1.4 TERMINAL BUILDING REGULATORY ASSESSMENT

The following sections describe the findings from the site visit in detail, complete with pictures and tables describing the existing conditions and whether they comply with current regulatory requirements for a public use passenger terminal facility.

1.4.1 Building Code Compliance (Intl/Fed/State/Local)

This section reviews the terminal facility against current building codes to identify areas where compliance may not be occurring.

1.4.1.1 Fire-Rated Assemblies

Due to the various Use Groups, fire-rated partitions are required for separation. Although these separations may have existed, but due to typical maintenance, installation or removal of wiring, wall mounted items, etc. penetrations have been made. These penetrations will not have had the proper protective fire-stopping required to maintain the fire-rated assembly.

Examples where rated partitions are required:

FIGURE 125 – STORAGE ON FIRST FLOOR

FIGURE 126 – BAGGAGE MAKE UP

- First floor storage at far west end was not initially intended as storage
- Commercial Kitchen and all adjacent occupancies
- Office Areas (Business Occupancy) and Terminal (Assembly Occupancy)
- Baggage Make-up (Low Hazard Occupancy) and Office (Business Occupancy)
- Smoke Barrier passageway at ATCT
- A thorough examination of the space use allocation should be done to determine where fire separations, both vertically and horizontally, should occur. Proper fire penetrative materials should be applied at both existing and new penetrations to provide protection.

1.4.1.2 ATCT Operations

In the ticketing area, adjacent to the queue for the TSA security checkpoint, the cables for the control tower are exposed. This leaves operations of the Airport and the overall safety of the flights at risk.

FIGURE 127 – EXPOSED CABLES

- Cables leading to the ATCT should be encased in a rated shaft wall, protected from fire, penetrations, and in general, public access.

1.4.1.3 Means of Egress

Accordion gate Holdroom egress is not permitted. The path of egress shall not be interrupted by a building element other than a means of egress component. The accordion gate cannot be used at the stairs as they indicate a path of travel to the exit. It would pose a life safety hazard if it were closed and locked.

FIGURE 128 – ACCORDION GATE

- The accordion gate needs to be removed for life safety purposes. A clear path of exiting needs to be maintained.

1.4.1.4 Accessibility

No vertical grab bar in restrooms per ICC A117.1.

FIGURE 129 – NO VERTICAL GRAB BAR IN RESTROOMS

- Per IBC 2021, a vertical grab bar is required at all accessible stalls. Prior to installation, blocking will need to be provided in the wall, along with repair of finishes and the installation of the grab bar.

1.4.1.5 Stairway Landing

Landing at the Conference room is insufficient. Landings are required to be at a minimum depth of 44" in the direction of travel. Doors in the fully open position shall not reduce a required dimension by more than 7". Handrails at the same stairs are not compliant as they do not have the required extension at the bottom of the stairs.

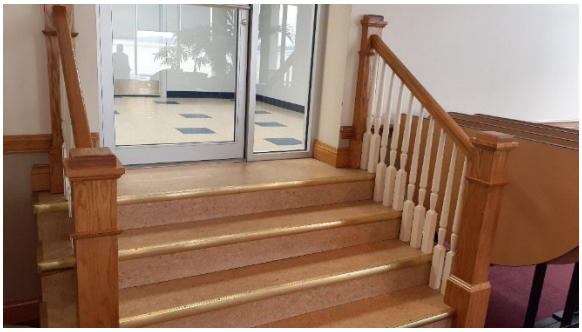

FIGURE 130 – STAIRWAY LANDING

- Since the door swings into the room, a 36" door requires the landing to be 77" deep in the direction of travel. This will require a reconfiguration of the door, landing, stairs, and handrails.

1.4.1.6 Handrail

Loading dock handrail is not present. Handrails are required at all stairways, including the loading docks.

FIGURE 131 – LOADING DOCK

- Provide a handrail on each side of the stairway.

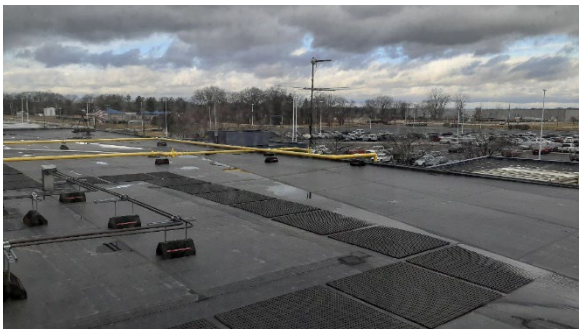

FIGURE 132 – TERMINAL ROOF

- The roof was reported to have been replaced approximately 5 years ago. However, a new roofing system will require to meet IECC. To meet the IECC R value requirements, additional insulation will be necessary which in some cases will require the roof edge or parapets to be raised. This may affect adjacent materials, electrical, heating, cooling, and other systems.

