# **FBO BUILDING STUDY**

FOR

# McMINNVILLE MUNICIPAL AIRPORT



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#### 1. INTRODUCTION

The McMinnville Municipal Airport is located on a 650 acre site approximately three miles east of McMinnville, Oregon. The airport has a fixed base operator (FBO), Cirrus Aviation, who provides aircraft parts and rentals, flight instruction, aircraft maintenance, and fuel (80-100LL and Jet A).

The FBO currently conducts operations out of a former military barracks that was imported from Camp Adair in 1946. As a result of 62 years of growth and the changing face of McMinnville, the current FBO building has become outdated and is in need of replacement.

The City has engaged Steele Associates, a Bend, OR based architectural firm, to recommend alternatives for the new building and parking facilities. In their report titled *New Facility Programming Document for McMinnville Municipal Airport FBO Building,* two building footprints were developed for consideration by the City. In addition, two sites were identified that could serve as future locations for a new FBO Building. These locations included a landscape island at the end of Cirrus Drive, and an open triangular piece of land along the east side of Cirrus Drive. Of these two locations, the landscape island at the end of Cirrus Drive was recommended due to its prominent location at the airport entrance, the ability to free up additional space near the fueling facilities, and ease of construction.

Subsequent to the Steele Associates study, the City retained Century West Engineering Corp. (CWEC), the City's aviation engineering and planning consultant, to review the sites presented in the Steele report, and to identify other potential sites that should be considered for the new FBO building. This report summarizes the results of CWEC's investigation.

# 2. SITE LOCATION CRITERIA

The selection of an optimal site depends on a number of factors. Factors considered in this study include the following.

#### 2.1 Disruption of FBO Operations During Construction

FBO operations must be maintained during construction of the new facility. This can be achieved by constructing the new building in a new location and maintaining the existing FBO during construction, or relocating FBO operations to a temporary location during construction. The latter would allow relocation of a new building on or immediately adjacent to the existing building location.

#### 2.2 Fuel Truck Access

There are two aboveground storage tanks (ASTs) located west of the existing FBO. Fuel trucks access the ASTs by entering through a 12' sliding gate

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west of the FBO. In order to enter the gate, trucks must enter through the FBO's east driveway approach in order to be properly aligned to pass through the gate. Sometimes it's necessary to move parked cars to provide maneuvering room for the fuel truck.

The new FBO building and associated parking should be located to allow unobstructed access to the ASTs. Potential access points to the ASTs include a second 12' sliding gate east of the FBO in addition to the gate referenced above. Presently this gate isn't used due to the positioning of the driveway approach relative to that gate, and the width of the gate. Improvements for a new building should also consider widening one or both gates to improve fuel truck access.

# 2.3 Environmental Impact

The primary environmental impact with any site will be the increase in impervious area and the resulting increase in runoff volume and rate. In addition to constructing building facilities in an environmentally friendly manner (such as LEED certification), the remainder of the site can also be designed to minimize the quantity and level of pollutants in stormwater discharged from the site. Increases in impervious area should be minimized.

# 2.4 Expandability

A desirable feature of any site is room to expand. Although the airport currently has no plans for future expansion of its FBO, the site and building should be selected to allow for building expansion.

# 2.5 Visibility

Because of two hangars located on the airfield it is not possible to have a site that will offer an unobstructed view of the entire airfield. However, the new building should be located to maximize views of the airport from the building.

# 2.6 Cost

The cost of developing the new location should be economical not only in terms of the structure itself, but also in terms of the infrastructure improvements that will be required to develop the building at that location.

# 3. DEVELOPMENT OF ALTERNATIVES

Based on meetings with City staff and a review of the site, five locations were identified that fit the above criteria to various degrees. Tentative layouts for each alternative are included in Appendix A. Each is described below.

