

# Analysis and Visualization of Timing and Tracking Data: Examples From ~~Two Exhibit Evaluations~~ One Exhibit Evaluation

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INSTITUTE FOR LEARNING INNOVATION

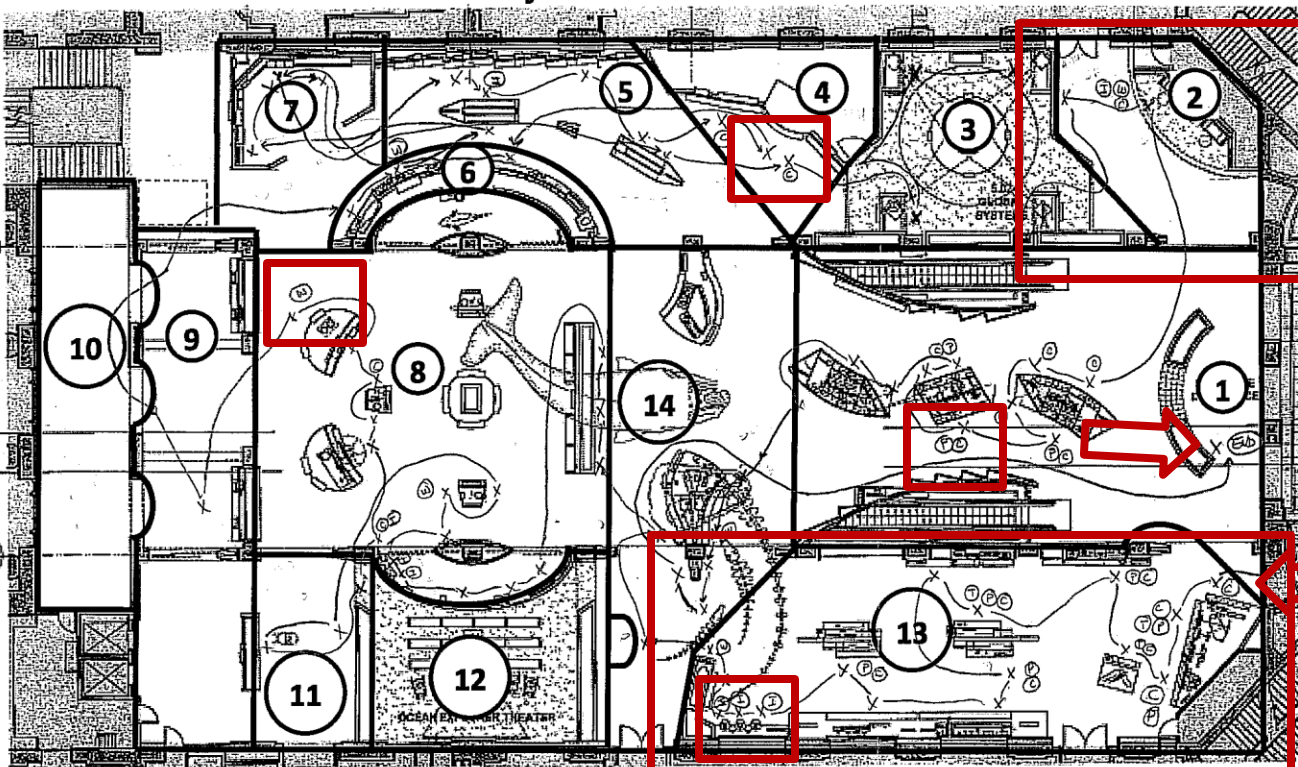
American Evaluation Association

November 11, 2010

# What I'll cover today

- More about what's possible to report, than a discussion of evaluation results.
- Analysis: common ways to represent timing/tracking data
  - Most/least frequently visited areas
  - Time spent
  - Visitor behavior
- Data Visualization: two ways to visualize timing/tracking data
  - “Heat” Maps
  - Paths

# National Museum of Natural History's Ocean Hall Evaluation



Crowd Density:	Interactions:
<input checked="" type="checkbox"/> 1 = Empty	I ..... Interactive (active)
<input type="checkbox"/> 2 = Sparsely visited	W ..... Watch video / media (passive)
<input type="checkbox"/> 3 = Moderately crowded	T ..... Touch
<input type="checkbox"/> 4 = Very crowded	P ..... Point Object
	C ..... Group conversation
	N ..... "Navigator" conversation
	D ..... Downtime / rest

