

FAARFIELD 2.0

Beta Overview

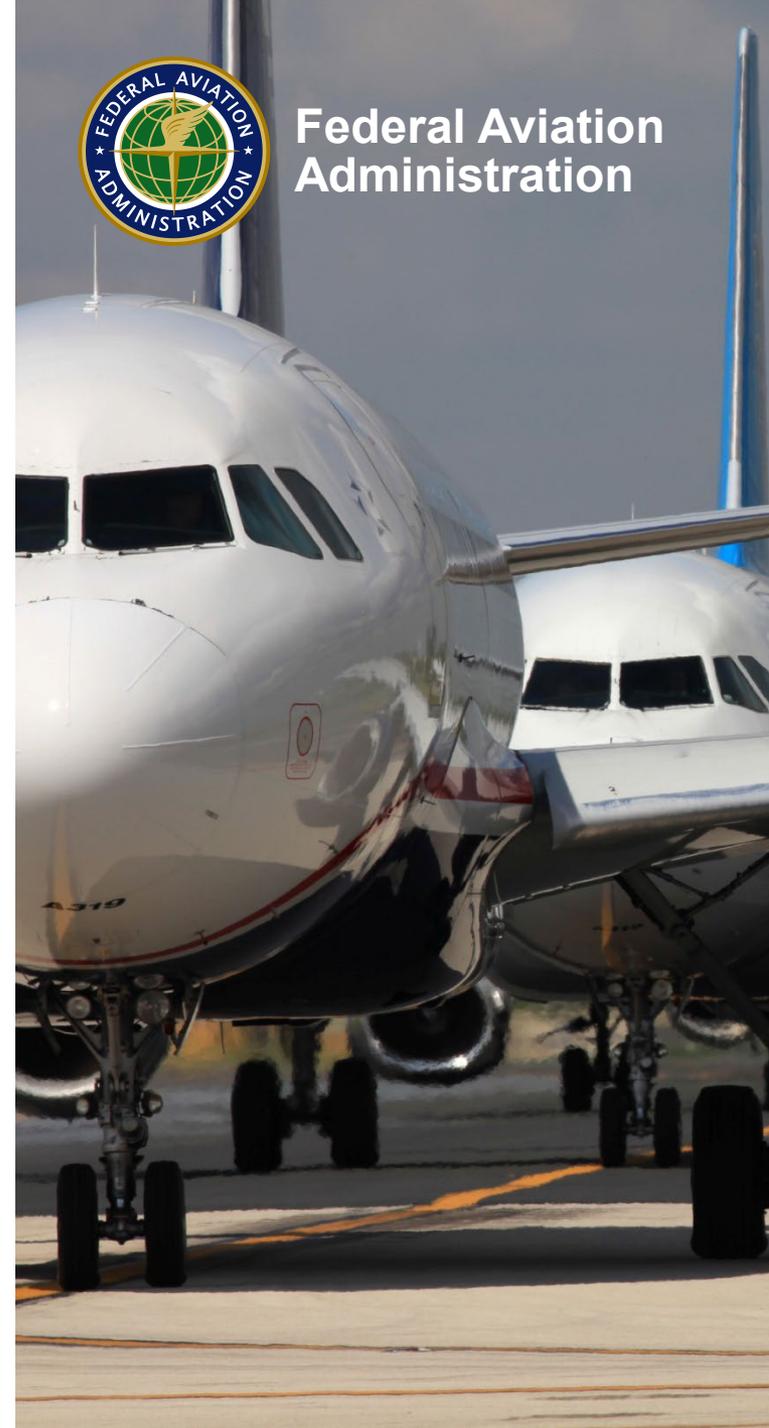
Presented to: REDAC Subcommittee for Airports

By: David R. Brill, P.E., Ph.D.

