Appendix H: Snow Removal Equipment (SRE) and Maintenance Facility Space Analysis

Analysis Overview

The objective of this appendix is to provide a detailed analysis of the snow removal equipment (SRE), attachments, and associated space and related facilities at the La Crosse Regional Airport (LSE or Airport) to determine if the Airport has sufficient space for their existing and planned future equipment. This analysis also examines the existing layout to determine if the existing layout and circulation is sufficient for existing and future SRE. Lastly, this appendix will analyze several other spaces in the SRE and maintenance facility to determine their sufficiency including:

- Vehicle storage
- Vehicle circulation
- Maintenance shop and wash bay
- Parts and equipment storage
- Sand and chemical storage
- Office and personnel support space

Overview of Snow Removal Equipment (SRE) and Maintenance Facility

Snow removal equipment (SRE) and maintenance equipment at LSE are currently stored in a facility located in the southwest General Aviation (GA) area. The building, constructed in 1991, is currently 22,800 square feet and has immediate access to the unsecure landside through an access gate near the building. SRE vehicles transit through the T-hangar area to access runways and taxiways.

The current SRE facility has several areas where additional space is needed. A preliminary space assessment was conducted to evaluate potential triggers for expanding or relocating the current SRE/maintenance storage facility.

The required response time to clear snow from an airport environment is based on the number of annual operations at the airport. Total aircraft operations in 2017 were 18,034 and are projected to grow to 19,440 by 2037. Based on guidance in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5200-30D, *Airport Field Condition Assessments and Winter Operations Safety*, because LSE has more than 10,000 operations but fewer than 40,000 operations, it should have enough equipment to clear priority areas within one hour.

FAA Order 5100.38D, *Airport Improvement Program (AIP) Handbook*, allows for acquisition of SRE for Part 139 certified airports. According to the AIP Handbook, “any equipment required for clearing snow and ice from the runways, principal taxiways, aprons, and emergency access roads is eligible.” Additionally, the FAA Snow Removal Calculation spreadsheet is required to calculate the AIP-eligible SRE and associated vehicle storage area. Eligibility is determined based on calculations for primary runway, taxiways, and critical apron area, coupled with airport size and winter climate history. According to the AIP Handbook, FAA funding for SRE facilities is limited to space in the facility that is necessary for eligible SRE as well as storing abrasive or chemicals used in treatment of paved areas. All other areas and equipment recommended in AC 150/5220-18A, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*, must be paid for by the sponsor. AIP-eligible equipment for LSE, according to the FAA Snow Removal Calculation spreadsheet included in Passenger Facility Charge (PFC) Application #11, approved by the FAA in 2017, are shown in **Table 1.**

Table 1: Identification of Justifiable Snow Removal Equipment			
Eligible Items	**Max Justifiable Quantity**	**LSE Existing Quantity**	**LSE Needs**
Snow Blower	3	2	+1
Plow	6	4	+2
Sweeper	4	3	+1
Hopper Spreader	4	0	+4
Front End Loader	1	1	0
Total Quantities	**18**	**10**	**8**

Source: 2017 Passenger FC Application; Mead & Hunt, Inc.

