

TJHSST Hallway Simulation

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ABSTRACT

The project centers primarily around the creation of a traffic simulation—a simulation tailored specifically to the study of movement around

Thomas Jefferson High School for Science and Technology. The project taps into several areas of research, yet the ideas and research can be

described as concentrated in the following areas:

- Traffic Modeling: This project models traffic.
- Computer Simulation: This project is a simulation.
- Multi-agent Systems: This project studies a system with multiple agents.
- Group Dynamics: This project studies a dynamic group.

INTRODUCTION

- Increase understanding of TJHSST hallways
- TJHSST—both building and demographics—have changed since past research

DESCRIPTION OF HOW IT WORKS (PATHFINDING METHODS)

- Returns as soon as it finds a workable path
- Randomizes which paths it
- Selects first to eliminate bias
- Requires that students find a path before break (10 minutes) is over and they are late for class.

RESULTS:

TOP 5 MOST CROWDED:

- 2 (The 2nd floor intersection of hallways near the backside of the school. This is the location of a 4-way intersection (hallways in three direction and stairs leading to the 1st floor).
- 14 (The 1st floor intersection near the front of the school.)
- 22 (The Junior Lounge, which intersects 3 hallways, an exit, and a pathway leading to trailers).
- 23 (The 1st floor hallway in which many physics classes are taken)
- 16 (The hallway leading to the Millennium Courtyard).

TOP 5 LEAST CROWDED:

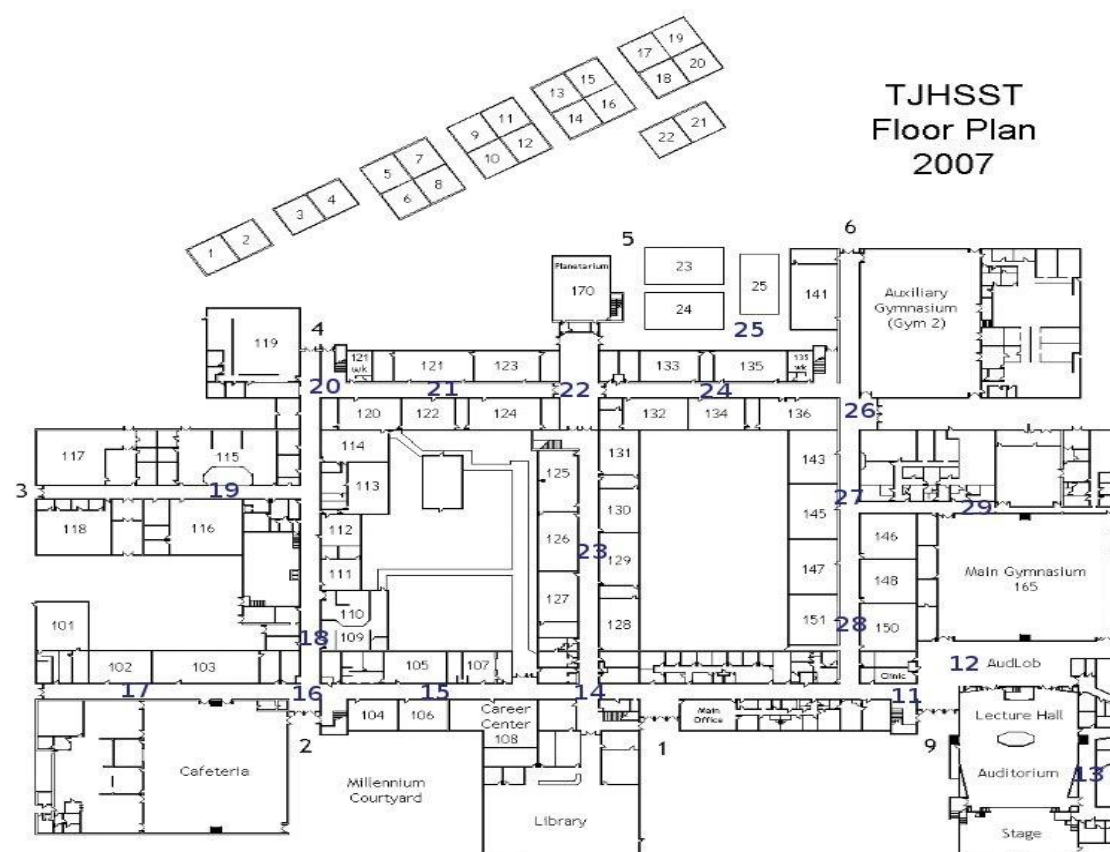
- 29 (The hallway leading to one of the entrances to the boys locker room and the back door entrance to the main gym).
- 25 (The pathway to the section of trailers located between Dr. Acios room and the Junior lounge).
- 17 (The hallway leading to and fro the cafeteria).
- 13 (The hallway leading to the band and chorus rooms).
- 19 (The h Lab).

