Exploratory Data Analysis Project
Nov 2021

METIS®

Lee's Pizza - NYC Market Entry

Prepared by: Li Sun

MTA

Introduction

- Motivation - Lee's Pizza
  - Brick & mortar pizza store that serves pizza late night.
  - Desire to open a store in Manhattan
  - Specializes in a grab-and-go store (no delivery)
  - Interested in Non-touristy Manhattan Neighborhoods

- Problem -
  - Doesn't know NYC's market and hires me to provide answers to:

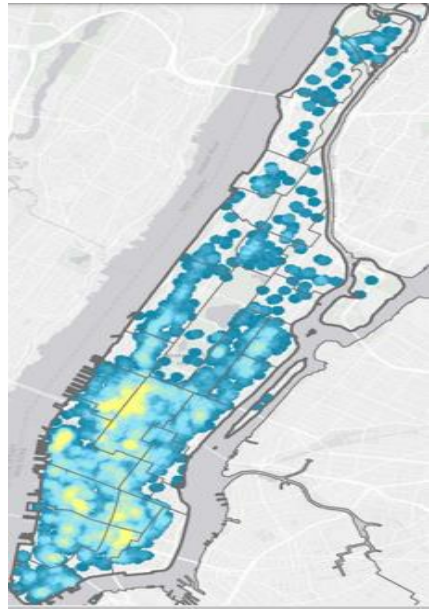
    1) **Where** – where Manhattan neighborhood(s) should Lee's Pizza consider opening a store?
    2) **When -** should they expand beyond their normal hours of operation (8pm-4am)?

- Goal – Analyze data to answer the two questions

Methodology - #1) where should Lee's Pizza considering opening?

- Customers –
  - Customers are typically Nightlife people, who are hungry for slices of pizza coming or going to parties

  - MTA Subway Turnstile data of subway stations -> Foot Traffic -> Potential Pizza Buyers / Customers
  - Assumption #1 – Healthy conversion rate of foot traffic to Pizza sales
  - Assumption #2 – Majority of Nightlife partiers takes the subway
- Neighborhoods
  - 6 Target Neighborhoods (13 Subway Stations) based on Manhattan Nightlife Establishment Density (e.g. Bars, Clubs, see Appendix)
    1. East Village
    2. West Village
    3. Hell's Kitchen
    4. NoMad
    5. Murray Hill
    6. Lower East Side
  - Metric - Average Daily Foot traffic / # of competitors in each Neighborhood (8pm-4am)



Methodology - #2) should Lee's expand beyond their normal hours of operation (8pm-4am)?

- Time –
  - Using same dataset
  - Create a times series of Average Foot Traffic through the day in the Targeted Neighborhoods.