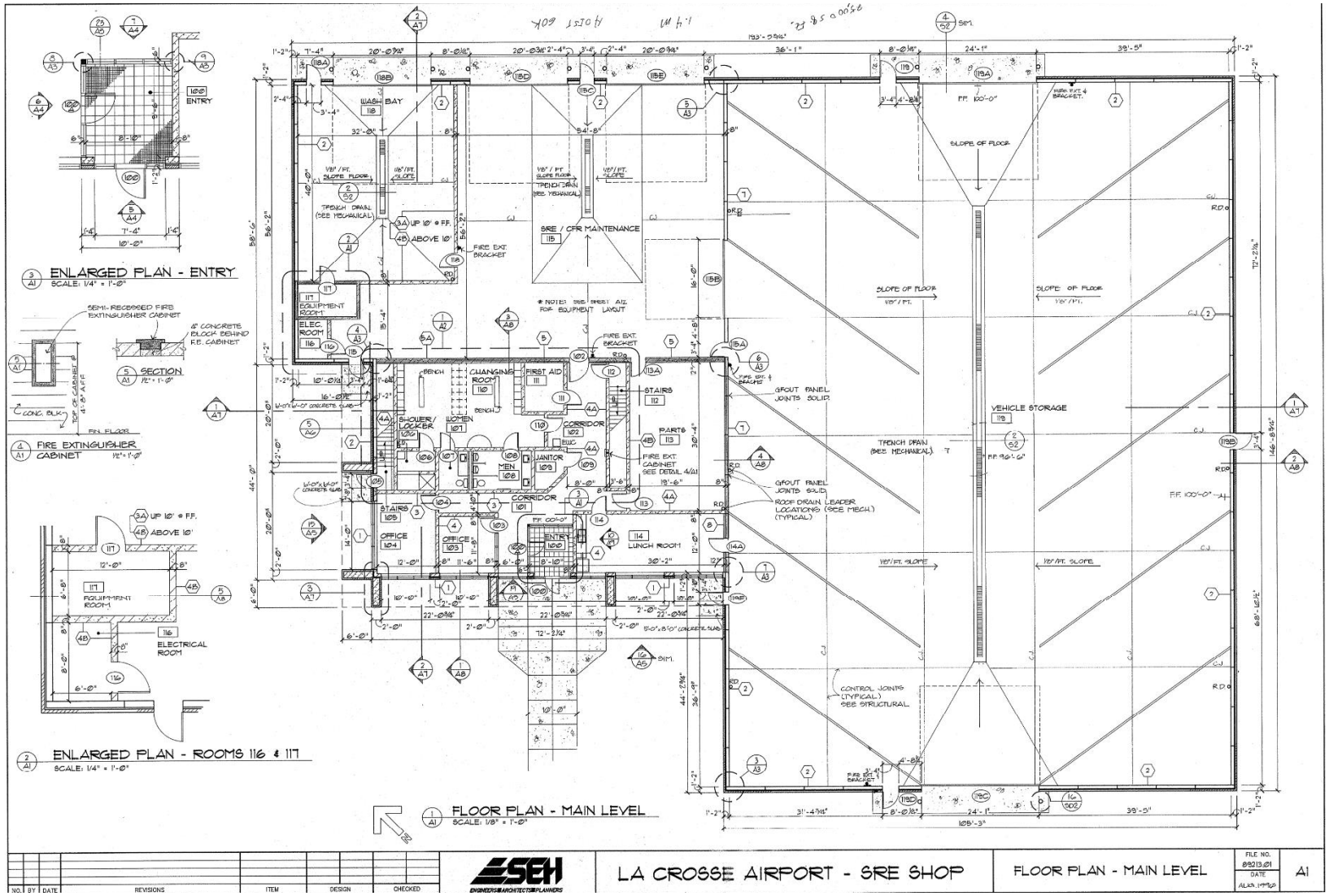
Vehicle Storage

The existing vehicle storage and circulation area is approximately 15,500 square feet, 12,044 of which are for vehicle storage and 3,456 of which are for vehicle circulation. The facility has a single drive-through aisle design with eight angled equipment stalls. According to AC 150/5220-18A, a drive-through aisle design is an efficient design for airports with small to medium equipment fleets; however, the existing layout is not conducive to efficient circulation and vehicle storage for two reasons: 1) existing SRE equipment are too large to be parked in equipment stalls, and 2) the vehicle circulation area is too narrow for modern SRE equipment.