ANALYSIS

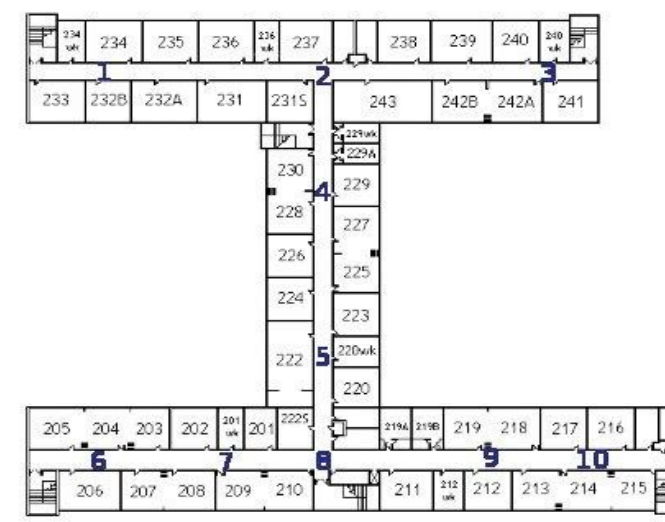
All students got to their desired destination on time
The traffic results were realistic when compared to personal experiences
Bathrooms and Exits
Class Sizes
Students only required to find a path, not the most likely path

CONCLUSION (WHAT NEEDS TO BE DONE TO IMPROVE THE SIMULATION)

Collect real-life data for comparison
Fix the student scheduling algorithm to remove bathrooms and exits as classrooms.
Give each room a class-size attribute to improve the accuracy of the results.
Adjust the path finding algorithm to make students take more accurate paths and take past crowding experiences into account.



TJHSST Floor Plan 2007



Second Floor -- Front of Building

Hall Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
0	82	26	94	92	44	74	50	16	82	34	24	48	70	48	54	24	68	92	42	24	94	38	112	60	42	40	18	66	20	1598
1	22	98	18	24	52	48	30	82	16	60	62	68	18	108	4	196	0	42	36	84	6	144	34	6	6	142	56	46	18	1526
2	88	102	132	56	12	146	0	104	50	22	104	18	34	80	30	62	0	62	16	14	42	16	110	12	26	60	24	54	14	1490
3	42	136	30	54	28	56	16	60	50	40	22	34	16	192	4	140	0	22	42	14	14	72	64	8	6	146	38	80	26	1452
4	40	124	140	88	2	74	14	70	94	18	90	16	14	58	32	52	0	80	10	6	14	78	152	8	12	46	24	50	16	1422
5	56	182	28	22	24	18	12	100	38	52	56	14	2	204	20	84	0	24	4	60	14	122	92	2	4	110	32	24	10	1410
6	82	102	76	82	28	32	12	38	78	42	48	2	4	164	70	10	0	10	2	60	36	94	204	38	0	36	18	32	6	1406
7	70	162	64	22	62	8	14	86	24	42	84	4	0	172	76	44	0	40	2	42	42	172	64	14	6	34	16	36	0	1402
8	22	214	20	22	20	6	22	150	26	26	144	46	2	74	10	118	0	70	0	76	12	174	14	16	2	62	38	16	0	1402
9	84	36	86	72	40	42	52	20	76	50	28	62	46	32	38	10	68	84	60	32	58	22	62	76	32	42	14	68	8	1400
Sum	688	1182	688	534	312	504	222	726	534	386	662	312	206	1132	338	740	136	526	214	412	332	932	908	260	136	718	278	472	118	14508
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Hall Traffic Given Hall and Time