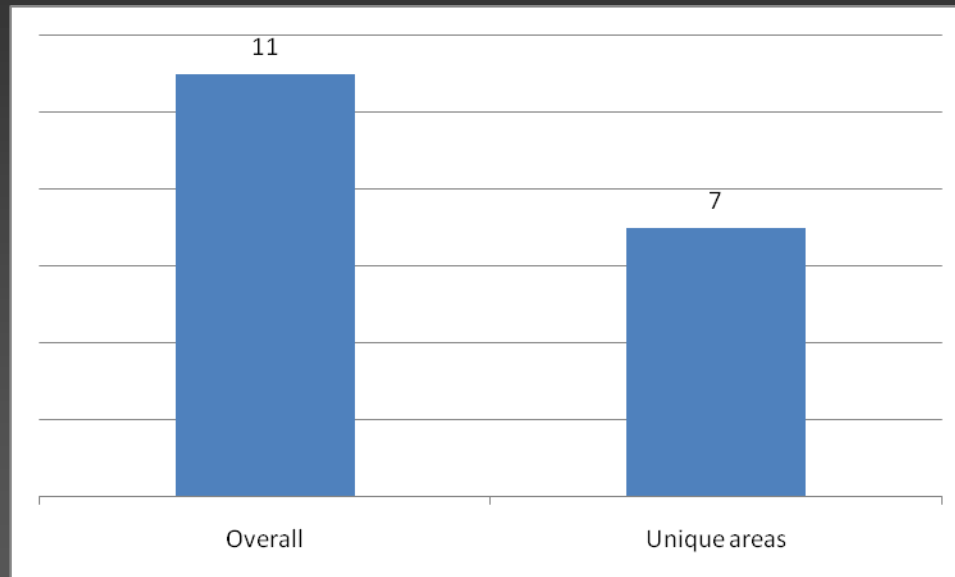
Notes:
Mitigating Factors: [Tour, temperature, IMAX, Family Guide, etc.]

TIMING & TRACKING			
DATE:	1/29/2009		
RESEARCHER/ ID:	CF35		
	START	STOP	
TIME OF DAY	3:12	4:08	
SITE TIME	00:00	55:48	
	TIME IN	TIME OUT	
1 Biodiversity	15:48	55:48	
2 Ocean Systems / Ocean News	40:42	45:31	
3 Global Systems	38:11	40:42	
4 Coral Reefs	33:50	34:54	
36:26 - 37:08	29:37	29:50	
5 Shores to Shallows	31:50	32:50	
	34:54	35:50	
6 Collections Wall	26:36	29:37	
7 Poles	29:50	31:50	
	35:50	36:26	
8 Open Ocean	14:40	20:30	
	21:48	25:40	
9 Living on an Ocean Planet	25:40	26:10	
	26:20	26:36	
10 Changing Exhibit	26:10	26:20	
11 Deep Ocean Exploration	20:30	21:30	
12 Ocean Explorer Theater	21:30	21:48	
13 Journey Through Time	0:00	12:30	
14 Whales	12:30	14:40	
	50:41	54:48	

