

# SMU Post-Game Parking Evacuation Simulation

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# Management Summary

## **Problem**

- Reduce the amount of time required to fully empty SMU parking garages after football games and route all traffic off campus.
- Current benchmark of 45 minutes for Moody Garage is unsatisfactory



# Management Summary

## **Approach**

- Use ProModel 6.0 to simulate traffic
- Base off of previous traffic study commissioned by SMU



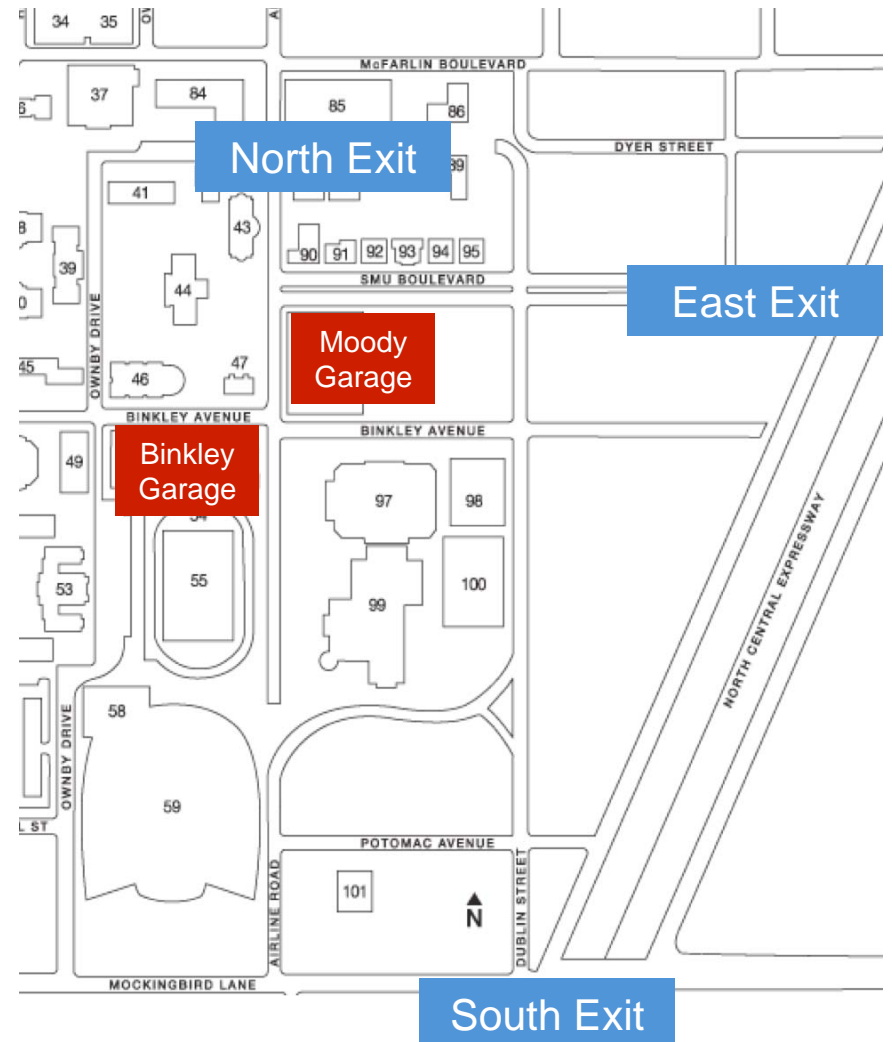
# Management Summary

## **Deliverables**

- A more efficient traffic routing
- Improvement of evacuation time
- Recommendations for use of garage exits
- Implementation of new Binkley Garage

# Situation Analysis

- 3 exits: North, South, East
- 2 garages: Binkley, Moody
- 1,680 cars





# Software

- ProModel 6.0 modeling software
- Simulates cars from the garage to a campus exit
- Allows for queues at intersections
- Simulates traffic lights and stop signs



# Data

- Taken from study commissioned by SMU
- Car arrival rate at garage calculated from observations
- Queue lengths calculated using scale maps



# Model Assumptions

- 21% North Exit, 38% South Exit, 41% East Exit
- Garages full to capacity (1,680 cars in system)
- Once a car reaches a campus exit it leaves the system
- Speed of 10 mph
- Leave garage at a rate of 4.5 cars per minute, exponentially distributed



