Enclosure 3
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MITRE
Center for Advanced
Aviation System Development

Air Traffic Control Workforce Planning

An Overview of Key Considerations

Prepared for
Aeropuertos y Servicios Auxiliares

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### Principal Acronyms and Abbreviations

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<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ACC</td>
<td>Area Control Center</td>
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<tr>
<td>AICM</td>
<td>Mexico City International Airport</td>
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<tr>
<td>ANSP</td>
<td>Air Navigation Service Provider</td>
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<td>ATC</td>
<td>Air Traffic Control</td>
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<td>FAA</td>
<td>U.S. Federal Aviation Administration</td>
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<td>ICAO</td>
<td>International Civil Aviation Organization</td>
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<td>MITRE</td>
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<td>NAICM</td>
<td>Nuevo Aeropuerto Internacional de la Ciudad de México</td>
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<td>SENEAM</td>
<td>Servicios a la Navegación en el Espacio Aéreo Mexicano</td>
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<td>ATCT</td>
<td>Air Traffic Control Tower</td>
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<td>U.S.</td>
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1. Introduction

The MITRE Corporation (MITRE) is assisting Aeropuertos y Servicios Auxiliares and the aviation authorities of Mexico with the implementation of a new airport, referred to in this document as Nuevo Aeropuerto Internacional de Ciudad de México (NAICM), to replace the current Mexico City International Airport (AICM). The proposed runway layout of NAICM will allow for dual- and triple-independent arrival and departure operations. As a result, controllers\(^1\) providing Aerodrome and Approach Control services for NAICM will be required to learn new procedures and work with new Air Traffic Control (ATC) equipment. To help in the transition to handling these complex procedures, Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM), with the assistance of MITRE, is planning to set-up dual independent approach and departure operations at Cancún International Airport to allow controllers to develop the techniques and gain experience in conducting independent operations that can later be used at NAICM.

The unique training and staffing requirements associated with these complex procedures, as well as the need to manage the workforce transition to the new airport, make workforce planning critical to the success of NAICM. As part its assistance to the aviation authorities of Mexico with planning for the transition of operations to the new airport, MITRE is providing general controller workforce planning guidance to SENEAM. This document covers the workforce planning process as well as other factors that significantly influence ATC facility staffing levels.

1.1 Purpose and Structure of this Document

This report is intended to provide decision makers, principally working in SENEAM but also other Mexican aviation authorities, with a methodology for evaluating controller workforce needs. The methodology is generic in nature, and thus can be tailored to any ATC facility.

MITRE would like to make SENEAM aware of key concepts and best practices in the field of workforce planning for potential use at ATC facilities in Mexico. As with all labor relations, workforce planning has the potential to be a highly sensitive topic. Thus the above-mentioned decision makers will need to account for the political- and labor-related complexities inherent to the planning and hiring process. It should also be noted that the generic workforce planning principles presented in this document can also be applied to other essential airport- and ATC-related personnel that will be required at NAICM (e.g., emergency personnel, technical staff, etc.).

This document is structured as follows:

- Section 1 provides background and context for SENEAM’s workforce planning activities during the transition to NAICM

\(^{1}\) For the purposes of this paper, the term “controller” refers to a validated air traffic controller, currently licensed, and actively working in at least one of the following domains: Aerodrome, Approach, Approach Radar, Area or Area Radar Control.
Section 2 offers a general discussion of workforce planning, including a definition, a description of its importance to ATC and the benefits that come from performing this activity.

Section 3 presents a detailed description of the key parts of a five-step process involved in workforce planning.

Section 4 outlines other factors that can have a profound impact on controller workforce estimates.

Section 5 provides an overview of workforce planning best practices.

Section 6 offers some suggested next steps.

2. Controller Workforce Planning

This section provides a general discussion of workforce planning; including a definition, a discussion on its importance to ATC and the benefits that come from performing this activity.

