



Optimal Flight Time

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Introduction



- Operational delay is a metric used in studying flight and system efficiency.
- Operational delay is measured in terms of the difference between scheduled and actual gate-to-gate time.
- The time difference between planned and actual reflects the unexpected delay.
- Airlines often build the ‘expected’ delay into their flight schedules.
- Actual extent of delay is underreported when compared against schedule.



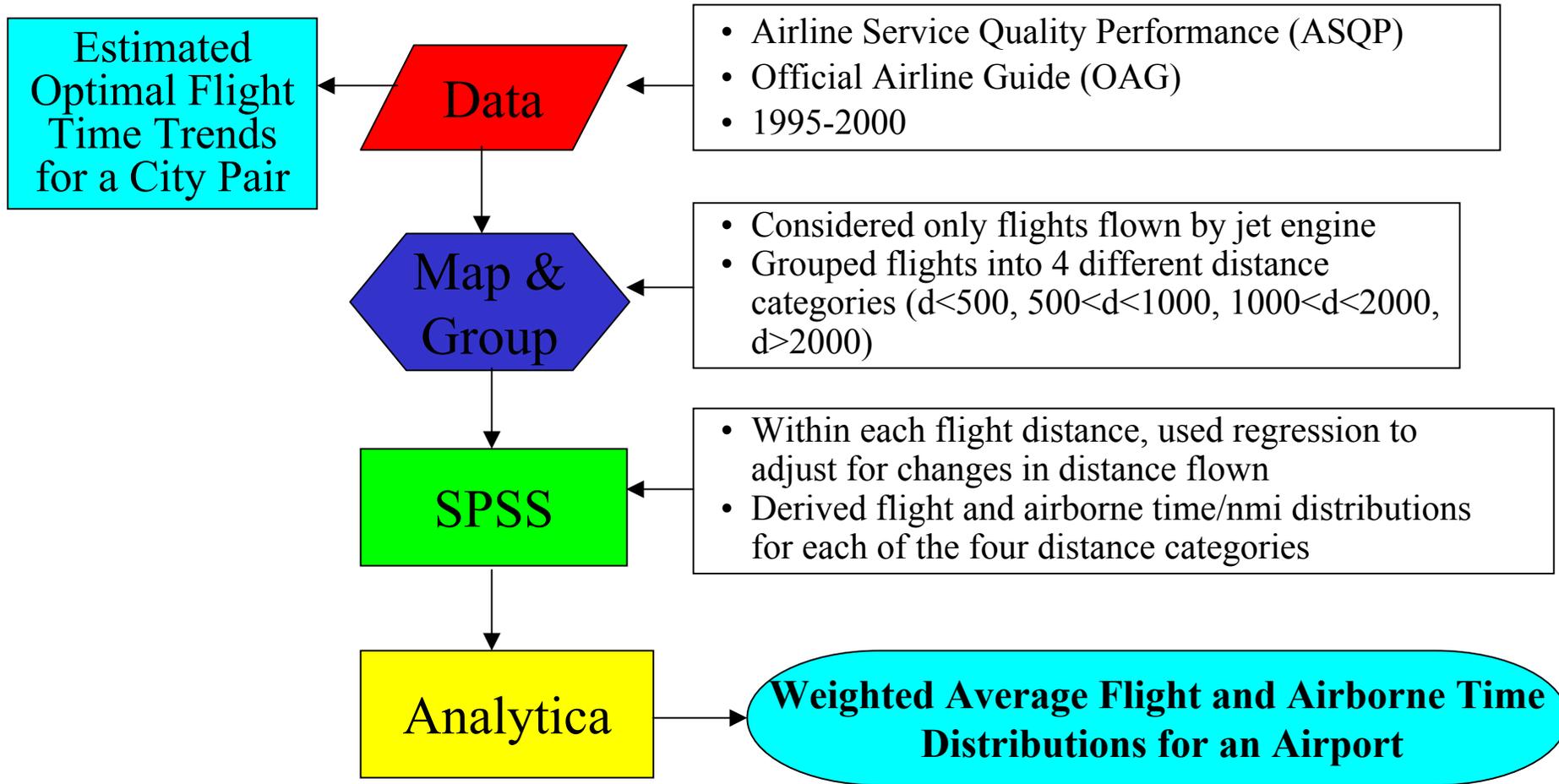
Introduction (Cont'd)



- It is necessary to measure delay against a fixed point of reference (i.e., a minimum feasible time or “optimal” time).
- In this study, several methods were proposed to estimate the optimal flight time.