- Metrics –
  - **Average Foot Traffic / 4 HR TIME block**

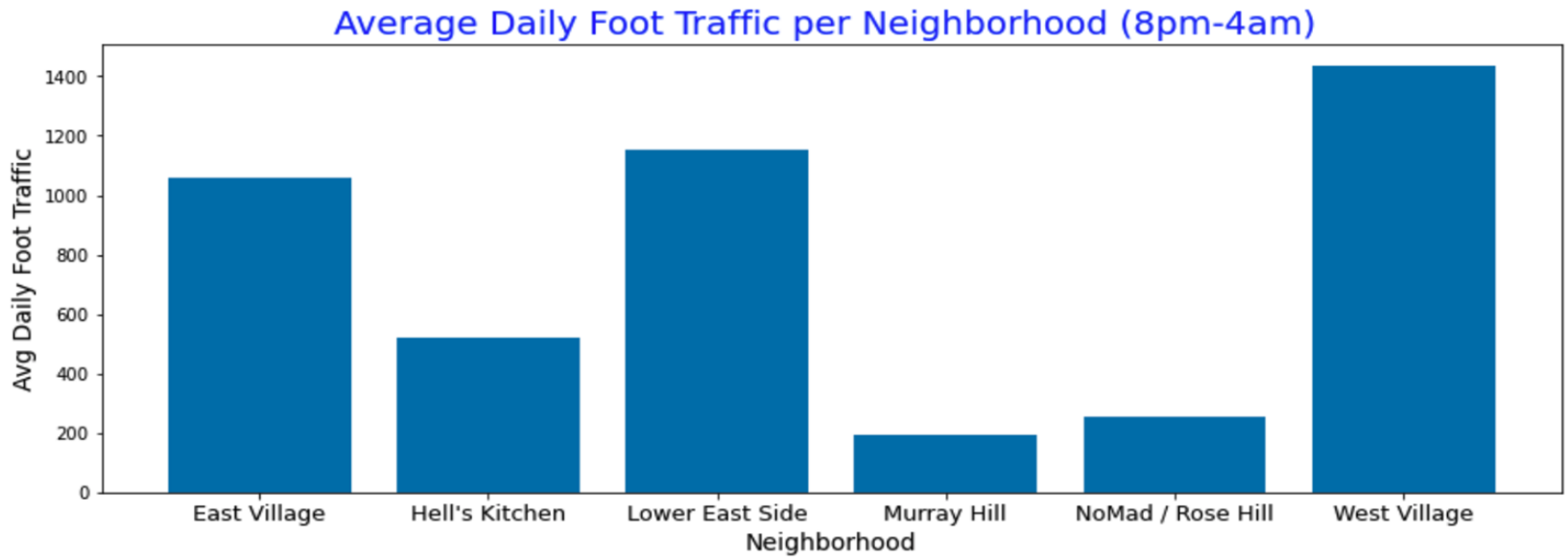
<u>Both Questions #1 and #2</u>

- Data –
  - 15 weeks of 2019 MTA Turnstile Data (July 20 – Oct 26, 2019)
  - Competitor Pizza stores per targeted Neighborhood on Yelp

- Tools –
  - Pandas for data manipulation
  - Matplotlib for visualization
  - SQL (DB Browser) & Excel to browse through subset of data
  - Google Map to find all subway stations per Neighborhood

Results – Two Neighborhood to consider for opening Lee's Pizza store

- West Village, East Village, and Lower East Side has the most Daily Foot Traffic between 8pm-4am

