

#### JOHN F. KENNEDY INTERNATIONAL AIRPORT

#### REHABILITATION OF RUNWAY 4R/22L AND ASSOCIATED TAXIWAYS

#### RUNWAY DECLARED DISTANCE INFORMATION

#### PHASES 1 AND 3

	TORA	TODA	ASDA	LDA
RWY 13L	9,225 ft	9,225 ft	9,225 ft	8,318 ft
RWY 31R*	8,570 ft	8,570 ft	8,083 ft	8,486 ft
RWY 13R	14,010 ft	14,010 ft	14,010 ft	11,967 ft
RWY 31L*	13,806 ft	13,806 ft	13,806 ft	11,248 ft
RWY 22R*	9,189 ft	9,189 ft	8,329 ft	7,795 ft

#### NOTES:

Distances in the above table are calculated for the following taxiway intersection departures.

**RWY 31R** – TAXIWAY "Y" INTERSECTION DEPARTURES. NO BACK-TAXI FULL LENGTH DEPARTURES.

**RWY 31L** – TAXIWAY "JB" INTERSECTION DEPARTURES. NO BACK-TAXI FULL LENGTH DEPARTURES.

**RWY 22R** – TAXIWAY "F" INTERSECTION DEPARTURES MAY BE USED AT ATCT DISCRETION.

#### PHASE 2

EXPECT FULL RUNWAY LENGTHS FOR ALL RUNWAYS.

### Updated Operational Performance **Assessment: JFK Stage 4 Construction** Including: 2016 and 2017 Demand Schedules

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24 January 2017



#### Background

- In 2017 runway 04R/22L at JFK will be closed for rehabilitation
- A multiple-phase closure schedule was selected

Two full closures: February 27 to May 31, 2017; September 5 to November 16, 2017

- Nightly closures: June 1, 2017 to September 4, 2017
- To prepare for the closures, the facilities have provided a "playbook" construction about expected configurations and rates that will be used during
- Prioritized configurations
- For VMC and IMC conditions
- Customized for arrival and departure banks
- This briefing provides an operational performance assessment of JFK performance with and without construction
- Based on historic capacity from 2013, 2014, and 2016\* (04L/22R construction took place in 2015) as well as the facility-provided playbook
- Modeling scheduled demand from March 2017; all other months from 2016
- Including unscheduled demand as well as cargo operations



## October 2016 Playbook **Facility Provided Configurations and Rates**

#### **Arrival Bank**

#### SMC C

Configuration	AAR,ADR
31L, 31R   31L	54, 22
13L   13R	37, 46
4L   4L	30, 20
22R   22R	30, 20

#### Ĭ C

Configuration	AAR,ADR
31L, 31R   31L	48, 20
13L   13R	28, 46
4L   4L	28, 16
22R   22R	28. 16

#### **Departure Bank**

#### YMC

Configuration	AAR,ADR	
31R   22R, 31L	34, 52	
13L   13L, 13R	18, 52	< Mornings*
4L   4L, 31L	18, 52	< Mornings*
22R   22R, 31L	22, 52	
13L   13R	37, 46	
31R, 31L   31L	34, 44	
4L   4L	22, 28	
22R   22R	22, 28	

#### MC

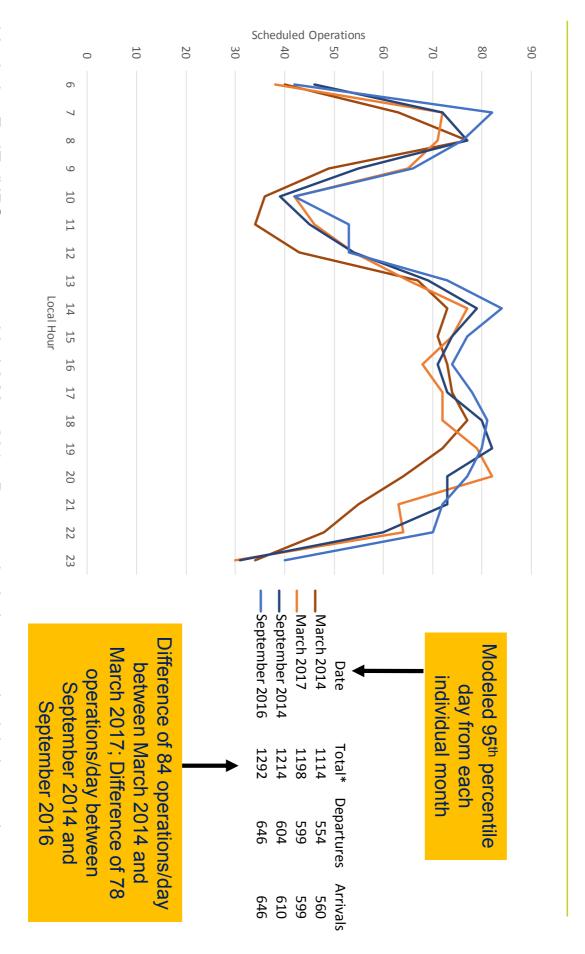
Configuration 31R   22R, 31L	<b>AAR,ADR</b> 32, 52
31R, 31L   31L	32, 44
4L   4L, 31L	18, 44
22R   22R, 31L	20, 52
13L   13R	28, 46
4L   4L	20, 27
22R   22R	20, 27

#### NOTES:

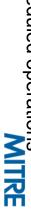
Primarily intended for morning use (0700-0959); however, not limited to morning use only Departure Bank period occurs from 0700-0959 local time and again from 1700-2259



# Total Operations by Peak (95th Percentile) Demand Days (Scheduled and Cargo Operations\*): March and September



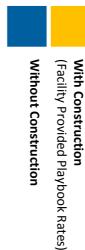
<sup>© 2017</sup> The MITRE Corporation. All rights reserved \* Includes FedEx/UPS counts provided 2 May 2014; Does not include non-scheduled operations MITRE



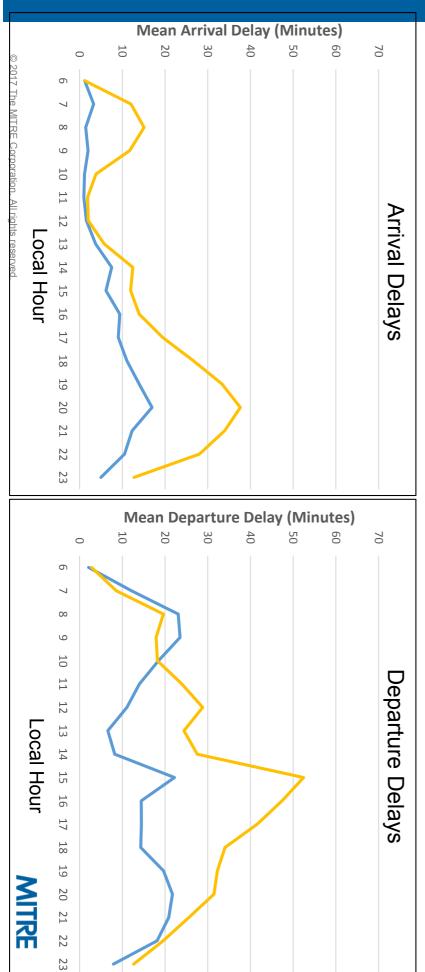
# By Hour; Average of 2013, 2014 & 2016 (Mar-May, Sep-Nov) Mean Arrival and Departure Delay per Flight: Weekdays

- These results represent an average across the entire construction period
- Month by month performance varies greatly
- Arrival delays peak in the late evening just under 40 minutes per flight
- Departure delays exceed 50 minutes per flight in the late afternoon (1500 local)
- Departure delays do not recover after morning departure push