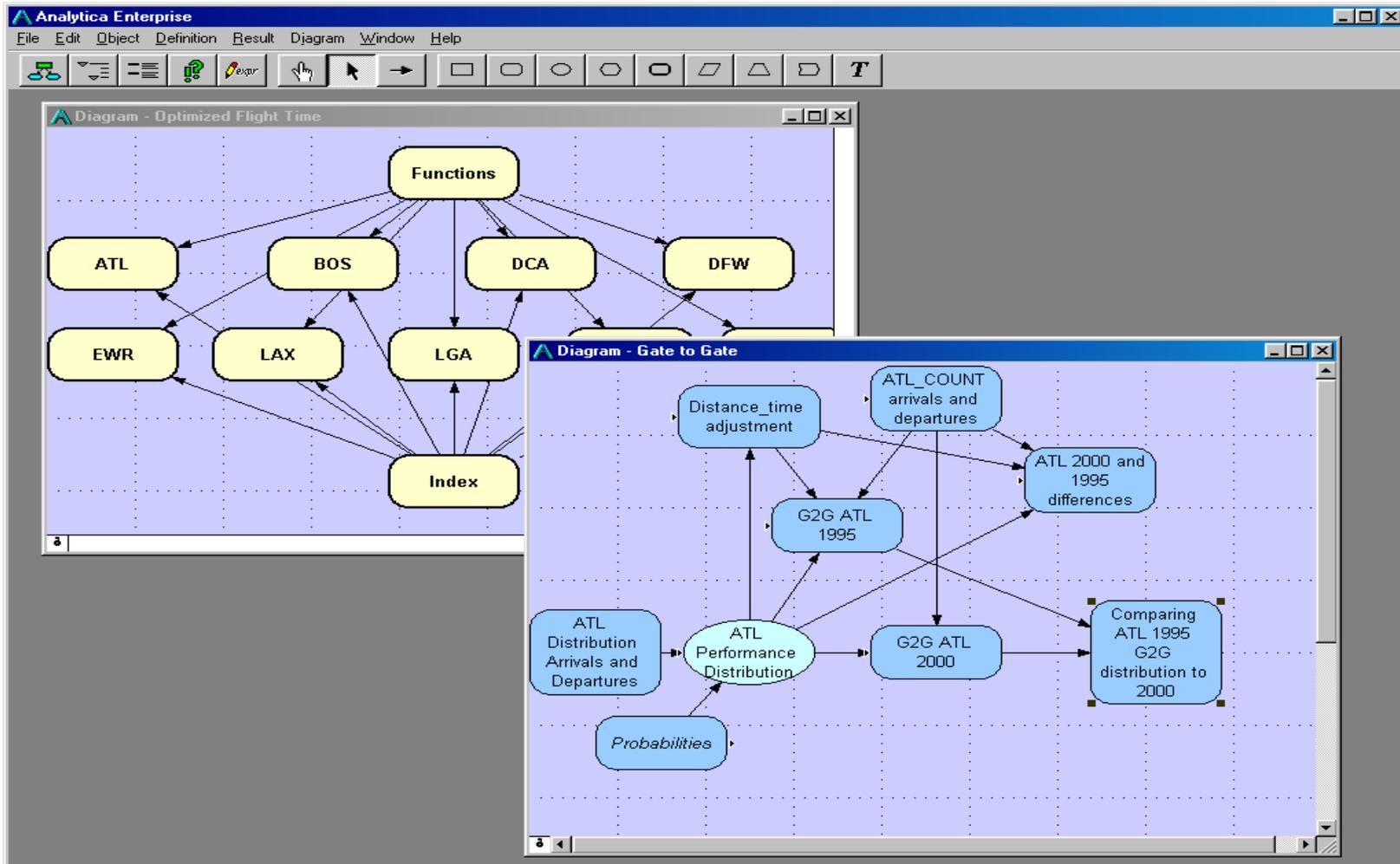
Methodology





Methodology (Cont'd)

