Evaluating the Environmental, Emotional, and Economic Impact of Pedestrian-Only Streets In New York City

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During Spring 2020, in response to the COVID-19 pandemic, NYC implemented a new program called NYC Open Streets. This entailed limiting the use of cars on streets and opening the use for restaurants, biking, etc., essentially creating a “pedestrian-only” streets environment.


Example of pedestrian-only street layout

Map of all NYC open Streets

https://gothamist.com/news/nyc-adding-12-more-miles-open-streets-week-9-miles-protected-bike-lanes-may
Literature Review

Walkable streets: pedestrian behavior, perceptions and attitudes
Vikas Mehta

- Streets should be used as a social space, and thus require certain characteristics to improve user experience
- Emotional well-being can potentially be improved by streets through satisfying the “hierarchy of needs,” the most difficult need being a sense of belonging

Measurement of black carbon concentration as an indicator of air quality benefits of traffic restriction policies within the ecopass zone in Milan, Italy
Giovanni Invernizzi et al.,

- Three zones in Italy were tested for black carbon emissions
- Black carbon was deemed to be a good indicator for air pollution
- As evident from the figure, the pedestrian zone had consistently lower black carbon emissions, likely indicating improved air quality
Methodology

Logistics

• Online Survey created on Qualtrics (68 Total questions)
• Distributed to NYC Website via Prolific from 8/1/2020 to 8/3/2021
• N = 950
• N = 99 for Business Stakeholders (Owners/Workers)

Sample Questions

- Emotional
  - How did being on a pedestrian only street effect your stress level?
  - On a scale of 1 to 5, how important do you think the pedestrian-only streets are for your ability to socialize?

- Environmental
  - How would you rank the role of pedestrian-only streets on decreasing pollution in the surrounding neighborhood?
  - Would you prefer to live near or on a pedestrian-only street because of its perceived environmental benefits?

- Economic
  - If you work on a store on a pedestrian-only street, then how do you perceive the impact of the pedestrian-only street status on the business?
  - If you have shopped on a pedestrian-only street, then how has it impacted your ability to access businesses?
The Emotional Impact of Pedestrian-Only Streets

• In general, in Figure 1 across all respondents, pedestrian only streets appeared to have a positive impact on people’s mood after respondents had been on them.

• In Figure 2 it evident that across all income levels, the average impact on mood is relatively the same with the most positive impacts of mood seen in the middle range income.
The Economic Impact of Pedestrian-Only Streets

- In Figure 3, we analyzed the perception of New Yorkers on pedestrian-only street's impact on business accessibility. The impact is generally positive.
- In Figure 4, we analyzed the opinion of business owners and workers on their perception of pedestrian only street's impact on the business success. The perceived impact is positive.
The Environmental Impact of Pedestrian-Only Streets

- Pedestrian-only streets were perceived to decrease pollution within surrounding neighborhoods (Figure 5).
- Income does not have a significant influence on the perception of pedestrian-only streets impact on pollution, however, age and education level were significantly correlated.

Figure 5: Perception of pedestrian-only street's role decreasing pollution in the surrounding neighborhood.

Figure 6: Linear Regression analyzing the significance of income's impact on the perception decreased pollution was caused by pedestrian only streets.
Conclusion

• Pedestrian-Only streets had positive perceived environmental, emotional and economic impacts based on those surveyed
• Open Streets in NYC had significant positive impacts and should be made permanent
  • The NYC open streets program was in fact restarted again in summer 2021 due to its perceived beneficial impacts
• Next Steps include:
  • Running additional linear regressions to gain a greater understanding of the significance between certain variables
  • Verifying the trends with available economic and environmental data available in the region
  • Gaining a better understanding of how these results can be used to shape policy