#### Mean Delay (Modeled)



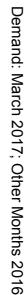
Demand: March 2017; Other Months 2016

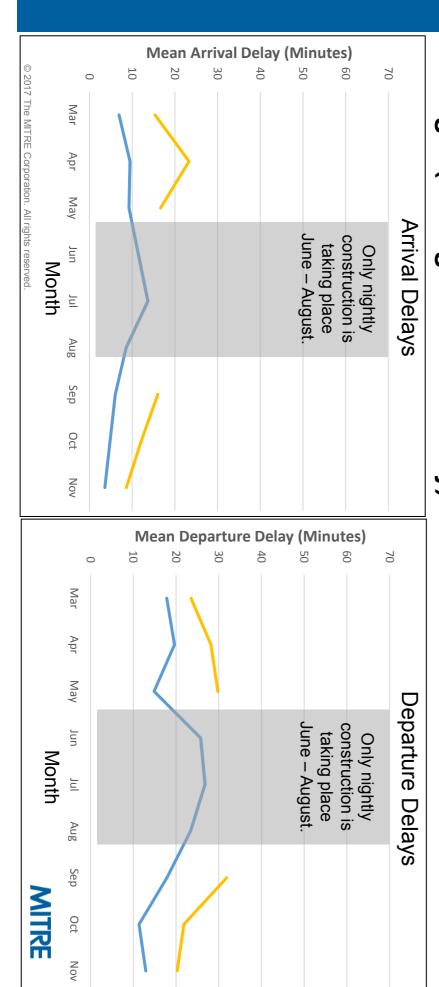


# By Month; Average of 2013, 2014 & 2016 Mean Arrival and Departure Delay per Flight: Weekdays

- the day) over 20 minutes per flight (average across Arrival delays are worst in April; peaking
- flight (average across the day) Departure delays are worst in May and September; peaking around 30 minutes per

With Construction
(Facility Provided Playbook Rates)
Without Construction





# Mean Total Delay (Arrival and Departure) per Flight: Weekdays

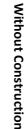
By Hour (Mar-May, Sep-Nov) and Month; Average of 2013, 2014 & 2016

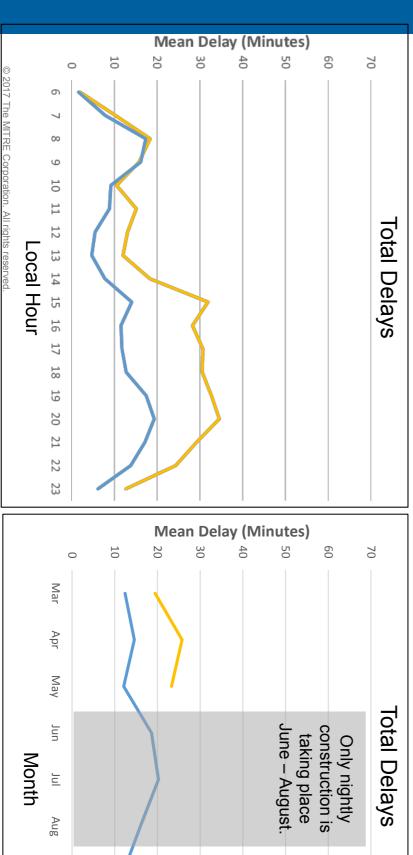
- These results represent the *average* of arrival and departure delays across all flight in a day
- Results by hour represent an average across the entire construction period
- Month by month performance varies greatly
- Average delays exceed 30 minutes per flight between 1500 and 2100 local for all but one hour

#### Mean Delay (Modeled)



With Construction
(Facility Provided Playbook Rates)





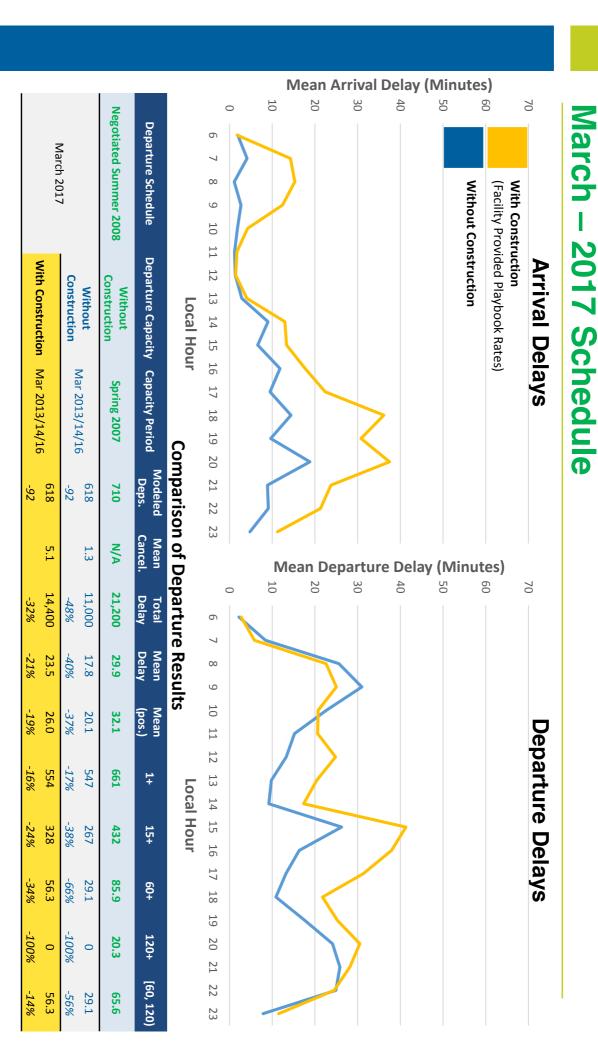
Sep

Oct

Nov



# by Hour; Average of 2013, 2014 & 2016 Mean Arrival and Departure Delay per Flight: Weekdays





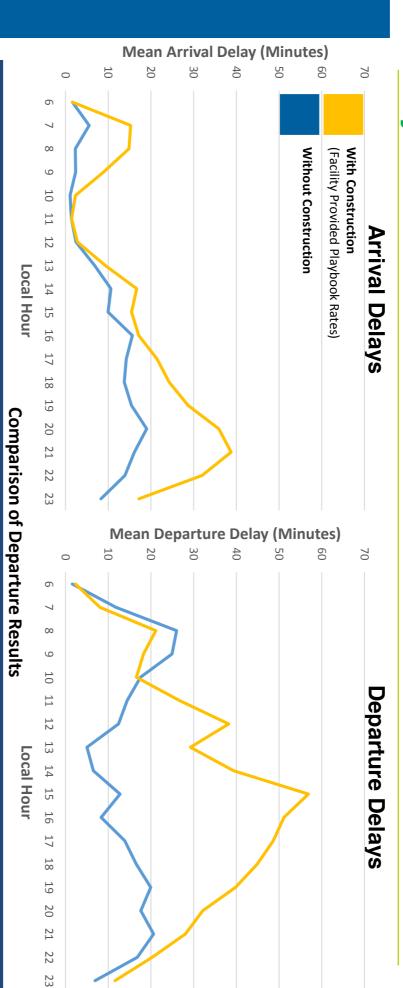
# by Hour; Average of 2013, 2014 & 2016 Mean Arrival and Departure Delay per Flight: Weekdays