Analytica Model



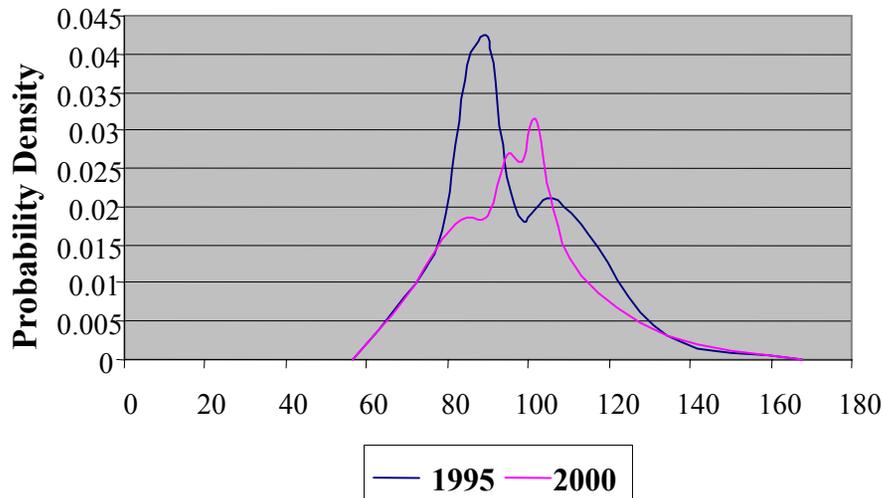


Results

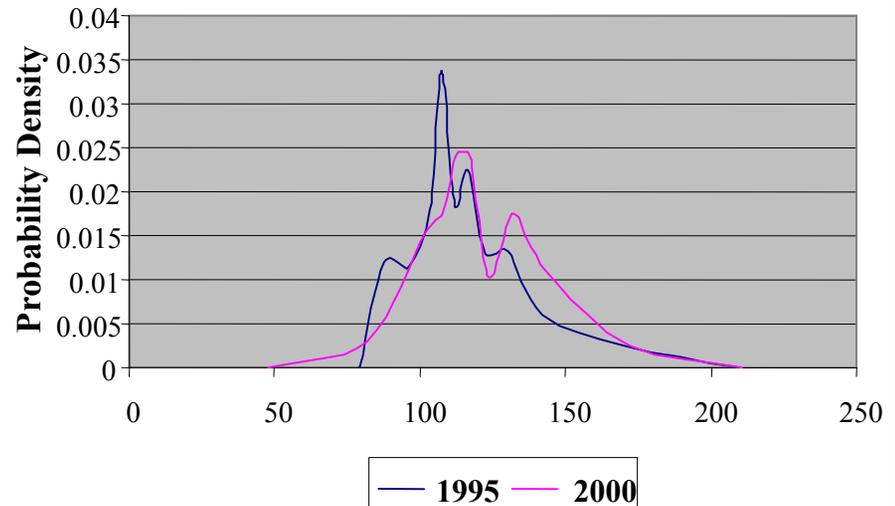
Airborne and Gate-to-Gate Distributions at Atlanta Airport



Airborne Time Distribution



Gate-to-gate Time Distribution



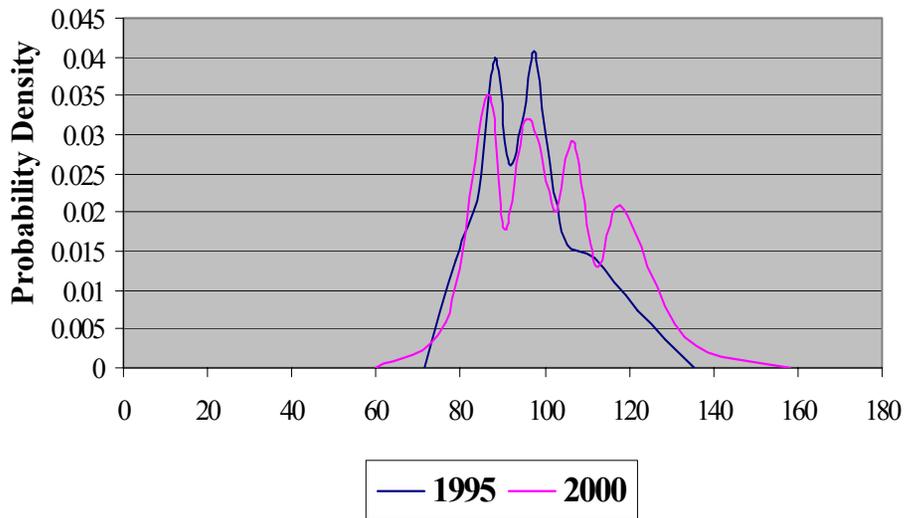


Results (Cont'd)

