Analysis of Taxi Time of Commercial Aircrafts at International Airports: Study of Manila International Airport (MNL/RPLL)

国際空港における航空機の遅延実態分析－マニラ国際空港を事例として

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**Background**
- Aviation System Performance Metric (ASPM) defined taxi times as the duration spent by an aircraft between rolling from a gate to when it takes off or from the entrance of taxiways to a gate after it lands. Goldberg and Chesser (2008), estimated that taxi-out delays contribute to 26% of the total delay experienced by a departing flight.

**Study Area**
- Manila International Airport (MNL/RPLL)
  - Primary airport in Metro Manila and serves as gateway to Philippines
  - Consists of 4 passenger terminals and 2 runways
  - Handles both international and domestic flights
  - In 2018, 45 million enplanement was recorded

**Summary**
- Analyzing and estimating taxi times of aircrafts at airports are expected to be important in reducing aircraft taxi delay thus reducing landing and takeoff delays.
- Commercial databases present easy access to vast amount of information thus, is able to provide historical and real time data to its users.
- **Future work**: (1) Compare results of other international airports in Philippines; (2) Analyze block times of city pairs.

**Objectives**
1) Airport Congestion
Growing passenger enplanement, put pressure on the airline industry → scheduled flights > airport capacity

2) Mechanism of Delay
Various casual factors related to aircraft, airline operation → gate, airborne, taxiing, weather

**Data Overview**
- **flightradar24 online database** - Data collection of flight data which include, flight number, origin, destination, published scheduled times, actual time of take-off and landing
- **Inclusive Dates**: January 2019 – April 2019

**Figure 1** taxi-out procedure

**Figure 2** Manila International Airport Complex
- Primary airport in Metro Manila and serves as gateway to Philippines
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**Figure 3** Flight Distribution per hour (Total Actual vs Total Scheduled)

**Figure 4** Representation of (a) arrival delay (b) departure delay performance; arrivals and departures 15 minutes are considered as on-time threshold

**Figure 5** Histogram – taxi out time from all passenger terminals; weighted mean = 18 mins

**Investigate the taxi time at international airports by empirical analysis of commercial aircrafts data from commercial database**
- Determine the mechanism of airside traffic delay
- Assess congestion in terms of taxi time delay