2.1 A Definition of Workforce Planning

The United States (U.S.) Office of Personnel Management\(^2\) uses the following definition for workforce planning:

*Workforce planning serves as the foundation for managing an organization's human capital. It enables organizations to plan strategically to meet current and future workforce needs and prevents unnecessary surprises in maintaining a steady-state workforce.*

When workforce planning is done correctly, it ensures that an organization has the right number of people, with the necessary skills, deployed to a specific location, when and where they are needed. Positions with low skill requirements rarely require workforce planning. If workers can be trained in a matter of days or weeks, they can easily meet the location, time and skill requirements. In contrast, when it takes years for workers to obtain skills, and those skills are domain specific and are not transferable to new locations, it becomes much more difficult to meet business needs without some workforce planning. Controllers fall into this latter category, which is why workforce planning plays a major role in developing and maintaining a viable ATC workforce.

2.2 Importance for Air Traffic Control

According to the International Civil Aviation Organization (ICAO)³,

"Manpower planning is essential to ensure that there is always sufficient trained staff available to meet the demands of the service."

In particular, workforce planning plays a crucial role in maintaining an adequate supply of air traffic controllers who ensure the safe, orderly and expeditious flow of air traffic. These individuals are highly skilled, and typically specialize in a particular domain and location. Their skills take years to obtain, and the knowledge they acquire is not always easily transferable from one location to another without additional training and knowledge (e.g., an enroute controller moving to a position in an Air Traffic Control Tower [ATCT]).

Workforce planning for ATC is especially complex; unfolding over long periods of time, requiring the alignment of multiple forecasts of demand and supply, and necessitating continual adjustments to assumptions and data. However, the benefits can be great, as controller workforce planning leads to enhanced quality in the prediction, assignment and use of staff.

2.3 Benefits of Controller Workforce Planning

Workforce planning takes seemingly unrelated activities (e.g., the number of qualified instructors and controller retirement eligibility) and connects them in a forward looking way, to ensure a sustainable future workforce.

At a high-level, ATC workforce planning is the confluence of three separate forecasts:

1. Future workload at a facility (i.e., traffic)

2. Number of controllers still at the facility in the future, and

3. Number of additional trainees that must be fully validated at the facility in order to handle the future workload (i.e., successful trainees)

This intense reliance on forecasting underscores the uncertainty inherent in the ATC planning process. The planning consists of mapping out all of the key activities to identify the primary drivers of those uncertainties so measures can be taken to mitigate the effects. This preemptive identification allows decision makers to place resources where they will have the most impact. It also gives them the tools to prevent bottlenecks and reduce uncertainty.

Generally, most of the bottlenecks occur in the training phase of the process, and are due to the multitude of elements that rely on forecasts for their input. The elements required to do the key activity mapping consists of determining the following:

- Number of controller retirements

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• Ratio of people entering training compared to the number that complete the training and become validated

• Length of time required to validate a new controller

• Number of promotions and attrition at the facilities

• Future traffic volumes

Workforce planning helps an Air Navigation Service Provider (ANSP) understand and quantify the impact of these forecasts. In some instances action can be taken to reduce the uncertainty, such as improving the ratio of successful trainees, or shortening the time it takes to become a validated controller.

2.4 Aligning Training Capacity with Need

One area where workforce planning can have an immediate impact is in the training of new controllers. By knowing the number of trainees and what types of certifications that will be required in the future, an ANSP can appropriately gear up the training staff to accommodate the incoming recruits. This also ensures that the capacity of the training facilities do not become a bottleneck in the certification process, which then enables the ANSP to grow the workforce to meet expected future traffic volumes.

Often instructors need to be recruited and trained well in advance of incoming recruits. The pool of instructors typically comes from the existing pool of controllers. If not done strategically, instructor selection can drain an already thin workforce of its best controllers. Thus, workforce planning helps ANSPs anticipate how much and where training capacity is needed to avoid the downward spiral that can be triggered when staffing levels reach critically low levels.

