

MEMORANDUM

TO: Town Board of Supervisors, Town of Middleton, WI

FROM: Daniel P. Bartholomew, AICP, ACE, A.A.E., Airport Solutions, LLC

CC: Attorney Michael J. Lawton, Boardman Clark, LLP

DATE: October 27, 2020

SUBJECT: City of Middleton C29 Airport Master Plan Chapter 3: Facility Requirements

In an Airport Master Plan, the Facility Requirements chapter is the culmination of a “gap analysis” based on existing facility conditions (Chapter 1 - Inventory) and existing and future aircraft operations presented in Chapter 2 - Aviation Forecast. This gap analysis essentially highlights the areas where the airport facility either meets, exceeds, or is deficient in its ability to ensure a safe and efficient operational environment during the next 20-years. Measures identified in this chapter will be evaluated and carried forward to the next Master Plan chapter, Chapter 4 - Aviation Alternatives, where they will be further refined and prioritized.

The primary mission of the Federal Aviation Administration (FAA) is to ensure the safe and efficient use of airports and the aviation system. Based on an evaluation of the C29 Master Plan Facility Requirements (Chapter 3), it appears that the following items should be the primary focus of next the C29 Master Plan (Chapter 4) Aviation Alternatives:

- Mitigation of property within the Runway 01 Runway Protection Zone (RPZ)
- Runway 01/19 Safety Area
- Alternative Turf Landing Area (TLA)
- Removal or relocation of Taxiway A2
- Runway/Taxiway pavement rehabilitation
- Replacement of existing incandescent runway and taxiway lighting with LED
- Enhancing taxiway fillets when/if 500 annual TDG-2 aircraft operations are achieved
- Taxiway F congestion mitigation
- Acquisition of additional property for aircraft storage
- Obstruction mitigation
- Perimeter fencing
- Drainage improvements

Four parcels south of Airport Road, not owned by the airport, are currently impacted by the Runway 01 RPZ. As a means to protect persons and property on the ground, the FAA states that *“The airport owner must have sufficient interest in the Runway Protection Zones to protect the Runway Protection Zones from both obstructions and incompatible land use. Finally, the airport owner must strive to attain compatible zoning around the airport in order to prevent incompatible land uses that:*

- *Could cause sufficient conflict that endangers the airport*
- *Cause it to be closed or*

• *Require substantial remedial investment to purchase conflicting developed property.*

There are currently four parcels impacted by this RPZ, two are currently vacant while two have been improved and include buildings:

- Deming Way, LLC. Parcel Number: 255/0708-034-4530-2 (Includes Building)
- Deming Way, LLC. Parcel Number: 255/0708-034-4001-1
- Deming Way, LLC. Parcel Number: 255/0708-034-5531-8
- Robin Deming, LLC. Parcel Number: 255/0708-034-5475-7 (Includes Building)

In addition, two public use roads (Airport Road (Average Daily Vehicle Count approximately 10,000) and Deming Way) are located within the RPZ.

As a means to acquire “sufficient interest” in the RPZ, the FAA provides the airport sponsor with three options:

“(1) The first and the preferred method is for the airport to purchase the approach areas in fee. Ownership in fee is preferred because it provides maximum control for the airport.

(2) The second is through purchase of an easement (or a combination of easement and zoning).

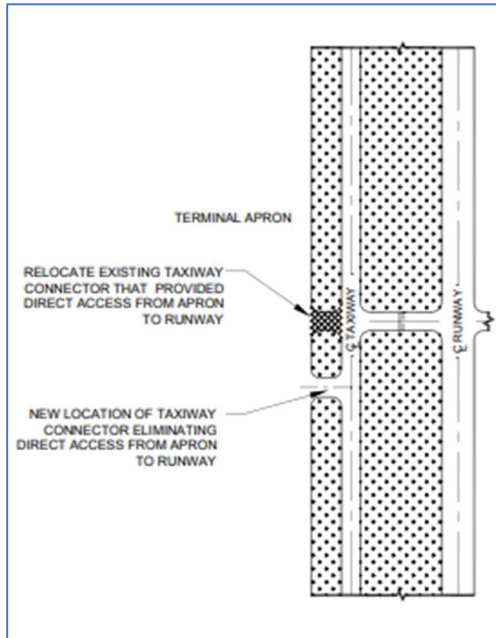
(3) The third alternative is to rely upon adequate zoning which should be enacted even if fee or easement ownership is in place.”

