Comparison of AI Driven Congestion Management

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To demonstrate the feasible and effective implementation of an AI driven commuter engagement and dynamic pricing system, we draw insights from 2 comparable initiatives: New York City's Congestion Relief Zone and San Francisco's SFpark pilot program. These examples highlight the successful application of congestion management programs and the use of real-time data to alleviate traffic congestion. Both cities provide a valuable framework for Salt Lake City to build on in addressing its own traffic congestion challenges.

KEY TAKEAWAYS

- Technology enabled systems increase the efficiency and effectiveness of solutions, and both programs leverage historical and real-time data. Our proposed solution aims to leverage real-time data with traffic analytics and data integration through the new system/app.
- Dynamic pricing and congestion pricing were successful strategies in both cases. Our proposed solution aims to test dynamic pricing and incentivization for public transit use.
- Multimodal support is critical. The proposed solution emphasizes and prioritizes this by integrating data from various modes of transport.
- Behavioral nudges play a significant role in encouraging the use of public transit. SF*park* uses subtle price nudges to shift behavior. The proposed solution intends to leverage these behavioral insights to optimize public transit use and nudge commuters toward sustainable choices, helping to reduce traffic congestion.
- A plan will be needed for offering subsidies, exemptions, or alternative options for public transit-dependent commuters.

1. NEW YORK CITY'S CONGESTION RELIEF ZONE

Context

New York City has long been notorious for its horrendous traffic, and it was ranked as the world's most congested city in the 2023 INRIX Traffic Scorecard report. Moreover, drivers are estimated to lose $1,762 annually

in fuel costs due to time spent idling in traffic. To address this issue, New York City implemented the nation's first Congestion Relief Zone, which took effect on Sunday, January 5, 2025. This initiative incentivizes commuters to use public transit instead of driving, thereby avoiding higher fees on major highways and other transit routes. The program aims to reduce traffic congestion, enhance transit efficiency, and generate revenue for the Metropolitan Transportation Authority (MTA). In its first week, the program led to a 7.5% reduction in traffic entering the tolling zone, translating into approximately 43,000 fewer vehicles daily. Morning rush-hour travel times improved as much as 40% in certain areas.

Relevance To Salt Lake City

As Salt Lake City continues to expand its public transit system, it may consider incentivizing public transit use by offering monetary benefits. This approach does not necessitate penalizing drivers; rather, Salt Lake City could encourage public transit ridership by providing discounted fares or free rides.

The New York trial had the following results:

1. 219,000 fewer vehicles entered the central business district in the first workweek.
2. Overall travel times were 30% to 40% faster on inbound river crossings.
3. Bus routes crossing the East and Hudson Rivers saw the greatest improvement in speeds, with time savings of up to 4 minutes per trip.

> *"When a car is able to travel faster over a bridge or through a tunnel, that motorist saves a few minutes, but when a bus is able to do the same, 50 people benefit from those time savings. We hope to see a continuing trend of better bus speeds, which will only make the transit network stronger, and complement the best subway on-time performance in over a decade and increased service frequencies across 12 subway lines."*
>
> MTA President Demetrius Crichlow

Application

Salt Lake City has an opportunity to implement similar congestion-based pricing strategies to incentivize riders and increase public transit ridership. This change could enhance the commuting experience for both public transit users and drivers. Furthermore, by leveraging real-time data, Salt Lake City could determine the best ways to serve new commuters, optimizing transit routes and schedules accordingly.

2. SAN FRANCISCO'S SFPARK

Context

San Francisco, like many urban cities, struggles with traffic congestion exacerbated by drivers circling for parking, which accounts for an estimated 30% of downtown traffic. To address this issue, the San Francisco Municipal Transportation Agency launched SFpark, a federally funded pilot program aimed at reducing congestion through demand-responsive pricing and real-time parking data. By utilizing sensors and smart meters, SFpark provides real-time availability data and adjusts parking prices to encourage drivers to park in less crowded areas.

Relevance To Salt Lake City

Although SFpark focuses on parking rather than public transit, its underlying strategy of utilizing real-time data and dynamic pricing to manage urban mobility is directly applicable to Salt Lake City's congestion challenges. SFpark demonstrates that modest price adjustments based on demand can lead to more efficient resource utilization and reduced vehicle traffic. Salt Lake City could adopt dynamic fare pricing for transit to influence commuter behavior without resorting to punitive measures. This approach would create incentives for more balanced ridership, reduced traffic, and lower greenhouse gas emissions. Additionally, the net parking revenue from SFpark increased by $1.9 million per year.

Application

Salt Lake City has the opportunity to learn from San Francisco's SFpark initiative. Rather than adjusting parking prices, Salt Lake City could leverage AI to predict peak congestion periods, which would activate a real-time dynamic pricing model for transit fares and encourage more people to use public transit. This approach should help reduce congestion caused by peak-hour driving and better distribute transit use across routes and time windows, emulating SFpark's success in optimizing parking demand. An important aspect of SFpark is its collection of real-time data, which not only provides information on available on- and off-street parking but also facilitates a transparent, rules-based, and data-driven approach to adjusting parking prices. Similarly, Salt Lake City could integrate datasets from the Utah Department of Transportation and the Utah Transit Authority (UTA), combining bus, TRAX light rail, FrontRunner commuter rail, and other public transit data with real-time traffic information to build a comprehensive multimodal transit system. Such a solution would encourage more commuters to choose public transit, ultimately reducing greenhouse gas emissions and enhancing service reliability while contributing to the net revenue.

3. FINAL COMPARISON

The following table presents a final comparison of New York City's Congestion Relief Zone, San Francisco's SFpark, and our proposed solution for traffic congestion in Salt Lake City:

	New York City's Congestion Relief Zone	San Francisco's SFpark	Proposed Solution for Salt Lake City
Primary Goal	Reduce traffic congestion, improve transit efficiency, increase revenue.	Reduce traffic congestion, improve parking availability, increase revenue.	Reduce traffic congestion, increase public transit ridership, integrate multimodal transportation options while contributing to revenue.
Secondary Goal	Improve air quality, reduce emissions.	Lower greenhouse gas emissions, optimize street use.	Lower greenhouse gas emissions.
Mechanism	Vehicle tools based on time of day and vehicle type.	Dynamic parking rates based on real-time data.	Dynamic pricing based on real-time data and incentivization for public transit use.
Data Collection	Traffic sensors, tolling gantries, plate readers.	Sensors in parking spaces.	Data from traffic sensors would adopt real-time data and potential use of app data.
Technology Used	Automated tolling systems.	Sensors, mobile app interface.	AI enabled system.
Impact	7.5% reduction in traffic. $15 billion earmarked for MTA transit. Ridership increases on express bus routes.	Time to find parking space decreased by 40%. Double parking decreased by 22%. Greenhouse gas emissions decreased by 30%. Net parking revenues increased by approximately $1.9 million per year. Indirect benefit (less driving around looking for parking).	Potential to reduce peak-hour congestion by 10% to 15%. Potential to increase ridership with better integration and incentivization. Opportunity to increase revenue from public transit use. Opportunity for reinvestment in UTA. Potential to reduce greenhouse gas emissions.

Policy Primer

CASE STUDY

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