

SECTION 2.0 PURPOSE AND NEED

Purpose

The purpose of the CIP project elements is to:

- Enhance Airport safety and security.
- Enhance the efficiency of the Airport to more fully meet the current and anticipated demand.

Several of the CIP projects will provide operational safety and security improvements at Provincetown Municipal Airport that comply with current FAA, Massachusetts Department of Transportation (MassDOT) Aeronautics Division, and TSA safety and security design standards for a non-hub primary service airport. The use of these standards is mandatory for airport projects receiving Federal grant-in-aid assistance. It is the policy of the Airports Division of the FAA New England regional office that airport improvement projects must comply with the national airport design standards.

Three of the CIP projects will address existing and anticipated capacity needs. The proposed addition to the Terminal would replace the lost passenger space taken by TSA for secure waiting areas, and passenger and baggage screening, and support future passenger needs. The proposed improvements to the parking lot and the turf apron are design to address the current and projected needs at the Airport.

Need

The CIP projects are needed because:

- Certain airfield facilities do not meet current safety and security standards.
- The Airport's existing parking and terminal facilities cannot efficiently meet current and projected demand.

To explain the purpose and need for these projects, the following discussion of the FAA and TSA safety and security regulations, standards and guidelines is provided as background.

2.1 Overview of Airport Safety and Security Design Standards

The following discussion is based on information obtained from FAA, MassDOT, and TSA. Additional information was obtained from staff at the FAA New England Regional Office, Planning Branch, and Safety & Standards Branch. Applicable portions of regulations and design standards are included in Appendix 6.

The primary mission of the FAA is safety. As stated in FAA Order 5100.38C, Airport Improvement Program Handbook: "The highest aviation priority of the United States is the safe and secure operation of the airport and airway system." The authority to regulate the aviation system, and the extensive design standards are discussed below.

Acts of Congress

Safety

The Federal Aviation Administration has been given the authority to regulate civil aviation by several acts of Congress. Starting with the Air Commerce Act of 1926, the new aeronautics branch of the Department of Commerce assumed responsibility for aviation oversight and concentrated on safety rulemaking and certification of pilots and aircraft. It also took over operation of the nation's system of lighted airways from the Post Office Department. The Civil Aeronautics Act of 1938 transferred responsibilities to a new independent agency, the Civil Aeronautics Authority. The Federal Aviation Act of 1958 created a new independent body, the Federal Aviation Agency, with broader authority to combat aviation hazards. In 1966 Congress authorized the Department of Transportation and the Agency became the Federal Aviation Administration. The Airport and Airway Development Act of 1970 made FAA responsible for safety certification of airports served by air carriers. The Airport and Airway Improvement Act of 1982 established the Airport Improvement Program (AIP). The AIP provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS is comprised of all commercial service airports, all reliever airports, and selected general aviation airports.

Security

The FAA became more involved in the field of aviation security during the hijacking epidemic of the 1960s. The Aviation Security Improvement Act of 1990 directed the FAA to develop guidelines for airport design to allow for security enhancement. The Aviation and Transportation Security Act (ATSA), signed into law November 2001, established the Transportation Security Administration (TSA) following the September 11, 2001 terrorist attacks. The TSA was given responsibility for securing all modes of transportation, including aviation. The establishment of the Department of Homeland Security (DHS) in 2002 further defined the responsibilities of TSA. Although the public is most aware of efforts to improve security relative to passenger and baggage screening, another area of aviation security pertains to the perimeters of airport properties. In June 2006, TSA issued Recommended Security Guidelines for Airport Planning, Design and Construction, which includes guidelines for perimeter security and access points.

Laws and Regulations

The FAA has the statutory authority to issue rules on aviation safety under Title 14 and Title 49 of the United States Code. The United States Code is the codification by subject matter of the general and permanent laws of the United States. It is divided by broad subjects into 50 titles and published by the Office of the Law Revision Counsel of the U.S. House of Representatives.

Safety

Title 14 presents regulations governing the activities of the Department of Transportation and the National Aeronautics and Space Administration in the areas of aeronautics and space, including: aircraft, aviators, airspace, air traffic, certification of air carriers and operations, and airports. Chapter 1 of Title 14 includes the Federal Aviation Administration, Department of Transportation. The following section is relevant to the discussion of the proposed projects at the Airport:

- 14 CFR Part 77 applies to Objects Affecting Navigable Airspace. Part 77 establishes standards for determining obstructions in navigable airspace. These standards are established through imaginary obstacle free surfaces with relation to the airport and each runway.

Security

Regulations relative to airport security can be found at Title 14 CFR Part 107 and Part 121. Part 107 regulates airport security and Part 121 defines the operating regulations for commercial carriers.

Title 49 also relates to security at airports. Title 49 presents regulations governing research and special programs administration, railroads, highways, vessel cargo containers, traffic safety, surface transportation, transit administration, and transportation safety. The following section is relevant to the discussion of the proposed projects at the Airport:

- 49 CFR Subchapter C Part 1542 applies to Civil Aviation Security. Part 1542 requires airport operators to adopt and carry out a security program approved by TSA.
- 49 CFR Part 1544 applies to the security of airport operations.