1.4.2 ADA Compliance

This section will discuss the facility's compliance with the Americans with Disabilities Act (ADA). Established in 1990, the ADA provides guidelines for access, information, and services in many areas, including transportation, which protects people with disabilities.

1.4.2.1 Audio-visual requirements, Assistive listening system

The audio-visual, paging, and public address systems are non-functional and are further described in sections 1.3.1.17 and 1.3.5.2.3 of this report.

1.4.2.2 Wayfinding

Some signs which have ADA requirements are worn, or out of compliance.

FIGURE 133 – EXIT DOORS

- Exit doors at discharge and exit stairways are required to be identified by tactile signs. Required wayfinding signs need to be updated with current ADA standards.

1.4.2.3 Visually Impaired Obstructions

Wall mounted items create a hazard for the visually impaired. The bottom of an object located more than 27" a.f.f. cannot protrude more than 4" from the wall. Fire extinguisher cabinets protrude beyond 4".

FIGURE 134 – ITEMS PROTRUDING MORE THAN 4"

- Any wall-mounted items that protrude beyond 4" and located more than 27" a.f.f. need to be recessed or relocated if found to be in a fire-rated wall.

1.4.2.4 Elevator

Public access elevator from TSA to Holdroom does not have:

- Visible hall signal car indicator.
- No audible signal for the arrival
- No verbal announcement of a stop
- No audible signals (one for up and two for down or annunciator)
- Reopening the device without physical contact
- Emergency communication per ASME A17.1

FIGURE 135 – ELEVATOR

- The elevator cab needs to be updated to be ADA compliant.

1.4.2.5 Escalator

ADA references ASME A17.1 Safety Code for Elevators and Escalators. Yellow demarcation along sides and edge of treads at escalator is missing.

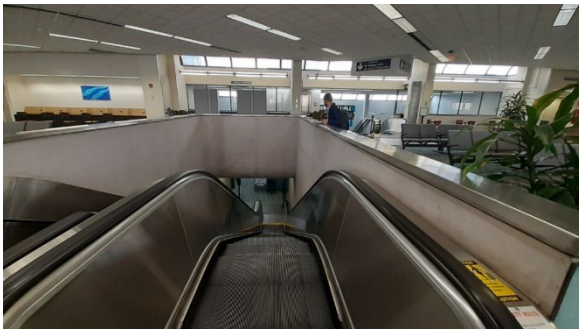

FIGURE 136 – ESCALATOR

- Escalator treads need demarcation. Other mechanical components of the escalator should be checked against current ADA guidelines.

1.4.2.6 Counters

Standing space at fixed counters, such as at the car rentals counters, do not have an accessible work counter. At least 5% of the standing spaces shall be accessible. Only National has an added shelf at a lowered counter, designated as accessible. However, this does not allow for the exchange of services and money because the service counter behind it is tall. This additional shelf requires a person to reach even further.

FIGURE 137 – RENTAL CAR COUNTERS

- Provide an accessible counter at all service counters.

1.4.2.7 Passenger Boarding Bridges (PBB)

Two of the three passenger boarding bridges are non-compliant for various reasons:

- Slope exceeds 1:12
- No handrails or improper handrail extensions
- Inadequate landings between sloped areas

