



Chicago O'Hare International Airport Fleet Mix in Fly Quiet Hours and Runway Length Requirements

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Flight Data Set October 19 to September 10, 2015 **Before Runway 10R-28L Opening**

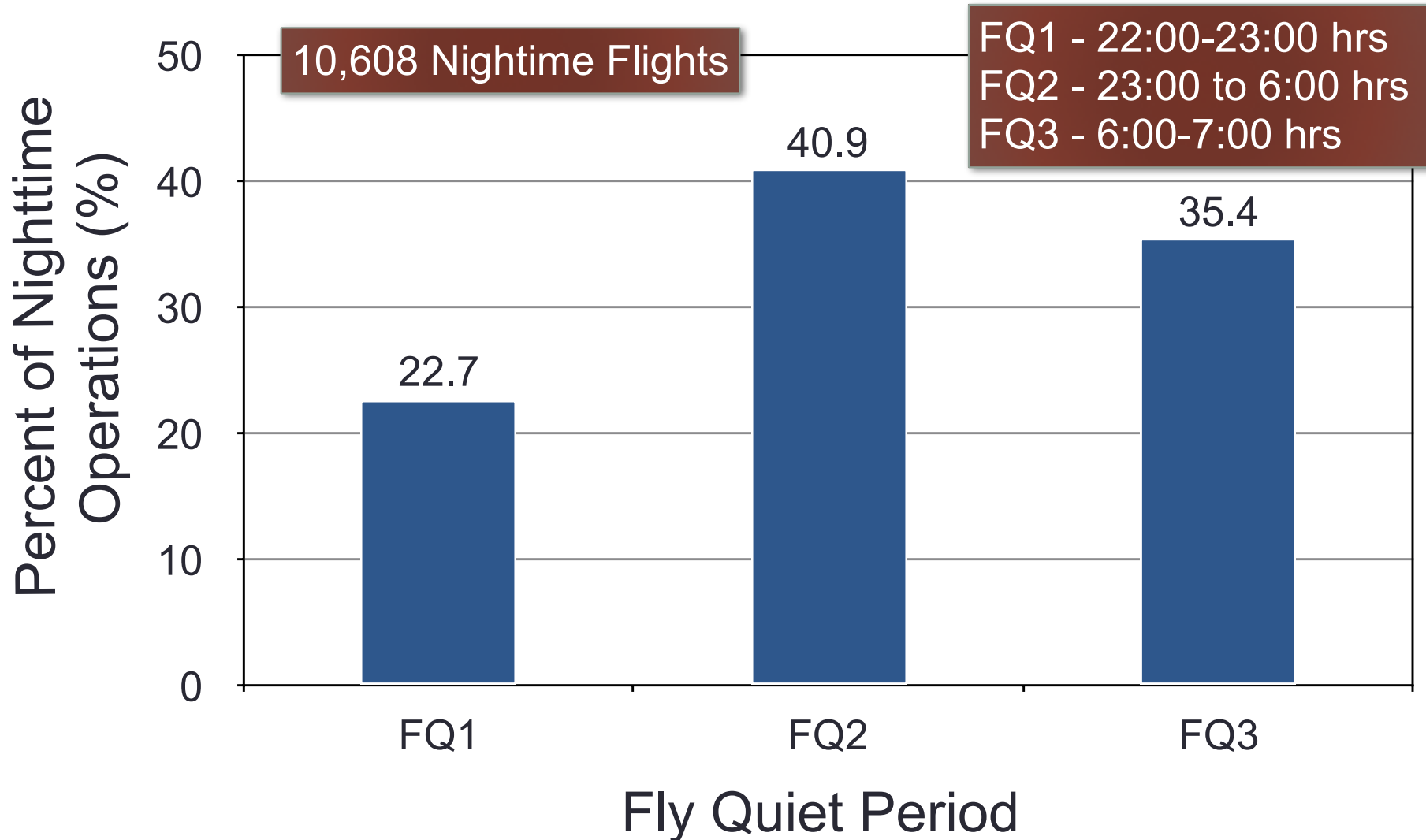


CDA Data Analysis

- Derived a fleet mix operating at ORD using a partial set of flight data provided by CDA and LBA
- **Data set includes all flights between October 19 and September 10, 2015**
- 95,136 total flights
 - 84,528 daytime flights (88.8%)
 - 10,608 nighttime flights (11.2%) - total FQ flights
- Fly Quiet periods and hours
 - FQ1 between 10-11:00 PM
 - FQ2 between 11:00 PM and 6:00 AM
 - FQ3 between 6:00 and 7:00 AM