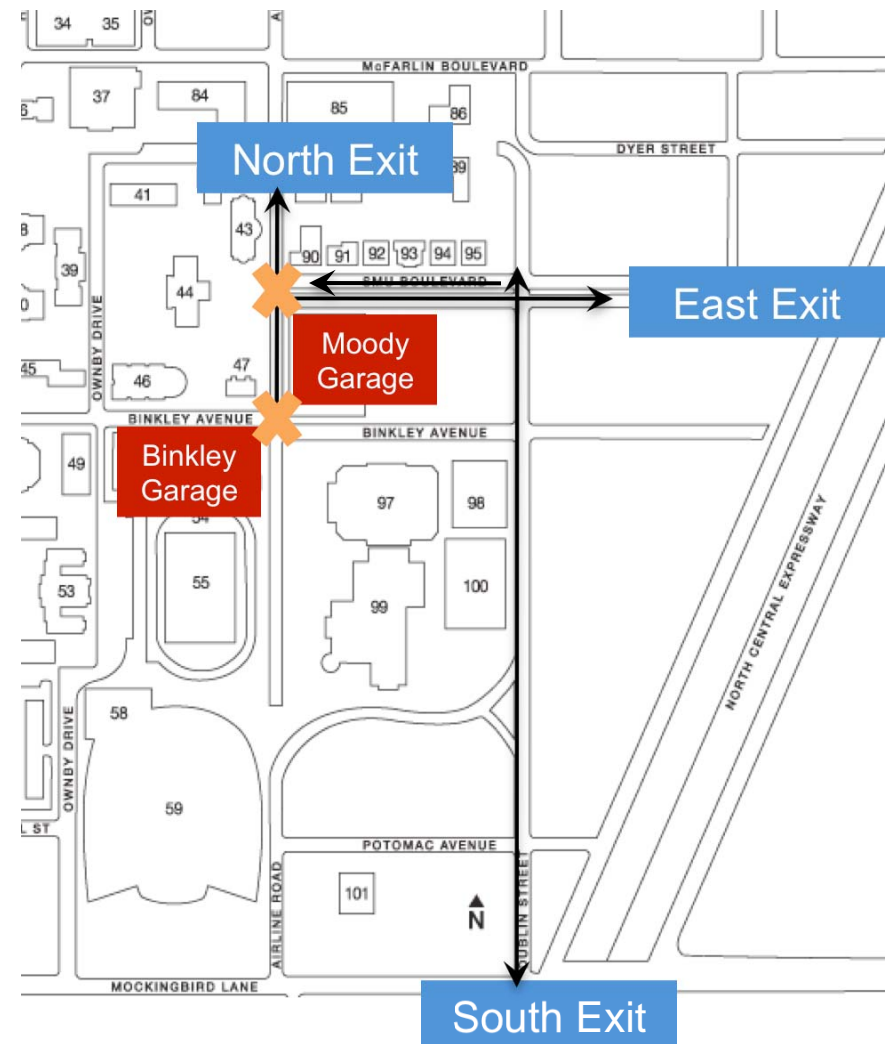


# Campus Routing Assumptions

- Bishop Boulevard closed to traffic during and after football games
- Binkley Avenue is closed for parking, but could be opened to traffic
- All traffic will exit North to Hillcrest, East to 75, or South to Mockingbird

