NYC Late-Night Transit Equity

A Call for Action

A data-driven portfolio piece analyzing overnight public transit reliance across New York City, highlighting disparities, and presenting pathways to a more equitable late-night transit system.

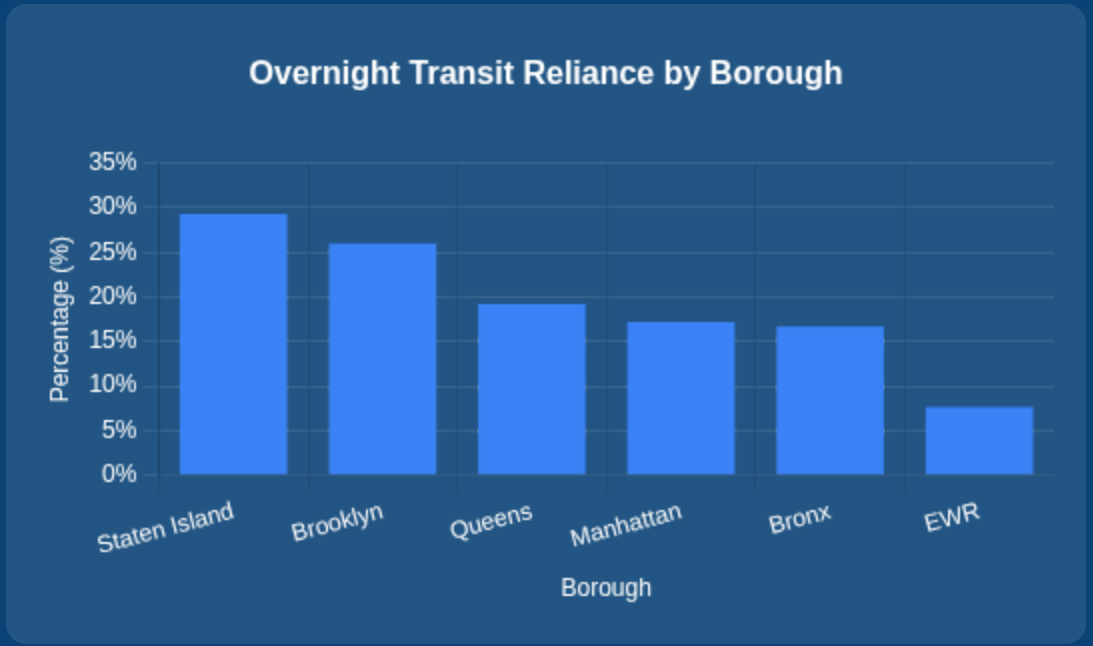
August 26, 2025

Executive Summary

Key Findings

- **Inequitable Distribution:** Significant disparities exist in overnight transit reliance across NYC boroughs and zones
- **High-Need Zones:** Lower East Side (59%), Alphabet City (53.8%), and Greenwich Village South (47.7%) show highest overnight dependency
- **Borough Patterns:** Staten Island (29.3%) and Brooklyn (26.0%) have higher overnight reliance than Manhattan overall (17.2%)
- **Peak Hours:** Critical service gaps exist during 10PM-1AM period, when demand is highest in key zones

Data reveals a transit system that does not adequately serve late-night workers, with service frequency misaligned with community needs.



EWR = Newark Liberty International Airport

Late-night workers in outer boroughs and specific Manhattan zones face the greatest transit inequities

SECTION 1

The Problem: Equity Gaps in Late Night Transit

Not all NYC neighborhoods and communities have equal access to reliable overnight public transit. Late-night workers disproportionately face longer waits, fewer options, and greater safety risks.