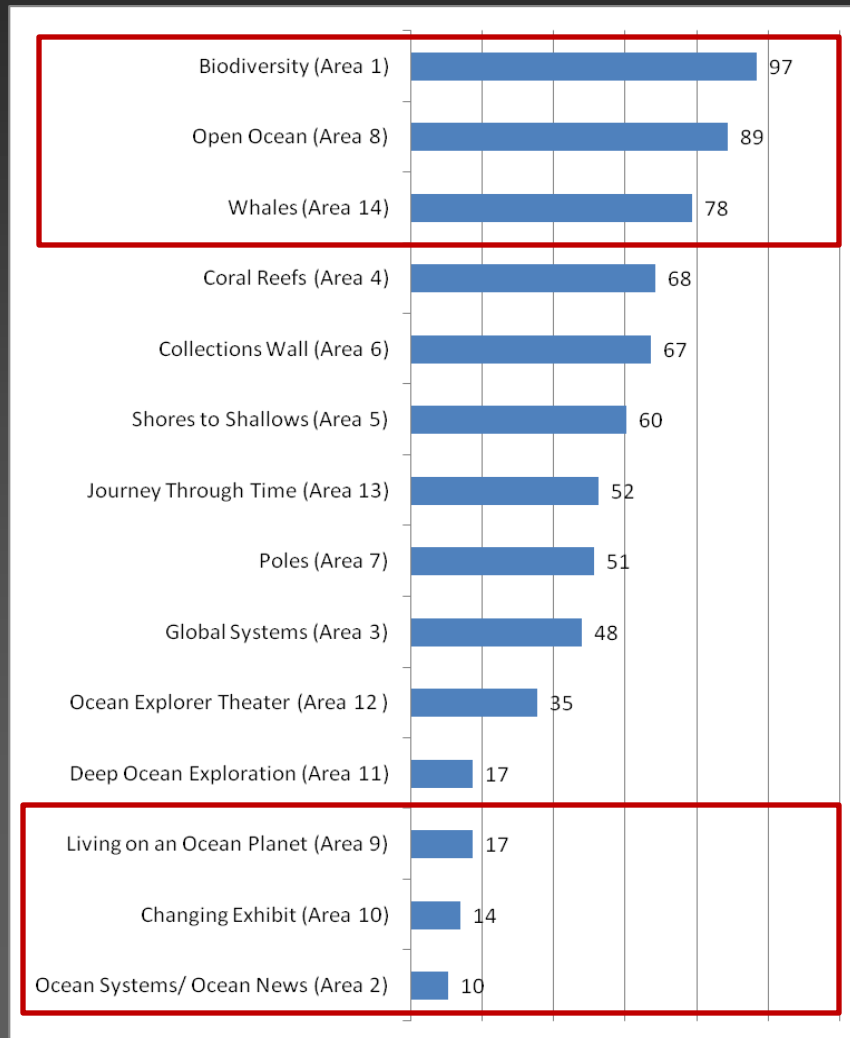
*Most/Least Frequently  
Visited Areas*

Data can be presented as an aggregate  
(median number of areas visited overall)...

Number of areas visited in  
Sant Ocean Hall: overall vs.  
unique areas



... or the number of visits to each specific area.