The Airport has indicated that the combination plow/broom cannot be parked in the existing stalls due to the size of the equipment and the dimensions of the stalls. During the warmer months, the combination plow/sweepers are parked in the existing drive-through aisle and during the winter months they are parked outside. Oftentimes, the Airport must move one vehicle to access another vehicle. Storing vehicles outside shortens the useful life of equipment, and regularly shuffling equipment is inefficient and reduces response time during snow and other maintenance events. Attachments for these vehicles are stored wherever space can be found whether it be along the walls or in the corners of the vehicle storage area.

AC 150/5220-18A stipulates that storage of the vehicles and equipment is determined by calculating the eligible area needed to house each vehicle including the Equipment Safety Zone (ESZ) required on each side of the vehicle. According to AC 150/5220-18A, Table 3-2, equipment parallel to other equipment requires an ESZ of 10 feet, or 5 feet per side. According to AC 150/5220-18A, Table 3-1, the ESZ for parked equipment is calculated without attachments. During the winter months, SRE vehicles have their equipment attached to allow Airport staff to respond quickly to winter events. It is unreasonable to remove large plows and brooms each time a vehicle is pulled in the vehicle storage area and the layout of existing equipment stalls does not accommodate vehicles with their equipment attached. **Figure 1** depicts the layout for the existing SRE and maintenance facility.

Figure 1: Existing Snow Removal Equipment and Maintenance Facility Layout



Sources: Airport Staff

Single or dual drive-through lanes require a larger ESZ than the current design. To accommodate single or dual drive-through lanes for existing SRE at LSE, the eligible square feet may be greater than the existing footprint of the vehicle storage and circulation area. Based on AC 150/5220-18A, Table 3-1, single drive-through lanes require an ESZ of 15 feet, while the ESZ of dual drive-through lanes depends on the size of plow and sweeper attachments. LSE currently parks vehicles parallel to other vehicles which requires an ESZ of 10 feet.

The existing equipment stalls are approximately 48 feet long and 27 feet wide. The eight stalls in the existing facility provide approximately 1,296 square feet per vehicle. To park just one of the Airport's combination plow/sweeper, the dimensions of the vehicle, plow, and sweeper attachment must be taken into consideration along with an ESZ of 10 feet. The combination plow/sweeper equipment are approximately 48 feet long and 20 feet wide. To accommodate an ESZ of 10 feet, approximately 1,740 square feet of storage area is required, which is approximately 500 square feet more than the existing equipment stalls provide. The size of the combination plow/sweepers and the required ESZ contribute significantly to the overall inefficiency of the existing vehicle storage area.

The smallest plow vehicle that LSE owns is Airport 14 which is an Oshkosh HT which measures 22 feet long and 8 feet wide. With the required ESZ, the space needed for the vehicle is 576 square feet; however, during the winter months, the Airport attaches equipment to the vehicles and oftentimes those attachments are not removed until spring. The plow attachment for Airport 14 is 20 feet long and 8 feet wide and requires 325 square feet of storage area when not attached to the corresponding plow vehicle. Attachments stored while not attached to their corresponding vehicle required a smaller ESZ than when they are attached to vehicles. To park the smallest plow vehicle with attached plow that LSE owns with an ESZ of 10 feet, approximately 936 square feet is required. While the equipment stalls provide approximately 1,296 square feet of vehicle storage, Airport 14 is too long to store in the equipment stalls with its plow attached.

LSE's existing SRE and maintenance equipment includes: two snow blowers, four plows, three sweepers, and one front end loader (**Table 1**). Based on the SRE vehicle storage area layout at LSE, the parked equipment dimensions from AC 150/5220-18A, Table 3-1, an ESZ of 10 feet, or five feet per side, were used to calculate SRE eligible area. **Table 2** presents SRE vehicles by vehicle make/model and their primary vehicle function, the dimensions of each vehicle, their attachments, the dimensions including the ESZ, and the total estimated eligible area required. **Table 2** also includes SRE that the Airport intends to purchase in the next five years (2020-2024). According to the AIP Handbook, Table O-3, at the time an SRE facility is programmed for construction, expansion, modification, improvements, or rehabilitation, the eligible equipment must be owned, on order, or budgeted by the airport within the next five years to be considered in the eligible area for AIP funding. Future equipment depicted in **Table 2** includes future equipment identified to purchase in the next five years according to the Airport's Capital Improvement Plan.