Airport Operations Safety Design Standards and Guidelines

The FAA publishes documents known as Advisory Circulars (ACs) and Orders, while not regulations, provide accepted operational safety design standards to meet responsibilities pursuant to the regulations. The use of these standards is mandatory for airport projects receiving Federal grant-in-aid assistance. AIP funded projects are required to comply with certain FAA Advisory Circulars (AC). The list of required ACs is provided in Appendix 6 and can also be found at <www.faa.gov/airports_airtraffic/airports/aip/media/aip_pfc_checklist_fy2007.pdf>.

FAA Airport Design Advisory Circular (AC 150/5300-13) includes the design standards for all civilian airports. As stated on the signature page of the Advisory, “For airport projects receiving Federal grant-in-aid assistance, the use of these standards is mandatory.” The design standards are important because they establish a uniformity and consistency of design that has been adopted by the FAA to promote the safe movement of aircraft at all airports in the United States. Whenever possible, existing airport facilities are brought to current standards as an adjunct to other projects, such as pavement reconstruction and other improvement projects.

Specific sections of relevant ACs and Orders that apply to the proposed projects are provided later in this section.

Airport Security Design Standards and Guidelines

FAA Airport Design Advisory Circular (AC 150/5300-13, Chapter 6, Paragraph 614) includes site requirements for NAVAID facilities and security of those facilities.

In June 2001, the FAA issued revised Recommended Security Guidelines pursuant to the Aviation Security Improvement Act of 1990. In June 2006, TSA issued Recommended Security Guidelines for Airport Planning, Design and Construction.

In Massachusetts, public-use airports are subject to requirements issued by the MassDOT Aeronautics Division Directive Airport Security AD-001a. Each airport is required to prepare an Airport Security Plan in accordance with the Directive and Federal guidelines.

On the local level, the Provincetown Airport Commission applies all the guidance documents to prepare a Security Plan for the Airport that is appropriate for the type of airport operations, secure areas, and other conditions specific to the Airport. The specifics of the PVC Security Plan cannot be discussed in this unclassified document for security reasons. However, the most visible impact has been the mandatory conversion of approximately 1,600 square feet (61%) of the passenger lobby to TSA restricted area.

Airport Waivers

FAA policy states that all new airport projects receiving AIP funds must be constructed in compliance with the national design standards for airports. Existing facilities such as taxiways, runways and safety areas must be brought up to current design standards as part of any construction project to the fullest extent possible.

Waivers to airport design standards for a specific airport may be granted if there are unique local conditions and an equivalent level of safety can be provided under the waiver. Any waiver of an airspace clearance standard related to new construction, reconstruction, expansion, or upgrade on an airport which receives Federal aid requires special review and FAA approval. The waiver must be fully justified on the basis of need and must provide an equivalent level of safety. These are reviewed on a case by case basis.

FAA issued the Airport a Waiver in 1980 of the standard for the width of the FAR Part 77 primary surface, which is one of several navigable airspace surfaces. The clearing of the Airport's primary surface is 500 feet wide (250 feet off the runway centerline on either side) instead of the standard 1,000 foot width. It was determined that tree clearing to comply with the standard 1,000 foot primary surface would have an adverse impact on the Cape Cod National Seashore (CCNS) that could be avoided while still providing an equivalent level of safety. The Waiver was justified based on the slow approach speed of the DC-3, the small GA aircraft using the Airport at the time, and the installation of the Instrument Landing System (ILS), which would provide an acceptable level of safety at the Airport. Waivers are typically written for the aircraft type using the airport at the time. In 1980, the Waiver was written for safe operations of the DC-3 commuter aircraft and small General Aviation (GA) type aircraft which were the primary aircraft type at the time.

Waivers may be revoked if necessary to safely accommodate any significant changes in aircraft operating at an airport. Although the type of aircraft operating at the Airport has changed, there is no indication that the 1980 Waiver will be revoked. The Waiver is included in Appendix 6.

The justification of applying for waivers for the proposed CIP safety projects was evaluated. Measures that would provide an equivalent level of safety for operations on the taxiways would require a control tower which the Airport does not have.

2.2 Airport Operational Safety and Security CIP Projects

The purpose and need for each of the twelve (12) project elements is presented in this and the following section. Table 2-1 provides the specific references for the FAA, MassDOT, and TSA safety and security design standards. The applicable portions of the referenced documents are provided in Appendix 6. A summary of the purpose and need for each of the 12 CIP project elements is provided in Table 2-2.

