



MIT International Center for Air Transportation

Recent Developments in Pricing and Revenue Management

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**Airline Industry Consortium
Annual Meeting**

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Outline: Developments in Pricing and RM

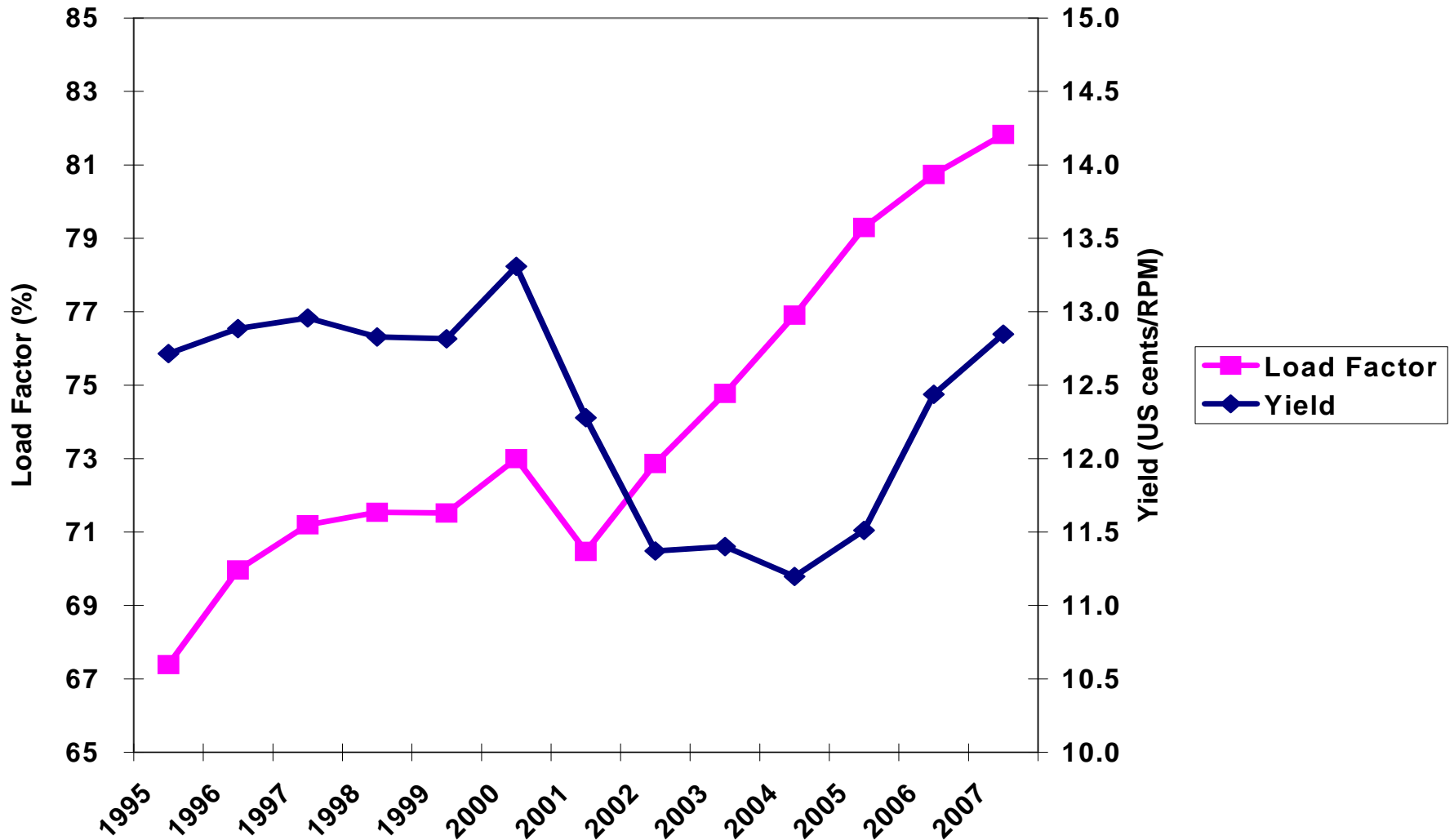
- **Impacts of fare simplification on average fares and load factors**
 - Widespread removal of Saturday night minimum stay restrictions in US domestic markets to compete with LCCs (2005)
 - Re-institution of restrictions in some markets to increase revenues as fuel prices surged in 2008
- **10% capacity cuts driven by fuel price increases**
 - Impacts on average fares and mix of passengers carried
- **Movement toward “fare family” approach to pricing**
 - Differentiated products with multiple fare levels
- **New developments in RM systems and modeling**



Fares, Restrictions and RM Systems

- **Average fares collected in a market affected by**
 - **Price levels** associated with multiple “fare products”
 - **Restrictions** on different fare products that affect passenger choice of options during the booking process
 - **Revenue Management (RM) systems** that control number of seats made available to different fare products
- **“Fare simplification” in response to LCC competition led to less restricted fare structures**
 - Removal of Saturday night stay restriction allowed business travelers with high willingness to pay (WTP) to buy lower fares
 - US domestic airlines saw dramatic decreases in yields (average fares) and record high load factors

US Airline Yields and Load Factors 1995-2007





Passenger Origin Destination Simulator

- **Passenger Origin Destination Simulator (PODS) simulates passenger choice of flights and fares**
 - Assumes passengers choose among fare types and airlines, based on schedules, prices, restrictions and seat availability
 - Realistic environment for testing impacts of fare structures and RM systems on average fares, load factors and revenues
- **PODS experiments show how average fares and load factors change, holding all price levels constant**
 - Fare simplification and recent return to some restrictions
 - Recent capacity reductions in response to higher fuel costs
 - New “Fare Families” approach to airline pricing



Fare Simplification between 2000 and 2005

- Most US domestic markets moved to “simplified fares” with no Saturday night minimum stay requirement
- Advance purchase requirements were also shortened

2000 RESTRICTED

FARE	AP	Min Stay	Cancel Fee	Non Refund
\$500	0	NO	NO	NO
\$400	3	NO	YES	NO
\$315	7	YES	YES	YES
\$175	10	YES	YES	YES
\$145	14	YES	YES	YES
\$125	21	YES	YES	YES