Until the current Turf Runway (Runway 01) configuration can be altered, or the runway closed, the airport sponsor should contact the owner of each parcel and purchase an aviation easement to preserve the integrity of the RPZ. In the longer term, since property within an RPZ require extremely restrictive easement agreements, due to the limited use of the property, a fee simple purchase of the properties, at fair market value, is the most viable option. Several courts have ruled that the impacts of an airport on private property constitutes a regulatory taking. As a result, airport sponsors have been directed by the courts to either purchase specific rights or acquire fee simple ownership, at the highest and best use fair market value. Neither the City of Middleton Height Limitation Zoning nor the PDD-S Planned Development District SIP zoning classification protect the Runway RPZ from incompatible development. In addition, it does not appear that an aviation easement(s), specific to the RPZ, have been established.

Additional mitigation measures may be warranted since roadways (other than on airport service roads) are discouraged from traversing an RPZ.

Taxiway A currently penetrates the Runway Safety Area (RSA) of Runway 01/19. This could create a safety issue when aircraft are using Runway 01/19 while aircraft are on Taxiway A. This issue could be remedied by either closing or relocating Runway 01/19.

The alternative Turf Landing Area (TLA) located on the south side of the west end of Runway 10/28 could create safety concerns for aircraft operating on Taxiway A and/or at hold positions. If it is determined that an alternative turf landing area is needed, it should be located north of the primary runway, away from Taxiway A. The location of this TLA should be noted on the official Airport Layout Plan (ALP), listed in the Airport Facility Directory, and published as a C29 Notice to Airmen (NOTAM).

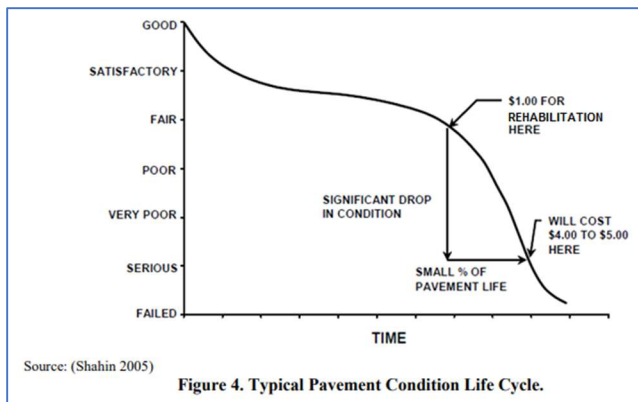


The existing configuration of Taxiway A2 allows direct access between the primary runway and the Terminal/FBO apron. The FAA considers this configuration to be a potential safety hazard and typically support efforts by the airport sponsor to remedy this situation. According to FAA Advisory Circular (AC) 150/5300-13A, airports should not “design taxiways to lead directly from an apron to a runway without requiring a turn. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway but instead accidentally enters a runway.” (See Figure 1) This should be a priority funding item to enhance safety at C29.

Figure 1: Pavement Life Cycle

Source: FAA AC 150/5300-13A - Figure 4-3 Proper Taxiway Design

Much of the pavement at C29 is reaching its anticipated useful life, and will likely require the commencement of rehabilitation efforts within the next 5-years. Based on Pavement Condition Index (PCI) numbers shown in Table 3-17 of the C29 Airport Master Plan, within the next 5-years, a significant number



of pavement areas will deteriorate to a PCI of 60, often considered the threshold for necessary pavement rehabilitation/construction. For various reasons, allowing pavement to deteriorate below this level can cause an accelerated drop in pavement conditions, greatly increasing rehabilitation/reconstruction cost. Figure 2 shows the accelerated nature of pavement conditions and rehabilitation costs once the PCI reaches the fair/poor condition. Pavement conditions as they relate to PCI values are shown below in Table 1.

Figure 2: Pavement Life Cycle

Source: ACRP PROJECT NO. 09-11 Pavement Maintenance Guidelines for General Aviation Airport Management

| Table 4. PCI Rating and Recommended Pavement Treatment. | | | |
|---|--------------|--|---|
| PCI | Rating | Description | Pavement Treatment |
| 100 | Good | Only minor distresses. | Routine maintenance only |
| 85 | Satisfactory | Low and medium distresses. | Preventative maintenance |
| 70 | Fair | Some distresses are severe. | Corrective maintenance and rehabilitation |
| 55 | Poor | Severity of some of the distresses can cause operational problems. | Rehabilitation or reconstruction |
| 40 | Very Poor | Severe distresses cause operational problems. | Rehabilitation or reconstruction |
| 25 | Serious | Many severe distresses cause operational restrictions. | Immediate repairs and reconstruction |
| 10 | Failed | Pavement deterioration prevents safe aircraft operations. | Reconstruction |
| 0 | | | |