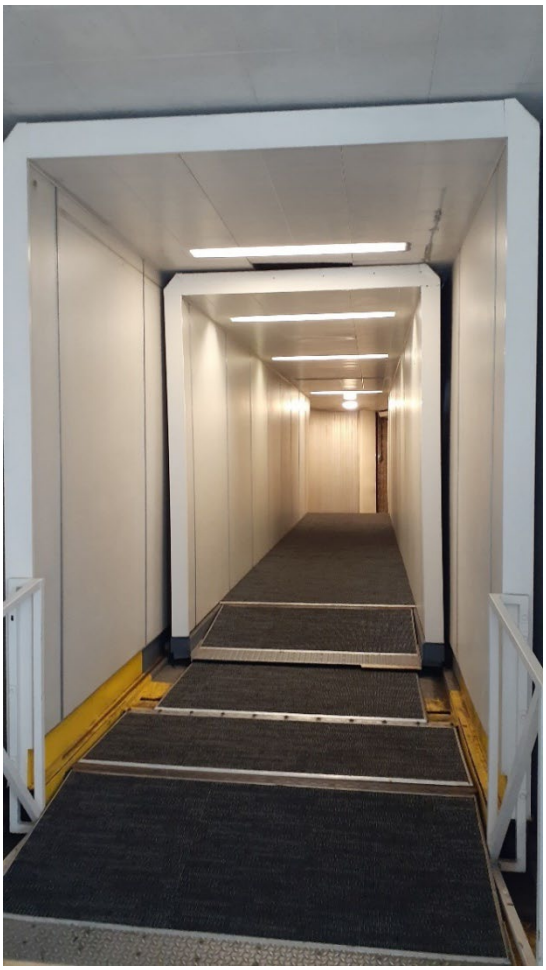

FIGURE 138 – PASSENGER BOARDING BRIDGE

- Three of the PBB's are antiquated and non-compliant. One is inoperable, and the other two are older should be replaced. The fourth PBB, gate 5, a 2017 ThyssenKrupp model, appears to be in good operating condition and compliant.

1.4.2.8 Stairs/Ramps

Throughout the building, several issues were found with nearly all handrails.

- Stair landing at the conference room is insufficient. It is required to be 48" in length.
- Handrails at exit stairwell in office area do not have a compliant cross-section. Cross-section of handrails cannot exceed 2 ¼".
- Handrails at the conference room & Port Authority office stairs
- Handrails ramp to offices/stairwells do not have the required 12" extension at the top and bottom of the ramp.

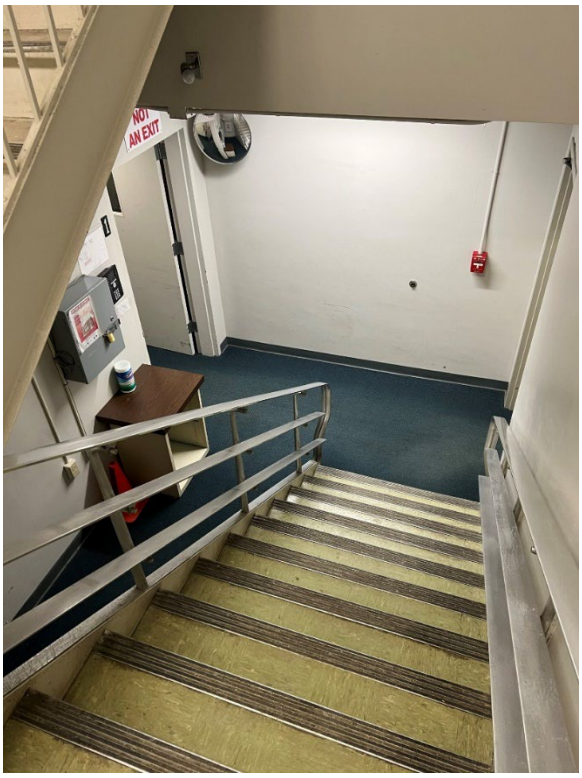

FIGURE 139 – STAIRWELL

- Handrails should be replaced to provide proper lengths, diameters, and extensions. In some cases, blocking will need to be provided where handrails require extension.

1.4.2.9 Restrooms

FIGURE 140 – FLUSH CONTROL ON TOILET

- Flush controls for toilet must be on the open side. Flush control is located on the side nearest the wall.