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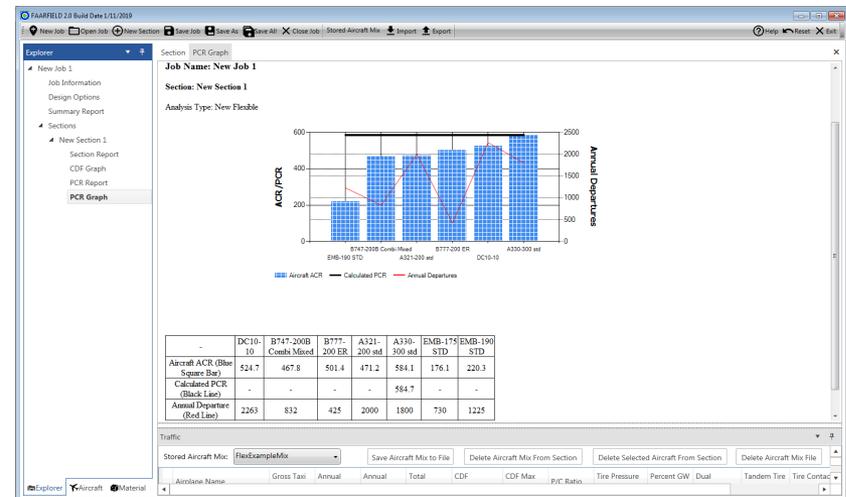
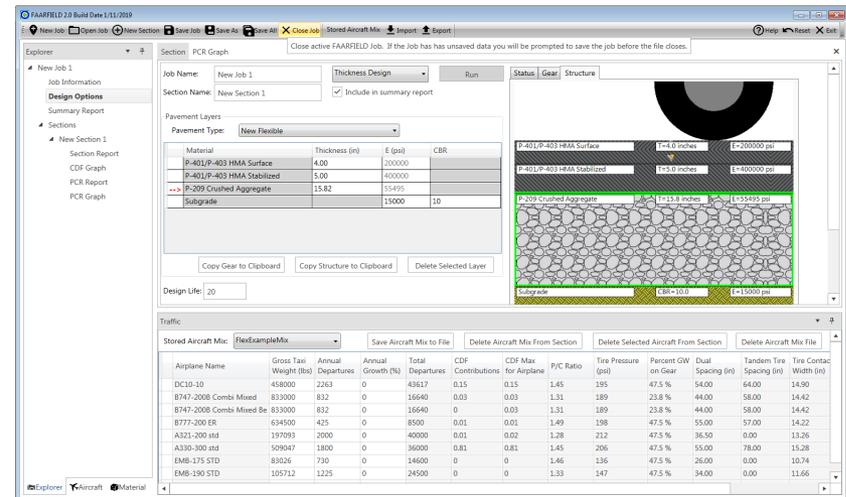