The purpose of nine of the twelve projects is to provide operational safety and security at the Airport. The listed order of the projects does not necessarily reflect the order in which they would be constructed. Construction and permitting phasing is discussed in Section 6. The CIP projects are:

1. Westerly Taxiway System Improvements
2. Relocate East End Taxiway
3. Reconstruct Terminal Apron
4. Reconstruct Easterly End of Parallel Taxiway
5. Install Taxiway Edge Lights and Construct Electric Vault
6. Sightseeing Shack Improvements
7. Improve Access Road To Medium Intensity Approach Light System with Flashers (MALSF) Approach Lights
8. Construct Service Access Roads to the Localizer Equipment Shelter (LES) and to the Automated Weather Observation Station (AWOS)
9. Install a Perimeter Safety/Security Fence

2.2 PROPOSED SAFETY AND SECURITY PROJECTS

1. Westerly Taxiway (TW) System Improvements

The components of the TW system at the westerly end of Runway 7 are closely interconnected in terms of function and design. For these reasons the West End Connector TW, the westerly end of the Parallel TW, and the Mid Connector TW are included under the heading of Westerly TW System Improvements. The sub elements of the Westerly TW System are discussed separately in terms of purpose and need and for the alternatives analysis. They are combined as one project in terms of impacts and mitigation because the elements overlap and the entire taxiway system would be constructed together.

A. Relocate the West End Taxiway (TW)

Purpose: Safety

The purpose of relocating the West End Connector TW (West End TW) is to comply with FAA flight operation safety standards. There are three issues with the current alignment:

1. The West End TW is a jug-handle shaped taxiway. The jug-handle configuration was constructed years ago to accommodate the turning radius of the DC-3 airliners that were flown at the time. The DC-3s are no longer in operation. Currently, FAA design standards provide for an L-shaped intersection with a right angle to the runway for operational safety. Such a reconfiguration would generally be programmed when the taxiway pavement needs to be reconstructed.

2. The existing taxiway is located within the Runway 7 approach surface as defined by 14 CFR Part 77. Because of this condition, pilots waiting to depart Runway 7 are required to hold short of the runway, limiting their view of the runway, which makes the taxiing procedure especially hazardous during low visibility and peak operating times.

3. The taxiway intersects parallel to the end of the runway rather than at a right angle to the runway because the runway was shifted east to accommodate FAA required Runway Safety Areas (RSAs) and minimize environmental impacts. This intersection is not in compliance with the current FAA design standards. This increases the risks of runway incursions or collisions on the runway and must be corrected. This is a non-compliant safety issue for the Airport.

The West End TW is within the approach surface as a result of the shift of the runway to the east to accommodate runway safety areas (MEPA Certificate on FEIR #9386, January 14, 2000). At the time the runway was reconstructed with the safety areas, it was not feasible to include the reconstruction of the taxiways. It has always been the intention to correct this design deficiency as funds became available.

Need: Does not meet current FAA safety and design standards.

The West End TW needs to be relocated because it is within the approach surface, it intersects parallel to the end of the runway and it is not at a right angle with the runway so that approaching aircraft are not visible to taxiing planes. The fact that the Airport does not have a control tower adds to the need for a standard design taxiway at the Runway 7 end.

This project is needed because of the existing flight operation safety issues. Additionally, the taxiway pavement is eligible for reconstruction and funding is available. Although the taxiway would be relocated again if the runway were extended, (as noted in the comments on the ENF), it is not anticipated that a need for additional runway length would occur before the Year 2024 planning period and the safety issue must be addressed now.

Reference: 14 CFR Part 77.25(d); AC 150/5300-13 (See Table 2-1 and Appendix 6 for specific sections)

FAA has indicated that the West End connector taxiway would not qualify for a Waiver and must comply with national design standards when it is constructed.

B. Realign and Reconstruct the Westerly End of the Parallel Taxiway (TW)

Purpose: Safety

The purpose of realigning the parallel TW is to enhance safety by providing a straight alignment between the runway ends and the apron area in accordance with FAA design standards. The current taxiway shifts to the north at the mid-connector taxiway. An additional purpose of reconstructing the taxiway is to replace the section of aging pavement. Pavement is constructed according to FAA specifications, and the pavement is showing signs of deterioration. It is eligible for FAA reconstruction funding.

Need: Shift in taxiway presents an operational safety hazard.

The Parallel TW needs to be realigned and reconstructed because the taxiway centerline shifts twenty feet to the north between the Mid Connector taxiway and the West End taxiway. This shift in the centerline requires the pilot to change speed and direction, which presents a hazardous situation to pilots during nighttime and low visibility conditions. There are periods when fog moves in over the Airport and is trapped by the dunes to the north and south which provide natural barriers so the fog cannot dissipate. This reduces visibility and increases the risk of pilots “missing the turn” in what they expect to be a straight taxiway. The aircraft could potentially hit another parked aircraft or veer off into the wetlands. This hazard is not in compliance with FAA design standards. The shift in centerline resulted from a 1984 project to address non-compliance with an FAA Object Free Area. The taxiway centerline was shifted approximately twenty feet to the south between the mid and east taxiway connectors. The section between the Mid Connector TW and West End TW was not shifted at the time.

It has been suggested in the comments on the ENF that installing taxiway edge lights alone could address the operational safety issues. Taxiway edge lights would enhance safety during nighttime conditions, but the hazardous geometry still needs to be brought into compliance with FAA standards to enhance overall safety. This area of the Airport does not have any ambient lighting, as in the vicinity of the Terminal and East End TW area.

The realignment also provides the opportunity to remove some pavement along the length of the parallel taxiway as discussed later in the document.

