



**TECHNOLOGY – *Smart Solutions for  
Airport Capacity***

**Efficient Ramp Management**

**FAA/NASA/Industry**

**Airport Planning**

**Tom Duffy, Safegate Airport Systems**

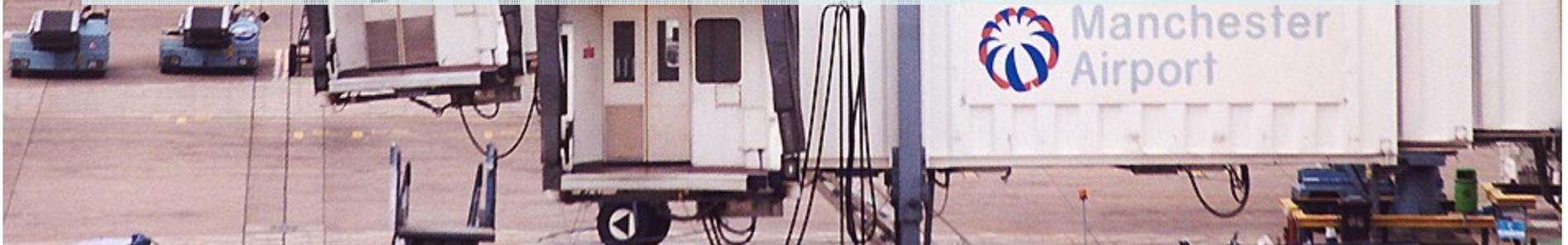
**September 13, 2006**

# What is the “efficient ramp”?

- ✦ Safe
- ✦ Best use of real property
- ✦ Facilitates cost-effective turns for airlines

## What is at stake?

- ✦ A new gate: \$10,000,000 – \$20,000,000
- ✦ A new aircraft: \$50,000,000 or more!
- ✦ Fuel cost for 5 minutes: \$125
- ✦ Cost of a ramp accident: \$250,000
- ✦ An efficient ramp: **Priceless!**





# The traditional U.S. airport ramp

- ✦ Controlled by airlines (market share)
- ✦ Ramp equipment owned by airlines
- ✦ Exclusive use gates = no benefit to airport for productivity
- ✦ Results
  - Low efficiency
  - Little flexibility



# Today's Picture

- ✦ Airport's must create airline competition
- ✦ Capital projects deferred or minimized
  - Security requirements consume too much capital
- ✦ Highly volatile business model
  - Traffic
  - Movements
  - Rules & Regulations