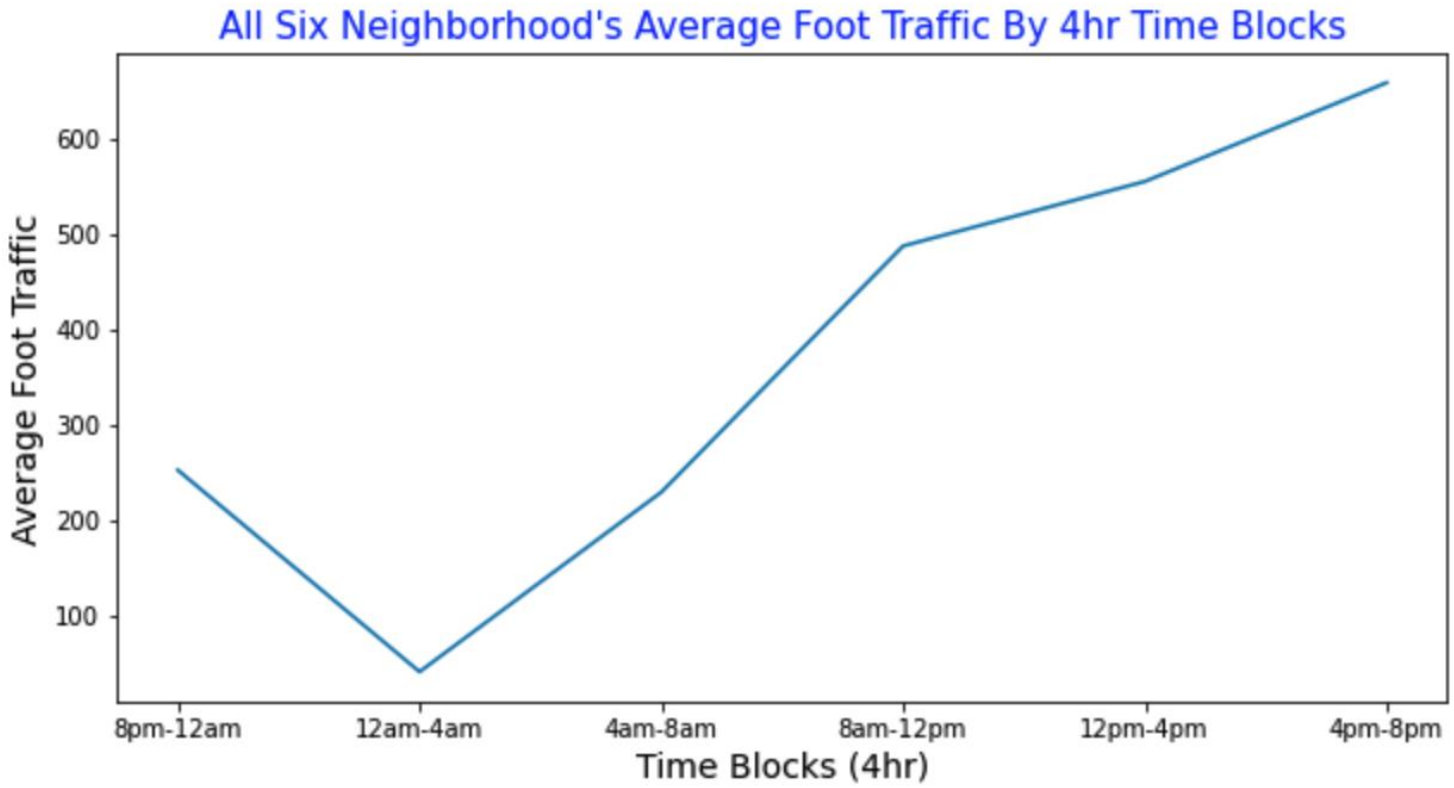


- West Village and NoMad has the most foot traffic with least # of competitors between 8pm – 4am

Neighborhood	Avg Daily Foot_Traffic (8pm-4am)	Competitors	Foot Traffic / Competitor
East Village	1,056	7	151
Hell's Kitchen	520	5	104
Lower East Side	1,153	9	128
Murray Hill	192	3	64
→ NoMad / Rose Hill	252	1	252
→ West Village	1,436	5	287

- Assumption: Foot Traffic / Competitor assumes that Foot Traffic is spread equally