Due to the size of SRE, their associated attachments and the required ESZ, the space needed to effectively store equipment is larger than the existing space in the vehicle storage area. To demonstrate the space needed to store all existing and future SRE vehicles with their equipment attached, **Table 3** is included to show the length and width of each vehicle and its equipment attached including an ESZ of 15 feet, or 7½ feet per side, from parked equipment that includes a safe walk around zone in front of at least three feet.. **Table 3** depicts the modified eligible area needed to house all SRE vehicles with their equipment attached.

Table 2: LSE Snow Removal Equipment, Attachments, and Eligible Area							
Unit #	**Equipment Type**	**Year**	**Make**	**Model**	**Dimensions (feet, h x l x w)**	**Dimensions and ESZ (feet, l[1] x w[1])**	**Eligible Area (square feet)**
Existing Vehicles							
10	Plow	2000	Oshkosh	P2526	12.5x35x8	45x18	810
13	Plow	2000	Oshkosh	P2526	12.5x35x8	45x18	810
14	Plow	2014	Oshkosh	HT	12.5x22x8	32x18	576
15	Sweeper/Blower[2]	2018	MB-4 MTE	-	27x10	37x20	740[3]
16	Front End Loader	2004	Case	821C	12x28x8	38x18	684
17	Blower	2009	Oshkosh	H273B	12.5x26x8	36x18	648
23	Plow	2011	Oshkosh	HT (Plow and Broom)	12.5x42x20	52x30	1,560
Total Existing Estimated Eligible Area: Vehicles							***5,828***
Existing Attachments							
10	Plow	-	-	-	20x8	25x13	325
13	Plow	-	-	-	20x8	25x13	325
14	Plow	-	-	-	20x8	25x13	325
15	Sweeper	-	-	-	9x9	14x14	196
15	Blower	-	-	-	20x7	25x12	300
17	Blower	-	-	-	8x8.5	13x13.5	176
42	Sweeper	2005	M-B, Tracking Tow Runway Broom	Model 4600	18x8	23x13	299
43	Sweeper	2005	M-B, Tracking Tow Runway Broom	Model 4600	18x8	23x13	299
Total Existing Estimated Eligible Area: Attachments							**2,245**
Future Vehicles and Attachments							
F42	Sweeper	2020	-	-	20x18	25x23	575
F43	Sweeper	2020	-	-	20x18	25x23	575
F10	Plow[4]	2024	-	-	12.5x42x20	52x60	1,560
Total Future Estimated Eligible Area: Vehicles and Attachments							***2,710***
Total Existing and Future Eligible Area: Vehicles and Attachments							**10,783**

1 The Eligible Area includes 10 feet per side for the ESZ found in AC 150/5220-18A, Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials, Table 3-1.

2 According to the AIP Handbook, an MTE counts as two pieces of equipment for eligibility purposes.

3 Eligible area for this piece of equipment is rounded up to the nearest foot.

4 This piece of equipment will replace one of the 2000 Oshkosh Airfield Plows and another existing plow to be determined at a later date.

ESZ = Equipment Safety Zone

MTE = Multi-Tasking Equipment

SRE = Snow Removal Equipment

Sources: LSE Airport Certification Manual; Airport Staff; Mead & Hunt, Inc.