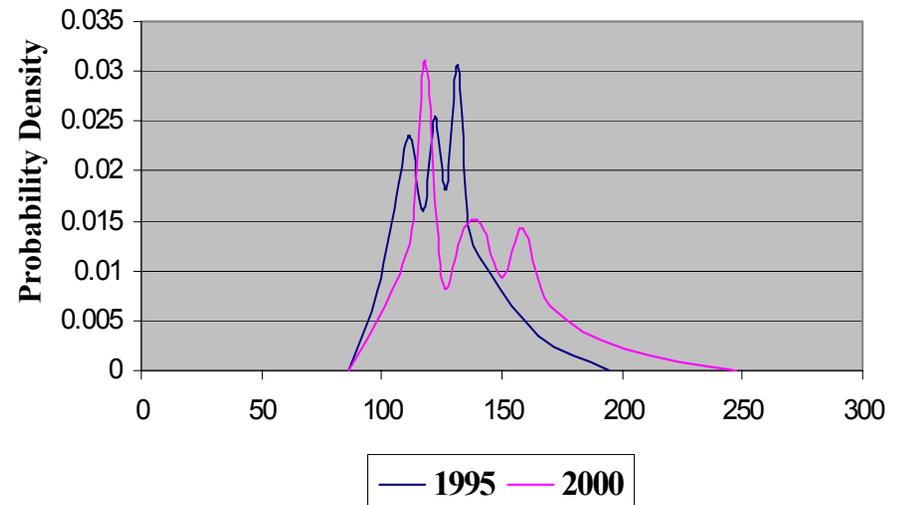
Airborne and Gate-to-Gate Distributions at New York LaGuardia Airport



Airborne Time Distribution



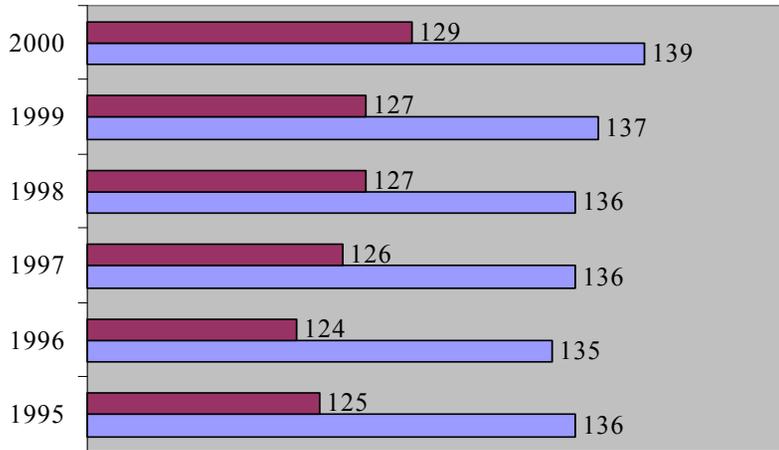
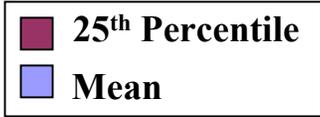
Gate-to-gate Time Distribution



