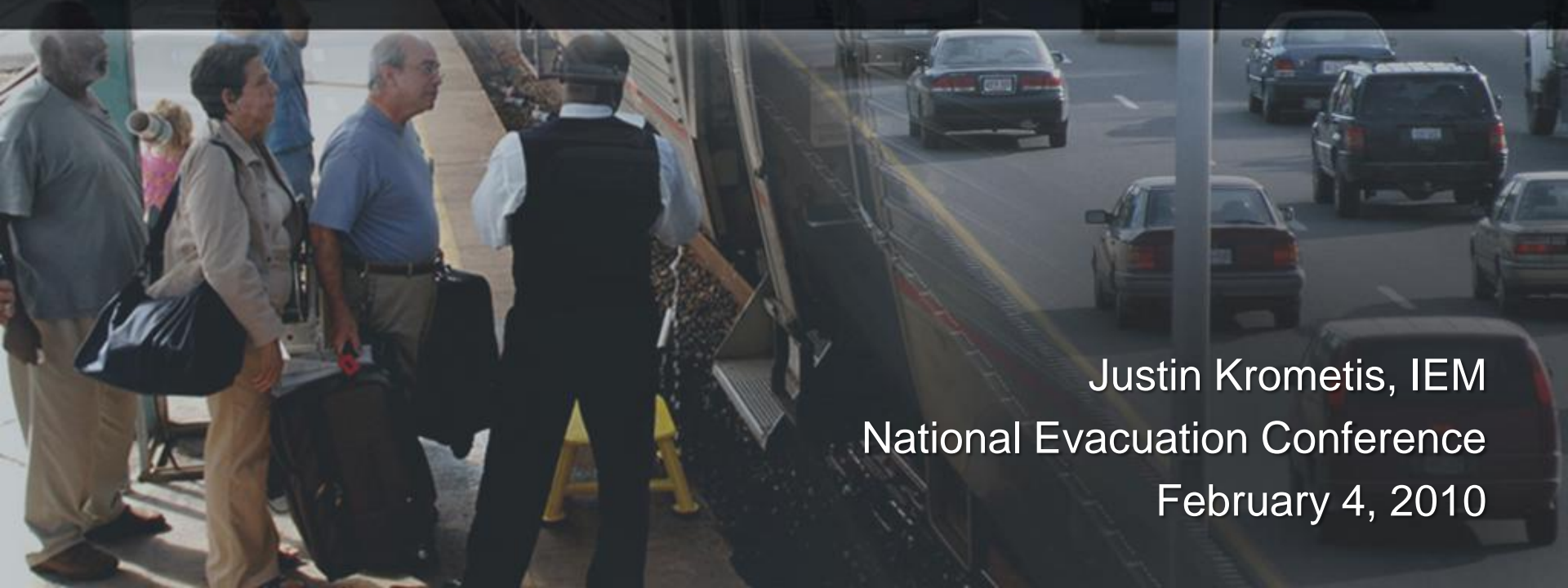




Modeling Mass Evacuation Staging Centers

A Case Study in New Orleans



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- In mass evacuations, evacuees are often channeled through centralized locations for:
 - Registration
 - Medical triage
 - Allocation to evacuation modes
- The layout, process, and resources at these facilities can significantly impact evacuation efficiency

- Model evacuee processing and mode allocation
 - Enter potential setup and get performance measures
 - Alter parameters to determine their impact and evaluate alternative processing plans
- Identify potential problems before they arise in practice
- Maximize operational efficiency
- Optimize staffing and resources

Case Study: UPT in New Orleans



- Union Passenger Terminal (UPT) in New Orleans
- All publicly-assisted evacuees in city pass through UPT
- Three modes:
 - Motor coach
 - Bus to MSY airport
 - Train to Memphis



UPT Procedures

Registration

Evacuees with Pets

General Population without Pets

Evacuees with Medical Needs

Enter UPT

Screening

Security Screening

Medical Triage

Determine Transport Mode

Transportation

Shuttle Bus to Airport

Motor Coach to Shelter

ADA-Compliant Motor Coach

Rail

- Processing steps required, such as:
 - Receiving evacuees at entrance
 - Security screening
 - Medical screening
 - Triage by mode
- Pattern and rate of evacuee arrivals
- Room for waiting (max queue) at each step
- Time required for each processing step
- Number of workstations at each processing step (e.g., number of people registering evacuees)

- Overall throughput rate
- Overall end-to-end processing time by arrival time
 - By evacuee type
- Evacuees processed at each step
- Evacuees waiting at each step
- Queues at each step