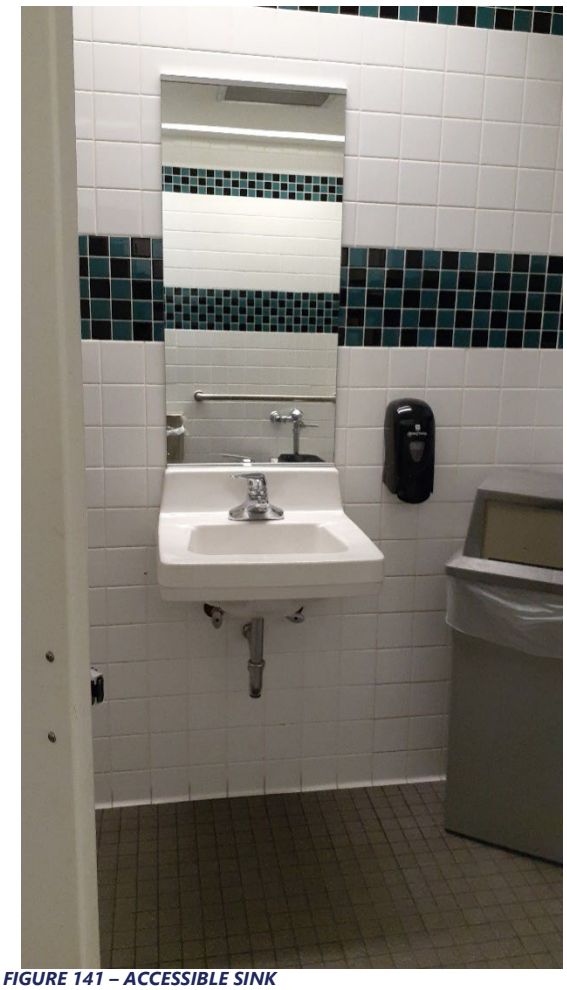

FIGURE 141 – ACCESSIBLE SINK

- No pipe protector at sink in an accessible toilet stall
- The tissue dispenser requires 12″ min. clearance above the grab bar.
- The soap dispenser in an accessible stall does not have compliant floor clearance due to trash receptacle.
- The top of the side grab bar is less than 33″ a.f.f.

Public restroom at second floor Airside Holdroom

- Toilet seat cover dispenser within 12″ above the rear grab bar
- The paper towel dispenser projects more than 4″ from the wall.

FIGURE 142 – SECOND FLOOR PUBLIC RESTROOM

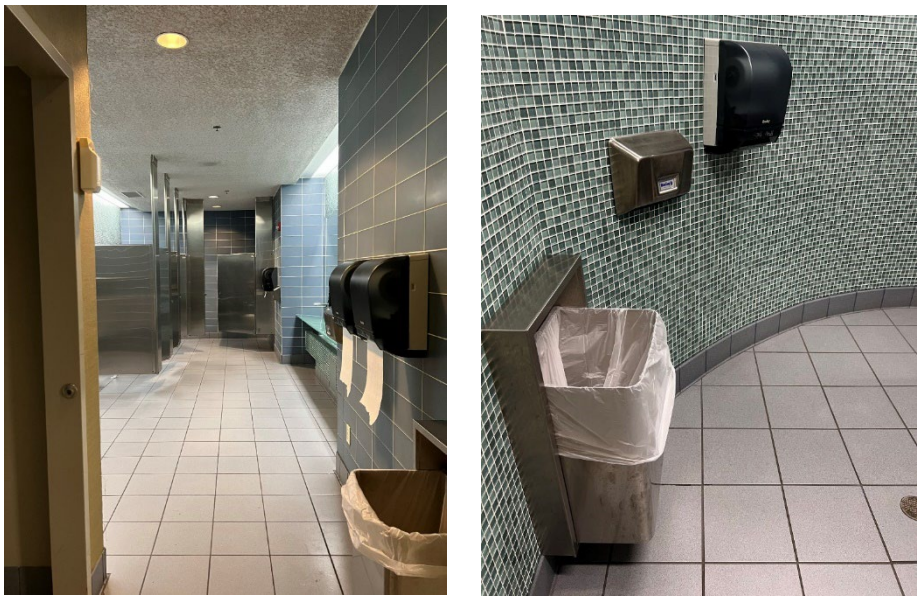

FIGURE 143 – PAPER TOWEL DISPENSER IN RESTROOM

The public restroom at the west end of Ticketing should be out of service. It is understood that the Police and other staff use this restroom. There are multiple things wrong with it, including code, and maintenance issues.

Restroom at corridor by first-floor administration offices.

- Tissue and toilet seat cover dispensers require 12" min. clearance above the grab bar.

FIGURE 144 – FIRST FLOOR ADMINISTRATION RESTROOM

1.4.2.10 Family Restroom

The Assembly use group requires an accessible family or assisted-use toilet room where more than six male and female water closets are required. There is one family restroom near Gate 5, however it may require upgrades to comply with current regulatory requirements.

- Provide a compliant family or assisted-use toilet room on both landside and airside, as required per ADA, either by renovating existing facilities, or by creating new spaces.

1.4.2.11 Sidewalk

Portions of the sidewalk have light fixtures/signs which reduce the path.

