

Introduction

The IATA Airport Development Reference Manual (ADRM) is the industry's most important guide for airlines, airports, government authorities, architects and engineering consultants who are either planning new or extending existing airport facilities. The ADRM's information is an invaluable consolidation of best industry practice with respect to the development of world class airports through better briefing and design. Its content represents the consolidated recommendations of world class airport facilities.

The previous 9 editions of the ADRM (9th Editional format has some obvious constraints; most notably the difficulty of responding quickly to what is an inherently dynamic, fast-changing industry as well as the editorial need to limit the published material to manageable proportions. The latest manual adopts a completely different web-based approach which will allow both for regular updates and organizational partners. In order to take full advantage of the opportunities offered by this new approach the structure of the new manual has been retained and developed as appropriate.

 the ability to offer a complexity associated with all airport, especially large international airport, especially large international airport, especially large international airport, especially large international airport developments means that the information contained with all airport developments means that the information contained with a sociated with a socia frequently there are many variables from which it is possible to derive several different interpretations. IATA strongly recommends that any commissioning airline, airport or government authority selects experienced architects and consulting instances across the world where well-meaning but inexperienced architects and consulting instances across the world where well-meaning but inexperienced architects and consulting instances across the world where well-meaning but inexperienced architects and consulting instances across the world where well-meaning but inexperienced architects and consulting instances across the world where well-meaning but inexperienced architects and consulting instances across the engineers have misunderstood or misinterpreted complex data and consequently delivered wholly inappropriate solutions. The web-based format is based upon the three primary themes/chapters: (1) Forecasting, (2) Master Planning and (3) Passenger Terminal.

the aviation of the ADRM meets the needs of the aviation community as a whole. Intrinsically, best practice airport are very close business partners. A collaborative working relationship with ACI ensures that the ADRM meets the needs of the aviation community as a whole. Intrinsically, best practice airport developments, is beneficial for airline customers and passengers.



Facility Requirements (Analytical Approach, Capacity Equations, Sample Calculations

Self-Service Facilities – Check-in **Baggage Drop Facilities** Passport Control Security Screening **Boarding Gates** Baggage Claim **Customs Processes** Public Halls



New LOS Guidelines

		SPACE STANDARDS FOR WAITING AREAS (m ² /pax)			WAITING TIME STANDARDS FOR PROCESSING FACILITIES (Minutes)			WAITING TIME STANDARDS FOR PROCESSING FACILITIES (Minutes)			PROPORTION OF SEATED OCCUPANTS		
Passenge	r Terminal Processor					conorny Cli	3535	Busine	ess Class / F	irst Class			
ADRM 9th Edition		A B	с	DE	A B	с	DE	A B	С	DE	A B	С	
AD	VM 10th Edition	Over design	Optimum	Suboptimum	Over design	Optimum	Subopfinum	Over design	Optimum	Suboplinum		n Optimum	n Sul
Public Departure Hall					-								
Check-in	Self-Service Boarding	1			1								
	Pass / Tagging										1		
	Bag Drop Desk										1		
	(queue width 1.4 - 1.6 m))						_			1		
								Busines	s Class Che	ck-in Desk			
	Check in Desk												
	(queue width 1.4 - 1.6 m)							First	Class Check	rin Desk			
Security Checkpoint									Fast Trac	k			
(queue width: 1.2 m) Emigration (Passport Control)													
									Fast Trac	ĸ			
(qu	sue width: 1.2 m}												
Boarding Seating													
					-								
Sale Lounge	Standing				-								
Immigration (Passport Control) (queue width: 1.2 m) Transfers Baggage Claim Area Namow Body					1				Fast Trac	k			
											1		
		· · ·			1						1		
					First p	assenger to	first bag	First p	assenger to	first bag	1		
	Wide Body												
Public Arrival Hall					-			n.b. Priorit) before Eco	bags to be nony	delivered			
CIP Lounges					1								

Updating of the Airport Development Reference Manual, New 10th Edition, March 2014

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Step 1: Calculate the demand output from the previous processor. The demand includes passenger volume from:

- The service desks (CD);
- The self-service booths (SSCB); and
- Web/mobile processing.

PK_{30MN} = (CD * 60 / PT_{CD} * 30) + (BD * 60 / PT_{BD} * 30) + (PHP * PK * (1 - (CR + BR))

Step 2: Calculate the approximate number of emigration control desks using the following equation:

 $PDi = (PK_{SOMIN} * PT_{PD} / 60) / (30 + MQT)$

Step 3: Adjust requirements to account for variability in passenger arrival distribution within the peak period and in processing time using the following equation:

PD = PDi * Cf

Step 4: Calculate the maximum number of passengers in queue using the following formula:

QMAX = Qf * Peak 30-min

Step 5: Calculate the area required for the departure emigration control using the following equation:

A = (PD * PDd * PDw) + QMAX * SP + (PD * PDw * W)

The area consists of the processing area, the queuing area and a circulation area after process to allow passengers to get to the next facility.