Reference: AC 150/5300-13 (See Table 2-1 and Appendix 6 for specific sections)

FAA requires parallel taxiways connect to the runway thresholds at ILS airports. FAA policy is that this deficiency in the TW alignment must be corrected in accordance with current design standards when the pavement is reconstructed.

C. Realign the Mid Connector TW

Purpose: Safety

The purpose of realigning the Mid Connector TW is to bring the taxiway into compliance with FAA operational safety design standards. Similar to the West End taxiway, the Mid Connector taxiway is a jug-handle shape that was designed for the old tailwheel-equipped Douglas DC-3 passenger plane. The taxiway does not meet at the current standard right angle with the runway. However, aircraft holding to depart are not located within any clear zones, and the current alignment does not pose any current operational hazards.

Need: Does not meet current FAA safety and design standards.

The Mid Connector taxiway should be realigned because it does not meet current FAA standards and is not at a right angle with the runway. Although FAA has indicated that the mid TW would be acceptable for the short term until the pavement is reconstructed, it would be more cost efficient for design and construction to realign the Mid TW at the same time the parallel taxiway is realigned. For these reasons, the realignment is proposed as part of the Westerly TW System Improvements.

Reference: AC 150/5300-13 (See Table 2-1 and Appendix 6 for specific sections)

FAA requires that this alignment be brought up to current standards when the pavement is reconstructed.

2. Relocate the East End TW

Purpose: Safety

The East End TW has the standard design of a ninety-degree intersection but does not comply with the design standard to connect with the end of Runway 25. Pilots are required to “back taxi” in order to reach the end of Runway 25 prior to takeoff. This creates the potential for collisions between a back-taxiing aircraft and one that may be landing.

As some have pointed out, this offset is a result of the shift of the runway 200 feet to the east to provide RSAs. The taxiway was in existence at the time, but was not part of the project to construct RSAs. FAA did not require that it be reconstructed at that time and it was not included in the 1999 EIS/EIR.

Need: Aircraft must back-taxi on active runway, creating an operational safety hazard.

The project will eliminate the need to back-taxi on an active runway, in compliance with FAA operational safety and airfield design standards. The back-taxi maneuver creates a potential conflict with aircraft on final approach to landing. This operational hazard should be eliminated to be in compliance with FAA’s runway Incursion Prevention Program.

Reference: AC 150/5300-13 (See Table 2-1 and Appendix 6 for specific sections)

FAA requires that this intersection be brought up to current standards when the pavement is reconstructed.

3. Reconstruct the Terminal Apron

Purpose: Airfield Pavement Maintenance and Safety

The purpose of the terminal apron project is to maintain airfield safety and operational access by reconstructing the pavement within the existing footprint.

Need: Pavement is over twenty years old.

The terminal apron pavement needs to be reconstructed because it has deteriorated to fair condition. In the Certificate on the DEIR/NPC, the Secretary of EOEEA allowed the project to go forward prior to completion of the FEIR/EA. The project does not result in an increase in pavement or change in the footprint. A Notice of Intent was filed with the Provincetown Conservation Commission and the project was constructed in 2008. The Order of Conditions for the project is included in Section 10.3.

Reference: AC 150/5320-6d (See Table 2-1 and Appendix 6 for specific sections)

This project has been given clearance to go forward prior to circulation of the FEIR/EA and was completed in 2008.

4. Reconstruct the Easterly End of the Parallel TW within the Existing Footprint

Purpose: Airfield Pavement Maintenance and Safety

The purpose of reconstructing the pavement within the existing footprint of the easterly portion of the partial parallel taxiway is to replace pavement that is in poor condition. In the Certificate on the DEIR/NPC, the Secretary of EOEEA allowed the project to go forward prior to completion of the FEIR/EA, if funding is available. The project does not result in an increase in pavement or change in the footprint.

Need: Pavement is over twenty years old.

The project is needed because the pavement is in poor condition. Pavement at airports needs to be maintained so that loose or cracked pavement does not damage aircraft or present a hazard to operations.

In the Certificate on the DEIR/NPC, the Secretary of EOEEA allowed the project to go forward prior to completion of the FEIR/EA. The project does not result in an increase in pavement or change in the footprint. Although the reconstruction of the easterly end of the parallel taxiway has also been allowed by the Secretary to go forward ahead of the completion of the MEPA process, the project will likely be completed as part of the westerly taxiway system improvements.

Reference: AC 150/5220-6d (See Table 2-1 and Appendix 6 for specific sections)

FAA requires that the pavement be maintained up to current standards.

5. Install TW Lighting and Construct an Electric Vault

Purpose: Safety

The purpose of the TW edge lights, signs, and a new separate electric vault is to improve operational safety on the taxiways during nighttime operations and to upgrade the reliability of the power supply to the taxiway and runway lighting system.

Need: Lack of TW edge lights and signage presents an operational safety hazard.
Electric vault is not up to electrical code standards.

Medium Intensity Taxiway Edge Lights (MITLs) are needed for the taxiway system. The taxiways currently have reflectors but the lack of lighting can be a safety hazard during inclement weather or sudden fog conditions. Improvements to the lighting system for the taxiways would require additional space for the airfield electric vault which is currently located inside the sightseeing shack. A separate electrical vault is required to support the new lighting system, to allow adequate space that meets electrical code, and bring the system up to standards.