# Benchmark

- Current plan
- 1 exit from Moody Garage
- Binkley Avenue closed

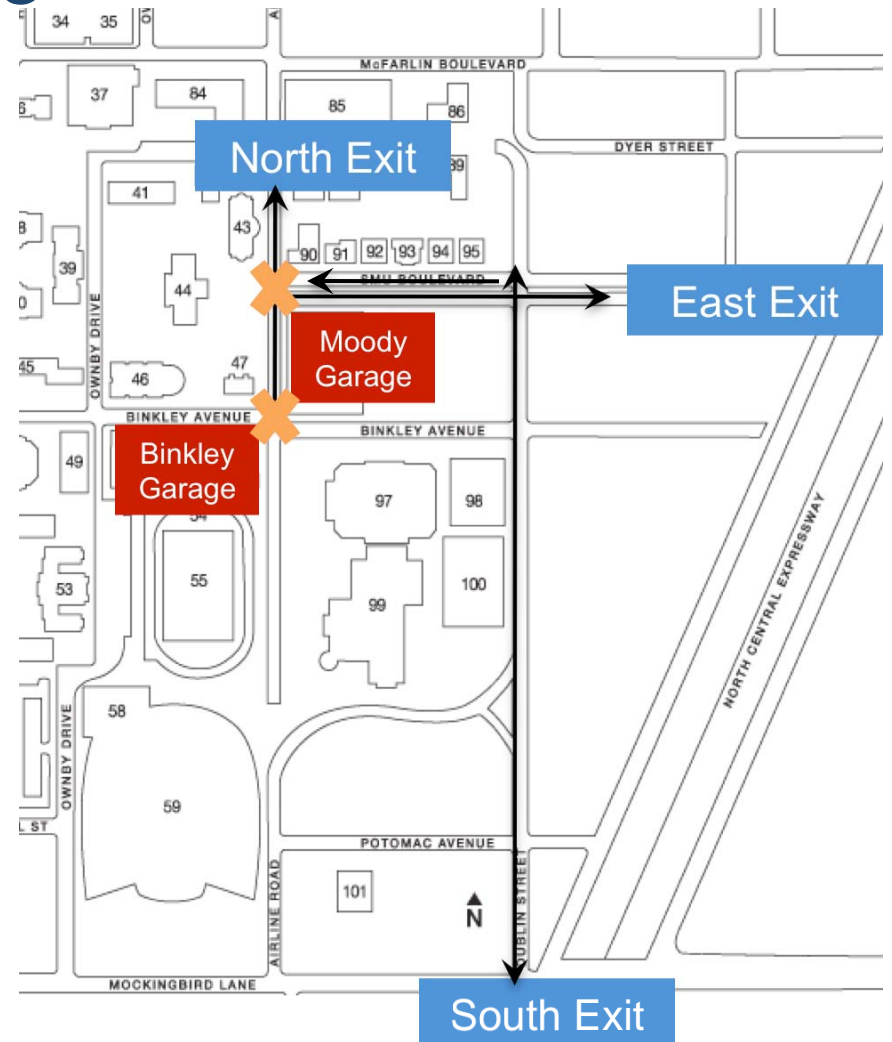




# Benchmark

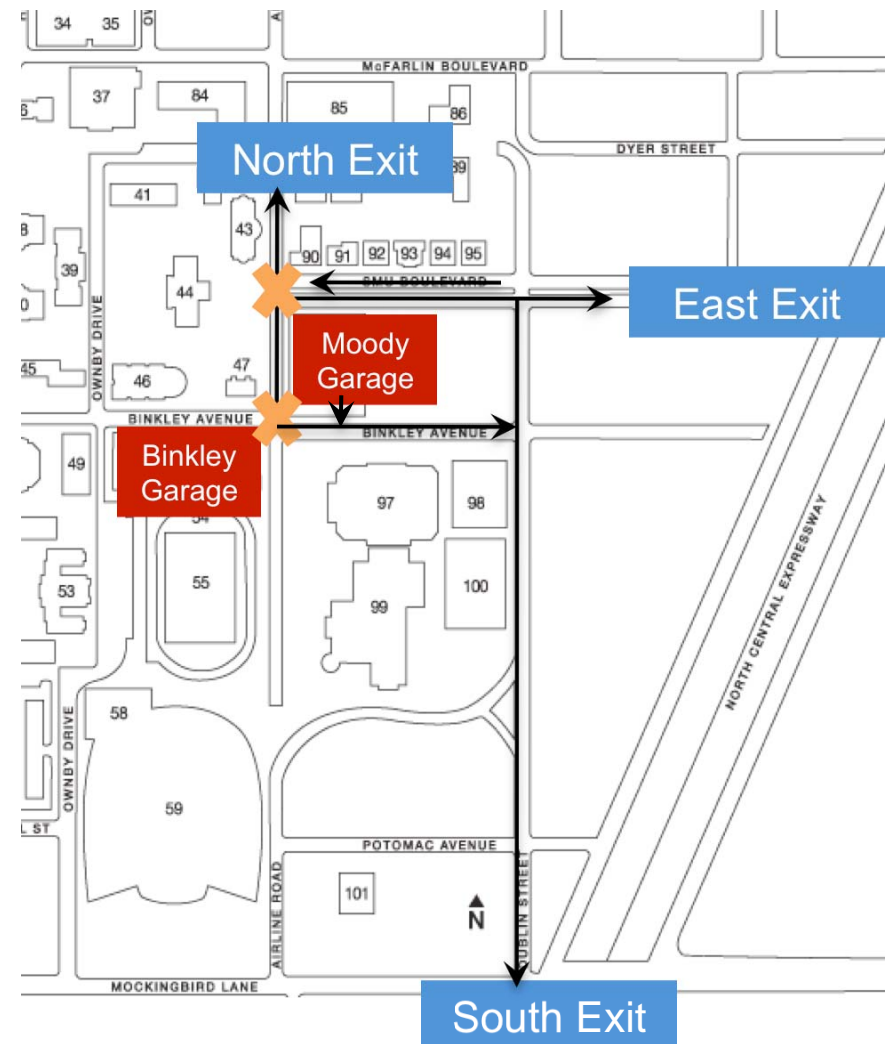
# Benchmark - Results

- 1 hr 20.64 min
- Congestion at SMU/ Airline intersection
- 5.69 min avg wait time
- 9.32 min avg per car from garage to exit