Table 3: LSE Snow Removal Equipment and Attachments: Modified Eligible Area for Single Drive-Through Lane									
Unit #	**Equipment Type**	**Year**	**Make**	**Model**	**Dimensions (feet, l x w)**	**Attachment**	**Dimensions (feet, l x w)**	**Combined Dimensions and ESZ[1] (feet, l x w)**	**Total Eligible Area (square feet)**
Existing Vehicles and Attachments									
10	Plow	2000	Oshkosh	P2526	35x8	Plow	20x8	70x23	1,610
13	Plow	2000	Oshkosh	P2526	35x8	Plow	20x8	70x23	1,610
14	Plow	2014	Oshkosh	HT	22x8	Sweeper	18x8	55x23	1,265
15	Sweeper/Blower[2]	2018	MB-4 MTE	-	27x10	Sweeper/Blower	29x9	56x35	1,960
16	Front End Loader	2004	Case	821C	28x8	Front End Loader	-	42x23	966
17	Blower	2009	Oshkosh	H273B	26x8	Blower	8.5x8	49.5x33	1,634*
23	Plow	2011	Oshkosh	HT (Plow and Broom)	42x20	Sweeper	18x8	75x35	2,625
Total Existing Estimated Eligible Area: Vehicles + Attachments									***11,670***
Future Vehicles and Attachments									
F14/42	Sweeper	2020	-	-	22x8	Sweeper	20x18	27x33	1,881
F23/43	Sweeper	2020			42x20	Sweeper	20x18	77x33	2,541
F10	Plow	2024			35x8	Plow	20x8	70x33	2,310
Total Future Estimated Eligible Area: Vehicles + Attachments									***6,732***
Total Estimated Existing and Future Eligible Area: Vehicles + Attachments									**18,402**

1 The combined dimensions and ESZ are indicative of each vehicle with its corresponding equipment attached plus the ESZ of 15 feet, or 7½ per side, for parked equipment from other parked equipment that includes a safe walk around zone in front of at least three feet according to guidance in AC 150/5220-18A, Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials, Table 3-1.

2 According to the AIP Handbook, an MTE counts as two pieces of equipment for eligibility purposes.

3 Eligible area for this piece of equipment is rounded up to the nearest whole number.

ESZ = Equipment Safety Zone

F = Future

MTE = Multi-Tasking Equipment

SRE = Snow Removal Equipment

Sources: LSE Airport Certification Manual; Airport Staff; Mead & Hunt, Inc.

Table 2 indicates that the existing equipment parking stalls are sufficiently long enough for most SRE vehicles; however, LSE does have one plow that is too long to fit into the stall when considering the required ESZ. While there may be enough room in existing stalls to store the vehicles, there is not enough room to store vehicles with their equipment attached. As shown in **Table 3**, parking vehicles with their equipment attached requires a significant increase to the size of the equipment stalls.

As discussed previously, the existing equipment stalls are approximately 48 feet long and 27 feet wide. As depicted in **Table 3**, all of LSE's SRE vehicles except one will not fit in the existing equipment stalls as they will be too long. The largest plow and its attachment, including the required ESZ, would also be too wide for the existing stalls when parked parallel to other equipment.

Another factor limiting vehicle storage is the angled design of the existing equipment stalls, which eliminates approximately 2,523 square feet of the vehicle storage area that unusable for parking vehicles which is in the four corners of the vehicle storage area.

As LSE cannot feasibly accommodate all pieces of existing SRE and their attached equipment due to the size of the equipment stalls and the angled design, it is recommended that LSE reconfigure the vehicle storage area to accommodate a dual drive-through aisle design and remove the angled parking stalls to provide more space for parked SRE with their equipment attached. The following section will discuss the existing vehicle circulation and how it affects the existing vehicle storage area layout at LSE.

Vehicle Circulation

Due to the undersized vehicle storage area and angled equipment stall design, the vehicle circulation in the existing facility is inefficient and not sufficiently sized for existing and future SRE at LSE. The existing vehicle circulation area (drive-through aisle) is approximately 144 feet long and 24 feet wide which is approximately 3,456 square feet.

