

# Enclosure 4

(Ref. in Technical Letter F500-L17-070)

## MITRE

Center for Advanced  
Aviation System Development

### Guadalajara International Airport Expansion Feasibility Examination and Technology Transfer

#### *Initial Data Request*

The data described herein are requested by **Monday 31 July 2017 (or earlier, if possible)**. Electronic transmission is preferred and should be e-mailed to [rkleinha@mitre.org](mailto:rkleinha@mitre.org) (Ing. Robert W. Kleinhans). If regular mail is preferred (CD-ROM, DVD, paper) the information should be shipped via FedEx or DHL. Please include with the delivery a Table of Contents that references in a clear manner the various parts of this request. Likewise, please describe in detail differences, if any, between the request and what is being delivered. The original source of each data item should be provided as well.

Please contact Ing. Robert W. Kleinhans no later than **Monday 10 July 2017** if there are any concerns about providing the requested data on time, as delays may affect MITRE's project delivery schedule.

Prepared for

**Grupo Aeroportuario de la Ciudad de México**

**June 2017**



## 1. Introduction

The MITRE Corporation (MITRE) is assisting, through Grupo Aeroportuario de la Ciudad de México (GACM), the aviation authorities of Mexico in the development of a new airport, referred to in this document as Nuevo Aeropuerto Internacional de la Ciudad de México (NAICM), to replace the current Aeropuerto Internacional de la Ciudad de México (AICM). The proposed runway layout of NAICM will allow for dual- and triple-independent arrival and departure operations.

Under Task 8 of the GACM-MITRE agreement, MITRE is to assist the Mexican aviation authorities in the examination of problems relating to airport expandability in Mexico so that, in the process, Mexican engineers and other analysts practice and learn how to reexamine modifications concerning NAICM airside and aeronautical matters in the future. In February 2017, after consultation with MITRE, the Mexican aviation authorities selected Guadalajara International Airport (Guadalajara Airport) as the airport for MITRE to study. Therefore, MITRE will work on a runway-related solution regarding the expandability of Guadalajara Airport.

The purpose of this document is to request initial information on Guadalajara Airport necessary to perform many of the early project tasks. It is important to note that this data request should not be considered final or all inclusive, as additional information will be requested throughout the project.

**The data, described herein, are requested no later than Monday 31 July 2017. Please contact Ing. Robert W. Kleinhans at [rkleinha@mitre.org](mailto:rkleinha@mitre.org) as soon as possible but no later than Monday 10 July 2017 if there are any issues or concerns with providing the requested data on time.**

Also, use the above email address for the transmission of data in electronic format. If data needs to be shipped (preferably via FedEx or DHL), send it to the following address:

Ing. Robert W. Kleinhans  
The MITRE Corporation  
7515 Colshire Drive  
McLean, VA 22102  
U.S.A.

## 2. Data Request

This section lists and describes data required to conduct tasks pertaining to the expansion feasibility analysis of Guadalajara Airport. All data (e.g., figures, tables, documents, etc.) should be in English. If translating the material to English may delay the transmission of the requested data, please consult MITRE before spending time and resources in translation services.

It is highly preferred that the requested information is provided in electronic format (e.g., Excel, Word, AutoCAD, etc.). While paper format is acceptable, use it as a last option. Where appropriate, AutoCAD file content should be three-dimensional (3D) with



elevation information in meters above Mean Sea Level (MSL). All maps, boundaries, runway thresholds, and all coordinates in general should be provided in either latitude and longitude or the Universal Transverse Mercator (UTM) coordinate systems and World Geodetic System 1984 (WGS 84) reference datum. If the coordinates sent to MITRE use a reference datum other than WGS 84, please specify the datum used.

MITRE's primary source of information is Mexico's Aeronautical Information Publication (AIP). MITRE cannot take responsibility for any errors, discrepancies, or inconsistencies contained in the AIP.

