

Enclosure 3

(Ref. Technical Letter F063-L08-040)



**Center for Advanced
Aviation System Development**

Master Data Request

The data described herein are requested by **Monday 28 July 2008**. Electronic transmission is preferred and should be e-mailed to rkleinha@mitre.org (Ing. Robert W. Kleinhans, Project Leader). If mail is preferred the information should be shipped via FedEx. 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 any differences, if any, between the request and what is being delivered, as well as the original source of each item.

Please contact Ing. Kleinhans no later than **Monday 30 June 2008** if there are any issues or concerns with providing the requested data on time, as MITRE needs to allocate staff in a most efficient manner.

Prepared for

**Dirección General de Aeronáutica Civil
Secretaría de Comunicaciones y Transportes**

6 June 2008

1.0 Introduction

As part of MITRE's support of Mexico's Dirección General de Aeronáutica Civil (DGAC), MITRE is to request information required to conduct detailed analyses pertaining to the Texcoco Initiative and other tasks. The data being requested herein are particularly important in the analysis of the Texcoco area for the development of a large metropolitan airport to serve the Mexico City basin.

The data requirements described in this document are necessary to perform many of the early Texcoco-related tasks. Furthermore, note that many tasks are interrelated and, therefore, delays to one task may create a cumulative effect that could impact follow-up tasks. Additional data request documents will be submitted, as necessary, at the appropriate time later on in the project.

The data described herein are requested by Monday 28 July 2008. Please see the note concerning other deadlines in the front cover of this document.

All inquiries concerning this data request should be addressed to Ing. Robert W. Kleinhans, Project Leader, at rkleinha@mitre.org explaining in detail, and in English, the inquiry in question. The above Internet address should also be the one utilized for the transmission of data. In case Ing. Kleinhans is out of town or if the inquiry must be in Spanish or it requires further contractual interpretation, questions can be addressed to Dr. Bernard Lisker at bernard@mitre.org or, if data needs to be shipped (please via FedEx), send it to the following address:

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

2.0 Data Request

This section lists and, if necessary, describes the initial data required to conduct early tasks pertaining to the aeronautical analysis of the Texcoco area. The list should not be construed as being all-inclusive, as additional information will be requested throughout the project. Figures, tables, and information of a mainly numerical nature can be sent to MITRE in Spanish. Other data, particularly lengthy conceptual texts, are required in English. If in doubt, or if such information is lengthy please consult MITRE before spending time in translating the information.

To the extent possible, the information should be sent in electronic format (e.g., Excel, Word, AutoCAD, etc.). While paper format is acceptable, it should be a last option. In

the case of AutoCAD, where appropriate, three-dimensional (3D) values (that is, z-values) should be provided (e.g., building elevations). In the case of elevations, these should be provided in meters above Mean Sea Level (MSL). All maps, boundaries, runway thresholds, and in general, all coordinates that are to be provided to MITRE should be based on the Universal Transverse Mercator (UTM)/World Geodetic System 1984 (WGS 84) coordinate system. If for any reason any data sent to MITRE does not use WGS 84, the DGAC should clearly specify the coordinate system being used. In the absence of such annotation, MITRE will assume that the coordinate system is WGS 84.

It is important to note that MITRE plans to use as a primary source of information the most recent version (as of this date) of Mexico's Aeronautical Information Publication (AIP). This is the official, publicly available civil aviation authority publication of Mexico regarding principal aeronautical data. Therefore, MITRE cannot take responsibility for errors, discrepancies, or inconsistencies thereof.

ALL THE INFORMATION REQUESTED THROUGHOUT THE REST OF THIS DOCUMENT SHOULD TAKE INTO ACCOUNT THE CONSIDERATIONS MENTIONED ABOVE.

Airport Layouts and Similar Information

The following is a list of information concerning airport layouts and similar data that are being requested:

- Existing survey information for the Texcoco area, including such information as roads, buildings, canals, water holding basins, and contour lines.