Results – Consider expanding beyond hours of operations



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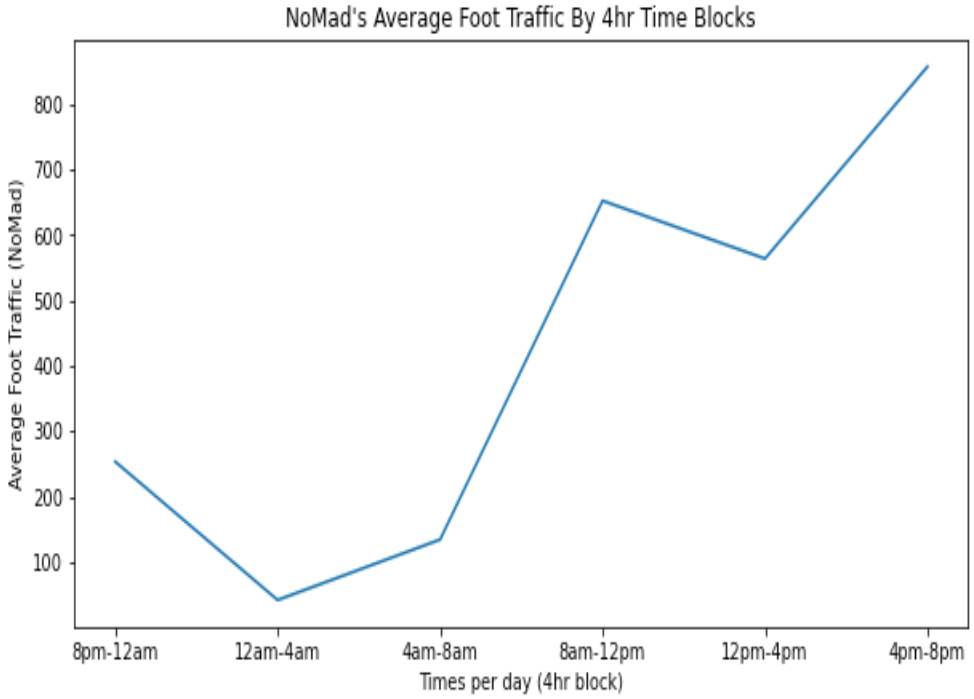
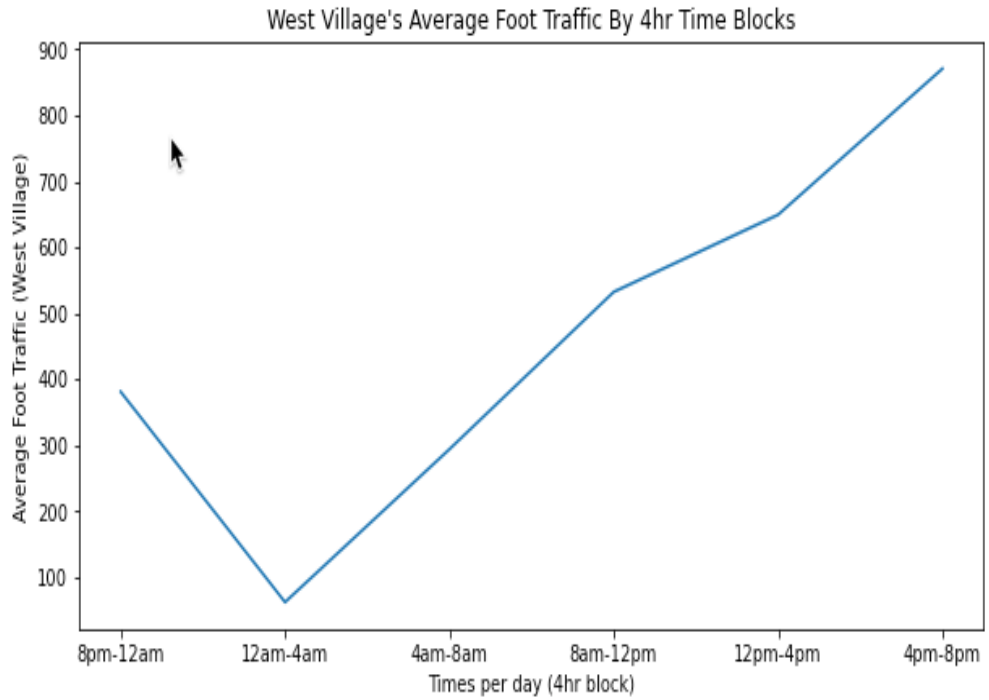