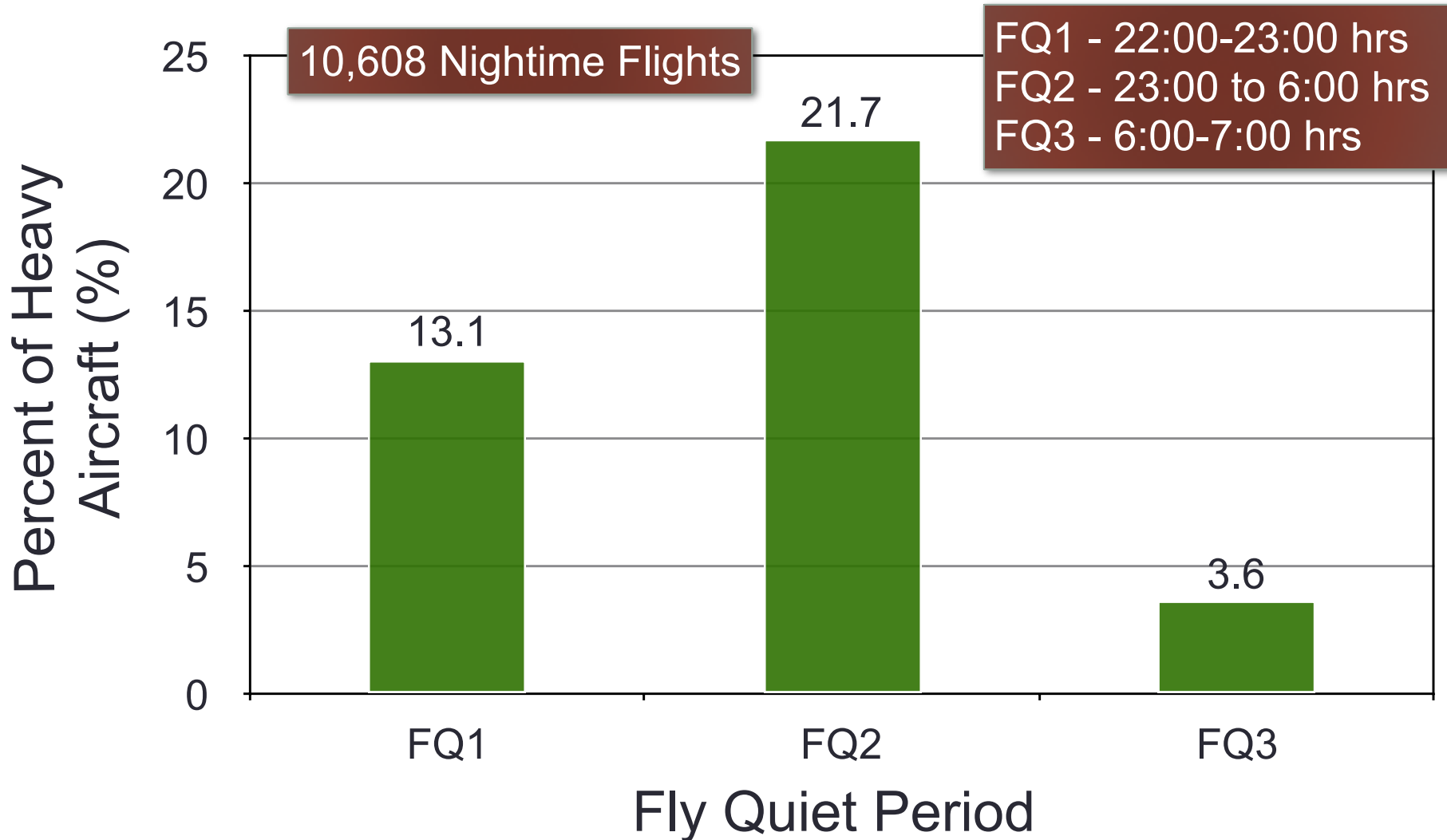
Percent Operations During Fly Quiet Period



source of data: CDA (10,608 flights in FQ between Oct/19/15 and Sep/10/15)



Percent of Heavy Operations During FQ Hours



source of data: CDA (10,608 flights in FQ between Oct/19/15 and Sep/10/15)