The information expected will be considered as preliminary as a new survey will be required in order for MITRE to site new runways, evaluate instrument approach and departure procedures, and support other tasks, such as the analysis of noise impact. Therefore, MITRE has prepared, under separate cover, a document entitled "Specifications for the Survey of the Texcoco Area and its Surroundings" (it is being sent along with this document) to assist the DGAC in the development of a survey that meets MITRE's analytical requirements. **The data mentioned above (and described under separate cover) is requested by Friday 28 November 2008.**

- Plans showing the preliminary boundaries, including coordinates, within which MITRE may consider for the location of runways with their associated safety areas in the Texcoco area. MITRE has received some information regarding possible boundaries for the new airport site in the Texcoco area from Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM). This information was contained in a document titled "Preliminary Design of Feasibility Airspace for the New Mexico City Airport Project", dated December 2007 (see Figure 1 in

Enclosure 4 to Ref. F063-L08-040, dated 6 June 2008, delivered at the same time as this paper). If that information is definitive, MITRE needs confirmation of it.

- 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 information pertaining to the DGAC's investigation should be sent to MITRE.
- Existing weather information for the Texcoco area, as well as other key airports in the Mexico City basin.

Reliable weather information is important to the project. In accordance with the contract, MITRE requires that an automated meteorological observation system be installed in the Texcoco area. MITRE has prepared, under separate cover, a document entitled "Specifications for an Automated Meteorological Observation System for the Texcoco Area" (it is being sent along with this document) in order to assist the DGAC in obtaining such a system. In the meantime, please provide any reliable historical weather data (up to five years) for the Texcoco area from appropriate sources (e.g., local weather stations and/or equipment) that could help MITRE in better understanding weather characteristics. Historical data from Mexico City International Airport (AICM) would also be of some assistance.

The historical weather data requested above 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.

- Suggested orientation (preferably a range of orientations) for the Texcoco parallel runways (based on True North).

This is due to the lack of on-site weather data provided by an automated weather observation system. The appropriateness of the runway orientation will be confirmed after MITRE receives and analyzes at least one year of reliable on-site weather data collected by an automated weather observation system. Note that MITRE can use a DGAC runway orientation recommendation without receiving automated weather observation system data as long as MITRE is relieved of this responsibility.

- Length of new runways for the Texcoco site to be used by MITRE. The DGAC's recommendations may be provided on the basis of feedback from air carriers operating at AICM and known restrictions regarding aircraft types, payloads and range, as well as future critical aircraft requirements. Note that it may be

necessary to provide a range of runway lengths (i.e., maximum and minimum) in order to allow for flexibility in siting runways within the boundaries. For example, lack of available land in the southeast portion of the Texcoco area may limit runway length.

- Future critical aircraft (e.g., A380). In the case of the future critical aircraft, state its year of introduction.
- Mexican standards regarding minimum distance from runways to bodies of water.
- Conceptual airport layout of a new airport in the Texcoco area, if available. Include coordinates and threshold elevations of any proposed new runways.
- Existing information on bird surveys conducted of the Texcoco area. Information on bird activity is important to determining the suitability of a site for an airport. As per the contract, appropriate bird surveys will be performed by the DGAC in order for MITRE to conduct an assessment of the impact and mitigation of birds on aircraft operations in the Texcoco area. The development of this survey will be required during the upcoming stages of the project and will involve close coordination with MITRE and other appropriate experts. In the meantime, any existing bird survey data that could give MITRE a better understanding of bird activity in order to better locate runways early on would be helpful.

Land use, Obstacle, Topography, and Imagery Information

The following is a list of information concerning land use, obstacles, topography and imagery that are being requested:

- Existing land use maps (residential, commercial, environmental, transmission lines, etc.) of the Texcoco area and its surroundings.
- Location of areas that MITRE should consider as noise sensitive.
- Existing aerial and/or satellite imagery (the most current available) of the Texcoco area and its surroundings, if available. The images should preferably be in color and should be geo-registered (e.g., Geo-TIFF files) for insertion into AutoCAD.
- International Civil Aviation Organization (ICAO) Aerodrome Operating Charts, or equivalent, Types A, B and C for AICM and Toluca. These types of charts contain obstacle data that may prove useful in the analysis of instrument procedures.
- Readily available Geographic Information System (GIS) data for the Texcoco and Mexico City area. These data should encompass an area within a 40-km radius

around coordinate 19 30 00N/98 59 30W (based on WGS 84), which is located roughly in the center of the Texcoco area. Information on the coordinates and elevation of terrain and other obstacles (e.g., buildings, towers, antennas, etc.), residential, commercial and industrial areas, highways and roads, lakes, rivers, canals, and other land use items should be included. The preferred format is ESRI Shape files.