Federal Aviation
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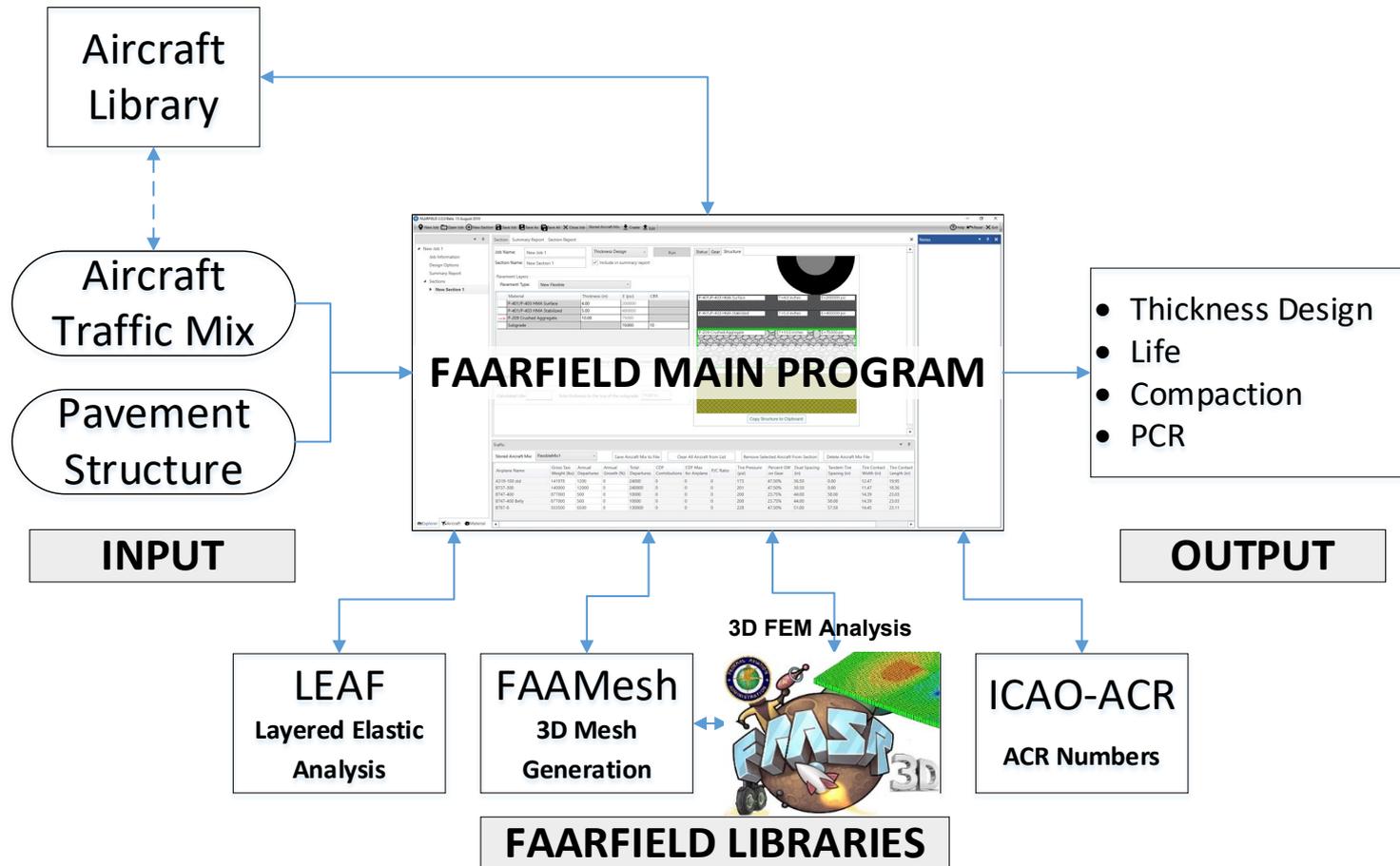


New! FAARFIELD 2.0 Beta

- Support for ACR-PCR.
- Release with next update of AC 150/5320-6.
- Modernized graphical user interface (GUI).
 - Job and section entry.
 - Improved start-up screen.
 - Explorer-based navigation.
 - Improved flow between screens.
- All .NET compatible.
- Rational data file structure.
- On-demand report generation.
- **No change to thickness design requirements at this time.**



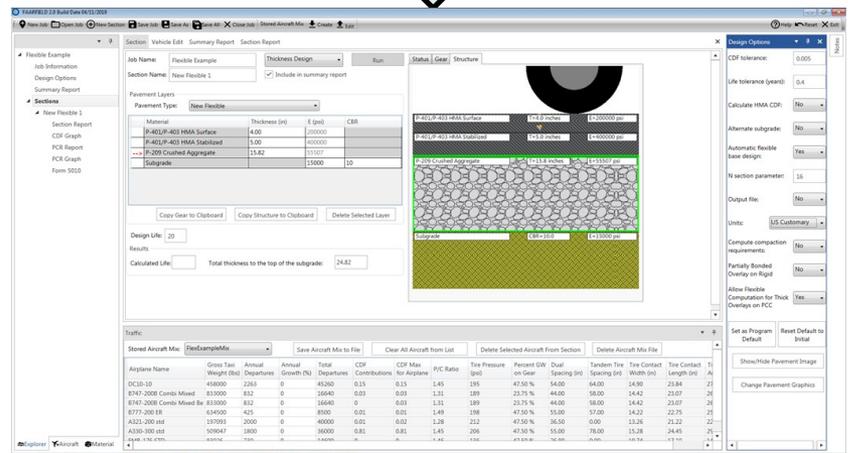
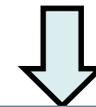
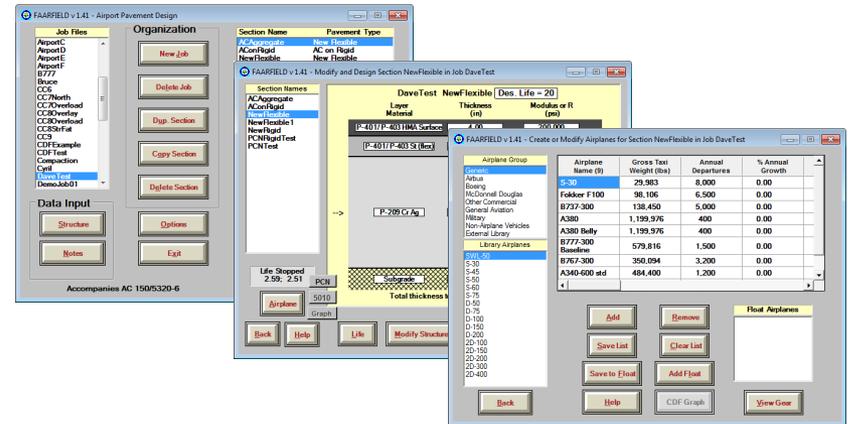
FAARFIELD 2.0 Organization