2005 SIMPLIFIED

FARE	AP	Min Stay	Cancel Fee	Non Refund
\$500	0	NO	NO	NO
\$400	0	NO	YES	NO
\$315	7	NO	NO	YES
\$175	7	NO	YES	YES
\$145	14	NO	YES	YES
\$125	14	NO	YES	YES



Return to Minimum Stay Restrictions on Lowest Fares in 2008

- By 2008, surging fuel prices led legacy carriers to re-institute Saturday night minimum stays for lowest fares
- But, less restricted higher fares remained in place

2005 SIMPLIFIED

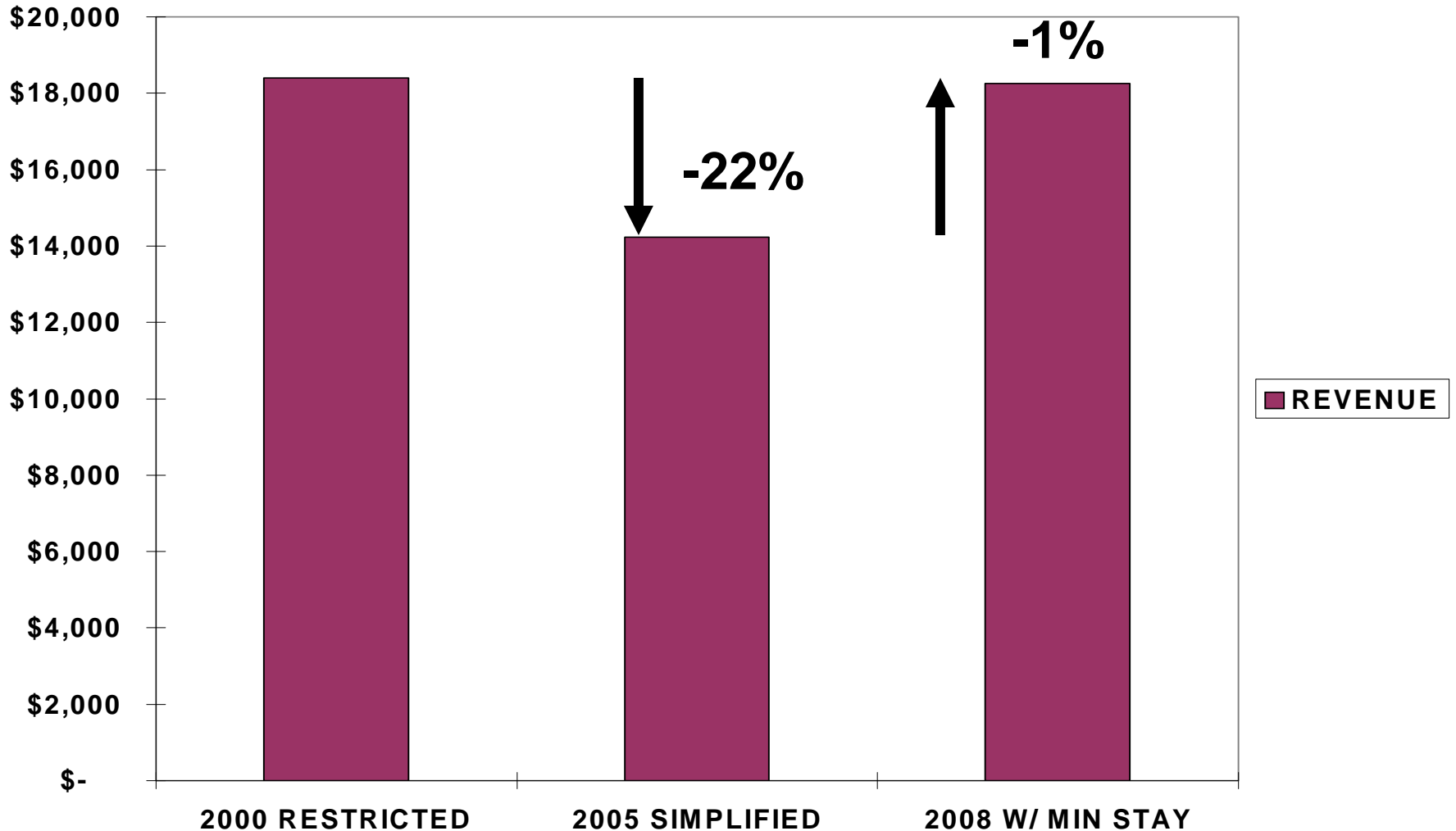
FARE	AP	Min Stay	Cancel Fee	Non Refund
\$500	0	NO	NO	NO
\$400	0	NO	YES	NO
\$315	7	NO	NO	YES
\$175	7	NO	YES	YES
\$145	14	NO	YES	YES
\$125	14	NO	YES	YES