- Readily available information on obstacles (e.g., buildings, towers, antennas, etc.) within a 40-km radius around coordinate 19 30 00N/98 59 30W (based on WGS 84), which is located roughly in the center of the Texcoco area. Information on the coordinates and elevation of the obstacles should be included. These data may be available as a result of recent surveys, engineering drawings, or other development projects recently conducted in the Texcoco area.
 - Tips: AICM air traffic controllers may be aware of tall structures that could be an obstacle to air navigation. Utility drawings may also contain helpful information on power lines, utility poles, antennas, etc. Another option is to look for obvious tall structures using binoculars and mark their approximate location on a map (e.g., road atlas) or accurately identify the structure using a hand-held Global Positioning System (GPS) device. This information will help MITRE locate runways and conduct procedure design work early on in the project prior to receiving more detailed photogrammetric and obstacle survey data.
- Topographic maps.

The MITRE team has been examining in as much detail as possible, given readily available information, the terrain around the Texcoco area in association with potential operations once the new airport is constructed. As a result of this work, the team determined the location of the most relevant areas for which topographic information is required. Despite the DGAC's responsibility in the purchase and delivery of maps encompassing these areas (significantly large), in the interest of time MITRE took the initiative to contact several map providers in Mexico and the U.S. and ordered the maps. Nevertheless, the information that is required is being listed below for two reasons:

1. To make the DGAC aware of this requirement in case MITRE does not receive the entire order;
2. To inform the DGAC that the map collection being purchased by MITRE originated from Mexico's Instituto Nacional de Estadística Geografía e Informática (INEGI). Therefore, MITRE requests a one-line statement from the DGAC approving MITRE's use of such information. This request is due to the fact that MITRE has encountered in the past some discrepancies in INEGI information, and also given that MITRE is aware

that some states of Mexico have institutions that do similar work and may be preferred.

- MITRE requires (and has ordered) the following:
 - One electronic geo-referenced (e.g., Geo-TIFF) file of the 1:50,000 scale topographic maps (72 maps in total) shown in Figure 1 (which is based on the nomenclature system of Mexico's INEGI).

100° 20'	100° 00'	99° 40'	99° 20'	99° 00'	98° 40'	98° 20'	98° 00'	97° 40'	
F14C66	F14C67	F14C68	F14C69	F14D61	F14D62	F14D63	F14D64		20° 45'
F14C76	F14C77	F14C78	F14C79	F14D71	F14D72	F14D73	F14D74		20° 30'
F14C86	F14C87	F14C88	F14C89	F14D81	F14D82	F14D83	F14D84		20° 15'
E14A16	E14A17	E14A18	E14A19	E14B11	E14B12	E14B13	E14B14		20° 00'
E14A26	E14A27	E14A28	E14A29	E14B21	E14B22	E14B23	E14B24		19° 45'
E14A36	E14A37	E14A38	E14A39	E14B31	E14B32	E14B33	E14B34		19° 30'
E14A46	E14A47	E14A48	E14A49	E14B41	E14B42	E14B43	E14B44		19° 15'
E14A56	E14A57	E14A58	E14A59	E14B51	E14B52	E14B53	E14B54		19° 00'
E14A66	E14A67	E14A68	E14A69	E14B61	E14B62	E14B63	E14B64		18° 45'
									18° 30'

Note: map numbers may have changed. If there are any discrepancies, please use the coordinate information shown above.

Figure 1. 1:50,000 Scale Topographic Maps

- One electronic geo-referenced (e.g., Geo-TIFF) file of the 1:250,000 scale topographic maps (9 maps in total) shown in Figure 2 (which is based on the nomenclature system of Mexico's INEGI).