# Alternative 1

- 2 exits from Moody Garage
- Open Binkley Avenue

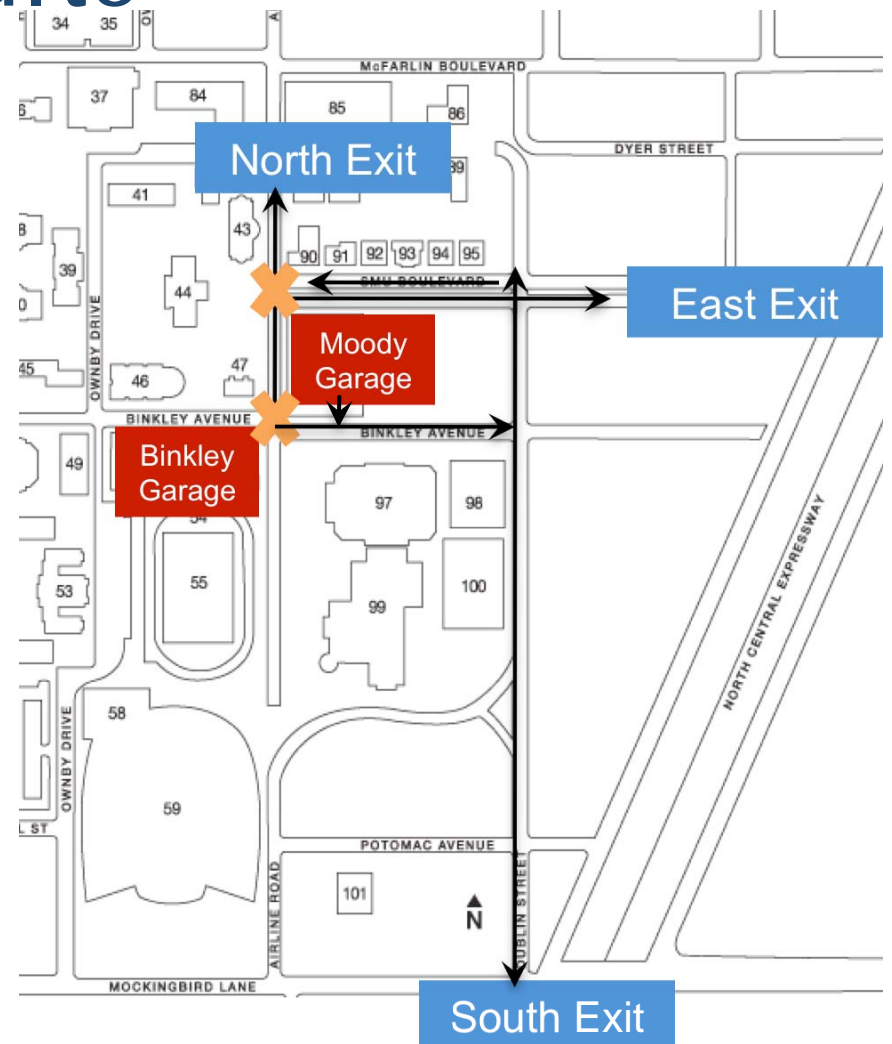




# Alternative 1

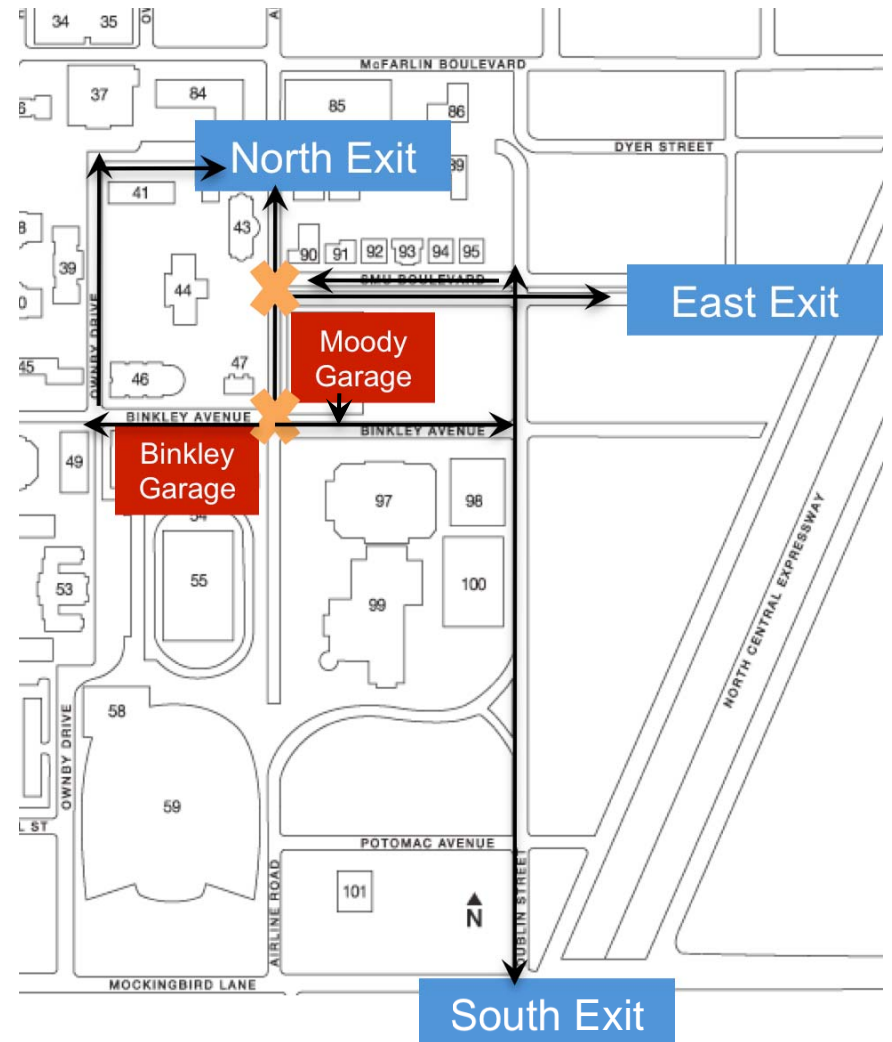
# Alternative 1 - Results

- 1 hr 10.57 min
- Congestion at Binkley Garage
- 6.53 min avg wait time
- 10.07 min avg time from garage to exit