Reference: DOT/FAA/AR-04/10, Section 4; AC 150/5300-13 (See Table 2-1 and Appendix 6 for specific sections)

FAA requires that facilities be maintained to current operational and safety standards as part of reconstruction projects.

6. Sightseeing Shack Improvements

Purpose: Safety/Maintenance

The purpose of the Sightseeing Shack project is to repair or replace the building once the electrical equipment is removed.

Need: Building is in poor condition.

Since the building walls may need to be opened to remove the electrical equipment as part of the Install Taxiway Lighting and Construct Electric Vault improvements, and the structure is in poor condition, the building needs to be repaired or replaced with a new structure.

Reference: 2005 Master Plan.

It is the intent of the Airport Commission to maintain a building in the same location of similar size and with similar architecture, including a front porch.

7. Improve Access Road to the MALSF Approach Lights

Purpose: Safety

The purpose of improving the existing access road to the Runway 7 approach lights is to address an operational safety issue.

Construction of the existing embankment for the access road to the Medium Intensity Approach Light System with Flashers (MALSF) at the Runway 7 end was permitted by the DEP Decision on the Request for a Variance, dated May 18, 2001, and a CCC DRI Decision dated April 13, 2000. A new survey was completed for the final design stage for that project. When the impact area was recalculated with the updated elevation information, a discrepancy was discovered. In order to build the road with shoulders and a turn-around, additional area of Bordering Vegetated Wetland (BVW) would have needed to be filled beyond the amount specified in the Variance. Staff at DEP, the Provincetown Conservation Commission, and the CCC was consulted at the time. A request to amend the Variance was not prepared because of time and legal constraints relative to funding, construction contracts, and runway closures. Therefore, in order to be in compliance with the Variance, the road was constructed on a filled embankment approximately 3 feet above the adjacent wetland area, but without shoulders and without a turn-around area. Permitting agencies reviewed and approved the access road as constructed.

Need: FAA service vehicles must back up 400 feet on narrow embankment, presenting an operational safety hazard.

Several years of vehicle operations on the access road have confirmed the need for an improvement to the road. Because of the narrow width and lack of a turn-around area, FAA service vehicles must back up for a distance of 400 feet before being able to turn around. Without shoulders, this maneuver has always been difficult because the drivers of the FAA utility vehicles have difficulty seeing the edge of the road, especially in poor weather. Recently a vehicle went off the road onto the side slope. A large crane parked within the runway safety area was required to extricate the van. The runway had to be closed while the crane was on location.

FAA design standards for access roads to FAA owned and operated facilities have specific pavement requirements for the roads when they join a runway or taxiway. FAA Order 6940.1 specifies a paved access road for a minimum of 300 feet if it comes off a runway or taxiway. The pavement minimizes the potential for a vehicle to track stones or other foreign material onto the runway or taxiways, which might damage a plane. Aircraft turbine engines can be damaged from the ingestion of stones or other foreign objects.

At the time the MALSF road was constructed trucks were able to drive on the abandoned runway pavement resulting from the shift in the runway. This pavement will be removed as part of the relocation of the West End TW. The area will be rehabilitated as grassland habitat as part of the proposed mitigation for the CIP projects. Because of that pavement removal, the Airport proposes to pave the first 300 feet of the access road in accordance with FAA Order 6940.1. The access road to the glide slope antenna is currently paved for the entire distance.

Reference: Order 6940.1; AC 150/5300-13 (See Table 2-1 and Appendix 6 for specific sections)

FAA requires that this be brought up to current standards as funds become available.

8. Construct Service Access Roads to the Localizer Equipment Shelter (LES) and to the Weather Station (AWOS)

Purpose: Safety

The purpose of constructing access roads is to comply with FAA operational standards by providing vehicle access to the airfield equipment. The service access roads would improve maintenance access, especially in inclement weather or emergencies. As explained below, the access roads to the AWOS and LES have always been required, but at the time, construction of road access was put aside in order to complete the critical runway and MALSF improvements.

The CCC has asked in its comment letter on the ENF why the LES and AWOS access roads were not identified as a need during the RSA and MALSF approach lights project review. The need to relocate the AWOS was not anticipated during the design of the RSA and MALSF project. Therefore, relocating the AWOS was not part of the design or permitting project for the runway and MALSF improvements. The AWOS wind tower has its own clearance requirements and the strict clearance requirements of the AWOS wind tower instrument became apparent after the design and environmental permitting process was completed and the project had advanced to the construction phase. Significant tree clearing would have been necessary to avoid moving the AWOS after the RSA project. To avoid the need to cut additional trees, the AWOS was relocated to the infield between the runway and the taxiway, next to the wind cone and segmented circle. The AWOS field design change

was reviewed and approved by DEP, the Provincetown Conservation Commission, and CCC. Because of the constraints of construction contracts, runway closures, and committed funding, an access road was not included in the submission because it would have required additional design and permitting. Access by road is proposed now because FAA requires compliance with applicable regulations for any new construction at an airport.