If a facility’s staffing becomes too constrained, controllers will not be able to spend sufficient time working with the trainees for them to complete their training. Without new validated controllers at a facility, staffing resources will remain constrained, and the situation could potentially deteriorate further, as controllers retire or fail their medical exams due to job-related stress.

3. The Five Step Planning Process

Workforce planning is recognized as an important activity in human resources literature and it is especially important for the controller workforce. Regardless of the size of the workforce, the same general steps apply. Figure 1 illustrates the steps and also emphasizes that workforce planning is an iterative process. The first step determines or sets the strategic direction of the workforce plan, aligning the future workforce with the business needs. This step is followed by assessing the current workforce (Step 2) and understanding the future needs (Step 3). After evaluating the current and future requirements, a recruiting and training plan (Step 4) is developed to fill the gaps that were identified. The final step is to monitor, evaluate, and revise,
if necessary, the actions taken to implement the plan that was developed. These basic workforce planning steps are described in more detail in the following subsections.

![Diagram showing basic workforce planning steps: Step 1: Set Strategic Direction, Step 2: Understand Current Workforce, Step 3: Understand Future Needs, Step 4: Recruit and Create Training Plan to Fill Gap, Step 5: Monitor, Evaluate, Revise.]

**Figure 1. Basic Workforce Planning Steps**

Software and decision support tools are often used to ensure the process is completed successfully. In addition, once a controller workforce plan has been developed, the data and information gathered should be archived to improve the forecasts for the next version of the plan. When data is collected and stored over time for essential activities, trends can be detected and used to improve the accuracy of projections.

### 3.1 Step 1: Set Strategic Direction

An ANSP must leverage its controller workforce to successfully carry out its mission. Thus, the strategic direction of the workforce plan dictates what services an ANSP will be able to provide in the future. Several key decisions involving the scope of the strategic plan must be made at this initial stage in the process. To begin the process, an ANSP must decide which facilities the workforce plan will address, the number and type of positions at each included facility, and the plan’s time horizon.

At a minimum, workforce planning should be done for the currently staffed positions and facilities because a controller’s training is location-specific. Depending on the scope of the workforce involved (if it covers personnel beyond controllers), additional facilities may need to be included as well. Other factors that influence the number of facilities to plan for include: the commissioning or decommissioning of airports, substantial increases or decreases in traffic levels, and changes in the composition of airport users (general aviation compared to scheduled carriers).
Each ANSP must also decide what segment of its workforce the plan will address. Aside from controllers, other potential candidate workforce segments that benefit from accurate workforce planning include emergency personnel, inspectors, instructors, flight services, and technicians.

ICAO recommends that a manpower or workforce plan forecast span at least five years into the future. This lengthy time frame is largely driven by the amount of time it takes to validate a new controller at a facility. While a longer term plan is always preferable, it must be balanced against the reliability of traffic forecasts and controller retirement projections that become increasingly difficult to predict beyond the five year mark.

When evaluating options, an ANSP must also weigh its desired strategic direction against budgetary constraints and political realities. This is why other factors, such as level-of-service requirements, business practices, and labor rules are discussed separately as they have a disproportionate influence on the calculation of controller workforce needs.

3.2 Step 2: Understand Size and Composition of Current Workforce

This step primarily involves gathering data about the existing workforce. At a minimum, the following pieces of information are needed for each controller: birthdate, facility, and skill level (including the positions they can work). This information is then used as a foundation to determine the current workforce levels that would be available in future years. Figure 2 shows a generic example for a “Year One” assessment at various generic facilities being studied. In addition, it is beneficial to keep track of continuing education requirements and certifications so reminders and appointments can be made in a timely manner. This helps ensure controllers stay current on training and avoids preventable workforce shortages.