# 3.1 Alternative 1 – Relocation North of Existing FBO Office

In Alternative 1, the new facility would be constructed in the landscape island at the end of Cirrus Drive. This was the site recommended in the report by Steele Associates. Under this alternative, the new building would be constructed in the landscape island at the end of Cirrus Drive. Parking would also be located in the island as well. However, unlike the layout in the Steele Associates report, parking is created around the perimeter of the island instead of being placed in the island. Traffic would circulate around the building in a clockwise direction. The area of the existing FBO building could be redeveloped with a combination of landscaping, additional parking, and a driveway dedicated to fuel truck access to the ASTs.

This facility could be constructed while maintaining the FBO in its current location. Following construction, this building would be either demolished or removed. This would reduce disruptions to FBO operations by limiting the number of moves to one move at the end of construction.

Fuel trucks would access the ASTs following the same route presently used. By moving parking across the street the likelihood of obstructions to fuel truck access would be reduced, improving accessibility.

Construction in the landscape island would increase the amount of impervious area on the site which would in turn result in slight increases in peak runoff and pollutant discharge. However, this can be offset by redeveloping some of the existing area around the existing FBO to landscaping.

Future expansion of the new building could be accomplished by extending the building into the open area immediately west of the building.

The distance to the airfield would be increased in Alternative 1. All foot traffic between the FBO and the airfield also would need to cross the street increasing the interaction between vehicular and foot traffic.

#### 3.2 Alternative 2 – Relocation NE of Existing FBO Office

In Alternative 2, the open area NE of the existing FBO would be utilized for the new facility. This was the second alternative outlined in the report by Steele Associates. Under this alternative, the new building would be constructed in the open area east of Cirrus Drive. Handicapped parking would be located adjacent to the building, but any additional parking would be located south of the new building in the vicinity of the existing FBO building. Traffic patterns would remain much as they are today. The area of the existing FBO building could be redeveloped with a combination of landscaping, additional parking, and a driveway dedicated to fuel truck access to the ASTs.

This facility could be constructed while maintaining the FBO in its current location. Following construction, this building would be either demolished or

removed. This would reduce disruptions to FBO operations by limiting the number of moves to one move at the end of construction.

Fuel trucks would access the ASTs following the same route presently used. By locating parking adjacent to the airfield the likelihood of obstructions to fuel truck access are reduced.

Construction in the landscape island would increase the amount of impervious area on the site which would in turn result in slight increases in peak runoff and pollutant discharge. However, as with Alternative 1, this can be offset by redeveloping some the existing area around the existing FBO to landscaping.

Future expansion of the new building could be accomplished by extending the building into the open area immediately east and north of the building.

As in Alternative 1, the distance to the airfield would be increased. However, foot traffic between the FBO and the airfield will take place along the street reducing interactions between foot and vehicular traffic.

#### 3.3 Alternative 3 – Rebuild over Existing FBO Office

In Alternative 3, the new FBO building would be constructed on the site of the existing building. The entrance to the building would be centered at an existing entry to the airfield. All parking would be located east of the building adjacent to the airfield. The remaining area could be landscaped, used for storage, or reserved for future expansion of the existing FBO building.

This facility would require removal or demolition of the existing FBO building prior to construction. FBO operations would need to be temporarily relocated during construction, and then relocated again once the new building is complete. Based on conversations with airport staff, the west hangar on the airfield that can serve as a temporary FBO during construction. Parking may also be limited during construction, and additional temporary parking may be needed until the entire facility is complete.

Because of the layout of parking, there would be insufficient maneuvering room for fuel truck access through the existing gate on the west side of the site. However, modifications can be made to the entry and gate to the east so fuel trucks may access the ASTs. Modifications would include construction of a wider driveway approach and replacement of the existing 12' wide gate with a 20 foot gate.

By confining construction to the vicinity of the existing FBO building, increases in site impervious area could be avoided. Total impervious area on the site can even be reduced by converting some of the area that is currently paved to landscaping.

Future expansion of the new building could be accomplished by extending the building into the open area immediately east of the building.

By maintaining the current building location, there would be no increases in the distance between the FBO building and the airfield. Furthermore, there is almost a complete separation between foot and vehicular traffic contributing to increased safety.

#### 3.4 Alternative 4 – Rebuild East of Existing FBO Office

In Alternative 4, the new facility would be constructed east of the existing FBO building. All parking would be located west of the building adjacent to the airfield. The remaining area could be could be landscaped, used for storage, or reserved for future expansion of the existing FBO building.