Similarly, the need to provide power service to the new localizer shelter (LES) was not included in the design and permitting process for the RSA and approach lights projects. Excavation to install the power cable was allowed by the CCC and DEP on the alignment of an existing foot path in Wetland B, provided the area was replanted and restored to the original narrow path. Although a narrow path walkway was allowed to be disturbed, there was not enough time to request a change to the DEP Variance and CCC DRI to include an access road to the localizer shelter. Access by road is proposed now because FAA requires compliance with applicable regulations for any new construction at an airport.

Need: Access is not in compliance with FAA Order 6940.1.

Equipment used by FAA technicians to serve the Localizer and AWOS is heavy and not easily transported by foot. The FAA technicians support a regional network of equipment, driving their utility trucks and vans to each site. Navigational equipment is repaired and replaced during all weather conditions to ensure safe airline operating conditions. Airports with passenger service are priority for immediate equipment repairs. The project is needed because current vehicle access to the Localizer Equipment Shelter and the Automated Weather Observing Station (AWOS) is off the active runway over unpaved surfaces.

Reference: Order 6940.1; AC 150/5300-13 (See Table 2-1 and Appendix 6 for specific sections)

FAA requires that this be brought up to current standards as funds become available.

9. Install Perimeter Safety/Security Fence

Purpose: Safety and Security

The purpose of the perimeter fencing is both safety and security. First, the fencing would improve safety by deterring deer and coyote, as well as hunters and hikers, from encroaching on the airfield's operational area. Additionally, for the safety and security of all users of the CCNS, the perimeter fence is proposed to separate areas designated for airport operations from airport lease areas that are currently used by the public for recreational activities.

Secondly, fencing secures the Airport Operating Area (AOA), the Security Identification Display Area (SIDA), and other security areas from unauthorized access, in compliance with TSA Guidelines. The key concerns and concepts are to restrict access, control the flow of people, provide security screening, separate critical areas, protect areas and assets, and protect aircraft, people and property.

Need: Perimeter fence is needed for operational safety and security.

The Airport currently has fencing at the east end of Runway 25 which is adjacent to the CCNS bike path, and around the terminal apron and the fueling station.

Fencing is also needed to enclose currently unsecured areas and minimize unauthorized access for security. The Airport is a commercial service airport with scheduled flights into Boston Logan International Airport via Cape Air. Since Cape Air flies directly to Logan's secure terminal areas for direct connections to Jet Blue and other passenger airlines as discussed in Section 4, the Cape Air passengers must be pre-screened at Provincetown Airport. This direct connection to Logan means that airfield security at PVC must meet the rigid standards found under FAR Part 107.

Fencing is needed to deter deer and coyote from coming onto the runways and other operating areas. There have been several collisions over the years between aircraft and deer, resulting in damage to the planes and death of the animals. There have also been incidences when coyotes were on the runway and interfered with landing operations.

On limited occasions, hikers and horseback riders have gone down the runway, mistaking it as a paved road. Additionally, since recreational activities at the CCNS include a hunting program for deer, waterfowl, rabbit, and other species, there is a need to identify and limit access to the Airport operating lease area for the safety of all users. Currently, hunting is allowed by NPS regulation up to the edge of the glide slope critical area, which is directly adjacent to the runway as shown on Figure 1.3. Occasionally in hunting season, hunters have been observed crossing the runway and two hunting blinds were recently discovered as close as 200 feet from the runway. Despite signs, hunting activity is taking place within the airport operation area. These incidents are considered runway incursions, which increase the risk of accidents and need to be addressed to be in compliance with FAA's Runway Incursion Prevention Program.

Reference: *Recommended Security Guidelines for Airport Planning, Design and Construction*, revised June 15, 2006, TSA; AC 150/5300-13; MassDOT Aeronautics Division Directive AD-001a, November 14, 2001 (See Table 2-1 and Appendix 6 for specific sections)

FAA and the Airport Commission recognize that the Airport is located within a sensitive environment. An alternative that provides for critical sections of fence, along with signage and the use of natural barriers has been evaluated and is discussed in Sections 3, 5 and 6.

