

# ATAC SIMMOD Activities

## North American SIMMOD Users Group

Baltimore, MD  
15 September 2005



SCALE

0' 500' 1000'

### AIRPORT LAYOUT LEGEND

	EXISTING AIRFIELD CONTOUR
	PROPOSED AIRFIELD CONTOUR
	ELEVATION OF F&O SURFACE
	WATER TABLE
	UNDEVELOPED AREA

ACCESS ROAD

# General News

- Simmod *PLUS!* version 7.1 released in July 2005
- Patch to update to version 7.1.1 to be released in September 2005

# Simmod *PLUS!* / *PRO!* Maintenance

## Network Builder and Animator changes:

1. Curved ground links were not properly modeled. The Network Builder generated incorrect link lengths and the Animator moved the aircraft icons only on a straight path between the nodes of the curved link.
2. Database and input logic implemented for the new features `RUNWAY_TAKEOFF_OCCUPANCIES` and `DEPARTURE_Q_GROUP`.

# SIMMOD Engine Maintenance

## Ground logic changes:

1. In cases where an aircraft blocks ground links during a pushback, The aircraft would not first check that no other aircraft was taxiing on these links prior to commencing the pushback. Fixed.
2. The gate selection logic would not function correctly if the airline identifier contained a number. Fixed.

# SIMMOD Engine Maintenance

## Ground logic changes:

3. The gate input logic would not read all the staging data for the gate in cases where there were more than one plan and the inputs were not grouped by plan. Fixed.
4. In some cases where a flight was blocked from leaving the gate due to an aircraft on a blocking link, the flight would wait an excessive amount of time. Fixed.

# SIMMOD Engine Maintenance

## Ground logic changes:

5. Previously, if a gate has been designated that aircraft should hold at the gate if the departure queue is full and that aircraft should use departure staging, flights would taxi to the staging area even though the staging area was filled to capacity. Aircraft will now hold at the gate until space is available at the staging area.
6. The correct staging area would not necessarily be chosen for arrival flights that re-routed. Fixed.

# SIMMOD Engine Maintenance

Ground logic changes since last meeting:

7. The procedure logic allows an aircraft to be released from the departure queue when no other procedures were blocking the departure procedure, even if the runway is occupied. The former global variable `DQ_HOLD_UNTIL_RWY_CLEAR` value of 1 forced the procedure logic to wait for the runway to be clear before allowing a departing aircraft to be released from a departure queue. This global variable has been replaced by the departure procedure `HoldUntilRwyClear` input parameter so that departing aircraft using different procedures can behave differently.

# SIMMOD Engine Maintenance

## Ground logic changes:

8. The former global variable `ALLOW_ALINK_DEPQ_INV_BLK` value of 1 enabled any departure queue subject to airlink blocking with the ability to inversely block airlinks. The inverse blocking duration was hard-coded as 30 seconds. This global variable has been replaced by the departure queue `InvBlkDur` input parameter. A value of 0.0 indicates no inverse blocking. Values greater than zero represent the inverse blocking duration in seconds.

# SIMMOD Engine Maintenance

## Ground logic changes:

9. The departure queue logic allowed passing in the queue if the passing aircraft would not cause the passed aircraft to be delayed (given a later release time). The departure queue PassDelayFlag input parameter has been added so that a value of “P” causes the logic to ignore this rule.
10. If an aircraft was re-assigned to another gate at a taxicheckpoint or staging pad, it would not re-examine the GATERWY inputs to determine if it should use a different taxipath. Fixed.

# SIMMOD Engine Maintenance

Ground logic changes:

11. Landing aircraft using procedures with an end node at the end of the runway but actually use a high speed exit to complete their roll would not properly block the last node of the runway to other procedures and taxiing aircraft. Fixed.

# SIMMOD Engine Maintenance

## Airspace logic changes:

1. The default value of the global variable `node_sep_ac_choice` has been changed from 0 to 2. When 0, the logic used the trailing aircraft's speed in the separation calculations. This approach can result in a loss of separation, whereas using 2, the leading aircraft's speed, will ensure that the desired separation is never lost.

# SIMMOD Engine Maintenance

## Airspace logic changes:

2. When determining the separation of aircraft leaving a node, the logic was erroneously using the trailing aircraft's speed on arrival to the node rather than expected speed upon leaving the node. Fixed.

# SIMMOD Engine Maintenance

## Airspace logic changes:

3. Minor changes were made to improve the forecasting calculations and to ensure that metering vector delay does not exceed the value permitted on a given link. The metering logic allows passing to occur on links that prohibit passing unless the new global variable `enforce_metering_no_passing` is set to 1.

# SIMMOD Engine Maintenance

## Incorporated FAA changes:

1. The `multiple_rwcross_delay` global variable was added. This variable represents the number of seconds of delay additional applied to each aircraft that are crossing the same runway after a departure or arrival passes. This delay is intended to represent the amount of time required by a ground controller to issue crossing instructions.

# SIMMOD Engine Maintenance

Incorporated FAA changes:

2. Staggering would be lost if aircraft held at nodes downstream from the pre-stagger nodes. The enhancement updates the estimated time of arrival at the runway if downstream holding occurs and imposes consecutive stagger holding if necessary at the pre-stagger nodes.
3. A new table has been included to `SIMU10` to provide summary statistics for each departure queue.