This building could be constructed while maintaining the FBO in its current location. Following construction, this building would be either demolished or removed. This would reduce disruptions to FBO operations by limiting the number of moves to one move at the end of construction. Parking may also be cramped during construction, and additional temporary parking may be needed until the entire facility is complete.

As with Alternative 3, future access by fuel trucks will need to take place through the gate to the east of the site. The addition of a driveway approach and possibly widening of the existing gate may be required.

By confining construction to the vicinity of the existing FBO building, increases in site impervious area could be avoided. Total impervious area on the site could even be reduced by converting some of the area that is currently paved with landscaping.

Future expansion of the new building could be accomplished by extending the building to the west. This expansion will also impact parking. Additional spaces would need to be added to the east to maintain parking capacity.

Location of the new building to the west of the existing will remain approximately equal to existing. As with Alternative 3, there will be almost a complete separation between foot and vehicular traffic contributing to increased safety.

#### 3.5 Alternative 5 – Rebuild West of Existing FBO Office

In Alternative 5, the new facility would be constructed west of the existing FBO building. All parking would be located east of the new building and adjacent to the airfield. The remaining area could be could be landscaped, used for storage, or reserved for future expansion of the existing FBO building.

This building could be constructed while maintaining the FBO in its current location. Following construction, this building would be either demolished or removed. This would reduce disruptions to FBO operations by limiting the number of moves to one move at the end of construction. Parking may also be limited during construction, and additional temporary parking may be needed until the entire facility is complete.

As with Alternative 3, future access by fuel trucks will need to take place through the gate to the east of the site. The addition of a driveway approach and possibly widening of the existing gate may be required.

By confining construction to the vicinity of the existing FBO building, increases in site impervious area could be avoided. Total impervious area on the site can be reduced by converting some of the area that is currently paved to landscaping.

Future expansion of the new building could be accomplished by extending the building to the east. This expansion will also impact parking. Additional spaces would need to be added to the east to maintain parking capacity.

Location of the new building to the west of the existing will remain approximately equal to existing. As with Alternative 3, there will be almost a complete separation between foot and vehicular traffic contributing to increased safety.

#### 3.6 Cost Analysis

Cost estimates were prepared for each of the above alternatives. A summary of the cost is shown below in Figure 1. Detailed estimates are included in Appendix B.





Overall costs among all alternatives are similar. This is due to the fact that the building cost, which was constant among, all alternatives, is responsible for roughly 90% of the construction cost. Differences in the cost of other site costs therefore have a minimal impact on the total construction cost.

#### 4. PREFERRED ALTERNATIVE SELECTION

Selection of a preferred alternative will be influenced by a number of factors. Some like cost are easily quantified and can be presented as a single number. Others, such as environmental considerations, and safety are more qualitative in nature. These are difficult to evaluate in the same manner.

CWEC recommends an approach rooted in the concept of sustainability where all factors be considered in making a selection. As an aid in weighing these factors together, a matrix has been constructed that attempts to assign values to each of the factors considered. Each alternative was ranked on a scale of 1 to 5 for each of the criteria discussed above with 1 representing the lowest rank and 5 the highest. In cases where all alternatives met a given criterion equally well, they were scored the same. The results are shown below in Table 1.

Criteria	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Disruptions During					
Construction	5	5	3	3	3
Fuel Truck Access	5	5	3	3	3
Environmental Impact	1	2	3	4	5
Expandability	1	5	4	3	2
Visibility	2	1	5	3	4
Cost	1	2	4	3	5
Overall Score	15	20	22	19	22

#### Table 1 - Selection Matrix

This indicates that Alternatives 3 and 5 best satisfy all criteria overall. Alternative 5 allows for better use of space and minimizes the amount of impervious area added resulting in a slight environmental benefit. Alternative 3 will allow for more efficient expansion in the future. Depending on which criteria is of greatest importance to the Airport Staff, any of these could be a preferred alternative.