Heavy Aircraft Operating During FQ Hours

<i>Aircraft</i>	<i>Percent in FQ (%)</i>	<i>Aircraft</i>	<i>Percent in FQ (%)</i>
74N	0.57	B763	1.79
A30	2.87	B764	0.43
A306	8.39	B772	7.53
A30B	0.43	B773	0.14
A332	0.14	B77L	14.84
A333	1.94	B77W	5.09
A343	2.37	B788	1.08
A346	0.22	DC10	7.17
B744	19.57	MD10	1.72
B748	15.48	MD11	4.23
B74F	0.14	B763	1.79
B762	3.87		

source of data: CDA (1,395 flights by heavy aircraft in FQ hours between Oct/19/15 and Sep/10/15)



Runway Operations by Heavy Aircraft in FQ Hours

<i>Runway</i>	<i>Percent Operations by Heavy Aircraft</i>
10C	13.91
10L	13.41
14R	1.72
22L	3.30
27L	1.65
28C	21.65
28R	25.23
32L	18.35
4R	0.36
9R	0.43

source of data: CDA (1,587 flights by heavy aircraft in FQ hours between Oct/19/15 and Sep/10/15)



Preliminary Observations

- The percent of nighttime operations at ORD is around 0.7% higher than the flight operations data provided by CDA for selected days in 2014
- The peak hour use for heavy aircraft operations at ORD during FQ hours is the period 22:00-23:00 hours
- Larger number of heavy aircraft operate in the long FQ2 hours (23:00 PM to 6:00 AM) but at a lower tempo per hour
- 35.4% of the total ORD nighttime flights occur between 6:00 to 7:00 AM



Preliminary Observations (2)

- Between 26-35% of the heavy operations during FQ hours are cargo aircraft (uncertainty exists between some flights do not have operator)
- The Boeing 747-400, Boeing 747-8, Boeing 777-300 and Boeing 777-200 are the most frequent heavy aircraft users during FQ hours
- Runways 28R and 28C are used 47% of the time by heavy aircraft during FQ hours
- Runway 32L accounted for more than 18% of the FQ heavy operations at ORD (all departures)