As discussed previously, the Airport must park combination SRE in the drive-through aisle to fit equipment inside the existing facility and these pieces of equipment must be moved out of the building to access other SRE vehicles. Moving equipment to access other equipment is inefficient and reduces the ability of LSE to respond to winter weather events. AC 150/5200-18A, Chapter 3, Section 3-2, discusses the configuration of SRE and maintenance buildings. According to AC 150/5220-18A, Chapter 3, Section 3-2, "the design goal of the configuration is to facilitate the duties of personnel, expedite the movement of equipment, and provide ready access to materials and supplies." The current facility design does not meet this goal.

LSE has an equipment replacement program in place to phase out equipment that has reached its useful life and replace it with modern SRE designed to meet the Airport's needs. Modern SRE is often larger than old equipment, and often Multi-Tasking Equipment (MTE) is preferred over single-function equipment. MTE maximize staff efficiency by increasing the equipment's functions with multiple attachments to each vehicle. The existing vehicle circulation area is insufficient to accommodate an increased vehicle size corresponding to modern SRE such as MTE. If LSE continues to replace aging equipment with modern MTE, the existing vehicle circulation will significantly impede the ability of LSE to respond quickly to snow events and it is likely more SRE will have to be stored outdoors.

According to AC 150/5220-18A, SRE are costly pieces of complex and technologically advanced equipment for the control of snow, slush, and ice on the country's airports. To protect and service this expensive investment, the FAA recommend specifically designed maintenance buildings with adequate storage areas. These buildings should provide a protected environment for the equipment to prolong the useful life of the investment. Storing SRE outside degrades the vehicles and attachments and can shorten the useful life.

Due to the size of existing SRE at LSE and the space needs of modern MTE, LSE requires increased vehicle circulation area to move equipment in and out of the facility efficiently and quickly. To increase vehicle circulation, this master plan recommends changing the layout of the vehicle storage area to accommodate a wider drive-through lane design with increased vehicle circulation.

For LSE's two combination plow/sweepers, the existing drive through lane is too narrow to accommodate the equipment safely. According to AC 150/5220-18A, Table 3-1, moving equipment on single drive-through lane requires an ESZ of 15 feet, or 7½ feet per side, from parked equipment that includes a safe walk around zone in front of at least 3 feet. To accommodate the combination plow/sweeper equipment, a single drive-through lane must be at least 30 feet wide. As the largest combination plow/sweeper requires a width of 27½ feet with its ESZ, it is recommended that the drive-through lane be at least 40 feet wide to safely maneuver large pieces of equipment.

To increase the width of the existing drive-through lane to 40 feet, existing entrances and exits would need to be modified as well as the vehicle storage layout. Additionally, two employee access doors would need to be relocated to accommodate the wider drive-through lane and associated equipment access doors. It is recommended that LSE consider modifying the existing vehicle circulation area to accommodate 40-foot-wide dual drive-through lanes and to accommodate existing SRE and future SRE planned in the next five years which is equivalent to approximately 11,520 square feet of storage space. Additionally, LSE should expand the vehicle storage area to the south an additional 71 feet to accommodate their existing and future equipment. Extending the length of the vehicle storage area would provide enough space for a 15-foot ESZ around all pieces of equipment in addition to the dual drive-through aisle design.

While modification of existing equipment stalls and the drive-through lane would aid in reducing the existing storage and circulation issues, it is unlikely that modification to the existing facility will be sufficient for the Airport long-term. Any modern equipment the Airport acquires long-term are likely to be larger than existing equipment to fulfill multiple functions; for this reason, the existing vehicle storage area will continue to be constrained unless it is expanded.

Maintenance Shop and Wash Bay

The existing SRE building includes a 4,600-square-foot shop with two maintenance bays and one wash bay measuring approximately 800 square feet each. The existing maintenance and wash bays are undersized and cannot accommodate the Airport's largest vehicles due to inadequate depth and will not be able to accommodate future SRE.