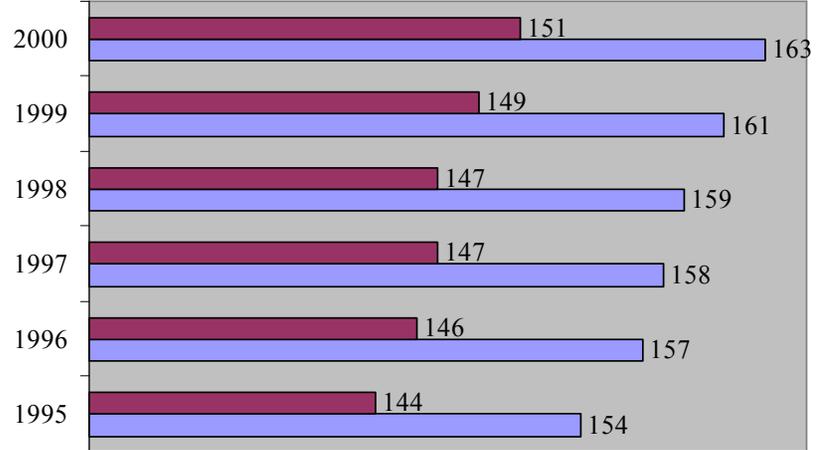


Results (Cont'd)

Gate-to-gate Time (minutes)



Atlanta - Dallas Ft. Worth



Boston - Chicago



Washington, D.C. - Chicago



Dallas Ft. Worth - Denver

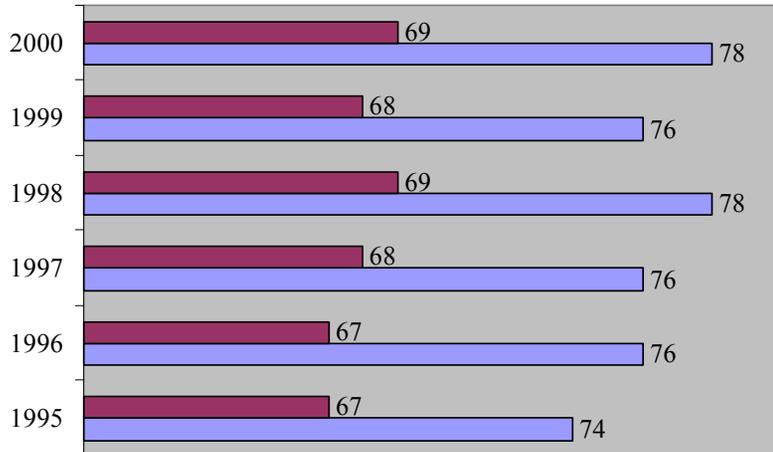


Results (Cont'd)

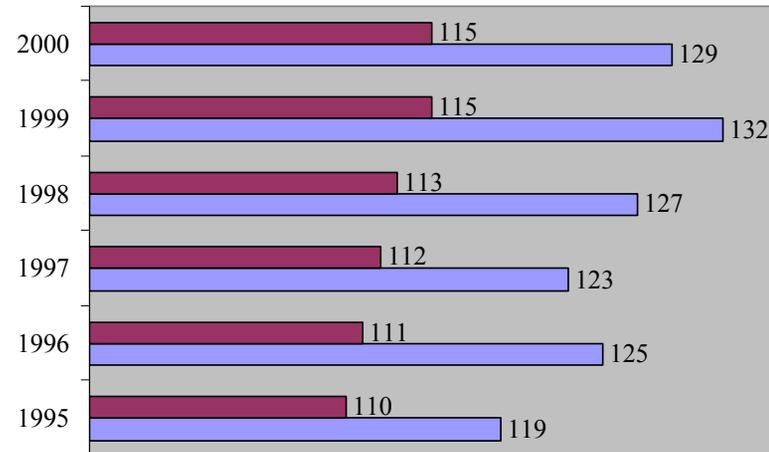
Gate-to-gate Time (minutes)