Table 1: PCI Ratings and Recommendations

Source: ACRP PROJECT NO. 09-11 Pavement Maintenance Guidelines for General Aviation Airport Management

The C29 Master Plan highlights certain issues with the current airfield lighting system. This includes the lack of cable conduit associated with the incandescent lighting network which is sensitive to environmental conditions such as frost heaving and water intrusion. Since the FAA now allows AIP funds to be used to acquire and install LED lighting systems, this would be an ideal opportunity to repair an existing fickle system with an environmentally conscious, energy/money saving option. As a means to avoid subsequent lighting relocation, this project could be associated with enhancements to certain taxiway fillet geometries upon a sustained level of 500 TDG-2 aircraft operations.

The chapter mentions that the area served by Taxiway F *“generates a great deal of traffic to and from this area. As such, it is not uncommon for aircraft congestion to occur, which can create backups onto the primary Taxiway A.”* Any efforts to alleviate congestion near Taxiway F may meet with some funding pushback from the FAA, nonetheless, this should be addressed. Typically, pavement used by an “exclusive” interest entity is not eligible for AIP funding. FAA Order 5100.38D, also known as the “Airport Improvement Program (AIP) Handbook”, is quite clear about which project are, and are not, eligible for federal funding. This document states:

“Pavement – Exclusive Use. *This includes exclusive use and near exclusive use aprons, taxiways, and taxilanes. Near exclusive use means that the airport has no procedures for the management and operation of the apron, hangar, or taxiway to ensure prompt access by each potential user. Appendix A contains a more complete definition and references on exclusive use.”*

In addition, the pavement associated with the apron for this area may also be ineligible for construction and/or rehabilitation, if it is deemed to be of an exclusive nature. Ultimately, funding depends on the actual level of exclusivity of the area. Past and future funding may need to be reimbursed and/or covered by the entity operating the potentially exclusive use area served by Taxiway F. FAA Order 5100.38D states:

“Apron pavement is only eligible if it will be used for aircraft parking or as a compass calibration pad and is not exclusive use (see Appendix A for a definition and references on exclusive use). A good rule of thumb is that the public should be able to park on the pavement in order for it to be considered eligible apron area.

The portion of the apron project that will be used for support areas, such as service vehicle parking and fixed based operator equipment storage, is not eligible.”

“The apron in front of a building that cannot be used for public parking or taxiing of aircraft is considered part of the building (and the associated building funding rules apply). This includes the wingtip clearance from the building as defined in the current version of Advisory Circular 150/5300-13, Airport Design.

The rest of the apron pavement in front of a hangar is only eligible as apron work if it is available for public aircraft parking and is not exclusive use.”

During the past 20-years, the number of based aircraft at C29 has experienced consistent growth. This growth has been forecast to continue at a somewhat tempered rate through the master planning period. Some evidentiary support is provided for an increase in the number of based aircraft in the form of a hanger wait list. Since past planning efforts have not actively protected for future airport growth, especially the land area required for aircraft storage, the airport should, if feasible, actively seek additional aircraft hangar and tie-down space, through potential voluntary property acquisition. Few viable areas remain due to development encroachment, airspace protection, and transportation corridors on three sides of the airport property. The airport should make it a priority to consider where and how future based aircraft will be stored.

Obstructions, especially those related to trees, are a creeping crisis for airports, and the area surrounding C29 is no exception. It appears that several trees penetrate the 20:1 Threshold Siting Surface (TSS). Penetrations to this surface will likely prompt a response from the FAA Flight Standards District Office (FSDO) to close the primary runway to all aircraft approaches except those under daytime visual conditions, until the obstructions are mitigated. Other obstructions, although not as egregious, penetrate the 30:1 Glideslope Qualification Surface (GQS), the 34:1 Non-Precision Instrument Approach Surface (NPI), and the 40:1 Departure Surface. Figure 3-9 “Runway 10 Part 77 Surfaces” shows obstruction penetrations along other portions of the C29 airspace surfaces, including some along the Runway 28 approach. Figure 3-4 “Runway 10 Plan and Profile” should be scaled to show the entire 11,000-foot extent of the Runway 10 Part 77 surface. An additional exhibit should be added to show existing obstructions along the Runway 28 approach. The modification and addition of these exhibits would provide a better picture of the current obstruction issues around the airport.