The corridor width will vary with the importance of the passenger flows. The planner may obtain the corridor width from standard calculations. A minimum width of three meters should be provided in low volume areas.

How to Better Manage Capacity and Passenger Expectations?

Managing capacity and passenger expectation is not an easy task for large hubs neither it is for smaller airports. This can even become a critical element in airport concession agreements where operators need to meet minimum service levels as well as for airports trying to differentiate themselves from their competitors. The best way to address this challenge is to rely on good and relevant information as well as on benchmarks.

Technical passenger perception surveys combined with on-site measurements and observations of queuing patterns and facility layouts is an efficient exercise to get such information.

Typical Data Gathering Program

ATB Facil	lities	Benchmarking used to compare	From one region to another			
ATD TOCH		benefitialising used to compare	From one airport class/type to another			
Pax Process	ing Facilities:					
	Traditional check-in Desks					
	Self-Service Check-in Kiosks					
	Self-Service Bag Tagging					
	Self-Service Bag Drop					
	Traditional Security checkpoint					
	Self-Service Security Check					
	Traditional Passport Control Desks					
	Self-Service Passport Control Kosks					
	Traditional Boarding Desks					
	Self-Service Boarding Kiosks					
	-					
	Baggage Claim Devices					
static/Accur	mulating Facilities:					
	Public Departures Lobby					
	Departure Hold Rooms					
	Public Arrivals Hall					
Types of ob:	sevation to conduct at terminal facilities					
	Observation/Measurement	Purpose	Can be provided by the airport surveys	Facilities		
	Queue layout, width+length	Reviewing LOS standard	Measured from CAD drawings and on-site visits	All processing	g facilities	
	Queuing time	Reviewing LOS standard		All processing	g facilities	
	Bags/Pax ratios while in line	Reviewing LOS standard + Benchmarking	Statistics from previous recent observations	Check-in faci	- ilities, Security checkpoints, B	aggage claim devices
	Enplanning Pax Arrival Rate/Profile	Capacity Equation + Benchmarking		Check-in faci		
	Deplaning Pax Arrival Rate/Profile	Capacity Equation + Benchmarking		Gate lounge		
	Process Time	Capacity Equation + Benchmarking		All processing		
	Queuing Experience Perception	Reviewing LOS standard		All processing		
	Max Que uing Time allowed	Capacity Equation	Can be obtained from surveys to airlines	All processing	-	
	Number of opened desks	Capacity Equation		All processing	-	
	De sks dime nsio ns	Dimensionning of facilities	Measured from CAD drawings and on-site visits	All processing	-	
	# of opened desks per flight size	Benchmarking	Can be obtained from surveys to airlines	All processing	-	
	Ratio of self-service kiosks/traditional desks	Benchmarking	Obtained from CAD drawings		curity checkpoints, Passport c	ontrol
	Area + num ber of seats	Benchmarking	Obtained from CAD drawings	Public Depart		
	Area + number of seats	Benchmarking	Obtained from CAD drawings	Departure Ho		
	Area + number of seats	Benchmarking	Obtained from CAD drawings	Public Arriva		
	Area + number of seals	Denchmarking	oprailed individual wings	P GUILE AI TIVE		
	Airport Survey					
Airii ne s and		te en en elter als en fan en 16 energine fan littine, ter ende	ann a ha na sta sistin a			
	Questions to airports : PPHP determination, level of traffic vs. ultima		pax c na ra cteristicis,			
	Questions to airlines : plans for self-service facilities, trends, pax cha	racteristics, wait times policies, statting policies				
	tion sche dule / airport	# -{	Duration	Territor		
Period	Activity Machine with simple and states in Resting to Alations	# of Resources	Duration	Total man-ho	ours	
Jay 1 - AM	Meeting with a irport a uthorities + Regulatory Bodies + Airlines	Supervisor + (4) surve yors	2 hours	10		
	Site visit	Supervisor + (4) surve yors	2 hours	10		
Day 1-PM	Measurements (que ue la youts, desks dimensions, etc.)	2 Surveyors	4 hours	8		
	Enplanning Pax Arrival Rate/Profile (passenger survey)	2 Surveyors	4 ho urs	8		
			4 ho urs	4		
	Airlines Survey (staff allocation + wait times policies, etc.)	1 Supervisor				
Day 2 - AM	Check-in lo bby (pro cess time + waiting time)	2 Surveyors	4 ho urs	8		
Day 2 - AM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time)	2 Surveyors 2 Surveyors	4 hours 4 hours	8		
Day 2 - AM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey)	2 Surveyors	4 ho urs			
Day 2 - A.M	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time)	2 Surveyors 2 Surveyors	4 hours 4 hours	8		
Day 2 - A.M	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey)	2 Surveyors 2 Surveyors	4 hours 4 hours	8		