Cost is one factor that has been included in the above evaluation. However, due to the fact that there is only a 1% difference between the highest and lowest cost (Alternative 1 excepted), cost could easily be removed from consideration. When cost is eliminated as a factor, Alternatives 2 and 3 rank the highest. A matrix excluding cost as a factor is shown below in Table 2.

Criteria	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Disruptions During Construction	5	5	3	3	3
Fuel Truck Access	5	5	3	3	3
Environmental Impact	1	2	3	4	5
Expandability	1	5	4	3	2
Visibility	2	1	5	3	4
Overall Score	14	18	18	16	17

Table 2 – Selection Matrix (Cost Excluded)

#### 5. CONCLUSIONS

Based on the considerations outlined above, Alternative 3 appears to best meet the needs of the airport in terms of providing efficient space and serving as a prominent landmark to visitors entering the airport. Final selection should be made by the Airport Staff, weighing in and giving priority to those factors that are of greatest importance to them.



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Appendix A

Site Layouts











Appendix B

**Cost Estimates** 

				Unit	Total
Item	Description	Quantity	Units	Cost	Cost
1	Mobilization	1	LS	\$37,100	\$37,100
2	Temporary Flagging, Marking, and Signing	1	LS	\$1,000	\$1,000
3	Construction Staking	1	LS	\$3,000	\$3,000
4	Clearing and Grubbing	1	LS	\$2,000	\$2,000
5	Unclassified Excavation	1,800	CY	\$20	\$36,000
6	New FBO Building	1	LS	\$516,800	\$516,800
7	Class C HMAC, 3" Thickness	815	TON	\$100	\$81,500
8	1"-0" Aggregate Base, 8" Thickness	2,049	TON	\$30	\$61,470
9	Sidewalks	94	SY	\$3.00	\$282
10	Handicap Ramp	1	EA	\$1,500	\$1,500
11	Landscaping	530	SY	\$5.00	\$2,650
12	Utility Hookups	1	LS	\$5,000	\$5,000
13	Pavement Marking	150	SF	\$1.50	\$225
14	Demolition of Existing FBO Building	1	LS	\$10,000	\$10,000
15	Pavement Removal	4,060	LS	\$5	\$20,300
16	Gate Replacement	1	LS	\$4,000	\$4,000
	Subtotal				\$782,827
	Contingency		25%		\$195,707
	Total				\$978,534

ltem	Description	Quantity	Units	Unit Cost	Total Cost
1	Mobilization	1	LS	\$29,800	\$29,800
2	Temporary Flagging, Marking, and Signing	1	LS	\$1,000	\$1,000
3	Construction Staking	1	LS	\$3,000	\$3,000
4	Clearing and Grubbing	1	LS	\$1,500	\$1,500
5	Unclassified Excavation	150	CY	\$20	\$3,000
6	New FBO Building	1	LS	\$516,800	\$516,800
7	Class C HMAC, 3" Thickness	296	TON	\$100	\$29,600
8	1"-0" Aggregate Base, 8" Thickness	27	TON	\$30	\$810
9	Sidewalks	40	SY	\$3.00	\$120
10	Handicap Ramp	1	EA	\$1,500	\$1,500
11	Driveway Approach	0	EA	\$2,500	\$0
12	Landscaping	340	SY	\$5.00	\$1,700
13	Utility Hookups	1	LS	\$5,000	\$5,000
14	Pavement Marking	130	SF	\$1.50	\$195
15	Demolition of Existing FBO Building	1	LS	\$10,000	\$10,000
16	Existing Surface Restoration	1	LS	\$20,000.00	\$20,000
	Subtotal				\$624,025
	Contingency		25%		\$156,006
	Total				\$780,031

