Chapter 5

Terminal Alternatives

Missoula International Airport
Master Plan Update

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The terminal complex defines a major land use for the airport, and is the image most people associate with Missoula International Airport (MSO). As discussed in Chapter 3, the current terminal building has been expanded numerous times but still functions at a less than desirable level for some activities. As passenger activity grows, the terminal complex must be expanded, putting further pressure on the existing facilities. The landside facilities (parking and circulation) also require improvement, and are evaluated under a separate task. This chapter discusses alternate locations and concepts for accommodating the near and long range needs of the passenger terminal complex.

5.1 Terminal Development Concepts

As a first step in defining terminal concepts, development opportunity areas were identified. There are two major areas as illustrated in Exhibit 5-1:

- The existing terminal area bounded by the terminal access roads on the north; Taxiway F on the west; and the building restriction lines for Runway 11/29 and Runway 7/25 on the south and east.

- A new midfield site south of Runway 11/29, extending to a new post-planning-period parallel runway; and east of the restricted zones for Runway 7/25. The site would also contain the proposed air traffic control tower (ATCT).

5.1.1 Typical Terminal Configurations

Three typical configurations were developed to test the potentials of the two opportunity areas. Each configuration reflected potential long-term terminal facility requirements. Different configurations could be more appropriate for each opportunity area.

- Each configuration has 10-12 typical aircraft design group (ADG) III narrowbody gates (B737-800 with winglets).

- All have a similar size and arrangement of ticketing and bag claim facilities on a single level with security and concessions located in the center.

- The curbsides have four lanes adjacent to the terminal to provide a double parking lane, weaving lane, and a lane for through traffic. It has been shown that this configuration works best for all except the smallest airports.

- Holdrooms are on the second floor of the concourse(s) with operations and support spaces on the apron level.

- Ticketing, bag claim, and gates can expand independently of each other.

- For a given number of gates, maximum walking distances for originating passengers are similar.
These typical terminal configurations are illustrated in Exhibit 5-2 and discussed below.

**Linear Configuration:**
- Aircraft are arranged in a single flight line.
- The concourse is single-loaded for gates but may have concessions on the other side.

Possible advantages:
- Good for sites with limited depth for development.
- Aircraft pushbacks are independent from adjacent gates.
- Passenger orientation is good. This is most similar to existing terminal (on the upper level).

Possible disadvantages:
- Single-loaded concourse requires more circulation space than double-loaded concourses for the same number of gates.
- Depending on orientation and number of connecting taxiways, aircraft maneuvering can be limited.

**Double-loaded pier with holdrooms and concessions on both sides:**
- Two flight lines each with half of the gates.

Possible advantages:
- Good for deep sites and/or limited width.
- Aircraft pushbacks are independent on each side.
- Opportunity for concessions exist close to most gates in the pier.

Possible disadvantages:
- Expansion potential is limited to 12-14 gates before walking distances and aircraft flow on each taxilane become an issue.

**Double Pier Configuration:**
- Two double-loaded piers with holdrooms and concessions on both sides.
- Four flight lines each with 1/4 of the gates.
- Single taxilane between piers.

Possible advantages:
- Good for sites with few constraints.
- Most expansion potential while limiting maximum walking distances.
- Taxi lane depths are short; half of gates have minimal taxi flow issues.

Possible disadvantages:
- Internal gates have dependent push-backs against those on opposite pier. This can be mitigated by dual taxilanes between piers at the cost of a wider terminal footprint and longer connecting corridors.
- Requires duplication of concessions and restrooms near gates.
5.1.2 Preliminary Analysis of Existing Terminal Site Opportunity Area

Two concepts were evaluated for the existing site - the single and double pier. These were positioned to the west side of the site to take maximum advantage of the depth of the site on that side and avoid - to the extent possible - interference with the existing terminal. Although a linear concept could also be used, the deep configuration of the site and the adjacent GA development would not normally favor a linear concept.

**Single Pier (Exhibit 5-3)**

The location would be west of existing terminal, with the terminal taxilane aligned with Taxiway F. This location would allow the single pier terminal to be developed in a single phase with an overnight move into the new terminal. After relocation, the existing terminal could be demolished or converted for other uses.

Advantages:

- Allows construction to occur while keeping existing terminal in operation.
- Could allow existing terminal to remain for other functions as needed.

Disadvantages:

- Some encroachment of GA area for landside access and possible ticketing expansion.
- Possible expansion of bag claim would require some demolition of existing building in future phases.

**Double Pier (Exhibit 5-4)**

The location would be west of, and overlapping the existing terminal. This would require three major construction phases:

1. Build new ticketing wing, security, and 6 gates west pier. Operate the west pier and ticketing wing while maintaining existing bag claim.
2. Demolish most of existing terminal, but keep bag claim in operation. Build new bag claim and east pier.
3. Open new bag claim and east pier. Demolish remainder of existing terminal.

Advantages:

- Most expansion potential for existing site.

Disadvantages:

- Complex phasing to maintain operations in existing terminal.
- Impacts GA area for west pier aircraft parking and taxilane.

Based on this preliminary analysis, and the estimated demand for gates over the planning period, the single pier concept was considered the preferred new terminal option for the existing site. The double pier concept was not carried forward for further analysis. It should be noted, however, that a new single pier terminal, if sited properly, could be expanded into a double pier configuration in the future if required.
5.1.3 Preliminary Analysis of the Midfield Terminal Site Opportunity Area

The use of the midfield site assumes that a new ATCT will be built and have direct roadway access from the east. All concepts involve a new terminal built initially as a single phase "green field" site with an overnight move from the existing terminal complex. These concepts would also require all new landside facilities to support the terminal. The midfield site would allow the broadest range of terminal concepts and maximum growth potential. Three general locations and configurations were considered:

- West of ATCT, double pier
- North of ATCT, single pier
- West of ATCT, single pier

West of ATCT, Double pier (Exhibit 5-5)

The location would be west of the proposed ATCT. The extended safety areas of Runway 7/25 would act as the western boundary. The ATCT would be located within the landside parking area.

Advantages:
- Most expansion potential - in excess of 20 gates.

Disadvantages:
- ATCT in parking lot reduces highest value parking spaces or convenience. Further shift of terminal west would reduce gate expansion potential beyond 20 gates.

North of ATCT, Single pier option A (Exhibit 5-6)

The location would be north of the proposed ATCT. This would separate the ATCT from the landside parking areas.

Advantages:
- Public parking is not affected by ATCT or its employee parking.

Disadvantages:
- Expansion potential limited by Runways 7/25 and 11/29.
- Concept is not the most optimal building layout for a midfield site.

West of ATCT, Single pier B option B (Exhibit 5-7)

The location would be west of the proposed ATCT. As with the double pier concept, the ATCT would be within the landside parking area.

Advantages:
- Gate expansion potential is greater than the single pier option A, depending on distance of terminal from ATCT.

Disadvantages:
- ATCT in parking lot reduces highest value parking spaces. Further shift of terminal west would reduce gate expansion potential.