### **Airport Information**

The following is a list of required information concerning Guadalajara Airport:

- Current Master Plan report and airport layout plan, including runways, taxiways, location of navigational aids and auxiliary aeronautical equipment, aprons, buildings, and other important airport components. Include coordinates and threshold elevations of the existing runways and any displaced thresholds.
- Proposed improvements to the current layout of Guadalajara Airport and proposed long-term airport expansion plans. Include information on the proposed location of any **future** runway(s), even if definitive decisions have not been made, and its associated airfield components, including:
  - The coordinates and elevation for each runway threshold, including any planned displaced thresholds
  - The length and the width of the runway(s)
  - The type and length of any planned approach lighting systems (e.g., precision approach Category I lighting system) and associated runway lighting system (e.g., runway edge lights, centerline lights, etc.) for both runway directions
- Current and proposed airport property boundary information. Include information on any land to be acquired for the construction of a future runway(s) parallel to existing Runway 10/28 or areas within which MITRE may consider for the location of a future runway(s).
  - List of all issues regarding potential impediments to airport construction within the above-mentioned boundaries. Examples of potential impediments include soil/subsoil composition, flooding, existing infrastructure, environmental and archeological concerns, and any other potentially disruptive conditions.
- The critical aircraft for the current and, separately, for the expanded airport
- Up to five years of historical weather data. The weather data should include information on wind direction and speed (including gusts), ceiling, visibility, and temperature in a manner as specific as possible regarding frequency of



occurrences. The units of measurement must be provided and data should be delivered electronically in Microsoft Excel.

- Reliable weather information is important to the project. It is hoped that existing weather information, if available, will be sufficient. However, if MITRE determines that existing weather data are not appropriate for analytical purposes due to lack of accuracy, reliability or completeness, then, in accordance with the GACM-MITRE contract, MITRE may request that authorities install an Automated Weather Observing System (AWOS) at the airport.

### **Land-use, Obstacle, Topography, and Imagery Information**

The following is a list of required information concerning land-use, obstacles, topography, and imagery:

- Existing land-use maps of the areas surrounding Guadalajara Airport (e.g., residential, commercial, environmental, etc.)
- The location of any noise-sensitive areas surrounding Guadalajara Airport. The location of any noise-sensitive areas should be depicted on a land-use type drawing/map.
- The latest available aerial imagery of the airport and its surroundings. The images should preferably be in color and geo-registered (e.g., Geo-TIFF files) for insertion into AutoCAD, if possible.
- Geographic Information System (GIS) data for the areas within a 40-km radius of Guadalajara Airport. GIS data typically include helpful information on highways; roads; residential, commercial, and industrial areas; buildings; lakes; rivers; canals; and other land-use items. The preferred format of the data is ESRI shapefiles.
- Obstacle data with associated vertical and lateral accuracies, if available. Note that MITRE will primarily be using obstacle data derived from a satellite-based photogrammetric survey to be procured by MITRE; however, any complementary data that MITRE could receive in the meantime will be helpful.
  - Natural and man-made obstacles (e.g., hills, buildings, towers, antennas, power lines, surveyed terrain spot elevations, etc.) within a 40-km radius around Guadalajara Airport that could be an obstacle to air navigation. Information on the coordinates and elevation of the obstacles should be included. These data may be available from recent surveys, engineering drawings, or other development projects recently conducted in the area.
    - Recommendation: utility infrastructure drawings may also contain helpful information on power lines, utility poles, antennas, etc.