Data Set November 30 to October 20, 2015 After Runway 10R-28L Opening

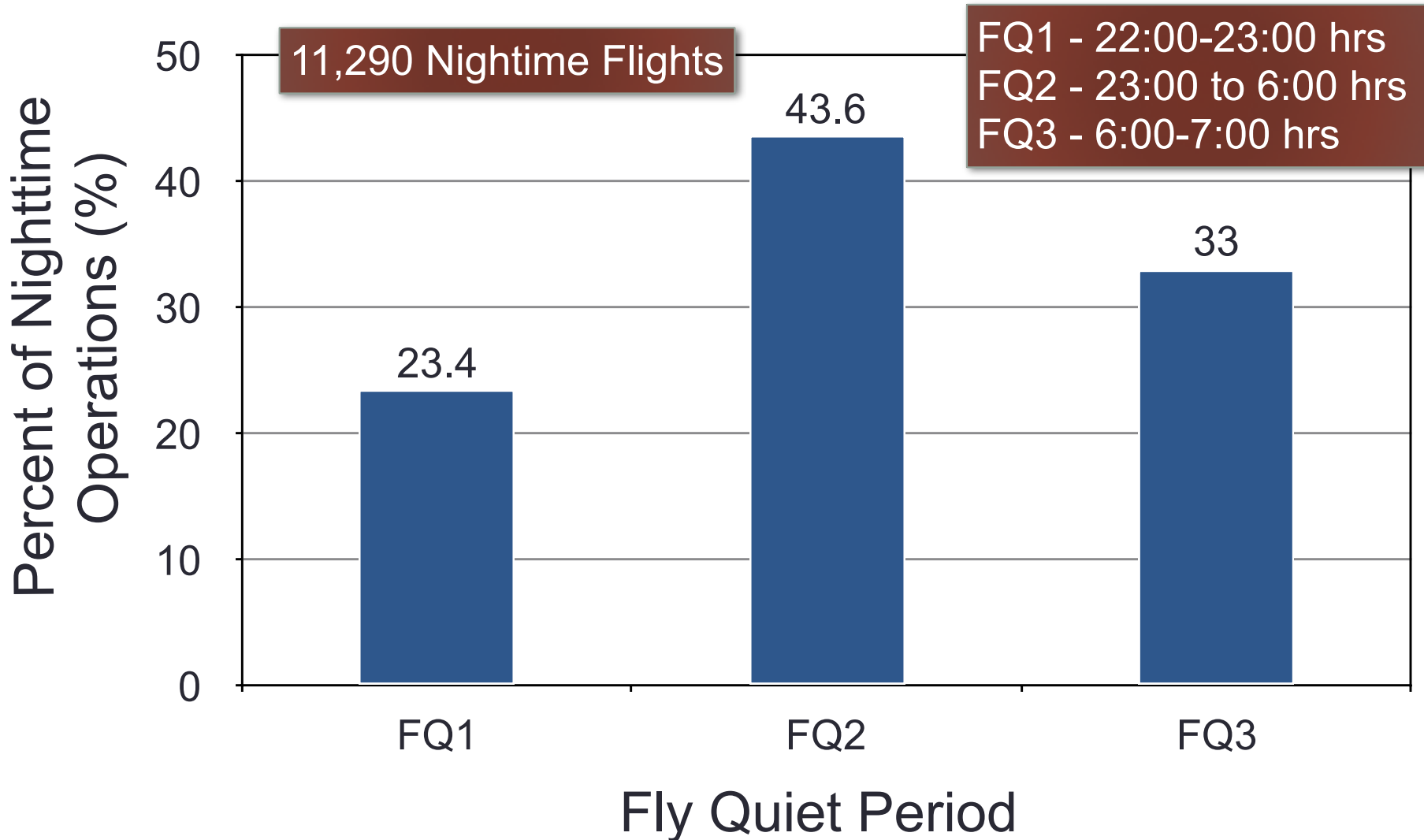


CDA Data Analysis

- Derived a fleet mix operating at ORD using a partial set of flight data provided by CDA and LBA
- **Data set includes all flights between October 20 and November 30, 2015**
- 96,220 total flights
 - 84,930 daytime flights (88.3%)
 - 11,290 nighttime flights (11.7%) - total FQ flights
- Fly Quiet periods and hours
 - FQ1 between 10-11:00 PM
 - FQ2 between 11:00 PM and 6:00 AM
 - FQ3 between 6:00 and 7:00 AM



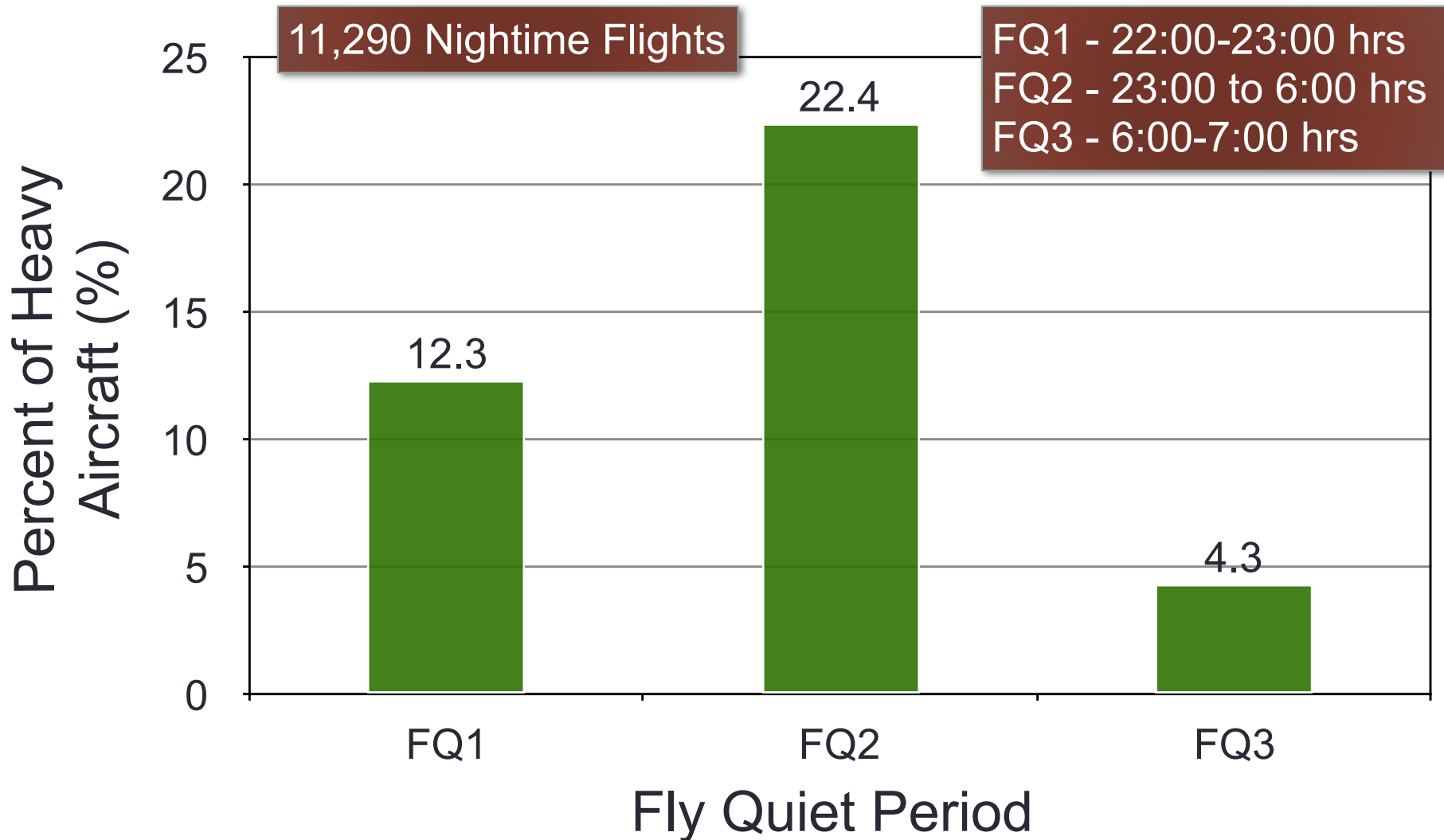
Percent Operations During Fly Quiet Period