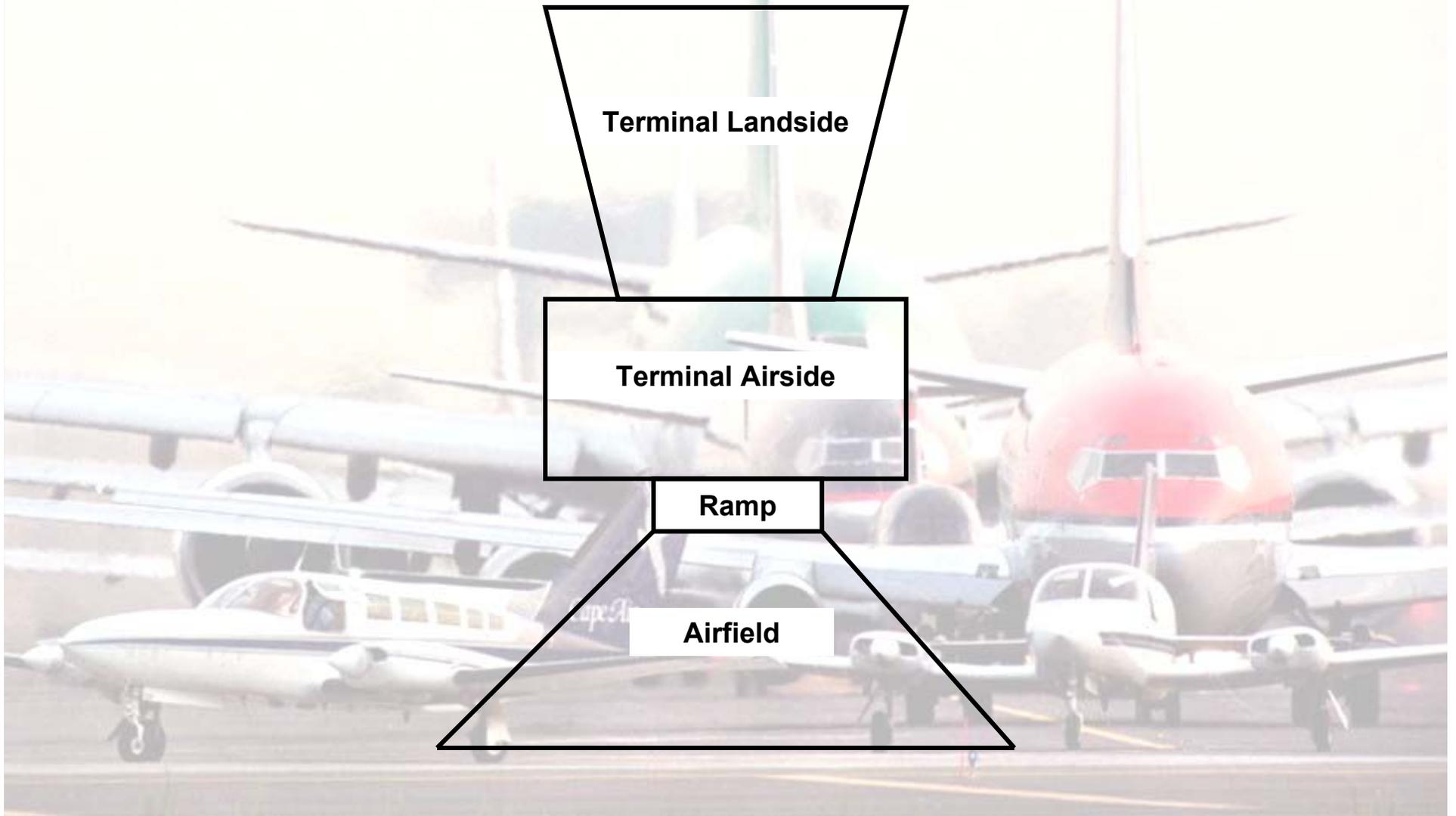
# Tomorrow's Bottleneck?