Research Methodology

Data Source

NYC Taxi & Limousine Commission Yellow Taxi data (2024)

Comprehensive trip records with pickup/dropoff locations and timestamps

Seasonal coverage: February, April, July, October 2024

Analysis Tools

- Python
- DuckDB
- pandas
- matplotlib
- seaborn
- Jupyter

Sample Size

13.4 million raw trips, 13.2 million cleaned trips

- 2.3+ million overnight trips (10PM - 5:59AM)
- All five boroughs + Newark Airport (EWR)
- 265+ taxi zones analyzed (minimum 10,000 trips per zone)

Key Metric Definition

Overnight Reliance

$$(\text{Overnight Trips} \div \text{Total Trips}) \times 100$$

Measures percentage of total trips occurring during overnight hours (10:00 PM to 5:59 AM, 8-hour window)

Data Collection

Raw trip data from NYC TLC public dataset (4 seasonal months in 2024)

Data Cleaning

Filter records: $0-2000 fare, 0-100 mile trips, standardize zones, handle missing values

Analysis

Calculate overnight reliance metrics by zone (minimum 10,000 trips threshold), peak hour analysis

Visualization

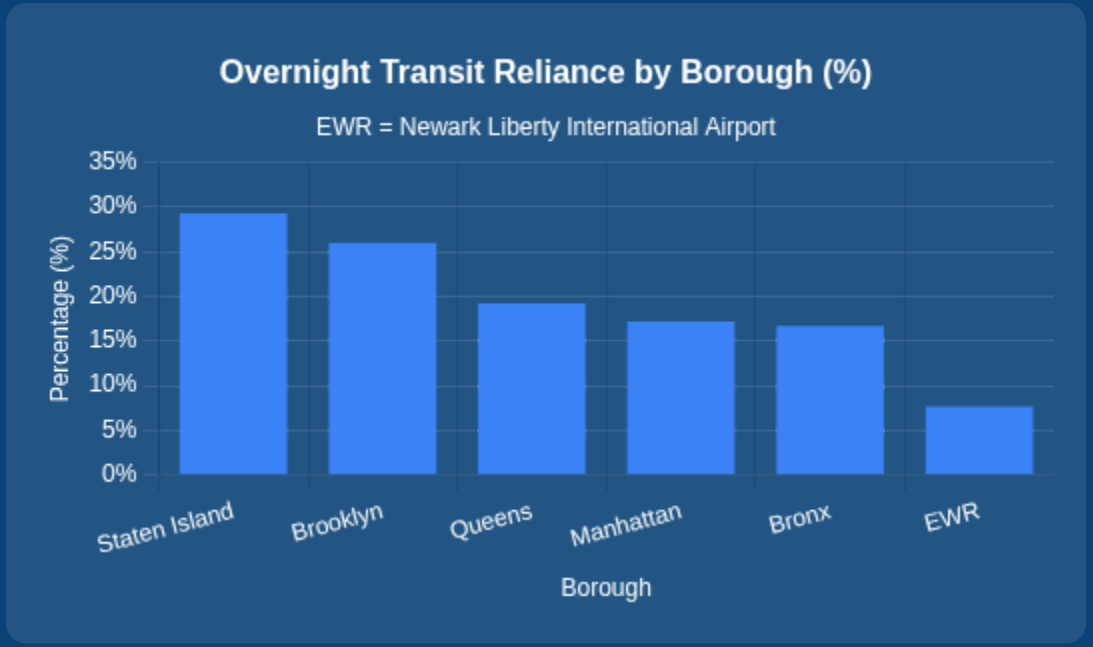
Create actionable insights through charts, heatmaps, and data tables

Data Deep Dive: Understanding Overnight Reliance

Key Metrics

- **Overnight Trip Volume:** 2.3+ million overnight trips analyzed across NYC boroughs
- **Reliance Percentage:** Percentage of total trips that occur during overnight hours (10PM-5AM)
- **Geographic Disparity:** Significant variation across boroughs, with Staten Island and Brooklyn showing higher overnight dependency
- **Zone Analysis:** Lower East Side shows highest overnight reliance at 59%, indicating potential service mismatch

Data Insight: While Manhattan has the highest volume of overnight trips (2+ million), outer boroughs show higher reliance percentages, suggesting greater dependency on overnight transit options despite less frequent service.



Who Relies on Overnight Transit?

