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MEMORANDUM

TO: Mark Holzer (FAA)

FROM: Kyle Nelson, PE (MN)

DATE: December 16, 2023

RE: Taxiway C Project Update & FFY24 Project Alternatives
SEH No. MINOT 175535 14.00

The purpose of this memorandum is to provide a project update on the ongoing Taxiway C preliminary design project and present project alternatives for MOT's FFY2024 AIP discretionary grant.

Taxiway C – Preliminary Design Project Update

The Taxiway C preliminary design effort began in early November with geotechnical borings to document existing site conditions and to determine if a rehabilitation project is feasible. The existing sections studied include (3) distinct segments, with existing conditions and rehabilitation feasibility summarized below, as well as in **Figure 1** and **Figure 2** attached to this memorandum.

Segment 1 – Taxiway C (between C4 & C6)

- **Existing Section:** 6.5"-7.5" of bituminous pavement, with underlying aggregate and granular base material.
- **Rehabilitation Discussion:** A rehabilitation for this section is feasible, however it is recommended that the section is strengthened via a 3" mill and 4.5" bituminous overlay. MOT's fleet mix includes aircraft over 100,000 lbs, which triggers the requirement (for new full section construction) of a 5" stabilized base and 4" surface course. Adding 1.5" of bituminous to this pavement section, per the above method, will increase the overall section to approach 8"-9" and is expected to add ~10 years to the useful life of the pavement, along with regular preventative maintenance. The pavement thickness at the intersections with C4 and C6 would remain at 6.5"-7.5" due to the need to match existing grades. See **Figure 1**.

Segment 2 – Taxiway C (between Rwy 8/26 and Txy C4)

- **Existing Section:** 18"-20"+ of bituminous pavement, with underlying base material and sandy lean clay.
- **Rehabilitation Discussion:** A rehabilitation for this section is feasible via a 4.5" mill and overlay. This section has experienced multiple overlays over its service life, with the most recent occurring in 1998. The section has sufficient thickness to support this rehabilitation and extend its useful life for ~10 years. See **Figure 1**.

Segment 3 – Taxiway C3 (between GA Ramp and Taxiway C)

- **Existing Section:** 12" to 18+" of bituminous pavement, with underlying base material and subgrade.
- **Rehabilitation Discussion:** A rehabilitation for this section is feasible via a 4.5" mill and overlay. The section has sufficient thickness to support this rehabilitation and extend its useful life for ~10 years. See **Figure 2**.

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The proposed typical 4.5" mill and overlay depth on segments 1, 2, and 3 accounts for complete removal of the previous two lifts of bituminous pavement, without leaving a thin layer between existing and proposed pavement layers.

FFY 2024 Proposed Project Alternatives: Taxiway C-C3

With the above information summarized, below are project alternatives to assist in construction method solution selection for MOT's FFY 2024 AIP Discretionary Grant. While a rehabilitation is feasible for these pavements, a full reconstruction would still yield the greatest useful life of 20+ years. It should also be noted that any rehabilitation would maintain the existing geometry and any reconstruction would reduce the width from the existing 75' on Taxiway C to 50' (Taxiway Design Group III width) that MOT would be eligible for.

Alternative 1: Rehabilitation of Taxiway C (South of 8/26)

- **CIP Cost:** \$4.8M
- **Description:** Complete 4.5" overlay rehabilitation on Taxiway C between Runway 8/26 and Taxiway C6 per the above methods for Segments 1 & 2.
- **Considerations:**
 - Lowest cost alternative.
 - Strengthens existing Taxiway C pavement between C4 and C6.
 - 10 years added to useful life.
 - Pavement thickness at Taxiway C intersection with C4 and C6 would remain the same as existing.

Alternative 2: Rehabilitation of Taxiway C (South of 8/26) and Taxiway C3

- **CIP Cost:** \$6.8M
- **Description:** Complete 4.5" overlay rehabilitation per the above methods for Segments 1 through 3.
- **Considerations:**
 - In addition to Alternative 1, adds in the rehabilitation of Taxiway C3.
 - Would not provide an opportunity to correct direct access issue for Taxiway C3 to Runway 13/31 - Per previous discussions with the ADO, this is acceptable for a rehabilitation project, but not a full reconstruction.

Alternative 3: Reconstruct Taxiway C (South of 8/26)

- **CIP Cost:** \$11M
- **Description:** Complete full section reconstruction of Taxiway C between Runway 8/26 and Taxiway C6. Would include new bituminous pavement, aggregate base, granular borrow, and geotextile fabric.
- **Considerations:**
 - 20-year minimum useful life.
 - Would result in reduced width of 50' on fully reconstructed sections.

Alternative 4: Reconstruct Taxiway C (South of 8/26) & Rehabilitation of Taxiway C3

- **CIP Cost:** \$13M
- **Description:** Complete full section reconstruction of Taxiway C between Runway 8/26 and Taxiway C6. Complete 4.5" mill and overlay rehabilitation for Taxiway C3.
- **Considerations:**
 - In addition to Alternative 3, adds in rehabilitation of Taxiway C3.

Alternative 5: Reconstruct Segment 1 (C4-C6), Rehabilitation of Segment 2 (Rwy 8/26 – Txy C)

- **CIP Cost:** \$6.5M
- **Description:** Complete full section reconstruction of Taxiway C between Taxiway C4 and C6 to TDG 3 (50' width) standards). Complete 4.5" mill and overlay on Segment 2.
- **Considerations:**
 - Taxiway C width would change from 50' wide (TDG 3) to 75' wide (existing width) at Taxiway C4. Taxiway edge lights would not line up due to differing pavement widths.

Alternative 6: Reconstruct Segment 1, Rehabilitate Segments 2 & 3

- **CIP Cost:** \$8.5M
- **Description:** Full section reconstruction between Taxiway C4 and C6 (Segment 1). Rehabilitate Taxiway C (Segment 2) and Taxiway C3 (Segment 3)
- **Considerations:**
 - Adds rehabilitation of Taxiway C3 to Alternative 5.

Edge Lighting Discussion

Costs for all alternatives include LED taxiway edge lighting replacement. The existing edge lighting has exceeded its useful life according to the FAA's AIP Handbook. The minimum useful life is 10 years per Table J-4, and the existing light fixtures were installed in 2013. To align with funding availability, it's recommended that lighting replacement occurs at the start of the 10-year rehabilitation cycle. The edge lighting replacement will include all system components such as new conduit, base cans, wire, and lights.

Electrical Vault Rehabilitation Project

Also included in MOT's FFY 2024 AIP grant request, this project will replace several pieces of equipment inside the existing electrical vault, including the control panel, relay-based interface panel, ATCT lighting panel, ATG radio control, and most of the regulators. The existing equipment was installed in 1993 when the vault was constructed and needs replacement, with much of the equipment approaching 30 years of life. Per Table J-4 in the AIP Handbook, the minimum useful life for airfield electrical/lighting equipment is 10 years. The estimated CIP project cost for the electrical vault rehabilitation work is ~\$525,000.

KDN

Attachments: **Figure 1, Figure 2, Figure 3**

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