Terminal Landside

Terminal Airside

Ramp

Airfield

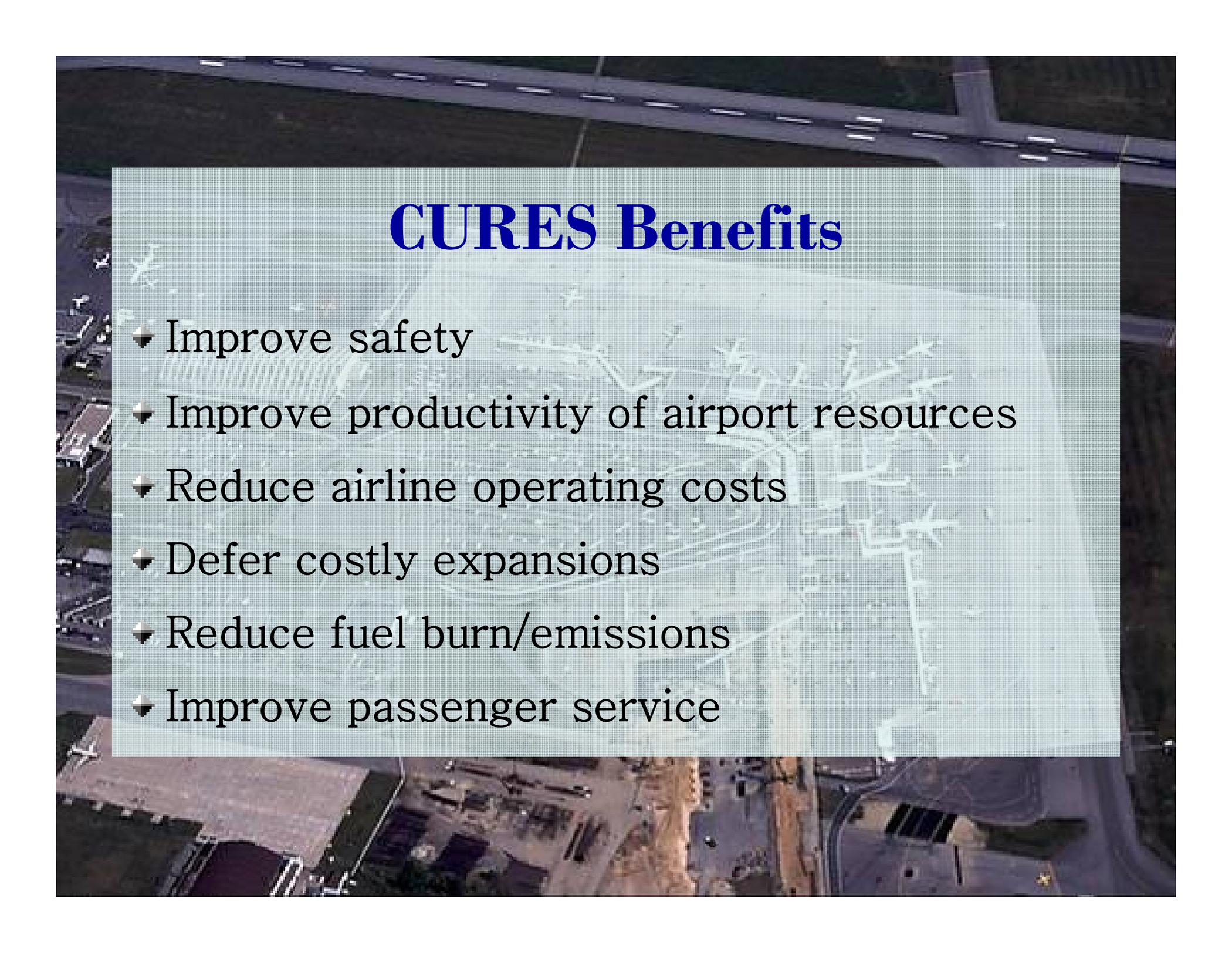


**Where are we headed?**



# Common Use Ramps

- ✦ CURES – Common Use Ramp Equipment & Systems
- ✦ Must be driven by airports
- ✦ Same benefits as CUTE, except maybe more



# CURES Benefits

- ✦ Improve safety
- ✦ Improve productivity of airport resources
- ✦ Reduce airline operating costs
- ✦ Defer costly expansions
- ✦ Reduce fuel burn/emissions
- ✦ Improve passenger service

# Ramp Management Systems

The list of U.S. airports with comprehensive RMS:



# Aircraft Parking Guidance

## Visual Docking Guidance Systems

- ◆ Reduces dependency on ground personnel
- ◆ Improves flexibility of gate assignments
- ◆ Increases ground safety
- ◆ Provides operational data
- ◆ Results
  - Cut taxi times
  - Reduce fuel burn
  - Reduce block times
  - Avoid accidents



Safedock®

Terminal 3  
Satellite

# Gate Management Systems

## Real-Time Gate Status



Park On Time	GPU On...	PCA O...	GPU Of...	PCA Off(-)	Park Off Time