Neighborhood Disparities

- **Lower Income Communities:** Highest reliance in neighborhoods with greater percentages of service workers
- **Brooklyn Concentrations:** 3 of the 5 highest-need zones are in Brooklyn (Williamsburg and East Williamsburg)
- **Outer Boroughs:** Staten Island and Brooklyn residents disproportionately rely on overnight service
- ⚠ **Top 5 High-Need Zones:** Williamsburg North Side (70%), East Williamsburg (68%), Eltingville/Annadale/Prince's Bay (67%), Bushwick North (62%), Williamsburg South Side (60%)

Equity Implications

Late-night service workers, healthcare professionals, and residents of lower-income neighborhoods face the greatest burden from limited overnight transit options. These disparities compound existing transportation inequities across NYC communities, with Brooklyn neighborhoods showing particularly high overnight dependency.

Essential workers (healthcare, food service, cleaning) most affected by overnight transit gaps

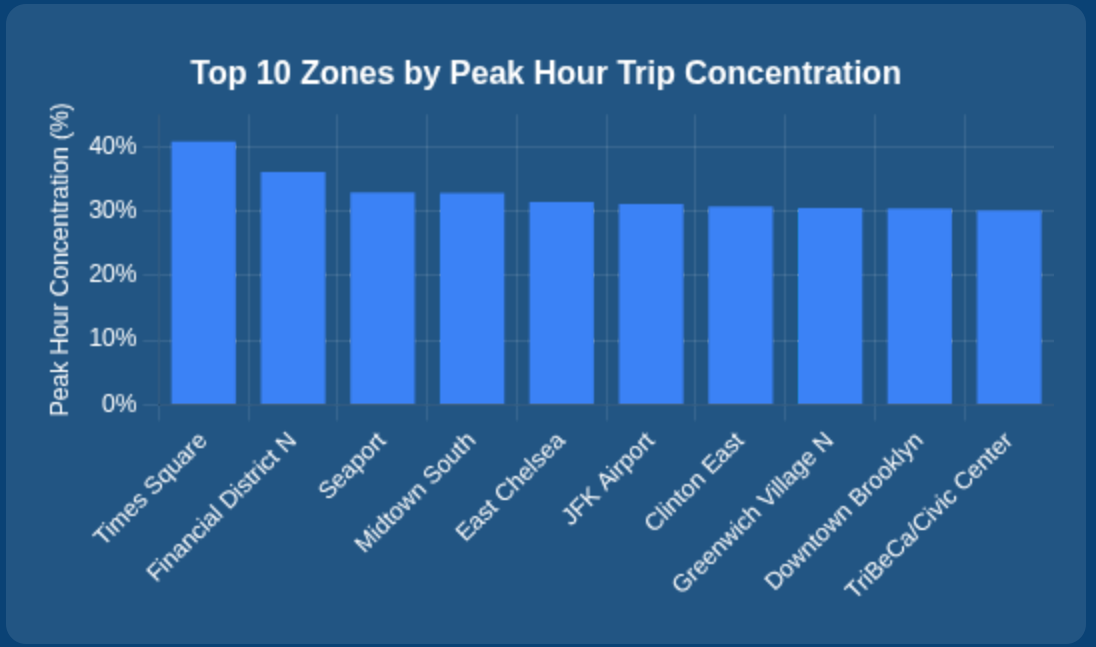
All 5 high-need zones have over 60% overnight trip reliance

Peak Hours & Service Gaps

Key Insights

- **Variable Peak Hours:** Different zones show distinct peak patterns throughout the overnight period
- **Late Night Peaks:** Lower East Side peaks between midnight-2 AM, showing nightlife patterns
- **Early Morning Patterns:** Some areas like Williamsburg (North) show significant 5 AM peaks, suggesting worker commutes
- **Service Gap:** Transit frequency often reduced during critical overnight hours when demand spikes in specific neighborhoods

Peak demand varies significantly by neighborhood, requiring zone-specific transit solutions rather than a one-size-fits-all approach.



Note: These high-volume zones differ from the high-reliance zones discussed elsewhere

Zone-Specific Peak Hours

00:00-02:00
Lower East Side
Peak Hours

23:00
Willets Point
Corona Peak

05:00
Williamsburg
Morning Peak

SECTION 2

Proposed Solutions: Advancing Equity

Expand overnight transit frequency in underserved high-reliance zones.
Adjust bus routes and subway schedules to better serve late-shift workers.
Prioritize investments for Brooklyn, Bronx, and key Manhattan zones.