Any obstructions identified that penetrate the airport’s Terminal Enroute Procedure Surfaces (TERPS) should be a priority for mitigation. Obstructions under private ownership would need to be done with the assistance of an aviation easement agreement, representing fair market value of the mitigated assets (e.g. trees, etc.), at the expense of the airport owner (unless another funding source can be acquired). Any prospective lengthening of the runway and/or the implementation of lower approach minimums will likely encounter additional obstructions requiring mitigation.

The Master Plan mentions a prospective effort to construct a 12-foot fence along unsecure area of the property as a mean to control wildlife. Funding for this project will likely require the completion of a Wildlife Hazard Assessment and a recommendation resulting from a subsequent Wildlife Management Plan.

C29 appears to be located in FEMA Flood Zone AE (100-year flood susceptibility), and is impacted by both standing water and drainage issues (As referenced by the August 2018 Flood). For both wildlife mitigation, environmental water quality, and asset protection purposes, efforts to address flooding should be one of

the facility's primary focus areas. This is especially pertinent if additional non-pervious surfaces associated with aircraft storage and/or expanded paved areas are constructed. The addition of more non-pervious areas could significantly exacerbate already constrained water retention and water flow systems.

Appendix D of the C29 Master Plan contains a handful of letters in support of enhancing operational conditions at C29, including the need for lower approach minimums before they could consider using or relocating their aircraft to the facility. The following is a sample of quotes from these letters:

"Our records show that 28 flights likely took place from Morey and 15 flights were likely diverted to other airports due to inclement weather or other factors. Note that sometimes the charter companies report back to us that they have been diverted elsewhere, but not all the time."

"It is unsafe for most business jets to use Morey Field when there is inclement weather. Many flights that have been scheduled to use Morey Field are often rescheduled or diverted to Dane County Regional Airport on short notice due to inclement weather. A longer runway would allow pilots and passengers to utilize Morey during inclement weather and eliminate last minute changes for plane, crew, and airport scheduling and staffing."

"About 30% of our scheduled Morey trips per year are relocated to Wisconsin Aviation or Dane County Regional airport due to the inability to fly out of Morey during inclement weather."

"Unless conditions are ideal our flight operations are typically to and from the Dane County Regional Airport"

"In addition, a more precise instrument approach is needed to RWY 10 and 28. The lowest ceiling and vis approach today is limited to a 400-foot ceiling and 11/2mi vis on the RNAV LPV to 28 and 650' and 1 miles on the Localizer to 10. Runway lighting is also not adequate to shoot lower vis approaches below 400 feet and 11/2mi vis."

"An ILS or RNAV LPV approach to a DA of 250 feet AGL and minimum visibility of 3/4 mile."

"Over the past 3 years of operations, 60+ % are during the "worst weather months" October to March. Often times we return to Morey at night with IFR or low IFR conditions. Most of the trips we are able to successfully get into Morey however almost every year there are times when either the ceiling is too low for Morey's instrument approaches..."

Chapter 3 of the Draft C29 Airport Master Plan states *"Given the amount of existing infrastructure and its proximity to the runway centerline, the ability to implement a precision instrument approach or to obtain minimums as low as 3/4-mile are unlikely to be implemented at C29 over the 20-year planning horizon."* This statement essentially nullifies the premise that lower approach minimums at C29 will increase utilization, since such minimums are not likely attainable. Given that these letters also couple the need for a longer primary runway with that of reduced approach minimums, the argument, based on letters of support for a longer runway, is also unsound. Ultimately, the addition of a longer runway without reduced approach minimums would have little significant utilitarian value for the facility or aircraft operators.

The C29 Airport Master Plan Facility Requirements presents a rather unconventional discussion by comparing the runway length of the primary runway at other Wisconsin Large General Aviation Airports

Based on this analysis, it would appear that a number of existing safety and operational items need to be addressed at C29 prior to any facility enhancements. These include addressing the mitigation of RPZ areas for the protection of persons and property on the ground, the mitigation of obstructions penetrating critical airspace surfaces, airfield geometry modifications to address potentially unsafe conditions, replacing the current runway and taxiway lighting system to enhance reliability and foster lower energy use, and the hardening and mitigation of flooding and drainage issues. These items are important safety and operational priorities and should be addressed as soon as funding may become available.