It is important to bear in mind that the current number of controllers at a facility is not necessarily the optimal number of controllers. While an ANSP may have healthy staffing levels overall, individual facilities may still be under staffed. Staffing requirements are also heavily influenced by labor agreements, controller availability, facility staffing practices and hours of operation. These items will be discussed in Section 4.
3.3 Step 3: Understand Future Needs

This is the most challenging step in workforce planning. Even though the future is unpredictable, estimates are needed to develop a successful plan. Estimates fall into two broad categories as follows:

1. How many existing controllers will still be at a facility in the future, and

2. How many controllers will be needed at a facility

3.3.1 Existing Workforce Forecasts

The number of controllers at a facility is primarily driven by demographics, and is a fairly straightforward calculation that should be informed by historical data. Unfortunately, some of these individual variables can be difficult to accurately predict, especially at smaller facilities. The main components of this calculation and how these components are combined in the calculation are as follows:

- The current number of controllers at a facility today,
  - Minus (-) the number of controllers that will have retired by the target planning date,
- Minus (-) the number of controllers that have left the workforce for other reasons (fail their annual exams, deaths, disability, voluntary or involuntary leave, etc.) by the target date,
- Minus (-) the number of controllers that will have been promoted and are no longer working traffic,
- Plus (+) the number of controllers that will have been added to the workforce by the target date (either newly validated controllers or transfers from other facilities).

Figure 3 provides a visual depiction of the elements and how they impact the calculation of future controller workforce at a facility. Figure 4 shows sample generic data of how the “Year One” workforce is projected to look at “Year Five”.

![Controller Workforce Flow Chart](image)

**Figure 3. Controller Workforce Flow Chart**

![Bar Chart](image)

**Figure 4. Generic Example of Current and Future Workforce in Five Years**

ACC = Area Control Center, TWR = Air Traffic Control Tower
3.3.2 Future Workforce Needs

Establishing the number of controllers needed at a facility by the target date poses a different challenge. First, the process assumes there is an optimal number of controllers. If a facility is currently understaffed or overstaffed, it can be difficult to ascertain the appropriate number of controllers needed in the future since the facility is not currently at an optimal number. Second, the calculation must take into account how changes in traffic levels, workload, airspace complexity, ATC equipment and procedures, and position responsibilities will affect staffing levels. One way to approach this problem is to conduct studies and analyze how traffic levels relate to staffing. A simplified way is to classify, or tier, facilities based on annual traffic levels.

3.4 Step 4: Recruit and Train to Fill Gaps

Once the forecast of the existing workforce and future workforce needs are known for each facility, reconciling the differences between the two estimates results in the number of new controllers needed by the workforce planning target date. Figure 5 shows a generic example of the total workforce needed, represented by the full height of the bar, as well as the two types of workforce components that will make up that future workforce (forecast of existing workforce and needed controller recruits).

With this number in mind, an ANSP can determine a timeline for recruiting and training controllers in order to fill the gap by the target date. An ANSP should be mindful that not all recruits will be successful, and not all trainees will be able to handle the duties they were originally recruited to fulfill. In addition, after evaluating future needs, there should also be a better understanding of what curriculum adjustments will be needed to accommodate existing plans for ATC modernization, or, as in this case of Mexico, the opening of brand new and expanded ATC facilities such as the new air traffic control tower at NAICM.

![Figure 5. Generic Example of Needed Workforce in Five Years](image-url)
3.5 Step 5: Monitor, Evaluate, Revise

As previously mentioned, a controller workforce plan typically covers a five-year interval. The plan should be updated on a regular basis, generally annually, to reflect adjusted forecasts. Once a plan is set in motion, an ANSP should continue to collect data to evaluate how the plan is progressing and make any necessary revisions. Major disruptions, such as a change in the macroeconomic climate, can have a detrimental impact on earlier forecasts. For example, if the economy slows, traffic levels can decrease and fewer controllers may retire when they are eligible. The combined effect of these two trends can drastically reduce the need to place new controllers at a facility.