Larger maintenance and wash bays should be provided. Furthermore, the industry standard for SRE equipment is increasing and new industry standard bays allow for overhead oil, grease, and air systems in addition to an overhead hydraulic hoist for heavy equipment. AC 150/5220-18A, Table 3-3, recommends

two maintenance bays be provided with 1,000 square feet per maintenance bay. AC 150/5220-18, Chapter 1, Section 1-2 classifies airport size by their "total paved runway as identified by the airport operator's winter storm management plant that will be clear of snow, ice, and/or slush." LSE, according to their FAA Snow Removal Calculation spreadsheet, have over 1,000,000 square feet of total paved runway which means that LSE is classified as a very large airport under guidance found in AC 150/5220-18A, Chapter 1, Section 1-2. According to AC 150/5220-18A, Table 3-3, very large-sized airports should have two maintenance bays that are 1,000 square feet per bay. According to AC 150/5220-18A, Table 3-3, wash bays for large and very large-sized airports should measure 1,000 square feet as well.

Maintenance shops and wash bays are eligible under guidance found in the AIP Handbook, although the Handbook only allows for one maintenance bay sized for safety or security equipment (i.e. ARFF equipment). An additional 600 square feet of maintenance and wash bay space is recommended to meet Airport demands.

Parts and Equipment Storage

There is minimal storage in the main SRE and maintenance facilities for additional equipment and vehicle attachments. The existing 500-square-foot parts storage room used to store small parts for SRE and maintenance equipment is at capacity. An old hangar southeast of the SRE and maintenance facility is storage for SRE attachments such as plow blades or sweepers. This hangar is not heated or insulated and is nearing the end of its useful life. The Airport desires new storage areas to replace this building, which would ideally be heated and properly insulated to protect and extend the useful life of equipment. Oftentimes the existing parts and equipment storage is full and additional equipment, such as plow blades and sweeper supplies are put where Airport staff can find space. If no space can be found inside, operations vehicles are parked outside to ensure that parts and equipment can be stored inside the facility.

According to AC 150/5220-18A, it is ideal to designate storage areas in one location for parts and equipment collocated with SRE and maintenance facilities. While there is a room dedicated to parts storage in the SRE and maintenance facilities, it is undersized and is only large enough for small equipment parts.

AC 150/5220-18A classifies airports according to the total paved runway area identified by the airport operator's winter storm management plan that will be cleared of snow, ice, and/or slush. Airports that have at least 1,000,000 square feet of total paved runway are classified as a very large airport. LSE falls into the category of a very large airport as the total paved runway area is over 1,000,000 square feet. According to AC 150/5220-18A, Table 3-3, very large airports have a typical space allocation for a parts area associated with snow removal operations of 1,000 square feet. Additionally, parts areas associated directly with snow vehicles should be at least 400 square feet. While AC 150/5200-18A provides typical space allocations, the final floor allocations for SRE parts and equipment should be determined by the airport operator.

Based on AC 150/5220-18A, the Airport's needs, and the existing parts storage, LSE requires an additional 1,000 square feet to accommodate existing SRE parts and attachments. Based on guidance in the AIP Handbook, parts and equipment storage is not AIP-eligible. Should the Airport add additional parts and equipment storage, the Airport will be required to fund it themselves or through other avenues, such as state funding.

Sand and Chemical Storage

AC 150/5220-18A and current AIP eligibility requirements allow for funding of indoor sand and chemical storage areas. Heated sand storage areas prevent moisture in the sand from freezing, which requires more effort to load and may hamper response times during snow events. According to AC 150/5220-18A, sand and chemical storage should be sized to reduce restriction or difficulty of loading solid materials onto spreader trucks and ensure that solid material does not spill outside the limits of the storage floor area during delivery. AC 150/5220-18A stipulates that space allocation for solid de/anti-icers and sand should be determined by the Airport's operational requirements and historical usage amounts. Additionally, FAA guidance stipulates that caution should be taken when determining floor areas to consider the approach that the Airport uses to combat the type of winter storms that occur at the Airport. The difficulty in receiving new material deliveries and replenishing them during storms also needs to be considered.