2008 w/MIN STAY

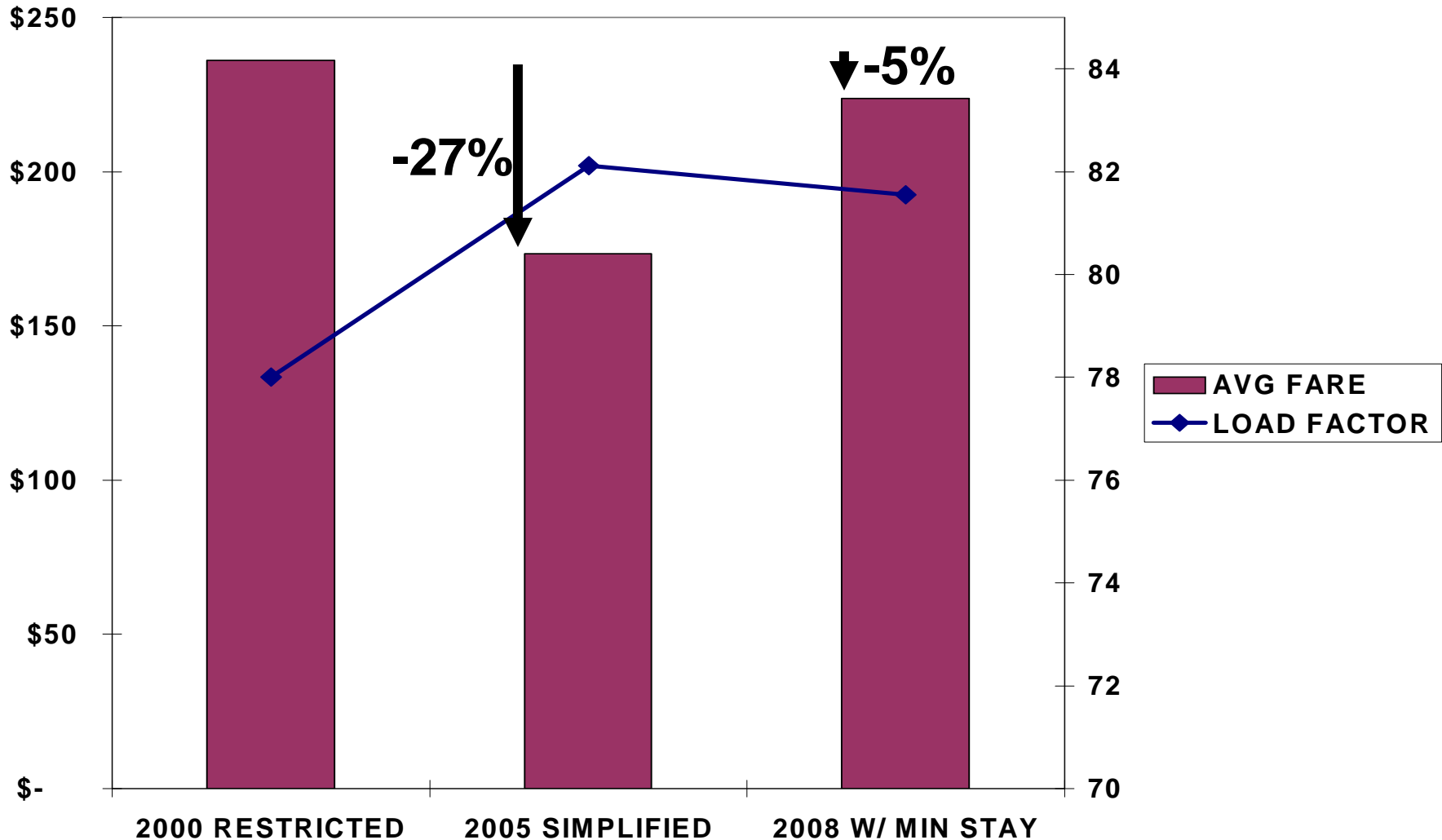
FARE	AP	Min Stay	Cancel Fee	Non Refund
\$500	0	NO	NO	NO
\$400	0	NO	YES	NO
\$315	7	NO	NO	YES
\$175	7	YES	YES	YES
\$145	14	YES	YES	YES
\$125	14	YES	YES	YES



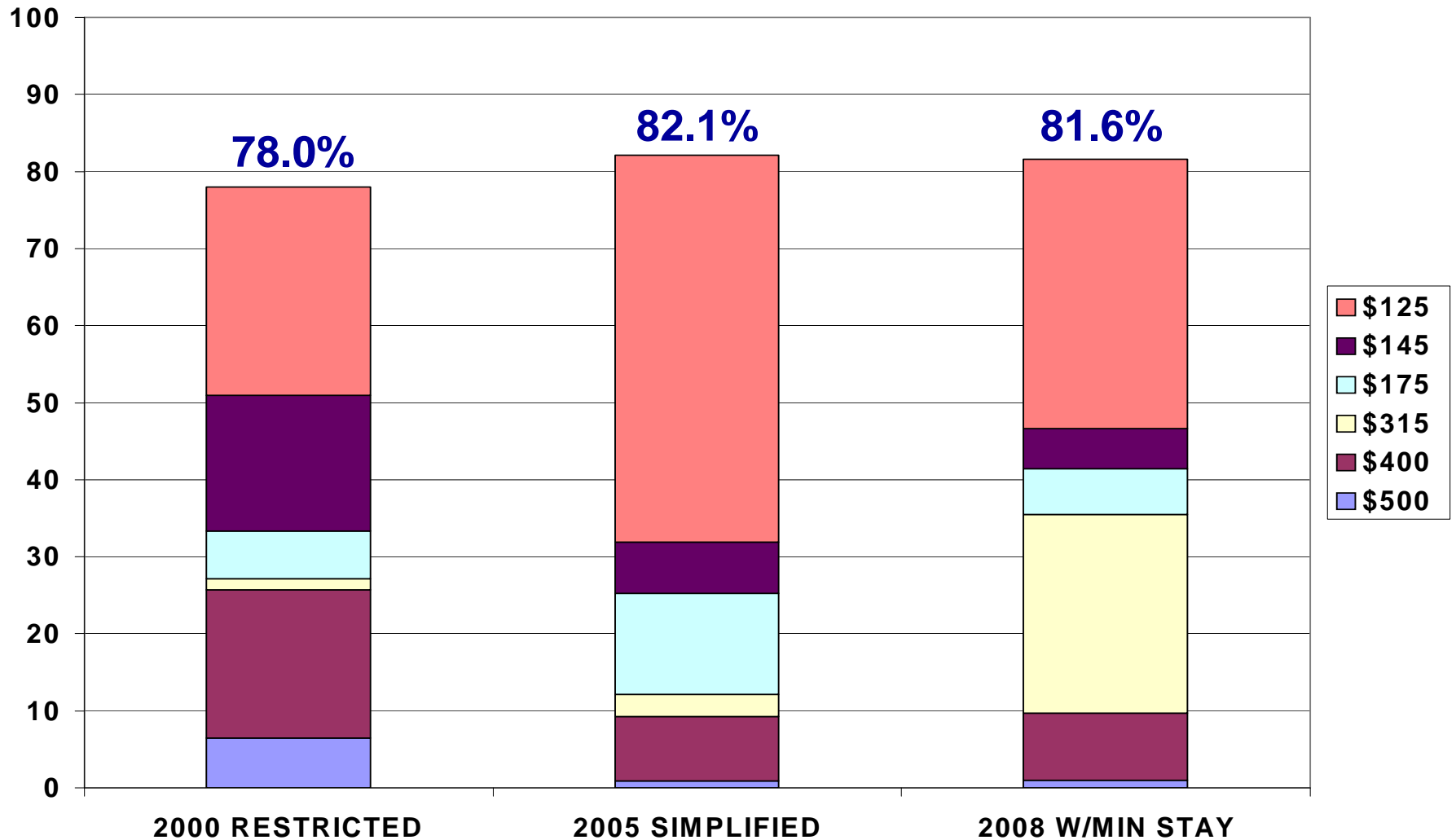
Simulation Results: Minimum Stays on Lowest Fares Increase Total Revenues