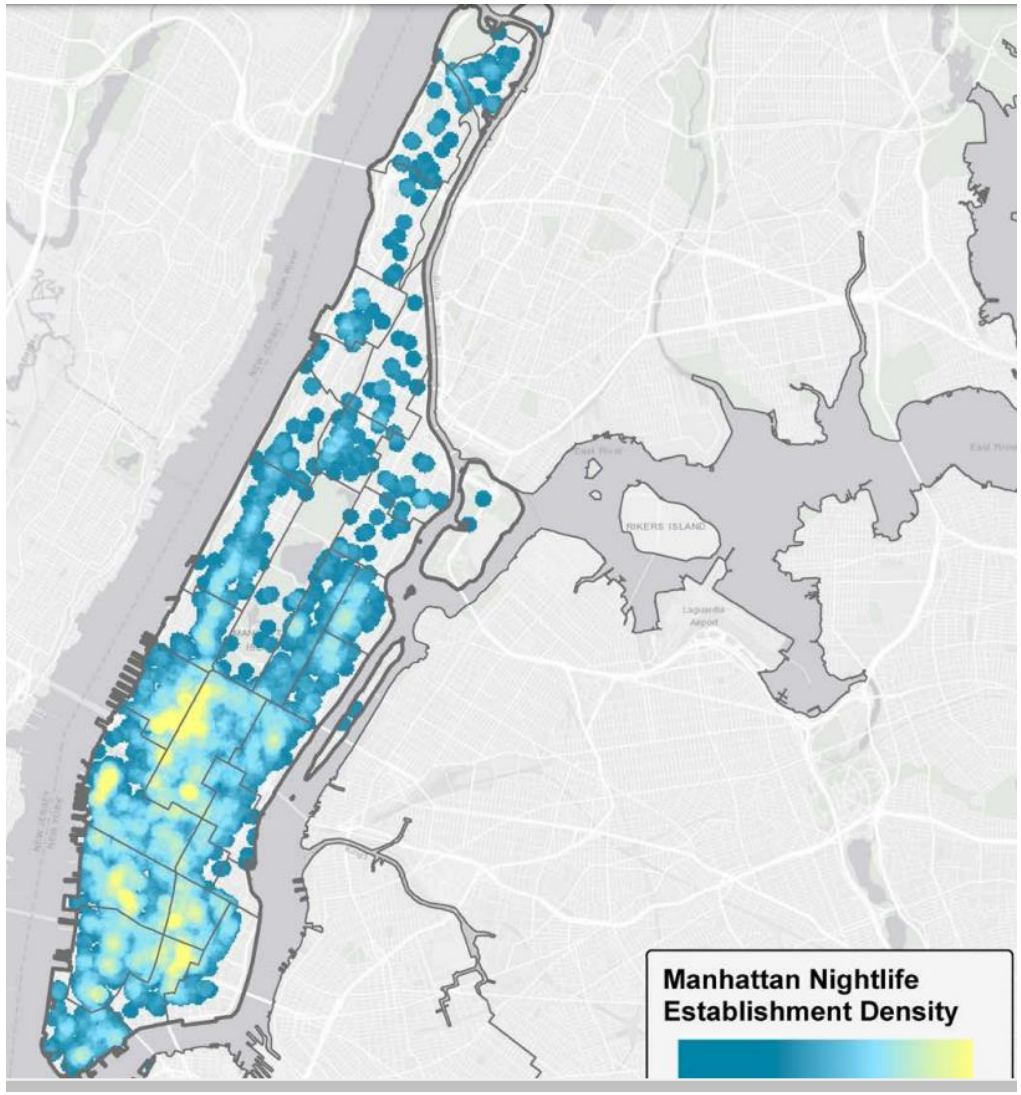


Conclusion

- Based on the information given & analysis conducted:
  1) Recommend Lee's Pizza to explore opening a store in West Village and NoMad
  2) Recommend Lee's Pizza to expand outside their hours of operations in order to capture significantly higher foot traffic at both locations.