	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey)	2 Surveyors 2 Surveyors	4 hours 4 hours	8		
	Check-in lo bby (pro cess time + waiting time) Departure Passport Control (pro cess time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities]	2 Surveyors 2 Surveyors 1 Supervisor	4 hours 4 hours 4 hours	8		
	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time)	2 Surveyo rs 2 Surveyo rs 1 Supervisor 2 Surveyo rs	4 hours 4 hours 4 hours 4 hours	8 4		
	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of podiums/flight size + time)	2 Surveyo rs 2 Surveyo rs 1 Supervisor 2 Surveyo rs 1 Surveyo rs	4 hours 4 hours 4 hours 4 hours 4 hours 4 hours	8 4 8 4		
	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of pod ums/flight size + time) Deplaning process (# of doors/flight size + # of pax + time)	2 Surveyors 2 Surveyors 1 Supervisor 2 Surveyors 1 Surveyor 1 Surveyor	4 hours 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours	8 4 8 4 4 4		
Day 2 - PM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of pod ums/flight size + time) Deplaning process (# of doors/flight size + # of pax + time) Security checkpoint (perception survey)	2 Surveyors 2 Surveyors 1 Supervisor 2 Surveyors 1 Surveyor 1 Surveyor 1 Surveyor	4 hours 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours	8 4 8 4 4 4	- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -	
Day 2 - PM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of pod ums/flight size + time) Deplaning process (# of doors/flight size + # of pax + time) Security checkpoint (perception survey) Arrival Passport Control (process time + waiting time)	2 Surveyo rs 2 Surveyo rs 1 Supervisor 2 Surveyo rs 1 Surveyo r 1 Surveyo r 1 Surveyo r 2 Surveyo rs	4 hours 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours	8 4 8 4 4 4	Image: Constraint of the sector of	
Day 2 - PM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of pod ums/flight size + time) Deplaning process (# of doors/flight size + # of pax + time) Security checkpoint (perception survey) Arrival Passport Control (process time + waiting time) Baggage Claim (time + density)	2 Surveyo rs 2 Surveyo rs 1 Supervisor 2 Surveyo rs 1 Surveyo r 1 Surveyo r 1 Surveyo r 2 Surveyo rs 2 Surveyo rs 2 Surveyo rs	4 hours 4 hours	8 4 8 4 4 4 4 4 8 8 8		
Day 2 - PM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of pod ums/flight size + time) Deplaning process (# of doors/flight size + # of pax + time) Security checkpoint (perception survey) Arrival Passport Control (process time + waiting time)	2 Surveyo rs 2 Surveyo rs 1 Supervisor 2 Surveyo rs 1 Surveyo r 1 Surveyo r 1 Surveyo r 2 Surveyo rs	4 hours 4 hours	8 4 8 4 4 4 4 8 8		
Day 2 - PM Day 3 - AM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of pod ums/flight size + time) Deplaning process (# of doors/flight size + # of pax + time) Security checkpoint (perception survey) Arrival Passport Control (process time + waiting time) Baggage Claim (time + density) Arrival Passport Control (perception survey)	2 Surveyors 2 Surveyors 1 Supervisor 2 Surveyors 1 Surveyor 1 Surveyor 1 Supervisor 2 Surveyors 2 Surveyors 2 Surveyors 1 Supervisor	4 hours 4 h	8 4 8 4 4 4 4 8 8 8 8 4		
Day 2 - PM Day 3 - AM	Check-in lo bby (process time + waiting time) Departure Passport Control (process time + waiting time) Check-in lo bby + departure passport control (perception survey) [To include: desks + self-service facilities] Security checkpoints (throughput + waiting time) Boarding Process (# of pod ums/flight size + time) Deplaning process (# of doors/flight size + # of pax + time) Security checkpoint (perception survey) Arrival Passport Control (process time + waiting time) Baggage Claim (time + density)	2 Surveyo rs 2 Surveyo rs 1 Supervisor 2 Surveyo rs 1 Surveyo r 1 Surveyo r 1 Surveyo r 2 Surveyo rs 2 Surveyo rs 2 Surveyo rs	4 hours 4 hours	8 4 8 4 4 4 4 4 8 8 8		

Collected data can also be used for benchmarking purposes. Benchmarks are helpful if one wishes to compare regions or airport types/class with one another. Benchmarking data can include: average process times; passenger arrival rate profiles, # of desks per flight size, ratios of self-service kiosks/traditional desks, etc...

IATA, with the support of AECOM has already started a data gathering exercise to help airports better manager their capacity. A reliable set of benchmarks would need to cover a wider range of airports size and geography. Airports interested in passenger perception surveys may enquire further to Mr. Brazeau or Ms. Martel.

Targeted Sample of Airports







Sample Results

Airport Size						
LARGE/HUB (>35 MAP)	MEDIUM (15 to 35 MAP)	SMALL (<15 MAP)				
3	3	3				
3	3	3				
3	3	3				
3	3	3				