Average Fares and Load Factors

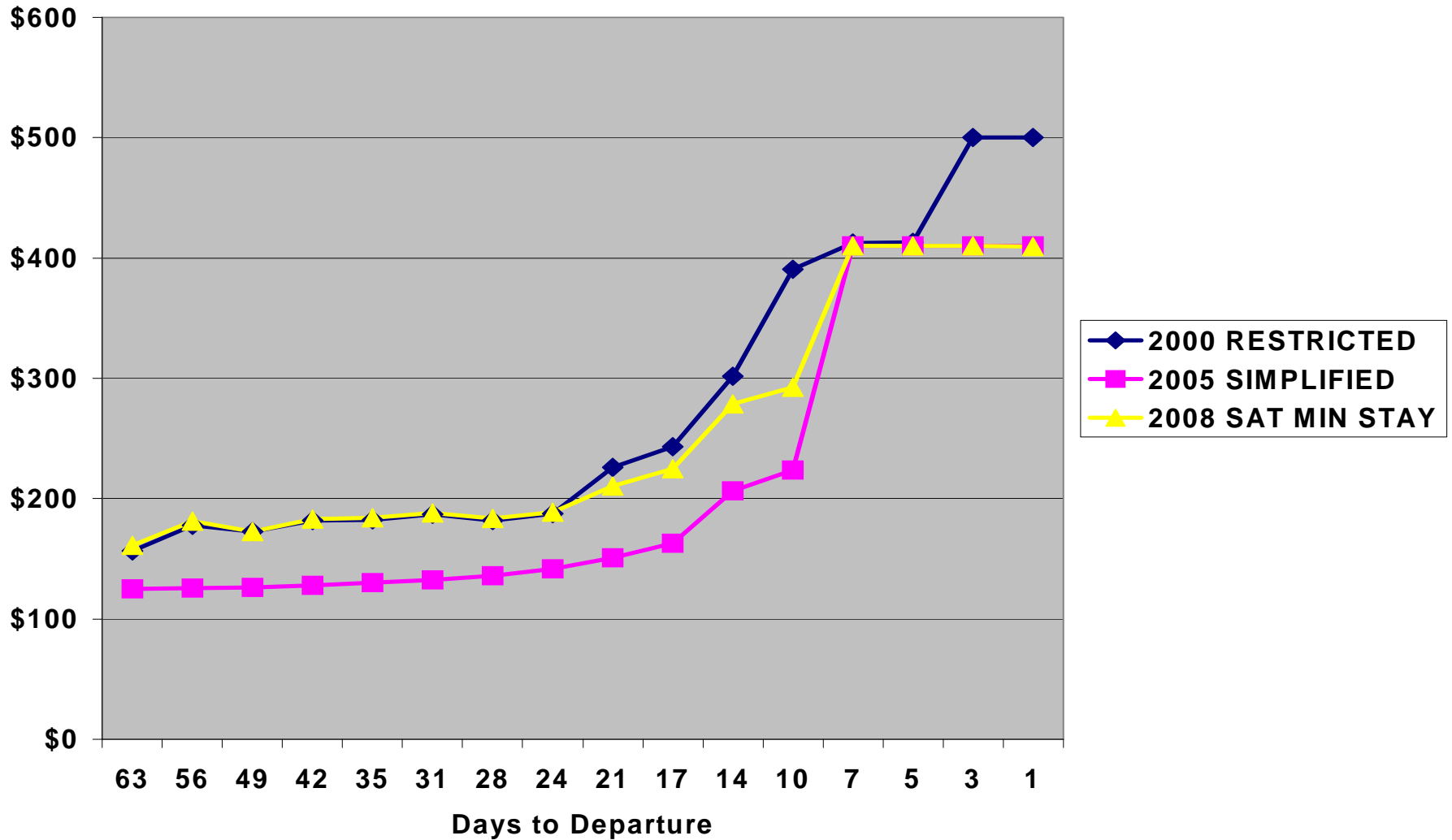


Bookings by Fare Class

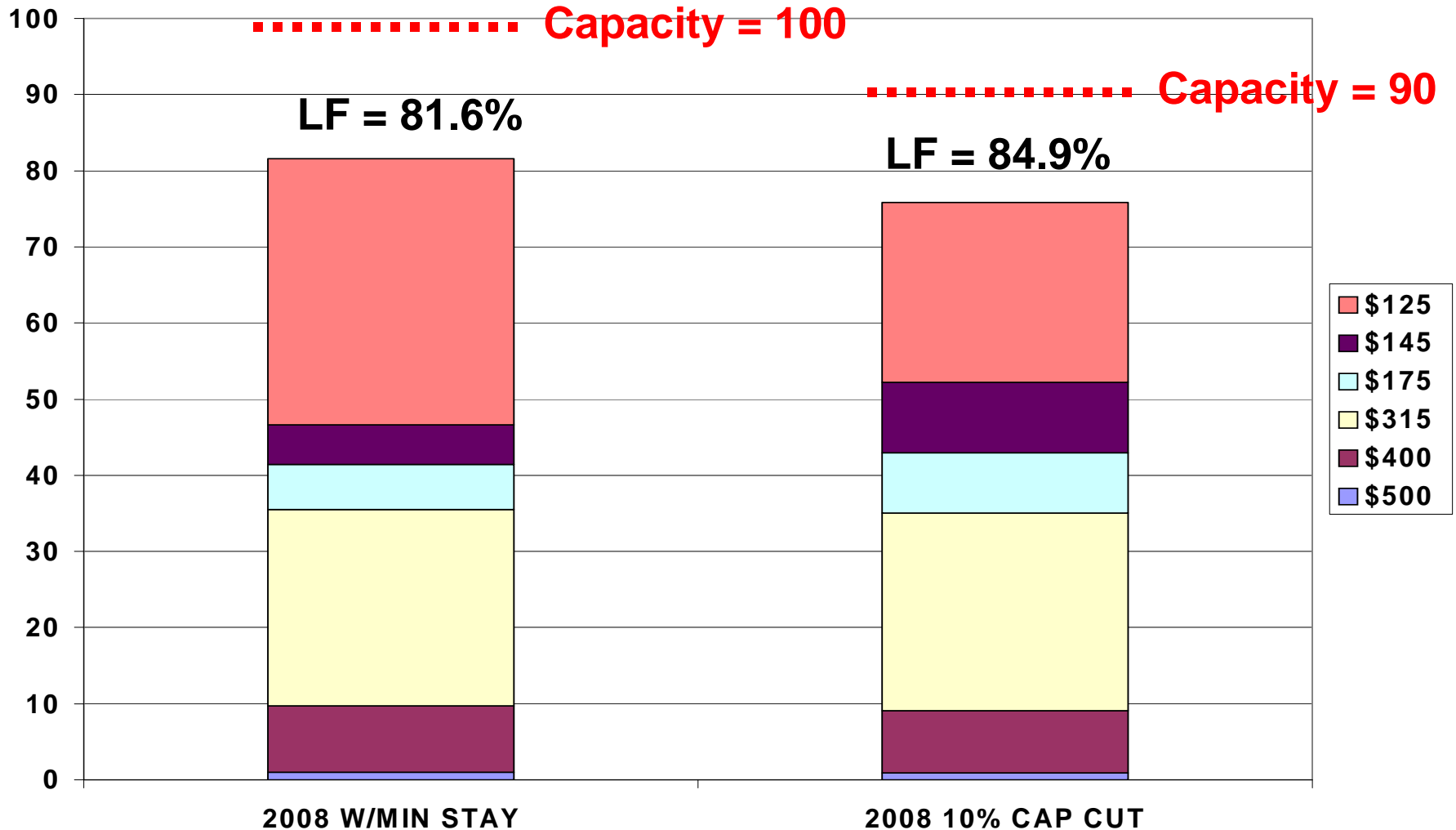




Average Fare Paid by Days to Departure



Fall 2008: 10% Capacity Reduction





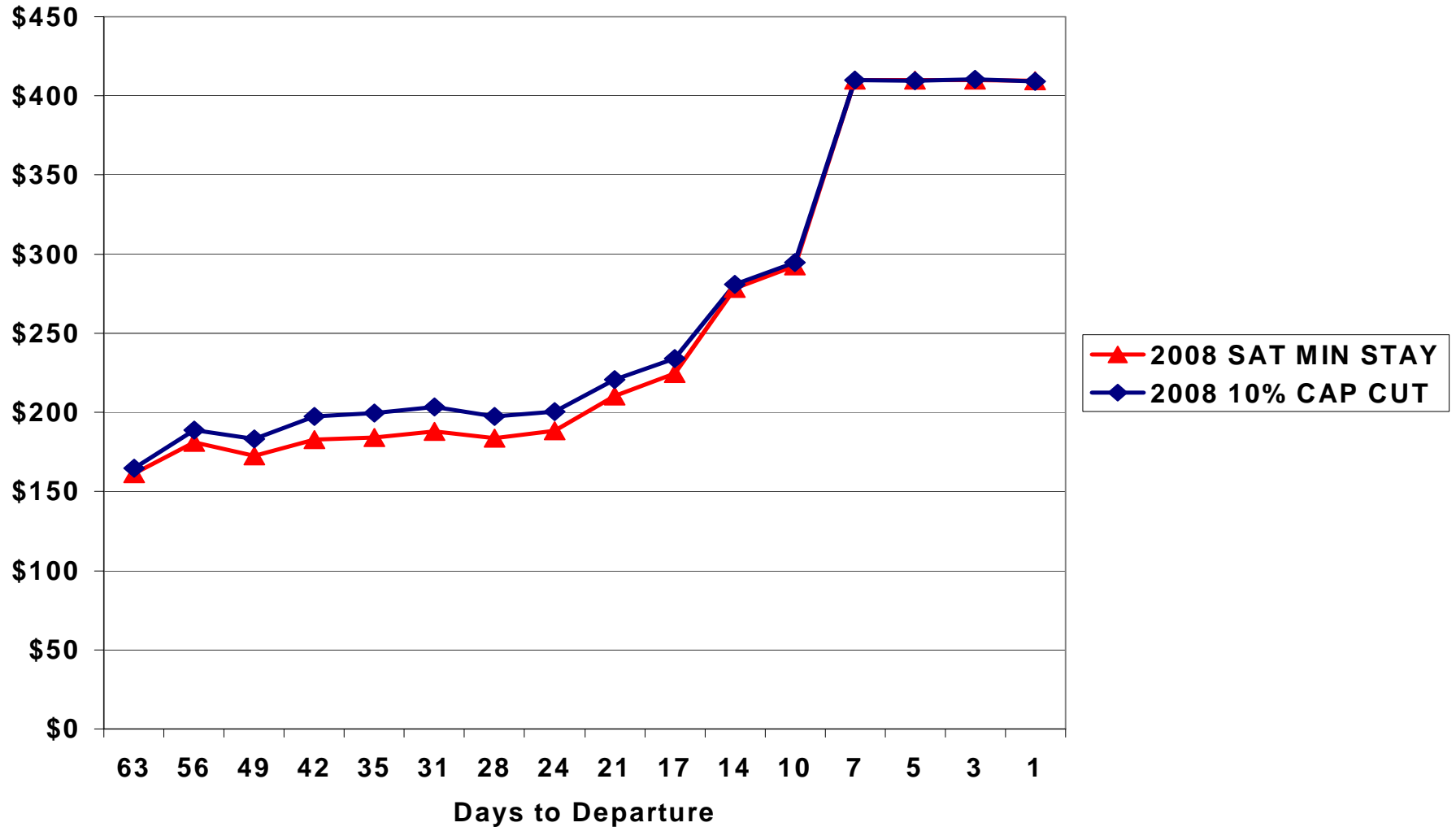
Summary: Impacts of 10% Capacity Cut

	2008 W/MIN STAY	2008 10% CAP CUT	% CHANGE
CAPACITY	100	90	-10%
<u>PASSENGERS</u>	<u>81.6</u>	<u>75.8</u>	-7%
BUSINESS	39.7	38.8	-2%
LEISURE	41.8	37.1	-11%
LOAD FACTOR	81.6%	84.2%	3%
REVENUE	\$18,251	\$17,582	-4%
AVE FARE	\$224	\$232	4%