FIGURE 145 – PARKING LOT SIDEWALK FACING EAST

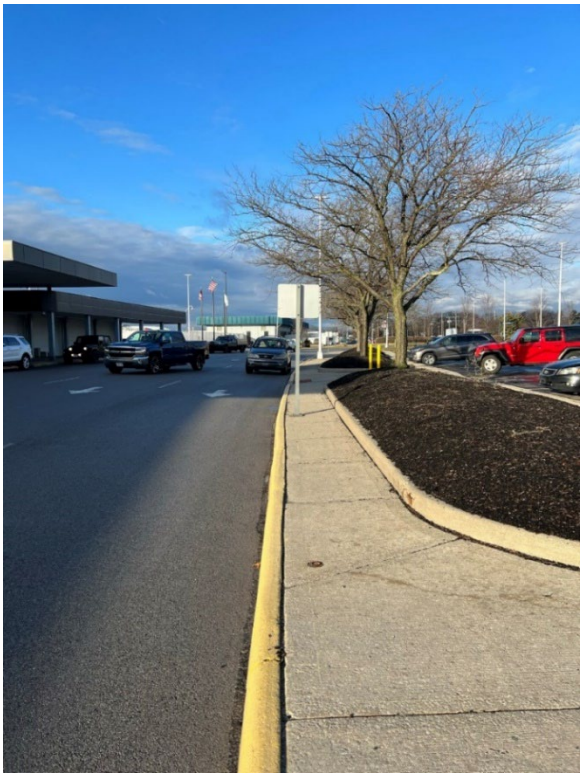

FIGURE 146 – PARKING LOT SIDEWALK FACING WEST

- Sidewalks should provide an accessible path. Poles, signs, and other obstructions should be relocated.

1.4.3 Energy Code

Due to the nature of the upgrades, the energy compliance will need to meet the current standards of the Energy Code. The location of the Airport is in climate zone 5. The envelope requirements would be as follows:

- R-30, Insulation entirely above the roof deck
- R-13, walls plus R-7.5 continuous Insulation
- R-10 for an unheated slab on grade floor and 24" below at foundation wall
- U-.38 fixed fenestrations, SHGC of .38 for SEW elevations and .51 for N elevation Projection factor < .2
- U-.77 entrance doors
- U-.5 skylights, SHGC OF.4

If select demolition and renovation is decided upon, the implications for some of the replacement or changes to the envelope elements may require modifications to the existing building components. Replacement of insulated metal panels, for example, will require a higher r value, which in turn requires a thicker panel. This has widespread effects on both the exterior and interior as to how the improved products come together and fit with existing components.

> Architectural elements requiring IECC upgrades: windows, metal panels, sectional and coiling doors, and man doors. These elements were singled out because of other failures listed elsewhere in this report and as a minimum are assumed to be replaced.

1.4.3.1 Air Barrier

IBC, starting in 2012, enacted a change requiring the envelope be designed to limit air leakage. Air barriers are required to meet a permeability of at least 4 cfm/ft^2. Although different portions of the building were constructed at various times, it is most assured that there is no air barrier present within the wall cavity.

- Any portion of the exterior wall that is modified will require the installation of an air barrier which meets the required permeability of the IECC.

1.4.3.2 Roof

Overall, the roof appears to be in good condition as does not seem to be the source of the water infiltration.

1.5 SUMMARY AND CONCLUSION

As discussed at the beginning of this report, the first step to receiving federal funding support through the Federal Aviation Administration's (FAA) Airport Improvement Program (AIP) for terminal facility upgrades or development is to complete a comprehensive facility assessment. A recent Air Service Study, conducted in 2021, has also validated the need for terminal facility improvements.

This analysis has described the findings from the site visit conducted by a team of architects, engineers, and planners. The consensus is that the facility has many critical items and systems beyond their lifespan and needs replacing. Additionally, the presence of asbestos and mold requires special mitigation to remove these environmental hazards. Based on the current commercial flight activity, the terminal facility is oversized, with many hallways and spaces used for functions other than their intended purposes or completely unused. Architecturally and mechanically, the facility has many code violations that must be addressed. Many large machines used to provide power, and air conditioning are beyond their design lifespan and require heavy maintenance or replacement. Other life-safety items such as lightning protection and backup systems are not installed or are non-functioning. With this terminal facility assessment completed, the next step, as part of the Facility Requirement analysis is to develop potential solutions to modernize the facility.