# Alternative 2

- 2 exits from Moody Garage
- Open Ownby Drive and Binkley Avenue

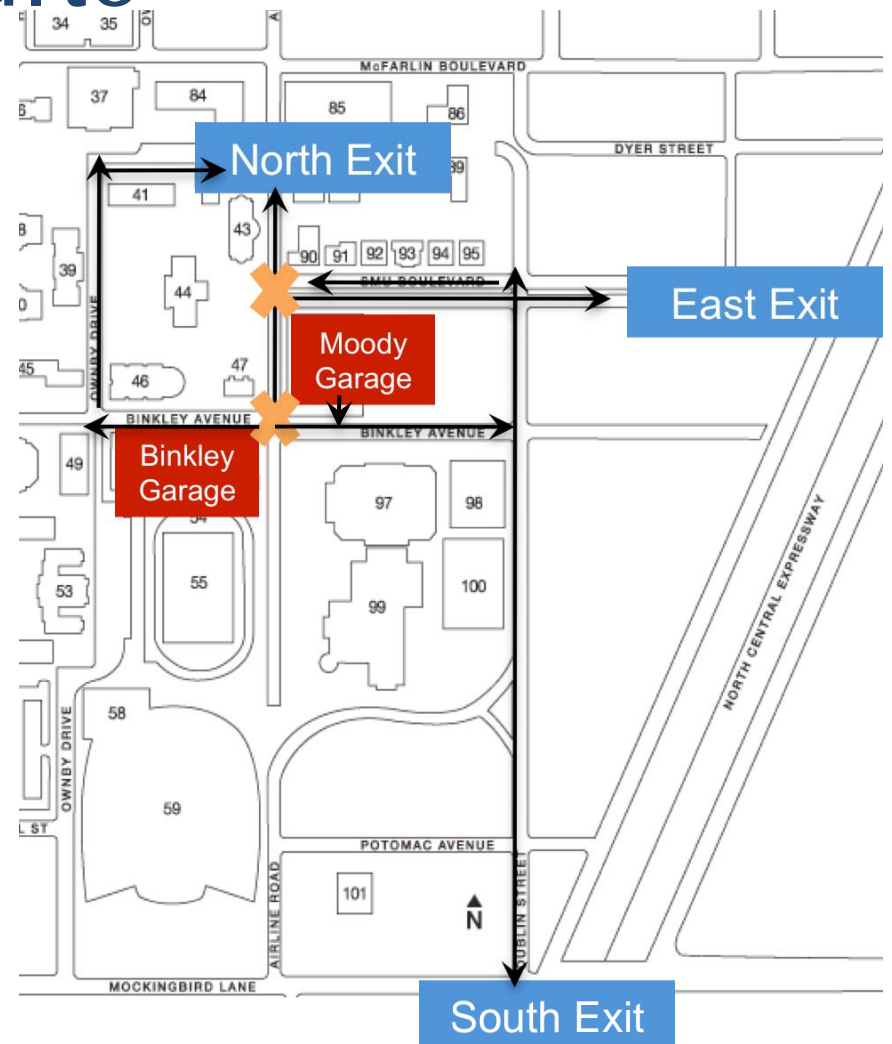






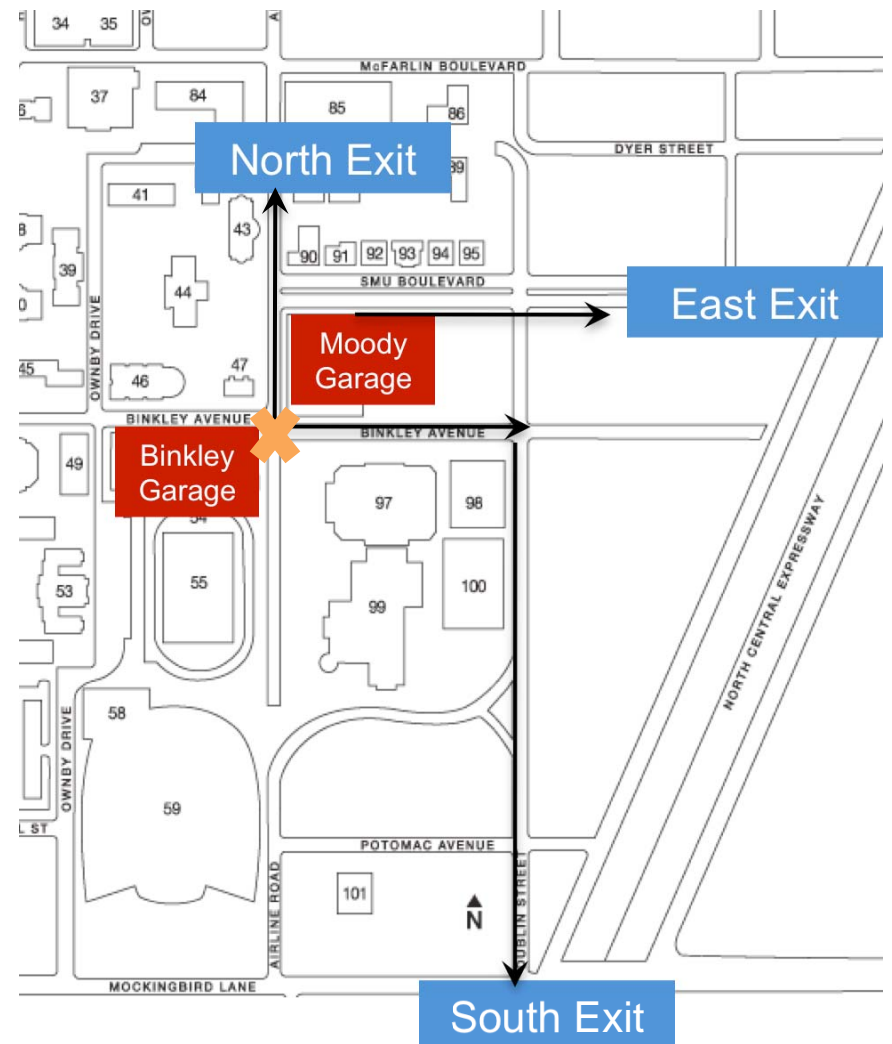
# Alternative 2 - Results

- 3 hr 42.02 min
- Potential pedestrian issues near Hughes-Trigg
- 50.52 min avg wait time
- 70.17 min avg time from garage to exit