- Fewer passengers carried but higher load factors, as expected.
- Large reduction in leisure passengers carried, not much change in business passengers – average fare increases.
- Total revenues down 4% (vs. cost savings of 10% capacity cut).



Capacity Cut Affects Average Fare Paid by Early Booking Leisure Passengers



New Pricing Developments – Product Differentiation and “Fare Families”

	 <p>TANGO Our best value</p>	 <p>TANGO PLUS Get up and go!</p>	 <p>LATITUDE A perfect fit</p>	 <p>EXECUTIVE CLASS Maximum comfort and freedom</p>
<p>MOVE UP TO A WHOLE NEW LEVEL OF CHOICE AND FLEXIBILITY!</p> <p>★ Optional attributes you can add or remove from your fare</p> <p>✓ Attributes included in your fare</p>				
		<p>MOVE UP TO TANGO PLUS FROM AS LOW AS</p> <p>\$30 AND BENEFIT FROM THESE FEATURES</p>	<p>MOVE UP TO LATITUDE FROM AS LOW AS</p> <p>\$80 AND BENEFIT FROM THESE FEATURES</p>	<p>MOVE UP TO EXECUTIVE CLASS</p> <p>MOVE ALL THE WAY TO THE TOP OF COMFORT AND CONVENIENCE</p>
<p>Access to airport discount parking ★</p>		✓	✓	✓
<p>Eligibility for upgrade to Executive Class®</p>		✓ ⁵	✓ ⁶	
<p>Call centre and airport service fee</p>	\$20	\$20	✓	✓
<p>Any-time change fee⁷</p>	\$40 Plus additional fare difference	\$40 Plus additional fare difference	✓ Plus additional fare difference	✓ Plus additional fare difference
<p>Same-day airport changes⁸</p>	\$150	\$50	✓	✓
<p>Prepaid Onboard Café voucher (\$7 value)⁹ ★</p>	+\$5	+\$5		
<p>Complimentary snack, sandwich or meal</p>			✓	✓



Fare Families on Air Canada Web Site

Day's lowest fare→							Sun 03-Feb \$98	Mon 04-Feb \$98	Tue 05-Feb \$98	Wed 06-Feb \$98	Thu 07-Feb \$220	Fri 08-Feb \$220	Sat 09-Feb \$118	Sun 10-Feb \$98	Mon 11-Feb \$118	Tue 12-Feb \$98	Wed 13-Feb \$220
From: Toronto, Pearson Int'l, ON (YYZ)																	
To: Fort Lauderdale, Fll Int'l, FL (FLL) Compare our fare options																	
Op.	Flights	Depart	Arrive	Aircraft	Stops	Connections	Tango	Tango Plus	Latitude	Executive Class							
Direct Flights																	
	AC938	07:15	10:25	320	0		<input type="radio"/> \$307	<input type="radio"/> \$343	<input type="radio"/> \$583	<input type="radio"/> \$1048							
	AC1216	10:10	13:20	321	0		<input type="radio"/> \$358	<input type="radio"/> \$394	<input type="radio"/> \$634	<input type="radio"/> \$1048							
	AC900	14:45	17:55	320	0		<input type="radio"/> \$419	<input type="radio"/> \$454	<input type="radio"/> \$694	<input type="radio"/> \$1048							
	AC932	21:00	00:10 + 1 day	321	0		<input type="radio"/> \$220	<input type="radio"/> \$256	<input type="radio"/> \$496	<input type="radio"/> \$1048							
Connecting Flights																	
	AC480	06:30	07:45	E90	★	0	Montreal (YUL)	<input type="radio"/> \$358	<input type="radio"/> \$394	<input type="radio"/> \$634	<input type="radio"/> \$1048						
	AC924	08:45	12:20	320		0											
	AC480	06:30	07:45	E90	★	0	Montreal (YUL)	<input type="radio"/> \$358	<input type="radio"/> \$394	<input type="radio"/> \$634	<input type="radio"/> \$1048						
	AC928	11:00	14:36	319		0											
	AC400	07:00	08:15	767		0	Montreal (YUL)	<input type="radio"/> \$358	<input type="radio"/> \$394	<input type="radio"/> \$634	<input type="radio"/> \$1048						
	AC928	11:00	14:36	319		0											