Revisions would also need to be made to the workforce plan if a major airline significantly changed their schedule or goes bankrupt. For example, establishing a regional hub or consolidating operations into a single hub, would change anticipated controller workload. An example of this occurred in the U.S. when US Airways downgraded Pittsburgh International Airport (hereinafter referred to as Pittsburgh) from a “hub” to a “focus city” in 2004. As a consequence, the airport saw a 63% drop in annual operations from 2000 to 2009. The U.S. controller workforce plan, which is updated annually by the U.S. Federal Aviation Administration (FAA), was responsive to this drastic change in operations, and slowly lowered its staffing range. During the six-year period for which workforce plans were available, actual Pittsburgh controller staffing levels dropped 20%. Current staffing levels are still above the staffing plan’s range (see Table 1 below). However, the U.S. FAA is making progress in reaching its workforce target.

<table>
<thead>
<tr>
<th>Pittsburgh Controller Numbers</th>
<th>Plan Estimate</th>
<th>Actual</th>
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<tr>
<td>Year</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>2007</td>
<td>41</td>
<td>51</td>
</tr>
<tr>
<td>2008</td>
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<tr>
<td>2014</td>
<td>32</td>
<td>39</td>
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Source: FAA’s Air Traffic Controller Workforce Plan (2007 - 2014)

Even when there are no major outside disruptions, it is still important to monitor the progress of the workforce plan. If forecast projections are not quite on target to meet their five-year estimate, then adjustments should be made as soon as possible to address any potential shortfalls. The sooner problems are identified; the more options decision makers will have available to address them.
4. Other Workforce Considerations

There are four other key factors that influence controller workforce requirements. They are:

1. Controller availability
2. Labor rules
3. Business practices
4. Level-of-service

This document includes a discussion of these other factors because they strongly influence the planning process. ANSP workforce needs are directly related to the existing level-of-service, business and labor rules, and set the boundaries of what can be realistically achieved. These areas are frequently targeted by ANSPs when they need to alleviate short-term staffing problems.

ANSPs have varying degrees of control over the factors discussed in this section. Controller availability is the end result once all these factors have been accounted for. Labor rules are rarely under the control of the ANSP, as they tend to be set at a national level. Business practices are typically decided at the ANSP level, but they are often the result of extensive negotiations with labor unions. Thus they can be changed, albeit on a slower and more incremental basis. If needed changes cannot be implemented for the existing workforce, they can be phased in with newly hired controllers.

Facility level-of-service is something an ANSP has the most control over. Adjusting the hours of service at an airport can have a considerable impact on facility staffing requirements. Thus, level-of-service changes are one of the best avenues to pursue when an ANSP is faced with immediate staffing shortages.

Any anticipated changes to these four areas should be reflected in the calculation of future workforce needs at a facility.

4.1 Controller Availability

Controller availability is the term used for translating facility staffing requirements into specific position coverage. For example, to have at least one person on duty at a facility that is open 24 hours a day every day of the year, 8,760 hours are needed to staff one position. In many countries, controllers work eight hour shifts for five days a week. So at the most, one controller can staff 2,086 of those hours, not accounting for any sick leave, vacation time or any other time off. Once other leave such as vacation, sick time, and training hours are notionally accounted for (see Figure 6), a controller reports to work at a facility approximately 1,718 hours a year. To get the number of available work days, the average hours in a year is divided by the number of hours in a shift, which in this example is eight hours. The resulting workdays per year is 215.
Figure 6. Notional Calculation of Average Controller Workdays

However, a controller rarely provides eight full hours of ATC service during a shift. Typically, the controller is allowed breaks and meal periods, as well as time to review procedures and situational awareness briefings. All these extraneous shift-related activities reduce the number of hours a controller is actively working traffic when they are at a facility. Figure 7 shows a notional calculation of controller time on position during a shift.

Figure 7. Notional Calculation of Controller Time on Position

Once these daily activities are taken into account, it leaves only 1,073 controller hours a year to staff a position (1,718 annual hours multiplied by the 5/8 hours worked during a shift, assuming the controller is managing traffic for five hours a day).