102° 00'	100° 00'	98° 00'	96° 00'
F14 10	F14 11	F14 12	21° 00'
E14 01	E14 02	E14 03	20° 00'
E14 04	E14 05	E14 06	19° 00'
			18° 00'

Note: map numbers may have changed. If there are any discrepancies, please use the coordinate information shown above.

Figure 2. 1:250,000 Scale Topographic Maps

Operational Statistics

The following is a list of information concerning aircraft operational statistics that are being requested. All data should be provided in Microsoft Excel.

- Operational information of AICM. *It is important to note that Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM) has already provided MITRE (in December 2007) with AICM hourly operations data (arrivals and departures) for the peak days of each month for 2006 through October 2007. All that is being requested here is the complement to complete 2007 and as many months as possible of 2008.*
 - Total number of annual operations (“movements”) from 1996 to the present. Earlier data, if available, would also be helpful.
 - Total number of monthly operations for 2007 and through the latest available month in 2008.
 - Total number of daily operations (arrivals and departures separately) for the peak-day of the peak-traffic month of 2007. Ensure that the selected day was not a high-volume day due to unusual circumstances (e.g., a major international political event).
 - Hourly operations (arrivals and departures separately) for the peak-day of the peak-traffic month of 2007 (this is essentially one 24-line table). Confirm whether the times are local or Coordinated Universal Time (UTC). Ensure that the selected hour was not a high-volume hour due to unusual circumstances (e.g., a very high traffic hour due to an unexpected runway closing during the previous hour).
 - Seven days of detailed daily operations data for AICM for any week considered by the DGAC as a relatively high-volume peak week (Sunday through Saturday) in 2007 or 2008. Please choose a week during which both directions of the main runways (Runway 05 and Runway 23) are being used. For a sample of what is expected, see Figure A-1 in the Appendix to this document.

The information being requested should include:

- Date
- Scheduled departure (STD) or arrival (STA) time. Indicate whether the time is local or UTC.
- Actual arrival or departure time. Indicate whether the time is local or UTC.

- Operator name (airline). If not a commercial operation, indicate whether it is General Aviation, military, or governmental.
 - Operator flight number
 - Aircraft type (model and sub-model, for example, Boeing 777-200)
 - Tail (or registration) number
 - Type of operation (arrival or departure)
 - Origin airport (for arrivals) or destination airport (for departures)
 - Runway used (Runway 11 or Runway 29)
 - Route name (Standard Instrument Departure [SID], instrument approach procedure or departure/entry fix) utilized for that specific departure or arrival
- Operational information of Santa Lucía Military Base.
 - Type of aircraft operating at the base.
 - Annual operations (“movements”) from 2007. Earlier data, if available, would also be helpful.
 - Monthly and hourly operational statistics for 2007 (earlier data, if available, would also be helpful), as well as through the latest available month in 2008.
- Provide radar data for the same seven days previously mentioned above with sufficient information to be able to cross reference aircraft identification with a particular radar track. The radar data should include information on operations at AICM and all other key airports in the Mexico City basin (i.e., Toluca, Puebla, Querétaro, and Cuernavaca), including Santa Lucía Military Base. The information should include:
 - Aircraft position data - format needs to include either:
 - Known origin (usually the radar antenna) in latitude/longitude and then displacement coordinates from the known origin, or
 - Latitude/longitude and altitude of each aircraft position.
 - Time data for each position to the nearest second.
- Provide video maps that depict extended runway centerlines, airports, significant fixes, holding patterns, airspace boundaries, sector boundaries, etc. of AICM and all other key airports in the Mexico City basin (i.e., Toluca, Puebla, Querétaro, and Cuernavaca), including Santa Lucía Military Base.

Appendix

Figure A-1 below shows a sample of the operations data MITRE requires. (Note that the data sample comes from a 2001 survey of AICM operations.) These data should be provided electronically in Microsoft Excel.