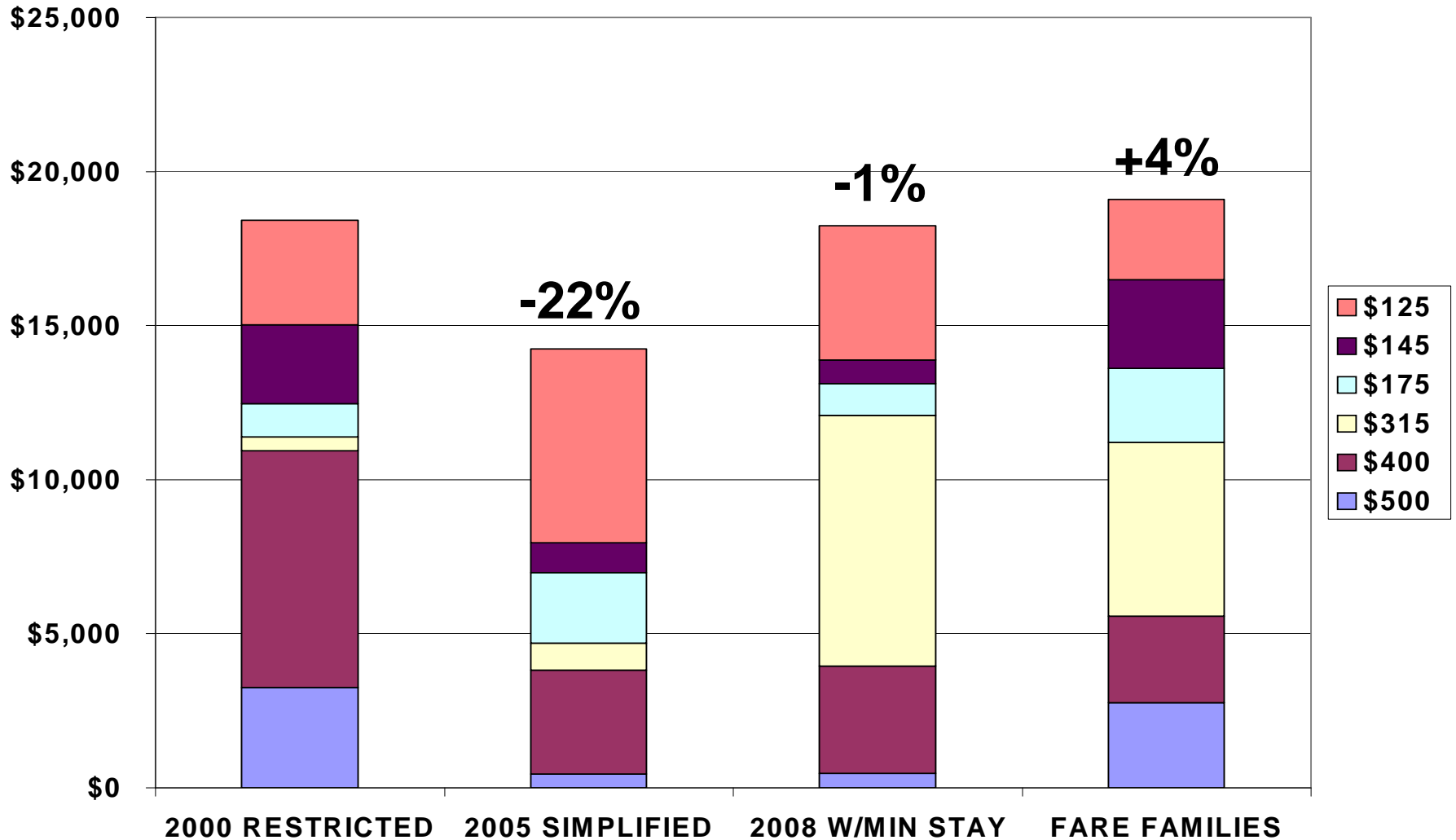
PODS Simulations of Fare Families

- **Two or more “fare families” with explicit differences in amenities and restrictions**
 - Reduced emphasis on “lowest available fare” on web sites
 - Passengers choose based on both price levels and differences in product characteristics and restrictions
- **Preliminary PODS simulations of Fare Family concept:**
 - Both families can be booked right up until departure day

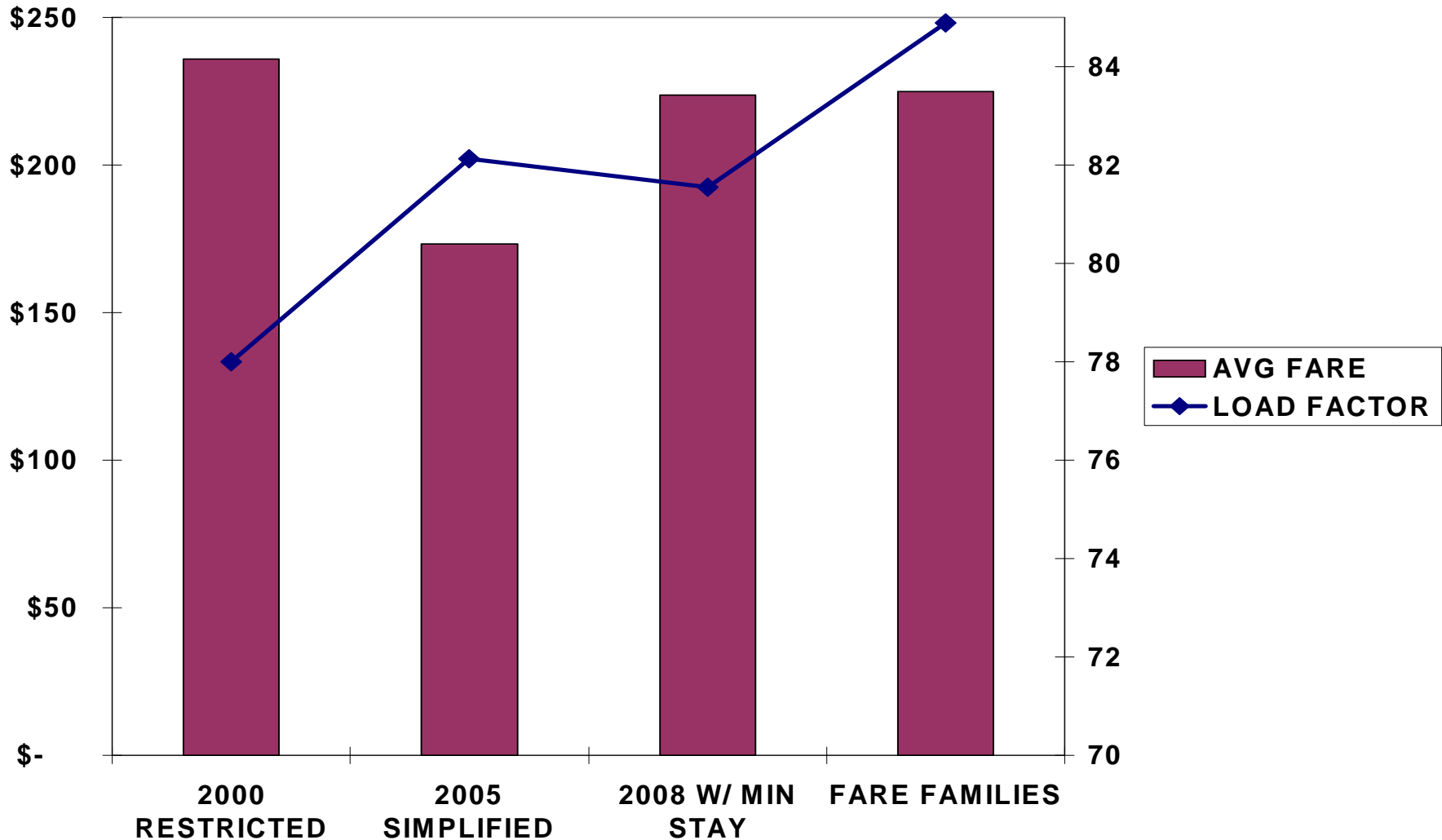
FARE	AP	Min Stay	Cancel Fee	Non Refund
\$500	0	NO	NO	NO
\$400	7	NO	NO	NO
\$315	14	NO	NO	NO
\$175	0	YES	YES	YES
\$145	7	YES	YES	YES
\$125	14	YES	YES	YES