GUI Modernization

Major improvements:

- Easier job and section entry.
- Explorer-based navigation.
- Improved screen re-sizing and appearance.
- Improved flow between screens.
- Ability to store traffic mixes.
- Rationalized data file structure.
- On-demand report generation.
- Remove program logic from GUI controls.
- Etc.



FAARFIELD 2.0 GUI Layout

EXPLORER

TOOLBAR

FUNCTION SELECTION

RUN

OPTIONS

HELP

PAVEMENT TYPE SELECTION

STRUCTURE TABLE

STRUCTURE IMAGE

MATERIAL LIBRARY TAB

AIRCRAFT LIBRARY TAB

TRAFFIC TABLE

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Section

Job Name: New Job 1 Thickness Design Run Status Gear Structure

Section Name: New Section 1 Include in summary report

Pavement Layers

Pavement Type: New Flexible

Material	Thickness (in)	E (psi)	CBR
P-401/P-403 HMA Surface	4.0	200000	
P-401/P-403 HMA Stabilized	5.0	400000	
P-209 Crushed Aggregate	10.0	75000	
Subgrade		15000	10

Design Life: 20

Results

Computed Life: Total thickness to the top of the subgrade: 19.00 in.

Traffic

Stored Aircraft Mix: FlexibleMix1 Save Aircraft Mix to File Clear All Aircraft from List Remove Selected Aircraft From Section Delete Aircraft Mix File

Airplane Name	Gross Taxi Weight (lbs)	Annual Departures	Annual Growth (%)	Total Departures	CDF Contributions	CDF Max for Airplane	P/C Ratio	Tire Pressure (psi)	Percent GW on Gear	Dual Spacing (in)	Tandem Tire Spacing (in)	Tire Contact Width (in)	Tire Contact Length (in)
A319-100 std	141978	1200	0	24000	0	0	0	173	47.50%	36.5	0.0	12.5	19.9
B737-300	140000	12000	0	240000	0	0	0	201	47.50%	30.5	0.0	11.5	18.4
B747-400	877000	500	0	10000	0	0	0	200	23.75%	44.0	58.0	14.4	23.0
B747-400 Belly	877000	500	0	10000	0	0	0	200	23.75%	44.0	58.0	14.4	23.0
B787-8	503500	6500	0	130000	0	0	0	228	47.50%	51.0	57.5	14.4	23.1

Design Options

Calculate HMA CDF: No

Automatic flexible base design: Yes

Output file: No

Units: US Customary

Allow Flexible Computation for Thick Overlays on PCC: Yes

Set as Program Default Reset Default to Initial

Show/Hide Pavement Image

Change Pavement Graphics

Explorer Aircraft Material

Design Options Notes



Features of Modernized GUI

- **Multi-display interface.**
- **Highly configurable process flow.**
 - Consolidated data entry to single screen.
 - Open, resize, move, dock/undock, close screens independently.
 - Makes use of right-click context menus.
- **Resizable screens.**
- **Allows working with multiple jobs & sections.**
 - Switch between jobs/sections/pavement types with 1 click.
 - Cut and paste between jobs.
- **Standard Windows file management.**
 - Built-in Windows tools for saving/opening jobs.
 - Section and job names follow Windows standards.
- **Built-in standard pavement section library accessible from menu.**

Explorer Navigation

- **FAARFIELD 2.0** supports multiple jobs open at the same time.
- Use the Explorer to navigate between jobs, and display:
 - Sections
 - Section Reports
 - PCR Reports/Graphs
 - 5010 Reports
 - Summary Reports (All sections in a job)