At LSE, existing sand storage is approximately 2,043 square feet and is in an unheated, separate facility southeast of the SRE and maintenance building. Due to the placement of the sand storage building, SRE personnel must transit behind the SRE facility in the GA hangar areas via taxilanes. While the exact age of the sand storage building is unknown, it is understood to have been constructed before 1999. Airport staff has indicated there is cinder block deterioration, but the extent of the damage requires further investigation. According to AIP guidelines, the useful life for buildings is 40 years. The building is at least 20 years old and is expected to reach the end of its useful life by the end of the planning period.

The Airport plans to remove the existing sand storage building to facilitate future GA hangar development, which will require relocating sand storage. It is ideal that sand storage be collocated with the SRE and maintenance facility. Additionally, it is desirable that chemical storage also be collocated with sand storage. AC 150/5220-18A, Table 3-2, shows typical storage allocation for material storage items. AC 150/5220-18A stipulates that sizing needs for sand, deicer, and salt storage are highly influenced by the approach used and the quantity of materials or combination of materials applied to combat the type of winter storms encountered at airports.

LSE staff require storage for solid and liquid chemicals. LSE requires the following space allocations for chemicals and sand:

- One 6,500-gallon poly tank of liquid deice chemicals
- 20 pallets of solid deice chemicals
- 20 cubic yards of solid urea
- 60 cubic yards of sand.

As a result of these factors, it is estimated that approximately 5,460 square feet of sand and chemical storage is required by the Airport and AIP-eligible under current FAA guidance. Based on the current sand storage area at LSE, LSE requires an additional 3,417 square feet for sand and chemical storage.

Office and Personnel Support Space

Although office and personnel support spaces are not eligible for FAA funding under current AIP guidelines, they are important to consider when determining facility needs. AC 150/5200-18A recommends that the building configuration include areas that focus on administrative and operational functions such as training rooms. The existing personnel area in the SRE facility is approximately 2,200 square feet and includes offices, a lunchroom, restrooms, locker rooms, a first aid room, and a janitor's closet. Currently, no training space is available in the SRE and maintenance facilities, and the two offices are of insufficient size for group trainings. Additional space for personnel training is desirable at an estimated 400 square feet.

Space Assessment Summary

SRE and maintenance space requirements for each functional area are summarized in **Table 4.** While the building has adequate vehicle storage capacity in terms of square footage, the vehicle storage layout does not utilize the space in such a way that accommodates all of the Airport's AIP-justified SRE.

Development of alternatives for SRE and maintenance space will seek to satisfy these requirements. Chapter 4 of the Master Plan evaluates alternatives that provide additional space in the areas identified and more efficient vehicle storage and circulation.

Table 4: SRE and Maintenance Facility Space Requirements

Functional Area	Existing SF	Additional Required SF	Total Required SF	AIP Eligible
Vehicle Storage	12,044	6,358	18,402	Yes
Vehicle Circulation	3,456	2,304	5,760	Yes
Maintenance Shop and Wash Bay	4,600	600	5,200	Yes
Parts and Equipment Storage	500	1,000	1,500	No
Sand and Chemical Storage	2,043[2]	3,417	5,460	Yes
Office and Personnel Support Space	2,200	400	2,600	No
Total	**24,843**	**14,079**	**38,922**	**-**

1 While the building does have adequate vehicle storage and capacity in terms of square footage, the vehicle storage layout does not utilize the space in such a way that accommodates all of Airport's AIP-justified SRE.
2 Sand and chemical storage currently located outside of the existing SRE/maintenance facility.
SF = Square Feet
Sources: Mead & Hunt, Inc.; Airport Staff.