# SIMMOD Engine Maintenance

Incorporated FAA changes:

4. The current format of `SIMU14` spreads each record over two lines. A optional global variable `simu14_format` has been implemented to control the format more precisely as follows:
  - 1 One line per record; include all headers and footers
  - 2 Two lines per record; include all headers and footers (Default)
  - 11 One line per record; include footers but no headers
  - 12 One line per record; include headers but no footers
  - 13 One line per record; no headers or footers
  - 21 Two line per record; include footers but no headers
  - 22 Two line per record; include headers but no footers
  - 23 Two line per record; no headers or footers

# SIMMOD Engine Maintenance

## Enhancements:

1. An additional parameter was added to the ExitLnkDist field of the RUNWAY\_EXITS\_LINKS inputs. This optional parameter allows the analyst to specify a runway occupancy time for a given combination of runway/gate/aircraft model/exit rather than by assuming a specific initial speed over the threshold. The runway roll calculations still assume constant deceleration.

# SIMMOD Engine Maintenance

## Enhancements:

2. A new input type has been added to the `SIMU07` file — `RUNWAY_TAKEOFF_OCCUPANCIES`. These optional inputs allow the analyst to specify a runway occupancy time for a given combination of runway/aircraft model rather than by assuming a specific speed at the time when the wheels leave the ground. The length of the takeoff roll distance is determined using the same probability value used to choose the occupancy time. The runway roll calculations still assume constant acceleration.

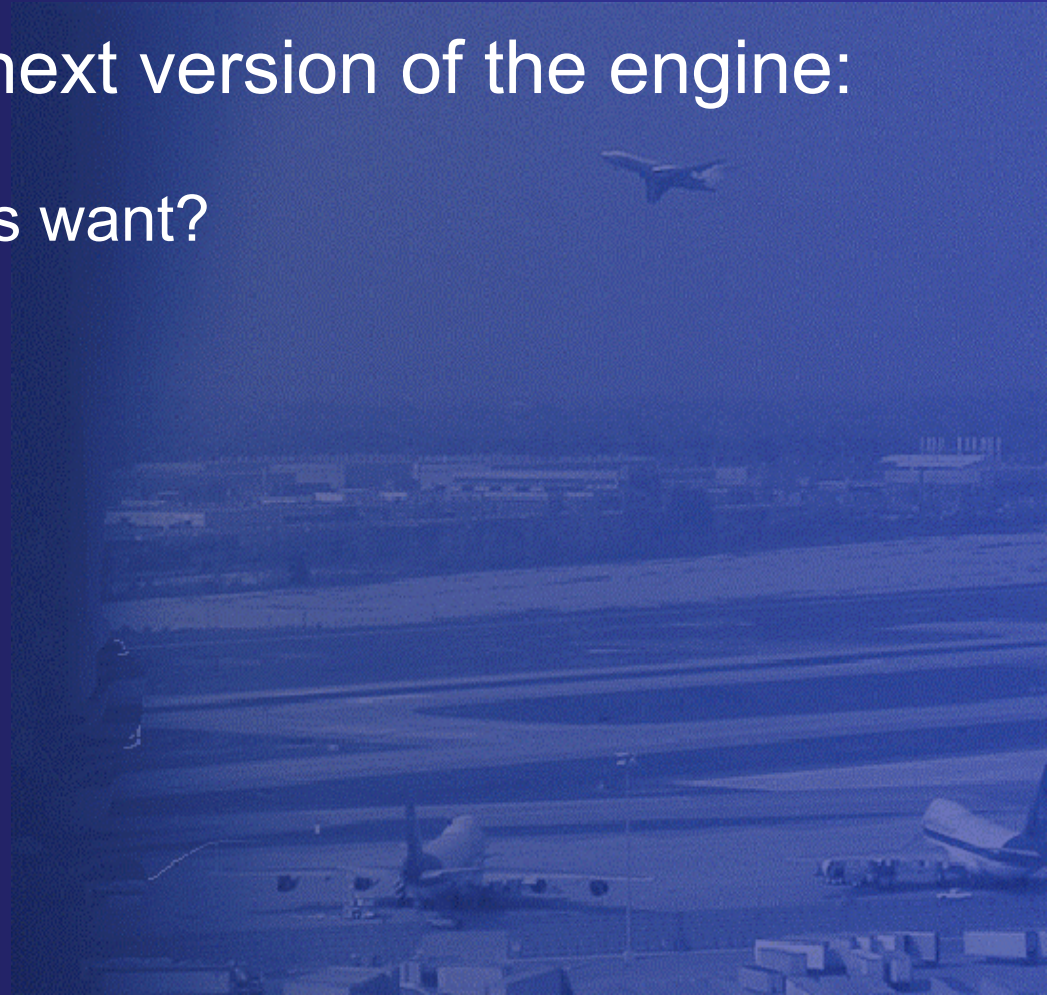
# SIMMOD Engine Maintenance

## Enhancements:

3. The new input `DEPARTQ_GROUP` has been created. This input allows the analyst to define groups of departure queues such that all of the member queues of the group are treated as one for the purposes of determining the next departure, queue ordering, and re-routing.

# SIMMOD Engine Maintenance

- Ongoing work for next version of the engine:
  - ??? What do users want?



# ATAC SIMMOD User Base

166 users (including 62 Simmod *PLUS!* customers) have obtained the ATAC SIMMOD engine since the release of version 2.5 in October 2001. These users are from the following 33 countries:

Argentina	Denmark	Japan	Spain
Australia	Estonia	Kazakhstan	Sweden
Austria	France	Malaysia	Taiwan
Bosnia and Herzegovina	Germany	Mexico	Thailand
Brazil	Greece	Poland	Turkey
Canada	India	Russia	UK
Chile	Indonesia	South Africa	USA
China	Italy	South Korea	Vietnam
Croatia			