*Most Frequently Visited*

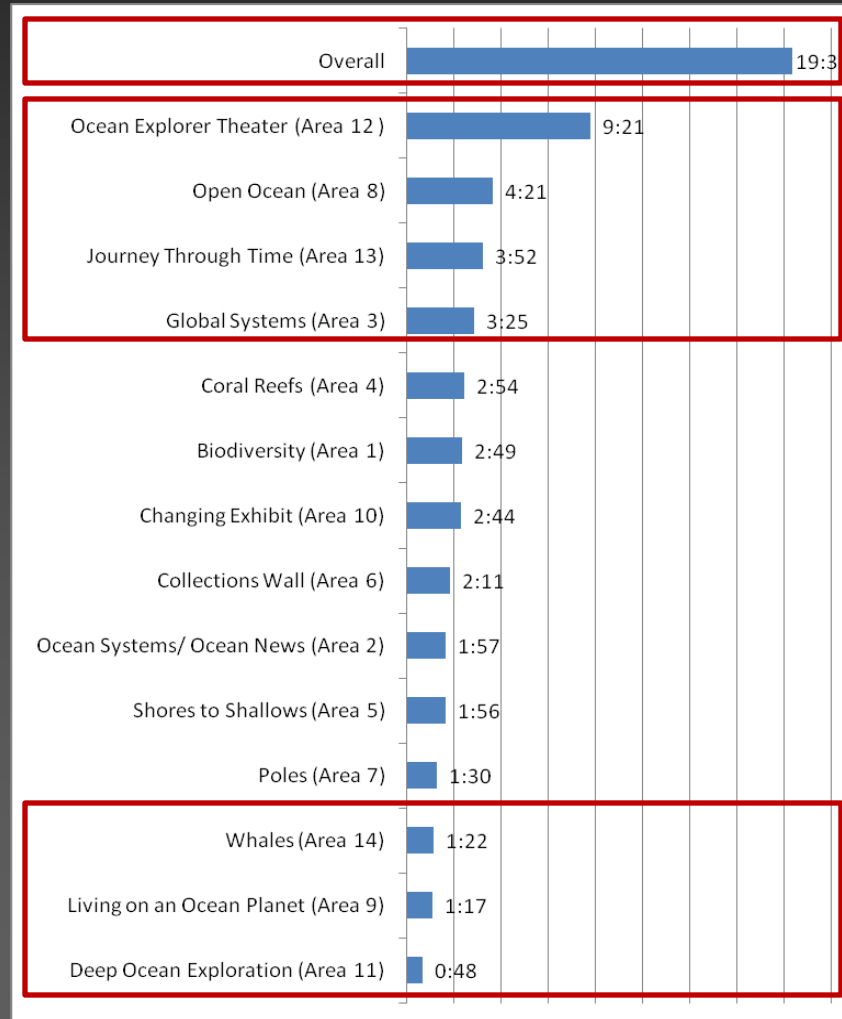
*Least Frequently Visited*

Percentage of visitors in each area of the Sant Ocean Hall (n=88)

*Time Spent*

Similarly, time spent can be presented overall or for each specific area.

Time spent in Sant Ocean Hall:  
overall vs. unique areas (in  
minutes:seconds, median)