- Any International Civil Aviation Organization (ICAO) Obstacle Charts for Guadalajara Airport, such as:
  - Aerodrome Obstacle Chart – Type A and B
  - Aerodrome Terrain and Obstacle Chart
- The typical height of trees around Guadalajara Airport
- Information regarding any planned construction and/or alteration to the existing man-made obstacles at or surrounding Guadalajara Airport

### **Operational Statistics and Other Aeronautical Information**

The following is a list of information concerning aircraft operations at Guadalajara Airport (in Microsoft Excel):

- Operational information (**excluding helicopter operations and overflights**):
  - Total number of annual operations (“movements”) from 2006 to the present. Earlier data, if available, would also be helpful.
  - Total number of monthly operations from January 2016 through the latest available month in 2017
  - Total number of daily operations (arrivals and departures separately) for all days of 2016.
  - Provide seven consecutive days of detailed daily operations data for any week considered by authorities to be a typical high-volume peak week (Sunday through Saturday) in 2016. For a sample of what is expected, see Figure 1. The information being requested at a minimum should include:
    - Dates comprising the selected week
    - Scheduled and actual departure and arrival times - confirm whether the time is local or Coordinated Universal Time (UTC)
    - Operator name (airline) and flight number. If not a commercial operation, indicate whether it is General Aviation, military, or governmental.
    - Aircraft type (model and sub-model, for example, Boeing 737-800)
    - Registration (“tail number”)
    - Type of operation (arrival or departure)
    - Origin airport (for arrivals) or destination airport (for departures)
    - Runway used



- Route name (Standard Instrument Departure [SID], instrument approach procedure or departure/entry fix) utilized for that specific departure or arrival

| Date      | Scheduled Time (UTC) (hh/mm) | Actual Time of Arrival/Departure (UTC) (hh:mm:ss) | Operator         | Flight Number | Aircraft Type | Tail Number | Operation | Origin / Destination | Runway | Route Name (SID or STAR) |
|-----------|------------------------------|---|------------------|---------------|---------------|-------------|-----------|----------------------|--------|--------------------------|
| 10-Aug-15 | 0:01                         | 0:01:00   | KLM              | 685           | B744          | PHBFE       | Arrival   | EHAM                 | 05R    | TEPAS-MATEO6             |
| 10-Aug-15 | 0:03                         | 0:03:00   | AMX              | 229           | MD82          | XASXJ       | Arrival   | MMGL                 | 05R    | CISNE-MATEO6             |
| 10-Aug-15 | 0:04                         | 0:04:00   | Military         | -             | KC135         | XASGF       | Arrival   | MMVR                 | 05R    | PAVON-MATEO6             |
| 10-Aug-15 | 0:06                         | 0:06:00   | SER              | 706           | DC9           | XARRY       | Departure | MMDO                 | 05L    | ARCOS1                   |
| 10-Aug-15 | 0:06                         | 0:06:00   | General Aviation | -             | Lear 25       | XATLN       | Arrival   | MMPA                 | 05R    | TEPAS-MATEO6             |
| 10-Aug-15 | 0:07                         | 0:07:00   | AMX              | 160           | DC93          | N1003P      | Departure | MMGL                 | 05L    | LEONA1                   |
| 10-Aug-15 | 0:08                         | 0:08:00   | AFR              | 438           | B772          | FGSPL       | Arrival   | LFPG                 | 05R    | TEPAS-MATEO6             |
| 10-Aug-15 | 0:09                         | 0:09:00   | AMX              | 6365          | DC9           | XAAMC       | Departure | MMZH                 | 05L    | LEONA1                   |
| 10-Aug-15 | 0:09                         | 0:09:00   | AMX              | 2             | B762          | XATNS       | Arrival   | LEMD                 | 05R    | TEPAS-MATEO6             |
| 10-Aug-15 | 0:10                         | 0:10:00   | AMX              | 935           | MD82          | N945AS      | Arrival   | MMMY                 | 05R    | TEPAS-MATEO6             |
| 10-Aug-15 | 0:12                         | 0:12:00   | TAO              | 148           | AT500         | XATAI       | Departure | MMDO                 | 05R    | ARCOS1                   |

Figure 1. Sample of Requested Operations Data

**Other Aeronautical Information**

As the project progresses, MITRE will request more detailed aeronautical information concerning airspace, Air Traffic Control (ATC) rules, procedures within the Guadalajara Terminal Maneuvering (Control) Area (TMA), military flights at Zapopan Military Base, Special Use Airspace (SUA), potential airspace interaction matters, and other information.