08/01/2005 06:10:33	00:02:42	00:11:17	00:01:51	00:09:22	08/01/2005 07:15:25
08/01/2005 07:48:20	00:01:10	00:09:32	00:07:29	00:09:25	08/01/2005 10:20:04
08/01/2005 10:39:29	00:00:37	00:19:45	00:19:48	00:33:51	08/01/2005 11:42:23
08/01/2005 12:23:12	00:00:47	00:13:05	00:07:53	00:12:04	08/01/2005 13:36:05
08/01/2005 15:35:46	00:01:19	00:03:28	00:09:01	00:14:03	08/01/2005 16:38:40
08/01/2005 16:53:27	00:01:27	00:03:17	00:25:22	00:31:09	08/01/2005 18:58:10
08/01/2005 19:25:27	00:01:25	00:05:59	00:05:59	00:16:27	08/01/2005 21:14:14
08/01/2005 21:48:26	00:01:25	00:07:11	00:01:59	00:16:27	08/02/2005 07:10:19
08/02/2005 07:47:01	00:00:54		00:03:02		08/02/2005 08:39:56
08/02/2005 09:27:44	00:00:46	00:02:46	00:09:58	00:26:30	08/02/2005 10:21:37
08/02/2005 10:41:29	00:01:20	00:03:39	00:07:27	00:07:31	08/02/2005 11:20:22
08/02/2005 11:58:23	00:00:51	00:01:57	00:07:04	00:08:13	08/02/2005 13:22:15
08/02/2005 14:21:31	00:01:12		00:04:02		08/02/2005 15:46:13
08/02/2005 17:40:55	00:01:09	00:05:50	00:03:06	00:05:56	08/02/2005 19:27:31
08/02/2005 20:17:06	00:01:12	00:05:04			