Accounting for both annual availability and the shift availability in this notional example, a 24-hour facility would need between eight and nine controllers on staff, just to have one person providing an ATC service at all times. This number is derived through a simple mathematical equation:

- 8,760 staff position hours needed at a facility
- Divided by 1,073 hours available per controller
- Equals 8.2 controllers needed to provide service
When tailored to Mexico’s annual- and shift-related activities, these numbers will change. However, the basic calculations and concepts are still the same.

While the example given in this section is notional, it should be apparent that the items listed in Figures 6 and 7 have a disproportionate impact on the availability factor, and thus controller staffing needs. In addition, the number of days and hours a facility is open, directly influences the numerator of this calculation, so it has a considerable impact on controller staffing needs as well. The example outlined above can be expanded once a facility knows how many positions need to be staffed at each facility.

ICAO offers a slightly different method of calculating controller staffing as it accounts for multiple positions at a facility. The publication emphasizes the use of a “peak-hour” or busy time periods when assessing the number of positions needed in order to maintain adequate safety margins.

4.2 Labor Rules

Labor rules typically come from national or agency-wide directives. They frequently address working conditions and personnel related policies such as retirement age, disability leave, retirement, vacation time and sick leave. All of these factors must be accounted for in the workforce planning process. Data on these items are often collected by the Human Resources Department of an organization. The data should be analyzed to derive annual averages or rates for each controller, which are then used in the annual availability calculation.

It is important to use data specific to the controller workforce, and not the general population, as controllers exhibit unique characteristics due to the stressful nature of their job. For example, in some countries it has been observed that controllers use sick and disability benefits at higher rates than the rest of the general population. In the notional calculation of annual availability shown earlier, most of the items listed in the annual availability calculation are labor rules.

4.3 Business Practices

While labor rules impact annual availability, most business practices affect controller shift availability. Business practices typically govern day-to-day operations, such as shift scheduling, shift duration and breaks. These practices vary significantly across countries, and can even vary from one facility to the next. Examples of business rules that can vary by facility include:

- The number of hours in a shift
- The number of shifts per day
- Shift start and end times
- The use of standard or variable shift start times

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- The number and type of positions at a facility
- The number of days worked in a week/month
- Position responsibilities
- If positions are combined as traffic ebbs and flows (i.e., whether staffing responds to workload)

In many cases these practices can be adjusted to increase productivity.

4.4 Level-of-Service

Level-of-service is a measure used to determine the effectiveness of public infrastructure. It is primarily used in transportation planning, where service levels are weighed against safety, congestion, user needs and budgetary constraints. When applied to aviation, level-of-service typically refers to all aspects of ATC, including the communication, navigation, and surveillance infrastructure. Ensuring separation between aircraft, via a controller, is the most resource intensive level-of-service an ANSP can provide. For the purposes of this document, level-of-service is generically used to refer to the time period when ATC separation (control) services are provided by a controller.

Level-of-service is the result of two main staffing decisions:

1. Which facilities will have controllers providing ATC services, and
2. How many hours a day these facilities are open

The level-of-service an ANSP has chosen to provide directly impacts Step 2 (assessing the current workforce) and Step 3 (understanding the future workforce) of the workforce planning process because it influences the number of controllers needed.

A level-of-service analysis can also provide guidance, when used in conjunction with workload studies, in determining the optimal number of controllers needed today and in the future. When level-of-service decisions are made (e.g., increased or decreased facility hours, new facilities to staff, etc.), workforce planners should be advised immediately, otherwise controller staffing resources may not be available when they are needed with the proper domain validation at a given location.

There are many tradeoffs to be made when determining the appropriate level-of-service. For instance, with the same number of controllers, an ANSP can staff more facilities with fewer hours, or they can staff fewer facilities for longer periods of time. If a facility is open, but there are not enough positions/controllers to work all the traffic, flights will be delayed. Therefore, to determine the right level-of-service for an ANSP, these tradeoffs need to be clearly understood.
5. Best Practices

Actively developing a workforce plan is an industry best practice. Long training lead times and a dynamic environment make workforce planning critical. The earlier an ANSP begins to plan and adapt those plans to the ever changing environment, the more likely they will have a smooth workforce transition. Some examples of frequency of workforce plan revisions include the FAA and Airservices Australia who both have a formal planning process that is updated annually and published on the internet. EUROCONTROL (which uses the term manpower planning as opposed to workforce planning), on the other hand, publishes very detailed planning guidelines on their website that provide a step-by-step outline of the process. These guidelines should be consulted if Mexico decides to undertake a detailed planning process.