Operational Data - Sample Only

Date: _____
Wind Speed and Direction: _____

No.	Date	STD/STA (hour:minute)	Actual Time of Arrival/Departure (hour:minute:second)	Operator	Flight Number	Aircraft Type	Tail Number	Type of Operation	Origin/Destination	Runway	Route Name
1	10-Aug-01	23:45	000145	KLM	685	B744	PHBFE	LLEGADA	EHAM	5 R	
2	10-Aug-01	23:20	000350	AMX	229	MD82	XASXJ	LLEGADA	MMGL	5 R	CISNE-MATEO6
3	10-Aug-01	23:20	000551	MXA	626	F100	XASGF	LLEGADA	MMVR	5 R	
4	10-Aug-01	23:40	001255	SER	706	DC9	XARRY	SALIDA	MMDO	5 R	ARCOS1
5	10-Aug-01	3:45	002146	TAO	317	AT43	XATLN	LLEGADA	MMPA	5 L	
6	10-Aug-01	23:50	002328	AMX	160	DC93	N1003P	SALIDA	MMGL	5 L	LEONA1
7	10-Aug-01	0:15	002518	AFR	438	B772	FGSPL	LLEGADA	LFPG	5 R	
8	10-Aug-01	23:05	003525	AMX	6365	DC9	XAAMC	SALIDA	MMZH	5 L	LEONA1
9	10-Aug-01	21:40	003405	AMX	2	B762	XATNS	LLEGADA	LEMD	5 R	
10	10-Aug-01	22:00	003645	AMX	935	MD82	N945AS	LLEGADA	MMMY	5 R	
11	10-Aug-01	0:05	002725	TAO	148	AT500	XATAI	SALIDA	MMDO	5 R	ARCOS1
12	10-Aug-01	1:05	004959	AMX	495	B752	N802AM	LLEGADA	KLAX	5 R	CISNE-MATEO6
13	10-Aug-01	1:00	005200	MXA	901	A320	N405MX	LLEGADA	KLAX	5 R	CISNE-MATEO6
14	10-Aug-01	22:50	004359	SER	404	DC9	XALAC	SALIDA	MMAS	5 L	ARCOS1
15	10-Aug-01	1:40	010419	CHP	232	DC9	XATIM	LLEGADA	MMTP	5 R	PAVON-MATEO6
16	10-Aug-01	23:20	010203	AMX	936	MD82	N583MD	SALIDA	MMMY	5 L	ARCOS1
17	10-Aug-01	22:30	010357	MXA	522	A320	FOHMI	LLEGADA	MMAA	5 R	PAVON-MATEO6
18	10-Aug-01	1:35	011723	COA	1840	B737	N77303	SALIDA	KIAH	5 L	VISOS1
19	10-Aug-01	1:30	012021	UPS	6095	B752	N407UP	SALIDA	KEFD	5 L	VISOS1
20	10-Aug-01	1:20	012951	MXA	887	A320	N291MX	LLEGADA	CYYZ	5 R	TEPAS-MATEO6
21	10-Aug-01	1:05	013510	MXA	745	B722	XAMEJ	LLEGADA	MMTM	5 R	TEPAS-MATEO6
22	10-Aug-01	0:40	014615	MXA	542	A320	N369MX	LLEGADA	MMZH	5 R	PAVON-MATEO6
23	10-Aug-01	1:00	014121	CHP	315	DC9	XATJS	SALIDA	MMVA	5 L	APAN2
24	10-Aug-01	1:50	014738	SER	900	DC9	XAADK	SALIDA	MMCV	5 L	VISOS1
25	10-Aug-01	2:50	021523	AMX	592	DC9	XADEL	LLEGADA	MMUN	5 R	PAVON-MATEO6
26	10-Aug-01	20:40	021758	AMX	509	DC93	XAAMD	SALIDA	MMVA	5 L	APAN2
27	10-Aug-01	22:00	020803	MXA	346	A320	N361DA	LLEGADA	MMUN	5 R	PAVON-MATEO6
28	10-Aug-01	2:15	022432	MXA	19	B722	XAMXD	SALIDA	MMMY	5 L	ARCOS1
29	10-Aug-01	2:50	023601	MXA	908	B752	N764MX	SALIDA	KLAX	5 R	ARCOS1