The screenshot displays the FAARFIELD 2.0 Beta software interface. The Explorer pane on the left shows a tree view of jobs and sections. Two jobs, 'Airport A' and 'Airport B', are highlighted with red boxes. Under 'Airport B', the 'Rigid Taxiway A' section is selected. The main design area shows the 'Section' configuration for 'Rigid Taxiway A'. The 'Pavement Layers' table is as follows:

Material	Thickness (in)	E (psi)	k (pci)	R (psi)
P-501 PCC Surface	14.0	4000000		650
P-401/P-403 HMA Stabilized	5.0	400000		
P-209 Crushed Aggregate	6.0	75000		
Subgrade		15000	172.4	

Below the table, the 'Design Life' is set to 20. The 'Results' section shows 'Calculated Life' and 'Total thickness to the top of the subgrade: 25.00 in.' The bottom of the interface features a 'Traffic' table with the following data:

Airplane Name	Gross Taxi Weight (lbs)	Annual Departures	Annual Growth (%)	Total Departures	CDF Contributions	CDF Max for Airplane	P/C
DC10-10	458000	2263	0	45260	0	0	0
B747-200B Combi Mixed	833000	832	0	16640	0	0	0
B747-200B Combi Mixed Be	833000	832	0	16640	0	0	0
B777-200 ER	634500	425	0	8500	0	0	0

User-Defined Aircraft Mode

Create, edit and save user-defined aircraft within the program.

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New Job Open Job New Section Save Job Save As Save All Close Job Stored Aircraft Mix Create Edit Help Reset Exit

Aircraft

FAARFIELD Aircraft Group

- Generic
- Airbus
- Boeing
- McDonnell Douglas
- Other Commercial
- General Aviation
- Military
- Non-Airplane Vehicles
- External Library

FAARFIELD Aircraft Library

- C-141A ICAO Flexible
- 2D-400 Ext1 (UDA)
- B737-900xt (UDA)
- B737-9ext (UDA)
- B767 ER Growth (UDA)
- Test3D (UDA)

Section **Vehicle Edit**

User Defined Aircraft Info

Select Aircraft: B767 ER Growth (UDA)

Gross Taxi Weight (lbs): 413000

Percent Gross Weight On Whole Main Gear: 0.95

PCR Percent Gross Weight On Gear: 0.924

Tire Pressure (psi): 200

User Defined Gear

Tires

X Coord. (in)	Y Coord. (in)
-224.3	28.0
-179.3	28.0
-224.3	-28.0
-179.3	-28.0

Evaluation Points

X Coord. (in)	X Coord. (in)
-201.8	0.0
-201.8	-8.8
-201.8	-17.5
-197.3	-19.6
-192.8	-21.7
-188.3	-23.8

Delete Tire Delete Eval. Point Update Gear Image Update User Defined Aircraft

Design Options

Calculate HMA CDF: No

Automatic flexible base design: Yes

Output file: No

Units: US Customary

Allow Flexible Computation for Thick Overlays on PCC: Yes

Set as Program Default Reset Default to Initial

Show/Hide Pavement Image

Change Pavement Graphics

Traffic

Stored Aircraft Mix: Save Aircraft Mix to File Clear All Aircraft from List Remove Selected Aircraft From Section Delete Aircraft Mix File

Airplane Name	Gross Taxi Weight (lbs)	Annual Departures	Annual Growth (%)	Total Departures	CDF Contributions	CDF Max for Airplane	P/C Ratio	Tire Pressure (psi)	Percent GW on Gear	Dual Spacing (in)	Tandem Tire Spacing (in)	Tire Contact Width (in)	Tire Cont. Length (in)
A320-100	150796	600	0	12000	0	0	0	200	47.50%	36.5	0.0	11.9	19.1
A340-600 std	807333	1000	0	20000	0	0	0	234	35.98%	55.0	78.0	15.7	25.2
A340-600 std Belly	807333	1000	0	20000	0	0	0	222	23.04%	46.3	77.9	12.9	20.7
A380	1238998	300	0	6000	0	0	0	218	19.00%	53.1	66.9	14.7	23.5
A380 Belly	1238998	300	0	6000	0	0	0	218	28.50%	0.0	0.0	14.7	23.5
B737-800	174700	2000	0	40000	0	0	0	204	47.50%	34.0	0.0	12.7	20.4
B777-300 ER	777000	1000	0	20000	0	0	0	234	47.50%	55.0	57.5	14.0	22.0