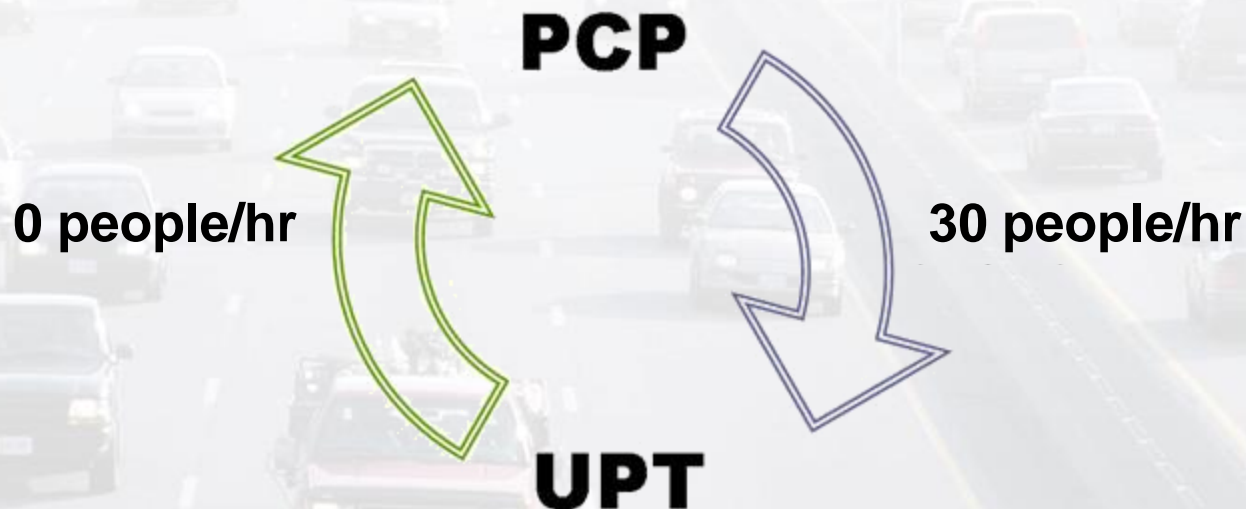
- How many registrars are needed?

Number of People Not Registered After 24 Hours

Evacuees	25 Registrars	35 Registrars	45 Registrars	55 Registrars
15,000	82	0	0	0
20,000	4,557	0	0	0
25,000	9,318	3,274	0	0
30,000	13,982	7,938	1,858	0

Proposed Solution: Registration on Buses

- Should evacuees be registered on buses to UPT?
 - Reduces processing time at UPT
- Or should all registrars be allocated to UPT?
 - Greater processing capacity



Registration on Buses (cont.)