Appendix

Appendix 1 – Manhattan Nightlife Establishment Density



https://www1.nyc.gov/assets/mome/pdf/ESI-NYCEDC-Nightlife-Report-2018.pdf

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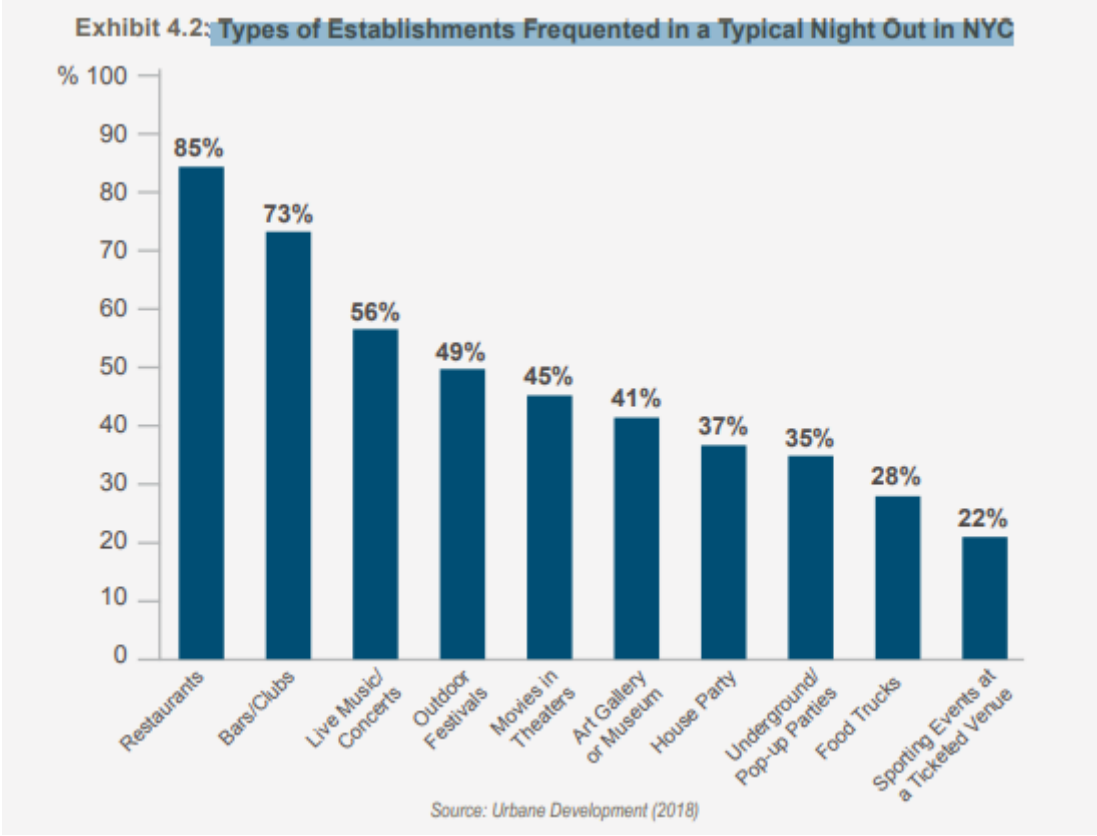