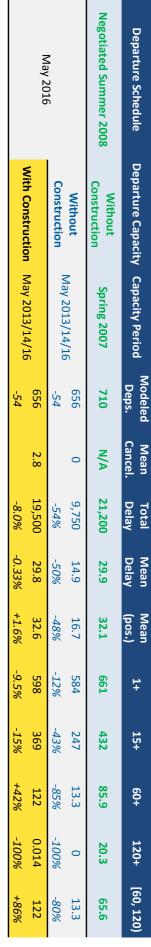




# by Hour; Average of 2013, 2014 & 2016 Mean Arrival and Departure Delay per Flight: Weekdays

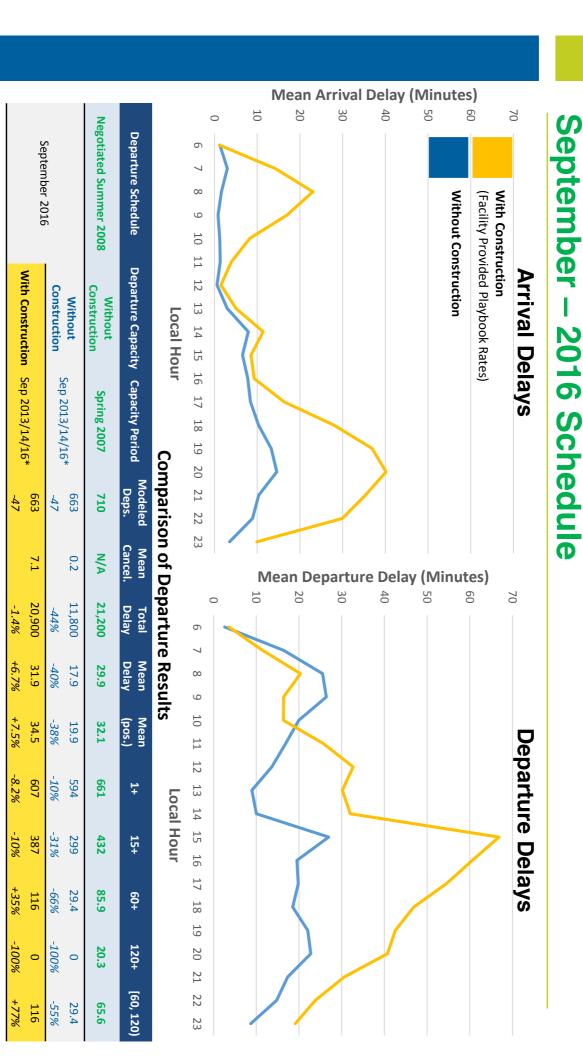
May – 2016 Schedule



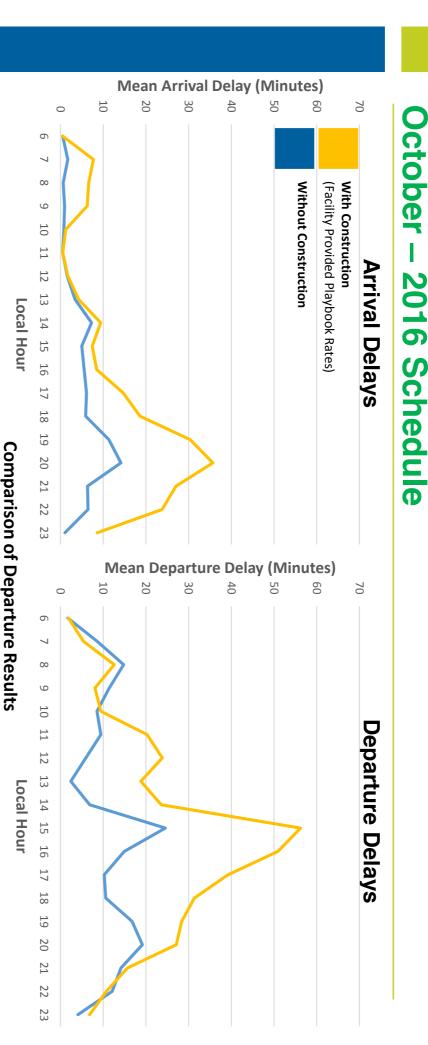




# by Hour; Average of 2013, 2014 & 2016\* Mean Arrival and Departure Delay per Flight: Weekdays







	סרוממפו לחדם	000000000000000000000000000000000000000		Mcgoriated Jaillier 2000	Negotiated Summer 2008	המסמונטות טכוות מות	
שונוו כטווצנו מכנוטוו טכנ 2013/14/16	With Construction	Construction	Without	Construction	Without	Departure capacity capacity relied	Departure Capacity
OCT 2013/14/10	Oct 2012/11/16*	OCI 2013/14/10	Oct 2012/11/16*	Spriii 6 2007	Spring 2007	capacity relion	Capacity Boriod
-80	630	-80	630	7.10	710	Deps.	Modeled Mean
	1.7		0	14/2	2	Cancel.	Mean
-35%	13,700 21.9	-66%	7,170	21,200	21 200	Delay	Total
-27%	21.9	-62%	11.4	20.0	20 0	Delay	Mean
-22%	24.9	-58%	13.4	32.1	2) 1	(pos.)	Mean
-17%	551	-19%	534	100	661	1	i F
-33%	291	-57%	186	102	123	-	ř
-37%	54.4	-97%	2.78	0.0	о О	5	n F
-100%	0	-100%	0	20.0	20 2	1001	1204
-17%	54.4	-96%	2.78	0.0	л л	[00, 120]	[60 120)



With Construction Nov 2013/14/16\*

2.7

12,500

20.3

551

-32%

-30%

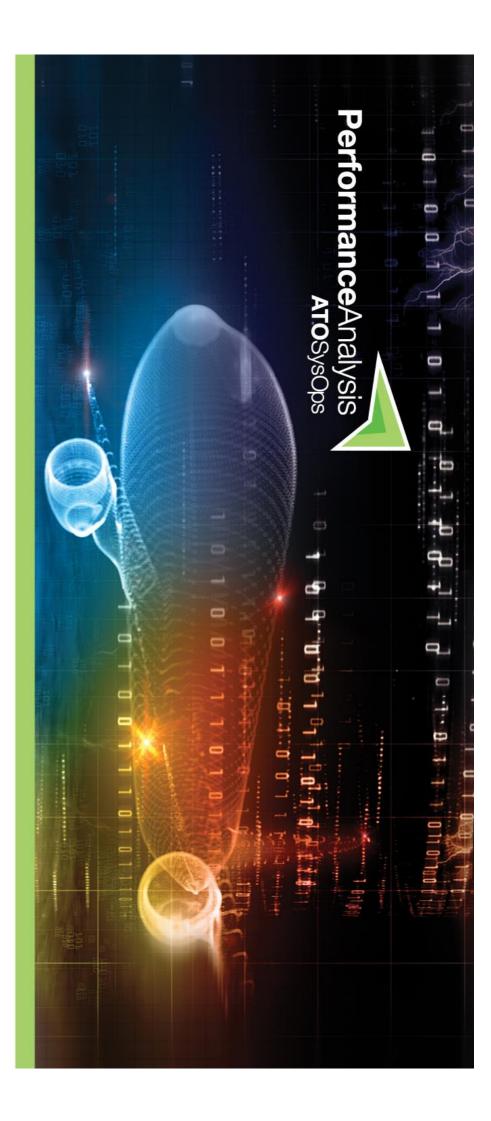
-36%

-100%

# by Hour; Average of 2013, 2014 & 2016\* Mean Arrival and Departure Delay per Flight: Weekdays







# JFK International Airport

04R/22L Runway Closure
Taxi Impact Assessment

Presented to:
JFK Stakeholders

Developed by:

Tony Chiari, Jennifer Morris Airport and Airspace Analysis

**Date:** 01/26/17



# VMC Delay and Taxi Times for Low Traffic Scenario

Configuration	VMC Average Arrival Delay	VMC Average Departure Delay	VMC Average Taxi-In Time	VMC Average Taxi-Out Time
04L   04L	71.4	2.1	6.3	10.8
04L   04L, 31L	43.4	1.6	6.3	9.0
13L   13L, 13R	14.0	2.5	7.2	11.9
13L   13R	13.0	1.6	7.2	11.6
22R   22R	64.8	2.3	7.2	8.6
22R   22R, 31L	44.5	1.1	7.2	7.3
31L, 31R   31L	1.8	2.2	7.8	7.6
31R   22R, 31L	12.7	2.3	7.4	8.3

feet with a visibility of below 3 miles. VMC defined as a celling of 2,000 feet and above with a visibility of 3 miles and greater, IMC defined as a ceiling below 2,000





# IMC Delay and Taxi Times for Low Traffic Scenario

Configuration 04L   04L	IMC Average Arrival Delay	IMC Average Departure Delay	Tax	IMC Average Taxi-In Time 6.3
04L   04L, 31L	112.5	1.4		6.3
13L   13L, 13R		VMC ONLY CONFIGURATION		NFIGURATION
13L   13R	84.7	1.4		7.2
22R   22R	145.9	1.8		7.2
22R   22R, 31L	115.5	0.9		7.1
31L, 31R   31L	<b>8</b> .5	2.3		7.8
31R   22R, 31L	84.4	1.9		7.3

feet with a visibility of below 3 miles. VMC defined as a celling of 2,000 feet and above with a visibility of 3 miles and greater, IMC defined as a ceiling below 2,000





# VMC Delay and Taxi Times for High Traffic Scenario

Configuration	VMC Average Arrival Delay	VMC Average Departure Delay	VMC Average Taxi-In Time	VMC Average Taxi-Out Time
04L   04L	92.6	1.9	6.3	10.4
04L   04L, 31L	64.3	1.7	6.3	8.9
13L   13L, 13R	32.2	2.7	7.4	12.2
13L   13R	31.9	1.7	7.4	11.7
22R   22R	87.1	2.3	7.2	8.6
22R   22R, 31L	64.9	1.2	7.2	7.3
31L, 31R   31L	2.8	2.4	7.6	7.6
31R   22R, 31L	31.0	2.4	7.5	8.6

VMC defined as a celling of 2,000 feet and above with a visibility of 3 miles and greater, IMC defined as a ceiling below 2,000 feet with a visibility of below 3 miles.





# IMC Delay and Taxi Times for High Traffic Scenario

Configuration	Arrival Delay	Departure Delay	Taxi-In Time	Taxi-Out Time
041   041	194.6	1.4	6.3	9.9
041   041, 311	149.6	1.3	6.3	8.5
13L   13L, 13R		VMC ONLY CONFIGURATION	NFIGURATION	
13L   13R	111.8	1.3	7.3	11.3
22R   22R	188.4	1.7	7.1	8.0
22R   22R, 31L	152.8	0.9	7.2	7.0
31L, 31R   31L	20.6	2.6	7.6	7.8
31R   22R, 31L	111.6	1.9	7.4	8.2

feet with a visibility of below 3 miles. VMC defined as a celling of 2,000 feet and above with a visibility of 3 miles and greater, IMC defined as a ceiling below 2,000





## **Backup Slides**

Total Delays over the Entire Construction Period

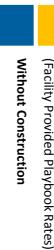


# **Departure Only Results**

#### Mean Departure Delay (Minutes) 10 © 2017 The MITRE Corporation. All rights reserved. 6 $\infty$ 9 10 11 12 13 14 **Local Hour** 16 17 18 19 Comparison of Departure Results 20 21 22

## Mean Departure Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016 March – 2017 Schedule

## Mean Departure Delay (Modeled)



With Construction

Without Construction

all hours Results are based on 2017 "plus-ups" and 2013/14/16 capacity,

20

30

50

60

70

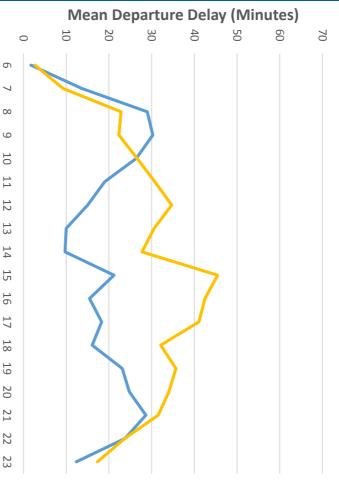
40

	Midicil 2017	A 200 17		Negotiated Sullillel 2008	orotistod Cummor 2008	Debaitale ochedale	
with construction   Mar 2013/14/16	With Construction	Construction	Without	Construction	Without	Departure capacity capacity relied	Departure Capacity
Midi 2013/14/10	70121116	NIGI 2013/14/10	Mar 2012/11/16	Spring 2007	Spring 2007	capacity relied	Capacity Dariod
-92	618	-92	618	01.7	710	Deps.	Modeled
	5.1		1.3	14/21	2	Cancel. Delay	Mean
-32% -21%	5.1 14,400 23.5	-48%	1.3 11,000 17.8	N/A 21,200	21 200	Delay	Total
-21%	23.5	-40%	17.8	23.3	30 0	Delay	Mean
-19%	26.0	-37%	20.1	7.1	2	(pos.)	Mean
-16%	554	-17%	547	100	661	5	‡
-24%	328	-38%	267	432	127	Ę	17.
-34%	56.3	-66%	29.1	0.00	0	5	60 F
-100%	0	-100%	0	20.5	200	107	120+
-14%	56.3	-56%	29.1	00.0	ה ה	נסט, דבט)	[60 120]



# Average of 2013, 2014 & 2016 Mean Departure Delay per Flight: Weekdays by Hour;

April – 2016 Schedule



### Mean Departure Delay (Modeled)

(Facility Provided Playbook Rates)

With Construction

Without Construction

Results are based on 2016 schedule and 2013/14/16 capacity, all

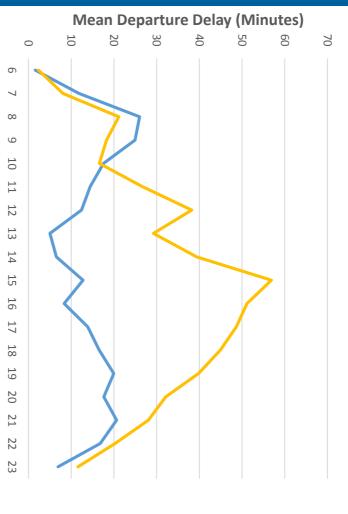
**Comparison of Departure Results** 22

**Local Hour** 

Departure Schedule  Negotiated Summer 2008	Departure Capacity Capacity Period Without Construction Spring 2007	Capacity Period Spring 2007	Modeled Mean Deps. Cancel. 710 N/A	Mean Cancel.	Mean Total Mean Cancel. Delay Delay N/A 21,200 29.9	Mean Delay 29.9	Mean (pos.) 32.1	1+	15+ 432	60+ 85.9	120+ 20.3	
Negotiated Summer 2008	Without Construction	Spring 2007	710	N/A	21,200	29.9	32.1	661	432	85.9		20.3
	Without	31/11/2002 30/1	651	0.5	12,800 19.6	19.6	21.8	587	307	39.2		0
A 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Construction	Abi 2015/14/10	-59		-40%	-34%	-32%	-11%	-29%	-54%	-1(	-100%
April 2010	With Construction	Apr 2012/1/16	651	8.2	18,100 28.2	28.2	30.6	592	361	92.3		0
	with construction Apr 2013/14/10	Abi 2013/14/10	-59		-15% -5.7%	-5.7%	-4.7%	-10%	-16%	+7.5%	-1(	-100%
										I		