# Alternative 3

- Use Binkley Avenue
- 1 exit from Moody Garage
- Forced exits
  - Binkley Garage = North/South
  - Moody Garage = East

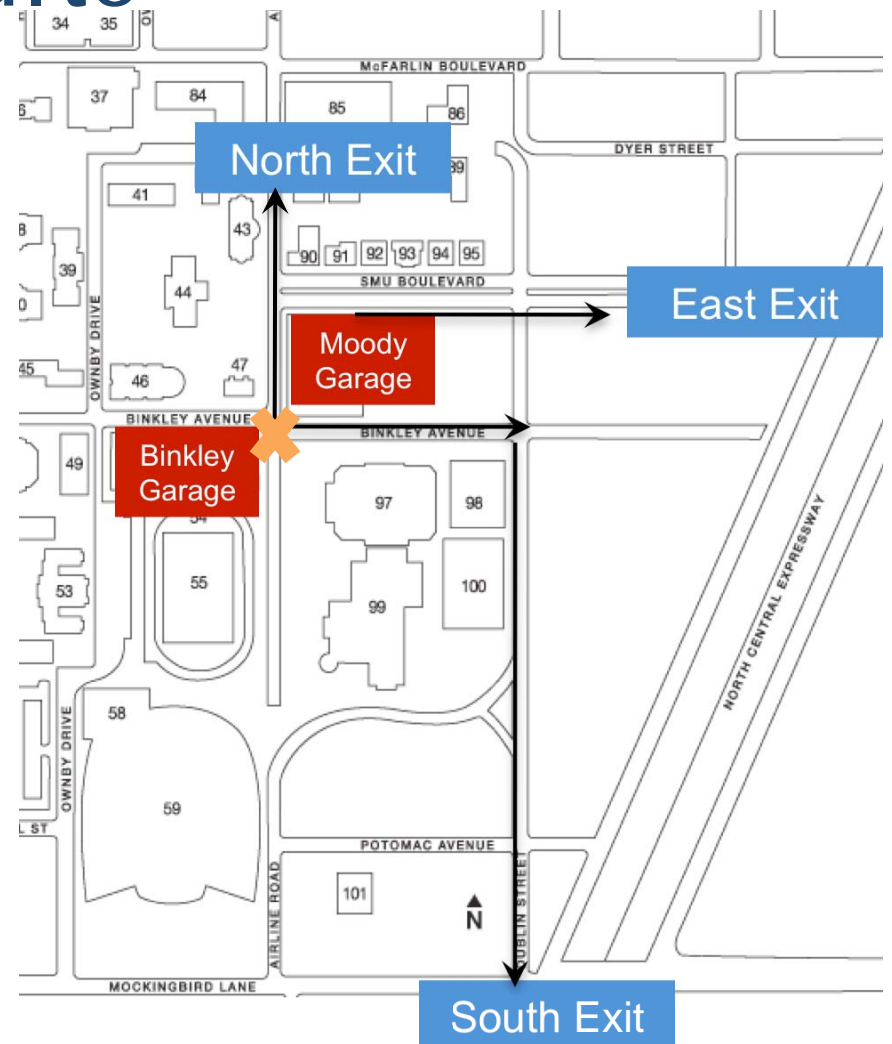




# Alternative 3

# Alternative 3 - Results

- 1 hr 7.53 min
- No congestion!
- 0.03 min avg wait time
- 2.51 min avg time from garage to exit





# Results

- Current benchmark of 1 hr 20.64 min with congestion
- Routing traffic through Ownby is problematic
- 2 exits from Moody are inefficient



# Recommendations

- Open Binkley Avenue to exiting traffic
- Force cars from Binkley Garage to exit North or South
- Force cars from Moody Garage to exit East



# Thank you to...

- Professor Gheorghe Spiride
- Mark D. Rhodes, Director of Parking and ID Services
- Dr. Richard Barr





**Questions?**