Table 2-1 Summary of Regulations Pertaining to CIP Projects	
Improvement Project	Regulations
1. Westerly Taxiway System Improvements	
West Entrance	14CFR FAR Part 77.25(d) FAA Waiver No. 55 AC 150/5300-13, Appendix 16, Table A16-1A, Note 9 AC 150/5300-13, Paragraph 409 (holding bay) AC 150/5300-13, Paragraph 413 AC 150/5300-13, Paragraph 204
Mid Connector	AC 150/5300-13, Paragraph 407 AC 150/5300-13, Paragraph 413 AC 150/5300-13, Paragraph 204
Parallel TW	AC 150/5300-13, Appendix 16, Table A16-1A, Note 9 AC 150/5300-13, Paragraph 204
2. Relocate East End TW	AC 150/5300-13, Appendix 16, Table A16-1A, Note 9 AC 150/5300-13, Paragraph 413 AC 150/5300-13, Paragraph 204
3. Reconstruct Terminal Apron	AC 150/5320-6D, Paragraph 302a
4. Reconstruct Easterly End of Partial Parallel TW	AC 150/5320-6D, Paragraph 302a
5. Install TW Lighting and Construct Electric Vault	DOT/FAA/AR-04/10, Section 4 - AC 150 /5300-13, Paragraph 803,3, d
6. Sightseeing Shack Improvements	
7. Improve Access Road to Approach Lights (MALSF)	AC 150/5300-13, Paragraph 310 Order 6940.1
8. Construct Service Access Roads to AWOS and LES	AC 150/5300-13, Paragraph 310 Order 6940.1
9. Install Perimeter Fence	DHS/TSA June 2006 Guidelines, Part III, Section A < http://www.tsa.gov/assets/pdf/airport_security_design_guidelines.pdf > AC 150/5300-13, Paragraph 614 MassDOT Aeronautics Directive AD-001a, November 14, 2001
10. Expand Auto Parking	*CCC Technical Bulletin 96-003
11. Expand Terminal Building	49CFR Part 1542.103(14) and Part 1544
12. Expand Turf Apron	*
<p><i>Note: Referenced sections are provided in Appendix 6.</i></p> <p><i>*: Project was developed as part of the 2005 Master Planning Process and in accordance with the Airport's Mission Statement.</i></p>	

2.3 Airport Capacity Improvement CIP Projects

The purpose of the remaining three CIP project elements is to provide capacity improvements to meet existing and projected demand at the Airport.

- 10. Expand Auto Parking
- 11. Expand Terminal Building
- 12. Expand Turf Apron

The Forecasts included in the 2005 Airport Master Plan Update identify existing and future facility needs. As part of the Airport's master planning process, aviation forecasts were prepared for

scheduled aircraft operations and passenger enplanements (boardings). Forecasts of passenger enplanements and scheduled aircraft operations (Cape Air) were used to design the auto parking project and terminal needs. Definitions of all terms are provided in the Glossary.

The Forecasts, along with discussions with the Airport Commission, project that peak hour scheduled operations will increase from 10 in 2004 to 12 in 2024. Peak hour passengers are anticipated to increase at an annual rate of 0.7%, from 92 (2005) during the peak hour to 104 in 2024.

10. Expand Auto Parking

Purpose: Capacity

The purpose of expanding the existing 62 space auto parking area is to more adequately meet existing and future parking needs and reconstruct the deteriorating access road.

Need: Inadequate parking to meet current and future needs.

Recognized guidelines for parking are published for commercial airports similar to PVC by the Institute for Traffic Engineers (ITE), which is the methodology required in the CCC Guidelines for Transportation Impact Assessment, Technical Bulletin 96-003. Current peak period parking space needs range from 62 to 126 spaces over weekdays or weekends. It is projected that for the highest demand period of 2024 on a Saturday during peak season, 145 spaces will be needed. Therefore, there is a need for 75 to 83 additional spaces to meet long term future needs. This range in demand was derived from the recorded enplaning 2005 passengers. Although scheduled flights are often used for parking projections, enplaning passengers were used for the Provincetown Airport. Enplaning passengers is a more accurate projection to use compared to flights, because of the variation in the number of sections in a flight at the Airport and specific operating conditions at the Airport. Parking data observations taken during weekdays in August 2006 and a full week in August 2007 were used for the parking analysis. Observations recorded in the 2008 Supplemental Study were not used in the analysis but were collected to make observations during a holiday week and weekend. Observations taken during weekdays in August 2010 were used to compare relative space requirements observed and recorded previously. These observations were similar to August 2007 recordings.

The proposed two phase parking expansion will meet existing and future needs through the mid term planning period. If the parking demand surpasses the long term projections and Phase 2 is proposed, a new separate EA for Phase 2 would be prepared.

Reference: *ITE Parking Generation Handbook, 2nd Edition, 1987*; CCC Technical Bulletin 96-003; and *March 2006 Traffic Operations Report and Parking Study*

11. Expand Terminal Building

Purpose: Replace lost public use area and meet future demand.

The purpose of expanding the terminal building is to replace passenger area that was displaced by TSA for mandatory passenger screening and security personnel, as well as to meet projected passenger and support needs.

Need: There is inadequate public space for passenger use and support functions.

Public use area in the terminal lobby is needed to replace the area occupied by the TSA screening areas and space for security personnel. The public space has been decreased by 61 percent due to TSA operations that were not incorporated into the design for the current building. The public use area lost to TSA includes the outside porch (650 SF), the indoor passenger waiting area (700 SF), and the inside baggage room (310 SF), totaling more than 1,660 SF. This represents 34 percent of the entire terminal building and 61 percent of the passenger lobby and public waiting areas. The screening of passengers and baggage has resulted in a dramatically reduced public waiting area, as well as reduced areas for other passenger processing functions.

The Planning and Design Guidelines for Airport Terminal Facilities Advisory Circular AC 150/5360-13 indicates that for airports with less than 250,000 enplanements, 150 SF of gross terminal building area per design peak hour passenger is the typical planning criteria. The design peak hour total number of passengers for 2024 would be 104. Applying 150 SF per peak hour passenger yields a terminal area of 15,600 SF. However, this planning criterion would not be appropriate for the Airport, given its seasonal nature and location within the CCNS.