*Most Time Spent*

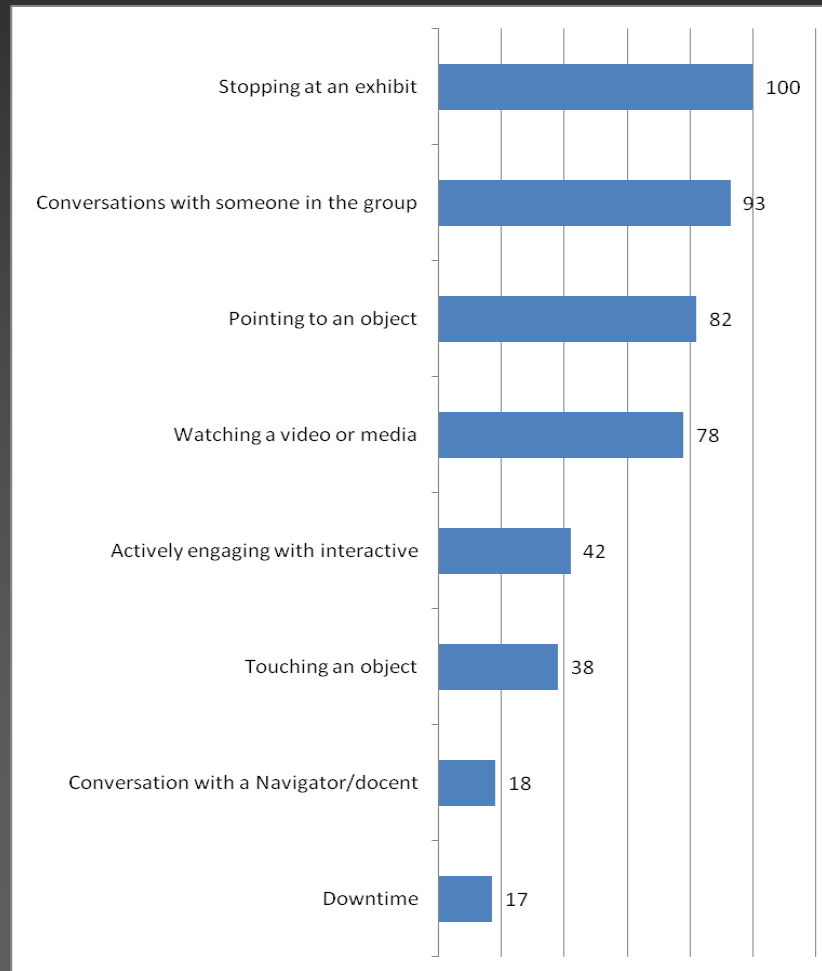
*Least Time Spent*



# *Visitor Behavior*

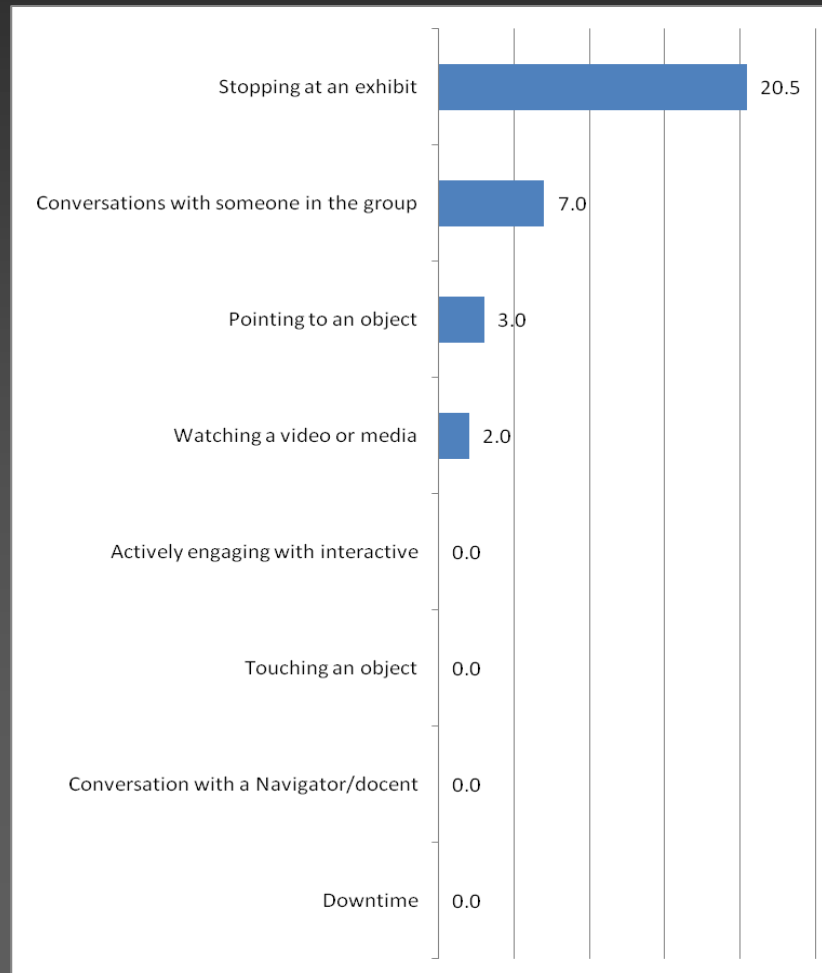
# Visitor behavior data can be presented as percentage of visitors engaging in each behavior...

Percentage of visitors demonstrating selected behaviors in the Sant Ocean Hall (n=88)



... or as the number of times a behavior happens.