Terminal 1

Hammerhead F

# Integrated Auto-Docking

VDGS

Flow of information

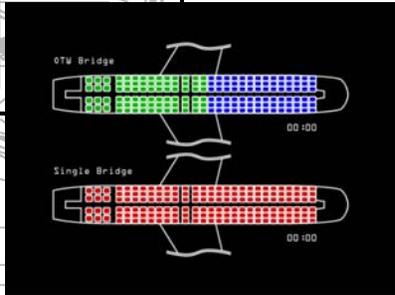
FIS



Over-The-Wing Bridge

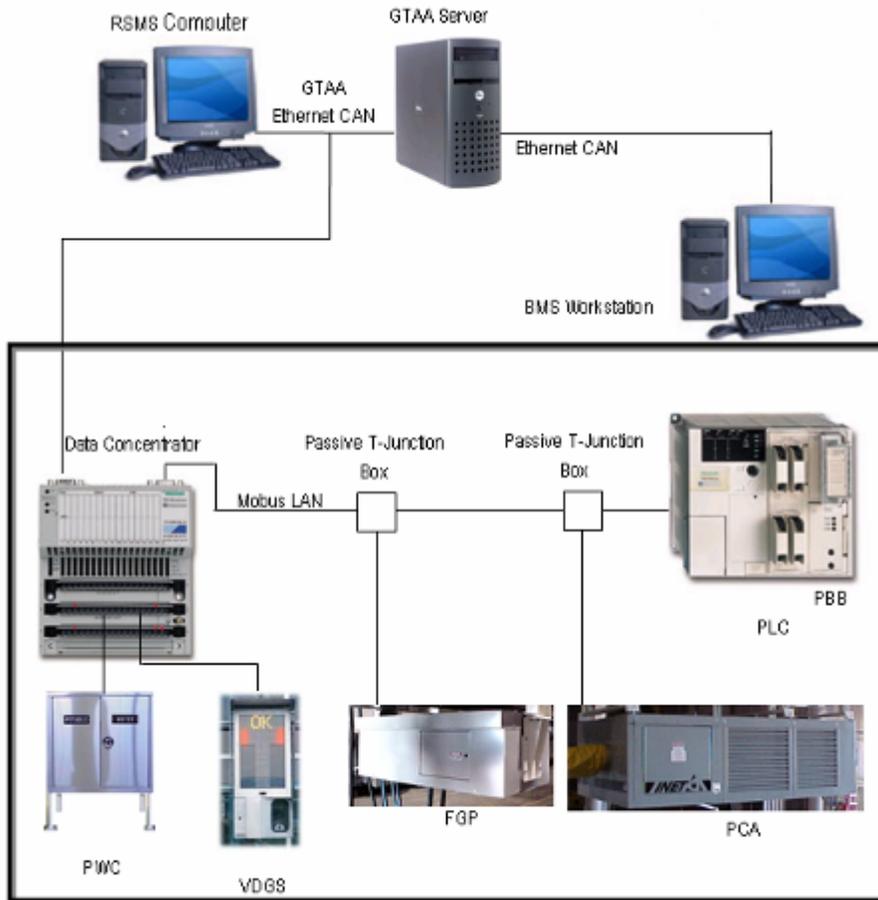
Apron Drive Bridge

Flow of information



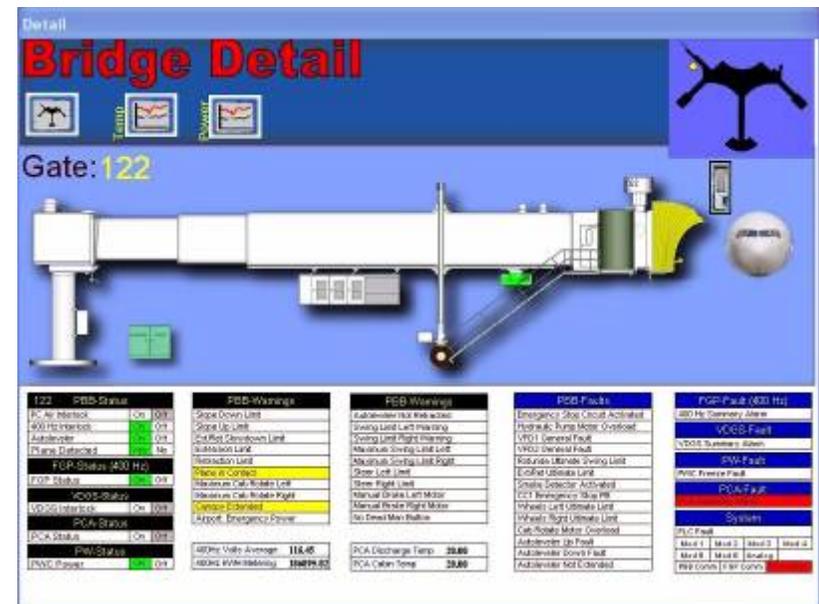
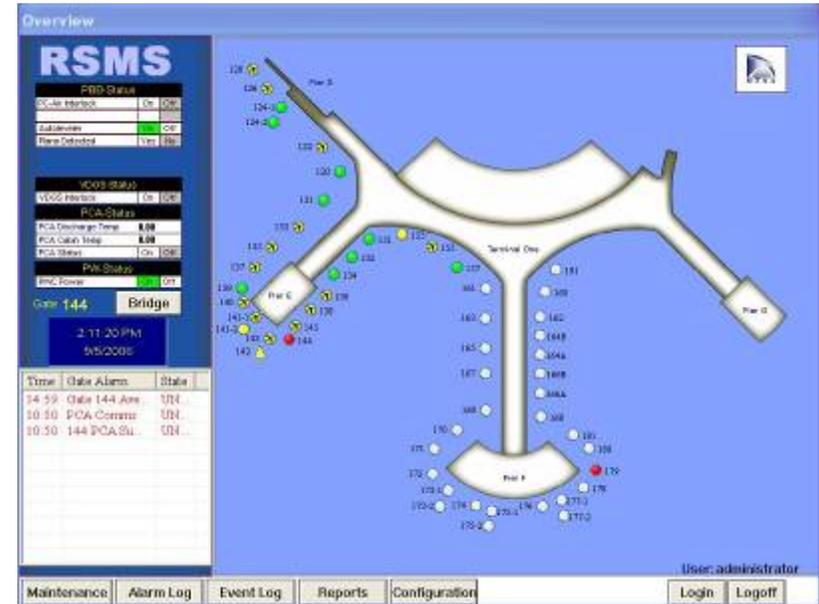
Courtesy of Dew Engineering & Development, Ltd.