## Mean Departure Delay per Flight: Weekdays by Hour; May - 2016 Schedule Average of 2013, 2014 & 2016



## Mean Departure Delay (Modeled)

**S** = 1

With Construction

(Facility Provided Playbook Rates)

Without Construction

Results are based on 2016 schedule and 2013/14/16 capacity, all hours

## **Comparison of Departure Results**

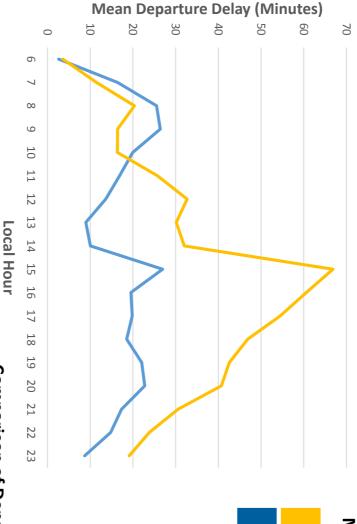
**Local Hour** 

Departure Schedule	Departure Capacity Capacity Period Without Spring 2007	Capacity Period	Modeled Mean Deps. Cancel		Total Delay	Mean Delay	Mean (pos.)	1+	15+ 432	60+	120+
Negotiated Summer 2008	Without Construction	Spring 2007	710	N/A	21,200	29.9	32.1	661	432	85.9	20.3
	Without	31/11/2100	656	0	9,750 14.9	14.9	16.7	584	247	13.3	0
May 2016	Construction	IVIdy 2013/14/10	-54		-54%	-50%	-48%	-12%	-43%	-85%	-100%
OTO APIAL	With Construction	1/1/2000 velv	656	2.8	19,500 29.8	29.8	32.6	598	369	122	0.014
	with construction living 2013/ 14/ 10	May 2013/14/10	-54		-8.0% -0.33%	-0.33%	+1.6%	-9.5%	-15%	+42%	-100%



# Mean Departure Delay per Flight: Weekdays by Hour;

# **Average of 2013, 2014 & 2016\* September – 2016 Schedule**



### Mean Departure Delay (Modeled)



#### With Construction

(Facility Provided Playbook Rates)

Without Construction

Results are based on 2016 schedule and 2013/14/16\* capacity, all hours

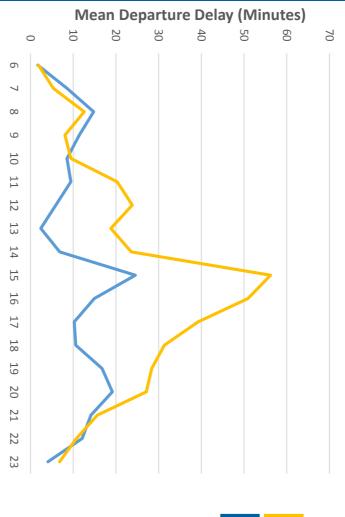
## **Comparison of Departure Results**

Departure Schedule	Departure Capacity Capacity Period	Capacity Period	Modeled Deps.	Mean Cancel.	Total Delay	Mean Delay	Mean (pos.)	1	15+	60+	120+	[60, 120
Negotiated Summer 2008	Without Construction	Spring 2007	710	N/A	N/A 21,200 29.9	29.9	32.1	661	432	85.9	20.3	65.6
	Without	*31/11/5105	663	0.2	0.2 11,800 17.9	17.9	19.9	594	299	29.4	0	29.4
Contombor 2016	Construction	3eb 2013/14/10	-47		-44%	-40%	-38%	-10%	-31%	-66%	-100%	-55%
septeniber zoto	With Construction	Son 2012/11/16*	663	7.1	7.1 20,900 31.9	31.9	34.5	607	387	116	0	116
	with construction sep 2013/14/10	3eb 2013/14/10	-47		-1.4% +6.7%	+6.7%	+7.5%	-8.2%	-10%	+35%	-100%	+77%
										- 1		



# Mean Departure Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016\*

October – 2016 Schedule



### Mean Departure Delay (Modeled)

With Construction

(Facility Provided Playbook Rates)

Without Construction

Results are based on 2016 schedule and 2013/14/16\* capacity, all hours

## **Comparison of Departure Results**

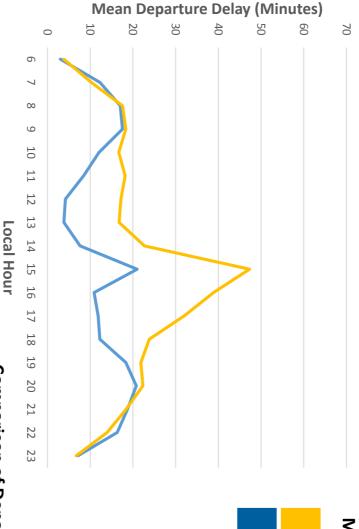
**Local Hour** 

Departure Schedule	Departure Capacity Capacity Period	Capacity Period	Modeled Deps.	Mean Cancel.	Total Delay	Mean Delay	Mean (pos.)	¥	15+	60+	120+	[60, 120)
Negotiated Summer 2008	Without Construction	Spring 2007	710	N/A	21,200 29.9	29.9	32.1	661	432	85.9	20.3	65.6
	Without	Oct 2012/11/16*	630	0	7,170 11.4	11.4	13.4	534	186	2.78	0	2.78
000000000000000000000000000000000000000	Construction	OCI 2013/14/16	-80		-66%	-62%	-58%	-19%	-57%	-97%	-100%	-96%
Octobel 2010	With Construction	Oct 2012/11/16*	630	1.7	1.7 13,700 21.9	21.9	24.9	551	291	54.4	0	54.4
	אונוו כטוואנו שכנוסוו   סכנ 2013/ 14/ 18	Ott 2013/14/16	-80		-35% -27%	-27%	-22%	-17%	-33%	-37%	-100%	-17%



# Mean Departure Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016\*

# November – 2016 Schedule



### Mean Departure Delay (Modeled)

With Construction

(Facility Provided Playbook Rates)

Without Construction

Results are based on 2016 sche

Results are based on 2016 schedule and 2013/14/16\* capacity, all hours

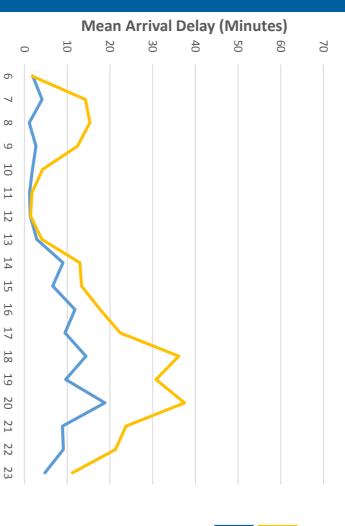
## Comparison of Departure Results

With Construction	NOVELLIDEI ZOTO	Construction	Without	Negotiated Summer 2008 Construction	Without	בילים ימים ביורמים בילים ימים בילים בי	
With construction Nov 2013/14/16	No. 2012/11/16*	NOV 2013/14/10	Nov 2012 /1 // 1/ 8*	Spring 2007		Departure Capacity Capacity Conton	ity Capacity Beriod
-93	617	-93	617	/10		Deps.	Modeled Mean
	2.7		0	N/A		Cancel.	Mean
-41%	12,500 20.3	-62%	7,980 12.9	21,200		Delay	Total
-32%	20.3	-57%	12.9	29.9	3	Delay	Mean
-30%	22.6	-54%	14.8	32.1	3	(pos.)	Mean
-17%	551	-19%	538	661		:	ř
-36%	275	-51%	213	432		į	17.
-46%	46.8	-90%	8.63	85.9		9	n F
-100%	0	-100%	0	20.3		120	120+
-29%	46.8	-87%	8.63	65.6		100, 120,	[60 120)