source of data: CDA (11,290 flights in FQ between Nov/30/15 and Oct/20/15)



Percent of Heavy Operations During FQ Hours



source of data: CDA (11,290 flights in FQ between Nov/30/15 and Oct/20/15)



Heavy Aircraft Operating During FQ Hours

<i>Aircraft</i>	<i>Percent in FQ (%)</i>	<i>Aircraft</i>	<i>Percent in FQ (%)</i>
<i>74N</i>	<i>0.95</i>	<i>B762</i>	<i>3.28</i>
<i>76P</i>	<i>0.25</i>	<i>B763</i>	<i>2.33</i>
<i>A30</i>	<i>7.25</i>	<i>B764</i>	<i>0.06</i>
<i>A306</i>	<i>1.76</i>	<i>B772</i>	<i>11.47</i>
<i>A30B</i>	<i>0.44</i>	<i>B773</i>	<i>0.06</i>
<i>A332</i>	<i>0.13</i>	<i>B77L</i>	<i>13.23</i>
<i>A333</i>	<i>0.50</i>	<i>B77W</i>	<i>6.11</i>
<i>A343</i>	<i>2.65</i>	<i>B788</i>	<i>1.45</i>
<i>A346</i>	<i>0.50</i>	<i>DC10</i>	<i>8.13</i>
<i>B744</i>	<i>20.60</i>	<i>MD10</i>	<i>2.65</i>
<i>B748</i>	<i>11.91</i>	<i>MD11</i>	<i>3.97</i>
<i>B74F</i>	<i>0.32</i>		

source of data: CDA (1,587 flights by heavy aircraft in FQ hours between Nov/30/15 and Oct/20/15)



Runway Operations by Heavy Aircraft in FQ Hours

<i>Runway</i>	<i>Percent Operations by Heavy Aircraft</i>
10C	7.06
10L	12.04
10R	0.06
14R	2.08
22L	4.91
27L	0.82
28C	21.80
28R	36.86
32L	13.93
9R	0.44

source of data: CDA (1,587 flights by heavy aircraft in FQ hours between Nov/30/15 and Oct/20/15)



Preliminary Observations

- The percent of nighttime operations at ORD is around 1.2% higher than the flight operations data provided by CDA for selected days in 2014
- The 1.2% is statistically significant (more data will be studied to support this conclusion)
- The peak hour for heavy aircraft operations at ORD during FQ hours is the period 22:00-23:00 hours
- Larger number of heavy aircraft operate in the long FQ2 hours (23:00 PM to 6:00 AM) but at a lower tempo per hour
- 33% of the total ORD nighttime flights occur between 6:00 to 7:00 AM



Preliminary Observations (2)

- Between 26-35% of the heavy operations during FQ hours are cargo aircraft (uncertainty exists between some flights do not have operator)
- The Boeing 747-400, Boeing 747-8, Boeing 777-300 and Boeing 777-200 are the most frequent heavy aircraft users during FQ hours
- Runways 28R and 28C are used 58.7% of the time by heavy aircraft during FQ hours
- Runway 32L accounted for almost 14% of the FQ heavy operations at ORD (all departures)



Runway Length Requirements for Aircraft Design Group D, VI



Runway Length Requirements