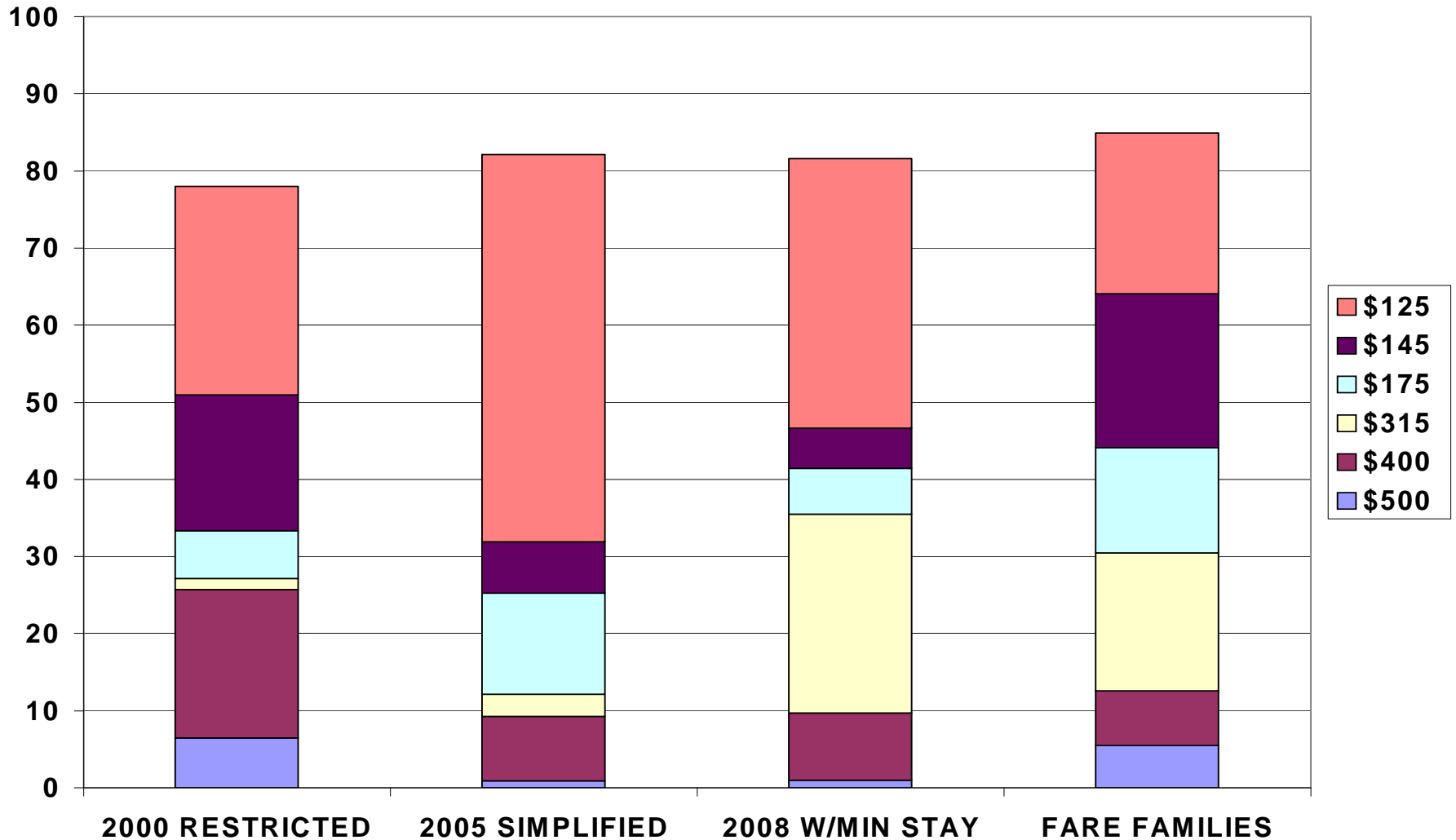
Fare Families Can Increase Revenues



Average Fares and Load Factors



Fare Families Capture More Sell-up and Late Booking Leisure Passengers





New Developments in RM Modeling

- **Forecasting and optimization methods to maximize revenues in evolving fare structures**
 - RM forecasting models must be changed to reflect passenger willingness to pay (WTP)
 - RM optimization models must incorporate likelihood of passenger sell-up when lower classes closed
- Both forecasting and optimization require estimates of WTP and/or sell-up rates (“elasticity”)
- **Methods developed and/or tested in MIT PODS research consortium**
 - Funded by seven large international airlines
 - Passenger Origin Destination Simulator used to evaluate revenue impacts of RM models in competition markets

- **Fare structures and RM systems have important impacts on average fares and total revenues**
 - Segmentation restrictions contribute to revenue maximization
 - RM systems protect seats for late-booking high-fare passengers
- **Most important recent developments include**
 - Fare simplification, followed by a return to more restrictions
 - Movement toward “fare families” and product differentiation
- **RM challenges with changing fare structures**
 - “Simplified” and changing fare structures make RM more difficult
 - Development of new models for forecasting, optimization and estimation of willingness to pay