# **Arrival Only Results**

### Mean Arrival Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016 March – 2017 Schedule



#### Mean Arrival Delay (Modeled)

(Facility Provided Playbook Rates)

#### With Construction

Without Construction

Results are based on 2017 "plus-ups" and 2013/14/16 capacity,

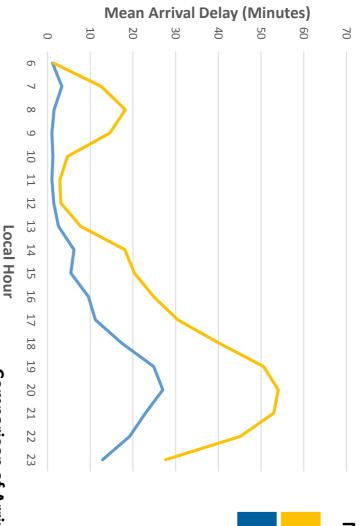
#### **Comparison of Arrival Results**

**Local Hour** 

	MIGICII ZOTI	March 2017		Negotiated Summer 2008		Allivai Sciledale	Arrival Schodulo
AATTI COIISTI ACTION	With Construction Mar 2013/11/16	Construction	Without	Construction	Without	Annual capacity capacity relied	Arrival Capacity
Mai 2013/14/10	Mar 2013/11/16	Mai 7013/14/10	Mar 2012/11/16	Spring 2007	•	capacity Fellou	Capacity Davion
-105	615	-105	615	720		Arrs.	Modeled Mean
	4.1		0.1	N/A		Cancel.	Mean
-46%	4.1 9,370 15.3	-75%	0.1 4,270 6.94	N/A 17,400 24.2		Delay	Total
-37%	15.3	-71%	6.94	24.2		Delay	Mean
-31%	18.9	-67%	9.11	27.2		(pos.)	Mean
-20%	495	-25%	468	622		1	Ē
-40%	180	-73%	79.9	298		5	Î,
-46%	43.6	-90%	8.02	80.8		5	e F
-100%	0	-100%	0	25.2		107	1201
-22%	43.6	-86%	8.02	55.6		[00, TZ0]	[60 120)



### Mean Arrival Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016 April – 2016 Schedule



#### Mean Arrival Delay (Modeled)

(Facility Provided Playbook Rates)

With Construction

Without Construction

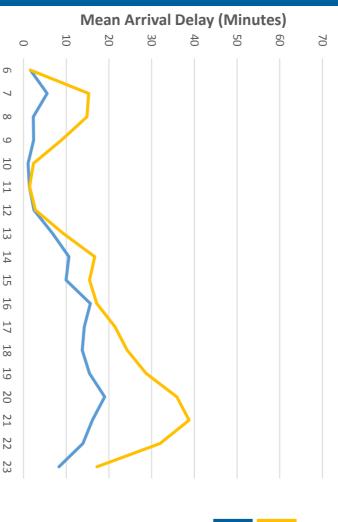
Results are based on 2016 schedule and 2013/14/16 capacity, all

#### **Comparison of Arrival Results**

	April 2010	A 55:1 2016		Megoriaren aniiiilei 2000	Nogotistod Summor 2000	Airival Scheddle	Arrival Schodulo
with construction whi zotal tal to	With Construction	Construction	Without	Construction	Without	Arrival capacity capacity relicu	Arrival Canacity
WDI 2013/14/10	Apr 2012/11/16	Abi 2013/14/10	Apr 2012/11/16	opring 2007	2007	capacity relion	Capacity Dariod
-69	651	-69	651	/20	720	Arrs.	Modeled Mean
	9.9		1.3	N/A		Cancel.	
-14%	9.9 15,000 23.3	-64%	1.3 6,180 9.52	17,400	17 400	Delay	Total
-3.7%	23.3	-61%	9.52	24.2	,	Delay	Mean
+1.1%	27.5	-55%	12.2	21.2	77 7	(pos.)	Mean
-13%	544	-19%	506	270	677	1	F .
-11%	264	-63%	110	230	300	Ļ	Î
-4.2%	77.4	-72%	22.7	00.0	000	9	£
-100%	0.001	-100%	0	25.2	) )	107	1201
+39%	77.4	-59%	22.7	0.00	E E E	נסט, בבט)	[60 120)



### Mean Arrival Delay per Flight: Weekdays by Hour; May - 2016 Schedule Average of 2013, 2014 & 2016



#### Mean Arrival Delay (Modeled)

(Facility Provided Playbook Rates)

With Construction

Without Construction

Results are based on 2016 schedule and 2013/14/16 capacity, all

#### **Comparison of Arrival Results**

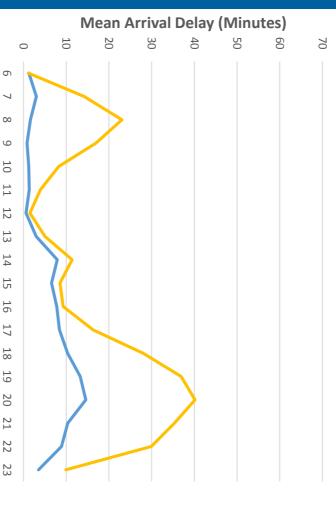
**Local Hour** 

	INIAA TOTO	May 2016		ואפקטנומנכט טמווווווכו בטסס	Negotiated Summer 2008		Arrival Schodulo
With Construction (May 2013/ 14) 10	With Construction	Construction	Without	Construction	Without	Citival Capacity Capacity College	Arrival Capacity
INIAY 2013/14/10	M21 2012 /1 / 16	IVIAY 2013/14/10	May 2012/11/16	Spring 2007	Spring 2007	capacity i ellou	Capacity Dariod
-67	653	-67	653	720	720	Arrs.	Modeled Mean
	6.1		0.7	14/2	2	Cancel.	Mean
-38%	6.1 10,800 16.7	-65%	0.7 6,040 9.26	17,400	N/A 17 ADD 24 2	Delay	Total
-31%	16.7	-62%	9.26	2.4.2	24.2	Delay	Mean
-29%	19.2	-58%	11.4	2.77	777	(pos.)	Mean
-10%	562	-15%	531	022	633	•	÷
-31%	207	-63%	110	230	208	ţ	ţ
-39%	49.4	-78%	18.1	00.0	× × × × × × × × × × × × × × × × × × ×	5	5
-100%	0	-100%	0	2.62	<b>25.</b> 2	120	120+
-11%	49.4	-67%	18.1	00.0	л л	[00, 120]	[60 120)



## Mean Arrival Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016\*

September – 2016 Schedule



#### Mean Arrival Delay (Modeled)

(Facility Provided Playbook Rates)