30	10-Aug-01	3:15	024731	TAO	351	AT43	XARXC	LLEGADA	MMSP	5 R	CISNE-MATEO6
31	10-Aug-01	0:25	031545	AAL	2115	B738	N926AN	LLEGADA	KMIA	5 R	TEPAS-MATEO6
32	10-Aug-01	2:30	033001	AAL	2148	A308	N59081	SALIDA	KMIA	5 L	APAN2
33	10-Aug-01	3:25	040522	AMX	117	MD82	XASXJ	LLEGADA	MMGL	5 R	CISNE-MATEO6
34	10-Aug-01	3:50	041930	SER	421	DC9	XASYQ	LLEGADA	MMMY	5 R	TEPAS-MATEO6
35	10-Aug-01	4:20	042139	AMX	597	MD87	N205AM	SALIDA	MMUN	5 L	APAN2
36	10-Aug-01	4:25	042329	CHP	243	B722	XASJE	SALIDA	MMMD	5 L	APAN2
37	10-Aug-01	2:30	042701	AMX	151	DC93	XAJEC	LLEGADA	MMDO	5 R	CISNE-MATEO6
38	10-Aug-01	21:00	041320	MXA	712	F100	PHLXG	SALIDA	MMIO	5 L	ARCOS1
39	10-Aug-01	2:35	043156	TAO	760	AT43	XATIC	SALIDA	MMZC	5 R	ARCOS1
40	10-Aug-01	3:35	044017	CHP	214	B732	XASIX	LLEGADA	MMTB	5 R	PAVON-MATEO6
41	10-Aug-01	22:00	045345	TAO	42	AT43	XASYH	SALIDA	MMPB	5 R	APAN2
42	10-Aug-01	4:40	051615	MXA	401	B722	XAHOH	LLEGADA	MMGL	5 R	CISNE-MATEO6
43	10-Aug-01	5:50	052424	TAO	344	AT500	XATPR	SALIDA	MMSP	5 R	ARCOS1
44	10-Aug-01	5:30	053552	COA	1841	B733	N14384	LLEGADA	KIAH	5 R	TEPAS-MATEO6
45	10-Aug-01	7:10	054950	AMX	938	MD82	N168PL	SALIDA	MMMY	5 L	ARCOS1
46	10-Aug-01	6:25	060151	CHP	362	B732	XANAK	SALIDA	MMGL	5 L	LEONA1
47	10-Aug-01	7:10	062129	GMT	739	B732	XAMAC	SALIDA	MMBT	5 L	AUTLA1
48	10-Aug-01	8:20	064845	AMX	433	MD82	XATLH	LLEGADA	MMAA	5 R	PAVON-MATEO6
49	10-Aug-01	6:25	065709	AMX	438	MD82	XAAMU	SALIDA	MMGL	5 L	LEONA1
50	10-Aug-01	6:45	065621	AIN	221	B722	XATQT	LLEGADA	MMAS	5 R	CISNE-MATEO6
51	10-Aug-01	6:45	065713	AMX	682	MD82	EIBTX	LLEGADA	MMLO	5 R	CISNE-MATEO6
52	10-Aug-01	8:15	070311	MXA	2253	A320	FOHMH	SALIDA	MMBT	5 L	AUTLA1
53	10-Aug-01	6:35	065055	SER	711	DC9	XARKT	LLEGADA	MMTC	5 R	CISNE-MATEO6
54	10-Aug-01	6:45	070220	AMX	426	MD87	N753RA	SALIDA	KIAH	5 L	VISOS1
55	10-Aug-01	6:50	070035	MXA	433	B722	XAMEL	LLEGADA	MMGL	5 R	CISNE-MATEO6
56	10-Aug-01	7:50	071541	MXA	665	F100	XASHI	SALIDA	MMVA	5 L	APAN2
57	10-Aug-01	7:00	071629	MXA	384	F100	XASHJ	LLEGADA	MGGT	5 R	PAVON-MATEO6
58	10-Aug-01	7:15	070532	AMX	177	B752	N801AM	LLEGADA	MMTJ	5 R	CISNE-MATEO6
59	10-Aug-01	7:35	072119	MXA	686	F100	XATCG	LLEGADA	MMCE	5 R	PAVON-MATEO6
60	10-Aug-01	6:50	071032	AMX	163	MD82	XAAMP	LLEGADA	MMCL	5 R	CISNE-MATEO6

STD = scheduled time of departure
STA = scheduled time of arrival

Figure A-1. Sample of Operations Data