Most ANSPs do not have much control over labor rules. Therefore they tend to concentrate on optimizing business practices and regularly evaluating level-of-service requirements. Together, these two factors help facilities optimize their workforce by ensuring that controller productivity remains high. NAV CANADA has a formal level-of-service policy to match resources with utilization. Business practices cover a wide array of topics, some of which are addressed below.

To identify the optimal number of controller positions needed at a facility, larger ANSPs use sophisticated software and modeling. These more complex heuristics allow the number of positions to be dictated by controller workload. They recognize that workload varies from month-to-month, day-to-day and hour-to-hour. For example, the number of controllers needed during the day is rarely the same as the number needed at night. These large ANSPs adjust the shift start and end times to coincide with air traffic peaks and valleys. In the U.S., this practice is known as “staffing to traffic”.

ICAO provides some guidelines and considerations for performing a workload study.\(^5\) EUROCONTROL also has extensive documentation available online with regard to managing shiftwork and determining day-to-day staffing needs. They also include another example of the availability factor calculation and provide specific examples.

As observed in Section 2 of this report, ANSP’s use workforce planning to develop a strategic controller recruiting and training plan. A good workforce plan typically emphasizes a steady hiring strategy, which means there are always sufficient training resources available for the trainees. A steady hiring plan also avoids age spikes in the controller workforce because it balances the age distribution at facilities.

Other best practices related to recruitment and training include:

- Reducing the time it takes to recruit and train new controllers (e.g., through the use of simulators, computer-based training, etc.)

- Using better tools to predict successful candidates (e.g., aptitude tests)

• Recruiting better qualified candidates for entry to the training program (e.g., those having advanced English language skills)

• Using incentives to retain controllers, both during training and after they have been validated, to avoid costly losses to other ANSPs or other industries

6. Suggested Next Steps

SENEAM is planning to transition operations and staff to NAICM in approximately five years. As discussed earlier, five years is also the typical workforce planning horizon. Thus, the sooner SENEAM begins to plan for the transition to the new airport, the more smoothly it is likely to be. This is especially important since NAICM will be conducting dual- and triple-independent operations when it opens.

The most challenging step of the workforce planning process, understanding future needs, will be especially complex in this situation, since the past cannot be used as a guide to the future. In the early stages of planning, SENEAM should focus its efforts on this step, in order to gain a firm understanding of their staffing needs at NAICM. This includes an estimate of the number and types of positions at the ATCT, and any related position changes at approach or enroute centers.

Any new or unique procedures or equipment associated with those positions, such as those required to conduct independent approaches, should be catalogued as well since addressing these matters, including training, will likely take long lead times. (Note that MITRE has already provided information to the aviation authorities of Mexico regarding ATC equipment requirements and other key considerations for conducting independent operations.) Simulation or modeling of the new operation could assist in identifying any skills or workload gaps, as well as be used for training purposes.

Another important step is to map out the flow of existing controllers, as there will be a lot of movement between facilities and additional staff will also be needed. If staff are relocated from other facilities, then plans to backfill staff numbers at those other facilities will be required.

It is also important to mention that Cancún International Airport will play an important role in assisting controllers in transitioning to independent operations as it will be used as a test-bed location to allow controllers to obtain experience in conducting those complex operations prior to the opening of NAICM. Therefore, Cancún International Airport independent operational test-bed matters should be taken into consideration when conducting workforce planning as well.

Proper planning and a proactive approach will ensure the ATC transition to NAICM fosters a safe and efficient operational environment.