Passenger enplanements are forecast to increase by 0.7 percent annually. Applying this 0.7 percent annual increase to the existing 4,800 SF terminal building plus the reclaimed 1,660 SF lost to TSA (6,460 SF) would yield a minimum 7,430 SF (rounded to 7,500 SF) terminal building spatial need. This area would accommodate the current deficiency of 1,660 SF in public space, as well as an increase in 970 SF to meet the projected twenty-year future demand.

The Airport Commission has included an additional 315 SF of space for a food vendor, 400 SF for the Airport Manager and Commission Office, and 450 SF of space for a conference room, which would result in an 8,595 SF (rounded to 8,600 SF) terminal building. Therefore, the range of terminal building spatial needs would be a range from 7,500 to 8,600 SF.

After considering the location of the Airport within the Cape Cod National Seashore, the limited room for expansion, and the seasonal variation of passenger demand, it was determined that a 7,500 SF to 8,600 SF building would address the passenger needs at the Airport. These areas will be refined during design planning sessions that would include NPS staff, Airport staff, and the Airport Commission.

Reference: 49CFR Part 1542.103(14) and Part 1544 (See Table 2-1 and Appendix 6 for specific sections)

12. Expand Turf Apron

Purpose: Capacity

The purpose of expanding the turf apron is to provide additional space for visiting aircraft during the peak season outside of the taxiway object free area (TOFA).

Construction of the turf apron area was permitted by the DEP Decision on the Request for a Variance, dated May 18, 2001, and a CCC DRI Decision dated April 13, 2000. New survey was completed for the final design phase. When the impact area was recalculated with the updated elevation information, a discrepancy was discovered. In order to build the full turf apron, an additional isolated wetland area would have needed to be filled beyond the amount specified in the Variance. A request to amend the Variance was not prepared because of time constraints relative to funding, construction contracts, and runway closures. Therefore, a smaller turf apron was constructed. The smaller apron does not meet current needs.

Activity at the Airport is highly seasonal with the majority of the Airport's annual aircraft operations occurring during the three-month June-July-August peak summer season. With this concentration of increased operations there is an increase in demand for aircraft parking which creates overcrowding on the aircraft parking apron and increased risk of an operational incident.

Need: Inadequate aircraft parking areas to meet current and future needs.

There is inadequate paved aircraft parking space during the summer and this seasonal overflow demand is accommodated on designated turf areas alongside the taxiway. At times, the Mid Connector taxiway is shut down in order to provide overflow parking. This creates an operational safety issue, due to the hazard of using an aircraft movement area for parking airplanes. Peak hour parking needs at the Airport were evaluated for aircraft parking needs at the Airport. The Airport Manager, FBO staff, and ramp attendants evaluated peak hour parking over a period of four years (2000 through 2004) and estimated that 60 aircraft were parked during the peak hour during this time period. The forecast of peak hour visiting aircraft anticipates an increase of 0.5% annually from 60 in 2004 to 68 in 2024. There is a need to meet this current and future demand. The need for parking ranges from an additional five spaces in the short-term to eight spaces to address the long-term aircraft parking needs.

Reference: *2005 PVC Airport Master Plan*

Table 2-2 Summary of Purpose and Need		
CIP Project Element	Purpose	Need
1. Westerly Taxiway System Improvements	Safety	Does not comply with FAA design and safety standards.
2. Relocate East End TW	Safety	Aircraft are required to back-taxi on active runway.
3. Reconstruct Terminal Apron Within Existing Footprint	Airfield Pavement Maintenance and Safety	Pavement is over 20 years old. Aircraft can be damaged by loose or cracked pavement.
4. Reconstruct Easterly End of Parallel Taxiway	Airfield Pavement Maintenance and Safety	Pavement is over 20 years old. Aircraft can be damaged by loose or cracked pavement.
5. Install TW Lighting and Construct Electric Vault	Safety	Lights and signage are needed to improve safety during nighttime and poor visibility conditions; electric vault is needed to upgrade the reliability of airfield lighting.
6. Sightseeing Shack Improvements	Safety/Maintenance	Building is in need of repair.
7. Improve Access Road To MALSF Approach Lights	Safety	FAA service vehicles must backup over 400 feet on narrow embankment.
8. Construct Service Access Roads to the Localizer Equipment Shelter and to the Weather Station	Safety	The Airport does not have access roads to these FAA facilities per FAA Order 6940.1.
9. Install a Perimeter Safety/Security Fence	Safety and Security	Airport does not comply with security guidelines for Part 107 airports.
10. Expand Auto Parking	Capacity	Peak season demand exceeds capacity.
11 Expand Terminal Building	Replace Lost Public Use Area and Capacity	Peak season demand exceeds capacity. TSA screening areas took 61% of the passenger lobby and public waiting areas.
12. Expand Turf Apron	Capacity	Peak season demand exceeds capacity.
<i>Source: Consultant Evaluations</i>		