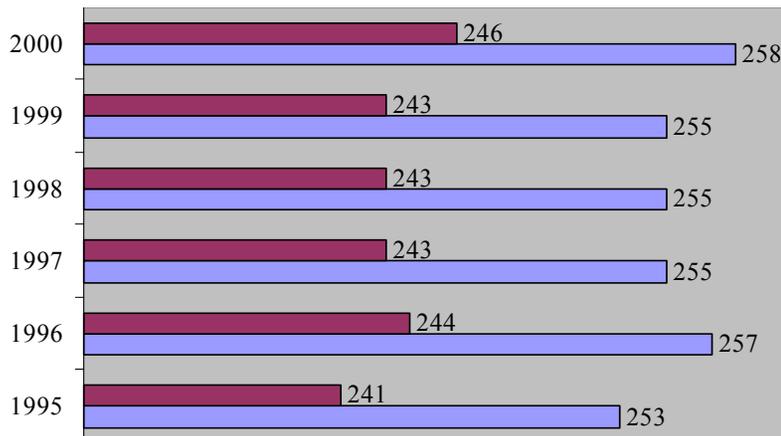
■ 25th Percentile
■ Mean



Los Angeles – San Francisco



Chicago - Newark



Chicago – Los Angeles

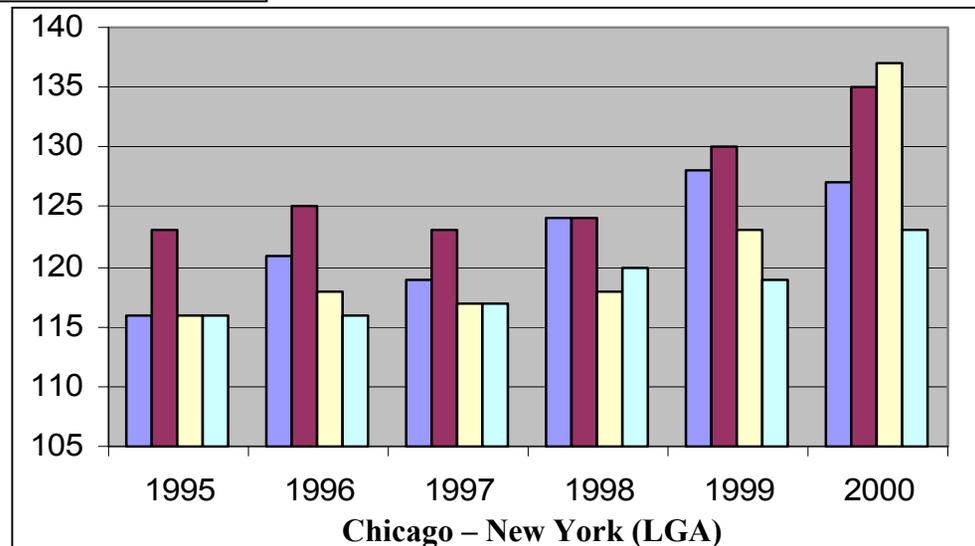
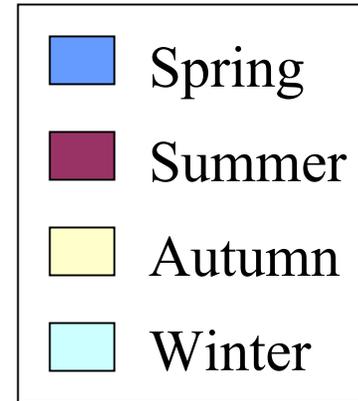
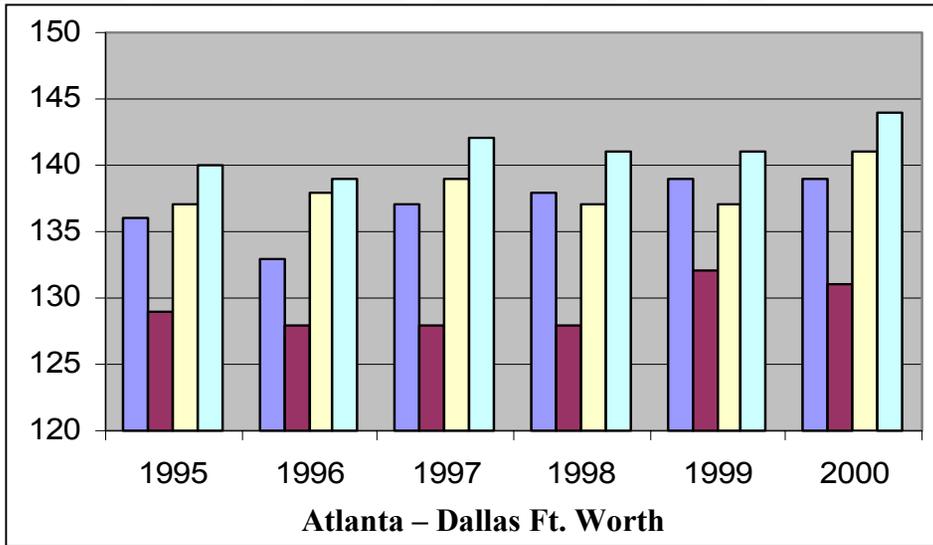