With Construction

Without Construction

Results are based on 2016 schedule and 2013/14/16\* capacity,

#### **Comparison of Arrival Results**

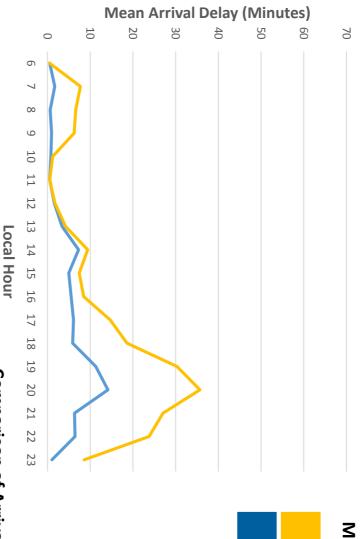
**Local Hour** 

-11%	663 3.4 10,600 16.0 19.0 555	Construction Sep 2013/14/10 -57 -77% -75% -71% -19%	663 0.5 4,030 6.08 7.97 506	on Spring 2007 /20 N/A 1/,400 24.2 27.2 622	Without	Arrs. Cancel. Delay Delay (pos.)	Modeled Mean Total Mean Mean
	3.4		0.5	N/A		Cancel.	Mean
-39%	10,600	-77%					
-34%	16.0	-75%	6.08	24.2		Delay	Mean
-30%	19.0	-71%	7.97	21.2		(pos.)	Mean
-11%	555	-19%	506	622	3	1	i F
-24%	227	-77%	67.1	298	3	ָּבָּ	Ì
-52%	38.4	-89%	9.20	80.8		2	E C
-100%	0	-100%	0	25.2	1	1071	1201
-31%	38.4	-83%	9.20	55.6	1	ניט, דבט	[60 130



## Mean Arrival Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016\*

October – 2016 Schedule



#### Mean Arrival Delay (Modeled)

(Facility Provided Playbook Rates)

With Construction

Without Construction

Results are based on 2016 schedule and 2013/14/16\* capacity,

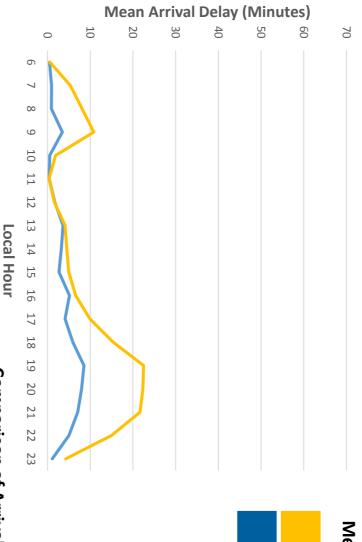
#### **Comparison of Arrival Results**

Arrival Capacity Capacity Period	Arrs.	Cancel.	Delay	Delay	(pos.)	ţ	15+	δ <u>+</u>	+07T	[60, 120)
g 2007	720	N/A	17,400	24.2	27.2	622	298	80.8	25.2	55.6
3/1/1/6*	618	0	2,990	4.84	6.55	456	52.9	2.53	0	2.53
.5/ 14/ 10	-102		-83%	-80%	-76%	-27%	-82%	-97%	-100%	-95%
3/1/1/6*	618	1.3	7,490	12.1	15.0	498	166	19.0	0	19.0
01/41/	-102		-57%	-50%	-45%	-20%	-44%	-76%	-100%	-66%
	Without Spring 2007 Construction Oct 2013/14/16* With Construction Oct 2013/14/16*		720 N/A 618 0 -102 618 1.3	720 N/A 618 0 -102 618 1.3	720 N/A 17,400 618 0 2,990 -102 -83% 618 1.3 7,490 -102 -57%	720 N/A 17,400 24.2 618 0 2,990 4.84 -102 -83% -80% 618 1.3 7,490 12.1 -102 -57% -50%	720 N/A 17,400 24.2 27.2  618 0 2,990 4.84 6.55  -102 -83% -80% -76%  618 1.3 7,490 12.1 15.0  -102 -57% -50% -45%	720 N/A 17,400 24.2 27.2 622 618 0 2,990 4.84 6.55 456 -102 -83% -80% -76% -27% 618 1.3 7,490 12.1 15.0 498 -102 -57% -50% -45% -20%	720         N/A         17,400         24.2         27.2         622         298           618         0         2,990         4.84         6.55         456         52.9           -102         -83%         -80%         -76%         -27%         -82%           618         1.3         7,490         12.1         15.0         498         166           -102         -57%         -50%         -45%         -20%         -44%	720         N/A         17,400         24.2         27.2         622         298         80.8           618         0         2,990         4.84         6.55         456         52.9         2.53           -102         -83%         -80%         -76%         -27%         -82%         -97%           618         1.3         7,490         12.1         15.0         498         166         19.0           -102         -57%         -50%         -45%         -20%         -44%         -76%



## Mean Arrival Delay per Flight: Weekdays by Hour; Average of 2013, 2014 & 2016\*

November – 2016 Schedule



#### Mean Arrival Delay (Modeled)

(Facility Provided Playbook Rates)

With Construction

Without Construction

Results are based on 2016 schedule and 2013/14/16\* capacity,

#### **Comparison of Arrival Results**

	ואסאבוווחבו לסדם	No.combox 2016		Negotiated Summer 2008	Arrival Schedule
with construction Nov 2013/14/10	With Construction	Construction	Without	Construction	Arrival Capacity Capacity Period
NOV 2013/14/10	*31/11/C*	1407 2013/14/10	NOV 2012 /1 // 6*	Spring 2007	Capacity Period
-103	617	-103	617	720	Modeled Arrs.
	0.9		0	N/A	Mean Cancel.
-69%	0.9 5,330 8.64	-87%	2,230 3.61	N/A 17,400 24.2	Total Delay
-64%	8.64	-85%	3.61	24.2	Mean Delay
-59%	11.1	-82%	4.96	27.2	Mean (pos.)
-23%	479	-28%	449	622	¥
-60%	119	-89%	33.6	298	15+
-83%	13.7	-100%	0.095	80.8	60+
-100%	0	-100%	0	25.2	120+
-75%	13.7	-100%	0.095	55.6	[60, 120)



## Average of 2013, 2014 & 2016\* Total Delays: Weekdays, Saturdays, & Sundays

		1,940,570	1,940			
		on (Minutes)	Difference from Construction (Minutes)	Difference fi		
	4,197,527			2,256,957		<b>Grand Total</b>
576,783	389,321	3,231,423	304,526	191,730	1,760,701	Sub-Totals
30,685	24,096	213,479	18,375	12,593	122,458	November
101,868	49,895	467,119	49,800	22,857	223,452	October
78,599	53,700	597,860	36,577	23,169	301,550	September
						August
Only	Nightly Construction Only	Nigi	Only	Nightly Construction Only	Nig	July
						June
120,619	82,061	695,948	57,084	36,138	363,187	May
151,551	107,306	661,692	82,739	53,028	379,219	April
93,461	72,264	595,325	59,951	43,947	370,835	March
Sundays: All Day	Saturdays: All Day	Weekdays: All Day	Sundays: All Day	Saturdays: All Day	Weekdays: All Day	
ion ook Rates)	With Construction Provided Playbook Rates)	Wi (Facility Pr	ction	Without Construction	With	
Month	truction for Each I	vs. Without Cons	Total Minutes of Delay With Construction vs. Without Construction for Each Month	Minutes of Delay	Total	

\*Preliminary: 2016 capacity data has not been finalized. Demand: March 2017, all other months 2016