Implementation Roadmap

Three-Phase Approach

1 Immediate Pilot (3-6 months)

- Launch increased service in top 5 highest-need zones
- Establish baseline metrics and data collection

2 Expansion (6-18 months)

- Extend coverage to all zones with >25% overnight reliance
- Create late-night worker advisory committee

3 Systemwide Integration (18-36 months)

- Implement equity-focused service standards citywide
- Annual equity impact assessment and adjustments

Implementation Timeline

Key Success Metrics

Reduced Wait Times
30% reduction in overnight wait times in target zones

Increased Ridership
15% increase in late-night transit usage

Safety Perception
25% improvement in safety perception surveys

Equity Index
Achieve 90+ equity score across all boroughs

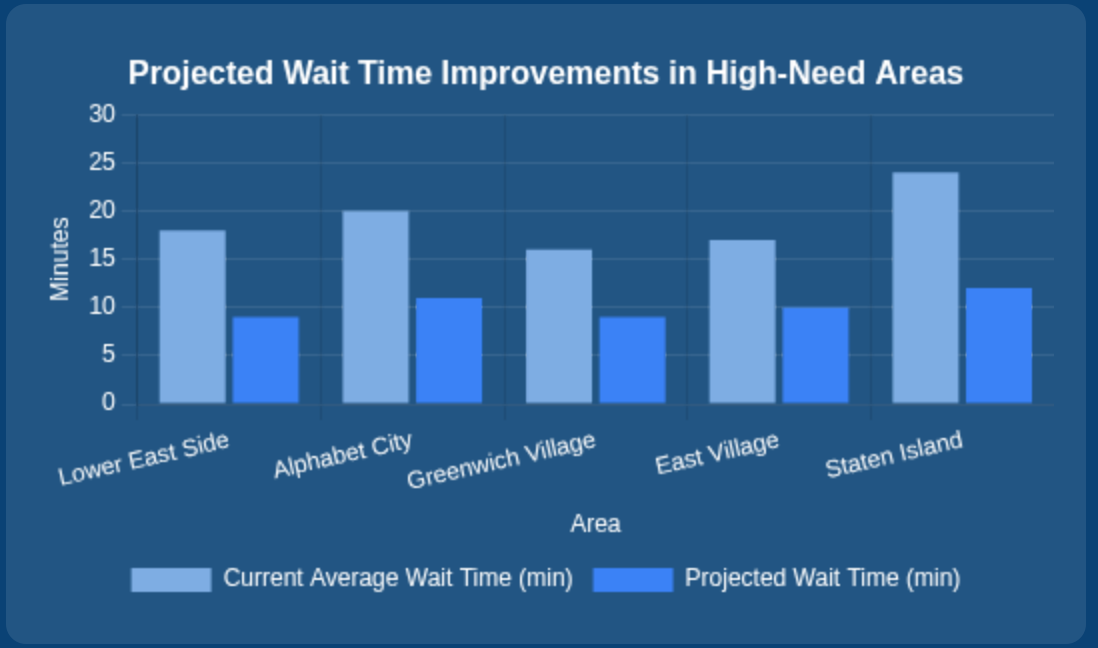
Expected Impact

Benefits of Improved Service

Reduced Wait Times
30-50% decrease in average wait times for high-reliance zones during overnight hours

Enhanced Safety
Improved perceptions of safety with better lit, more populated transit stops and stations

Economic Benefits
$1,200-1,800 annual savings per worker through reduced reliance on alternative transportation



Targeting highest-need zones first delivers maximum equity improvements

FINAL CALL

Call to Action: Transit Equity Now

1. Support increased funding for overnight routes in high-need areas
2. Advocate for data-driven transit equity assessments
3. Promote policies prioritizing late-night worker transit access

Get Involved

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nyc.gov/transit-equity

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NYC deserves a transit system that works for everyone, at every hour