Design Options Notes



Create a User-Defined Aircraft (UDA)

- Fill in the data fields. The aircraft gear will display in the grid at right.
- Click “Save New User Defined Aircraft”

Name your UDA

Enter percent value of gross weight on the whole gear (not one truck)

Save your UDA

Enter coordinates for one set of wheels. It will be reflected on the centerline.

Tires	X Coord. (in)	Y Coord. (in)
	-138.0	0.0
	-104.0	0.0

Evaluation Points	X Coord. (in)	X Coord. (in)
	-121.0	0.0
	-117.6	0.0
	-114.2	0.0
	-110.8	0.0
	-107.4	0.0
	-104.0	0.0

Aircraft	Total Departures	CDF Contributions	CDF Max for Airplane	P/C Ratio	Tire Pressure (psi)	Percent GW on Gear	Dual Spacing (in)	Tandem Tire Spacing (in)	Tire Contact Width (in)	Tire Cont. Length (in)
0000	0	0	0	0	200	47.50%	36.5	0.0	11.9	19.1
0000	0	0	0	0	234	35.98%	55.0	78.0	15.7	25.2
0000	0	0	0	0	222	23.04%	46.3	77.9	12.9	20.7
A380	1238998	300	0	0	218	19.00%	53.1	66.9	14.7	23.5
A380 Belly	1238998	300	0	0	218	28.50%	0.0	0.0	14.7	23.5
B737-800	174700	2000	0	0	204	47.50%	34.0	0.0	12.7	20.4
B777-300 ER	777000	1000	0	0	234	47.50%	55.0	57.5	14.0	22.0

Create a User-Defined Aircraft (UDA)

The screenshot displays the FAARFIELD 2.0 Beta software interface. The main window is titled 'Vehicle Edit' and contains a 'User Defined Aircraft Info' section with input fields for 'New User Defined Aircraft:', 'Gross Taxi Weight (lbs)', 'Percent Gross Weight On Whole Main Gear', 'PCR Percent Gross Weight On Gear', and 'Tire Pressure (psi)'. Below this are 'Tires' and 'Evaluation Points' tables. A callout box points to the 'FAARFIELD Aircraft Library' on the left, which lists various aircraft models, including 'Test3D (UDA)' and 'B739 (UDA)'. The bottom of the interface features a 'Traffic' section with a table of aircraft data and a 'Design Options' panel on the right.

The new UDA appears in the aircraft library under the "External Library" group.

Airplane Name	Gross Taxi Weight (lbs)	Annual Departures	Annual Growth (%)	Total Departures	CDF Contributions	CDF Max for Airplane	P/C Ratio	Tire Pressure (psi)	Percent GW on Gear	Dual Spacing (in)	Tandem Tire Spacing (in)	Tire Contact Width (in)	Tire Cont. Length (in)
A320-100	150796	600	0	12000	0	0	0	200	47.50%	36.5	0.0	11.9	19.1
A340-600 std	807333	1000	0	20000	0	0	0	234	35.98%	55.0	78.0	15.7	25.2
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A380	1238998	300	0	6000	0	0	0	218	19.00%	53.1	66.9	14.7	23.5
A380 Belly	1238998	300	0	6000	0	0	0	218	28.50%	0.0	0.0	14.7	23.5
B737-800	174700	2000	0	40000	0	0	0	204	47.50%	34.0	0.0	12.7	20.4
B777-300 ER	777000	1000	0	20000	0	0	0	234	47.50%	55.0	57.5	14.0	22.0



FAARFIELD 2.0 Beta Test

- **Beta test started January 29.**
 - Select group of testers from consultants, government, academia and international.
 - Issues, suggestions and comments have been requested by February 28.
- **Next steps:**
 - Preparing revised FAARFIELD 2.0 based on beta review comments.
 - Updated draft AC 150/5320-6G. Internal FAA review planned starting mid- to late March.

Questions?

<http://www.airporttech.tc.faa.gov/>

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