#### McMinnville Municipal Airport FBO Site Study 4022800701 Construction Cost Estimate

ltom	Description	Quantity	Units	Unit Cost	Total Cost
1	Mobilization	1	LS	\$29,400	\$29,400
2	Temporary Flagging, Marking, and Signing	1	LS	\$1,000	\$1,000
3	Construction Staking	1	LS	\$3,000	\$3,000
4	Clearing and Grubbing	1	LS	\$1,500	\$1,500
5	Unclassified Excavation	90	CY	\$20	\$1,800
6	New FBO Building	1	LS	\$516,800	\$516,800
7	Class C HMAC, 3" Thickness	252	TON	\$100	\$25,200
8	1"-0" Aggregate Base, 8" Thickness	120	TON	\$30	\$3,600
9	Sidewalks	86	SY	\$3.00	\$258
10	Handicap Ramp	1	EA	\$1,500	\$1,500
11	Driveway Approach	2	EA	\$2,500	\$5,000
12	Landscaping	196	SY	\$5.00	\$980
13	Utility Hookups	1	LS	\$3,000	\$3,000
14	Pavement Marking	130	SF	\$1.50	\$195
15	Demolition of Existing FBO Building	1	LS	\$10,000	\$10,000
16	Pavement Removal	1,600	SY	\$5	\$8,000
17	Gate Replacement	1	LS	\$4,000	\$4,000
18	Temporary FBO Relocation	1	LS	\$2,000	\$2,000
	Subtotal				\$617,233
	Contingency		25%		\$154,308
	Total				\$771,541

				Unit	Total
Item	Description	Quantity	Units	Cost	Cost
1	Mobilization	1	LS	\$29,200	\$29,200
2	Temporary Flagging, Marking, and Signing	1	LS	\$1,000	\$1,000
3	Construction Staking	1	LS	\$3,000	\$3,000
4	Clearing and Grubbing	1	LS	\$3,000	\$3,000
5	Unclassified Excavation	90	CY	\$20	\$1,800
6	New FBO Building	1	LS	\$516,800	\$516,800
7	Class C HMAC, 3" Thickness	252	TON	\$100	\$25,200
8	1"-0" Aggregate Base, 8" Thickness	120	TON	\$30	\$3,600
9	Sidewalks	105	SY	\$3.00	\$315
10	Handicap Ramp	1	EA	\$1,500	\$1,500
11	Driveway Approach	2	EA	\$2,500	\$5,000
12	Landscaping	180	SY	\$5.00	\$900
13	Utility Hookups	1	LS	\$3,000	\$3,000
14	Pavement Marking	140	SF	\$1.50	\$210
15	Demolition of Existing FBO Building	1	LS	\$10,000	\$10,000
16	Pavement Removal	1,600	SY	\$5	\$8,000
17	Gate Replacement	1	LS	\$4,000	\$4,000
18	Temporary FBO Relocation	1	LS	\$2,000	\$2,000
	Subtotal				\$618,525
	Contingency		25%		\$154,631
	Total				\$773,156

				Unit	Total
ltem	Description	Quantity	Units	Cost	Cost
1	Mobilization	1	LS	\$29,000	\$29,000
2	Temporary Flagging, Marking, and Signing	1	LS	\$1,000	\$1,000
3	Construction Staking	1	LS	\$3,000	\$3,000
4	Clearing and Grubbing	1	LS	\$1,500	\$1,500
5	Unclassified Excavation	90	CY	\$20	\$1,800
6	New FBO Building	1	LS	\$516,800	\$516,800
7	Class C HMAC, 3" Thickness	222	TON	\$100	\$22,200
8	1"-0" Aggregate Base, 8" Thickness	120	TON	\$30	\$3,600
9	Sidewalks	125	SY	\$3.00	\$375
10	Handicap Ramp	1	EA	\$1,500	\$1,500
11	Driveway Approach	2	EA	\$2,500	\$5,000
12	Landscaping	355	SY	\$5.00	\$1,775
13	Utility Hookups	1	LS	\$3,000	\$3,000
14	Pavement Marking	140	SF	\$1.50	\$210
15	Demolition of Existing FBO Building	1	LS	\$10,000	\$10,000
16	Pavement Removal	1,600	SY	\$5	\$8,000
17	Gate Replacement	1	LS	\$4,000	\$4,000
18	Temporary FBO Relocation	1	LS	\$2,000	\$2,000
	Subtotal				\$614,760
	Contingency		25%		\$153,690
	Total				\$768,450