# Ramp Services Monitoring System



Typical Passenger Boarding Bridge and Fixed Ground Support Equipment Gate Layout

Figure: 1



Courtesy of Greater Toronto Airport Authority

# Ramp Control Systems

- ✦ Increase capacity
- ✦ Increase safety
- ✦ Increase flexibility

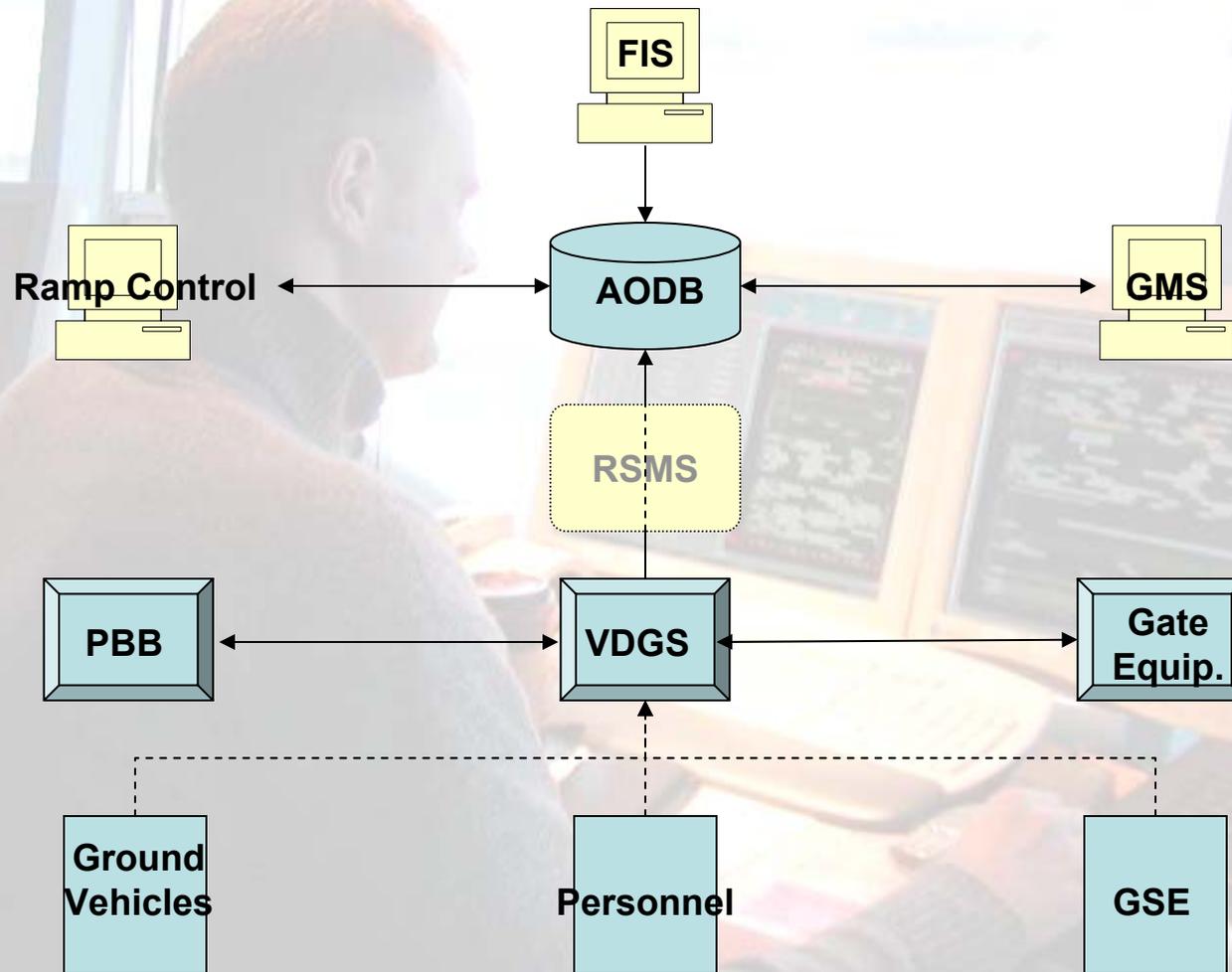
Courtesy of Seattle-Tacoma International Airport

# Sea-Tac Ramp Control Tower

## Key Components

- ◆ SDVS – Small digital voice switch; Ring down line
- ◆ ASDE-X Integration
- ◆ Passur display
- ◆ STARS display
- ◆ FDIO printers

# The Integrated Ramp



# Takeaways

- ◆ The efficient ramp will be one that utilizes common use practices
- ◆ The efficient ramp will contribute to competitive air service for airports
- ◆ The efficient ramp is a **MUST** for practical capacity growth and sustainable health of the airlines