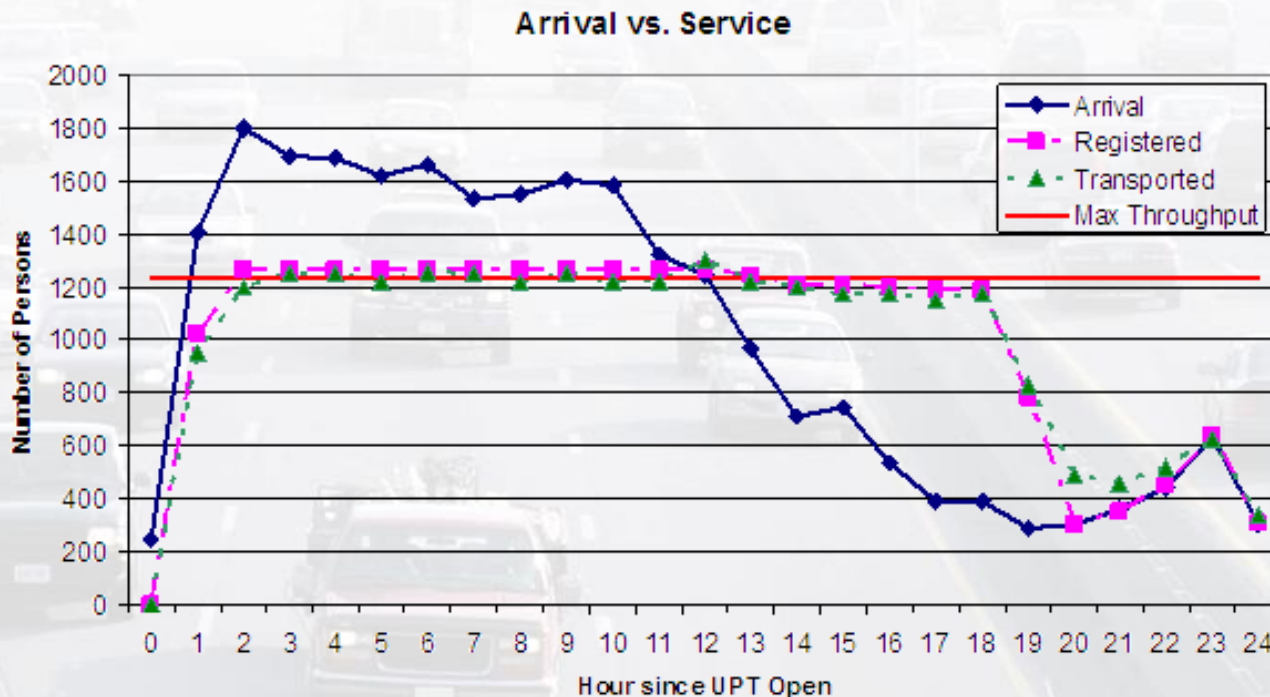


- Bus registrars will only register evacuees 50% of their time; the rest will be spent on empty buses back to the PCPs
- Increased capacity of additional registrars at UPT is more beneficial than reduced processing time

	Max Queue (persons)	Max Waiting Time (minutes)	Unregistered after 24 Hours (persons)	Additional Time to Complete Registration (minutes)
With Bus Registration	6,970	444	1,658	110
All Registrars at UPT	2,168	91	0	0

Evacuation Start Time

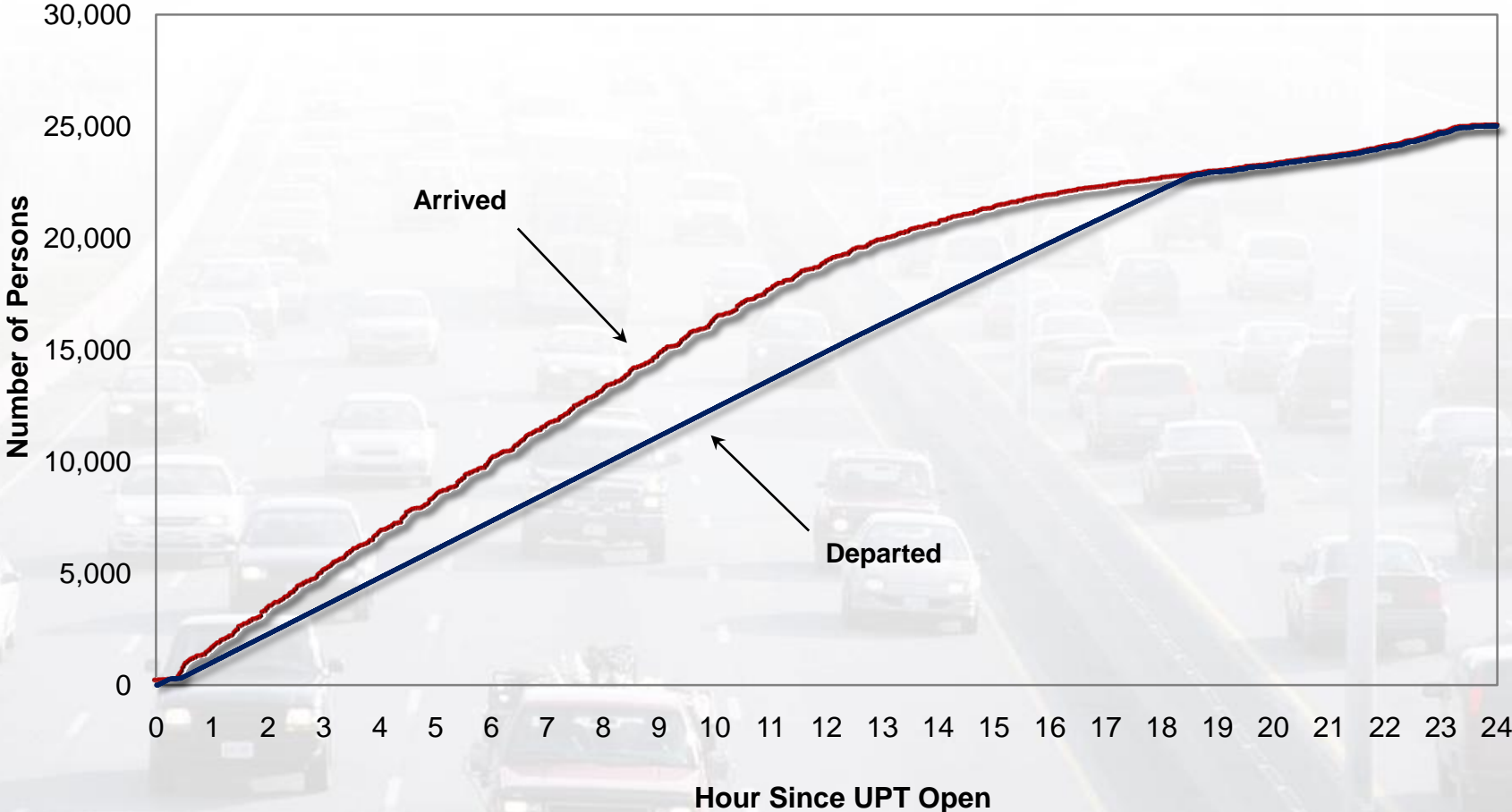
- Evacuation timeline works backwards from the onset of tropical storm winds
- Evacuation peak is expected during the day
 - How does this impact processing?