# Average of 2013, 2014 & 2016\* Departure Delays: Weekdays, Saturdays, & Sundays

With Construction         With Construction           Eekdays: All Day			1,033,910	1,033			
With Construction           Saturdays: All Day Day         Weekdays: All Saturdays: All Day Day           29,802         42,553         362,222         36,873           33,299         54,002         362,622         54,319           21,458         35,503         448,133         50,615           ightly Construction Only         Nightly Construction C           16,164         26,739         35,874         302,405         31,482           9,540         14,309         149,571         16,462         31,482           125,991         208,979         2,022,192         225,811           1,567,197         2,001,107         2,601,107			on (Minutes)	om Constructi	Difference fr		
With Construction           With Construction           Saturdays: All Day Day         Sundays: All Day Day         Weekdays: All Day Day         Saturdays: All Day Day         Weekdays: All Day Day         Saturdays: All Day Day         Weekdays: All Day Day         Saturdays: All Day Day         Day Day         Day Day         Day		2,601,107			1,567,197		<b>Grand Total</b>
With Construction           Saturdays: All Day Day         Sundays: All Day Day         Weekdays: All Saturdays: All Day Day         Weekdays: All Saturdays: All Day Day         Weekdays: All Saturdays: All Day Day         Day Day         Day Day         Day	353,105	225,811	2,022,192	208,979	125,991	1,232,227	Sub-Totals
With Construction           With Construction           Saturdays: All Day Day         Sundays: All Day Day         Weekdays: All Day Day         Saturdays: All Day Day         Weekdays: All Day Day         Saturdays: All Day Day         Mack Distriction Only         Saturdays: All Day Day         Saturdays: All Day         Saturdays: A	20,797	16,462	149,571	14,309	9,540	95,704	November
With Construction           Saturdays: All Day Day         Sundays: All Day Day         Weekdays: All Saturdays: All Day Day           29,802         42,553         362,222         36,873           33,299         54,002         362,622         54,319           21,458         35,503         448,133         50,615           ightly Construction Only         Nightly Construction C           16,164         26,739         397,239         36,060	66,054	31,482	302,405	35,874	15,729	157,668	October
With Construction           Saturdays: All Day Day         Sundays: All Day Day Day S1,553 33,299 54,002 21,458 35,503         Weekdays: All Day Day Day Day Day Day Day Day S4,002 362,622 54,319 362,622 54,319 362,622 50,615         With Construction Only           Ightly Construction Only         Nightly Construction C	53,359	36,060	397,239	26,739	16,164	225,009	September
With Construction           Saturdays: All Day         Sundays: All Day Day         Weekdays: All Day Day Day         Weekdays: All Saturdays: All Day Day         Weekdays: All Day Day Day         Weekdays: All Day Day         Day <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>August</td>							August
With Construction           Saturdays: All Day Day         Sundays: All Day Day Day 29,802         Weekdays: All Day Day Day Day Day 33,299         54,002 362,622         362,622 54,319 35,503         448,133 50,615	Only	htly Construction	Nig	Only	htly Construction	Nigı	July
## With Construction  Saturdays: All Day Day Day Day Day 29,802 42,553 33,299 54,002 21,458 35,503 448,133 50,615							June
Saturdays: All Day Day Day Day September 29,802 42,553 33,299 54,002 362,622 36,873	77,657	50,615	448,133	35,503	21,458	224,328	May
Saturdays: All Day Day Day Day 29,802 42,553 362,222 36,873	83,088	54,319	362,622	54,002	33,299	255,526	April
thout Construction  Saturdays: All Day  Day  With Construction  (Facility Provided Playb)  Weekdays: All Saturdays: All Day  Day  Day  Day  One Day  Day  One Day  Day  One Day  One Day  Day  One Day  O	52,150	36,873	362,222	42,553	29,802	273,992	March
W (Facility Pr	Sundays: All Day	Saturdays: All Day	Weekdays: All Day	Sundays: All Day	Saturdays: All Day	Weekdays: All Day	
local Milliages of Detay Antic Collection Ass. Anticoat Collection for Each Molitic	ion ook Rates)	ith Construct ovided Playb	Wi (Facility Pr	ction	out Constru	With	
Total Minutes of Delay With Construction vs. Without Construction for Each Month	Month	truction for Each I	vs. Without Cons	With Construction	Minutes of Delay	Total	

\*Preliminary: 2016 capacity data has not been finalized. Demand: March 2017, all other months 2016



## Average of 2013, 2014 & 2016\* Arrival Delays: Weekdays, Saturdays, & Sundays

		,660	906,660			
		on (Minutes)	Difference from Construction (Minutes)	Difference fr		
	1,596,420			689,760		<b>Grand Total</b>
223,679	163,510	1,209,231	95,547	65,739	528,474	Sub-Totals
9,889	7,633	63,908	4,066	3,053	26,754	November
35,814	18,412	164,714	13,926	7,128	65,783	October
25,240	17,640	200,621	9,839	7,004	76,541	September
						August
Only	Nightly Construction Only	Nigi	Only	Nightly Construction Only	Nig	July
						June
42,963	31,446	247,815	21,581	14,680	138,859	May
68,463	52,988	299,070	28,738	19,729	123,693	April
41,311	35,391	233,104	17,398	14,145	96,844	March
Sundays: All Day	Saturdays: All Day	Weekdays: All Day	Sundays: All Day	Saturdays: All Day	Weekdays: All Day	
ion ook Rates)	With Construction Provided Playbook Rates)	Wi (Facility Pr	ction	Without Construction	With	
Month	truction for Each N	vs. Without Cons	Total Minutes of Delay With Construction vs. Without Construction for Each Month	Minutes of Delay	Total	

\*Preliminary: 2016 capacity data has not been finalized. Demand: March 2017, all other months 2016



# John F. Kennedy International Airport

# 2017 Construction

NY District/NYAPIO Delay Reduction Initiatives Meeting

Eastern Regional Office January 26, 2017

# **Airside Construction Projects**



# Rehabilitation of Runway 4R22L Planned Construction Phasing

# Phase I - 1st Full Runway Closure – 94 Days (Feb 27- June 1, 2017)

- → Runway fully paved
- →Runway will be returned to operations on June 1 with edge lights only

Note: Phase I duration does not include any contingency days for weather and unforeseen conditions

# Phase II - Nightly Closures (00:00 – 07:00) (June 1 – Sept 4, 2017)

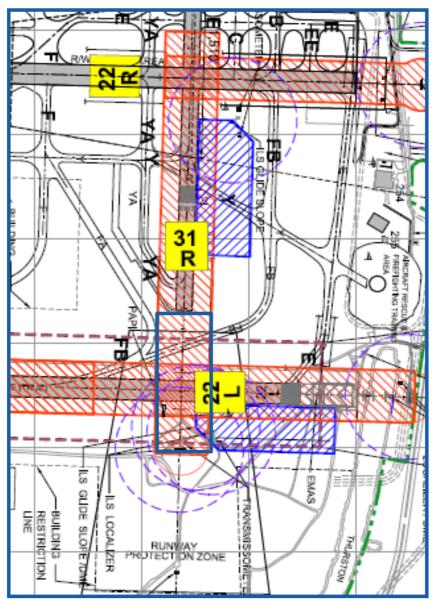
- →Adjustment to grade of centerline lights, two sets of Touch Down Zone lights, and lead-off lights
- → Work Outside RSA no time constraints

# Phase III - 2<sup>nd</sup> Full Runway Closure - 73 days (Sept 5 - Nov 17, 2017)

- → Decommissioning of Taxiways F and H
- → Construction of New F & H (within RSA)
- → Widening and rehabilitation portions of Taxiways E and Z
- → Rehabilitation of portion of Taxiway J
- → Drainage Outfalls 20 and 21
- →Any remaining runway scope that was not completed due to potential delays in Phases I & II
- → Any remaining work outside RSA

#### Stage 1A and 1B - Impact to Runway 13L Localizer Construction Staging - Phase I Feb 27 - Jun 1, 2017

- → The critical area of the 13L localizer overlaps with the construction area of Runway 4R-22L
- → All pre-paving work in this area will commence at night when Runway 13L is closed to operations, when operating on Runway 31R, or will utilize daily releases
- → Six (6) 72-hour 13L localizer shutdowns will be requested for drainage installations.
- → The Contractor to request access to the area 45 days prior to start excavation and drainage installation.
- → The area will be restored to grade at the end of each working period.



#### Note:

First 72-hour 13L localizer shutdown is tentatively scheduled to begin on March 7, 2017 (weather dependent).