Chicago – New York LaGuardia



Results (Cont'd)

Average Gate-to-Gate Time (minutes) by Seasons



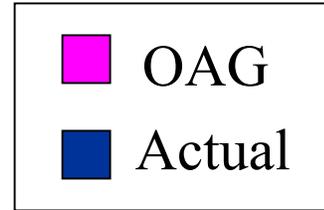
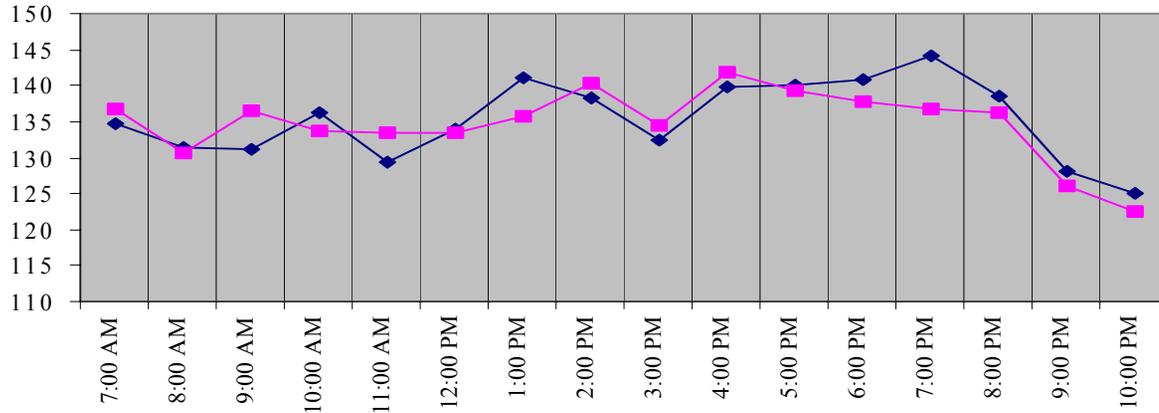


Results (Cont'd)

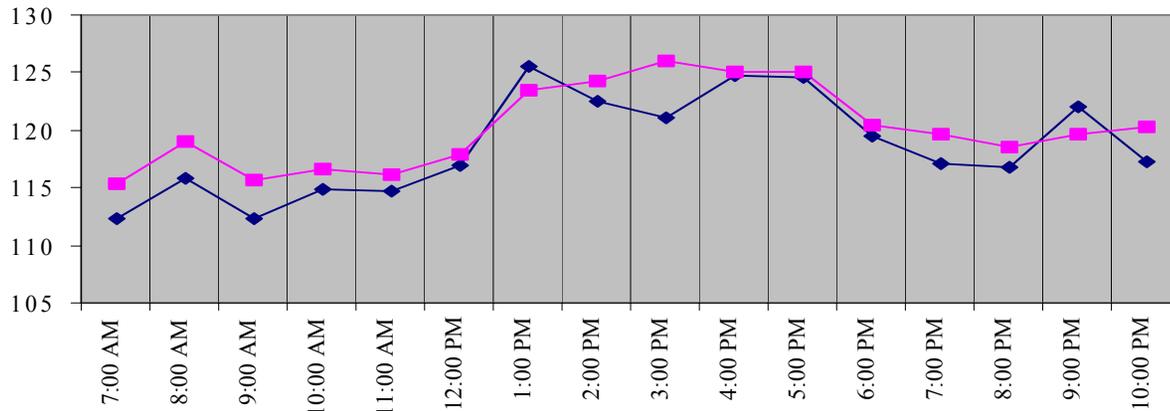
Average Gate-to-Gate Time by Departure Time of Day, 1995



Atlanta - Dallas Ft. Worth



Chicago - Newark





Summary



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- Optimal flight time is important in calculating system efficiency and delay costs.
 - Optimal flight time should be defined and used to identify all sources of delay.
 - Provides approaches to estimate optimal flight time