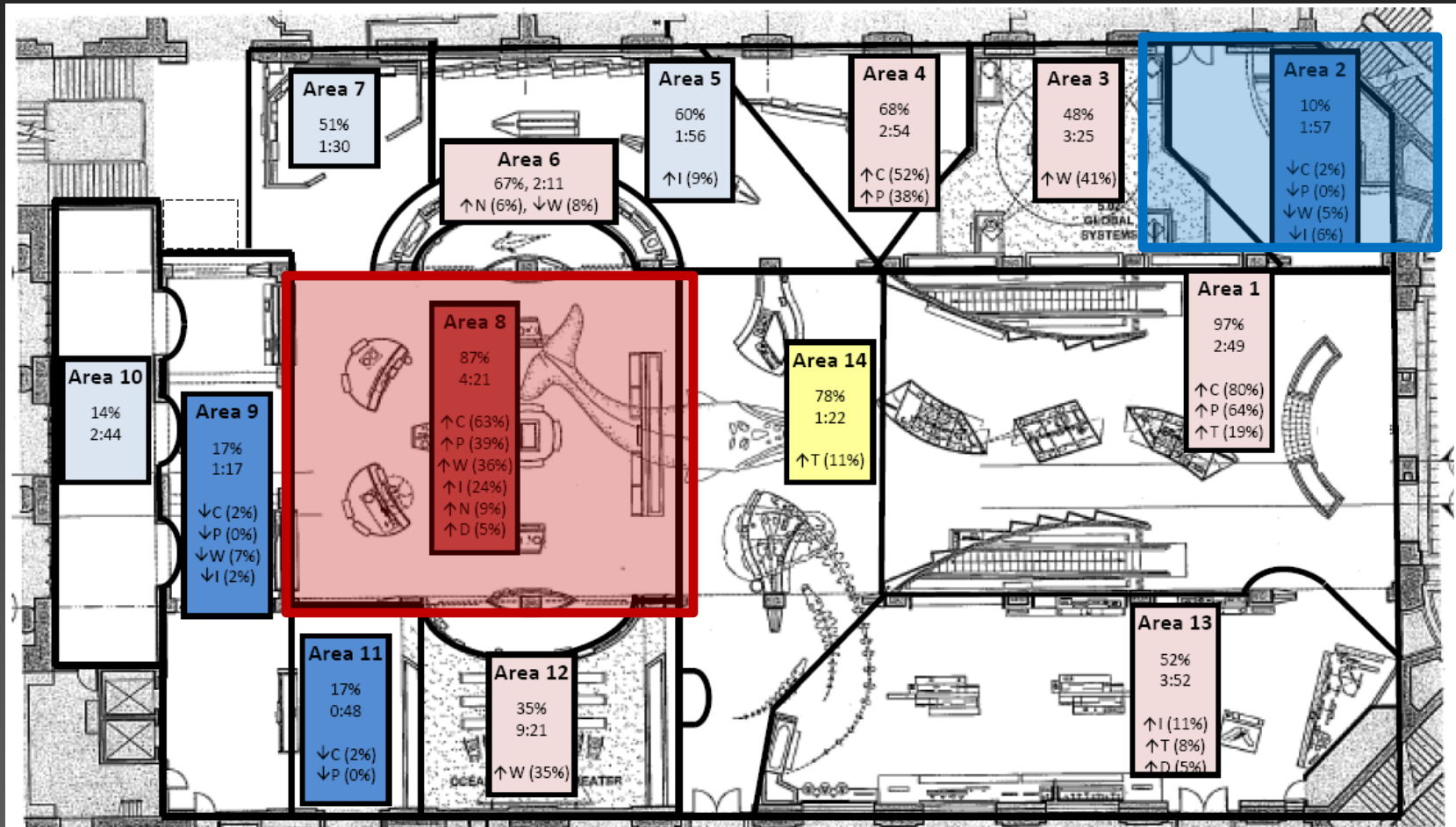
**Number of occurrences of  
selected behaviors in the Sant  
Ocean Hall (median) (n=88)**