Evacuation Starting at 8 AM



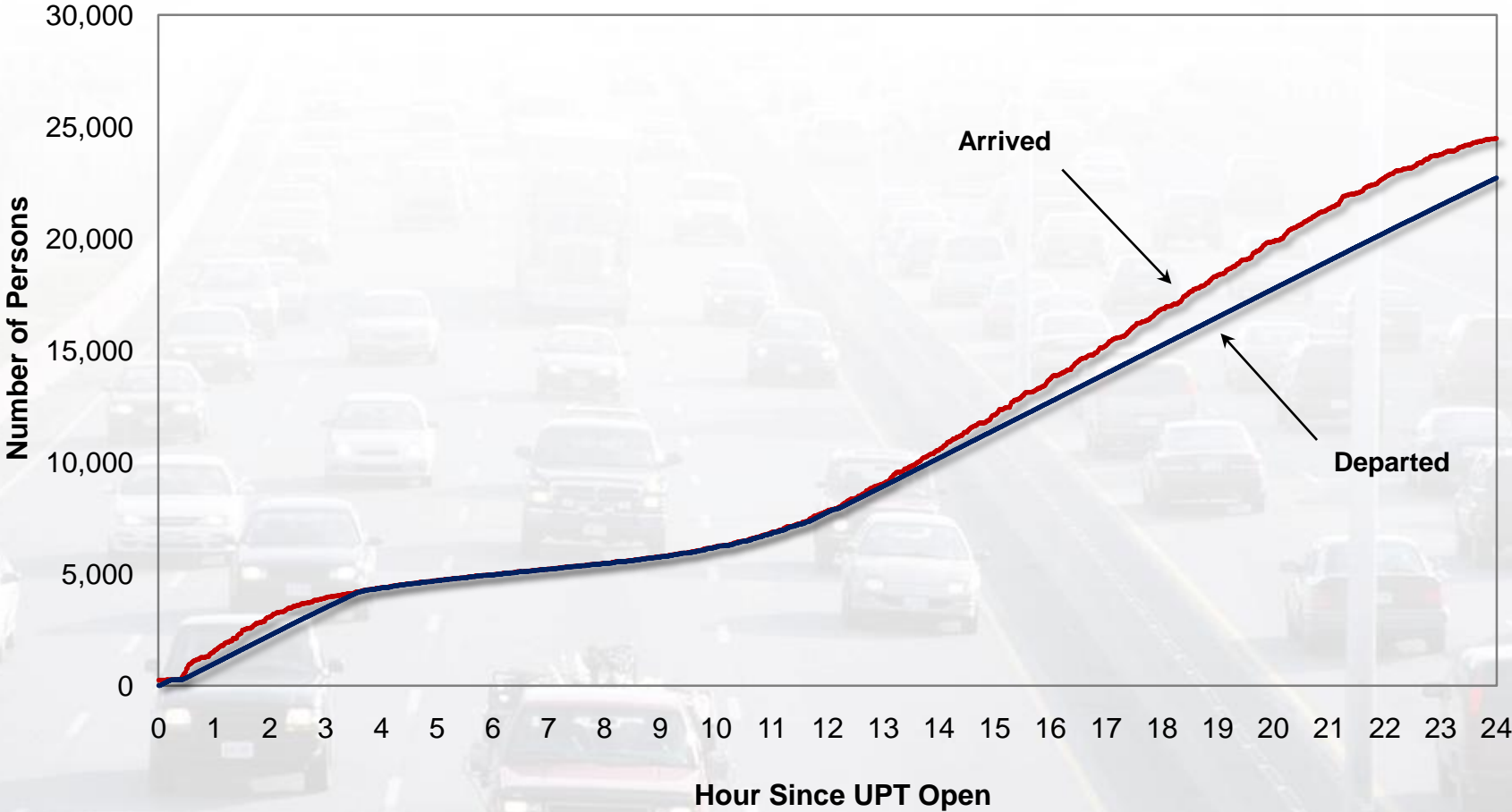
Cumulative Number of Evacuees Arrived at & Departed from UPT



Evacuation Starting at 8 PM



Cumulative Number of Evacuees Arrived at & Departed from UPT



- Modeling Allowed:
 - Investigation of situational contingencies (e.g., number of evacuees, time of evacuation)
 - Identification of resource needs (e.g., number of registrars)
 - Refinement of processing strategy (e.g., registration at UPT vs. registration on buses)

Questions or Comments?

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