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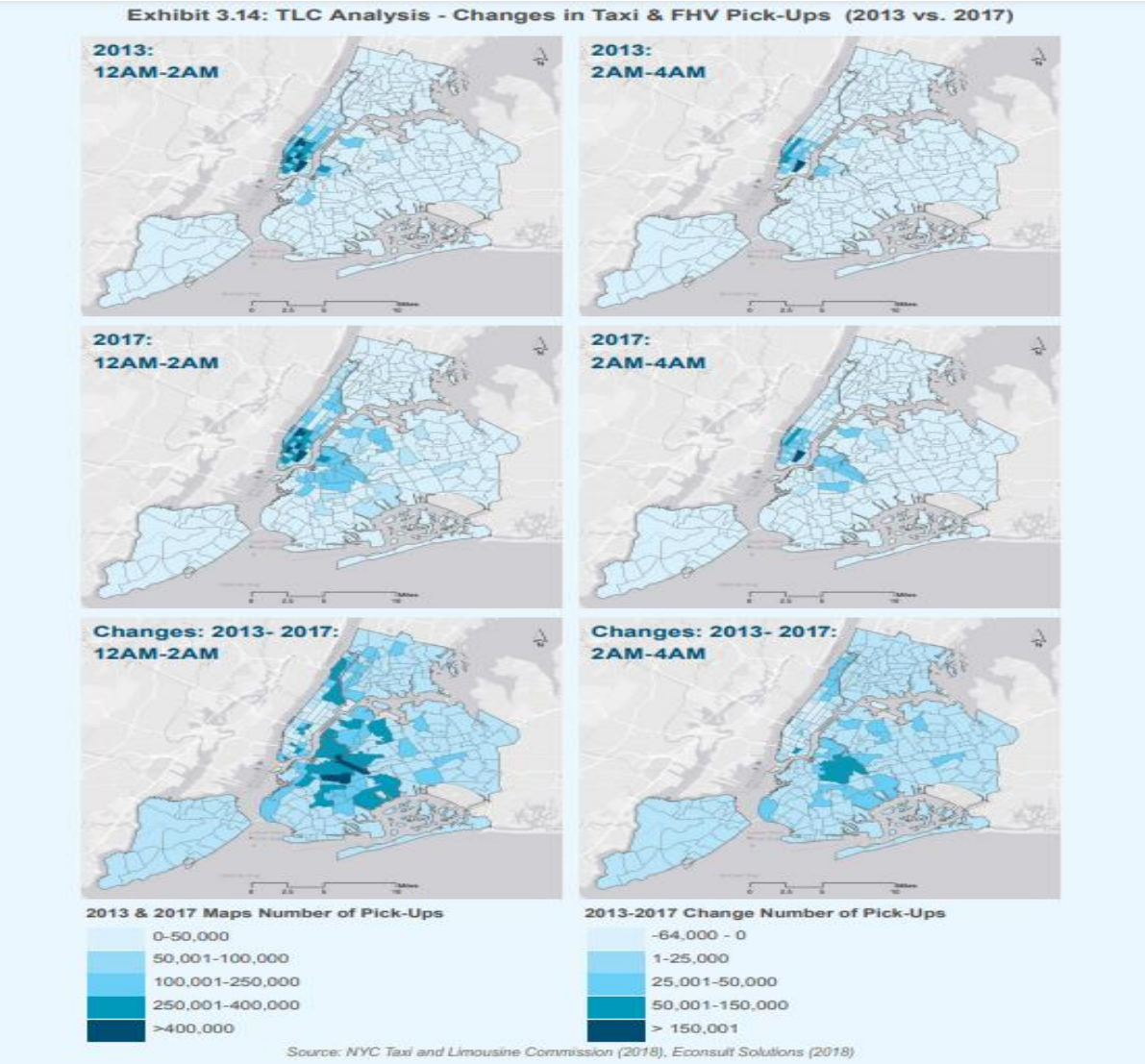

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Methodology - Where should Lee's Pizza considering opening?

- Methodology –
  - Potential customers are Nightlife people, who are hungry for slices of pizza
  - Use MTA Subway Turnstile data of subway stations located in each of the target Manhattan neighborhoods to gauge foot traffic of potential pizza customers
  - 6 Target Neighborhoods (13 Subway Stations) based on Manhattan Nightlife Establishment Density (e.g. Bars, Clubs, see Appendix)
    - 1. East Village & 2. West Village
    - 3. Hell's Kitchen
    - 4. NoMad / Rose Hill & 5. Murray Hill
    - 6. Lower East Side
  - Evaluate Daily Foot traffic / # of competitors in each target neighborhood
- Assumptions
  - Majority of late night traffic of potential late night pizza buyers (NightLife partiers) takes the subway
  - Healthy conversion rate of foot traffic to Pizza sales
- Data – 15 weeks of 2019 MTA Turnstile Data (July 02 – Oct 30, 2019), Competitor on Yelp
- Tools -
- Metrics –
  - Average Daily Foot Traffic (Entry + Exit) between 8pm-4am per target neighborhood
  - # of Competitor Pizza stores / Target Neighborhood
  - Average Daily Foot Traffic / Competitor per Neighborhood – desire is highest foot traffic, lowest competitor