# *“Heat” Maps*

*Can be for one variable or  
a combination of variables*

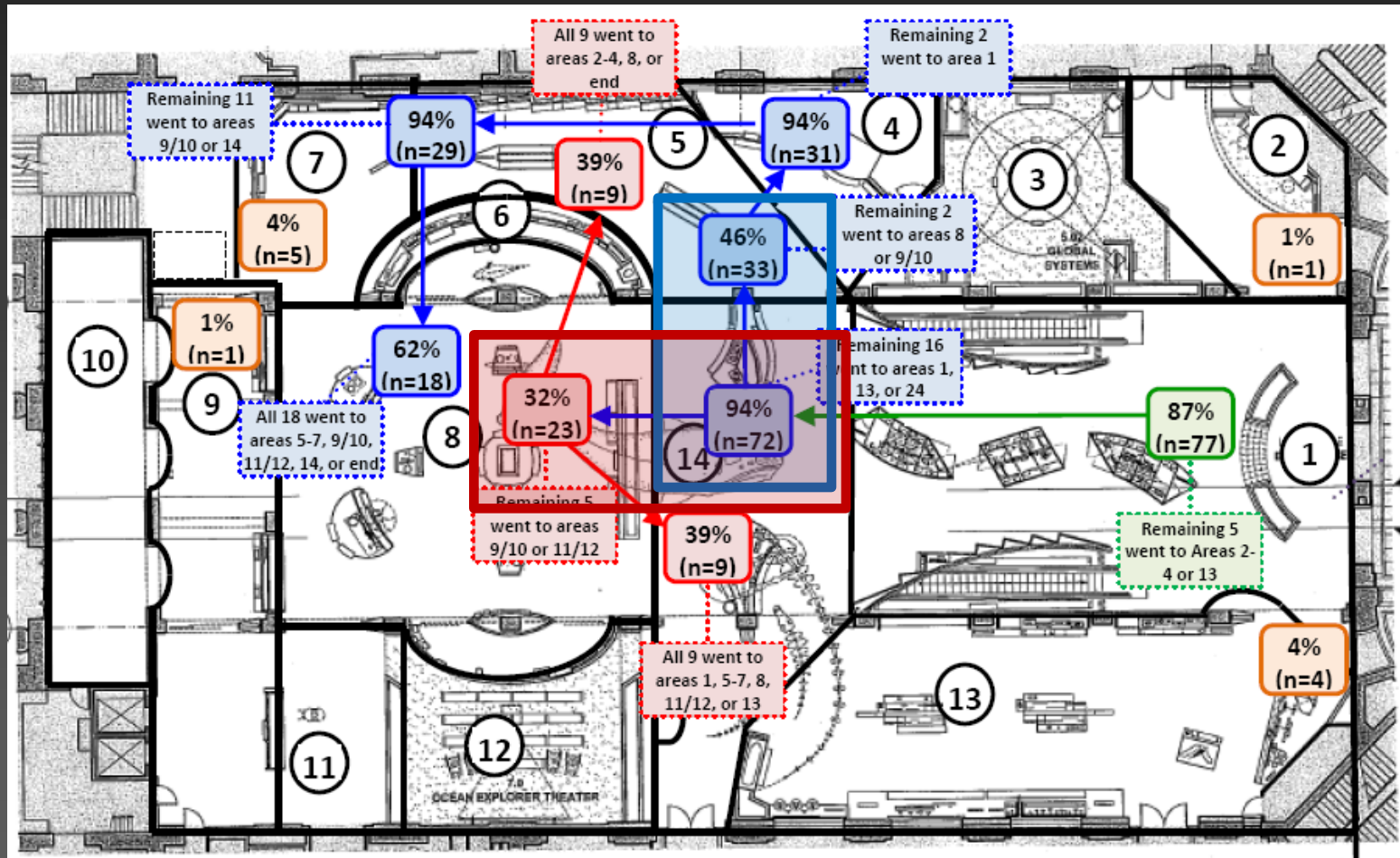
# Combination: visitation and time spent, with some behavior as well.



Interactions: ↓(Lowest), ↑(Highest)	Areas	
I..... Interactive (active)	Area 1 - Biodiversity	Area 8 - Open Ocean
W..... Watch video / media (passive)	Area 2 - Ocean Systems/ Ocean News	Area 9 - Living on an Ocean Planet
T..... Touch	Area 3 - Global Systems	Area 10 - Changing Exhibit
P..... Point Object	Area 4 - Coral Reefs	Area 11 - Deep Ocean Exploration
C..... Group conversation	Area 5 - Shores to Shallows	Area 12 - Ocean Explorer Theater
N..... "Navigator" conversation	Area 6 - Collections Wall	Area 13 - Journey Through Time
D..... Downtime / rest	Area 7 - Poles	Area 14 - Whales
		Low visitation and little time spent
		Moderate visitation and little time spent OR Little visitation and moderate time spent
		High visitation and little time spent
		High visitation and moderate time spent OR Moderate visitation and little time spent
		High visitation and high time spent

*Paths Taken*

# Two paths in these data: “right turn” and “straight ahead”



Areas				Key
Area 1 - Biodiversity	Combined 5-7:	Combined 9/10:	Combined 11/12:	Primary entry point
Combined 2-4:	Area 5 - Shores to Shallows	Area 9 - Living on an Ocean Planet	Area 11 - Deep Ocean Exploration	Other entry points
Area 2 - Ocean Systems/ Ocean News	Area 6 - Collections Wall	Area 10 - Changing Exhibit	Area 12 - Ocean Explorer Theater	Right turn path
Area 3 - Global Systems	Area 7 - Poles		Area 13 - Journey Through Time	Straight ahead path
Area 4 - Coral Reefs	Area 8 - Open Ocean		Area 14 - Whales	

# Conclusions

- There is a lot you can do with timing and tracking data!
- Besides descriptive information, you can explore your data more comparatively.
  - Comparisons among groups based on group demographics (*e.g., groups with kids vs. without kids*)
  - Comparisons among groups based on timing/tracking characteristics (*e.g., groups on “right turn” vs “straight ahead” or long vs. short visit groups*)



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